

Appendix D

Water Well Inventory Report



September 18, 2020

Reference No. 11210029

Mr. Frank Ertl
Badger Daylighting and Hydrovac Services
6678 Wellington Road 34
Cambridge, Ontario
N3C 2V4

Dear Mr. Ertl:

**Re: Water Well Record Search Update
Badger Daylighting & Hydrovac Services
6678 Wellington Road 34, Cambridge, Ontario (Site or Facility)**

1. Introduction

GHD Limited (GHD) has prepared this letter to provide an update to our August 20, 2020 water well survey completed for the above-referenced Site. The original survey involved the identification of on-site wells and off-site wells within 200 metres (m) of the Site property boundary based on the Ontario Ministry of the Environment, Conservation, and Parks (MECP's) on-line Water Well Record Database (Water Well Database)¹. The well locations provided in the Water Well Database are commonly only estimated by MECP in their mapping and need to be verified by a site inspection. GHD conducted a Site inspection with Badger on August 27, 2020. This letter provides the updated well survey and updated recommendations based on the Site inspection and further review of the records.

2. Water Well Search

GHD completed a search of the Water Well Database in order to identify water well records in the database for the on-Site wells and wells located within a 200 m radius of the Site. The search identified 7 on-site well records and 10 off-site (within 200 m of the Property boundary) as documented in the August 20, 2020 letter.

On-Site Wells

During the Site inspection only 4 of the 7 on-site wells identified in the Water Well Database were determined to actually be located on the Property. The locations of the 4 on-site wells are shown on the updated Water Well Search provided as Figure 1. Tabulations of the available well information, including record number, type of well recorded or estimated northing and easting, installation/refurbishment dates, current status, type of well, total depth, and geology are provided in Table 1 (4 on-site wells) and Table 2 (13 off-site wells).

¹ <https://www.ontario.ca/environment-and-energy/map-well-records>



GHD also inspected 3 adjacent residential properties for wells without entering the properties. Based on the well log details and inspections it appears that 3 of 7 wells previously reported as on-site wells are most likely located on 3 residential properties adjacent to the Site. GHD also did not access other off-site properties to attempt to verify the information provide in the Water Well Database for the other 10 off-site wells identified in the August 20, 2020 letter. The updated information and description for each of the 4 on-site and 13 off-site wells located within 200 m of the Site are provided below.

2.1 On-Site Water Supply (Domestic/House) Well 6702342

This domestic well is located on the southwest corner of the Property and was installed in 1967 has a 5 inch diameter well. The well log indicates that the well was installed to a total depth of 28 m and was an open well (no slotted screen) in bedrock.

GHD believes that this well is the original well located in the well house next to Buck Off Stables. Further information provided in a newer well record from 2009 (7143739) indicates that a 5 inch well was abandoned. Well 6702342 is the only on-site well with a 5-inch diameter.

GHD believes that the original 1967 domestic well was abandoned in 2009 and is no longer present.

2.2 Water Supply (Livestock) Well 6705884

This livestock well was installed in 1975 as a 6-inch diameter well. The well log indicates that the well was installed to a total depth of 29.5m and was an open well (no slotted screen) in limestone.

The well is described as located in the center of the Property with "long lane, backs into farm building, and name on mailbox". Further information provided in newer well records from 2009 (7143739 and A0871817) indicates that a 6 inch well was extended up 2.4 m. Well 6705884 is the only on-site well with a 6-inch diameter.

GHD believes that this livestock well is located in the well house next to Buck Off Stables and is currently in use.

2.3 Water Supply (Domestic Well) 6706720

This domestic well was installed in 1978 and appears to be located on-site in the field north of the Badger operations. The well log indicates that the well was installed in 1978 to a total depth of 33.8 m and was an open well (no slotted screen) in gravel.

The sketch on the well log suggests that the MECP map is not accurate as the northing reference point provided on the well log is 4810980 which locates the well at the well house to west of the Badger operations.

GHD believes that this domestic well is located in the well house to the west of Badger operations and is currently used for Badger's operations.



2.4 Water Supply (Domestic) Well 6708332

This domestic well was installed in 1985 and appears to be located in the southeast corner of the Property. The well log indicates that the well was constructed to a total depth of 28 m and was an open well (no slotted screen) in limestone.

The well log says that the well was constructed for a new house, 200m off the road. Although most of the address is redacted, the information suggests that this well is located on concession 3, lot 7, whereas the Badger property is located on parcel 8.

GHD believes that this well is not located on the Property but is located on a separate property west of the Site and adjacent to Country Road 34.

2.5 Water Supply (Domestic Well) 6710346

This well domestic well was installed in 1990 and appears to be located at the north end of Property. The well log indicate that the well was constructed to a depth of 42.6m and was an open well (no slotted screen) in limestone.

Well log information also indicates that this well was constructed for a new house. Although most of the address is redacted, the information suggests that this well is located south of the Site adjacent to Wellington Road 34.

GHD believes that this domestic well is located on a separate residential property southwest of the Site at 6668 County Road 34.

2.6 Water Supply (Domestic Well) 6714539

This domestic well was installed in 2003 and appears to be located at the north end of Property. The well log indicates that this well was constructed to a depth of 28m and was an open well (no slotted screen) in packed gravel.

However, the well log includes an exact address and provides the distance between Wellington Road 34, to the well and to the dwelling.

GHD believes that this domestic well is located on a separate residential property southwest of the Site at 6670 County Road 34.

2.7 On-Site Well Summary

Based on the above information there are currently two active water supply wells on the property. Livestock well 6705884 which is located in the well house next to Buck Off Stables and domestic well 6706720 is located in the Badger well house.



2.8 Additional (Monitoring) Well

During the Site investigation, it also was determined that there also is a hydrogeological monitoring well located east of the main Badger building that is not included in the Water Well Database. The well has a stick up steel casing and a lock but it was not locked at the time of the inspection. It also has a label of BH—214 inside the well lid but no other identification. Well sampling tubing was present in the well at time of inspection. GHD's well depth measurement indicated that the total depth from top of casing was 10.64 m.

2.9 Off-Site Wells Located Within 200 m of Property Line

The 10 off-site wells located within 200 m of the Property boundary were reported in GHD's August 20, 2020 letter and are also located (according to the Water Well Database) as shown on Figure 1 and the well installation details are provided in Table 2.

2.10 Conclusions and Recommendations

Based on the water well record search, onsite investigation and conversations with Badger, the locations and other information for the on and off-site wells was corrected, as shown on Figure 1 and provided in Tables 1 and 2. GHD verified that there are 2 water supply wells on site that are in good working order. Badger has collected groundwater samples from the 2 wells three times each during July and August 2020. Chemical analyses have been completed at an accredited environmental analytical laboratory. The chemical analyses have been reviewed by GHD and reported to Badger (under separate cover). The analyses indicated that all sample results met MECP O. Reg. 153/04 Table 2 Standards ².

GHD recommends that the monitoring well be developed and sampled for chemical analysis at least once to complete the evaluation of Site groundwater quality based on existing wells.

Please contact the undersigned if you have any questions (Telephone: 519-340-4222 or at Email: fred.taylor@ghd.com).

Yours truly,

GHD



Fred K. Taylor, P. Eng.

FT/cb/

cc: Amelia Soutar, GHD

Encl.

Well ID	Well Tag # (since 2003)	Depth (m)	Geology	Type of Well	Location	Installed	Refurbishment	Potable	Abandoned	Current Status
<u>On Site Wells</u>										
6702342	NA	29.3	Stones, sand, clay, bedrock	water supply domestic (house)	N/A	1967	N/A	Yes	No	Abandoned
6705884	NA	29.5	Clay, broken limestone, limestone	water supply (livestock)	Stable well house	1975	Yes	Yes	No	In use, well extended based on well record (7143739)
6706720	NA	33.8	Sand, gravel	water supply (domestic)	Badger well house	1978	N/A	Yes	No	In use
7143739	A087181	NA	N/A	Well record for abandonment and extension	N/A	2009	Yes	Yes	Yes	Well record of abandonment of 2 wells (dug well and 5 inch) and a well extension.
No Record	BH-214		Unknown	Monitoring		Unknown	Unknown	No	No	

Notes:

(1) Comments found on: <https://www.ontario.ca/environment-and-energy/map-well-records>
 NA - not available

Table 2

Well ID	Well Tag # (since 2003)	Depth (m)	Geology	Type of Well	Northing and Easting	Installed	Abandoned	Current Status
<u>Off Site Wells</u>								
6708332	NA	28.0	Gravel, sand, sly, limestone	water supply domestic	N/A	1985	no	Unknown
6710346	NA	42.6	Clay, sand, limestone	water supply domestic	N/A	1990	no	Unknown
6714539	NA	28.0	Top soil, clay, gravel	water supply domestic	N/A	2003	no	Unknown
6702340	NA	26.8	Gravel, clay, sand	water supply domestic	N/A	1950	N/A	Unknown
6702343	NA	38.4	Sand, gravel, rock	water supply domestic	N/A	1962	N/A	Unknown
6703141	NA	59.1	Sand, gravel, rock	water supply domestic	N/A	1968	N/A	Unknown
6704535	NA	50.9	Clay, gravel, rock	water supply domestic	N/A	1973	N/A	Unknown
6704990	NA	32.6	Clay, sand, gravel	water supply domestic	N/A	1974	N/A	Unknown
6712051	NA	33.8	Sand, clay, gravel	water supply domestic	N/A	1996	N/A	Unknown
7106164	A072033	31.1	Clay, sand, gravel, limestone	water supply domestic	N/A	2008	N/A	Unknown
7214322	A137700	41.8	Sand, gravel, limestone	water supply domestic	Easting: 560279 Northing: 4810368	2013	N/A	Unknown
7262884	A191498	38.1	Sand, Limestone	water supply domestic	Easting: 560039 Northing: 4810550	2016	no	Unknown
7262885	A087181	32.9	N/A	water supply domestic	Easting: 560654 Northing: 4810535	2016	yes	Well abandonment

Notes:

(1) Comments found on: <https://www.ontario.ca/environment-and-energy/map-well-records>
NA - not available

Attachment A



67 No 2342

UTM 11 U E

The Ontario Water Resources Commission Act

Elev. 0 R 1050

WATER WELL RECORD

Basin 23 Wellington County or District

Township, Village, Town or City Puskeech

Con. 3 III Lot 8

Date completed 14 May 67 (day month year)

Owner [Redacted] (print in block letters)

Address 474 Hwy Crescent R.R # 2, Nepean, Goulph

Casing and Screen Record

Pumping Test

Inside diameter of casing 6 1/4
 Total length of casing 92
 Type of screen —
 Length of screen —
 Depth to top of screen —
 Diameter of finished hole 5 in

Static level 33
 Test-pumping rate 20 G.P.M.
 Pumping level 37
 Duration of test pumping 1 hr
 Water clear or cloudy at end of test clear
 Recommended pumping rate 10 G.P.M.
 with pump setting of 50 to 70 feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Stones and Gravel	0	35	94	fresh
Sandy clay and small stones	35	85		
Sand and gravel	85	90		
Silty sand	90	92		
Rock	92	96		

For what purpose(s) is the water to be used? D. House

Is well on upland, in valley, or on hillside? upland

Drilling or Boring Firm W Pockhom

Address RR 2 Oneaster

Licence Number 2498

Name of Driller or Borer W Pockhom

Address RR 2 Oneaster

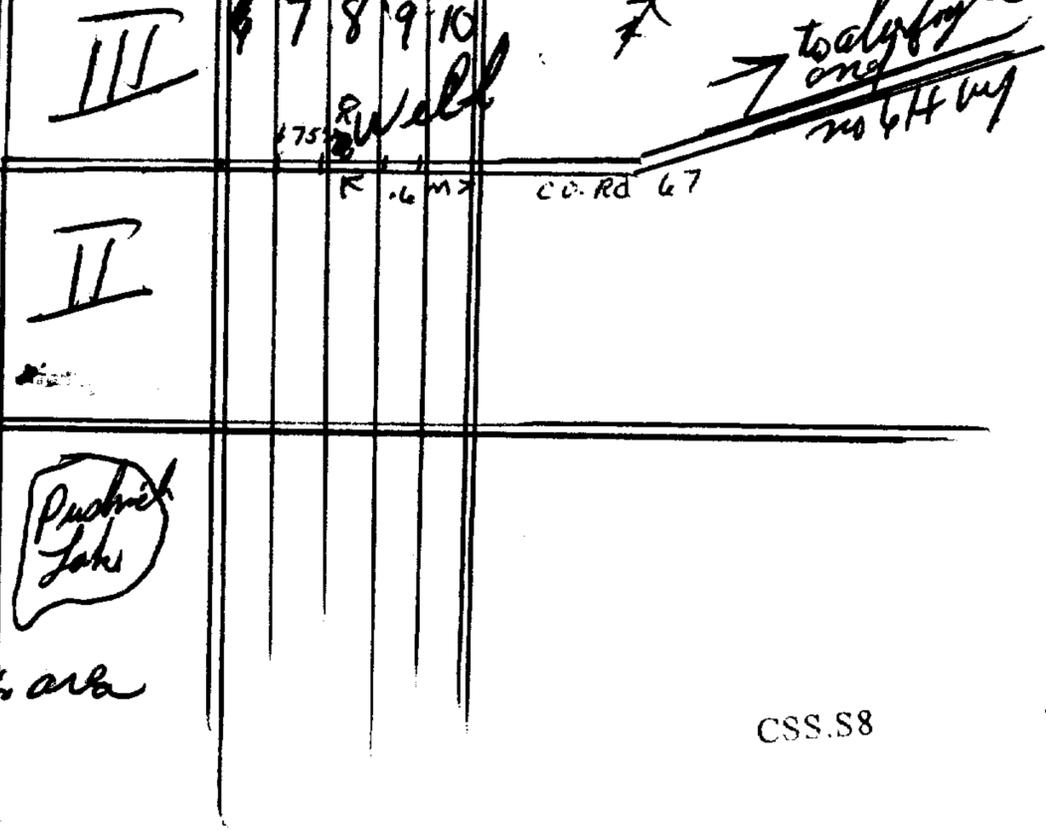
Date May 14/67

(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138 125th N & SRd 1/4 W side of county reformation area

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



40P/6W

17 5601010
5 9810150
5 71045



6703141-
3 9

DIVISION OF
WATER RESOURCES
JAN 9 1969
ONTARIO WATER
RESOURCES COMMISSION

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District **Wellington** Township, Village, Town or City
Con. **2** Lot **7** Date completed **4th December 1968**
(day month year)
Address **Guelph Ont. RR# 2 Hepler**

Casing and Screen Record
Inside diameter of casing **5 inch**
Total length of casing **111 ft**
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole **5 inch**

Pumping Test
Static level **42 ft**
Test-pumping rate **10** G.P.M.
Pumping level **60 ft**
Duration of test pumping **1/2 hr bailer test**
Water clear or cloudy at end of test **clear**
Recommended pumping rate **10** G.P.M.
with pump setting of **60** feet below ground surface

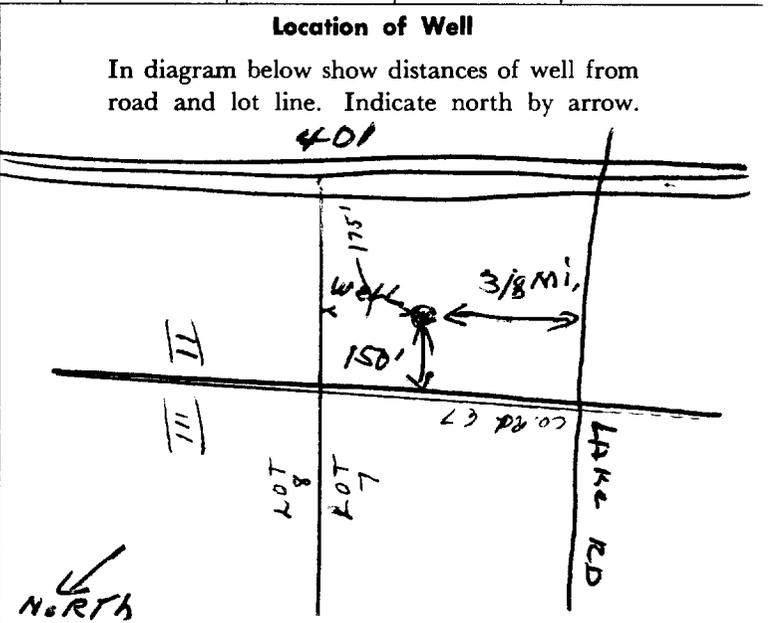
Well Log

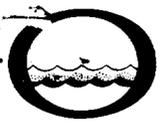
Overburden and Bedrock Record	From ft.	To ft.
stones and gravel	0	48
clay and gravel	48	90
hard packed sand	90	111
brown rock	111	155
light grey rock	180	194

Water Record

Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
180	fresh
to	
194	

For what purpose(s) is the water to be used? **household**
Is well on upland, in valley, or on hillside? **hillside**
Drilling or Boring Firm **Graham Well Drilling**
mailing R 2 Guelph Ont.
Address
Licence Number **2855**
Name of Driller or Borer **Arthur Titus**
Address **25 Eramosa Rd. Guelph**
Date **December 4th 1968**
(Signature of Licensed Drilling or Boring Contractor)





WATER WELL RECORD

40 P/SW1

Water management in Ontario

1. PRINT ONLY IN SPACES PROVIDED

2. CHECK CORRECT BOX WHERE APPLICABLE

11
1 2

670 4535

MUNICIP 670.12

CON Cdn

02

COUNTY OR DISTRICT WELLINGTON	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE DUSLINC H	CON., BLOCK, TRACT, SURVEY, ETC. 2	LOT 25-27 009
DATE COMPLETED DAY 27 MO 01 YR 73			
ADDRESS 22 Fairview or Preston			
RC. 24 10280	RC. 25 4	ELEVATION 26 10.35	RC. 30 5
BASIN CODE 23			

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
		well pit		0	5
Brown	Clay & Boulders			5	24
	sandy clay & boulders			24	87
	Cemented gravel				
	Rock			92	167

31	0005 23	0027 05 13	0067 06 26
32			

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
0160	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR		
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
05	1 <input checked="" type="checkbox"/> STEEL	244	0	93
	2 <input type="checkbox"/> GALVANIZED			0093
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			

SCREEN

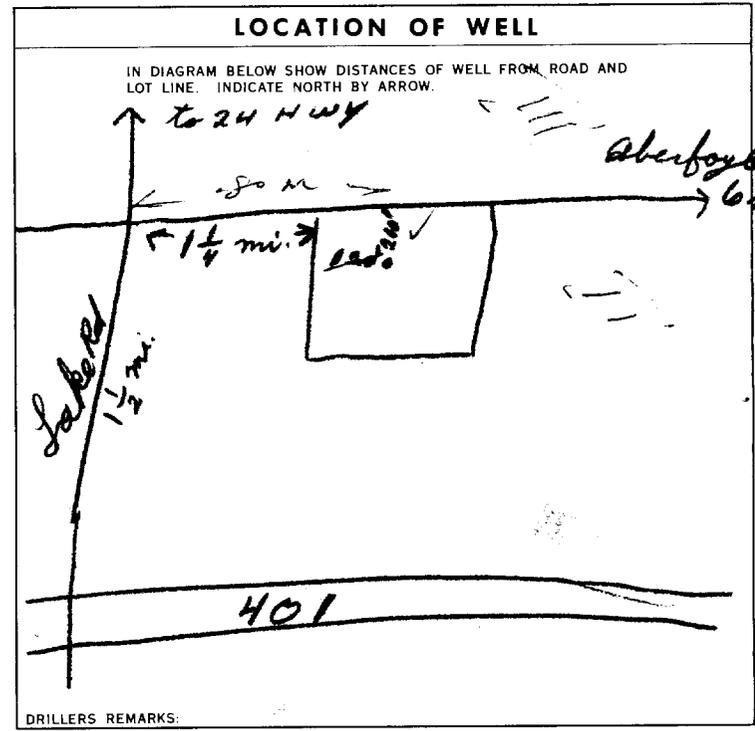
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE
10-13	14-17

71 PUMPING TEST

PUMPING TEST METHOD 1 <input type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	PUMPING RATE 0012 GPM.	DURATION OF PUMPING 01 HOURS 30 MINS.
STATIC LEVEL 032 FEET	WATER LEVEL END OF PUMPING 038 FEET	WATER LEVELS DURING PUMPING 15 MINUTES: 003 FEET 30 MINUTES: 032 FEET 45 MINUTES: 032 FEET 60 MINUTES: 032 FEET
RECOMMENDED PUMP TYPE 1 <input type="checkbox"/> SHALLOW 2 <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING 080 FEET	RECOMMENDED PUMPING RATE 0012 GPM.



FINAL STATUS OF WELL

1 WATER SUPPLY 5 ABANDONED, INSUFFICIENT SUPPLY
 2 OBSERVATION WELL 6 ABANDONED, POOR QUALITY
 3 TEST HOLE 7 UNFINISHED
 4 RECHARGE WELL

WATER USE

1 DOMESTIC 5 COMMERCIAL
 2 STOCK 6 MUNICIPAL
 3 IRRIGATION 7 PUBLIC SUPPLY
 4 INDUSTRIAL 8 COOLING OR AIR CONDITIONING
 9 NOT USED

METHOD OF DRILLING

1 CABLE TOOL 6 BORING
 2 ROTARY (CONVENTIONAL) 7 DIAMOND
 3 ROTARY (REVERSE) 8 JETTING
 4 ROTARY (AIR) 9 DRIVING
 5 AIR PERCUSSION

CONTRACTOR NAME Paul Weber	LICENCE NUMBER 5469
ADDRESS RR 2 Breslau	
NAME OF DRILLER OR BORE Clayton Shantz	LICENCE NUMBER
SIGNATURE OF CONTRACTOR	SUBMISSION DATE DAY 30 MO 1 YR 73

DATA SOURCE	CONTRACTOR 5469	DATE RECEIVED 020273
DATE OF INSPECTION	INSPECTOR	
REMARKS		



Ontario

WATER WELL RECORD

409/87

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

6704990

MUNICIPALITY 1670124

CON. CDN

LOT 007

COUNTY OR DISTRICT: Wellington
 TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Puslinch
 CON., BLOCK, TRACT, SURVEY, ETC.: conc. 2
 DATE COMPLETED: 14 02 74
 KITCHENER

17 380151 4810122 4 1045 4 23 MAR 20, 1975 50

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	clay	stones		0	40
"	"	gravel		40	60
Dark brown-hardpan,	sand			60	90
"	"	coarse gravel		90	100
"	sand	gravel		100	106
		gravel		106	107
Total depth 107 ft.					

31 0040605/12 0060605/11 0090614/28 0100614/28/11 0100629/11 01017/11

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0107	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
15-18	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
20-23	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
25-28	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
30-33	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

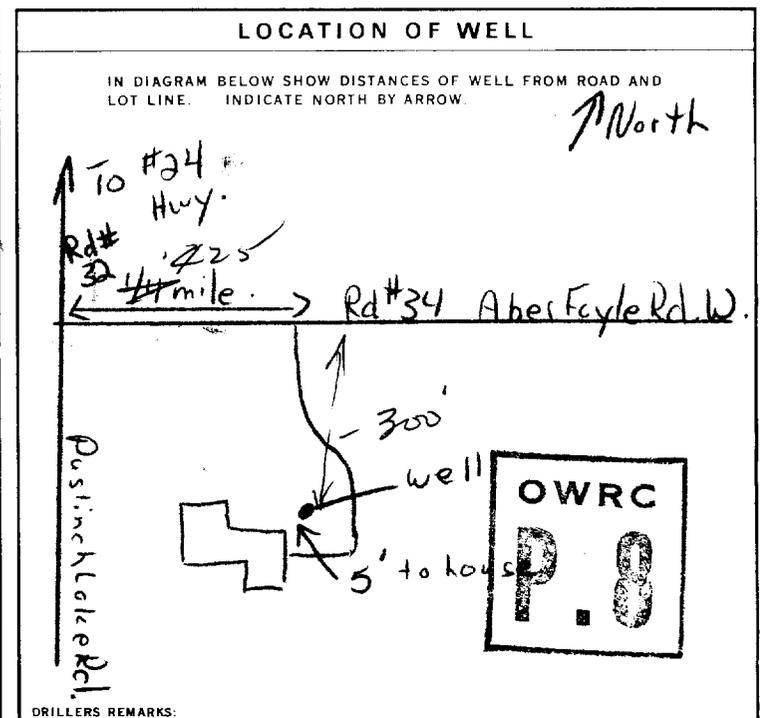
INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
05	STEEL	.188	0	106
05	STEEL		106	107

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE
10-13	14-17
18-21	22-25
26-29	30-33

71 PUMPING TEST

PUMPING TEST METHOD: PUMP BAILER
 PUMPING RATE: 0010 GPM
 DURATION OF PUMPING: 00 HOURS 00 MINS
 WATER LEVELS DURING: 19-21: 040 FEET, 22-24: 048 FEET, 26-28: 040 FEET
 PUMP INTAKE SET AT: 055 FEET
 RECOMMENDED PUMP SETTING: 055 FEET
 RECOMMENDED PUMPING RATE: 0020 GPM



FINAL STATUS OF WELL

1 WATER SUPPLY
 2 OBSERVATION WELL
 3 TEST HOLE
 4 RECHARGE WELL
 5 ABANDONED, INSUFFICIENT SUPPLY
 6 ABANDONED, POOR QUALITY
 7 UNFINISHED

WATER USE

1 DOMESTIC
 2 STOCK
 3 IRRIGATION
 4 INDUSTRIAL
 5 OTHER

METHOD OF DRILLING

1 CABLE TOOL
 2 ROTARY (CONVENTIONAL)
 3 ROTARY (REVERSE)
 4 ROTARY (AIR)
 5 AIR PERCUSSION

CONTRACTOR

NAME OF WELL CONTRACTOR: R.H. Graham Well Drilling
 LICENCE NUMBER: 2336
 ADDRESS: 212 Waverley Drive, GUELPH, Ont.
 NAME OF DRILLER OR BORER: J. Hawkins
 LICENCE NUMBER: 22W71
 SUBMISSION DATE: DAY 21 MO. 2 YR. 74

OFFICE USE ONLY

DATA SOURCE: 1
 CONTRACTOR: 2336
 DATE RECEIVED: 2 20 74
 DATE OF INSPECTION: _____
 INSPECTOR: _____
 REMARKS: _____



MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act
WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

6705884-11 67012 CON 03

COUNTY OR DISTRICT: Killarney TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Kustinch ELEVATION: 3 BLOCK, TRACT, SURVEY, ETC.: 3 LOT: 008

DATE COMPLETED: 04 18-53
DAY: 01 MONTH: 04 YEAR: 75

WELL NO.: 6705884-11 WELL ID: 380275 WELL ID: 4810720 WELL ID: 4 1060 WELL ID: 4 23 DATE: AUG 09, 1977 WELL ID: 320

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	Dray Well			0	15
Grey	clay			15	45
Grey	clay Hardpan			45	77
Grey	Broken Limestone			77	79
Grey	Limestone			79	97

31 0015 23 0045205 007720514 007921571 0097215

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	14
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	19
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	24
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	29
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	34-80

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
6 1/4	STEEL	188	0	2079
17-18	STEEL			20-23
24-25	STEEL			27-30

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
FROM	TO	
10-13	14-17	
18-21	22-25	
26-29	30-33	80

71 PUMPING TEST

PUMPING TEST METHOD: 1 PUMP 2 BAILER

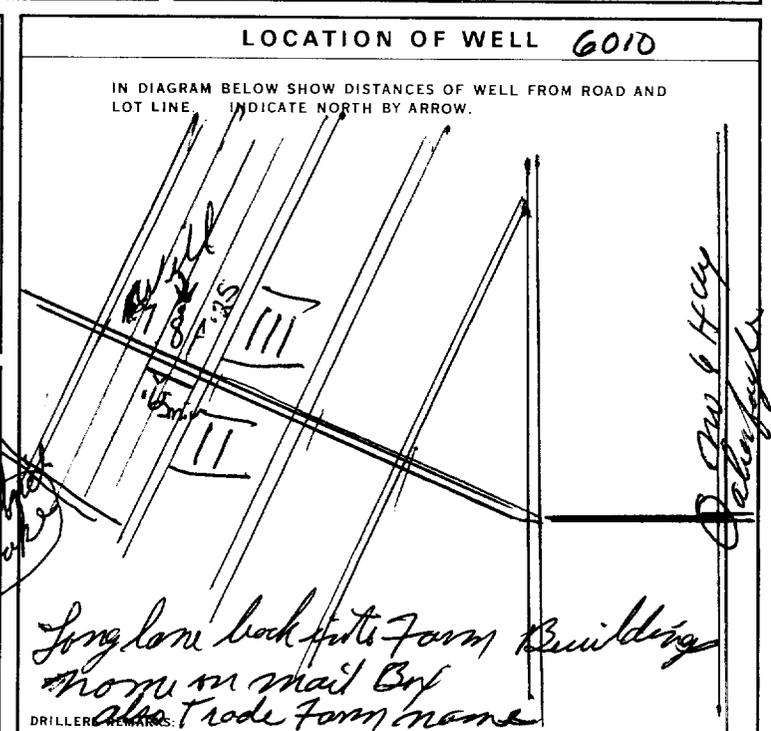
PUMPING RATE: 0007 GPM. DURATION OF PUMPING: 01 HOURS 00 MINS.

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING			
037	090	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES
		047	037	037	037

RECOMMENDED PUMP TYPE: SHALLOW DEEP

RECOMMENDED PUMP SETTING: 080 FEET

RECOMMENDED PUMPING RATE: 0007 GPM.



FINAL STATUS OF WELL

1 WATER SUPPLY 5 ABANDONED, INSUFFICIENT SUPPLY
2 OBSERVATION WELL 6 ABANDONED, POOR QUALITY
3 TEST HOLE 7 UNFINISHED
4 RECHARGE WELL

WATER USE

1 DOMESTIC 5 COMMERCIAL
2 STOCK 6 MUNICIPAL
3 IRRIGATION 7 PUBLIC SUPPLY
4 INDUSTRIAL 8 COOLING OR AIR CONDITIONING
9 OTHER 9 NOT USED

METHOD OF DRILLING

1 CABLE TOOL 6 BORING
2 ROTARY (CONVENTIONAL) 7 DIAMOND
3 ROTARY (REVERSE) 8 JETTING
4 ROTARY (AIR) 9 DRIVING
5 AIR PERCUSSION

CONTRACTOR

NAME OF WELL CONTRACTOR: Wesley Packham LICENCE NUMBER: 4208

NAME OF DRILLER: Wesley Packham LICENCE NUMBER: 4208

SUBMISSION DATE: DAY 1 MO. 04 YR. 75

OFFICE USE ONLY

DATA SOURCE: 1 CONTRACTOR: 4208 DATE RECEIVED: 300176

DATE OF INSPECTION: _____ INSPECTOR: _____

REMARKS: _____

CSS S8

WI



Ontario

WATER WELL RECORD

40 P/82

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11 6706720

MUNICIP. 67012

CON. C/PN

02

COUNTY OR DISTRICT: WELL Co. TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: PUSLINC H TWP CON., BLOCK, TRACT, SURVEY, ETC: CON. 2

DATE COMPLETED: 05 06 1978

RC: 10980 ELEVATION: 4 1030 BASIN CODE: 4 23

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	GRAVEL	SAND	STONEY	0	15
	SAND			15	100
	GRAVEL		FINE	100	111

37 0015 11/28/77 0190 28 0111 29

47 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-15	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
04	STEEL	.188	0 911

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	(CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33	

77 PUMPING TEST

PUMPING TEST METHOD: 1 PUMP 2 BAILER

PUMPING RATE: 0010 GPM

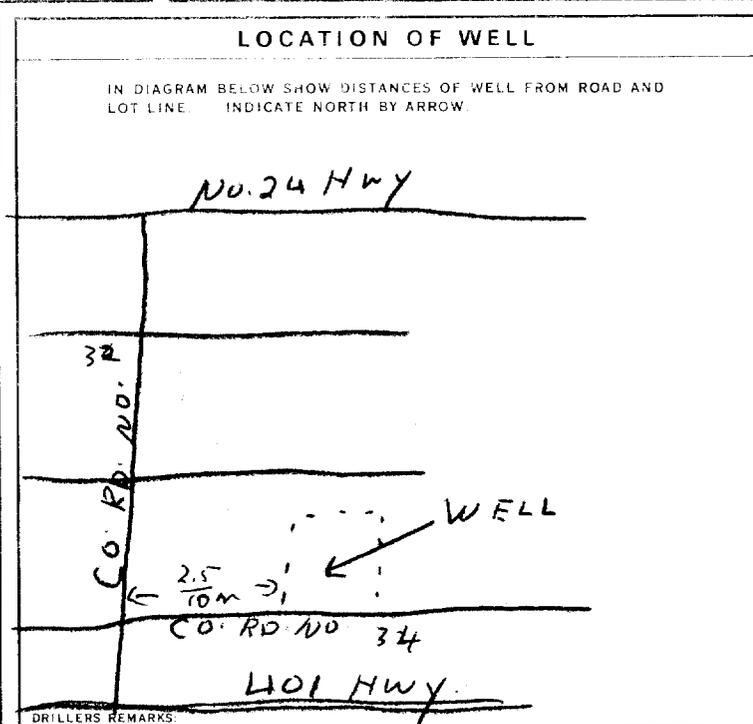
DURATION OF PUMPING: 03 HOUR

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING				
048	050	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES	
		26-28	29-31	32-34	35-37	

RECOMMENDED PUMP TYPE: SHALLOW DEEP

RECOMMENDED PUMP SETTING: 060 FEET

RECOMMENDED PUMPING RATE: 0008 GPM



54 FINAL STATUS OF WELL: 1 WATER SUPPLY

55-56 WATER USE: 1 DOMESTIC

57 METHOD OF DRILLING: 1 CABLE TOOL

CONTRACTOR: HARVEY HILL WELL DRILLING, 2564

ADDRESS: RRI ELORA ONT.

SIGNATURE OF CONTRACTOR: [Redacted]

SUBMISSION DATE: [Redacted]

OFFICE USE ONLY

DATA SOURCE: 1

CONTRACTOR: 2564

DATE RECEIVED: 070778

DATE OF INSPECTION: April 1979

INSPECTOR: [Signature]

REMARKS: [Redacted]

CSS.S8

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Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

6708332

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

COUNTY OR DISTRICT: 21111 TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Paslinch CON. BLOCK, TRACT, SURVEY, ETC: III LOT: 7

DATE COMPLETED: DAY 30 MO Nov. YR 85

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	gravel	stone clay		0	30
Brown	sand	gravel clay		30	50
Gray	clay	sand gravel		50	80
Gray	limestone			80	92

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13 90	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11 6 1/4	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	188	0	80
17-18 6 1/2	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		80	92

SCREEN

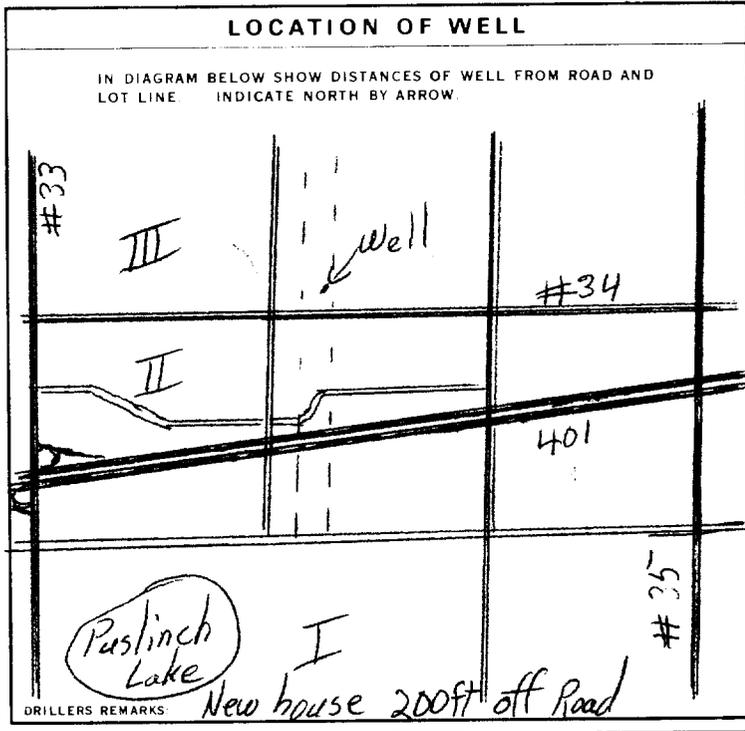
SIZES (S) OF OPENING (SLOT NO. 1)	DIAMETER INCHES	LENGTH FEET
	34-38	39-40
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN 41-44 30

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
10-13	14-17
18-21	22-25
26-29	30-33 80

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input checked="" type="checkbox"/> Air PUMP 2 <input type="checkbox"/> BAILER	9 GPM	1 15-16 HOURS 0 17-18 MINS
STATIC LEVEL	WATER LEVELS DURING	1 <input type="checkbox"/> PUMPING 2 <input checked="" type="checkbox"/> RECOVERY
19-21 34 FEET	22-24 92 FEET	15 MINUTES 26-28 40 FEET
	30 MINUTES 29-31 35 FEET	45 MINUTES 32-34 35 FEET
	60 MINUTES 35-37 34 FEET	
IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	92 GPM	1 <input checked="" type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	85 FEET	9 GPM



FINAL STATUS OF WELL

1 WATER SUPPLY 5 ABANDONED, INSUFFICIENT SUPPLY
2 OBSERVATION WELL 6 ABANDONED, POOR QUALITY
3 TEST HOLE 7 UNFINISHED
4 RECHARGE WELL

WATER USE

1 DOMESTIC 5 COMMERCIAL
2 STOCK 6 MUNICIPAL
3 IRRIGATION 7 PUBLIC SUPPLY
4 INDUSTRIAL 8 COOLING OR AIR CONDITIONING
 OTHER 9 NOT USED

METHOD OF DRILLING

1 CABLE TOOL 6 BORING
2 ROTARY (CONVENTIONAL) 7 DIAMOND
3 ROTARY (REVERSE) 8 JETTING
4 ROTARY (AIR) 9 DRIVING
5 AIR PERCUSSION

CONTRACTOR

NAME OF WELL CONTRACTOR: Packham Well Drilling Inc. LICENCE NUMBER: 4207
ADDRESS: 1235 Trinity Rd. Ancaster Ont.
NAME OF DRILLER OR BORER: Mervyn Packham LICENCE NUMBER: 4207
SIGNATURE OF CONTRACTOR: [Signature] SUBMISSION DATE: DAY 30 MO Nov. YR 85

OFFICE USE ONLY

DATA SOURCE: 58 CONTRACTOR: 59-62 DATE RECEIVED: 13.01.86 80
DATE OF INSPECTION: INSPECTOR:
REMARKS:

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED

2. CHECK CORRECT BOX WHERE APPLICABLE

11

6710346

MUNICIP 67012

CON. CON.

03

COUNTY OR DISTRICT: Wellington TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Puslinch CON. BLOCK, TRACT, SURVEY ETC: III LOT: 8 25-27

OWNER (SURNAME/FIRST): Van-Del Contracting LTD ADDRESS: RR#1 Breslau Ont NO B 1 MO DATE COMPLETED: DAY 8 MO May YR 90

21 ZONE EASTING NORTHING RC. ELEVATION RC. BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	clay	gravel stones		0	5
Grey	clay	silt	soft	5	80
Grey	sand	silt clay		80	94
White	Limestone			94	140

31 32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13 125	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
15-18 138	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11 6 1/4	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	188	0	97
17-18 6 1/8	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC		97	140
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			

SCREEN

SIZE (S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
31-33	34-38	39-40

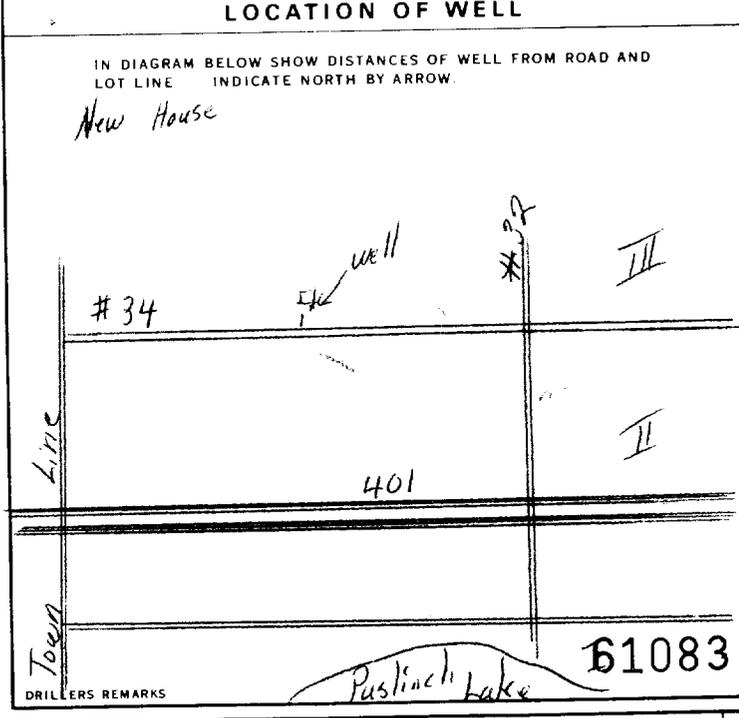
MATERIAL AND TYPE: _____ DEPTH TO TOP OF SCREEN: 41-44 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
FROM	TO
10-13	14-17
18-21	22-25
26-28	30-33

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input checked="" type="checkbox"/> AIR PUMP 2 <input type="checkbox"/> BAILER	100 GPM	15-16 HOURS 0 MINS
STATIC LEVEL	WATER LEVELS DURING	1 <input type="checkbox"/> PUMPING 2 <input checked="" type="checkbox"/> RECOVERY
19-21 37 FEET	22-24 140 FEET	25-28 37 FEET
	29-31 37 FEET	32-34 37 FEET
	35-37 37 FEET	
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	GPM	FEET
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	100 FEET	20 GPM



FINAL STATUS OF WELL

1 <input checked="" type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
2 <input type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED, POOR QUALITY
3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
4 <input type="checkbox"/> RECHARGE WELL	<input type="checkbox"/> DEWATERING

WATER USE

1 <input checked="" type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
<input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED

METHOD OF CONSTRUCTION

1 <input type="checkbox"/> CABLE TOOL	6 <input type="checkbox"/> BORING
2 <input type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND
3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING
4 <input checked="" type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING
5 <input type="checkbox"/> AIR PERCUSSION	<input type="checkbox"/> DIGGING <input type="checkbox"/> OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Packham Well Drilling Inc. WELL CONTRACTOR'S LICENCE NUMBER: 4207

ADDRESS: RR #2 Cheaster Ont.

NAME OF WELL TECHNICIAN: Mervyn Packham WELL TECHNICIAN'S LICENCE NUMBER: 10058

SIGNATURE OF TECHNICIAN/CONTRACTOR: _____ SUBMISSION DATE: DAY 8 MO May YR 90

OFFICE USE ONLY

DATA SOURCE: _____ CONTRACTOR: 4207 DATE RECEIVED: JUN 26 1990

DATE OF INSPECTION: _____ INSPECTOR: _____

REMARKS: _____

CSS.ES

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

6712051

Municipality 67012 Con. CON 07

11

County or District [Redacted] Township/Borough/City/Town/Village PUSHMINT Con block tract survey, etc. 7 Lot 3
Address R.R.#22 Cambridge Date completed 06/08/96
Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
	GRAVEL	SAND		0	20
	SAND		FINE	20	44
	GRAVEL	SAND		44	60
Brown	CLAY	SAND/GRAVEL		60	106
	GRAVEL	SAND	FINE	106	111
	GRAVEL		CONCRETE	111	
TOTAL = 111					
6" CASING DRIVE SIDE					

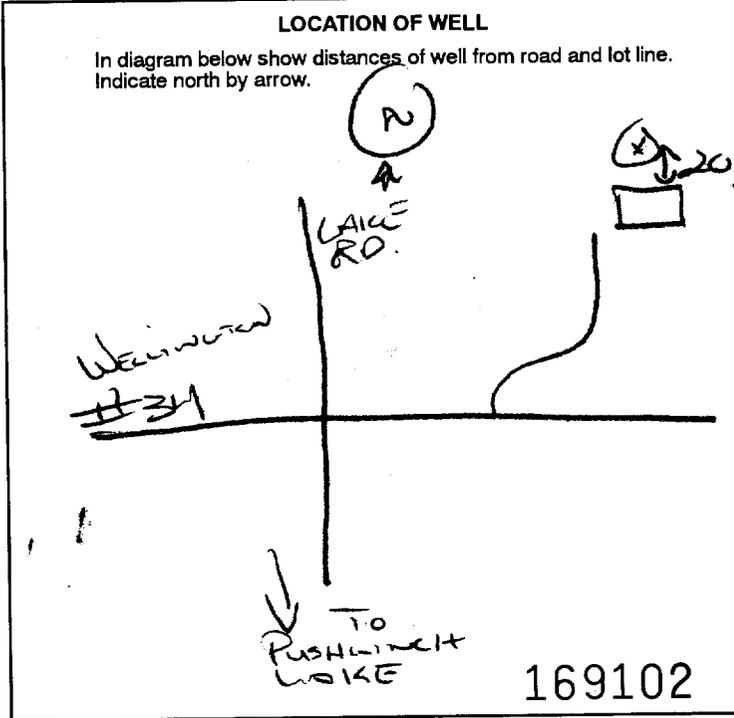
WATER RECORD			
Water found at - feet	Kind of water		
111	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals
	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas	

CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
6"	Steel	1.00 + 2		111

SCREEN	Sizes of opening (Slot No.)	Diameter inches	Length feet

PLUGGING & SEALING RECORD			
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
0	20	BENSAC	

PUMPING TEST		PUMPING RATE		DURATION OF PUMPING	
Static level	Water level end of pumping	20 GPM	11:14	Hours	Minutes
59.99 feet	69.79 feet				



FINAL STATUS OF WELL

Water supply Abandoned, insufficient supply Unfinished

Observation well Abandoned, poor quality Replacement well

Test hole Abandoned (Other)

Recharge well Dewatering

WATER USE

Domestic Commercial Not used

Stock Municipal Other

Irrigation Public supply

Industrial Cooling & air conditioning

METHOD OF CONSTRUCTION

Cable tool Air percussion Driving

Rotary (conventional) Boring Digging

Rotary (reverse) Diamond Other

Rotary (air) Jetting

Name of Well Contractor Steven New Drilling Ltd Well Contractor's Licence No. 2663

Address R.R.#5 GUYTON CANT.

Name of Well Technician Devin Robinson Well Technician's Licence No. 7-0590

Submission date 01/08/96

MINISTRY USE ONLY

Data source 2663 Contractor 2663 Date received AUG 27 1996

Date of inspection _____ Inspector _____

Remarks _____

CSS/ES

Measurements recorded in: Metric Imperial

Page _____ of _____

A072033

Well Owner's Information

6666 WELL RD #34 RR#22
County/District/Municipality: WELLINGTON
City/Town/Village: ~~WATERLOO~~ CAMBRIDGE
Province: Ontario
Postal Code: _____
UTM Coordinates Zone: 17 Easting: 560189 Northing: 4810496
Municipal Plan and Sublot Number: _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
BROWN	CLAY	STONES-SAND		0	18
BROWN	CLAY	SAND		18	45
BROWN	SAND			45	90
BROWN	SAND	GRAVEL		90	94
GREY	CLAY	GRAVEL		94	97
BROWN	LIMESTONE			97	102
TOTAL					102 FT

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0 to 20	BENTONITE SLURRY	

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
<input checked="" type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____				
If pumping discontinued, give reason:	Static Level	35 FT		
	1	38	1	40
Pump intake set at (m/ft): 80 FT	2	40	2	38
Pumping rate (l/min / GPM): 12 GPM	3	41	3	37
Duration of pumping: 1 hrs + 0 min	4	41	4	36
	5	42	5	35
Final water level end of pumping (m/ft): 43 FT	10	42	10	35
If flowing give rate (l/min / GPM):	15	43	15	35
	20	43	20	35
Recommended pump depth (m/ft): 80 FT	25	43	25	35
Recommended pump rate (l/min / GPM): 12 GPM	30	43	30	35
Well production (l/min / GPM): 12 GPM	40	43	40	35
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	50	43	50	35
	60	43	60	35

Method of Construction

Cable Tool Diamond
 Rotary (Conventional) Jetting
 Rotary (Reverse) Driving
 Boring Digging
 Air percussion
 Other, specify **AIR ROTARY**

Well Use

Public Commercial Not used
 Domestic Municipal Dewatering
 Livestock Test Hole Monitoring
 Irrigation Cooling & Air Conditioning
 Industrial
 Other, specify _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
6 1/8	STEEL	.188	+2	98	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____
6 1/8	OPEN HOLE		98	102	

Construction Record - Screen

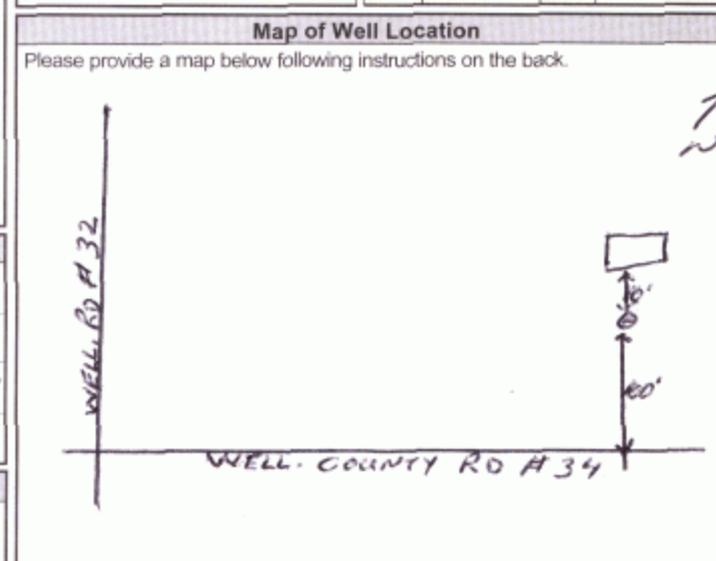
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To

Water Details

Water found at Depth (m/ft)	Kind of Water:	Hole Diameter
102 (m/ft)	<input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Depth (m/ft) Diameter (cm/in)
		0 20 8 3/4
		20 102 6 1/8

Well Contractor and Well Technician Information

Business Name: ~~NAME OF WELL CONTRACTOR~~ ADDRESS: 2086 SHANTZ STN. RD
 Well Contractor's Licence No.: 7385
 Business Address (Street Number Name): JIM WILSON WELL DRILLING
 Municipality: BRESLAU
 Province: ON Postal Code: N0B1M0 Business E-mail Address: _____
 Bus. Telephone No. (inc. area code): 5196482412 Name of Well Technician (Last Name, First Name): WILSON JIM
 Well Technician's Licence No.: T1924 Signature of Technician and/or Contractor: _____ Date Submitted: 20080529



Comments: _____

Well owner's information package delivered: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered: 20080505	Ministry Use Only Audit No. Z 80621 JUN 09 2008
Date Work Completed: 20080505	Received	

Address of Well Location (Street Number/Name) **#6678 WILKINSON RD. #34 R2#22** Township **PURNELL** Lot **A 8** Concession **3**

County/District/Municipality **WILKINSON** City/Town/Village **PURNELL** Province **Ontario** Postal Code _____

UTM Coordinates Zone **83** Easting **12560290** Northing **4810922** Municipal Plan and Sublot Number _____ Other _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
				From To
	ABANDONMENT			
		GRAVEL		
		36"		
		6 FT.		
		8 FT		
		EXTENDED 6" WELL		
		100 FT		
		18 FT		
		8"		
		3"		
		8 FT		
		ABANDONED 5" WELL		
		ABANDONED 6" WELL		

Annular Space		
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From To		
0 18	BENTONITE + GRAVEL (6" WELL)	
6 80	BENTONITE (5" WELL)	
	GRAVEL = 6 YARDS	
	BENTONITE = 1850 LBS.	

Method of Construction		Well Use	
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input type="checkbox"/> Domestic	<input type="checkbox"/> Municipal
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning
<input type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial	
<input type="checkbox"/> Other, specify _____		<input type="checkbox"/> Other, specify _____	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input checked="" type="checkbox"/> Alteration (Construction) <input checked="" type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____
			From	To	

Construction Record - Screen		Water Details		Hole Diameter		
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	Depth (m/ft)	Diameter (cm/in)

Well Contractor and Well Technician Information

Business Name of Well Contractor **Hannon Well Drilling** Well Contractor's Licence No. **2663**

Business Address (Street Number/Name) **2663 GUYTON ST. WILKINSON** Municipality _____

Province **ONT.** Postal Code **N1H6S2** Business E-mail Address **hannonwelldrilling@bellnet.ca**

Bus. Telephone No. (inc. area code) **5197630239** Name of Well Technician (Last Name, First Name) **Hannon Harry**

Well Technician's Licence No. **2663** Signature of Technician and/or Contractor **[Signature]** Date Submitted **2009/12/15**

Results of Well Yield Testing				
After test of well yield, water was: <input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason: Pump intake set at (m/ft) Pumping rate (l/min / GPM) Duration of pumping _____ hrs + _____ min Final water level end of pumping (m/ft) If flowing give rate (l/min / GPM) Recommended pump depth (m/ft) Recommended pump rate (l/min / GPM) Well production (l/min / GPM) Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Static Level			
	1		1	
	2		2	
	3		3	
	4		4	
	5		5	
10		10		
15		15		
20		20		
25		25		
30		30		
40		40		
50		50		
60		60		

Map of Well Location

Please provide a map below following instructions on the back.

Comments: _____

Well owner's information package delivered	Date Package Delivered	Ministry Use Only	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2009/11/17	Audit No.	Z 107698
		Date Work Completed	2009/12/15
		Registered	23 2010

Measurements recorded in: Metric Imperial

Well Location

Address of Well Location (Street Number/Name): 6669 COUNTY RD #34
 Township: RUSLINCH TWP Lot: 8 Concession: 2
 County/District/Municipality: WELLINGTON City/Town/Village: _____ Province: Ontario Postal Code: _____
 UTM Coordinates: Zone 18 Easting 317560279 Northing 4810368 Municipal Plan and Sublot Number: _____ Other: _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
BROWN	SAND	STONES		0	51ft
BROWN	SAND			51	90
BROWN	SAND	GRAVEL	WET	90	97
BROWN	LIMESTONE		BROKEN / CLAY LAYERS	97	112
Grey	LIMESTONE		HARD	112	137ft

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0 To 20	GROUT	

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
<input checked="" type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____				
If pumping discontinued, give reason:	Static Level	41ft		
Pump intake set at (m/ft): <u>75ft</u>	1		1	
Pumping rate (l/min / GPM): <u>40</u>	2		2	
Duration of pumping: <u>1</u> hrs + _____ min	3		3	
Final water level end of pumping (m/ft): _____	4		4	
If flowing give rate (l/min / GPM): _____	5		5	
Recommended pump depth (m/ft): <u>75-80ft</u>	10		10	42
Recommended pump rate (l/min / GPM): <u>15-20</u>	15		15	
Well production (l/min / GPM): <u>60T AIR</u>	20		20	41
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	25		25	
	30		30	
	40		40	
	50		50	
	60		60	41

Method of Construction

Cable Tool Diamond Public Commercial Not used
 Rotary (Conventional) Jetting Domestic Municipal Dewatering
 Rotary (Reverse) Driving Livestock Test Hole Monitoring
 Boring Digging Irrigation Cooling & Air Conditioning
 Air percussion Industrial Other, specify _____
 Other, specify AIR-DR

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
6"	STEEL	188	+2	102	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____
6"	OPEN HOLE		102	137	

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To
	N/A			

Water Details

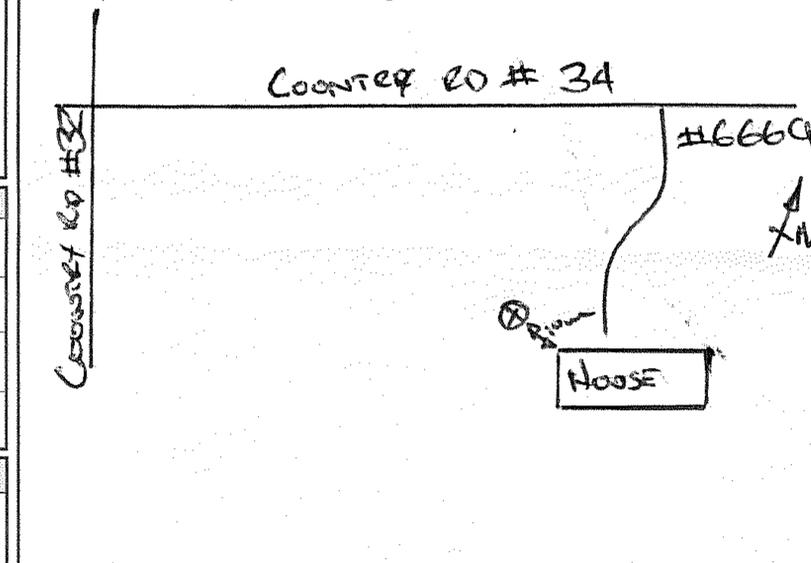
Water found at Depth (m/ft)	Kind of Water:	Hole Diameter
105 (m/ft)	<input checked="" type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Depth (m/ft): From 0 To 137 Diameter (cm/in): 6"
131 (m/ft)	<input checked="" type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	
	<input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	

Well Contractor and Well Technician Information

Business Name of Well Contractor: HIGHLAND WATER WELLS Well Contractor's Licence No.: 2576
 Business Address (Street Number/Name): Box 141, DURHAM Municipality: _____
 Province: ONT Postal Code: N0G1R0 Business E-mail Address: _____

Bus. Telephone No. (inc. area code): 5193696363 Name of Well Technician (Last Name, First Name): KOPPLETON, NIKEL
 Well Technician's Licence No.: 2130 Signature of Technician and/or Contractor: _____ Date Submitted: 20130319

Map of Well Location



Comments: _____

Ministry Use Only

Well owner's information package delivered: Yes No
 Date Package Delivered: Y Y Y Y M M D D
 Date Work Completed: 20130318
 Audit No.: 2162250
 Received: JAN 06 2014

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the [Open Data catalogue](#).

[Go Back to Map](#)

Well ID

Well ID Number: 7262884
 Well Audit Number: Z226390
 Well Tag Number: A191498

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	6656 WELLINGTON RD 34
Township	PUSLINCH TOWNSHIP
Lot	007
Concession	CON 03
County/District/Municipality	WELLINGTON
City/Town/Village	Cambridge
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 560039.00 Northing: 4810550.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
	SAND			0 ft	17 ft
	SAND	GRVL		17 ft	30 ft
	SAND	GRVL	CLAY	30 ft	50 ft
BRWN	SAND			50 ft	60 ft

BRWN SAND
GREY LMSN

60 ft 101 ft
101 ft 125 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	20 ft	BENTONITE SLURRY	

Method of Construction & Well Use

Method of Construction	Well Use
Other Method DUAL ROTARY	Domestic

Status of Well

Water Supply

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
6.125 inch	STEEL	-2 ft	103 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
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Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7556

Results of Well Yield Testing

After test of well yield, water was	CLEAR
If pumping discontinued, give reason	
Pump intake set at	110 ft
Pumping Rate	12 GPM
Duration of Pumping	1 h:0 m

Final water level	38.333 ft
If flowing give rate	
Recommended pump depth	110 ft
Recommended pump rate	12 GPM
Well Production	
Disinfected?	Y

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL	38 ft		
1	38.333 ft	1	38.083 ft
2	38.333 ft	2	38 ft
3	38.333 ft	3	38 ft
4	38.333 ft	4	38 ft
5	38.333 ft	5	38 ft
10	38.333 ft	10	38 ft
15	38.333 ft	15	38 ft
20	38.333 ft	20	38 ft
25	38.333 ft	25	38 ft
30	38.333 ft	30	38 ft
40	38.333 ft	40	38 ft
45		45	
50	38.333 ft	50	38 ft
60	38.333 ft	60	38 ft

Water Details

Water Found at Depth	Kind
125 ft	Untested

Hole Diameter

Depth From	Depth To	Diameter
0 ft	20 ft	10 inch
20 ft	103 ft	6.625 inch
103 ft	125 ft	6 inch

Audit Number: Z226390

Date Well Completed: March 03, 2016

Date Well Record Received by MOE: May 11, 2016

Updated: January 24, 2020

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the [Open Data catalogue](#).

[Go Back to Map](#)

Well ID

Well ID Number: 7262885
 Well Audit Number: Z226388
 Well Tag Number:

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	6656 WELL RD 34
Township	PUSLINCH TOWNSHIP
Lot	007
Concession	CON 03
County/District/Municipality	WELLINGTON
City/Town/Village	Cambridge
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 560654.00 Northing: 4810535.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
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Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	108 ft	HOLEPLUG	

Method of Construction & Well Use

Method of Construction	Well Use
	Domestic

Status of Well

Abandoned-Other

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
4 inch	STEEL		

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7556

Results of Well Yield Testing

After test of well yield, water was

If pumping discontinued, give reason

Pump intake set at

Pumping Rate

Duration of Pumping

Final water level

If flowing give rate

Recommended pump depth

Recommended pump rate

Well Production

Disinfected? Y

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind
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Hole Diameter

Depth From	Depth To	Diameter
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Audit Number: Z226388

Date Well Completed: March 03, 2016

Date Well Record Received by MOE: May 12, 2016

Updated: January 24, 2020

Appendix E

Groundwater and Surface Water Quality Data



GHD Limited (Waterloo)
ATTN: Laura Ermeta
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 25-NOV-20
Report Date: 30-NOV-20 08:54 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2533335

Project P.O. #: 73522069
Job Reference: 11210029-02
C of C Numbers: 17-871527
Legal Site Desc:



Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-1 GW-11210029-112420-MW-2 Sampled By: CLIENT on 24-NOV-20 @ 11:25 Matrix: WATER							
Physical Tests							
Conductivity	0.864		0.0030	mS/cm		26-NOV-20	R5298244
pH	7.46		0.10	pH units		26-NOV-20	R5298244
Anions and Nutrients							
Chloride (Cl)	8.11		0.50	mg/L		27-NOV-20	R5299616
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		26-NOV-20	R5298560
Total Metals							
Aluminum (Al)-Total	0.0066		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Arsenic (As)-Total	0.00050		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Barium (Ba)-Total	0.0783		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Boron (B)-Total	0.068		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Cadmium (Cd)-Total	0.000101		0.0000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Calcium (Ca)-Total	93.7		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cobalt (Co)-Total	0.00159		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Copper (Cu)-Total	0.0180		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Iron (Fe)-Total	<0.010		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Lead (Pb)-Total	0.000270		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Lithium (Li)-Total	0.0026		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Magnesium (Mg)-Total	34.3		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Manganese (Mn)-Total	0.354		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-NOV-20	R5298809
Molybdenum (Mo)-Total	0.00114		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Nickel (Ni)-Total	0.00897		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Phosphorus (P)-Total	<0.050		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Potassium (K)-Total	63.2	DLHC	0.50	mg/L	26-NOV-20	26-NOV-20	R5298095
Rubidium (Rb)-Total	0.0104		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Selenium (Se)-Total	0.000119		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Silicon (Si)-Total	4.98		0.10	mg/L	26-NOV-20	27-NOV-20	R5298095
Silver (Ag)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Sodium (Na)-Total	6.57		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Strontium (Sr)-Total	0.156		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Sulfur (S)-Total	7.18		0.50	mg/L	26-NOV-20	27-NOV-20	R5298095
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Thallium (Tl)-Total	0.000112		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Thorium (Th)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Tin (Sn)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	26-NOV-20	27-NOV-20	R5298095

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-1 GW-11210029-112420-MW-2							
Sampled By: CLIENT on 24-NOV-20 @ 11:25							
Matrix: WATER							
Total Metals							
Tungsten (W)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Uranium (U)-Total	0.000608		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Vanadium (V)-Total	<0.00050		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Zinc (Zn)-Total	0.0251		0.0030	mg/L	26-NOV-20	27-NOV-20	R5298095
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					26-NOV-20	R5298103
Dissolved Metals Filtration Location	FIELD					26-NOV-20	R5297816
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Arsenic (As)-Dissolved	<1.0	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Barium (Ba)-Dissolved	78.5	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Boron (B)-Dissolved	<100	DLHC	100	ug/L	26-NOV-20	26-NOV-20	R5298475
Cadmium (Cd)-Dissolved	0.118	DLHC	0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Cobalt (Co)-Dissolved	1.6	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Copper (Cu)-Dissolved	17.1	DLHC	2.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	26-NOV-20	27-NOV-20	R5298836
Molybdenum (Mo)-Dissolved	1.02	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Nickel (Ni)-Dissolved	9.2	DLHC	5.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Selenium (Se)-Dissolved	<0.50	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Sodium (Na)-Dissolved	6920	DLHC	500	ug/L	26-NOV-20	26-NOV-20	R5298475
Thallium (Tl)-Dissolved	0.10	DLHC	0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Uranium (U)-Dissolved	0.61	DLHC	0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Zinc (Zn)-Dissolved	26	DLHC	10	ug/L	26-NOV-20	26-NOV-20	R5298475
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		25-NOV-20	R5297893
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	26-NOV-20	26-NOV-20	R5298859
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		27-NOV-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	26-NOV-20	26-NOV-20	R5298859
Volatile Organic Compounds							
Acetone	<30		30	ug/L		30-NOV-20	R5299578
Benzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Bromodichloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Bromoform	<5.0		5.0	ug/L		30-NOV-20	R5299578
Bromomethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Carbon tetrachloride	<0.20		0.20	ug/L		30-NOV-20	R5299578
Chlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-1 GW-11210029-112420-MW-2 Sampled By: CLIENT on 24-NOV-20 @ 11:25 Matrix: WATER							
Volatile Organic Compounds							
Dibromochloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Chloroform	<1.0		1.0	ug/L		30-NOV-20	R5299578
1,2-Dibromoethane	<0.20		0.20	ug/L		30-NOV-20	R5299578
1,2-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,3-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,4-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dichlorodifluoromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
1,1-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,2-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methylene Chloride	<5.0		5.0	ug/L		30-NOV-20	R5299578
1,2-Dichloropropane	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		30-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
n-Hexane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methyl Ethyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
Methyl Isobutyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
MTBE	<2.0		2.0	ug/L		30-NOV-20	R5299578
Styrene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Tetrachloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Toluene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichlorofluoromethane	<5.0		5.0	ug/L		30-NOV-20	R5299578
Vinyl chloride	<0.50		0.50	ug/L		30-NOV-20	R5299578
o-Xylene	<0.30		0.30	ug/L		30-NOV-20	R5299578
m+p-Xylenes	<0.40		0.40	ug/L		30-NOV-20	R5299578
Xylenes (Total)	<0.50		0.50	ug/L		30-NOV-20	
Surrogate: 4-Bromofluorobenzene	98.6		70-130	%		30-NOV-20	R5299578
Surrogate: 1,4-Difluorobenzene	100.7		70-130	%		30-NOV-20	R5299578
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		30-NOV-20	R5299578
F1-BTEX	<25		25	ug/L		30-NOV-20	
F2 (C10-C16)	<100		100	ug/L	25-NOV-20	26-NOV-20	R5298486

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-1 GW-11210029-112420-MW-2							
Sampled By: CLIENT on 24-NOV-20 @ 11:25							
Matrix: WATER							
Hydrocarbons							
F2-Naphth	<100		100	ug/L		30-NOV-20	
F3 (C16-C34)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
F3-PAH	<250		250	ug/L		30-NOV-20	
F4 (C34-C50)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
Total Hydrocarbons (C6-C50)	<370		370	ug/L		30-NOV-20	
Chrom. to baseline at nC50	YES				25-NOV-20	26-NOV-20	R5298486
Surrogate: 2-Bromobenzotrifluoride	91.8		60-140	%	25-NOV-20	26-NOV-20	R5298486
Surrogate: 3,4-Dichlorotoluene	81.5		60-140	%		30-NOV-20	R5299578
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Acenaphthylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)pyrene	<0.010		0.010	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(b)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(k)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Chrysene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluoranthene	0.031		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluorene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		27-NOV-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
2-Methylnaphthalene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Naphthalene	<0.050		0.050	ug/L	25-NOV-20	27-NOV-20	R5298949
Phenanthrene	0.024		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Pyrene	0.037		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Acenaphthene	84.3		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d12-Chrysene	90.5		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d8-Naphthalene	86.2		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Phenanthrene	93.9		60-140	%	25-NOV-20	27-NOV-20	R5298949
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
4-Chloroaniline	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2-Chlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dichlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
Diethylphthalate	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-1 GW-11210029-112420-MW-2 Sampled By: CLIENT on 24-NOV-20 @ 11:25 Matrix: WATER							
Semi-Volatile Organics							
Dimethylphthalate	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dimethylphenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrophenol	<1.0		1.0	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,6-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		27-NOV-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	25-NOV-20	27-NOV-20	R5298692
Pentachlorophenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
Phenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2-Fluorobiphenyl	85.1		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: Nitrobenzene d5	94.5		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: p-Terphenyl d14	105.6		60-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2,4,6-Tribromophenol	115.1		50-140	%	25-NOV-20	27-NOV-20	R5298692
L2533335-2 GW-11210029-112420-MW-2D Sampled By: CLIENT on 24-NOV-20 @ 11:30 Matrix: WATER							
Physical Tests							
Conductivity	0.867		0.0030	mS/cm		26-NOV-20	R5299316
pH	7.68		0.10	pH units		26-NOV-20	R5299316
Anions and Nutrients							
Chloride (Cl)	8.00		0.50	mg/L		27-NOV-20	R5299616
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		26-NOV-20	R5298560
Total Metals							
Aluminum (Al)-Total	0.0064		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Arsenic (As)-Total	0.00050		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Barium (Ba)-Total	0.0774		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Boron (B)-Total	0.070		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Cadmium (Cd)-Total	0.000102		0.0000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Calcium (Ca)-Total	95.4		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cobalt (Co)-Total	0.00163		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Copper (Cu)-Total	0.0175		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Iron (Fe)-Total	<0.010		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Lead (Pb)-Total	0.000171		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-2 GW-11210029-112420-MW-2D Sampled By: CLIENT on 24-NOV-20 @ 11:30 Matrix: WATER							
Total Metals							
Lithium (Li)-Total	0.0027		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Magnesium (Mg)-Total	34.6		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Manganese (Mn)-Total	0.357		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-NOV-20	R5298809
Molybdenum (Mo)-Total	0.00111		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Nickel (Ni)-Total	0.00919		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Phosphorus (P)-Total	<0.050		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Potassium (K)-Total	63.7	DLHC	0.50	mg/L	26-NOV-20	26-NOV-20	R5298095
Rubidium (Rb)-Total	0.0105		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Selenium (Se)-Total	0.000125		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Silicon (Si)-Total	4.96		0.10	mg/L	26-NOV-20	27-NOV-20	R5298095
Silver (Ag)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Sodium (Na)-Total	6.78		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Strontium (Sr)-Total	0.155		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Sulfur (S)-Total	7.08		0.50	mg/L	26-NOV-20	27-NOV-20	R5298095
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Thallium (Tl)-Total	0.000113		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Thorium (Th)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Tin (Sn)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	26-NOV-20	27-NOV-20	R5298095
Tungsten (W)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Uranium (U)-Total	0.000609		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Vanadium (V)-Total	<0.00050		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Zinc (Zn)-Total	0.0253		0.0030	mg/L	26-NOV-20	27-NOV-20	R5298095
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					26-NOV-20	R5298103
Dissolved Metals Filtration Location	FIELD					26-NOV-20	R5297816
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Arsenic (As)-Dissolved	<1.0	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Barium (Ba)-Dissolved	78.5	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Boron (B)-Dissolved	<100	DLHC	100	ug/L	26-NOV-20	26-NOV-20	R5298475
Cadmium (Cd)-Dissolved	0.139	DLHC	0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Cobalt (Co)-Dissolved	1.6	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Copper (Cu)-Dissolved	17.0	DLHC	2.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	26-NOV-20	27-NOV-20	R5298836
Molybdenum (Mo)-Dissolved	1.12	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Nickel (Ni)-Dissolved	9.5	DLHC	5.0	ug/L	26-NOV-20	26-NOV-20	R5298475

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-2 GW-11210029-112420-MW-2D							
Sampled By: CLIENT on 24-NOV-20 @ 11:30							
Matrix: WATER							
Dissolved Metals							
Selenium (Se)-Dissolved	<0.50	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Sodium (Na)-Dissolved	7340	DLHC	500	ug/L	26-NOV-20	26-NOV-20	R5298475
Thallium (Tl)-Dissolved	0.11	DLHC	0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Uranium (U)-Dissolved	0.60	DLHC	0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Zinc (Zn)-Dissolved	26	DLHC	10	ug/L	26-NOV-20	26-NOV-20	R5298475
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		25-NOV-20	R5297893
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	26-NOV-20	26-NOV-20	R5298859
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		27-NOV-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	26-NOV-20	26-NOV-20	R5298859
Volatile Organic Compounds							
Acetone	<30		30	ug/L		30-NOV-20	R5299578
Benzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Bromodichloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Bromoform	<5.0		5.0	ug/L		30-NOV-20	R5299578
Bromomethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Carbon tetrachloride	<0.20		0.20	ug/L		30-NOV-20	R5299578
Chlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dibromochloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Chloroform	<1.0		1.0	ug/L		30-NOV-20	R5299578
1,2-Dibromoethane	<0.20		0.20	ug/L		30-NOV-20	R5299578
1,2-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,3-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,4-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dichlorodifluoromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
1,1-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,2-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methylene Chloride	<5.0		5.0	ug/L		30-NOV-20	R5299578
1,2-Dichloropropane	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		30-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
n-Hexane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methyl Ethyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
Methyl Isobutyl Ketone	<20		20	ug/L		30-NOV-20	R5299578

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-2 GW-11210029-112420-MW-2D Sampled By: CLIENT on 24-NOV-20 @ 11:30 Matrix: WATER							
Volatile Organic Compounds							
MTBE	<2.0		2.0	ug/L		30-NOV-20	R5299578
Styrene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Tetrachloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Toluene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichlorofluoromethane	<5.0		5.0	ug/L		30-NOV-20	R5299578
Vinyl chloride	<0.50		0.50	ug/L		30-NOV-20	R5299578
o-Xylene	<0.30		0.30	ug/L		30-NOV-20	R5299578
m+p-Xylenes	<0.40		0.40	ug/L		30-NOV-20	R5299578
Xylenes (Total)	<0.50		0.50	ug/L		30-NOV-20	
Surrogate: 4-Bromofluorobenzene	97.7		70-130	%		30-NOV-20	R5299578
Surrogate: 1,4-Difluorobenzene	100.8		70-130	%		30-NOV-20	R5299578
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		30-NOV-20	R5299578
F1-BTEX	<25		25	ug/L		30-NOV-20	
F2 (C10-C16)	<100		100	ug/L	25-NOV-20	26-NOV-20	R5298486
F2-Naphth	<100		100	ug/L		30-NOV-20	
F3 (C16-C34)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
F3-PAH	<250		250	ug/L		30-NOV-20	
F4 (C34-C50)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
Total Hydrocarbons (C6-C50)	<370		370	ug/L		30-NOV-20	
Chrom. to baseline at nC50	YES				25-NOV-20	26-NOV-20	R5298486
Surrogate: 2-Bromobenzotrifluoride	91.1		60-140	%	25-NOV-20	26-NOV-20	R5298486
Surrogate: 3,4-Dichlorotoluene	76.2		60-140	%		30-NOV-20	R5299578
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Acenaphthylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)pyrene	<0.010		0.010	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(b)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(k)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Chrysene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluoranthene	0.038		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluorene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-2 GW-11210029-112420-MW-2D Sampled By: CLIENT on 24-NOV-20 @ 11:30 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		27-NOV-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
2-Methylnaphthalene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Naphthalene	<0.050		0.050	ug/L	25-NOV-20	27-NOV-20	R5298949
Phenanthrene	0.027		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Pyrene	0.040		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Acenaphthene	89.3		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d12-Chrysene	93.9		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d8-Naphthalene	91.7		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Phenanthrene	98.1		60-140	%	25-NOV-20	27-NOV-20	R5298949
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
4-Chloroaniline	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2-Chlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dichlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
Diethylphthalate	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Dimethylphthalate	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dimethylphenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrophenol	<1.0		1.0	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,6-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		27-NOV-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	25-NOV-20	27-NOV-20	R5298692
Pentachlorophenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
Phenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2-Fluorobiphenyl	85.8		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: Nitrobenzene d5	93.7		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: p-Terphenyl d14	99.0		60-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2,4,6-Tribromophenol	114.6		50-140	%	25-NOV-20	27-NOV-20	R5298692
L2533335-3 GW-11210029-112420-MW-3 Sampled By: CLIENT on 24-NOV-20 @ 13:45 Matrix: WATER							
Physical Tests							
Conductivity	0.609		0.0030	mS/cm		26-NOV-20	R5299316
pH	7.90		0.10	pH units		26-NOV-20	R5299316

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-3 GW-11210029-112420-MW-3 Sampled By: CLIENT on 24-NOV-20 @ 13:45 Matrix: WATER							
Physical Tests							
Anions and Nutrients							
Chloride (Cl)	4.80		0.50	mg/L		27-NOV-20	R5299616
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		26-NOV-20	R5298560
Total Metals							
Aluminum (Al)-Total	0.210		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Antimony (Sb)-Total	0.00015		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Arsenic (As)-Total	0.00035		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Barium (Ba)-Total	0.0689		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Boron (B)-Total	0.012		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Cadmium (Cd)-Total	0.0000100		0.0000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Calcium (Ca)-Total	80.6		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cesium (Cs)-Total	0.000022		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cobalt (Co)-Total	0.00064		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Copper (Cu)-Total	0.00096		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Iron (Fe)-Total	0.224		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Lead (Pb)-Total	0.000299		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Lithium (Li)-Total	0.0099		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Magnesium (Mg)-Total	36.9		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Manganese (Mn)-Total	0.0906		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-NOV-20	R5298809
Molybdenum (Mo)-Total	0.0169		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Nickel (Ni)-Total	0.00162		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Phosphorus (P)-Total	<0.050		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Potassium (K)-Total	1.91		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Rubidium (Rb)-Total	0.00106		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Selenium (Se)-Total	0.000226		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Silicon (Si)-Total	7.25		0.10	mg/L	26-NOV-20	27-NOV-20	R5298095
Silver (Ag)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Sodium (Na)-Total	6.78		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Strontium (Sr)-Total	0.158		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Sulfur (S)-Total	8.99		0.50	mg/L	26-NOV-20	27-NOV-20	R5298095
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Thorium (Th)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Tin (Sn)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Titanium (Ti)-Total	0.00891		0.00030	mg/L	26-NOV-20	27-NOV-20	R5298095
Tungsten (W)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Uranium (U)-Total	0.00200		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-3 GW-11210029-112420-MW-3							
Sampled By: CLIENT on 24-NOV-20 @ 13:45							
Matrix: WATER							
Total Metals							
Vanadium (V)-Total	0.00087		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	26-NOV-20	27-NOV-20	R5298095
Zirconium (Zr)-Total	0.00022		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					26-NOV-20	R5298103
Dissolved Metals Filtration Location	FIELD					26-NOV-20	R5297816
Antimony (Sb)-Dissolved	0.15		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Arsenic (As)-Dissolved	0.31		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Barium (Ba)-Dissolved	67.9		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Boron (B)-Dissolved	11		10	ug/L	26-NOV-20	26-NOV-20	R5298475
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	26-NOV-20	26-NOV-20	R5298475
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Cobalt (Co)-Dissolved	0.57		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Copper (Cu)-Dissolved	3.02		0.20	ug/L	26-NOV-20	26-NOV-20	R5298475
Lead (Pb)-Dissolved	0.109		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	26-NOV-20	27-NOV-20	R5298836
Molybdenum (Mo)-Dissolved	15.8		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Nickel (Ni)-Dissolved	1.35		0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Selenium (Se)-Dissolved	0.278		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Sodium (Na)-Dissolved	6870		500	ug/L	26-NOV-20	26-NOV-20	R5298475
Thallium (Tl)-Dissolved	<0.010		0.010	ug/L	26-NOV-20	26-NOV-20	R5298475
Uranium (U)-Dissolved	1.86		0.010	ug/L	26-NOV-20	26-NOV-20	R5298475
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Zinc (Zn)-Dissolved	1.7		1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		25-NOV-20	R5297893
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	26-NOV-20	26-NOV-20	R5298859
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		27-NOV-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	26-NOV-20	26-NOV-20	R5298859
Volatile Organic Compounds							
Acetone	<30		30	ug/L		30-NOV-20	R5299578
Benzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Bromodichloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Bromoform	<5.0		5.0	ug/L		30-NOV-20	R5299578
Bromomethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Carbon tetrachloride	<0.20		0.20	ug/L		30-NOV-20	R5299578
Chlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dibromochloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Chloroform	<1.0		1.0	ug/L		30-NOV-20	R5299578

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-3 GW-11210029-112420-MW-3 Sampled By: CLIENT on 24-NOV-20 @ 13:45 Matrix: WATER							
Volatile Organic Compounds							
1,2-Dibromoethane	<0.20		0.20	ug/L		30-NOV-20	R5299578
1,2-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,3-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,4-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dichlorodifluoromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
1,1-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,2-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methylene Chloride	<5.0		5.0	ug/L		30-NOV-20	R5299578
1,2-Dichloropropane	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		30-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
n-Hexane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methyl Ethyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
Methyl Isobutyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
MTBE	<2.0		2.0	ug/L		30-NOV-20	R5299578
Styrene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Tetrachloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Toluene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichlorofluoromethane	<5.0		5.0	ug/L		30-NOV-20	R5299578
Vinyl chloride	<0.50		0.50	ug/L		30-NOV-20	R5299578
o-Xylene	<0.30		0.30	ug/L		30-NOV-20	R5299578
m+p-Xylenes	<0.40		0.40	ug/L		30-NOV-20	R5299578
Xylenes (Total)	<0.50		0.50	ug/L		30-NOV-20	
Surrogate: 4-Bromofluorobenzene	98.0		70-130	%		30-NOV-20	R5299578
Surrogate: 1,4-Difluorobenzene	100.4		70-130	%		30-NOV-20	R5299578
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		30-NOV-20	R5299578
F1-BTEX	<25		25	ug/L		30-NOV-20	
F2 (C10-C16)	<100		100	ug/L	25-NOV-20	26-NOV-20	R5298486
F2-Naphth	<100		100	ug/L		30-NOV-20	
F3 (C16-C34)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-3 GW-11210029-112420-MW-3 Sampled By: CLIENT on 24-NOV-20 @ 13:45 Matrix: WATER							
Hydrocarbons							
F3-PAH	<250		250	ug/L		30-NOV-20	
F4 (C34-C50)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
Total Hydrocarbons (C6-C50)	<370		370	ug/L		30-NOV-20	
Chrom. to baseline at nC50	YES				25-NOV-20	26-NOV-20	R5298486
Surrogate: 2-Bromobenzotrifluoride	90.2		60-140	%	25-NOV-20	26-NOV-20	R5298486
Surrogate: 3,4-Dichlorotoluene	79.0		60-140	%		30-NOV-20	R5299578
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Acenaphthylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)pyrene	<0.010		0.010	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(b)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(k)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Chrysene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluoranthene	0.059		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluorene	0.031	AI	0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
1+2-Methylnaphthalenes	0.067		0.028	ug/L		27-NOV-20	
1-Methylnaphthalene	0.024		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
2-Methylnaphthalene	0.043		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Naphthalene	<0.050		0.050	ug/L	25-NOV-20	27-NOV-20	R5298949
Phenanthrene	0.210		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Pyrene	0.059		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Acenaphthene	82.3		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d12-Chrysene	90.5		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d8-Naphthalene	85.6		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Phenanthrene	93.0		60-140	%	25-NOV-20	27-NOV-20	R5298949
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
4-Chloroaniline	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2-Chlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dichlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
Diethylphthalate	0.29	RRR	0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Dimethylphthalate	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dimethylphenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-3 GW-11210029-112420-MW-3 Sampled By: CLIENT on 24-NOV-20 @ 13:45 Matrix: WATER							
Semi-Volatile Organics							
2,4-Dinitrophenol	<1.0		1.0	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,6-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		27-NOV-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	25-NOV-20	27-NOV-20	R5298692
Pentachlorophenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
Phenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2-Fluorobiphenyl	91.1		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: Nitrobenzene d5	120.5		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: p-Terphenyl d14	110.3		60-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2,4,6-Tribromophenol	127.7		50-140	%	25-NOV-20	27-NOV-20	R5298692
Report Remarks : RRR: Although the method blank is non-detect there is a strong peak for Diethylphthalate causing uncertainty near the detection limit, interpret as a maximum value.							
L2533335-4 GW-11210029-112520-MW-1 Sampled By: CLIENT on 25-NOV-20 @ 11:20 Matrix: WATER							
Physical Tests							
Conductivity	0.557		0.0030	mS/cm		26-NOV-20	R5299316
pH	8.07		0.10	pH units		26-NOV-20	R5299316
Anions and Nutrients							
Chloride (Cl)	8.17		0.50	mg/L		27-NOV-20	R5299616
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		26-NOV-20	R5298560
Total Metals							
Aluminum (Al)-Total	0.352		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Antimony (Sb)-Total	0.00023		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Arsenic (As)-Total	0.00057		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Barium (Ba)-Total	0.0729		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Boron (B)-Total	0.024		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Cadmium (Cd)-Total	0.0000257		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Calcium (Ca)-Total	71.4		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cesium (Cs)-Total	0.000033		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Chromium (Cr)-Total	0.00088		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cobalt (Co)-Total	0.00059		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Copper (Cu)-Total	0.00139		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Iron (Fe)-Total	0.417		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Lead (Pb)-Total	0.000628		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Lithium (Li)-Total	0.0091		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-4 GW-11210029-112520-MW-1							
Sampled By: CLIENT on 25-NOV-20 @ 11:20							
Matrix: WATER							
Total Metals							
Magnesium (Mg)-Total	30.1		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Manganese (Mn)-Total	0.114		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Mercury (Hg)-Total	<0.000050		0.000050	mg/L		27-NOV-20	R5298809
Molybdenum (Mo)-Total	0.00424		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Nickel (Ni)-Total	0.00146		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Phosphorus (P)-Total	<0.050		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Potassium (K)-Total	4.10		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Rubidium (Rb)-Total	0.00100		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Selenium (Se)-Total	0.000074		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Silicon (Si)-Total	6.11		0.10	mg/L	26-NOV-20	27-NOV-20	R5298095
Silver (Ag)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Sodium (Na)-Total	8.50		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Strontium (Sr)-Total	0.257		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Sulfur (S)-Total	8.36		0.50	mg/L	26-NOV-20	27-NOV-20	R5298095
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Thallium (Tl)-Total	0.000011		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Thorium (Th)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Tin (Sn)-Total	0.00016		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Titanium (Ti)-Total	0.0128		0.00030	mg/L	26-NOV-20	27-NOV-20	R5298095
Tungsten (W)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Uranium (U)-Total	0.000879		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Vanadium (V)-Total	0.00092		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Zinc (Zn)-Total	0.0065		0.0030	mg/L	26-NOV-20	27-NOV-20	R5298095
Zirconium (Zr)-Total	0.00037		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					26-NOV-20	R5298103
Dissolved Metals Filtration Location	FIELD					26-NOV-20	R5297816
Antimony (Sb)-Dissolved	0.18		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Arsenic (As)-Dissolved	0.41		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Barium (Ba)-Dissolved	67.5		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Boron (B)-Dissolved	22		10	ug/L	26-NOV-20	26-NOV-20	R5298475
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	26-NOV-20	26-NOV-20	R5298475
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Cobalt (Co)-Dissolved	0.39		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Copper (Cu)-Dissolved	0.66		0.20	ug/L	26-NOV-20	26-NOV-20	R5298475
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	26-NOV-20	27-NOV-20	R5298836
Molybdenum (Mo)-Dissolved	3.77		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Nickel (Ni)-Dissolved	0.88		0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Selenium (Se)-Dissolved	0.069		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-4 GW-11210029-112520-MW-1 Sampled By: CLIENT on 25-NOV-20 @ 11:20 Matrix: WATER							
Dissolved Metals							
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Sodium (Na)-Dissolved	8450		500	ug/L	26-NOV-20	26-NOV-20	R5298475
Thallium (Tl)-Dissolved	<0.010		0.010	ug/L	26-NOV-20	26-NOV-20	R5298475
Uranium (U)-Dissolved	0.764		0.010	ug/L	26-NOV-20	26-NOV-20	R5298475
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Zinc (Zn)-Dissolved	1.3		1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		25-NOV-20	R5297893
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	26-NOV-20	26-NOV-20	R5298859
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		27-NOV-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	26-NOV-20	26-NOV-20	R5298859
Volatile Organic Compounds							
Acetone	<30		30	ug/L		30-NOV-20	R5299578
Benzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Bromodichloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Bromoform	<5.0		5.0	ug/L		30-NOV-20	R5299578
Bromomethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Carbon tetrachloride	<0.20		0.20	ug/L		30-NOV-20	R5299578
Chlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dibromochloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Chloroform	<1.0		1.0	ug/L		30-NOV-20	R5299578
1,2-Dibromoethane	<0.20		0.20	ug/L		30-NOV-20	R5299578
1,2-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,3-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,4-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dichlorodifluoromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
1,1-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,2-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methylene Chloride	<5.0		5.0	ug/L		30-NOV-20	R5299578
1,2-Dichloropropane	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		30-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
n-Hexane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methyl Ethyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
Methyl Isobutyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
MTBE	<2.0		2.0	ug/L		30-NOV-20	R5299578

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-4 GW-11210029-112520-MW-1 Sampled By: CLIENT on 25-NOV-20 @ 11:20 Matrix: WATER							
Volatile Organic Compounds							
Styrene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Tetrachloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Toluene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichlorofluoromethane	<5.0		5.0	ug/L		30-NOV-20	R5299578
Vinyl chloride	<0.50		0.50	ug/L		30-NOV-20	R5299578
o-Xylene	<0.30		0.30	ug/L		30-NOV-20	R5299578
m+p-Xylenes	<0.40		0.40	ug/L		30-NOV-20	R5299578
Xylenes (Total)	<0.50		0.50	ug/L		30-NOV-20	R5299578
Surrogate: 4-Bromofluorobenzene	98.1		70-130	%		30-NOV-20	R5299578
Surrogate: 1,4-Difluorobenzene	100.3		70-130	%		30-NOV-20	R5299578
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		30-NOV-20	R5299578
F1-BTEX	<25		25	ug/L		30-NOV-20	R5299578
F2 (C10-C16)	<100		100	ug/L	25-NOV-20	26-NOV-20	R5298486
F2-Naphth	<100		100	ug/L		30-NOV-20	R5299578
F3 (C16-C34)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
F3-PAH	<250		250	ug/L		30-NOV-20	R5299578
F4 (C34-C50)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
Total Hydrocarbons (C6-C50)	<370		370	ug/L		30-NOV-20	R5299578
Chrom. to baseline at nC50	YES				25-NOV-20	26-NOV-20	R5298486
Surrogate: 2-Bromobenzotrifluoride	95.5		60-140	%	25-NOV-20	26-NOV-20	R5298486
Surrogate: 3,4-Dichlorotoluene	83.6		60-140	%		30-NOV-20	R5299578
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Acenaphthylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)pyrene	<0.010		0.010	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(b)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(k)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Chrysene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluoranthene	0.091		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluorene	0.053		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-4 GW-11210029-112520-MW-1 Sampled By: CLIENT on 25-NOV-20 @ 11:20 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
1+2-Methylnaphthalenes	0.141		0.028	ug/L		27-NOV-20	
1-Methylnaphthalene	0.047		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
2-Methylnaphthalene	0.094		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Naphthalene	0.073		0.050	ug/L	25-NOV-20	27-NOV-20	R5298949
Phenanthrene	0.384		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Pyrene	0.096		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Acenaphthene	87.0		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d12-Chrysene	95.0		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d8-Naphthalene	89.7		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Phenanthrene	93.0		60-140	%	25-NOV-20	27-NOV-20	R5298949
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
4-Chloroaniline	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2-Chlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dichlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
Diethylphthalate	0.29	RRR	0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Dimethylphthalate	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dimethylphenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrophenol	<1.0		1.0	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,6-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		27-NOV-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	25-NOV-20	27-NOV-20	R5298692
Pentachlorophenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
Phenol	0.53		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2-Fluorobiphenyl	86.5		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: Nitrobenzene d5	92.9		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: p-Terphenyl d14	81.5		60-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2,4,6-Tribromophenol	122.9		50-140	%	25-NOV-20	27-NOV-20	R5298692
Report Remarks : RRR: Although the method blank is non-detect there is a strong peak for Diethylphthalate causing uncertainty near the detection limit, interpret as a maximum value.							
L2533335-5 TRIP BLANK Sampled By: CLIENT on 25-NOV-20 @ 12:00 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<30		30	ug/L		30-NOV-20	R5299578

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-5 TRIP BLANK Sampled By: CLIENT on 25-NOV-20 @ 12:00 Matrix: WATER							
Volatile Organic Compounds							
Benzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Bromodichloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Bromoform	<5.0		5.0	ug/L		30-NOV-20	R5299578
Bromomethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Carbon tetrachloride	<0.20		0.20	ug/L		30-NOV-20	R5299578
Chlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dibromochloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Chloroform	<1.0		1.0	ug/L		30-NOV-20	R5299578
1,2-Dibromoethane	<0.20		0.20	ug/L		30-NOV-20	R5299578
1,2-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,3-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,4-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dichlorodifluoromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
1,1-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,2-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methylene Chloride	<5.0		5.0	ug/L		30-NOV-20	R5299578
1,2-Dichloropropane	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		30-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
n-Hexane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methyl Ethyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
Methyl Isobutyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
MTBE	<2.0		2.0	ug/L		30-NOV-20	R5299578
Styrene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Tetrachloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Toluene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichlorofluoromethane	<5.0		5.0	ug/L		30-NOV-20	R5299578
Vinyl chloride	<0.50		0.50	ug/L		30-NOV-20	R5299578
o-Xylene	<0.30		0.30	ug/L		30-NOV-20	R5299578
m+p-Xylenes	<0.40		0.40	ug/L		30-NOV-20	R5299578
Xylenes (Total)	<0.50		0.50	ug/L		30-NOV-20	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-5 TRIP BLANK Sampled By: CLIENT on 25-NOV-20 @ 12:00 Matrix: WATER							
Volatile Organic Compounds							
Surrogate: 4-Bromofluorobenzene	98.4		70-130	%		30-NOV-20	R5299578
Surrogate: 1,4-Difluorobenzene	100.4		70-130	%		30-NOV-20	R5299578
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		30-NOV-20	R5299578
F1-BTEX	<25		25	ug/L		30-NOV-20	R5299578
Surrogate: 3,4-Dichlorotoluene	86.6		60-140	%		30-NOV-20	R5299578

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Cyanide, Weak Acid Diss	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Aluminum (Al)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Barium (Ba)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Boron (B)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Calcium (Ca)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Iron (Fe)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Lithium (Li)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Molybdenum (Mo)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Potassium (K)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Silicon (Si)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Sodium (Na)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Strontium (Sr)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Sulfur (S)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Uranium (U)-Total	MS-B	L2533335-1, -2, -3, -4

Sample Parameter Qualifier key listed:

Qualifier	Description
AI	Analytical interferences may be present. Result may be biased high.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
CN-WAD-R511-WT	Water	Cyanide (WAD)-O.Reg 153/04	APHA 4500CN I-Weak acid Dist Colorimet
<p>Weak acid dissociable cyanide (WAD) is determined by undergoing a distillation procedure. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
CR-CR6-IC-R511-WT	Water	Hex Chrom-O.Reg 153/04 (July 2011)	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
EC-R511-WT	Water	Conductivity-O.Reg 153/04 (July 2011)	APHA 2510 B
<p>Water samples can be measured directly by immersing the conductivity cell into the sample.</p>			

Reference Information

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
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Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L
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Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-D-UG/L-CVAA-WT	Water	Diss. Mercury in Water by CVAAS (ug/L)	EPA 1631E (mod)
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Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-D-UG/L-MS-WT	Water	Diss. Metals in Water by ICPMS (ug/L)	EPA 200.8
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The metal constituents of a non-acidified sample that pass through a membrane filter prior to ICP/MS analysis.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Reference Information

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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OGG-SPEC-CALC-WT	Water	Speciated Oil and Grease A/V Calc	CALCULATION
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Sample is extracted with hexane, sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.

OGG-SPEC-WT	Water	Speciated Oil and Grease- Gravimetric	APHA 5520 B
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The procedure involves an extraction of the entire water sample with hexane. Sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PH-WT	Water	pH	APHA 4500 H-Electrode
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Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

17-871527

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2533335

Report Date: 30-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5298692							
WG3451657-2 LCS								
1,2,4-Trichlorobenzene			89.1		%		50-140	27-NOV-20
2-Chlorophenol			84.1		%		50-140	27-NOV-20
2,4-Dichlorophenol			96.6		%		50-140	27-NOV-20
2,4-Dimethylphenol			76.6		%		30-130	27-NOV-20
2,4-Dinitrophenol			117.8		%		50-140	27-NOV-20
2,4-Dinitrotoluene			119.4		%		50-140	27-NOV-20
2,4,5-Trichlorophenol			101.0		%		50-140	27-NOV-20
2,4,6-Trichlorophenol			99.2		%		50-140	27-NOV-20
2,6-Dinitrotoluene			99.4		%		50-140	27-NOV-20
3,3'-Dichlorobenzidine			84.7		%		30-130	27-NOV-20
4-Chloroaniline			85.2		%		30-130	27-NOV-20
Biphenyl			97.8		%		50-140	27-NOV-20
Bis(2-chloroethyl)ether			88.4		%		50-140	27-NOV-20
Bis(2-chloroisopropyl)ether			87.1		%		50-140	27-NOV-20
Bis(2-ethylhexyl)phthalate			107.8		%		50-140	27-NOV-20
Diethylphthalate			94.7		%		50-140	27-NOV-20
Dimethylphthalate			93.5		%		50-140	27-NOV-20
Pentachlorophenol			112.4		%		50-140	27-NOV-20
Phenol			115.9		%		30-130	27-NOV-20
WG3451657-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	27-NOV-20
2-Chlorophenol			<0.30		ug/L		0.3	27-NOV-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	27-NOV-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	27-NOV-20
2,4-Dinitrophenol			<1.0		ug/L		1	27-NOV-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	27-NOV-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	27-NOV-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	27-NOV-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	27-NOV-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	27-NOV-20
4-Chloroaniline			<0.40		ug/L		0.4	27-NOV-20
Biphenyl			<0.40		ug/L		0.4	27-NOV-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	27-NOV-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	27-NOV-20



Quality Control Report

Workorder: L2533335

Report Date: 30-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5298692								
WG3451657-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	27-NOV-20
Diethylphthalate			<0.20		ug/L		0.2	27-NOV-20
Dimethylphthalate			<0.20		ug/L		0.2	27-NOV-20
Pentachlorophenol			<0.50		ug/L		0.5	27-NOV-20
Phenol			<0.50		ug/L		0.5	27-NOV-20
Surrogate: 2-Fluorobiphenyl			84.6		%		50-140	27-NOV-20
Surrogate: 2,4,6-Tribromophenol			72.1		%		50-140	27-NOV-20
Surrogate: Nitrobenzene d5			83.5		%		50-140	27-NOV-20
Surrogate: p-Terphenyl d14			103.5		%		60-140	27-NOV-20
CL-IC-N-WT Water								
Batch R5299616								
WG3453128-4 DUP WG3453128-3								
Chloride (Cl)		2.94	2.94		mg/L	0.2	20	27-NOV-20
WG3453128-2 LCS								
Chloride (Cl)			101.6		%		90-110	27-NOV-20
WG3453128-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	27-NOV-20
WG3453128-5 MS WG3453128-3								
Chloride (Cl)			99.9		%		75-125	27-NOV-20
CN-WAD-R511-WT Water								
Batch R5298560								
WG3451693-3 DUP WG3451693-5								
Cyanide, Weak Acid Diss		655	652		ug/L	0.4	20	26-NOV-20
WG3451693-2 LCS								
Cyanide, Weak Acid Diss			101.9		%		80-120	26-NOV-20
WG3451693-1 MB								
Cyanide, Weak Acid Diss			<2.0		ug/L		2	26-NOV-20
WG3451693-4 MS WG3451693-5								
Cyanide, Weak Acid Diss			N/A	MS-B	%		-	26-NOV-20
CR-CR6-IC-R511-WT Water								
Batch R5297893								
WG3451701-4 DUP WG3451701-3								
Chromium, Hexavalent		<0.50	<0.50	RPD-NA	ug/L	N/A	20	25-NOV-20
WG3451701-2 LCS								
Chromium, Hexavalent			99.4		%		80-120	25-NOV-20
WG3451701-1 MB								



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
CR-CR6-IC-R511-WT Water									
Batch R5297893									
WG3451701-1	MB								
Chromium, Hexavalent			<0.50		ug/L		0.5	25-NOV-20	
WG3451701-5	MS	WG3451701-3							
Chromium, Hexavalent			96.8		%		70-130	25-NOV-20	
EC-R511-WT Water									
Batch R5298244									
WG3452155-4	DUP	WG3452155-3							
Conductivity			0.241	0.245	mS/cm	1.6	10	26-NOV-20	
WG3452155-2	LCS								
Conductivity			99.7		%		90-110	26-NOV-20	
WG3452155-1	MB								
Conductivity			<0.0030		mS/cm		0.003	26-NOV-20	
Batch R5299316									
WG3452156-4	DUP	WG3452156-3							
Conductivity			0.539	0.543	mS/cm	0.7	10	26-NOV-20	
WG3452156-2	LCS								
Conductivity			99.2		%		90-110	26-NOV-20	
WG3452156-1	MB								
Conductivity			<0.0030		mS/cm		0.003	26-NOV-20	
F1-HS-511-WT Water									
Batch R5299578									
WG3453379-4	DUP	WG3453379-3							
F1 (C6-C10)			<25	<25	RPD-NA	ug/L	N/A	30	30-NOV-20
WG3453379-1	LCS								
F1 (C6-C10)			105.9		%		80-120	30-NOV-20	
WG3453379-2	MB								
F1 (C6-C10)			<25		ug/L		25	30-NOV-20	
Surrogate: 3,4-Dichlorotoluene			101.5		%		60-140	30-NOV-20	
WG3453379-5	MS	WG3453379-3							
F1 (C6-C10)			83.4		%		60-140	30-NOV-20	
F2-F4-511-WT Water									
Batch R5298486									
WG3451674-2	LCS								
F2 (C10-C16)			99.9		%		70-130	26-NOV-20	
F3 (C16-C34)			105.1		%		70-130	26-NOV-20	
F4 (C34-C50)			103.1		%		70-130	26-NOV-20	
WG3451674-1	MB								



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT Water								
Batch R5298486								
WG3451674-1 MB								
F2 (C10-C16)			<100		ug/L		100	26-NOV-20
F3 (C16-C34)			<250		ug/L		250	26-NOV-20
F4 (C34-C50)			<250		ug/L		250	26-NOV-20
Surrogate: 2-Bromobenzotrifluoride			89.9		%		60-140	26-NOV-20
HG-D-UG/L-CVAA-WT Water								
Batch R5298836								
WG3452289-3 DUP								
Mercury (Hg)-Dissolved		L2532511-4	<0.0050	RPD-NA	ug/L	N/A	20	27-NOV-20
WG3452289-2 LCS								
Mercury (Hg)-Dissolved			109.0		%		80-120	27-NOV-20
WG3452289-1 MB								
Mercury (Hg)-Dissolved			<0.0050		ug/L		0.005	27-NOV-20
WG3452289-4 MS								
Mercury (Hg)-Dissolved		L2532511-5	99.7		%		70-130	27-NOV-20
HG-T-CVAA-WT Water								
Batch R5298809								
WG3452162-4 DUP								
Mercury (Hg)-Total		WG3452162-3	0.0000063	J	mg/L	0.0000014	0.00001	27-NOV-20
WG3452162-2 LCS								
Mercury (Hg)-Total			108.0		%		80-120	27-NOV-20
WG3452162-1 MB								
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	27-NOV-20
WG3452162-6 MS								
Mercury (Hg)-Total		WG3452162-5	110.7		%		70-130	27-NOV-20
MET-D-UG/L-MS-WT Water								
Batch R5298475								
WG3451975-4 DUP								
Antimony (Sb)-Dissolved		WG3451975-3	<0.10	RPD-NA	ug/L	N/A	20	26-NOV-20
Arsenic (As)-Dissolved			<0.10	RPD-NA	ug/L	N/A	20	26-NOV-20
Barium (Ba)-Dissolved			<0.10	RPD-NA	ug/L	N/A	20	26-NOV-20
Beryllium (Be)-Dissolved			<0.10	RPD-NA	ug/L	N/A	20	26-NOV-20
Boron (B)-Dissolved			<10	RPD-NA	ug/L	N/A	20	26-NOV-20
Cadmium (Cd)-Dissolved			<0.0050	RPD-NA	ug/L	N/A	20	26-NOV-20
Chromium (Cr)-Dissolved			<0.50	RPD-NA	ug/L	N/A	20	26-NOV-20
Cobalt (Co)-Dissolved			<0.10	RPD-NA	ug/L	N/A	20	26-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT		Water						
Batch	R5298475							
WG3451975-4	DUP	WG3451975-3						
Copper (Cu)-Dissolved		<0.20	<0.20	RPD-NA	ug/L	N/A	20	26-NOV-20
Lead (Pb)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	26-NOV-20
Molybdenum (Mo)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	26-NOV-20
Nickel (Ni)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	26-NOV-20
Selenium (Se)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	26-NOV-20
Silver (Ag)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	26-NOV-20
Sodium (Na)-Dissolved		<50	<50	RPD-NA	ug/L	N/A	20	26-NOV-20
Thallium (Tl)-Dissolved		<0.010	<0.010	RPD-NA	ug/L	N/A	20	26-NOV-20
Uranium (U)-Dissolved		<0.010	<0.010	RPD-NA	ug/L	N/A	20	26-NOV-20
Vanadium (V)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	26-NOV-20
Zinc (Zn)-Dissolved		<1.0	<1.0	RPD-NA	ug/L	N/A	20	26-NOV-20
WG3451975-2	LCS							
Antimony (Sb)-Dissolved			103.4		%		80-120	26-NOV-20
Arsenic (As)-Dissolved			100.6		%		80-120	26-NOV-20
Barium (Ba)-Dissolved			98.3		%		80-120	26-NOV-20
Beryllium (Be)-Dissolved			103.7		%		80-120	26-NOV-20
Boron (B)-Dissolved			102.4		%		80-120	26-NOV-20
Cadmium (Cd)-Dissolved			99.6		%		80-120	26-NOV-20
Chromium (Cr)-Dissolved			99.1		%		80-120	26-NOV-20
Cobalt (Co)-Dissolved			97.8		%		80-120	26-NOV-20
Copper (Cu)-Dissolved			97.8		%		80-120	26-NOV-20
Lead (Pb)-Dissolved			100.8		%		80-120	26-NOV-20
Molybdenum (Mo)-Dissolved			103.1		%		80-120	26-NOV-20
Nickel (Ni)-Dissolved			99.3		%		80-120	26-NOV-20
Selenium (Se)-Dissolved			101.1		%		80-120	26-NOV-20
Silver (Ag)-Dissolved			99.6		%		80-120	26-NOV-20
Sodium (Na)-Dissolved			101.6		%		80-120	26-NOV-20
Thallium (Tl)-Dissolved			100.3		%		80-120	26-NOV-20
Uranium (U)-Dissolved			101.4		%		80-120	26-NOV-20
Vanadium (V)-Dissolved			101.3		%		80-120	26-NOV-20
Zinc (Zn)-Dissolved			98.1		%		80-120	26-NOV-20
WG3451975-1	MB							
Antimony (Sb)-Dissolved			<0.10		ug/L		0.1	26-NOV-20
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT								
	Water							
Batch	R5298475							
WG3451975-1	MB							
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	26-NOV-20
Barium (Ba)-Dissolved			<0.10		ug/L		0.1	26-NOV-20
Beryllium (Be)-Dissolved			<0.10		ug/L		0.1	26-NOV-20
Boron (B)-Dissolved			<10		ug/L		10	26-NOV-20
Cadmium (Cd)-Dissolved			<0.0050		ug/L		0.005	26-NOV-20
Chromium (Cr)-Dissolved			<0.50		ug/L		0.5	26-NOV-20
Cobalt (Co)-Dissolved			<0.10		ug/L		0.1	26-NOV-20
Copper (Cu)-Dissolved			<0.20		ug/L		0.2	26-NOV-20
Lead (Pb)-Dissolved			<0.050		ug/L		0.05	26-NOV-20
Molybdenum (Mo)-Dissolved			<0.050		ug/L		0.05	26-NOV-20
Nickel (Ni)-Dissolved			<0.50		ug/L		0.5	26-NOV-20
Selenium (Se)-Dissolved			<0.050		ug/L		0.05	26-NOV-20
Silver (Ag)-Dissolved			<0.050		ug/L		0.05	26-NOV-20
Sodium (Na)-Dissolved			<50		ug/L		50	26-NOV-20
Thallium (Tl)-Dissolved			<0.010		ug/L		0.01	26-NOV-20
Uranium (U)-Dissolved			<0.010		ug/L		0.01	26-NOV-20
Vanadium (V)-Dissolved			<0.50		ug/L		0.5	26-NOV-20
Zinc (Zn)-Dissolved			<1.0		ug/L		1	26-NOV-20
WG3451975-5	MS	WG3451975-3						
Antimony (Sb)-Dissolved			101.4		%		70-130	26-NOV-20
Arsenic (As)-Dissolved			101.2		%		70-130	26-NOV-20
Barium (Ba)-Dissolved			100.4		%		70-130	26-NOV-20
Beryllium (Be)-Dissolved			100.9		%		70-130	26-NOV-20
Boron (B)-Dissolved			97.2		%		70-130	26-NOV-20
Cadmium (Cd)-Dissolved			101.7		%		70-130	26-NOV-20
Chromium (Cr)-Dissolved			100.4		%		70-130	26-NOV-20
Cobalt (Co)-Dissolved			98.8		%		70-130	26-NOV-20
Copper (Cu)-Dissolved			99.1		%		70-130	26-NOV-20
Lead (Pb)-Dissolved			100.5		%		70-130	26-NOV-20
Molybdenum (Mo)-Dissolved			99.7		%		70-130	26-NOV-20
Nickel (Ni)-Dissolved			99.3		%		70-130	26-NOV-20
Selenium (Se)-Dissolved			104.5		%		70-130	26-NOV-20
Silver (Ag)-Dissolved			98.8		%		70-130	26-NOV-20
Sodium (Na)-Dissolved			101.7		%		70-130	26-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT								
	Water							
Batch	R5298475							
WG3451975-5 MS		WG3451975-3						
Thallium (Tl)-Dissolved			101.6		%		70-130	26-NOV-20
Uranium (U)-Dissolved			99.2		%		70-130	26-NOV-20
Vanadium (V)-Dissolved			101.5		%		70-130	26-NOV-20
Zinc (Zn)-Dissolved			101.1		%		70-130	26-NOV-20
MET-T-CCMS-WT								
	Water							
Batch	R5298095							
WG3451966-4 DUP		WG3451966-3						
Aluminum (Al)-Total		0.164	0.172		mg/L	4.4	20	26-NOV-20
Antimony (Sb)-Total		0.0013	0.0013		mg/L	2.5	20	26-NOV-20
Arsenic (As)-Total		0.0016	0.0018		mg/L	11	20	26-NOV-20
Barium (Ba)-Total		0.118	0.119		mg/L	0.5	20	26-NOV-20
Beryllium (Be)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	26-NOV-20
Bismuth (Bi)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	26-NOV-20
Boron (B)-Total		0.13	0.13		mg/L	1.0	20	26-NOV-20
Cadmium (Cd)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	26-NOV-20
Calcium (Ca)-Total		118	118		mg/L	0.4	20	26-NOV-20
Chromium (Cr)-Total		0.0051	<0.0050	RPD-NA	mg/L	N/A	20	26-NOV-20
Cesium (Cs)-Total		0.00016	0.00016		mg/L	1.4	20	26-NOV-20
Cobalt (Co)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	26-NOV-20
Copper (Cu)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	26-NOV-20
Iron (Fe)-Total		0.19	0.17		mg/L	7.4	20	26-NOV-20
Lead (Pb)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	26-NOV-20
Lithium (Li)-Total		0.067	0.066		mg/L	1.5	20	26-NOV-20
Magnesium (Mg)-Total		17.6	17.6		mg/L	0.1	20	26-NOV-20
Manganese (Mn)-Total		0.0082	0.0081		mg/L	1.1	20	26-NOV-20
Molybdenum (Mo)-Total		0.0127	0.0123		mg/L	2.7	20	26-NOV-20
Nickel (Ni)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	26-NOV-20
Phosphorus (P)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	26-NOV-20
Potassium (K)-Total		102	104		mg/L	1.5	20	26-NOV-20
Rubidium (Rb)-Total		0.184	0.185		mg/L	0.7	20	26-NOV-20
Selenium (Se)-Total		0.00062	0.00078	J	mg/L	0.00016	0.001	26-NOV-20
Silicon (Si)-Total		8.4	8.2		mg/L	2.1	20	26-NOV-20
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	26-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5298095							
WG3451966-4 DUP	WG3451966-3							
Sodium (Na)-Total		109	110		mg/L	0.4	20	26-NOV-20
Strontium (Sr)-Total		1.91	1.93		mg/L	1.1	20	26-NOV-20
Sulfur (S)-Total		61.5	61.0		mg/L	0.8	25	26-NOV-20
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-NOV-20
Tellurium (Te)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	26-NOV-20
Thorium (Th)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	25	26-NOV-20
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	26-NOV-20
Titanium (Ti)-Total		0.0069	0.0061		mg/L	12	20	26-NOV-20
Tungsten (W)-Total		0.0012	0.0012		mg/L	4.5	20	26-NOV-20
Uranium (U)-Total		0.00055	0.00055		mg/L	1.2	20	26-NOV-20
Vanadium (V)-Total		0.0095	0.0093		mg/L	1.6	20	26-NOV-20
Zinc (Zn)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	26-NOV-20
Zirconium (Zr)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	26-NOV-20
WG3451966-2 LCS								
Aluminum (Al)-Total			111.0		%		80-120	26-NOV-20
Antimony (Sb)-Total			104.6		%		80-120	26-NOV-20
Arsenic (As)-Total			108.7		%		80-120	26-NOV-20
Barium (Ba)-Total			105.7		%		80-120	26-NOV-20
Beryllium (Be)-Total			103.9		%		80-120	26-NOV-20
Bismuth (Bi)-Total			102.3		%		80-120	26-NOV-20
Boron (B)-Total			99.4		%		80-120	26-NOV-20
Cadmium (Cd)-Total			105.9		%		80-120	26-NOV-20
Calcium (Ca)-Total			103.7		%		80-120	26-NOV-20
Chromium (Cr)-Total			107.7		%		80-120	26-NOV-20
Cesium (Cs)-Total			101.2		%		80-120	26-NOV-20
Cobalt (Co)-Total			106.6		%		80-120	26-NOV-20
Copper (Cu)-Total			105.6		%		80-120	26-NOV-20
Iron (Fe)-Total			102.7		%		80-120	26-NOV-20
Lead (Pb)-Total			102.8		%		80-120	26-NOV-20
Lithium (Li)-Total			99.5		%		80-120	26-NOV-20
Magnesium (Mg)-Total			113.6		%		80-120	26-NOV-20
Manganese (Mn)-Total			108.4		%		80-120	26-NOV-20
Molybdenum (Mo)-Total			106.2		%		80-120	26-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5298095							
WG3451966-2	LCS							
Nickel (Ni)-Total			106.9		%		80-120	26-NOV-20
Phosphorus (P)-Total			101.2		%		70-130	26-NOV-20
Potassium (K)-Total			103.5		%		80-120	26-NOV-20
Rubidium (Rb)-Total			106.8		%		80-120	26-NOV-20
Selenium (Se)-Total			101.8		%		80-120	26-NOV-20
Silicon (Si)-Total			105.0		%		60-140	26-NOV-20
Silver (Ag)-Total			103.2		%		80-120	26-NOV-20
Sodium (Na)-Total			110.4		%		80-120	26-NOV-20
Strontium (Sr)-Total			103.1		%		80-120	26-NOV-20
Sulfur (S)-Total			105.3		%		80-120	26-NOV-20
Thallium (Tl)-Total			103.5		%		80-120	26-NOV-20
Tellurium (Te)-Total			100.2		%		80-120	26-NOV-20
Thorium (Th)-Total			100.5		%		70-130	26-NOV-20
Tin (Sn)-Total			98.5		%		80-120	26-NOV-20
Titanium (Ti)-Total			107.8		%		80-120	26-NOV-20
Tungsten (W)-Total			102.0		%		80-120	26-NOV-20
Uranium (U)-Total			103.2		%		80-120	26-NOV-20
Vanadium (V)-Total			108.2		%		80-120	26-NOV-20
Zinc (Zn)-Total			104.8		%		80-120	26-NOV-20
Zirconium (Zr)-Total			99.4		%		80-120	26-NOV-20
WG3451966-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	26-NOV-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	26-NOV-20
Boron (B)-Total			<0.010		mg/L		0.01	26-NOV-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	26-NOV-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	26-NOV-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	26-NOV-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	26-NOV-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	26-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5298095							
WG3451966-1	MB							
Iron (Fe)-Total			<0.010		mg/L		0.01	26-NOV-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	26-NOV-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	26-NOV-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	26-NOV-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	26-NOV-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	26-NOV-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	26-NOV-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	26-NOV-20
Potassium (K)-Total			<0.050		mg/L		0.05	26-NOV-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	26-NOV-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	26-NOV-20
Silicon (Si)-Total			<0.10		mg/L		0.1	26-NOV-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	26-NOV-20
Sodium (Na)-Total			<0.050		mg/L		0.05	26-NOV-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	26-NOV-20
Sulfur (S)-Total			<0.50		mg/L		0.5	26-NOV-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	26-NOV-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	26-NOV-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	26-NOV-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	26-NOV-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	26-NOV-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	26-NOV-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	26-NOV-20
WG3451966-5	MS	WG3451966-3						
Aluminum (Al)-Total			N/A	MS-B	%		-	26-NOV-20
Antimony (Sb)-Total			101.2		%		70-130	26-NOV-20
Arsenic (As)-Total			109.5		%		70-130	26-NOV-20
Barium (Ba)-Total			N/A	MS-B	%		-	26-NOV-20
Beryllium (Be)-Total			107.7		%		70-130	26-NOV-20
Bismuth (Bi)-Total			101.6		%		70-130	26-NOV-20
Boron (B)-Total			N/A	MS-B	%		-	26-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5298095							
WG3451966-5 MS		WG3451966-3						
Cadmium (Cd)-Total			101.6		%		70-130	26-NOV-20
Calcium (Ca)-Total			N/A	MS-B	%		-	26-NOV-20
Chromium (Cr)-Total			103.1		%		70-130	26-NOV-20
Cesium (Cs)-Total			99.2		%		70-130	26-NOV-20
Cobalt (Co)-Total			105.1		%		70-130	26-NOV-20
Copper (Cu)-Total			106.0		%		70-130	26-NOV-20
Iron (Fe)-Total			N/A	MS-B	%		-	26-NOV-20
Lead (Pb)-Total			100.6		%		70-130	26-NOV-20
Lithium (Li)-Total			N/A	MS-B	%		-	26-NOV-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	26-NOV-20
Manganese (Mn)-Total			104.6		%		70-130	26-NOV-20
Molybdenum (Mo)-Total			N/A	MS-B	%		-	26-NOV-20
Nickel (Ni)-Total			105.3		%		70-130	26-NOV-20
Phosphorus (P)-Total			125.5		%		70-130	26-NOV-20
Potassium (K)-Total			N/A	MS-B	%		-	26-NOV-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	26-NOV-20
Selenium (Se)-Total			99.8		%		70-130	26-NOV-20
Silicon (Si)-Total			N/A	MS-B	%		-	26-NOV-20
Silver (Ag)-Total			98.9		%		70-130	26-NOV-20
Sodium (Na)-Total			N/A	MS-B	%		-	26-NOV-20
Strontium (Sr)-Total			N/A	MS-B	%		-	26-NOV-20
Sulfur (S)-Total			N/A	MS-B	%		-	26-NOV-20
Thallium (Tl)-Total			102.5		%		70-130	26-NOV-20
Tellurium (Te)-Total			102.6		%		70-130	26-NOV-20
Thorium (Th)-Total			94.6		%		70-130	26-NOV-20
Tin (Sn)-Total			97.4		%		70-130	26-NOV-20
Titanium (Ti)-Total			107.9		%		70-130	26-NOV-20
Tungsten (W)-Total			102.2		%		70-130	26-NOV-20
Uranium (U)-Total			N/A	MS-B	%		-	26-NOV-20
Vanadium (V)-Total			105.5		%		70-130	26-NOV-20
Zinc (Zn)-Total			104.4		%		70-130	26-NOV-20
Zirconium (Zr)-Total			92.0		%		70-130	26-NOV-20

OGG-SPEC-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OGG-SPEC-WT		Water						
Batch	R5298859							
WG3451948-2	LCS							
Oil and Grease, Total			94.9		%		70-130	26-NOV-20
Mineral Oil and Grease			90.2		%		70-130	26-NOV-20
WG3451948-1	MB							
Oil and Grease, Total			<5.0		mg/L		5	26-NOV-20
Mineral Oil and Grease			<2.5		mg/L		2.5	26-NOV-20
PAH-511-WT		Water						
Batch	R5298949							
WG3451674-2	LCS							
1-Methylnaphthalene			89.0		%		50-140	27-NOV-20
2-Methylnaphthalene			82.6		%		50-140	27-NOV-20
Acenaphthene			89.4		%		50-140	27-NOV-20
Acenaphthylene			88.7		%		50-140	27-NOV-20
Anthracene			94.7		%		50-140	27-NOV-20
Benzo(a)anthracene			101.1		%		50-140	27-NOV-20
Benzo(a)pyrene			89.0		%		50-140	27-NOV-20
Benzo(b)fluoranthene			88.2		%		50-140	27-NOV-20
Benzo(g,h,i)perylene			88.8		%		50-140	27-NOV-20
Benzo(k)fluoranthene			87.8		%		50-140	27-NOV-20
Chrysene			107.1		%		50-140	27-NOV-20
Dibenzo(ah)anthracene			90.1		%		50-140	27-NOV-20
Fluoranthene			95.0		%		50-140	27-NOV-20
Fluorene			93.4		%		50-140	27-NOV-20
Indeno(1,2,3-cd)pyrene			103.8		%		50-140	27-NOV-20
Naphthalene			80.2		%		50-140	27-NOV-20
Phenanthrene			99.8		%		50-140	27-NOV-20
Pyrene			97.0		%		50-140	27-NOV-20
WG3451674-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	27-NOV-20
2-Methylnaphthalene			<0.020		ug/L		0.02	27-NOV-20
Acenaphthene			<0.020		ug/L		0.02	27-NOV-20
Acenaphthylene			<0.020		ug/L		0.02	27-NOV-20
Anthracene			<0.020		ug/L		0.02	27-NOV-20
Benzo(a)anthracene			<0.020		ug/L		0.02	27-NOV-20
Benzo(a)pyrene			<0.010		ug/L		0.01	27-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT		Water						
Batch	R5298949							
WG3451674-1 MB								
Benzo(b)fluoranthene			<0.020		ug/L		0.02	27-NOV-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	27-NOV-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	27-NOV-20
Chrysene			<0.020		ug/L		0.02	27-NOV-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	27-NOV-20
Fluoranthene			<0.020		ug/L		0.02	27-NOV-20
Fluorene			<0.020		ug/L		0.02	27-NOV-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	27-NOV-20
Naphthalene			<0.050		ug/L		0.05	27-NOV-20
Phenanthrene			<0.020		ug/L		0.02	27-NOV-20
Pyrene			<0.020		ug/L		0.02	27-NOV-20
Surrogate: d8-Naphthalene			86.5		%		60-140	27-NOV-20
Surrogate: d10-Phenanthrene			96.0		%		60-140	27-NOV-20
Surrogate: d12-Chrysene			93.2		%		60-140	27-NOV-20
Surrogate: d10-Acenaphthene			88.5		%		60-140	27-NOV-20
PH-WT		Water						
Batch	R5298244							
WG3452155-4 DUP		WG3452155-3						
pH		7.80	7.76	J	pH units	0.04	0.2	26-NOV-20
WG3452155-2 LCS			7.05		pH units		6.9-7.1	26-NOV-20
Batch	R5299316							
WG3452156-4 DUP		WG3452156-3						
pH		8.28	8.26	J	pH units	0.02	0.2	26-NOV-20
WG3452156-2 LCS			7.01		pH units		6.9-7.1	26-NOV-20
VOC-511-HS-WT		Water						
Batch	R5299578							
WG3453379-4 DUP		WG3453379-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5299578							
WG3453379-4	DUP	WG3453379-3						
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	30-NOV-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	30-NOV-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-NOV-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	30-NOV-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	30-NOV-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	30-NOV-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	30-NOV-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-NOV-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-NOV-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	30-NOV-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	30-NOV-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	30-NOV-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	30-NOV-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-NOV-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	30-NOV-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	30-NOV-20
Trichloroethylene		<0.50	<0.50		ug/L			30-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5299578							
WG3453379-4	DUP	WG3453379-3						
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	30-NOV-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
WG3453379-1	LCS							
1,1,1,2-Tetrachloroethane			89.1		%		70-130	30-NOV-20
1,1,2,2-Tetrachloroethane			74.2		%		70-130	30-NOV-20
1,1,1-Trichloroethane			100.5		%		70-130	30-NOV-20
1,1,2-Trichloroethane			83.8		%		70-130	30-NOV-20
1,1-Dichloroethane			90.6		%		70-130	30-NOV-20
1,1-Dichloroethylene			100.8		%		70-130	30-NOV-20
1,2-Dibromoethane			82.0		%		70-130	30-NOV-20
1,2-Dichlorobenzene			97.6		%		70-130	30-NOV-20
1,2-Dichloroethane			88.0		%		70-130	30-NOV-20
1,2-Dichloropropane			86.1		%		70-130	30-NOV-20
1,3-Dichlorobenzene			106.1		%		70-130	30-NOV-20
1,4-Dichlorobenzene			104.9		%		70-130	30-NOV-20
Acetone			86.0		%		60-140	30-NOV-20
Benzene			89.9		%		70-130	30-NOV-20
Bromodichloromethane			96.9		%		70-130	30-NOV-20
Bromoform			90.3		%		70-130	30-NOV-20
Bromomethane			83.2		%		60-140	30-NOV-20
Carbon tetrachloride			106.5		%		70-130	30-NOV-20
Chlorobenzene			93.9		%		70-130	30-NOV-20
Chloroform			94.9		%		70-130	30-NOV-20
cis-1,2-Dichloroethylene			90.5		%		70-130	30-NOV-20
cis-1,3-Dichloropropene			91.5		%		70-130	30-NOV-20
Dibromochloromethane			86.5		%		70-130	30-NOV-20
Dichlorodifluoromethane			71.6		%		50-140	30-NOV-20
Ethylbenzene			100.0		%		70-130	30-NOV-20
n-Hexane			97.9		%		70-130	30-NOV-20
m+p-Xylenes			100.9		%		70-130	30-NOV-20
Methyl Ethyl Ketone			63.0		%		60-140	30-NOV-20
Methyl Isobutyl Ketone			75.9		%		60-140	30-NOV-20
Methylene Chloride			90.0				70-130	



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5299578							
WG3453379-1	LCS							
Methylene Chloride			90.0		%		70-130	30-NOV-20
MTBE			97.4		%		70-130	30-NOV-20
o-Xylene			104.5		%		70-130	30-NOV-20
Styrene			91.0		%		70-130	30-NOV-20
Tetrachloroethylene			105.4		%		70-130	30-NOV-20
Toluene			97.4		%		70-130	30-NOV-20
trans-1,2-Dichloroethylene			101.9		%		70-130	30-NOV-20
trans-1,3-Dichloropropene			92.4		%		70-130	30-NOV-20
Trichloroethylene			100.7		%		70-130	30-NOV-20
Trichlorofluoromethane			99.5		%		60-140	30-NOV-20
Vinyl chloride			89.3		%		60-140	30-NOV-20
WG3453379-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	30-NOV-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	30-NOV-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	30-NOV-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	30-NOV-20
1,1-Dichloroethane			<0.50		ug/L		0.5	30-NOV-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	30-NOV-20
1,2-Dibromoethane			<0.20		ug/L		0.2	30-NOV-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	30-NOV-20
1,2-Dichloroethane			<0.50		ug/L		0.5	30-NOV-20
1,2-Dichloropropane			<0.50		ug/L		0.5	30-NOV-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	30-NOV-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	30-NOV-20
Acetone			<30		ug/L		30	30-NOV-20
Benzene			<0.50		ug/L		0.5	30-NOV-20
Bromodichloromethane			<2.0		ug/L		2	30-NOV-20
Bromoform			<5.0		ug/L		5	30-NOV-20
Bromomethane			<0.50		ug/L		0.5	30-NOV-20
Carbon tetrachloride			<0.20		ug/L		0.2	30-NOV-20
Chlorobenzene			<0.50		ug/L		0.5	30-NOV-20
Chloroform			<1.0		ug/L		1	30-NOV-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	30-NOV-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	30-NOV-20



Quality Control Report

Workorder: L2533335

Report Date: 30-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5299578							
WG3453379-2 MB								
Dibromochloromethane			<2.0		ug/L		2	30-NOV-20
Dichlorodifluoromethane			<2.0		ug/L		2	30-NOV-20
Ethylbenzene			<0.50		ug/L		0.5	30-NOV-20
n-Hexane			<0.50		ug/L		0.5	30-NOV-20
m+p-Xylenes			<0.40		ug/L		0.4	30-NOV-20
Methyl Ethyl Ketone			<20		ug/L		20	30-NOV-20
Methyl Isobutyl Ketone			<20		ug/L		20	30-NOV-20
Methylene Chloride			<5.0		ug/L		5	30-NOV-20
MTBE			<2.0		ug/L		2	30-NOV-20
o-Xylene			<0.30		ug/L		0.3	30-NOV-20
Styrene			<0.50		ug/L		0.5	30-NOV-20
Tetrachloroethylene			<0.50		ug/L		0.5	30-NOV-20
Toluene			<0.50		ug/L		0.5	30-NOV-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	30-NOV-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	30-NOV-20
Trichloroethylene			<0.50		ug/L		0.5	30-NOV-20
Trichlorofluoromethane			<5.0		ug/L		5	30-NOV-20
Vinyl chloride			<0.50		ug/L		0.5	30-NOV-20
Surrogate: 1,4-Difluorobenzene			101.1		%		70-130	30-NOV-20
Surrogate: 4-Bromofluorobenzene			100.4		%		70-130	30-NOV-20
WG3453379-5 MS		WG3453379-3						
1,1,1,2-Tetrachloroethane			90.2		%		50-140	30-NOV-20
1,1,2,2-Tetrachloroethane			83.2		%		50-140	30-NOV-20
1,1,1-Trichloroethane			96.2		%		50-140	30-NOV-20
1,1,2-Trichloroethane			89.5		%		50-140	30-NOV-20
1,1-Dichloroethane			91.7		%		50-140	30-NOV-20
1,1-Dichloroethylene			95.8		%		50-140	30-NOV-20
1,2-Dibromoethane			88.0		%		50-140	30-NOV-20
1,2-Dichlorobenzene			97.5		%		50-140	30-NOV-20
1,2-Dichloroethane			96.3		%		50-140	30-NOV-20
1,2-Dichloropropane			91.1		%		50-140	30-NOV-20
1,3-Dichlorobenzene			102.1		%		50-140	30-NOV-20
1,4-Dichlorobenzene			101.8		%		50-140	30-NOV-20
Acetone			101.0		%		50-140	30-NOV-20



Quality Control Report

Workorder: L2533335

Report Date: 30-NOV-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5299578							
WG3453379-5 MS		WG3453379-3						
Benzene			91.0		%		50-140	30-NOV-20
Bromodichloromethane			102.1		%		50-140	30-NOV-20
Bromoform			96.9		%		50-140	30-NOV-20
Bromomethane			78.5		%		50-140	30-NOV-20
Carbon tetrachloride			101.9		%		50-140	30-NOV-20
Chlorobenzene			93.3		%		50-140	30-NOV-20
Chloroform			96.9		%		50-140	30-NOV-20
cis-1,2-Dichloroethylene			91.7		%		50-140	30-NOV-20
cis-1,3-Dichloropropene			92.8		%		50-140	30-NOV-20
Dibromochloromethane			89.8		%		50-140	30-NOV-20
Dichlorodifluoromethane			59.9		%		50-140	30-NOV-20
Ethylbenzene			95.7		%		50-140	30-NOV-20
n-Hexane			90.2		%		50-140	30-NOV-20
m+p-Xylenes			96.5		%		50-140	30-NOV-20
Methyl Ethyl Ketone			78.1		%		50-140	30-NOV-20
Methyl Isobutyl Ketone			90.8		%		50-140	30-NOV-20
Methylene Chloride			92.3		%		50-140	30-NOV-20
MTBE			97.6		%		50-140	30-NOV-20
o-Xylene			102.6		%		50-140	30-NOV-20
Styrene			90.6		%		50-140	30-NOV-20
Tetrachloroethylene			96.3		%		50-140	30-NOV-20
Toluene			94.6		%		50-140	30-NOV-20
trans-1,2-Dichloroethylene			97.8		%		50-140	30-NOV-20
trans-1,3-Dichloropropene			91.3		%		50-140	30-NOV-20
Trichloroethylene			97.2		%		50-140	30-NOV-20
Trichlorofluoromethane			91.6		%		50-140	30-NOV-20
Vinyl chloride			81.3		%		50-140	30-NOV-20

Quality Control Report

Workorder: L2533335

Report Date: 30-NOV-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: Laura Ermeta

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Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

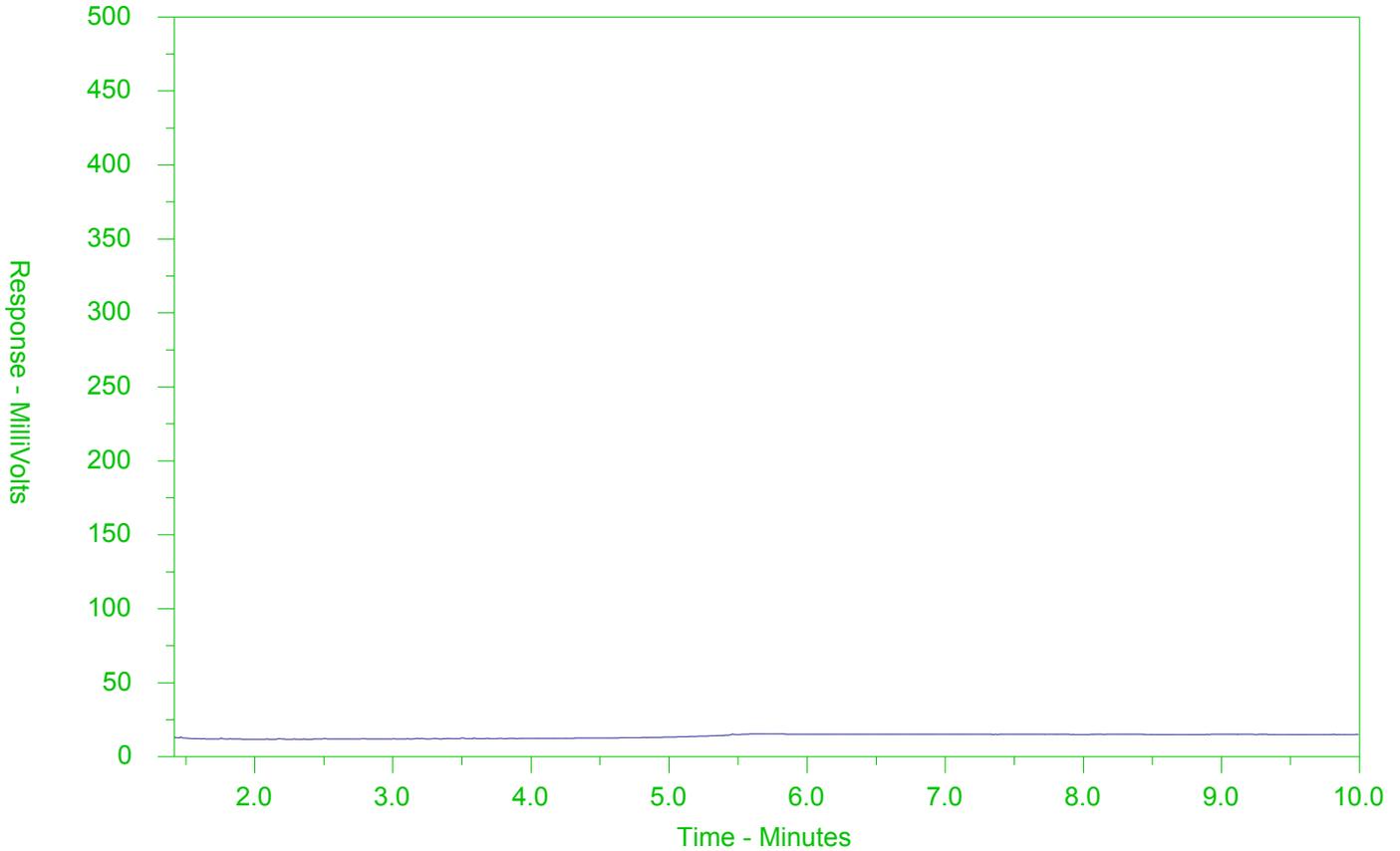
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2533335-1
 Client Sample ID: GW-11210029-112420-MW-2



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

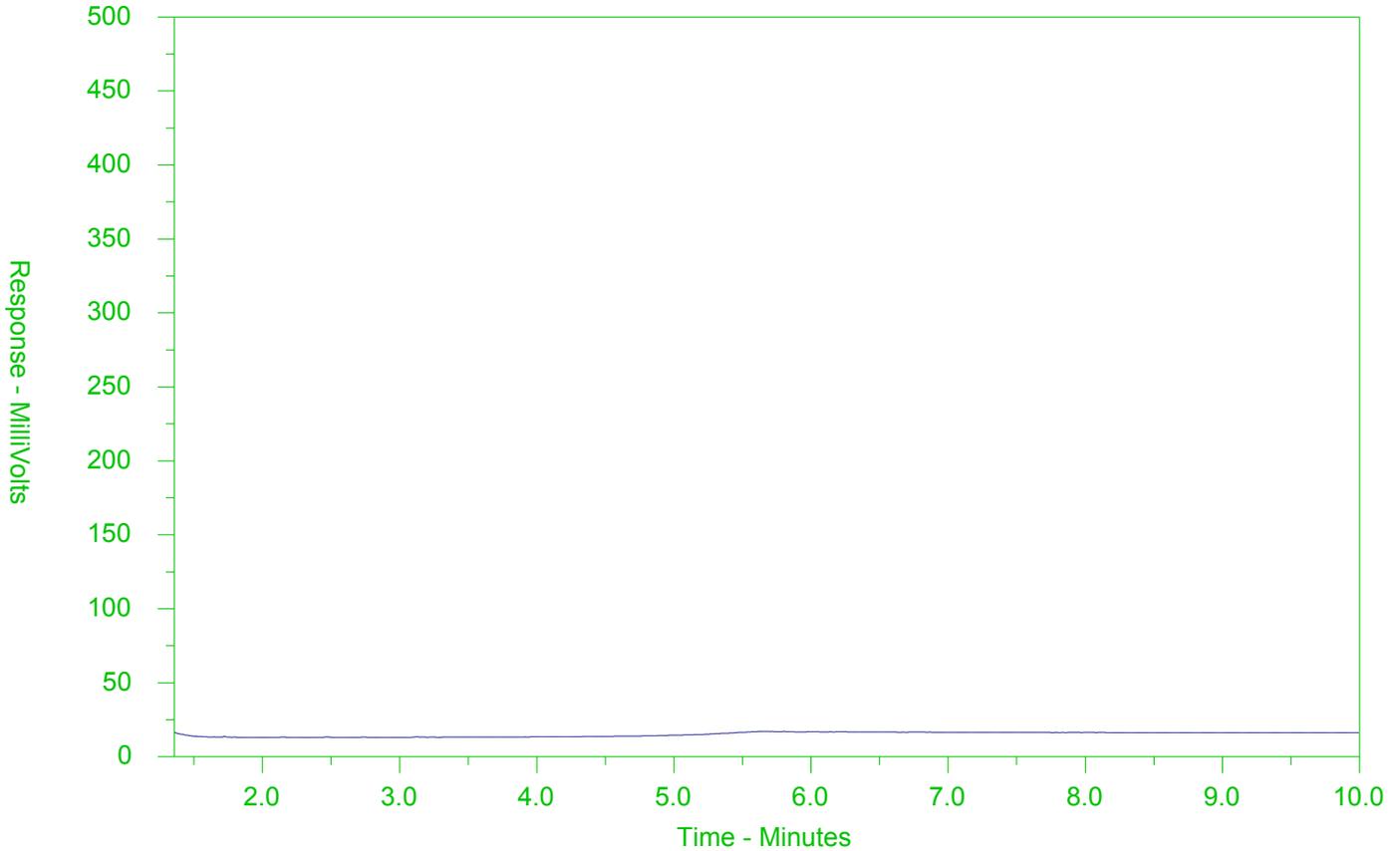
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2533335-2
 Client Sample ID: GW-11210029-112420-MW-2D



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

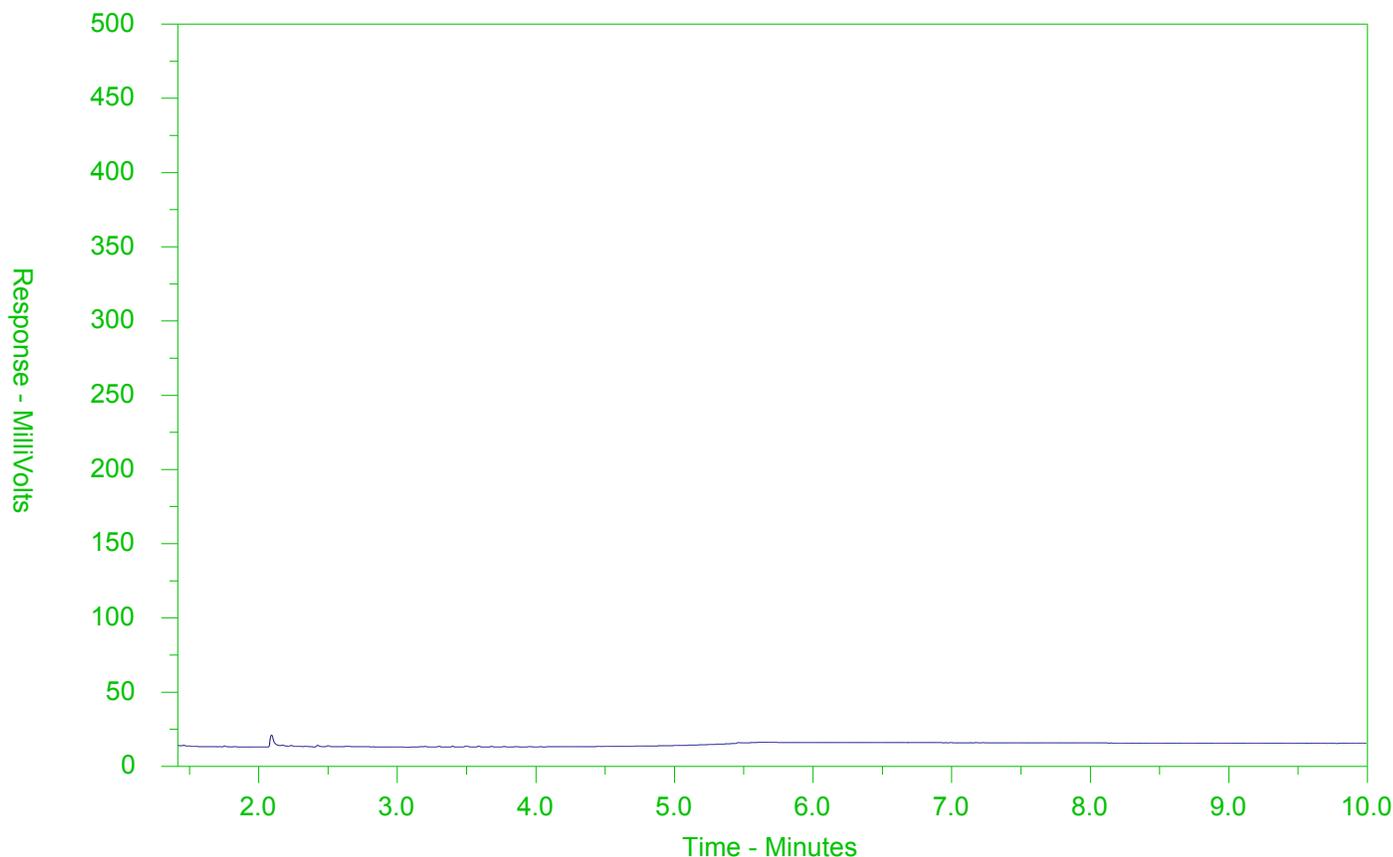
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2533335-3
 Client Sample ID: GW-11210029-112420-MW-3



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

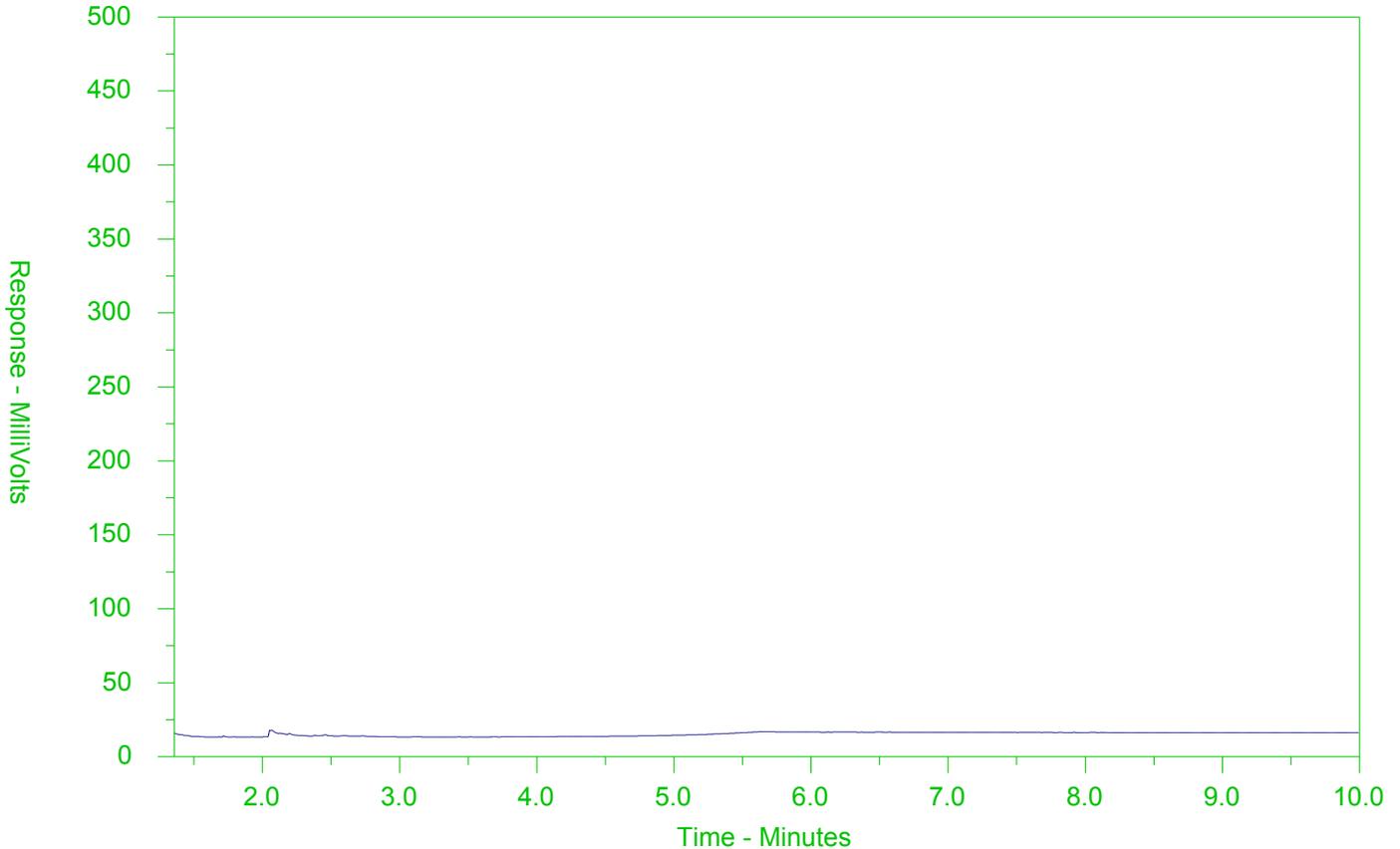
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2533335-4
 Client Sample ID: GW-11210029-112520-MW-1



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.




Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)					
Company: GHD		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply					
Contact: Jan Balk with		Quality Control (QC) Report with Report <input type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)	4 day [P4-20%] <input type="checkbox"/>		EMERGENCY	1 Business day [E - 100%] <input type="checkbox"/>	
Phone:		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked				3 day [P3-25%] <input type="checkbox"/>			Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/>	
Company address below will appear on the final report		Select Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			2 day [P2-50%] <input type="checkbox"/>					
Street: 455 Philip St		Email 1 or Fax: Jennifer.Balkwith@ghd.com			Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm					
City/Province: Waterloo ON		Email 2: Gary.Larios@ghd.com			For tests that can not be performed according to the service level selected, you will be contacted.					
Postal Code:		Email 3: Amelia.Selata@ghd.com			Analysis Request					
Invoice To: Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Invoice Distribution			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below NUMBER OF CONTAINERS P P FP P FP FP P P P VOC, FI Total Metals Dissolved Metals Total Hg Dissolved As Dissolved Cr6 CN SVOC PAH F2-F4 EC, PA, CL Oil & Grease					
Copy of Invoice with Report <input type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX								
Company:		Email 1 or Fax:			SAMPLES ON HOLD					
Contact:		Email 2:								SUSPECTED HAZARD (see Special Instructions)
Project Information		Oil and Gas Required Fields (client use)								
ALS Account # / Quote #: 13791		AFE/Cost Center: PO#								
Job #: 11210029-02-WATER		Major/Minor Code: Routing Code:								
PO / AFE:		Requisitioner:								
LSD:		Location:								
ALS Lab Work Order # (lab use only): L2533335 MM		ALS Contact:			Sampler:					
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type						
	GW-11210029-112420-MW-2	24-Nov-20	11:25	GW						
	- 2D	11	11:30							
	- 3	11	13:45							
	- 1	25-Nov-20	11:20							
	Trip Blank	11	12:00							
Drinking Water (DW) Samples' (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)					
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Frozen <input type="checkbox"/> SIP Observations Yes <input type="checkbox"/> No <input type="checkbox"/>					
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input checked="" type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>					
					Cooling Initiated <input type="checkbox"/>					
					INITIAL COOLER TEMPERATURES °C: 2.9 FINAL COOLER TEMPERATURES °C: 3.3					
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)					
Released by: M. Waldich	Date: 11-25-2020	Time: 12:53	Received by:	Date:	Time:	Received by: M	Date: Nov 25/20	Time: 1300		

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



GHD Limited (Waterloo)
ATTN: Laura Ermeta
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 04-DEC-20
Report Date: 14-DEC-20 10:02 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2537182

Project P.O. #: 73522069
Job Reference: 11210029-02
C of C Numbers: 17-871523
Legal Site Desc:


Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-1 GW-11210029-120420-MW-01							
Sampled By: CLIENT on 04-DEC-20 @ 11:30							
Matrix: WATER							
Physical Tests							
Conductivity	0.632		0.0030	mS/cm		08-DEC-20	R5309386
pH	7.68		0.10	pH units		08-DEC-20	R5309386
Anions and Nutrients							
Chloride (Cl)	11.7		0.50	mg/L		08-DEC-20	R5309768
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		07-DEC-20	R5309148
Total Metals							
Aluminum (Al)-Total	0.366		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Antimony (Sb)-Total	0.00021		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Arsenic (As)-Total	0.00055		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Barium (Ba)-Total	0.0939		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Boron (B)-Total	0.029		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Cadmium (Cd)-Total	0.0000319		0.0000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Calcium (Ca)-Total	91.0		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cesium (Cs)-Total	0.000039		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Chromium (Cr)-Total	0.00097		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cobalt (Co)-Total	0.00066		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Copper (Cu)-Total	0.00143		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Iron (Fe)-Total	0.439		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Lead (Pb)-Total	0.000725		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Lithium (Li)-Total	0.0124		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Magnesium (Mg)-Total	34.2		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Manganese (Mn)-Total	0.135		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		08-DEC-20	R5309314
Molybdenum (Mo)-Total	0.00325		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Nickel (Ni)-Total	0.00173		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Phosphorus (P)-Total	<0.050		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Potassium (K)-Total	5.56		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Rubidium (Rb)-Total	0.00099		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Selenium (Se)-Total	0.000109		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Silicon (Si)-Total	7.05		0.10	mg/L	07-DEC-20	07-DEC-20	R5308869
Silver (Ag)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Sodium (Na)-Total	9.85		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Strontium (Sr)-Total	0.269		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Sulfur (S)-Total	8.87		0.50	mg/L	07-DEC-20	07-DEC-20	R5308869
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Thallium (Tl)-Total	0.000012		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Thorium (Th)-Total	0.00011		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Tin (Sn)-Total	0.00028		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Titanium (Ti)-Total	0.0142		0.00030	mg/L	07-DEC-20	07-DEC-20	R5308869

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-1 GW-11210029-120420-MW-01							
Sampled By: CLIENT on 04-DEC-20 @ 11:30							
Matrix: WATER							
Total Metals							
Tungsten (W)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Uranium (U)-Total	0.000905		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Vanadium (V)-Total	0.00104		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Zinc (Zn)-Total	0.0102		0.0030	mg/L	07-DEC-20	07-DEC-20	R5308869
Zirconium (Zr)-Total	0.00040		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					07-DEC-20	R5308717
Dissolved Metals Filtration Location	FIELD					08-DEC-20	R5309129
Antimony (Sb)-Dissolved	0.16		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Arsenic (As)-Dissolved	0.36		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Barium (Ba)-Dissolved	93.5		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Boron (B)-Dissolved	23		10	ug/L	08-DEC-20	08-DEC-20	R5309628
Cadmium (Cd)-Dissolved	0.014		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Cobalt (Co)-Dissolved	0.43		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Copper (Cu)-Dissolved	0.70		0.20	ug/L	08-DEC-20	08-DEC-20	R5309628
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	07-DEC-20	07-DEC-20	R5308859
Molybdenum (Mo)-Dissolved	2.89		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Nickel (Ni)-Dissolved	1.13		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Selenium (Se)-Dissolved	0.096		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Sodium (Na)-Dissolved	9100		500	ug/L	08-DEC-20	08-DEC-20	R5309628
Thallium (Tl)-Dissolved	0.015		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Uranium (U)-Dissolved	0.816		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Zinc (Zn)-Dissolved	4.3		1.0	ug/L	08-DEC-20	08-DEC-20	R5309628
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		07-DEC-20	R5309177
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	07-DEC-20	07-DEC-20	R5309404
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		08-DEC-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	07-DEC-20	07-DEC-20	R5309404
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-DEC-20	R5310357
Benzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Bromodichloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Bromoform	<5.0		5.0	ug/L		10-DEC-20	R5310357
Bromomethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Carbon tetrachloride	<0.20		0.20	ug/L		10-DEC-20	R5310357
Chlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-1 GW-11210029-120420-MW-01 Sampled By: CLIENT on 04-DEC-20 @ 11:30 Matrix: WATER							
Volatile Organic Compounds							
Dibromochloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Chloroform	<1.0		1.0	ug/L		10-DEC-20	R5310357
1,2-Dibromoethane	<0.20		0.20	ug/L		10-DEC-20	R5310357
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
1,1-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,2-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methylene Chloride	<5.0		5.0	ug/L		10-DEC-20	R5310357
1,2-Dichloropropane	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-DEC-20	
Ethylbenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
n-Hexane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methyl Ethyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
Methyl Isobutyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
MTBE	<2.0		2.0	ug/L		10-DEC-20	R5310357
Styrene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Tetrachloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Toluene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichlorofluoromethane	<5.0		5.0	ug/L		10-DEC-20	R5310357
Vinyl chloride	<0.50		0.50	ug/L		10-DEC-20	R5310357
o-Xylene	<0.30		0.30	ug/L		10-DEC-20	R5310357
m+p-Xylenes	<0.40		0.40	ug/L		10-DEC-20	R5310357
Xylenes (Total)	<0.50		0.50	ug/L		10-DEC-20	
Surrogate: 4-Bromofluorobenzene	99.7		70-130	%		10-DEC-20	R5310357
Surrogate: 1,4-Difluorobenzene	98.8		70-130	%		10-DEC-20	R5310357
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-DEC-20	R5310357
F1-BTEX	<25		25	ug/L		11-DEC-20	
F2 (C10-C16)	<100		100	ug/L	07-DEC-20	08-DEC-20	R5309249

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-1 GW-11210029-120420-MW-01							
Sampled By: CLIENT on 04-DEC-20 @ 11:30							
Matrix: WATER							
Hydrocarbons							
F2-Naphth	<100		100	ug/L		11-DEC-20	
F3 (C16-C34)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
F3-PAH	<250		250	ug/L		11-DEC-20	
F4 (C34-C50)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
Total Hydrocarbons (C6-C50)	<370		370	ug/L		11-DEC-20	
Chrom. to baseline at nC50	YES				07-DEC-20	08-DEC-20	R5309249
Surrogate: 2-Bromobenzotrifluoride	92.2		60-140	%	07-DEC-20	08-DEC-20	R5309249
Surrogate: 3,4-Dichlorotoluene	104.3		60-140	%		10-DEC-20	R5310357
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Acenaphthylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)pyrene	<0.010		0.010	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(b)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(k)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Chrysene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluoranthene	0.075		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluorene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		11-DEC-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
2-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Naphthalene	<0.050		0.050	ug/L	07-DEC-20	09-DEC-20	R5310144
Phenanthrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Pyrene	0.109		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Acenaphthene	93.9		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d12-Chrysene	102.7		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d8-Naphthalene	89.9		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Phenanthrene	99.0		60-140	%	07-DEC-20	09-DEC-20	R5310144
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
4-Chloroaniline	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2-Chlorophenol	<0.30		0.30	ug/L	07-DEC-20	11-DEC-20	R5309926
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dichlorophenol	<0.30		0.30	ug/L	07-DEC-20	11-DEC-20	R5309926
Diethylphthalate	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-1 GW-11210029-120420-MW-01 Sampled By: CLIENT on 04-DEC-20 @ 11:30 Matrix: WATER							
Semi-Volatile Organics							
Dimethylphthalate	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dimethylphenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dinitrophenol	<1.0		1.0	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,6-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		11-DEC-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	07-DEC-20	11-DEC-20	R5309926
Pentachlorophenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
Phenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
Surrogate: 2-Fluorobiphenyl	86.9		50-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: Nitrobenzene d5	95.2		50-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: p-Terphenyl d14	91.5		60-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: 2,4,6-Tribromophenol	114.2		50-140	%	07-DEC-20	11-DEC-20	R5309926
L2537182-2 GW-11210029-120420-MW-02 Sampled By: CLIENT on 04-DEC-20 @ 13:05 Matrix: WATER							
Physical Tests							
Conductivity	0.688		0.0030	mS/cm		08-DEC-20	R5309386
pH	7.69		0.10	pH units		08-DEC-20	R5309386
Anions and Nutrients							
Chloride (Cl)	5.40		0.50	mg/L		08-DEC-20	R5309768
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		07-DEC-20	R5309148
Total Metals							
Aluminum (Al)-Total	0.0092		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Arsenic (As)-Total	0.00051		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Barium (Ba)-Total	0.0531		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Boron (B)-Total	0.043		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Cadmium (Cd)-Total	0.0000789		0.0000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Calcium (Ca)-Total	96.1		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Chromium (Cr)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cobalt (Co)-Total	0.00066		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Copper (Cu)-Total	0.0104		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Iron (Fe)-Total	<0.010		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Lead (Pb)-Total	0.000083		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-2 GW-11210029-120420-MW-02							
Sampled By: CLIENT on 04-DEC-20 @ 13:05							
Matrix: WATER							
Total Metals							
Lithium (Li)-Total	0.0019		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Magnesium (Mg)-Total	31.0		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Manganese (Mn)-Total	0.140		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		08-DEC-20	R5309314
Molybdenum (Mo)-Total	0.000528		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Nickel (Ni)-Total	0.00490		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Phosphorus (P)-Total	<0.050		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Potassium (K)-Total	31.2		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Rubidium (Rb)-Total	0.00587		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Selenium (Se)-Total	0.000113		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Silicon (Si)-Total	4.65		0.10	mg/L	07-DEC-20	07-DEC-20	R5308869
Silver (Ag)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Sodium (Na)-Total	4.90		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Strontium (Sr)-Total	0.119		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Sulfur (S)-Total	5.21		0.50	mg/L	07-DEC-20	07-DEC-20	R5308869
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Thallium (Tl)-Total	0.000068		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Thorium (Th)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Tin (Sn)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Titanium (Ti)-Total	0.00053		0.00030	mg/L	07-DEC-20	07-DEC-20	R5308869
Tungsten (W)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Uranium (U)-Total	0.000428		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Vanadium (V)-Total	<0.00050		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Zinc (Zn)-Total	0.0185		0.0030	mg/L	07-DEC-20	07-DEC-20	R5308869
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					07-DEC-20	R5308717
Dissolved Metals Filtration Location	FIELD					08-DEC-20	R5309129
Antimony (Sb)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Arsenic (As)-Dissolved	0.46		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Barium (Ba)-Dissolved	51.5		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Boron (B)-Dissolved	36		10	ug/L	08-DEC-20	08-DEC-20	R5309628
Cadmium (Cd)-Dissolved	0.073		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Cobalt (Co)-Dissolved	0.62		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Copper (Cu)-Dissolved	10.5		0.20	ug/L	08-DEC-20	08-DEC-20	R5309628
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	07-DEC-20	07-DEC-20	R5308859
Molybdenum (Mo)-Dissolved	0.524		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Nickel (Ni)-Dissolved	4.70		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-2 GW-11210029-120420-MW-02							
Sampled By: CLIENT on 04-DEC-20 @ 13:05							
Matrix: WATER							
Dissolved Metals							
Selenium (Se)-Dissolved	0.146		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Sodium (Na)-Dissolved	4670		500	ug/L	08-DEC-20	08-DEC-20	R5309628
Thallium (Tl)-Dissolved	0.063		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Uranium (U)-Dissolved	0.348		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Zinc (Zn)-Dissolved	17.7		1.0	ug/L	08-DEC-20	08-DEC-20	R5309628
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		07-DEC-20	R5309177
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	07-DEC-20	07-DEC-20	R5309404
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		08-DEC-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	07-DEC-20	07-DEC-20	R5309404
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-DEC-20	R5310357
Benzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Bromodichloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Bromoform	<5.0		5.0	ug/L		10-DEC-20	R5310357
Bromomethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Carbon tetrachloride	<0.20		0.20	ug/L		10-DEC-20	R5310357
Chlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dibromochloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Chloroform	<1.0		1.0	ug/L		10-DEC-20	R5310357
1,2-Dibromoethane	<0.20		0.20	ug/L		10-DEC-20	R5310357
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
1,1-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,2-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methylene Chloride	<5.0		5.0	ug/L		10-DEC-20	R5310357
1,2-Dichloropropane	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-DEC-20	
Ethylbenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
n-Hexane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methyl Ethyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
Methyl Isobutyl Ketone	<20		20	ug/L		10-DEC-20	R5310357

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-2 GW-11210029-120420-MW-02 Sampled By: CLIENT on 04-DEC-20 @ 13:05 Matrix: WATER							
Volatile Organic Compounds							
MTBE	<2.0		2.0	ug/L		10-DEC-20	R5310357
Styrene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Tetrachloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Toluene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichlorofluoromethane	<5.0		5.0	ug/L		10-DEC-20	R5310357
Vinyl chloride	<0.50		0.50	ug/L		10-DEC-20	R5310357
o-Xylene	<0.30		0.30	ug/L		10-DEC-20	R5310357
m+p-Xylenes	<0.40		0.40	ug/L		10-DEC-20	R5310357
Xylenes (Total)	<0.50		0.50	ug/L		10-DEC-20	
Surrogate: 4-Bromofluorobenzene	95.4		70-130	%		10-DEC-20	R5310357
Surrogate: 1,4-Difluorobenzene	100.0		70-130	%		10-DEC-20	R5310357
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-DEC-20	R5310357
F1-BTEX	<25		25	ug/L		11-DEC-20	
F2 (C10-C16)	<100		100	ug/L	07-DEC-20	08-DEC-20	R5309249
F2-Naphth	<100		100	ug/L		11-DEC-20	
F3 (C16-C34)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
F3-PAH	<250		250	ug/L		11-DEC-20	
F4 (C34-C50)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
Total Hydrocarbons (C6-C50)	<370		370	ug/L		11-DEC-20	
Chrom. to baseline at nC50	YES				07-DEC-20	08-DEC-20	R5309249
Surrogate: 2-Bromobenzotrifluoride	90.6		60-140	%	07-DEC-20	08-DEC-20	R5309249
Surrogate: 3,4-Dichlorotoluene	91.6		60-140	%		10-DEC-20	R5310357
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Acenaphthylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)pyrene	<0.010		0.010	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(b)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(k)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Chrysene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluorene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-2 GW-11210029-120420-MW-02 Sampled By: CLIENT on 04-DEC-20 @ 13:05 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		11-DEC-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
2-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Naphthalene	<0.050		0.050	ug/L	07-DEC-20	09-DEC-20	R5310144
Phenanthrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Pyrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Acenaphthene	93.8		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d12-Chrysene	93.7		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d8-Naphthalene	92.7		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Phenanthrene	94.8		60-140	%	07-DEC-20	09-DEC-20	R5310144
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
4-Chloroaniline	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2-Chlorophenol	<0.30		0.30	ug/L	07-DEC-20	11-DEC-20	R5309926
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dichlorophenol	<0.30		0.30	ug/L	07-DEC-20	11-DEC-20	R5309926
Diethylphthalate	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
Dimethylphthalate	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dimethylphenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dinitrophenol	<1.0		1.0	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,6-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		11-DEC-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	07-DEC-20	11-DEC-20	R5309926
Pentachlorophenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
Phenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
Surrogate: 2-Fluorobiphenyl	81.4		50-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: Nitrobenzene d5	93.0		50-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: p-Terphenyl d14	85.5		60-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: 2,4,6-Tribromophenol	96.4		50-140	%	07-DEC-20	11-DEC-20	R5309926
L2537182-3 GW-11210029-120420-MW-02D Sampled By: CLIENT on 04-DEC-20 @ 13:10 Matrix: WATER							
Physical Tests							
Conductivity	0.682		0.0030	mS/cm		08-DEC-20	R5309913
pH	8.15		0.10	pH units		08-DEC-20	R5309913

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-3 GW-11210029-120420-MW-02D Sampled By: CLIENT on 04-DEC-20 @ 13:10 Matrix: WATER							
Physical Tests							
Anions and Nutrients							
Chloride (Cl)	5.42		0.50	mg/L		08-DEC-20	R5309768
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		07-DEC-20	R5309148
Total Metals							
Aluminum (Al)-Total	0.0096		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Arsenic (As)-Total	0.00050		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Barium (Ba)-Total	0.0537		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Boron (B)-Total	0.043		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Cadmium (Cd)-Total	0.0000807		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Calcium (Ca)-Total	95.5		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cesium (Cs)-Total	0.000013		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Chromium (Cr)-Total	0.00058		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cobalt (Co)-Total	0.00067		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Copper (Cu)-Total	0.0108		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Iron (Fe)-Total	<0.010		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Lead (Pb)-Total	0.000095		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Lithium (Li)-Total	0.0019		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Magnesium (Mg)-Total	31.4		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Manganese (Mn)-Total	0.143		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		08-DEC-20	R5309314
Molybdenum (Mo)-Total	0.000542		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Nickel (Ni)-Total	0.00493		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Phosphorus (P)-Total	<0.050		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Potassium (K)-Total	32.2		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Rubidium (Rb)-Total	0.00594		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Selenium (Se)-Total	0.000128		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Silicon (Si)-Total	4.75		0.10	mg/L	07-DEC-20	07-DEC-20	R5308869
Silver (Ag)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Sodium (Na)-Total	5.05		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Strontium (Sr)-Total	0.120		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Sulfur (S)-Total	5.36		0.50	mg/L	07-DEC-20	07-DEC-20	R5308869
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Thallium (Tl)-Total	0.000068		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Thorium (Th)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Tin (Sn)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	07-DEC-20	07-DEC-20	R5308869
Tungsten (W)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Uranium (U)-Total	0.000432		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-3 GW-11210029-120420-MW-02D							
Sampled By: CLIENT on 04-DEC-20 @ 13:10							
Matrix: WATER							
Total Metals							
Vanadium (V)-Total	<0.00050		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Zinc (Zn)-Total	0.0189		0.0030	mg/L	07-DEC-20	07-DEC-20	R5308869
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					07-DEC-20	R5308717
Dissolved Metals Filtration Location	FIELD					08-DEC-20	R5309129
Antimony (Sb)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Arsenic (As)-Dissolved	0.46		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Barium (Ba)-Dissolved	52.8		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Boron (B)-Dissolved	36		10	ug/L	08-DEC-20	08-DEC-20	R5309628
Cadmium (Cd)-Dissolved	0.072		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Cobalt (Co)-Dissolved	0.64		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Copper (Cu)-Dissolved	10.8		0.20	ug/L	08-DEC-20	08-DEC-20	R5309628
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	07-DEC-20	07-DEC-20	R5308859
Molybdenum (Mo)-Dissolved	0.555		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Nickel (Ni)-Dissolved	4.94		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Selenium (Se)-Dissolved	0.111		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Sodium (Na)-Dissolved	4800		500	ug/L	08-DEC-20	08-DEC-20	R5309628
Thallium (Tl)-Dissolved	0.066		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Uranium (U)-Dissolved	0.351		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Zinc (Zn)-Dissolved	18.7		1.0	ug/L	08-DEC-20	08-DEC-20	R5309628
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		07-DEC-20	R5309177
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	07-DEC-20	07-DEC-20	R5309404
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		08-DEC-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	07-DEC-20	07-DEC-20	R5309404
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-DEC-20	R5310357
Benzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Bromodichloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Bromoform	<5.0		5.0	ug/L		10-DEC-20	R5310357
Bromomethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Carbon tetrachloride	<0.20		0.20	ug/L		10-DEC-20	R5310357
Chlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dibromochloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Chloroform	<1.0		1.0	ug/L		10-DEC-20	R5310357

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-3 GW-11210029-120420-MW-02D Sampled By: CLIENT on 04-DEC-20 @ 13:10 Matrix: WATER							
Volatile Organic Compounds							
1,2-Dibromoethane	<0.20		0.20	ug/L		10-DEC-20	R5310357
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
1,1-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,2-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methylene Chloride	<5.0		5.0	ug/L		10-DEC-20	R5310357
1,2-Dichloropropane	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-DEC-20	
Ethylbenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
n-Hexane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methyl Ethyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
Methyl Isobutyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
MTBE	<2.0		2.0	ug/L		10-DEC-20	R5310357
Styrene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Tetrachloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Toluene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichlorofluoromethane	<5.0		5.0	ug/L		10-DEC-20	R5310357
Vinyl chloride	<0.50		0.50	ug/L		10-DEC-20	R5310357
o-Xylene	<0.30		0.30	ug/L		10-DEC-20	R5310357
m+p-Xylenes	<0.40		0.40	ug/L		10-DEC-20	R5310357
Xylenes (Total)	<0.50		0.50	ug/L		10-DEC-20	
Surrogate: 4-Bromofluorobenzene	95.5		70-130	%		10-DEC-20	R5310357
Surrogate: 1,4-Difluorobenzene	99.3		70-130	%		10-DEC-20	R5310357
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-DEC-20	R5310357
F1-BTEX	<25		25	ug/L		11-DEC-20	
F2 (C10-C16)	<100		100	ug/L	07-DEC-20	08-DEC-20	R5309249
F2-Naphth	<100		100	ug/L		11-DEC-20	
F3 (C16-C34)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-3 GW-11210029-120420-MW-02D							
Sampled By: CLIENT on 04-DEC-20 @ 13:10							
Matrix: WATER							
Hydrocarbons							
F3-PAH	<250		250	ug/L		11-DEC-20	
F4 (C34-C50)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
Total Hydrocarbons (C6-C50)	<370		370	ug/L		11-DEC-20	
Chrom. to baseline at nC50	YES				07-DEC-20	08-DEC-20	R5309249
Surrogate: 2-Bromobenzotrifluoride	91.3		60-140	%	07-DEC-20	08-DEC-20	R5309249
Surrogate: 3,4-Dichlorotoluene	89.1		60-140	%		10-DEC-20	R5310357
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Acenaphthylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)pyrene	<0.010		0.010	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(b)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(k)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Chrysene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluorene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		11-DEC-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
2-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Naphthalene	<0.050		0.050	ug/L	07-DEC-20	09-DEC-20	R5310144
Phenanthrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Pyrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Acenaphthene	95.8		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d12-Chrysene	90.0		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d8-Naphthalene	94.4		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Phenanthrene	94.3		60-140	%	07-DEC-20	09-DEC-20	R5310144
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
4-Chloroaniline	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2-Chlorophenol	<0.30		0.30	ug/L	07-DEC-20	11-DEC-20	R5309926
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dichlorophenol	<0.30		0.30	ug/L	07-DEC-20	11-DEC-20	R5309926
Diethylphthalate	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
Dimethylphthalate	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dimethylphenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-3 GW-11210029-120420-MW-02D Sampled By: CLIENT on 04-DEC-20 @ 13:10 Matrix: WATER							
Semi-Volatile Organics							
2,4-Dinitrophenol	<1.0		1.0	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,6-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		11-DEC-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	07-DEC-20	11-DEC-20	R5309926
Pentachlorophenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
Phenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
Surrogate: 2-Fluorobiphenyl	86.4		50-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: Nitrobenzene d5	94.8		50-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: p-Terphenyl d14	90.4		60-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: 2,4,6-Tribromophenol	102.9		50-140	%	07-DEC-20	11-DEC-20	R5309926
L2537182-4 GW-11210029-120420-MW-03 Sampled By: CLIENT on 04-DEC-20 @ 15:10 Matrix: WATER							
Physical Tests							
Conductivity	0.624		0.0030	mS/cm		08-DEC-20	R5309913
pH	7.74		0.10	pH units		08-DEC-20	R5309913
Anions and Nutrients							
Chloride (Cl)	3.98		0.50	mg/L		08-DEC-20	R5309768
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		07-DEC-20	R5309148
Total Metals							
Aluminum (Al)-Total	0.0610		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Arsenic (As)-Total	0.00032		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Barium (Ba)-Total	0.0708		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Boron (B)-Total	0.011		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Cadmium (Cd)-Total	0.0000067		0.0000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Calcium (Ca)-Total	95.3		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cesium (Cs)-Total	0.000020		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cobalt (Co)-Total	0.00051		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Copper (Cu)-Total	0.00142		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Iron (Fe)-Total	0.068		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Lead (Pb)-Total	0.000123		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Lithium (Li)-Total	0.0060		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Magnesium (Mg)-Total	39.7		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-4 GW-11210029-120420-MW-03							
Sampled By: CLIENT on 04-DEC-20 @ 15:10							
Matrix: WATER							
Total Metals							
Manganese (Mn)-Total	0.0509		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		08-DEC-20	R5309314
Molybdenum (Mo)-Total	0.00169		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Nickel (Ni)-Total	0.00109		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Phosphorus (P)-Total	<0.050		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Potassium (K)-Total	1.35		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Rubidium (Rb)-Total	0.00067		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Selenium (Se)-Total	0.000107		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Silicon (Si)-Total	7.46		0.10	mg/L	07-DEC-20	07-DEC-20	R5308869
Silver (Ag)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Sodium (Na)-Total	4.39		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Strontium (Sr)-Total	0.130		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Sulfur (S)-Total	7.40		0.50	mg/L	07-DEC-20	07-DEC-20	R5308869
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Thorium (Th)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Tin (Sn)-Total	0.00013		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Titanium (Ti)-Total	0.00246		0.00030	mg/L	07-DEC-20	07-DEC-20	R5308869
Tungsten (W)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Uranium (U)-Total	0.000957		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Vanadium (V)-Total	0.00072		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	07-DEC-20	07-DEC-20	R5308869
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					07-DEC-20	R5308717
Dissolved Metals Filtration Location	FIELD					08-DEC-20	R5309129
Antimony (Sb)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Arsenic (As)-Dissolved	0.22		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Barium (Ba)-Dissolved	63.5		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Boron (B)-Dissolved	<10		10	ug/L	08-DEC-20	08-DEC-20	R5309628
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Cobalt (Co)-Dissolved	0.41		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Copper (Cu)-Dissolved	0.53		0.20	ug/L	08-DEC-20	08-DEC-20	R5309628
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	07-DEC-20	07-DEC-20	R5308859
Molybdenum (Mo)-Dissolved	1.85		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Nickel (Ni)-Dissolved	0.95		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Selenium (Se)-Dissolved	0.098		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-4 GW-11210029-120420-MW-03							
Sampled By: CLIENT on 04-DEC-20 @ 15:10							
Matrix: WATER							
Dissolved Metals							
Sodium (Na)-Dissolved	3680		500	ug/L	08-DEC-20	08-DEC-20	R5309628
Thallium (Tl)-Dissolved	<0.010		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Uranium (U)-Dissolved	0.867		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Zinc (Zn)-Dissolved	<1.0		1.0	ug/L	08-DEC-20	08-DEC-20	R5309628
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		07-DEC-20	R5309177
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	07-DEC-20	07-DEC-20	R5309404
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		08-DEC-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	07-DEC-20	07-DEC-20	R5309404
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-DEC-20	R5310357
Benzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Bromodichloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Bromoform	<5.0		5.0	ug/L		10-DEC-20	R5310357
Bromomethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Carbon tetrachloride	<0.20		0.20	ug/L		10-DEC-20	R5310357
Chlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dibromochloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Chloroform	<1.0		1.0	ug/L		10-DEC-20	R5310357
1,2-Dibromoethane	<0.20		0.20	ug/L		10-DEC-20	R5310357
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
1,1-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,2-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methylene Chloride	<5.0		5.0	ug/L		10-DEC-20	R5310357
1,2-Dichloropropane	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-DEC-20	
Ethylbenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
n-Hexane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methyl Ethyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
Methyl Isobutyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
MTBE	<2.0		2.0	ug/L		10-DEC-20	R5310357
Styrene	<0.50		0.50	ug/L		10-DEC-20	R5310357

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-4 GW-11210029-120420-MW-03 Sampled By: CLIENT on 04-DEC-20 @ 15:10 Matrix: WATER							
Volatile Organic Compounds							
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Tetrachloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Toluene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichlorofluoromethane	<5.0		5.0	ug/L		10-DEC-20	R5310357
Vinyl chloride	<0.50		0.50	ug/L		10-DEC-20	R5310357
o-Xylene	<0.30		0.30	ug/L		10-DEC-20	R5310357
m+p-Xylenes	<0.40		0.40	ug/L		10-DEC-20	R5310357
Xylenes (Total)	<0.50		0.50	ug/L		10-DEC-20	
Surrogate: 4-Bromofluorobenzene	94.5		70-130	%		10-DEC-20	R5310357
Surrogate: 1,4-Difluorobenzene	99.4		70-130	%		10-DEC-20	R5310357
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-DEC-20	R5310357
F1-BTEX	<25		25	ug/L		14-DEC-20	
F2 (C10-C16)	<100		100	ug/L	07-DEC-20	08-DEC-20	R5309249
F2-Naphth	<100		100	ug/L		14-DEC-20	
F3 (C16-C34)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
F3-PAH	<250		250	ug/L		14-DEC-20	
F4 (C34-C50)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
Total Hydrocarbons (C6-C50)	<370		370	ug/L		14-DEC-20	
Chrom. to baseline at nC50	YES				07-DEC-20	08-DEC-20	R5309249
Surrogate: 2-Bromobenzotrifluoride	89.3		60-140	%	07-DEC-20	08-DEC-20	R5309249
Surrogate: 3,4-Dichlorotoluene	80.1		60-140	%		10-DEC-20	R5310357
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Acenaphthylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)pyrene	<0.010		0.010	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(b)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(k)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Chrysene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluoranthene	0.053		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluorene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		14-DEC-20	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-4 GW-11210029-120420-MW-03 Sampled By: CLIENT on 04-DEC-20 @ 15:10 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
1-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
2-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Naphthalene	<0.050		0.050	ug/L	07-DEC-20	09-DEC-20	R5310144
Phenanthrene	0.029		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Pyrene	0.056		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Acenaphthene	94.0		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d12-Chrysene	94.9		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d8-Naphthalene	94.8		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Phenanthrene	95.6		60-140	%	07-DEC-20	09-DEC-20	R5310144
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
4-Chloroaniline	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
2-Chlorophenol	<0.30		0.30	ug/L	07-DEC-20	14-DEC-20	R5314036
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4-Dichlorophenol	<0.30		0.30	ug/L	07-DEC-20	14-DEC-20	R5314036
Diethylphthalate	<0.20		0.20	ug/L	07-DEC-20	14-DEC-20	R5314036
Dimethylphthalate	<0.20		0.20	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4-Dimethylphenol	<0.50		0.50	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4-Dinitrophenol	<1.0		1.0	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
2,6-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		14-DEC-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	07-DEC-20	14-DEC-20	R5314036
Pentachlorophenol	<0.50		0.50	ug/L	07-DEC-20	14-DEC-20	R5314036
Phenol	<0.50		0.50	ug/L	07-DEC-20	14-DEC-20	R5314036
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	14-DEC-20	R5314036
Surrogate: 2-Fluorobiphenyl	83.9		50-140	%	07-DEC-20	14-DEC-20	R5314036
Surrogate: Nitrobenzene d5	87.0		50-140	%	07-DEC-20	14-DEC-20	R5314036
Surrogate: p-Terphenyl d14	106.0		60-140	%	07-DEC-20	14-DEC-20	R5314036
Surrogate: 2,4,6-Tribromophenol	81.6		50-140	%	07-DEC-20	14-DEC-20	R5314036
L2537182-5 TRIP BLANK Sampled By: CLIENT on 04-DEC-20 @ 16:15 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-DEC-20	R5310357
Benzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Bromodichloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Bromoform	<5.0		5.0	ug/L		10-DEC-20	R5310357

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-5 TRIP BLANK							
Sampled By: CLIENT on 04-DEC-20 @ 16:15							
Matrix: WATER							
Volatile Organic Compounds							
Bromomethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Carbon tetrachloride	<0.20		0.20	ug/L		10-DEC-20	R5310357
Chlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dibromochloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Chloroform	<1.0		1.0	ug/L		10-DEC-20	R5310357
1,2-Dibromoethane	<0.20		0.20	ug/L		10-DEC-20	R5310357
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
1,1-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,2-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methylene Chloride	<5.0		5.0	ug/L		10-DEC-20	R5310357
1,2-Dichloropropane	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-DEC-20	
Ethylbenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
n-Hexane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methyl Ethyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
Methyl Isobutyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
MTBE	<2.0		2.0	ug/L		10-DEC-20	R5310357
Styrene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Tetrachloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Toluene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichlorofluoromethane	<5.0		5.0	ug/L		10-DEC-20	R5310357
Vinyl chloride	<0.50		0.50	ug/L		10-DEC-20	R5310357
o-Xylene	<0.30		0.30	ug/L		10-DEC-20	R5310357
m+p-Xylenes	<0.40		0.40	ug/L		10-DEC-20	R5310357
Xylenes (Total)	<0.50		0.50	ug/L		10-DEC-20	
Surrogate: 4-Bromofluorobenzene	95.2		70-130	%		10-DEC-20	R5310357
Surrogate: 1,4-Difluorobenzene	99.4		70-130	%		10-DEC-20	R5310357
Hydrocarbons							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-5 TRIP BLANK Sampled By: CLIENT on 04-DEC-20 @ 16:15 Matrix: WATER Hydrocarbons F1 (C6-C10) F1-BTEX Surrogate: 3,4-Dichlorotoluene	 <25 <25 94.2	 	 25 25 60-140	 ug/L ug/L %	 	 10-DEC-20 10-DEC-20 10-DEC-20	 R5310357 R5310357

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	2,4-Dinitrophenol	LCS-H	L2537182-1, -2, -3
Matrix Spike	Cyanide, Weak Acid Diss	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Barium (Ba)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Calcium (Ca)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Manganese (Mn)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Potassium (K)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Silicon (Si)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Sodium (Na)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Strontium (Sr)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Sulfur (S)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Uranium (U)-Total	MS-B	L2537182-1, -2, -3, -4

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
CN-WAD-R511-WT	Water	Cyanide (WAD)-O.Reg 153/04	APHA 4500CN I-Weak acid Dist Colorimet
<p>Weak acid dissociable cyanide (WAD) is determined by undergoing a distillation procedure. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
CR-CR6-IC-R511-WT	Water	Hex Chrom-O.Reg 153/04 (July 2011)	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
EC-R511-WT	Water	Conductivity-O.Reg 153/04 (July 2011)	APHA 2510 B
<p>Water samples can be measured directly by immersing the conductivity cell into the sample.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			

Reference Information

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
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Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L
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Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-D-UG/L-CVAA-WT	Water	Diss. Mercury in Water by CVAAS (ug/L)	EPA 1631E (mod)
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Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-D-UG/L-MS-WT	Water	Diss. Metals in Water by ICPMS (ug/L)	EPA 200.8
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The metal constituents of a non-acidified sample that pass through a membrane filter prior to ICP/MS analysis.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Reference Information

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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OGG-SPEC-CALC-WT	Water	Speciated Oil and Grease A/V Calc	CALCULATION
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Sample is extracted with hexane, sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.

OGG-SPEC-WT	Water	Speciated Oil and Grease-Gravimetric	APHA 5520 B
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The procedure involves an extraction of the entire water sample with hexane. Sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PH-WT	Water	pH	APHA 4500 H-Electrode
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Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

17-871523

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5309926							
WG3457478-2	LCS							
1,2,4-Trichlorobenzene			54.3		%		50-140	09-DEC-20
2-Chlorophenol			80.6		%		50-140	09-DEC-20
2,4-Dichlorophenol			92.0		%		50-140	09-DEC-20
2,4-Dimethylphenol			63.9		%		30-130	09-DEC-20
2,4-Dinitrophenol			143.4	LCS-H	%		50-140	09-DEC-20
2,4-Dinitrotoluene			138.7		%		50-140	09-DEC-20
2,4,5-Trichlorophenol			101.4		%		50-140	09-DEC-20
2,4,6-Trichlorophenol			98.9		%		50-140	09-DEC-20
2,6-Dinitrotoluene			108.9		%		50-140	09-DEC-20
3,3'-Dichlorobenzidine			87.3		%		30-130	09-DEC-20
4-Chloroaniline			37.0		%		30-130	09-DEC-20
Biphenyl			72.7		%		50-140	09-DEC-20
Bis(2-chloroethyl)ether			86.7		%		50-140	09-DEC-20
Bis(2-chloroisopropyl)ether			83.3		%		50-140	09-DEC-20
Bis(2-ethylhexyl)phthalate			110.2		%		50-140	09-DEC-20
Diethylphthalate			94.9		%		50-140	09-DEC-20
Dimethylphthalate			90.9		%		50-140	09-DEC-20
Pentachlorophenol			137.0		%		50-140	09-DEC-20
Phenol			104.4		%		30-130	09-DEC-20
WG3457478-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	09-DEC-20
2-Chlorophenol			<0.30		ug/L		0.3	09-DEC-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	09-DEC-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	09-DEC-20
2,4-Dinitrophenol			<1.0		ug/L		1	09-DEC-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	09-DEC-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	09-DEC-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	09-DEC-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	09-DEC-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	09-DEC-20
4-Chloroaniline			<0.40		ug/L		0.4	09-DEC-20
Biphenyl			<0.40		ug/L		0.4	09-DEC-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	09-DEC-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	09-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT		Water						
Batch R5309926								
WG3457478-1 MB								
	Bis(2-ethylhexyl)phthalate		<2.0		ug/L		2	09-DEC-20
	Diethylphthalate		<0.20		ug/L		0.2	09-DEC-20
	Dimethylphthalate		<0.20		ug/L		0.2	09-DEC-20
	Pentachlorophenol		<0.50		ug/L		0.5	09-DEC-20
	Phenol		<0.50		ug/L		0.5	09-DEC-20
	Surrogate: 2-Fluorobiphenyl		90.3		%		50-140	09-DEC-20
	Surrogate: 2,4,6-Tribromophenol		92.3		%		50-140	09-DEC-20
	Surrogate: Nitrobenzene d5		91.1		%		50-140	09-DEC-20
	Surrogate: p-Terphenyl d14		116.2		%		60-140	09-DEC-20
Batch R5314036								
WG3457854-2 LCS								
	1,2,4-Trichlorobenzene		82.1		%		50-140	14-DEC-20
	2-Chlorophenol		73.7		%		50-140	14-DEC-20
	2,4-Dichlorophenol		84.4		%		50-140	14-DEC-20
	2,4-Dimethylphenol		65.7		%		30-130	14-DEC-20
	2,4-Dinitrophenol		111.6		%		50-140	14-DEC-20
	2,4-Dinitrotoluene		101.9		%		50-140	14-DEC-20
	2,4,5-Trichlorophenol		93.7		%		50-140	14-DEC-20
	2,4,6-Trichlorophenol		89.8		%		50-140	14-DEC-20
	2,6-Dinitrotoluene		91.2		%		50-140	14-DEC-20
	3,3'-Dichlorobenzidine		61.6		%		30-130	14-DEC-20
	4-Chloroaniline		43.8		%		30-130	14-DEC-20
	Biphenyl		87.3		%		50-140	14-DEC-20
	Bis(2-chloroethyl)ether		85.4		%		50-140	14-DEC-20
	Bis(2-chloroisopropyl)ether		82.2		%		50-140	14-DEC-20
	Bis(2-ethylhexyl)phthalate		95.7		%		50-140	14-DEC-20
	Diethylphthalate		90.7		%		50-140	14-DEC-20
	Dimethylphthalate		88.4		%		50-140	14-DEC-20
	Pentachlorophenol		110.3		%		50-140	14-DEC-20
	Phenol		103.0		%		30-130	14-DEC-20
WG3457854-1 MB								
	1,2,4-Trichlorobenzene		<0.40		ug/L		0.4	14-DEC-20
	2-Chlorophenol		<0.30		ug/L		0.3	14-DEC-20
	2,4-Dichlorophenol		<0.30		ug/L		0.3	14-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-WAD-R511-WT		Water						
Batch	R5309148							
WG3457795-7	LCS							
Cyanide, Weak Acid Diss			104.7		%		80-120	07-DEC-20
WG3457795-6	MB							
Cyanide, Weak Acid Diss			<2.0		ug/L		2	07-DEC-20
WG3457795-9	MS	WG3457795-10						
Cyanide, Weak Acid Diss			N/A	MS-B	%		-	07-DEC-20
CR-CR6-IC-R511-WT		Water						
Batch	R5309177							
WG3457940-4	DUP	WG3457940-3						
Chromium, Hexavalent		<0.50	<0.50	RPD-NA	ug/L	N/A	20	07-DEC-20
WG3457940-2	LCS							
Chromium, Hexavalent			95.3		%		80-120	07-DEC-20
WG3457940-1	MB							
Chromium, Hexavalent			<0.50		ug/L		0.5	07-DEC-20
WG3457940-5	MS	WG3457940-3						
Chromium, Hexavalent			98.1		%		70-130	07-DEC-20
EC-R511-WT		Water						
Batch	R5309386							
WG3458364-4	DUP	WG3458364-3						
Conductivity		0.562	0.561		mS/cm	0.2	10	08-DEC-20
WG3458364-2	LCS							
Conductivity			96.6		%		90-110	08-DEC-20
WG3458364-1	MB							
Conductivity			<0.0030		mS/cm		0.003	08-DEC-20
Batch	R5309913							
WG3458418-4	DUP	WG3458418-3						
Conductivity		6.56	6.59		mS/cm	0.5	10	08-DEC-20
WG3458418-2	LCS							
Conductivity			95.8		%		90-110	08-DEC-20
WG3458418-1	MB							
Conductivity			<0.0030		mS/cm		0.003	08-DEC-20
F1-HS-511-WT		Water						
Batch	R5310357							
WG3458463-4	DUP	WG3458463-3						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	10-DEC-20
WG3458463-1	LCS							
F1 (C6-C10)			107.0		%		80-120	10-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F1-HS-511-WT								
	Water							
Batch	R5310357							
WG3458463-2	MB							
F1 (C6-C10)			<25		ug/L		25	10-DEC-20
Surrogate: 3,4-Dichlorotoluene			110.0		%		60-140	10-DEC-20
WG3458463-5	MS	WG3458463-3						
F1 (C6-C10)			103.1		%		60-140	10-DEC-20
F2-F4-511-WT								
	Water							
Batch	R5309249							
WG3457542-2	LCS							
F2 (C10-C16)			101.9		%		70-130	08-DEC-20
F3 (C16-C34)			104.2		%		70-130	08-DEC-20
F4 (C34-C50)			102.3		%		70-130	08-DEC-20
WG3457542-1	MB							
F2 (C10-C16)			<100		ug/L		100	08-DEC-20
F3 (C16-C34)			<250		ug/L		250	08-DEC-20
F4 (C34-C50)			<250		ug/L		250	08-DEC-20
Surrogate: 2-Bromobenzotrifluoride			91.0		%		60-140	08-DEC-20
HG-D-UG/L-CVAA-WT								
	Water							
Batch	R5308859							
WG3457683-5	DUP	L2537179-6						
Mercury (Hg)-Dissolved			<0.0050	RPD-NA	ug/L	N/A	20	07-DEC-20
WG3457683-2	LCS							
Mercury (Hg)-Dissolved			94.1		%		80-120	07-DEC-20
WG3457683-1	MB							
Mercury (Hg)-Dissolved			<0.0050		ug/L		0.005	07-DEC-20
WG3457683-4	MS	L2537182-1						
Mercury (Hg)-Dissolved			92.7		%		70-130	07-DEC-20
HG-T-CVAA-WT								
	Water							
Batch	R5309314							
WG3458201-3	DUP	L2537586-1						
Mercury (Hg)-Total			<0.0000050	RPD-NA	mg/L	N/A	20	08-DEC-20
WG3458201-2	LCS							
Mercury (Hg)-Total			109.0		%		80-120	08-DEC-20
WG3458201-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	08-DEC-20
WG3458201-4	MS	L2537182-1						
Mercury (Hg)-Total			99.4		%		70-130	08-DEC-20
MET-D-UG/L-MS-WT								
	Water							



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT								
	Water							
Batch	R5309628							
WG3458096-4	DUP	WG3458096-3						
Antimony (Sb)-Dissolved		0.16	0.16		ug/L	1.4	20	08-DEC-20
Arsenic (As)-Dissolved		0.36	0.35		ug/L	4.7	20	08-DEC-20
Barium (Ba)-Dissolved		93.5	97.3		ug/L	4.1	20	08-DEC-20
Beryllium (Be)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	08-DEC-20
Boron (B)-Dissolved		23	23		ug/L	0.2	20	08-DEC-20
Cadmium (Cd)-Dissolved		0.0142	0.0138		ug/L	2.9	20	08-DEC-20
Chromium (Cr)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	08-DEC-20
Cobalt (Co)-Dissolved		0.43	0.45		ug/L	4.3	20	08-DEC-20
Copper (Cu)-Dissolved		0.70	0.72		ug/L	2.7	20	08-DEC-20
Lead (Pb)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	08-DEC-20
Molybdenum (Mo)-Dissolved		2.89	2.96		ug/L	2.1	20	08-DEC-20
Nickel (Ni)-Dissolved		1.13	1.17		ug/L	3.7	20	08-DEC-20
Selenium (Se)-Dissolved		0.096	0.126	J	ug/L	0.030	0.1	08-DEC-20
Silver (Ag)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	08-DEC-20
Sodium (Na)-Dissolved		9100	9220		ug/L	1.3	20	08-DEC-20
Thallium (Tl)-Dissolved		0.015	<0.010	RPD-NA	ug/L	N/A	20	08-DEC-20
Uranium (U)-Dissolved		0.816	0.791		ug/L	3.0	20	08-DEC-20
Vanadium (V)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	08-DEC-20
Zinc (Zn)-Dissolved		4.3	4.5		ug/L	4.0	20	08-DEC-20
WG3458096-2	LCS							
Antimony (Sb)-Dissolved			94.0		%		80-120	08-DEC-20
Arsenic (As)-Dissolved			103.1		%		80-120	08-DEC-20
Barium (Ba)-Dissolved			104.8		%		80-120	08-DEC-20
Beryllium (Be)-Dissolved			86.8		%		80-120	08-DEC-20
Boron (B)-Dissolved			88.6		%		80-120	08-DEC-20
Cadmium (Cd)-Dissolved			96.1		%		80-120	08-DEC-20
Chromium (Cr)-Dissolved			102.1		%		80-120	08-DEC-20
Cobalt (Co)-Dissolved			95.2		%		80-120	08-DEC-20
Copper (Cu)-Dissolved			90.9		%		80-120	08-DEC-20
Lead (Pb)-Dissolved			93.1		%		80-120	08-DEC-20
Molybdenum (Mo)-Dissolved			102.3		%		80-120	08-DEC-20
Nickel (Ni)-Dissolved			95.5		%		80-120	08-DEC-20
Selenium (Se)-Dissolved			88.5		%		80-120	08-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT								
	Water							
Batch	R5309628							
WG3458096-2	LCS							
Silver (Ag)-Dissolved			92.6		%		80-120	08-DEC-20
Sodium (Na)-Dissolved			97.4		%		80-120	08-DEC-20
Thallium (Tl)-Dissolved			93.4		%		80-120	08-DEC-20
Uranium (U)-Dissolved			93.5		%		80-120	08-DEC-20
Vanadium (V)-Dissolved			105.0		%		80-120	08-DEC-20
Zinc (Zn)-Dissolved			90.1		%		80-120	08-DEC-20
WG3458096-1	MB							
Antimony (Sb)-Dissolved			<0.10		ug/L		0.1	08-DEC-20
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	08-DEC-20
Barium (Ba)-Dissolved			<0.10		ug/L		0.1	08-DEC-20
Beryllium (Be)-Dissolved			<0.10		ug/L		0.1	08-DEC-20
Boron (B)-Dissolved			<10		ug/L		10	08-DEC-20
Cadmium (Cd)-Dissolved			<0.0050		ug/L		0.005	08-DEC-20
Chromium (Cr)-Dissolved			<0.50		ug/L		0.5	08-DEC-20
Cobalt (Co)-Dissolved			<0.10		ug/L		0.1	08-DEC-20
Copper (Cu)-Dissolved			<0.20		ug/L		0.2	08-DEC-20
Lead (Pb)-Dissolved			<0.050		ug/L		0.05	08-DEC-20
Molybdenum (Mo)-Dissolved			<0.050		ug/L		0.05	08-DEC-20
Nickel (Ni)-Dissolved			<0.50		ug/L		0.5	08-DEC-20
Selenium (Se)-Dissolved			<0.050		ug/L		0.05	08-DEC-20
Silver (Ag)-Dissolved			<0.050		ug/L		0.05	08-DEC-20
Sodium (Na)-Dissolved			<50		ug/L		50	08-DEC-20
Thallium (Tl)-Dissolved			<0.010		ug/L		0.01	08-DEC-20
Uranium (U)-Dissolved			<0.010		ug/L		0.01	08-DEC-20
Vanadium (V)-Dissolved			<0.50		ug/L		0.5	08-DEC-20
Zinc (Zn)-Dissolved			<1.0		ug/L		1	08-DEC-20
WG3458096-5	MS	WG3458096-6						
Antimony (Sb)-Dissolved			96.4		%		70-130	08-DEC-20
Arsenic (As)-Dissolved			104.0		%		70-130	08-DEC-20
Barium (Ba)-Dissolved			N/A	MS-B	%		-	08-DEC-20
Beryllium (Be)-Dissolved			91.8		%		70-130	08-DEC-20
Boron (B)-Dissolved			84.1		%		70-130	08-DEC-20
Cadmium (Cd)-Dissolved			97.6		%		70-130	08-DEC-20
Chromium (Cr)-Dissolved			99.2		%		70-130	08-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT								
	Water							
Batch	R5309628							
WG3458096-5 MS		WG3458096-6						
Cobalt (Co)-Dissolved			92.3		%		70-130	08-DEC-20
Copper (Cu)-Dissolved			86.6		%		70-130	08-DEC-20
Lead (Pb)-Dissolved			92.4		%		70-130	08-DEC-20
Molybdenum (Mo)-Dissolved			101.5		%		70-130	08-DEC-20
Nickel (Ni)-Dissolved			94.0		%		70-130	08-DEC-20
Selenium (Se)-Dissolved			105.7		%		70-130	08-DEC-20
Silver (Ag)-Dissolved			77.2		%		70-130	08-DEC-20
Sodium (Na)-Dissolved			N/A	MS-B	%		-	08-DEC-20
Thallium (Tl)-Dissolved			95.6		%		70-130	08-DEC-20
Uranium (U)-Dissolved			N/A	MS-B	%		-	08-DEC-20
Vanadium (V)-Dissolved			101.3		%		70-130	08-DEC-20
Zinc (Zn)-Dissolved			94.1		%		70-130	08-DEC-20
MET-T-CCMS-WT								
	Water							
Batch	R5308869							
WG3457451-4 DUP		WG3457451-3						
Aluminum (Al)-Total		0.366	0.375		mg/L	2.5	20	07-DEC-20
Antimony (Sb)-Total		0.00021	0.00021		mg/L	2.2	20	07-DEC-20
Arsenic (As)-Total		0.00055	0.00055		mg/L	0.4	20	07-DEC-20
Barium (Ba)-Total		0.0939	0.0960		mg/L	2.2	20	07-DEC-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	07-DEC-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	07-DEC-20
Boron (B)-Total		0.029	0.029		mg/L	0.1	20	07-DEC-20
Cadmium (Cd)-Total		0.0000319	0.0000330		mg/L	3.4	20	07-DEC-20
Calcium (Ca)-Total		91.0	89.7		mg/L	1.5	20	07-DEC-20
Chromium (Cr)-Total		0.00097	0.00099		mg/L	1.3	20	07-DEC-20
Cesium (Cs)-Total		0.000039	0.000043		mg/L	9.2	20	07-DEC-20
Cobalt (Co)-Total		0.00066	0.00069		mg/L	5.0	20	07-DEC-20
Copper (Cu)-Total		0.00143	0.00241	J	mg/L	0.00098	0.001	07-DEC-20
Iron (Fe)-Total		0.439	0.432		mg/L	1.6	20	07-DEC-20
Lead (Pb)-Total		0.000725	0.000800		mg/L	9.9	20	07-DEC-20
Lithium (Li)-Total		0.0124	0.0122		mg/L	1.5	20	07-DEC-20
Magnesium (Mg)-Total		34.2	35.2		mg/L	2.8	20	07-DEC-20
Manganese (Mn)-Total		0.135	0.138		mg/L	2.8	20	07-DEC-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5308869							
WG3457451-4	DUP	WG3457451-3						
Molybdenum (Mo)-Total		0.00325	0.00320		mg/L	1.4	20	07-DEC-20
Nickel (Ni)-Total		0.00173	0.00180		mg/L	3.5	20	07-DEC-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	07-DEC-20
Potassium (K)-Total		5.56	5.73		mg/L	3.1	20	07-DEC-20
Rubidium (Rb)-Total		0.00099	0.00106		mg/L	6.7	20	07-DEC-20
Selenium (Se)-Total		0.000109	0.000100		mg/L	9.1	20	07-DEC-20
Silicon (Si)-Total		7.05	7.25		mg/L	2.8	20	07-DEC-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	07-DEC-20
Sodium (Na)-Total		9.85	10.1		mg/L	2.6	20	07-DEC-20
Strontium (Sr)-Total		0.269	0.262		mg/L	2.7	20	07-DEC-20
Sulfur (S)-Total		8.87	8.93		mg/L	0.6	25	07-DEC-20
Thallium (Tl)-Total		0.000012	0.000014		mg/L	8.5	20	07-DEC-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	07-DEC-20
Thorium (Th)-Total		0.00011	<0.00010	RPD-NA	mg/L	N/A	25	07-DEC-20
Tin (Sn)-Total		0.00028	0.00029		mg/L	4.6	20	07-DEC-20
Titanium (Ti)-Total		0.0142	0.0144		mg/L	1.6	20	07-DEC-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	07-DEC-20
Uranium (U)-Total		0.000905	0.000892		mg/L	1.5	20	07-DEC-20
Vanadium (V)-Total		0.00104	0.00108		mg/L	4.5	20	07-DEC-20
Zinc (Zn)-Total		0.0102	0.0110		mg/L	8.2	20	07-DEC-20
Zirconium (Zr)-Total		0.00040	0.00039		mg/L	2.8	20	07-DEC-20
WG3457451-2	LCS							
Aluminum (Al)-Total			107.0		%		80-120	07-DEC-20
Antimony (Sb)-Total			107.5		%		80-120	07-DEC-20
Arsenic (As)-Total			103.0		%		80-120	07-DEC-20
Barium (Ba)-Total			105.1		%		80-120	07-DEC-20
Beryllium (Be)-Total			107.6		%		80-120	07-DEC-20
Bismuth (Bi)-Total			102.2		%		80-120	07-DEC-20
Boron (B)-Total			107.1		%		80-120	07-DEC-20
Cadmium (Cd)-Total			100.9		%		80-120	07-DEC-20
Calcium (Ca)-Total			100.8		%		80-120	07-DEC-20
Chromium (Cr)-Total			101.6		%		80-120	07-DEC-20
Cesium (Cs)-Total			103.7		%		80-120	07-DEC-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5308869							
WG3457451-2	LCS							
Cobalt (Co)-Total			101.9		%		80-120	07-DEC-20
Copper (Cu)-Total			101.2		%		80-120	07-DEC-20
Iron (Fe)-Total			102.0		%		80-120	07-DEC-20
Lead (Pb)-Total			104.0		%		80-120	07-DEC-20
Lithium (Li)-Total			107.2		%		80-120	07-DEC-20
Magnesium (Mg)-Total			111.2		%		80-120	07-DEC-20
Manganese (Mn)-Total			103.4		%		80-120	07-DEC-20
Molybdenum (Mo)-Total			105.1		%		80-120	07-DEC-20
Nickel (Ni)-Total			102.0		%		80-120	07-DEC-20
Phosphorus (P)-Total			110.6		%		70-130	07-DEC-20
Potassium (K)-Total			102.4		%		80-120	07-DEC-20
Rubidium (Rb)-Total			106.0		%		80-120	07-DEC-20
Selenium (Se)-Total			102.0		%		80-120	07-DEC-20
Silicon (Si)-Total			102.4		%		60-140	07-DEC-20
Silver (Ag)-Total			103.6		%		80-120	07-DEC-20
Sodium (Na)-Total			109.6		%		80-120	07-DEC-20
Strontium (Sr)-Total			107.1		%		80-120	07-DEC-20
Sulfur (S)-Total			105.5		%		80-120	07-DEC-20
Thallium (Tl)-Total			102.5		%		80-120	07-DEC-20
Tellurium (Te)-Total			100.1		%		80-120	07-DEC-20
Thorium (Th)-Total			101.4		%		70-130	07-DEC-20
Tin (Sn)-Total			100.8		%		80-120	07-DEC-20
Titanium (Ti)-Total			102.0		%		80-120	07-DEC-20
Tungsten (W)-Total			100.7		%		80-120	07-DEC-20
Uranium (U)-Total			103.4		%		80-120	07-DEC-20
Vanadium (V)-Total			104.4		%		80-120	07-DEC-20
Zinc (Zn)-Total			104.4		%		80-120	07-DEC-20
Zirconium (Zr)-Total			98.7		%		80-120	07-DEC-20
WG3457451-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	07-DEC-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	07-DEC-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5308869							
WG3457451-1 MB								
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	07-DEC-20
Boron (B)-Total			<0.010		mg/L		0.01	07-DEC-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	07-DEC-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	07-DEC-20
Chromium (Cr)-Total			<0.000050		mg/L		0.0005	07-DEC-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	07-DEC-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Copper (Cu)-Total			<0.000050		mg/L		0.0005	07-DEC-20
Iron (Fe)-Total			<0.010		mg/L		0.01	07-DEC-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	07-DEC-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	07-DEC-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	07-DEC-20
Manganese (Mn)-Total			<0.000050		mg/L		0.0005	07-DEC-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	07-DEC-20
Nickel (Ni)-Total			<0.000050		mg/L		0.0005	07-DEC-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	07-DEC-20
Potassium (K)-Total			<0.050		mg/L		0.05	07-DEC-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	07-DEC-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	07-DEC-20
Silicon (Si)-Total			<0.10		mg/L		0.1	07-DEC-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	07-DEC-20
Sodium (Na)-Total			<0.050		mg/L		0.05	07-DEC-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	07-DEC-20
Sulfur (S)-Total			<0.50		mg/L		0.5	07-DEC-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	07-DEC-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	07-DEC-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	07-DEC-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	07-DEC-20
Vanadium (V)-Total			<0.000050		mg/L		0.0005	07-DEC-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	07-DEC-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5308869							
WG3457451-1 MB								
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	07-DEC-20
WG3457451-5 MS		WG3457451-6						
Aluminum (Al)-Total			105.8		%		70-130	07-DEC-20
Antimony (Sb)-Total			101.1		%		70-130	07-DEC-20
Arsenic (As)-Total			100.6		%		70-130	07-DEC-20
Barium (Ba)-Total			N/A	MS-B	%		-	07-DEC-20
Beryllium (Be)-Total			109.2		%		70-130	07-DEC-20
Bismuth (Bi)-Total			93.7		%		70-130	07-DEC-20
Boron (B)-Total			110.1		%		70-130	07-DEC-20
Cadmium (Cd)-Total			94.8		%		70-130	07-DEC-20
Calcium (Ca)-Total			N/A	MS-B	%		-	07-DEC-20
Chromium (Cr)-Total			100.7		%		70-130	07-DEC-20
Cesium (Cs)-Total			101.9		%		70-130	07-DEC-20
Cobalt (Co)-Total			97.2		%		70-130	07-DEC-20
Copper (Cu)-Total			91.7		%		70-130	07-DEC-20
Iron (Fe)-Total			100.5		%		70-130	07-DEC-20
Lead (Pb)-Total			94.4		%		70-130	07-DEC-20
Lithium (Li)-Total			109.4		%		70-130	07-DEC-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	07-DEC-20
Manganese (Mn)-Total			N/A	MS-B	%		-	07-DEC-20
Molybdenum (Mo)-Total			105.6		%		70-130	07-DEC-20
Nickel (Ni)-Total			94.6		%		70-130	07-DEC-20
Phosphorus (P)-Total			103.5		%		70-130	07-DEC-20
Potassium (K)-Total			N/A	MS-B	%		-	07-DEC-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	07-DEC-20
Selenium (Se)-Total			101.5		%		70-130	07-DEC-20
Silicon (Si)-Total			N/A	MS-B	%		-	07-DEC-20
Silver (Ag)-Total			95.4		%		70-130	07-DEC-20
Sodium (Na)-Total			N/A	MS-B	%		-	07-DEC-20
Strontium (Sr)-Total			N/A	MS-B	%		-	07-DEC-20
Sulfur (S)-Total			N/A	MS-B	%		-	07-DEC-20
Thallium (Tl)-Total			97.4		%		70-130	07-DEC-20
Tellurium (Te)-Total			93.4		%		70-130	07-DEC-20
Thorium (Th)-Total			98.6		%		70-130	07-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5308869							
WG3457451-5	MS	WG3457451-6						
Tin (Sn)-Total			97.1		%		70-130	07-DEC-20
Titanium (Ti)-Total			99.4		%		70-130	07-DEC-20
Tungsten (W)-Total			98.7		%		70-130	07-DEC-20
Uranium (U)-Total			N/A	MS-B	%		-	07-DEC-20
Vanadium (V)-Total			104.4		%		70-130	07-DEC-20
Zinc (Zn)-Total			89.0		%		70-130	07-DEC-20
Zirconium (Zr)-Total			92.5		%		70-130	07-DEC-20
OGG-SPEC-WT								
	Water							
Batch	R5309404							
WG3457440-2	LCS							
Oil and Grease, Total			85.6		%		70-130	07-DEC-20
Mineral Oil and Grease			80.4		%		70-130	07-DEC-20
WG3457440-1	MB							
Oil and Grease, Total			<5.0		mg/L		5	07-DEC-20
Mineral Oil and Grease			<2.5		mg/L		2.5	07-DEC-20
PAH-511-WT								
	Water							
Batch	R5310144							
WG3457542-2	LCS							
1-Methylnaphthalene			87.0		%		50-140	09-DEC-20
2-Methylnaphthalene			99.2		%		50-140	09-DEC-20
Acenaphthene			113.0		%		50-140	09-DEC-20
Acenaphthylene			103.4		%		50-140	09-DEC-20
Anthracene			83.0		%		50-140	09-DEC-20
Benzo(a)anthracene			95.7		%		50-140	09-DEC-20
Benzo(a)pyrene			93.8		%		50-140	09-DEC-20
Benzo(b)fluoranthene			73.4		%		50-140	09-DEC-20
Benzo(g,h,i)perylene			125.0		%		50-140	09-DEC-20
Benzo(k)fluoranthene			93.6		%		50-140	09-DEC-20
Chrysene			121.9		%		50-140	09-DEC-20
Dibenzo(ah)anthracene			123.5		%		50-140	09-DEC-20
Fluoranthene			106.9		%		50-140	09-DEC-20
Fluorene			102.6		%		50-140	09-DEC-20
Indeno(1,2,3-cd)pyrene			126.3		%		50-140	09-DEC-20
Naphthalene			101.6		%		50-140	09-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT								
	Water							
Batch	R5310144							
WG3457542-2	LCS							
Phenanthrene			103.8		%		50-140	09-DEC-20
Pyrene			111.0		%		50-140	09-DEC-20
WG3457542-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	09-DEC-20
2-Methylnaphthalene			<0.020		ug/L		0.02	09-DEC-20
Acenaphthene			<0.020		ug/L		0.02	09-DEC-20
Acenaphthylene			<0.020		ug/L		0.02	09-DEC-20
Anthracene			<0.020		ug/L		0.02	09-DEC-20
Benzo(a)anthracene			<0.020		ug/L		0.02	09-DEC-20
Benzo(a)pyrene			<0.010		ug/L		0.01	09-DEC-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	09-DEC-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	09-DEC-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	09-DEC-20
Chrysene			<0.020		ug/L		0.02	09-DEC-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	09-DEC-20
Fluoranthene			<0.020		ug/L		0.02	09-DEC-20
Fluorene			<0.020		ug/L		0.02	09-DEC-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	09-DEC-20
Naphthalene			<0.050		ug/L		0.05	09-DEC-20
Phenanthrene			<0.020		ug/L		0.02	09-DEC-20
Pyrene			<0.020		ug/L		0.02	09-DEC-20
Surrogate: d8-Naphthalene			99.4		%		60-140	09-DEC-20
Surrogate: d10-Phenanthrene			99.2		%		60-140	09-DEC-20
Surrogate: d12-Chrysene			97.8		%		60-140	09-DEC-20
Surrogate: d10-Acenaphthene			101.0		%		60-140	09-DEC-20
PH-WT								
	Water							
Batch	R5309386							
WG3458364-4	DUP	WG3458364-3						
pH		7.10	7.12	J	pH units	0.02	0.2	08-DEC-20
WG3458364-2	LCS							
pH			7.00		pH units		6.9-7.1	08-DEC-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-WT		Water						
Batch	R5309913							
WG3458418-4	DUP	WG3458418-3						
pH		8.11	8.12	J	pH units	0.01	0.2	08-DEC-20
WG3458418-2	LCS							
pH			7.02		pH units		6.9-7.1	08-DEC-20
VOC-511-HS-WT		Water						
Batch	R5310357							
WG3458463-4	DUP	WG3458463-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	10-DEC-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	10-DEC-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-DEC-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-DEC-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	10-DEC-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	10-DEC-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-DEC-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-DEC-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-DEC-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	10-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5310357							
WG3458463-4	DUP	WG3458463-3						
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	10-DEC-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	10-DEC-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-DEC-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-DEC-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-DEC-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Toluene		0.62	0.58		ug/L	6.7	30	10-DEC-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-DEC-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-DEC-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
WG3458463-1	LCS							
1,1,1,2-Tetrachloroethane			100.4		%		70-130	10-DEC-20
1,1,2,2-Tetrachloroethane			113.2		%		70-130	10-DEC-20
1,1,1-Trichloroethane			100.2		%		70-130	10-DEC-20
1,1,2-Trichloroethane			104.0		%		70-130	10-DEC-20
1,1-Dichloroethane			102.3		%		70-130	10-DEC-20
1,1-Dichloroethylene			101.2		%		70-130	10-DEC-20
1,2-Dibromoethane			101.2		%		70-130	10-DEC-20
1,2-Dichlorobenzene			105.0		%		70-130	10-DEC-20
1,2-Dichloroethane			103.3		%		70-130	10-DEC-20
1,2-Dichloropropane			103.0		%		70-130	10-DEC-20
1,3-Dichlorobenzene			104.6		%		70-130	10-DEC-20
1,4-Dichlorobenzene			102.6		%		70-130	10-DEC-20
Acetone			122.0		%		60-140	10-DEC-20
Benzene			100.2		%		70-130	10-DEC-20
Bromodichloromethane			109.4		%		70-130	10-DEC-20
Bromoform			116.2		%		70-130	10-DEC-20
Bromomethane			98.1		%		60-140	10-DEC-20
Carbon tetrachloride			103.7		%		70-130	10-DEC-20
Chlorobenzene			103.1		%		70-130	10-DEC-20



Quality Control Report

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5310357							
WG3458463-1	LCS							
Chloroform			105.6		%		70-130	10-DEC-20
cis-1,2-Dichloroethylene			104.0		%		70-130	10-DEC-20
cis-1,3-Dichloropropene			102.4		%		70-130	10-DEC-20
Dibromochloromethane			99.3		%		70-130	10-DEC-20
Dichlorodifluoromethane			103.7		%		50-140	10-DEC-20
Ethylbenzene			99.1		%		70-130	10-DEC-20
n-Hexane			97.1		%		70-130	10-DEC-20
m+p-Xylenes			101.6		%		70-130	10-DEC-20
Methyl Ethyl Ketone			115.3		%		60-140	10-DEC-20
Methyl Isobutyl Ketone			109.2		%		60-140	10-DEC-20
Methylene Chloride			107.1		%		70-130	10-DEC-20
MTBE			104.7		%		70-130	10-DEC-20
o-Xylene			107.9		%		70-130	10-DEC-20
Styrene			101.5		%		70-130	10-DEC-20
Tetrachloroethylene			103.7		%		70-130	10-DEC-20
Toluene			101.6		%		70-130	10-DEC-20
trans-1,2-Dichloroethylene			104.7		%		70-130	10-DEC-20
trans-1,3-Dichloropropene			109.6		%		70-130	10-DEC-20
Trichloroethylene			101.2		%		70-130	10-DEC-20
Trichlorofluoromethane			100.1		%		60-140	10-DEC-20
Vinyl chloride			107.1		%		60-140	10-DEC-20
WG3458463-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	10-DEC-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	10-DEC-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	10-DEC-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	10-DEC-20
1,1-Dichloroethane			<0.50		ug/L		0.5	10-DEC-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	10-DEC-20
1,2-Dibromoethane			<0.20		ug/L		0.2	10-DEC-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	10-DEC-20
1,2-Dichloroethane			<0.50		ug/L		0.5	10-DEC-20
1,2-Dichloropropane			<0.50		ug/L		0.5	10-DEC-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	10-DEC-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	10-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5310357							
WG3458463-2 MB								
Acetone			<30		ug/L		30	10-DEC-20
Benzene			<0.50		ug/L		0.5	10-DEC-20
Bromodichloromethane			<2.0		ug/L		2	10-DEC-20
Bromoform			<5.0		ug/L		5	10-DEC-20
Bromomethane			<0.50		ug/L		0.5	10-DEC-20
Carbon tetrachloride			<0.20		ug/L		0.2	10-DEC-20
Chlorobenzene			<0.50		ug/L		0.5	10-DEC-20
Chloroform			<1.0		ug/L		1	10-DEC-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	10-DEC-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	10-DEC-20
Dibromochloromethane			<2.0		ug/L		2	10-DEC-20
Dichlorodifluoromethane			<2.0		ug/L		2	10-DEC-20
Ethylbenzene			<0.50		ug/L		0.5	10-DEC-20
n-Hexane			<0.50		ug/L		0.5	10-DEC-20
m+p-Xylenes			<0.40		ug/L		0.4	10-DEC-20
Methyl Ethyl Ketone			<20		ug/L		20	10-DEC-20
Methyl Isobutyl Ketone			<20		ug/L		20	10-DEC-20
Methylene Chloride			<5.0		ug/L		5	10-DEC-20
MTBE			<2.0		ug/L		2	10-DEC-20
o-Xylene			<0.30		ug/L		0.3	10-DEC-20
Styrene			<0.50		ug/L		0.5	10-DEC-20
Tetrachloroethylene			<0.50		ug/L		0.5	10-DEC-20
Toluene			<0.50		ug/L		0.5	10-DEC-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	10-DEC-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	10-DEC-20
Trichloroethylene			<0.50		ug/L		0.5	10-DEC-20
Trichlorofluoromethane			<5.0		ug/L		5	10-DEC-20
Vinyl chloride			<0.50		ug/L		0.5	10-DEC-20
Surrogate: 1,4-Difluorobenzene			99.8		%		70-130	10-DEC-20
Surrogate: 4-Bromofluorobenzene			97.9		%		70-130	10-DEC-20
WG3458463-5 MS		WG3458463-3						
1,1,1,2-Tetrachloroethane			99.5		%		50-140	10-DEC-20
1,1,2,2-Tetrachloroethane			131.8		%		50-140	10-DEC-20
1,1,1-Trichloroethane			99.1		%		50-140	10-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5310357							
WG3458463-5 MS		WG3458463-3						
1,1,2-Trichloroethane			106.0		%		50-140	10-DEC-20
1,1-Dichloroethane			102.3		%		50-140	10-DEC-20
1,1-Dichloroethylene			99.0		%		50-140	10-DEC-20
1,2-Dibromoethane			103.2		%		50-140	10-DEC-20
1,2-Dichlorobenzene			104.8		%		50-140	10-DEC-20
1,2-Dichloroethane			105.4		%		50-140	10-DEC-20
1,2-Dichloropropane			105.8		%		50-140	10-DEC-20
1,3-Dichlorobenzene			103.9		%		50-140	10-DEC-20
1,4-Dichlorobenzene			102.6		%		50-140	10-DEC-20
Acetone			127.6		%		50-140	10-DEC-20
Benzene			102.2		%		50-140	10-DEC-20
Bromodichloromethane			111.4		%		50-140	10-DEC-20
Bromoform			117.4		%		50-140	10-DEC-20
Bromomethane			99.1		%		50-140	10-DEC-20
Carbon tetrachloride			102.6		%		50-140	10-DEC-20
Chlorobenzene			102.6		%		50-140	10-DEC-20
Chloroform			107.3		%		50-140	10-DEC-20
cis-1,2-Dichloroethylene			106.0		%		50-140	10-DEC-20
cis-1,3-Dichloropropene			103.6		%		50-140	10-DEC-20
Dibromochloromethane			99.7		%		50-140	10-DEC-20
Dichlorodifluoromethane			94.7		%		50-140	10-DEC-20
Ethylbenzene			94.8		%		50-140	10-DEC-20
n-Hexane			94.0		%		50-140	10-DEC-20
m+p-Xylenes			98.0		%		50-140	10-DEC-20
Methyl Ethyl Ketone			120.8		%		50-140	10-DEC-20
Methyl Isobutyl Ketone			112.0		%		50-140	10-DEC-20
Methylene Chloride			110.1		%		50-140	10-DEC-20
MTBE			105.1		%		50-140	10-DEC-20
o-Xylene			103.6		%		50-140	10-DEC-20
Styrene			98.7		%		50-140	10-DEC-20
Tetrachloroethylene			99.7		%		50-140	10-DEC-20
Toluene			98.7		%		50-140	10-DEC-20
trans-1,2-Dichloroethylene			102.4		%		50-140	10-DEC-20



Quality Control Report

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5310357							
WG3458463-5 MS		WG3458463-3						
trans-1,3-Dichloropropene			107.4		%		50-140	10-DEC-20
Trichloroethylene			100.7		%		50-140	10-DEC-20
Trichlorofluoromethane			98.1		%		50-140	10-DEC-20
Vinyl chloride			105.3		%		50-140	10-DEC-20

Quality Control Report

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: Laura Ermeta

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Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

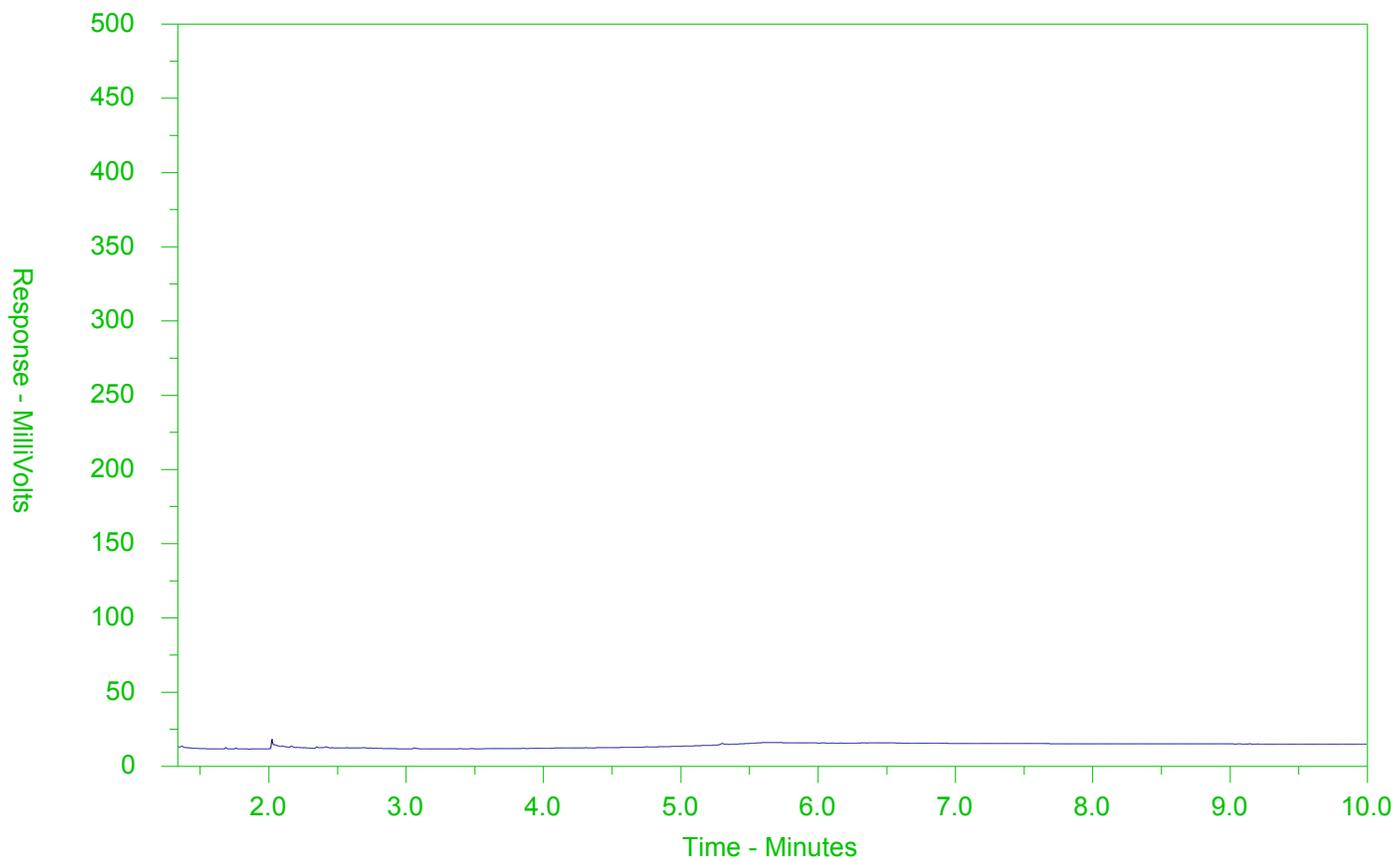
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2537182-1
 Client Sample ID: GW-11210029-120420-MW-01



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

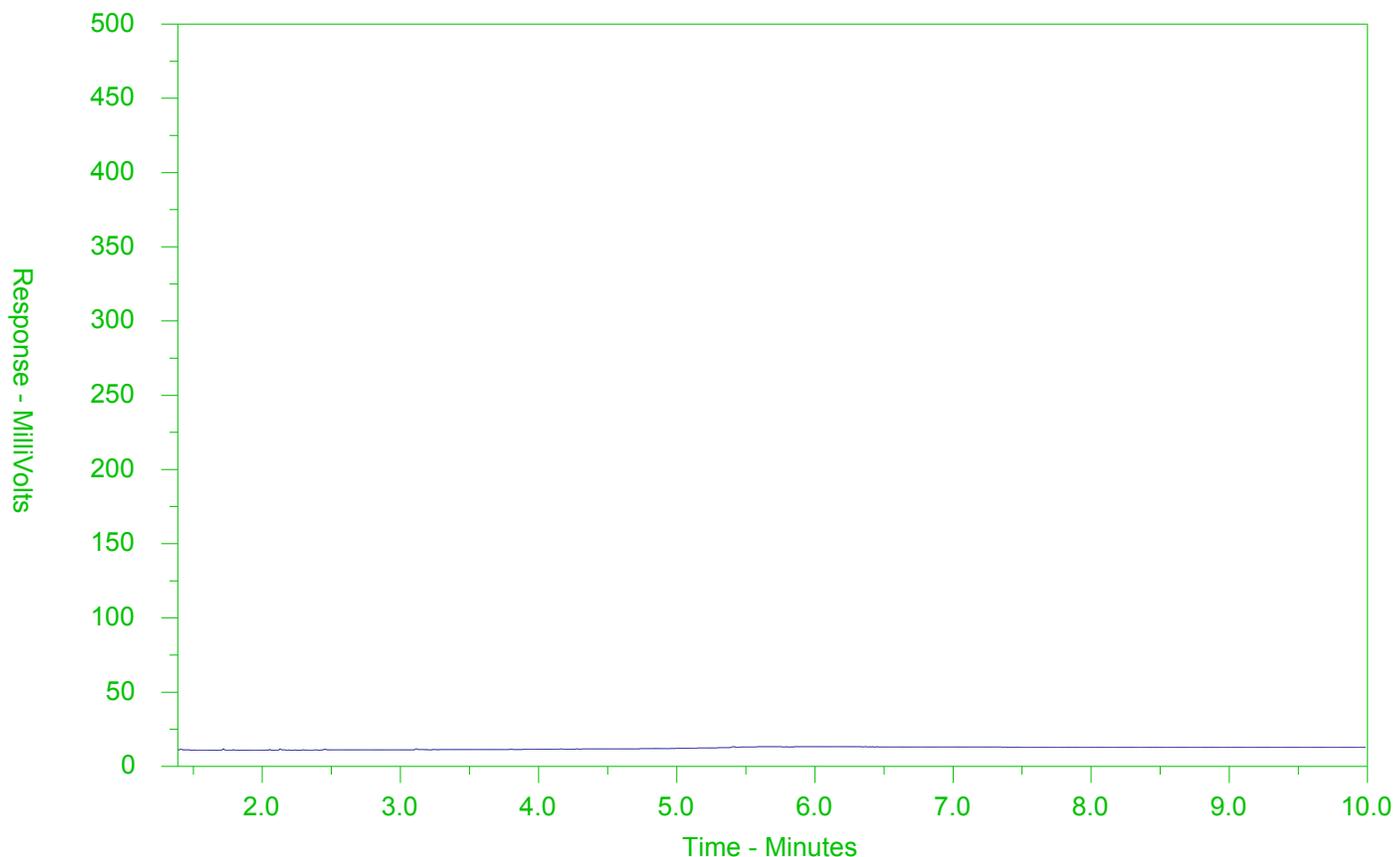
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2537182-2
 Client Sample ID: GW-11210029-120420-MW-02



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

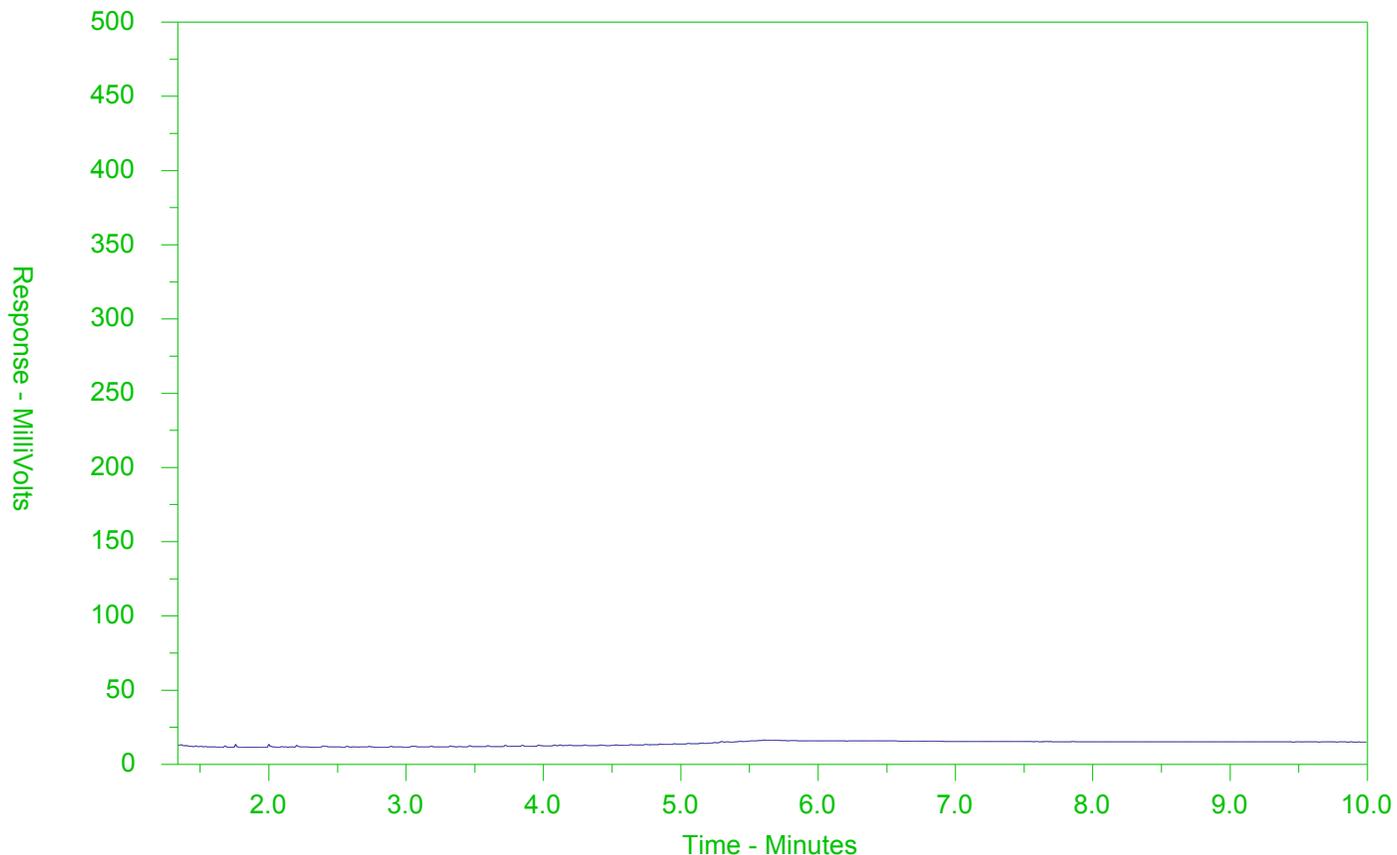
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2537182-3
 Client Sample ID: GW-11210029-120420-MW-02D



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

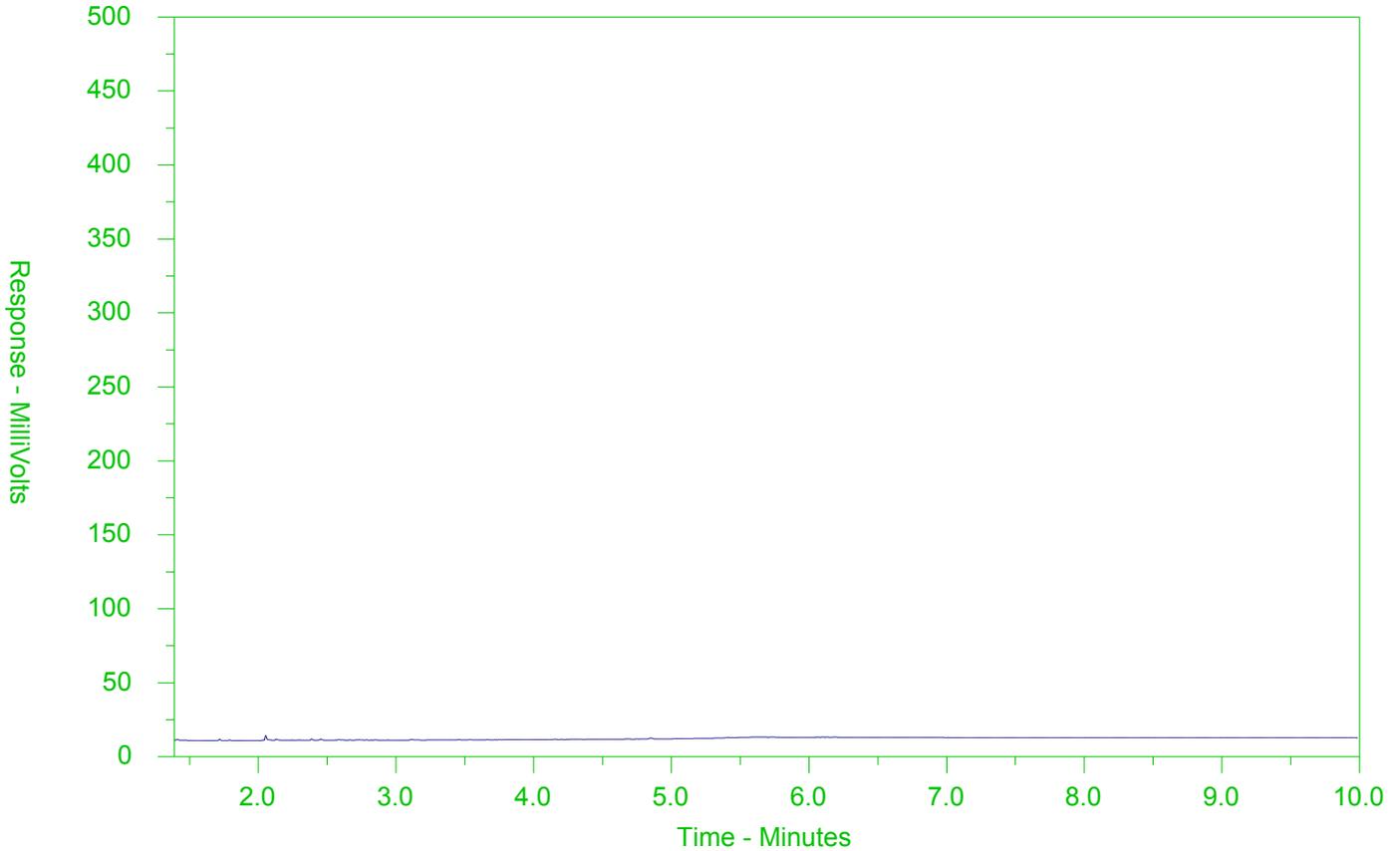
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2537182-4
 Client Sample ID: GW-11210029-120420-MW-03



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytical Request Form



COC Number: 17 - 871523

Page of

MJ

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2537182-COFC

Report To		Report Format / Distribution			Contact your AM to confirm all E&P TATs (surcharges may apply)																
Company: <i>GND</i>		Select Report Format: <input type="checkbox"/> PDF <input type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply					EMERGENCY											
Contact: <i>Jennifer Barkwith</i>		Quality Control (QC) Report with Report <input type="checkbox"/> YES <input type="checkbox"/> NO			4 day [P4-20%] <input type="checkbox"/>		1 Business day [E - 100%]			<input type="checkbox"/>											
Phone:		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			3 day [P3-25%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]			<input type="checkbox"/>											
Company address below will appear on the final report		Select Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Date and Time Required for all E&P TATs:					dd-mmm-yy hh:mm											
Street: <i>455 Philip St</i>		Email 1 or Fax			For tests that can not be performed according to the service level selected, you will be contacted.																
City/Province: <i>Wabano</i>		Email 2			Analysis Request																
Postal Code:		Email 3			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																
Invoice To		Invoice Distribution			NUMBER OF CONTAINERS	P	P	P	FP	P	FP	FP	P								
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				VOC FI															
Copy of Invoice with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Email 1 or Fax				F2-F4/PAM															
Company:		Email 2				Total Metals															
Contact:		Email 3				Dis Metals															
Project Information		Oil and Gas Required Fields (client use)				Total Hg															
ALS Account # / Quote #:		AFE/Cost Center:				Dis Hg															
Job #:		Major/Minor Code:				Dis Cr6															
PO / AFE:		Routing Code:				Cyanide															
LSD:		Requisitioner:				E/C Cl, PA															
ALS Lab Work Order # (lab use only): <i>L2537182</i>		ALS Contact:			SVOC																
Sampler:		Location:																			
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type																	
	<i>GW-11210029-120420-MW-01</i>	<i>04-Dec-20</i>	<i>1130</i>	<i>Water</i>	<i>13</i>	<i>X</i>															
	<i>- 02</i>		<i>1305</i>		<i>13</i>	<i>X</i>															
	<i>- 02D</i>		<i>1310</i>		<i>13</i>	<i>X</i>															
	<i>- 03</i>		<i>1510</i>		<i>13</i>	<i>X</i>															
	<i>Trip Blank</i>		<i>1615</i>		<i>2</i>	<i>X</i>															
Drinking Water (DW) Samples' (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)																
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Frozen <input type="checkbox"/>					SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>											
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input checked="" type="checkbox"/>					Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>											
					Cooling Initiated <input type="checkbox"/>					INITIAL COOLER TEMPERATURES °C											
										FINAL COOLER TEMPERATURES °C											
										<i>3.2 4.1</i>											
SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)															
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:	Received by:									
	<i>Dec 4 2020</i>	<i>1650</i>								<i>12/4/20</i>	<i>1700</i>										

SAMPLES ON HOLD
SUSPECTED HAZARDOUS (see Special Instructions)



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 02-JUL-20
Report Date: 14-JUL-20 14:27 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2468705

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2468705-1 W-11210029-20200702-12 Sampled By: CLIENT on 02-JUL-20 @ 10:30 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0056		0.0030	mg/L	03-JUL-20	06-JUL-20	R5142828
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	03-JUL-20	06-JUL-20	R5142637
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Arsenic (As)-Total	0.00517		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Barium (Ba)-Total	0.0495		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	03-JUL-20	06-JUL-20	R5142637
Boron (B)-Total	<0.010		0.010	mg/L	03-JUL-20	06-JUL-20	R5142637
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	06-JUL-20	R5142637
Calcium (Ca)-Total	70.6		0.050	mg/L	03-JUL-20	06-JUL-20	R5142637
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	03-JUL-20	06-JUL-20	R5142637
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	03-JUL-20	06-JUL-20	R5142637
Cobalt (Co)-Total	0.00011		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Copper (Cu)-Total	<0.00050		0.00050	mg/L	03-JUL-20	06-JUL-20	R5142637
Iron (Fe)-Total	0.400		0.010	mg/L	03-JUL-20	06-JUL-20	R5142637
Lead (Pb)-Total	0.000227		0.000050	mg/L	03-JUL-20	06-JUL-20	R5142637
Lithium (Li)-Total	0.0034		0.0010	mg/L	03-JUL-20	06-JUL-20	R5142637
Magnesium (Mg)-Total	32.6		0.0050	mg/L	03-JUL-20	06-JUL-20	R5142637
Manganese (Mn)-Total	0.0108		0.00050	mg/L	03-JUL-20	06-JUL-20	R5142637
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		07-JUL-20	R5143798
Molybdenum (Mo)-Total	0.000559		0.000050	mg/L	03-JUL-20	06-JUL-20	R5142637
Nickel (Ni)-Total	0.00170		0.00050	mg/L	03-JUL-20	06-JUL-20	R5142637
Phosphorus (P)-Total	<0.050		0.050	mg/L	03-JUL-20	06-JUL-20	R5142637
Potassium (K)-Total	0.978		0.050	mg/L	03-JUL-20	06-JUL-20	R5142637
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	03-JUL-20	06-JUL-20	R5142637
Selenium (Se)-Total	<0.000050		0.000050	mg/L	03-JUL-20	06-JUL-20	R5142637
Silicon (Si)-Total	8.89		0.10	mg/L	03-JUL-20	06-JUL-20	R5142637
Silver (Ag)-Total	<0.000050		0.000050	mg/L	03-JUL-20	06-JUL-20	R5142637
Sodium (Na)-Total	7.79		0.050	mg/L	03-JUL-20	06-JUL-20	R5142637
Strontium (Sr)-Total	0.148		0.0010	mg/L	03-JUL-20	06-JUL-20	R5142637
Sulfur (S)-Total	20.2		0.50	mg/L	03-JUL-20	06-JUL-20	R5142637
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	03-JUL-20	06-JUL-20	R5142637
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	03-JUL-20	06-JUL-20	R5142637
Thorium (Th)-Total	<0.00010		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Tin (Sn)-Total	<0.00010		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	03-JUL-20	06-JUL-20	R5142637
Tungsten (W)-Total	<0.00010		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Uranium (U)-Total	0.000252		0.000010	mg/L	03-JUL-20	06-JUL-20	R5142637
Vanadium (V)-Total	<0.00050		0.00050	mg/L	03-JUL-20	06-JUL-20	R5142637
Zinc (Zn)-Total	0.0054		0.0030	mg/L	03-JUL-20	06-JUL-20	R5142637

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2468705-1 W-11210029-20200702-12 Sampled By: CLIENT on 02-JUL-20 @ 10:30 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	03-JUL-20	06-JUL-20	R5142637
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		03-JUL-20	R5142654
Volatile Organic Compounds							
Acetone	<30		30	ug/L		08-JUL-20	R5145927
Benzene	<0.50		0.50	ug/L		08-JUL-20	R5145927
Bromodichloromethane	<2.0		2.0	ug/L		08-JUL-20	R5145927
Bromoform	<5.0		5.0	ug/L		08-JUL-20	R5145927
Bromomethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
Carbon tetrachloride	<0.20		0.20	ug/L		08-JUL-20	R5145927
Chlorobenzene	<0.50		0.50	ug/L		08-JUL-20	R5145927
Dibromochloromethane	<2.0		2.0	ug/L		08-JUL-20	R5145927
Chloroform	<1.0		1.0	ug/L		08-JUL-20	R5145927
1,2-Dibromoethane	<0.20		0.20	ug/L		08-JUL-20	R5145927
1,2-Dichlorobenzene	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,3-Dichlorobenzene	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,4-Dichlorobenzene	<0.50		0.50	ug/L		08-JUL-20	R5145927
Dichlorodifluoromethane	<2.0		2.0	ug/L		08-JUL-20	R5145927
1,1-Dichloroethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,2-Dichloroethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,1-Dichloroethylene	<0.50		0.50	ug/L		08-JUL-20	R5145927
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		08-JUL-20	R5145927
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		08-JUL-20	R5145927
Methylene Chloride	<5.0		5.0	ug/L		08-JUL-20	R5145927
1,2-Dichloropropane	<0.50		0.50	ug/L		08-JUL-20	R5145927
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		08-JUL-20	R5145927
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		08-JUL-20	R5145927
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		08-JUL-20	
Ethylbenzene	<0.50		0.50	ug/L		08-JUL-20	R5145927
n-Hexane	<0.50		0.50	ug/L		08-JUL-20	R5145927
Methyl Ethyl Ketone	<20		20	ug/L		08-JUL-20	R5145927
Methyl Isobutyl Ketone	<20		20	ug/L		08-JUL-20	R5145927
MTBE	<2.0		2.0	ug/L		08-JUL-20	R5145927
Styrene	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
Tetrachloroethylene	<0.50		0.50	ug/L		08-JUL-20	R5145927
Toluene	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,1,1-Trichloroethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,1,2-Trichloroethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
Trichloroethylene	<0.50		0.50	ug/L		08-JUL-20	R5145927

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2468705-1 W-11210029-20200702-12							
Sampled By: CLIENT on 02-JUL-20 @ 10:30							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		08-JUL-20	R5145927
Vinyl chloride	<0.50		0.50	ug/L		08-JUL-20	R5145927
o-Xylene	<0.30		0.30	ug/L		08-JUL-20	R5145927
m+p-Xylenes	<0.40		0.40	ug/L		08-JUL-20	R5145927
Xylenes (Total)	<0.50		0.50	ug/L		08-JUL-20	
Surrogate: 4-Bromofluorobenzene	91.7		70-130	%		08-JUL-20	R5145927
Surrogate: 1,4-Difluorobenzene	96.9		70-130	%		08-JUL-20	R5145927
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		08-JUL-20	R5145927
F1-BTEX	<25		25	ug/L		14-JUL-20	
F2 (C10-C16)	<100		100	ug/L	03-JUL-20	06-JUL-20	R5142623
F2-Naphth	<100		100	ug/L		14-JUL-20	
F3 (C16-C34)	<250		250	ug/L	03-JUL-20	06-JUL-20	R5142623
F3-PAH	<250		250	ug/L		14-JUL-20	
F4 (C34-C50)	<250		250	ug/L	03-JUL-20	06-JUL-20	R5142623
Total Hydrocarbons (C6-C50)	<370		370	ug/L		14-JUL-20	
Chrom. to baseline at nC50	YES				03-JUL-20	06-JUL-20	R5142623
Surrogate: 2-Bromobenzotrifluoride	84.6		60-140	%	03-JUL-20	06-JUL-20	R5142623
Surrogate: 3,4-Dichlorotoluene	69.3		60-140	%		08-JUL-20	R5145927
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Acenaphthylene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Anthracene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Benzo(a)anthracene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Benzo(a)pyrene	<0.010		0.010	ug/L	03-JUL-20	07-JUL-20	R5142701
Benzo(b)fluoranthene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Benzo(k)fluoranthene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Chrysene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Fluoranthene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Fluorene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		14-JUL-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
2-Methylnaphthalene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Naphthalene	<0.050		0.050	ug/L	03-JUL-20	07-JUL-20	R5142701
Phenanthrene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Pyrene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Surrogate: d10-Acenaphthene	95.8		60-140	%	03-JUL-20	07-JUL-20	R5142701
Surrogate: d12-Chrysene	81.8		60-140	%	03-JUL-20	07-JUL-20	R5142701

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2468705-1 W-11210029-20200702-12							
Sampled By: CLIENT on 02-JUL-20 @ 10:30							
Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	89.6		60-140	%	03-JUL-20	07-JUL-20	R5142701
Surrogate: d10-Phenanthrene	102.8		60-140	%	03-JUL-20	07-JUL-20	R5142701
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
4-Chloroaniline	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
2-Chlorophenol	<0.30		0.30	ug/L	13-JUL-20	14-JUL-20	R5152021
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4-Dichlorophenol	<0.30		0.30	ug/L	13-JUL-20	14-JUL-20	R5152021
Diethylphthalate	<0.20		0.20	ug/L	13-JUL-20	14-JUL-20	R5152021
Dimethylphthalate	<0.20		0.20	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4-Dimethylphenol	<0.50		0.50	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4-Dinitrophenol	<1.0		1.0	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4-Dinitrotoluene	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
2,6-Dinitrotoluene	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	13-JUL-20	14-JUL-20	R5152021
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	13-JUL-20	14-JUL-20	R5152021
Pentachlorophenol	<0.50		0.50	ug/L	13-JUL-20	14-JUL-20	R5152021
Phenol	<0.50		0.50	ug/L	13-JUL-20	14-JUL-20	R5152021
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	13-JUL-20	14-JUL-20	R5152021
Surrogate: 2-Fluorobiphenyl	86.8		50-140	%	13-JUL-20	14-JUL-20	R5152021
Surrogate: Nitrobenzene d5	91.7		50-140	%	13-JUL-20	14-JUL-20	R5152021
Surrogate: p-Terphenyl d14	116.1		60-140	%	13-JUL-20	14-JUL-20	R5152021
Surrogate: 2,4,6-Tribromophenol	76.2		50-140	%	13-JUL-20	14-JUL-20	R5152021
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	06-JUL-20	06-JUL-20	R5142612
Aroclor 1248	<0.020		0.020	ug/L	06-JUL-20	06-JUL-20	R5142612
Aroclor 1254	<0.020		0.020	ug/L	06-JUL-20	06-JUL-20	R5142612
Aroclor 1260	<0.020		0.020	ug/L	06-JUL-20	06-JUL-20	R5142612
Surrogate: Decachlorobiphenyl	142.0		50-150	%	06-JUL-20	06-JUL-20	R5142612
Total PCBs	<0.040		0.040	ug/L	06-JUL-20	06-JUL-20	R5142612
Surrogate: Tetrachloro-m-xylene	83.4		50-150	%	06-JUL-20	06-JUL-20	R5142612

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	1,2,4-Trichlorobenzene	LCS-ND	L2468705-1
Matrix Spike	Aluminum (Al)-Total	MS-B	L2468705-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2468705-1
Matrix Spike	Boron (B)-Total	MS-B	L2468705-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2468705-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2468705-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2468705-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2468705-1
Matrix Spike	Potassium (K)-Total	MS-B	L2468705-1
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2468705-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2468705-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2468705-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2468705-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2468705-1
Matrix Spike	Uranium (U)-Total	MS-B	L2468705-1

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

Reference Information

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2468705

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5152021							
WG3360817-2	LCS							
1,2,4-Trichlorobenzene			33.2	LCS-ND	%		50-140	14-JUL-20
2-Chlorophenol			82.3		%		50-140	14-JUL-20
2,4-Dichlorophenol			96.7		%		50-140	14-JUL-20
2,4-Dimethylphenol			107.0		%		30-130	14-JUL-20
2,4-Dinitrophenol			139.9		%		50-140	14-JUL-20
2,4-Dinitrotoluene			137.0		%		50-140	14-JUL-20
2,4,5-Trichlorophenol			97.2		%		50-140	14-JUL-20
2,4,6-Trichlorophenol			95.8		%		50-140	14-JUL-20
2,6-Dinitrotoluene			113.7		%		50-140	14-JUL-20
3,3'-Dichlorobenzidine			84.5		%		30-130	14-JUL-20
4-Chloroaniline			50.8		%		30-130	14-JUL-20
Biphenyl			50.2		%		50-140	14-JUL-20
Bis(2-chloroethyl)ether			94.3		%		50-140	14-JUL-20
Bis(2-chloroisopropyl)ether			75.9		%		50-140	14-JUL-20
Bis(2-ethylhexyl)phthalate			119.3		%		50-140	14-JUL-20
Diethylphthalate			95.9		%		50-140	14-JUL-20
Dimethylphthalate			93.2		%		50-140	14-JUL-20
Pentachlorophenol			113.1		%		50-140	14-JUL-20
Phenol			108.7		%		30-130	14-JUL-20
WG3360817-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	14-JUL-20
2-Chlorophenol			<0.30		ug/L		0.3	14-JUL-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	14-JUL-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	14-JUL-20
2,4-Dinitrophenol			<1.0		ug/L		1	14-JUL-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	14-JUL-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	14-JUL-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	14-JUL-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	14-JUL-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	14-JUL-20
4-Chloroaniline			<0.40		ug/L		0.4	14-JUL-20
Biphenyl			<0.40		ug/L		0.4	14-JUL-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	14-JUL-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	14-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
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 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5152021								
WG3360817-1 MB								
			<2.0		ug/L		2	14-JUL-20
			<0.20		ug/L		0.2	14-JUL-20
			<0.20		ug/L		0.2	14-JUL-20
			<0.50		ug/L		0.5	14-JUL-20
			<0.50		ug/L		0.5	14-JUL-20
			87.4		%		50-140	14-JUL-20
			80.8		%		50-140	14-JUL-20
			90.5		%		50-140	14-JUL-20
			130.1		%		60-140	14-JUL-20
CR-CR6-IC-WT Water								
Batch R5142654								
WG3355133-4 DUP								
		WG3355133-3	0.00579		mg/L	2.3	20	03-JUL-20
		0.00592						
WG3355133-2 LCS								
			103.6		%		80-120	03-JUL-20
WG3355133-1 MB								
			<0.00050		mg/L		0.0005	03-JUL-20
WG3355133-5 MS								
		WG3355133-3	104.5		%		70-130	03-JUL-20
F1-HS-511-WT Water								
Batch R5145927								
WG3357552-4 DUP								
		WG3357552-3	<25	RPD-NA	ug/L	N/A	30	08-JUL-20
WG3357552-1 LCS								
			110.6		%		80-120	08-JUL-20
WG3357552-2 MB								
			<25		ug/L		25	08-JUL-20
			84.0		%		60-140	08-JUL-20
WG3357552-5 MS								
		WG3357552-3	94.6		%		60-140	08-JUL-20
F2-F4-511-WT Water								
Batch R5142623								
WG3355185-2 LCS								
			100.8		%		70-130	06-JUL-20
			104.0		%		70-130	06-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch	R5142623							
WG3355185-2	LCS							
F4 (C34-C50)			105.7		%		70-130	06-JUL-20
WG3355185-1	MB							
F2 (C10-C16)			<100		ug/L		100	06-JUL-20
F3 (C16-C34)			<250		ug/L		250	06-JUL-20
F4 (C34-C50)			<250		ug/L		250	06-JUL-20
Surrogate: 2-Bromobenzotrifluoride			87.6		%		60-140	06-JUL-20
HG-T-CVAA-WT		Water						
Batch	R5143798							
WG3356339-3	DUP	L2467371-1						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	07-JUL-20
WG3356339-2	LCS							
Mercury (Hg)-Total			101.0		%		80-120	07-JUL-20
WG3356339-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	07-JUL-20
WG3356339-4	MS	L2467371-2						
Mercury (Hg)-Total			95.5		%		70-130	07-JUL-20
MET-T-CCMS-WT		Water						
Batch	R5142637							
WG3354650-4	DUP	WG3354650-3						
Aluminum (Al)-Total		0.906	0.894		mg/L	1.3	20	03-JUL-20
Antimony (Sb)-Total		0.00035	0.00035		mg/L	0.4	20	03-JUL-20
Arsenic (As)-Total		0.00113	0.00110		mg/L	2.8	20	03-JUL-20
Barium (Ba)-Total		0.0642	0.0655		mg/L	1.9	20	03-JUL-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-JUL-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	03-JUL-20
Boron (B)-Total		0.030	0.031		mg/L	1.6	20	03-JUL-20
Cadmium (Cd)-Total		0.0000154	0.0000181		mg/L	16	20	03-JUL-20
Calcium (Ca)-Total		36.7	34.3		mg/L	6.8	20	03-JUL-20
Chromium (Cr)-Total		0.00138	0.00137		mg/L	0.9	20	03-JUL-20
Cesium (Cs)-Total		0.000068	0.000067		mg/L	2.7	20	03-JUL-20
Cobalt (Co)-Total		0.00038	0.00039		mg/L	4.0	20	03-JUL-20
Copper (Cu)-Total		0.00232	0.00229		mg/L	1.1	20	03-JUL-20
Iron (Fe)-Total		0.789	0.774		mg/L	1.9	20	03-JUL-20
Lead (Pb)-Total		0.000465	0.000475		mg/L	2.1	20	03-JUL-20



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 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5142637							
WG3354650-4	DUP	WG3354650-3						
Lithium (Li)-Total		0.0026	0.0026		mg/L	1.3	20	03-JUL-20
Magnesium (Mg)-Total		9.79	9.92		mg/L	1.3	20	03-JUL-20
Manganese (Mn)-Total		0.0148	0.0146		mg/L	1.4	20	03-JUL-20
Molybdenum (Mo)-Total		0.00154	0.00153		mg/L	0.7	20	03-JUL-20
Nickel (Ni)-Total		0.00132	0.00129		mg/L	2.3	20	03-JUL-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	03-JUL-20
Potassium (K)-Total		2.26	2.26		mg/L	0.0	20	03-JUL-20
Rubidium (Rb)-Total		0.00235	0.00214		mg/L	9.1	20	03-JUL-20
Selenium (Se)-Total		0.000142	0.000188	J	mg/L	0.000046	0.0001	03-JUL-20
Silicon (Si)-Total		2.84	2.80		mg/L	1.4	20	03-JUL-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	03-JUL-20
Sodium (Na)-Total		14.1	14.0		mg/L	0.1	20	03-JUL-20
Strontium (Sr)-Total		0.184	0.183		mg/L	0.5	20	03-JUL-20
Sulfur (S)-Total		8.56	8.55		mg/L	0.2	25	03-JUL-20
Thallium (Tl)-Total		0.000010	<0.000010	RPD-NA	mg/L	N/A	20	03-JUL-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	03-JUL-20
Thorium (Th)-Total		0.00012	0.00014		mg/L	13	25	03-JUL-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-JUL-20
Titanium (Ti)-Total		0.0300	0.0300		mg/L	0.0	20	03-JUL-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-JUL-20
Uranium (U)-Total		0.000429	0.000435		mg/L	1.5	20	03-JUL-20
Vanadium (V)-Total		0.00197	0.00197		mg/L	0.3	20	03-JUL-20
Zinc (Zn)-Total		0.0323	0.0317		mg/L	2.0	20	03-JUL-20
Zirconium (Zr)-Total		0.00035	0.00036		mg/L	1.2	20	03-JUL-20
WG3354650-2	LCS							
Aluminum (Al)-Total			97.2		%		80-120	03-JUL-20
Antimony (Sb)-Total			102.9		%		80-120	03-JUL-20
Arsenic (As)-Total			98.0		%		80-120	03-JUL-20
Barium (Ba)-Total			98.4		%		80-120	03-JUL-20
Beryllium (Be)-Total			97.9		%		80-120	03-JUL-20
Bismuth (Bi)-Total			99.4		%		80-120	03-JUL-20
Boron (B)-Total			97.9		%		80-120	03-JUL-20
Cadmium (Cd)-Total			98.0		%		80-120	03-JUL-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5142637							
WG3354650-2	LCS							
Calcium (Ca)-Total			98.3		%		80-120	03-JUL-20
Chromium (Cr)-Total			98.8		%		80-120	03-JUL-20
Cesium (Cs)-Total			98.1		%		80-120	03-JUL-20
Cobalt (Co)-Total			96.8		%		80-120	03-JUL-20
Copper (Cu)-Total			96.0		%		80-120	03-JUL-20
Iron (Fe)-Total			99.6		%		80-120	03-JUL-20
Lead (Pb)-Total			99.2		%		80-120	03-JUL-20
Lithium (Li)-Total			96.9		%		80-120	03-JUL-20
Magnesium (Mg)-Total			99.0		%		80-120	03-JUL-20
Manganese (Mn)-Total			96.7		%		80-120	03-JUL-20
Molybdenum (Mo)-Total			99.3		%		80-120	03-JUL-20
Nickel (Ni)-Total			97.2		%		80-120	03-JUL-20
Phosphorus (P)-Total			101.4		%		70-130	03-JUL-20
Potassium (K)-Total			97.7		%		80-120	03-JUL-20
Rubidium (Rb)-Total			96.3		%		80-120	03-JUL-20
Selenium (Se)-Total			97.7		%		80-120	03-JUL-20
Silicon (Si)-Total			99.7		%		60-140	03-JUL-20
Silver (Ag)-Total			97.9		%		80-120	03-JUL-20
Sodium (Na)-Total			100.6		%		80-120	03-JUL-20
Strontium (Sr)-Total			101.3		%		80-120	03-JUL-20
Sulfur (S)-Total			100.3		%		80-120	03-JUL-20
Thallium (Tl)-Total			100.0		%		80-120	03-JUL-20
Tellurium (Te)-Total			96.6		%		80-120	03-JUL-20
Thorium (Th)-Total			97.1		%		70-130	03-JUL-20
Tin (Sn)-Total			97.6		%		80-120	03-JUL-20
Titanium (Ti)-Total			95.5		%		80-120	03-JUL-20
Tungsten (W)-Total			96.4		%		80-120	03-JUL-20
Uranium (U)-Total			102.0		%		80-120	03-JUL-20
Vanadium (V)-Total			98.0		%		80-120	03-JUL-20
Zinc (Zn)-Total			98.0		%		80-120	03-JUL-20
Zirconium (Zr)-Total			94.2		%		80-120	03-JUL-20
WG3354650-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	03-JUL-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	03-JUL-20



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 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5142637							
WG3354650-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	03-JUL-20
Boron (B)-Total			<0.010		mg/L		0.01	03-JUL-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	03-JUL-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	03-JUL-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	03-JUL-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	03-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	03-JUL-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	03-JUL-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	03-JUL-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	03-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	03-JUL-20
Potassium (K)-Total			<0.050		mg/L		0.05	03-JUL-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	03-JUL-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	03-JUL-20
Silicon (Si)-Total			<0.10		mg/L		0.1	03-JUL-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	03-JUL-20
Sodium (Na)-Total			<0.050		mg/L		0.05	03-JUL-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	03-JUL-20
Sulfur (S)-Total			<0.50		mg/L		0.5	03-JUL-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	03-JUL-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	03-JUL-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	03-JUL-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	03-JUL-20



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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5142637							
WG3354650-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	03-JUL-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	03-JUL-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	03-JUL-20
WG3354650-5 MS		WG3354650-6						
Aluminum (Al)-Total			N/A	MS-B	%		-	03-JUL-20
Antimony (Sb)-Total			100.4		%		70-130	03-JUL-20
Arsenic (As)-Total			98.3		%		70-130	03-JUL-20
Barium (Ba)-Total			N/A	MS-B	%		-	03-JUL-20
Beryllium (Be)-Total			96.4		%		70-130	03-JUL-20
Bismuth (Bi)-Total			91.4		%		70-130	03-JUL-20
Boron (B)-Total			N/A	MS-B	%		-	03-JUL-20
Cadmium (Cd)-Total			97.2		%		70-130	03-JUL-20
Calcium (Ca)-Total			N/A	MS-B	%		-	03-JUL-20
Chromium (Cr)-Total			99.5		%		70-130	03-JUL-20
Cesium (Cs)-Total			96.5		%		70-130	03-JUL-20
Cobalt (Co)-Total			93.5		%		70-130	03-JUL-20
Copper (Cu)-Total			92.3		%		70-130	03-JUL-20
Iron (Fe)-Total			N/A	MS-B	%		-	03-JUL-20
Lead (Pb)-Total			94.5		%		70-130	03-JUL-20
Lithium (Li)-Total			92.8		%		70-130	03-JUL-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	03-JUL-20
Manganese (Mn)-Total			N/A	MS-B	%		-	03-JUL-20
Molybdenum (Mo)-Total			99.5		%		70-130	03-JUL-20
Nickel (Ni)-Total			91.4		%		70-130	03-JUL-20
Phosphorus (P)-Total			97.8		%		70-130	03-JUL-20
Potassium (K)-Total			N/A	MS-B	%		-	03-JUL-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	03-JUL-20
Selenium (Se)-Total			96.5		%		70-130	03-JUL-20
Silicon (Si)-Total			N/A	MS-B	%		-	03-JUL-20
Silver (Ag)-Total			93.5		%		70-130	03-JUL-20
Sodium (Na)-Total			N/A	MS-B	%		-	03-JUL-20
Strontium (Sr)-Total			N/A	MS-B	%		-	03-JUL-20
Sulfur (S)-Total			N/A	MS-B	%		-	03-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5142637							
WG3354650-5 MS		WG3354650-6						
Thallium (Tl)-Total			93.6		%		70-130	03-JUL-20
Tellurium (Te)-Total			91.2		%		70-130	03-JUL-20
Thorium (Th)-Total			93.5		%		70-130	03-JUL-20
Tin (Sn)-Total			96.1		%		70-130	03-JUL-20
Titanium (Ti)-Total			98.6		%		70-130	03-JUL-20
Tungsten (W)-Total			94.1		%		70-130	03-JUL-20
Uranium (U)-Total			N/A	MS-B	%		-	03-JUL-20
Vanadium (V)-Total			99.9		%		70-130	03-JUL-20
Zinc (Zn)-Total			92.6		%		70-130	03-JUL-20
Zirconium (Zr)-Total			85.2		%		70-130	03-JUL-20
P-T-COL-WT								
	Water							
Batch	R5142828							
WG3354570-3 DUP		L2468705-1						
Phosphorus, Total		0.0056	0.0059		mg/L	6.8	20	06-JUL-20
WG3354570-2 LCS								
Phosphorus, Total			97.6		%		80-120	06-JUL-20
WG3354570-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	06-JUL-20
WG3354570-4 MS		L2468705-1						
Phosphorus, Total			93.6		%		70-130	06-JUL-20
PAH-511-WT								
	Water							
Batch	R5142701							
WG3355185-2 LCS								
1-Methylnaphthalene			89.8		%		50-140	06-JUL-20
2-Methylnaphthalene			86.7		%		50-140	06-JUL-20
Acenaphthene			97.8		%		50-140	06-JUL-20
Acenaphthylene			101.6		%		50-140	06-JUL-20
Anthracene			103.8		%		50-140	06-JUL-20
Benzo(a)anthracene			94.2		%		50-140	06-JUL-20
Benzo(a)pyrene			99.9		%		50-140	06-JUL-20
Benzo(b)fluoranthene			103.5		%		50-140	06-JUL-20
Benzo(g,h,i)perylene			107.0		%		50-140	06-JUL-20
Benzo(k)fluoranthene			102.2		%		50-140	06-JUL-20
Chrysene			93.8		%		50-140	06-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT		Water						
Batch	R5142701							
WG3355185-2	LCS							
Dibenzo(ah)anthracene			97.8		%		50-140	06-JUL-20
Fluoranthene			107.1		%		50-140	06-JUL-20
Fluorene			103.0		%		50-140	06-JUL-20
Indeno(1,2,3-cd)pyrene			108.6		%		50-140	06-JUL-20
Naphthalene			92.0		%		50-140	06-JUL-20
Phenanthrene			108.1		%		50-140	06-JUL-20
Pyrene			107.4		%		50-140	06-JUL-20
WG3355185-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	06-JUL-20
2-Methylnaphthalene			<0.020		ug/L		0.02	06-JUL-20
Acenaphthene			<0.020		ug/L		0.02	06-JUL-20
Acenaphthylene			<0.020		ug/L		0.02	06-JUL-20
Anthracene			<0.020		ug/L		0.02	06-JUL-20
Benzo(a)anthracene			<0.020		ug/L		0.02	06-JUL-20
Benzo(a)pyrene			<0.010		ug/L		0.01	06-JUL-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	06-JUL-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	06-JUL-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	06-JUL-20
Chrysene			<0.020		ug/L		0.02	06-JUL-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	06-JUL-20
Fluoranthene			<0.020		ug/L		0.02	06-JUL-20
Fluorene			<0.020		ug/L		0.02	06-JUL-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	06-JUL-20
Naphthalene			<0.050		ug/L		0.05	06-JUL-20
Phenanthrene			<0.020		ug/L		0.02	06-JUL-20
Pyrene			<0.020		ug/L		0.02	06-JUL-20
Surrogate: d8-Naphthalene			95.9		%		60-140	06-JUL-20
Surrogate: d10-Phenanthrene			103.0		%		60-140	06-JUL-20
Surrogate: d12-Chrysene			77.2		%		60-140	06-JUL-20
Surrogate: d10-Acenaphthene			96.5		%		60-140	06-JUL-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5142612							
WG3354767-2	LCS							
Aroclor 1242			118.8		%		60-140	06-JUL-20
Aroclor 1248			121.4		%		60-140	06-JUL-20
Aroclor 1254			116.3		%		60-140	06-JUL-20
Aroclor 1260			91.1		%		60-140	06-JUL-20
WG3354767-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	06-JUL-20
Aroclor 1248			<0.020		ug/L		0.02	06-JUL-20
Aroclor 1254			<0.020		ug/L		0.02	06-JUL-20
Aroclor 1260			<0.020		ug/L		0.02	06-JUL-20
Surrogate: Decachlorobiphenyl			111.0		%		50-150	06-JUL-20
Surrogate: Tetrachloro-m-xylene			84.4		%		50-150	06-JUL-20
VOC-511-HS-WT		Water						
Batch	R5145927							
WG3357552-4	DUP		WG3357552-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	08-JUL-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	08-JUL-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	08-JUL-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	08-JUL-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	08-JUL-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5145927							
WG3357552-4	DUP	WG3357552-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	08-JUL-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	08-JUL-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	08-JUL-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	08-JUL-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	08-JUL-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	08-JUL-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	08-JUL-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	08-JUL-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	08-JUL-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	08-JUL-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	08-JUL-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	08-JUL-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
WG3357552-1	LCS							
1,1,1,2-Tetrachloroethane			101.5		%		70-130	08-JUL-20
1,1,2,2-Tetrachloroethane			106.0		%		70-130	08-JUL-20
1,1,1-Trichloroethane			109.4		%		70-130	08-JUL-20
1,1,2-Trichloroethane			101.3		%		70-130	08-JUL-20
1,1-Dichloroethane			103.9		%		70-130	08-JUL-20
1,1-Dichloroethylene			105.0		%		70-130	08-JUL-20
1,2-Dibromoethane			98.4		%		70-130	08-JUL-20
1,2-Dichlorobenzene			103.6		%		70-130	08-JUL-20
1,2-Dichloroethane			103.5		%		70-130	08-JUL-20
1,2-Dichloropropane			108.9		%		70-130	08-JUL-20
1,3-Dichlorobenzene			99.0		%		70-130	08-JUL-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5145927							
WG3357552-1	LCS							
1,4-Dichlorobenzene			100.7		%		70-130	08-JUL-20
Acetone			116.8		%		60-140	08-JUL-20
Benzene			102.8		%		70-130	08-JUL-20
Bromodichloromethane			115.3		%		70-130	08-JUL-20
Bromoform			99.3		%		70-130	08-JUL-20
Bromomethane			117.9		%		60-140	08-JUL-20
Carbon tetrachloride			110.4		%		70-130	08-JUL-20
Chlorobenzene			101.4		%		70-130	08-JUL-20
Chloroform			109.2		%		70-130	08-JUL-20
cis-1,2-Dichloroethylene			101.0		%		70-130	08-JUL-20
cis-1,3-Dichloropropene			97.1		%		70-130	08-JUL-20
Dibromochloromethane			99.0		%		70-130	08-JUL-20
Dichlorodifluoromethane			105.8		%		50-140	08-JUL-20
Ethylbenzene			99.1		%		70-130	08-JUL-20
n-Hexane			108.7		%		70-130	08-JUL-20
m+p-Xylenes			102.5		%		70-130	08-JUL-20
Methyl Ethyl Ketone			112.2		%		60-140	08-JUL-20
Methyl Isobutyl Ketone			94.4		%		60-140	08-JUL-20
Methylene Chloride			102.5		%		70-130	08-JUL-20
MTBE			97.8		%		70-130	08-JUL-20
o-Xylene			106.6		%		70-130	08-JUL-20
Styrene			94.8		%		70-130	08-JUL-20
Tetrachloroethylene			103.4		%		70-130	08-JUL-20
Toluene			101.1		%		70-130	08-JUL-20
trans-1,2-Dichloroethylene			103.4		%		70-130	08-JUL-20
trans-1,3-Dichloropropene			100.1		%		70-130	08-JUL-20
Trichloroethylene			96.4		%		70-130	08-JUL-20
Trichlorofluoromethane			104.5		%		60-140	08-JUL-20
Vinyl chloride			119.7		%		60-140	08-JUL-20
WG3357552-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	08-JUL-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	08-JUL-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	08-JUL-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	08-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5145927							
WG3357552-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	08-JUL-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	08-JUL-20
1,2-Dibromoethane			<0.20		ug/L		0.2	08-JUL-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	08-JUL-20
1,2-Dichloroethane			<0.50		ug/L		0.5	08-JUL-20
1,2-Dichloropropane			<0.50		ug/L		0.5	08-JUL-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	08-JUL-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	08-JUL-20
Acetone			<30		ug/L		30	08-JUL-20
Benzene			<0.50		ug/L		0.5	08-JUL-20
Bromodichloromethane			<2.0		ug/L		2	08-JUL-20
Bromoform			<5.0		ug/L		5	08-JUL-20
Bromomethane			<0.50		ug/L		0.5	08-JUL-20
Carbon tetrachloride			<0.20		ug/L		0.2	08-JUL-20
Chlorobenzene			<0.50		ug/L		0.5	08-JUL-20
Chloroform			<1.0		ug/L		1	08-JUL-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	08-JUL-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	08-JUL-20
Dibromochloromethane			<2.0		ug/L		2	08-JUL-20
Dichlorodifluoromethane			<2.0		ug/L		2	08-JUL-20
Ethylbenzene			<0.50		ug/L		0.5	08-JUL-20
n-Hexane			<0.50		ug/L		0.5	08-JUL-20
m+p-Xylenes			<0.40		ug/L		0.4	08-JUL-20
Methyl Ethyl Ketone			<20		ug/L		20	08-JUL-20
Methyl Isobutyl Ketone			<20		ug/L		20	08-JUL-20
Methylene Chloride			<5.0		ug/L		5	08-JUL-20
MTBE			<2.0		ug/L		2	08-JUL-20
o-Xylene			<0.30		ug/L		0.3	08-JUL-20
Styrene			<0.50		ug/L		0.5	08-JUL-20
Tetrachloroethylene			<0.50		ug/L		0.5	08-JUL-20
Toluene			<0.50		ug/L		0.5	08-JUL-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	08-JUL-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	08-JUL-20



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 455 PHILLIP STREET
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 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5145927							
WG3357552-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	08-JUL-20
Trichlorofluoromethane			<5.0		ug/L		5	08-JUL-20
Vinyl chloride			<0.50		ug/L		0.5	08-JUL-20
Surrogate: 1,4-Difluorobenzene			97.2		%		70-130	08-JUL-20
Surrogate: 4-Bromofluorobenzene			92.3		%		70-130	08-JUL-20
WG3357552-5 MS		WG3357552-3						
1,1,1,2-Tetrachloroethane			102.3		%		50-140	08-JUL-20
1,1,2,2-Tetrachloroethane			112.6		%		50-140	08-JUL-20
1,1,1-Trichloroethane			108.4		%		50-140	08-JUL-20
1,1,2-Trichloroethane			105.1		%		50-140	08-JUL-20
1,1-Dichloroethane			104.5		%		50-140	08-JUL-20
1,1-Dichloroethylene			103.0		%		50-140	08-JUL-20
1,2-Dibromoethane			102.4		%		50-140	08-JUL-20
1,2-Dichlorobenzene			102.9		%		50-140	08-JUL-20
1,2-Dichloroethane			107.1		%		50-140	08-JUL-20
1,2-Dichloropropane			111.4		%		50-140	08-JUL-20
1,3-Dichlorobenzene			97.0		%		50-140	08-JUL-20
1,4-Dichlorobenzene			98.8		%		50-140	08-JUL-20
Acetone			125.5		%		50-140	08-JUL-20
Benzene			103.1		%		50-140	08-JUL-20
Bromodichloromethane			118.6		%		50-140	08-JUL-20
Bromoform			102.8		%		50-140	08-JUL-20
Bromomethane			115.7		%		50-140	08-JUL-20
Carbon tetrachloride			108.7		%		50-140	08-JUL-20
Chlorobenzene			101.2		%		50-140	08-JUL-20
Chloroform			110.6		%		50-140	08-JUL-20
cis-1,2-Dichloroethylene			101.2		%		50-140	08-JUL-20
cis-1,3-Dichloropropene			95.7		%		50-140	08-JUL-20
Dibromochloromethane			102.1		%		50-140	08-JUL-20
Dichlorodifluoromethane			100.5		%		50-140	08-JUL-20
Ethylbenzene			96.5		%		50-140	08-JUL-20
n-Hexane			105.1		%		50-140	08-JUL-20
m+p-Xylenes			99.9		%		50-140	08-JUL-20
Methyl Ethyl Ketone			108.0		%		50-140	08-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5145927							
WG3357552-5 MS		WG3357552-3						
Methyl Isobutyl Ketone			101.1		%		50-140	08-JUL-20
Methylene Chloride			104.2		%		50-140	08-JUL-20
MTBE			98.0		%		50-140	08-JUL-20
o-Xylene			105.0		%		50-140	08-JUL-20
Styrene			93.6		%		50-140	08-JUL-20
Tetrachloroethylene			100.2		%		50-140	08-JUL-20
Toluene			99.3		%		50-140	08-JUL-20
trans-1,2-Dichloroethylene			102.1		%		50-140	08-JUL-20
trans-1,3-Dichloropropene			98.2		%		50-140	08-JUL-20
Trichloroethylene			94.6		%		50-140	08-JUL-20
Trichlorofluoromethane			101.7		%		50-140	08-JUL-20
Vinyl chloride			116.5		%		50-140	08-JUL-20

Quality Control Report

Workorder: L2468705

Report Date: 14-JUL-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 16 of 16

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

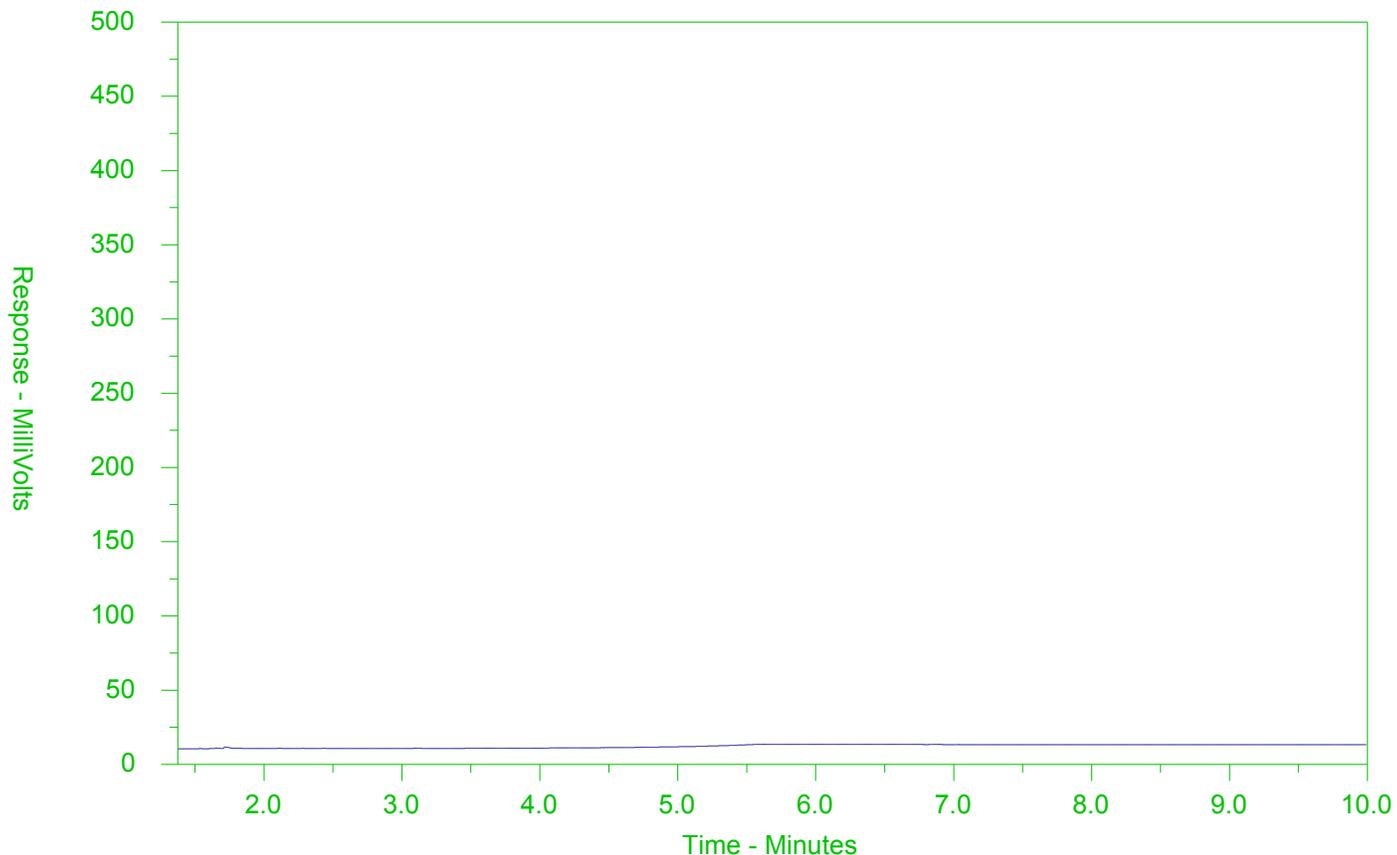
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2468705-1
 Client Sample ID: W-11210029-20200702-12



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 23-JUL-20
Report Date: 05-AUG-20 10:32 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2478867

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2478867-1 W-11210029-20200723-18							
Sampled By: CLIENT on 23-JUL-20							
Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	<0.0030		0.0030	mg/L	24-JUL-20	27-JUL-20	R5167529
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	24-JUL-20	24-JUL-20	R5166457
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Arsenic (As)-Total	0.00224		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Barium (Ba)-Total	0.0506		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	24-JUL-20	24-JUL-20	R5166457
Boron (B)-Total	<0.010		0.010	mg/L	24-JUL-20	24-JUL-20	R5166457
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	24-JUL-20	24-JUL-20	R5166457
Calcium (Ca)-Total	68.3		0.050	mg/L	24-JUL-20	24-JUL-20	R5166457
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	24-JUL-20	24-JUL-20	R5166457
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	24-JUL-20	24-JUL-20	R5166457
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Copper (Cu)-Total	0.00389		0.00050	mg/L	24-JUL-20	24-JUL-20	R5166457
Iron (Fe)-Total	0.022		0.010	mg/L	24-JUL-20	24-JUL-20	R5166457
Lead (Pb)-Total	0.000268		0.000050	mg/L	24-JUL-20	24-JUL-20	R5166457
Lithium (Li)-Total	0.0039		0.0010	mg/L	24-JUL-20	24-JUL-20	R5166457
Magnesium (Mg)-Total	31.8		0.0050	mg/L	24-JUL-20	24-JUL-20	R5166457
Manganese (Mn)-Total	0.00764		0.00050	mg/L	24-JUL-20	24-JUL-20	R5166457
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		24-JUL-20	R5166423
Molybdenum (Mo)-Total	0.000632		0.000050	mg/L	24-JUL-20	24-JUL-20	R5166457
Nickel (Ni)-Total	0.00086		0.00050	mg/L	24-JUL-20	24-JUL-20	R5166457
Phosphorus (P)-Total	<0.050		0.050	mg/L	24-JUL-20	24-JUL-20	R5166457
Potassium (K)-Total	0.996		0.050	mg/L	24-JUL-20	24-JUL-20	R5166457
Rubidium (Rb)-Total	0.00021		0.00020	mg/L	24-JUL-20	24-JUL-20	R5166457
Selenium (Se)-Total	<0.000050		0.000050	mg/L	24-JUL-20	24-JUL-20	R5166457
Silicon (Si)-Total	9.29		0.10	mg/L	24-JUL-20	24-JUL-20	R5166457
Silver (Ag)-Total	<0.000050		0.000050	mg/L	24-JUL-20	24-JUL-20	R5166457
Sodium (Na)-Total	7.51		0.050	mg/L	24-JUL-20	24-JUL-20	R5166457
Strontium (Sr)-Total	0.146		0.0010	mg/L	24-JUL-20	24-JUL-20	R5166457
Sulfur (S)-Total	20.1		0.50	mg/L	24-JUL-20	24-JUL-20	R5166457
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-JUL-20	24-JUL-20	R5166457
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	24-JUL-20	24-JUL-20	R5166457
Thorium (Th)-Total	<0.00010		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Tin (Sn)-Total	<0.00010		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	24-JUL-20	24-JUL-20	R5166457
Tungsten (W)-Total	<0.00010		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Uranium (U)-Total	0.000296		0.000010	mg/L	24-JUL-20	24-JUL-20	R5166457
Vanadium (V)-Total	<0.00050		0.00050	mg/L	24-JUL-20	24-JUL-20	R5166457
Zinc (Zn)-Total	0.0050		0.0030	mg/L	24-JUL-20	24-JUL-20	R5166457

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2478867-1 W-11210029-20200723-18 Sampled By: CLIENT on 23-JUL-20 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	24-JUL-20	24-JUL-20	R5166457
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		24-JUL-20	R5167456
Volatile Organic Compounds							
Acetone	<30		30	ug/L		28-JUL-20	R5168118
Benzene	<0.50		0.50	ug/L		28-JUL-20	R5168118
Bromodichloromethane	<2.0		2.0	ug/L		28-JUL-20	R5168118
Bromoform	<5.0		5.0	ug/L		28-JUL-20	R5168118
Bromomethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
Carbon tetrachloride	<0.20		0.20	ug/L		28-JUL-20	R5168118
Chlorobenzene	<0.50		0.50	ug/L		28-JUL-20	R5168118
Dibromochloromethane	<2.0		2.0	ug/L		28-JUL-20	R5168118
Chloroform	<1.0		1.0	ug/L		28-JUL-20	R5168118
1,2-Dibromoethane	<0.20		0.20	ug/L		28-JUL-20	R5168118
1,2-Dichlorobenzene	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,3-Dichlorobenzene	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,4-Dichlorobenzene	<0.50		0.50	ug/L		28-JUL-20	R5168118
Dichlorodifluoromethane	<2.0		2.0	ug/L		28-JUL-20	R5168118
1,1-Dichloroethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,2-Dichloroethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,1-Dichloroethylene	<0.50		0.50	ug/L		28-JUL-20	R5168118
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		28-JUL-20	R5168118
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		28-JUL-20	R5168118
Methylene Chloride	<5.0		5.0	ug/L		28-JUL-20	R5168118
1,2-Dichloropropane	<0.50		0.50	ug/L		28-JUL-20	R5168118
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		28-JUL-20	R5168118
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		28-JUL-20	R5168118
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		28-JUL-20	
Ethylbenzene	<0.50		0.50	ug/L		28-JUL-20	R5168118
n-Hexane	<0.50		0.50	ug/L		28-JUL-20	R5168118
Methyl Ethyl Ketone	<20		20	ug/L		28-JUL-20	R5168118
Methyl Isobutyl Ketone	<20		20	ug/L		28-JUL-20	R5168118
MTBE	<2.0		2.0	ug/L		28-JUL-20	R5168118
Styrene	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
Tetrachloroethylene	<0.50		0.50	ug/L		28-JUL-20	R5168118
Toluene	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,1,1-Trichloroethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,1,2-Trichloroethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
Trichloroethylene	<0.50		0.50	ug/L		28-JUL-20	R5168118

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2478867-1 W-11210029-20200723-18							
Sampled By: CLIENT on 23-JUL-20							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		28-JUL-20	R5168118
Vinyl chloride	<0.50		0.50	ug/L		28-JUL-20	R5168118
o-Xylene	<0.30		0.30	ug/L		28-JUL-20	R5168118
m+p-Xylenes	<0.40		0.40	ug/L		28-JUL-20	R5168118
Xylenes (Total)	<0.50		0.50	ug/L		28-JUL-20	
Surrogate: 4-Bromofluorobenzene	102.2		70-130	%		28-JUL-20	R5168118
Surrogate: 1,4-Difluorobenzene	101.0		70-130	%		28-JUL-20	R5168118
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		28-JUL-20	R5168118
F1-BTEX	<25		25	ug/L		30-JUL-20	
F2 (C10-C16)	<100		100	ug/L	24-JUL-20	26-JUL-20	R5167279
F2-Naphth	<100		100	ug/L		30-JUL-20	
F3 (C16-C34)	<250		250	ug/L	24-JUL-20	26-JUL-20	R5167279
F3-PAH	<250		250	ug/L		30-JUL-20	
F4 (C34-C50)	<250		250	ug/L	24-JUL-20	26-JUL-20	R5167279
Total Hydrocarbons (C6-C50)	<370		370	ug/L		30-JUL-20	
Chrom. to baseline at nC50	YES				24-JUL-20	26-JUL-20	R5167279
Surrogate: 2-Bromobenzotrifluoride	87.2		60-140	%	24-JUL-20	26-JUL-20	R5167279
Surrogate: 3,4-Dichlorotoluene	83.5		60-140	%		28-JUL-20	R5168118
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Acenaphthylene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Anthracene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Benzo(a)anthracene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Benzo(a)pyrene	<0.010		0.010	ug/L	24-JUL-20	28-JUL-20	R5168250
Benzo(b)fluoranthene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Benzo(k)fluoranthene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Chrysene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Fluoranthene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Fluorene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		30-JUL-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
2-Methylnaphthalene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Naphthalene	<0.050		0.050	ug/L	24-JUL-20	28-JUL-20	R5168250
Phenanthrene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Pyrene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Surrogate: d10-Acenaphthene	95.4		60-140	%	24-JUL-20	28-JUL-20	R5168250
Surrogate: d12-Chrysene	90.9		60-140	%	24-JUL-20	28-JUL-20	R5168250

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2478867-1 W-11210029-20200723-18 Sampled By: CLIENT on 23-JUL-20 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	95.1		60-140	%	24-JUL-20	28-JUL-20	R5168250
Surrogate: d10-Phenanthrene	97.0		60-140	%	24-JUL-20	28-JUL-20	R5168250
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
4-Chloroaniline	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
2-Chlorophenol	<0.30		0.30	ug/L	28-JUL-20	30-JUL-20	R5171958
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4-Dichlorophenol	<0.30		0.30	ug/L	28-JUL-20	30-JUL-20	R5171958
Diethylphthalate	<0.20		0.20	ug/L	28-JUL-20	30-JUL-20	R5171958
Dimethylphthalate	<0.20		0.20	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4-Dimethylphenol	<0.50		0.50	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4-Dinitrophenol	<2.0	RRR	2.0	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4-Dinitrotoluene	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
2,6-Dinitrotoluene	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		30-JUL-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	28-JUL-20	30-JUL-20	R5171958
Pentachlorophenol	<0.50		0.50	ug/L	28-JUL-20	30-JUL-20	R5171958
Phenol	<0.50		0.50	ug/L	28-JUL-20	30-JUL-20	R5171958
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	28-JUL-20	30-JUL-20	R5171958
Surrogate: 2-Fluorobiphenyl	77.3		50-140	%	28-JUL-20	30-JUL-20	R5171958
Surrogate: Nitrobenzene d5	93.3		50-140	%	28-JUL-20	30-JUL-20	R5171958
Surrogate: p-Terphenyl d14	93.2		60-140	%	28-JUL-20	30-JUL-20	R5171958
Surrogate: 2,4,6-Tribromophenol	95.3		50-140	%	28-JUL-20	30-JUL-20	R5171958
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	29-JUL-20	29-JUL-20	R5170783
Aroclor 1248	<0.020		0.020	ug/L	29-JUL-20	29-JUL-20	R5170783
Aroclor 1254	<0.020		0.020	ug/L	29-JUL-20	29-JUL-20	R5170783
Aroclor 1260	<0.020		0.020	ug/L	29-JUL-20	29-JUL-20	R5170783
Surrogate: Decachlorobiphenyl	101.1		50-150	%	29-JUL-20	29-JUL-20	R5170783
Total PCBs	<0.040		0.040	ug/L	29-JUL-20	29-JUL-20	R5170783
Surrogate: Tetrachloro-m-xylene	76.9		50-150	%	29-JUL-20	29-JUL-20	R5170783
Report Remarks : RRR: Detection limits raised due to suspected bias low results at or near the detection limit.							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Chromium, Hexavalent	MS-B	L2478867-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2478867-1
Matrix Spike	Boron (B)-Total	MS-B	L2478867-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2478867-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2478867-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2478867-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2478867-1
Matrix Spike	Potassium (K)-Total	MS-B	L2478867-1
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2478867-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2478867-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2478867-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2478867-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2478867-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)

Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

ALS Test Code	Matrix	Test Description	Method Reference**
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

ALS Test Code	Matrix	Test Description	Method Reference**
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

ALS Test Code	Matrix	Test Description	Method Reference**
F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS

Reference Information

Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
---------------	-------	---------------------------------------	-----------------------

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Reference Information

Laboratory Definition Code	Laboratory Location
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WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
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Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5171958							
WG3371588-2 LCS								
1,2,4-Trichlorobenzene			60.5		%		50-140	30-JUL-20
2-Chlorophenol			77.0		%		50-140	30-JUL-20
2,4-Dichlorophenol			88.2		%		50-140	30-JUL-20
2,4-Dimethylphenol			76.2		%		30-130	30-JUL-20
2,4-Dinitrophenol			77.4		%		50-140	30-JUL-20
2,4-Dinitrotoluene			129.2		%		50-140	30-JUL-20
2,4,5-Trichlorophenol			94.1		%		50-140	30-JUL-20
2,4,6-Trichlorophenol			93.4		%		50-140	30-JUL-20
2,6-Dinitrotoluene			104.1		%		50-140	30-JUL-20
3,3'-Dichlorobenzidine			42.8		%		30-130	30-JUL-20
4-Chloroaniline			66.1		%		30-130	30-JUL-20
Biphenyl			78.3		%		50-140	30-JUL-20
Bis(2-chloroethyl)ether			91.1		%		50-140	30-JUL-20
Bis(2-chloroisopropyl)ether			84.9		%		50-140	30-JUL-20
Bis(2-ethylhexyl)phthalate			102.5		%		50-140	30-JUL-20
Diethylphthalate			93.0		%		50-140	30-JUL-20
Dimethylphthalate			90.5		%		50-140	30-JUL-20
Pentachlorophenol			101.9		%		50-140	30-JUL-20
Phenol			109.9		%		30-130	30-JUL-20
WG3371588-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	30-JUL-20
2-Chlorophenol			<0.30		ug/L		0.3	30-JUL-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	30-JUL-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	30-JUL-20
2,4-Dinitrophenol			<1.0		ug/L		1	30-JUL-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	30-JUL-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	30-JUL-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	30-JUL-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	30-JUL-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	30-JUL-20
4-Chloroaniline			<0.40		ug/L		0.4	30-JUL-20
Biphenyl			<0.40		ug/L		0.4	30-JUL-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	30-JUL-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	30-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5171958								
WG3371588-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	30-JUL-20
Diethylphthalate			<0.20		ug/L		0.2	30-JUL-20
Dimethylphthalate			<0.20		ug/L		0.2	30-JUL-20
Pentachlorophenol			<0.50		ug/L		0.5	30-JUL-20
Phenol			<0.50		ug/L		0.5	30-JUL-20
Surrogate: 2-Fluorobiphenyl			69.8		%		50-140	30-JUL-20
Surrogate: 2,4,6-Tribromophenol			44.5	MBS	%		50-140	30-JUL-20
Surrogate: Nitrobenzene d5			68.9		%		50-140	30-JUL-20
Surrogate: p-Terphenyl d14			110.0		%		60-140	30-JUL-20
CR-CR6-IC-WT Water								
Batch R5167456								
WG3369681-4 DUP								
Chromium, Hexavalent		WG3369681-3	0.0593		mg/L	0.7	20	24-JUL-20
WG3369681-2 LCS								
Chromium, Hexavalent			101.4		%		80-120	24-JUL-20
WG3369681-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	24-JUL-20
WG3369681-5 MS								
Chromium, Hexavalent		WG3369681-3	N/A	MS-B	%		-	24-JUL-20
F1-HS-511-WT Water								
Batch R5168118								
WG3365814-4 DUP								
F1 (C6-C10)		WG3365814-3	<25	RPD-NA	ug/L	N/A	30	28-JUL-20
WG3365814-1 LCS								
F1 (C6-C10)			115.0		%		80-120	28-JUL-20
WG3365814-2 MB								
F1 (C6-C10)			<25		ug/L		25	28-JUL-20
Surrogate: 3,4-Dichlorotoluene			97.3		%		60-140	28-JUL-20
WG3365814-5 MS								
F1 (C6-C10)		WG3365814-3	95.6		%		60-140	28-JUL-20
F2-F4-511-WT Water								
Batch R5167279								
WG3369454-2 LCS								
F2 (C10-C16)			98.8		%		70-130	26-JUL-20
F3 (C16-C34)			102.7		%		70-130	26-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch R5167279								
WG3369454-2	LCS							
F4 (C34-C50)			99.7		%		70-130	26-JUL-20
WG3369454-1	MB							
F2 (C10-C16)			<100		ug/L		100	26-JUL-20
F3 (C16-C34)			<250		ug/L		250	26-JUL-20
F4 (C34-C50)			<250		ug/L		250	26-JUL-20
Surrogate: 2-Bromobenzotrifluoride			86.0		%		60-140	26-JUL-20
HG-T-CVAA-WT		Water						
Batch R5166423								
WG3369545-4	DUP	WG3369545-3						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	24-JUL-20
WG3369545-2	LCS							
Mercury (Hg)-Total			112.0		%		80-120	24-JUL-20
WG3369545-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	24-JUL-20
WG3369545-6	MS	WG3369545-5						
Mercury (Hg)-Total			96.1		%		70-130	24-JUL-20
MET-T-CCMS-WT		Water						
Batch R5166457								
WG3369388-4	DUP	WG3369388-3						
Aluminum (Al)-Total		0.0064	0.0058		mg/L	10	20	24-JUL-20
Antimony (Sb)-Total		0.00048	0.00048		mg/L	0.3	20	24-JUL-20
Arsenic (As)-Total		0.00078	0.00077		mg/L	0.7	20	24-JUL-20
Barium (Ba)-Total		0.130	0.126		mg/L	3.3	20	24-JUL-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-JUL-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-JUL-20
Boron (B)-Total		0.076	0.076		mg/L	0.0	20	24-JUL-20
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	24-JUL-20
Calcium (Ca)-Total		51.7	50.8		mg/L	1.7	20	24-JUL-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	24-JUL-20
Cesium (Cs)-Total		0.000195	0.000186		mg/L	4.5	20	24-JUL-20
Cobalt (Co)-Total		0.00044	0.00044		mg/L	1.4	20	24-JUL-20
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	24-JUL-20
Iron (Fe)-Total		0.108	0.106		mg/L	2.0	20	24-JUL-20
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5166457							
WG3369388-4	DUP	WG3369388-3						
Lithium (Li)-Total		0.0078	0.0075		mg/L	3.7	20	24-JUL-20
Magnesium (Mg)-Total		15.5	15.2		mg/L	2.3	20	24-JUL-20
Manganese (Mn)-Total		0.0317	0.0307		mg/L	3.3	20	24-JUL-20
Molybdenum (Mo)-Total		0.00589	0.00575		mg/L	2.3	20	24-JUL-20
Nickel (Ni)-Total		0.00249	0.00247		mg/L	0.8	20	24-JUL-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	24-JUL-20
Potassium (K)-Total		4.87	4.84		mg/L	0.7	20	24-JUL-20
Rubidium (Rb)-Total		0.00827	0.00810		mg/L	2.0	20	24-JUL-20
Selenium (Se)-Total		0.000139	0.000150		mg/L	7.7	20	24-JUL-20
Silicon (Si)-Total		1.88	1.86		mg/L	1.1	20	24-JUL-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-JUL-20
Sodium (Na)-Total		63.1	63.2		mg/L	0.2	20	24-JUL-20
Strontium (Sr)-Total		0.429	0.424		mg/L	1.1	20	24-JUL-20
Sulfur (S)-Total		29.8	29.5		mg/L	0.7	25	24-JUL-20
Thallium (Tl)-Total		0.000025	0.000026		mg/L	5.6	20	24-JUL-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	24-JUL-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	24-JUL-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-JUL-20
Titanium (Ti)-Total		0.00031	<0.00030	RPD-NA	mg/L	N/A	20	24-JUL-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-JUL-20
Uranium (U)-Total		0.000025	0.000025		mg/L	0.8	20	24-JUL-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	24-JUL-20
Zinc (Zn)-Total		0.0031	<0.0030	RPD-NA	mg/L	N/A	20	24-JUL-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	24-JUL-20
WG3369388-2	LCS							
Aluminum (Al)-Total			105.5		%		80-120	24-JUL-20
Antimony (Sb)-Total			104.5		%		80-120	24-JUL-20
Arsenic (As)-Total			101.2		%		80-120	24-JUL-20
Barium (Ba)-Total			100.4		%		80-120	24-JUL-20
Beryllium (Be)-Total			103.6		%		80-120	24-JUL-20
Bismuth (Bi)-Total			99.6		%		80-120	24-JUL-20
Boron (B)-Total			100.9		%		80-120	24-JUL-20
Cadmium (Cd)-Total			101.6		%		80-120	24-JUL-20



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 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5166457							
WG3369388-2	LCS							
Calcium (Ca)-Total			99.2		%		80-120	24-JUL-20
Chromium (Cr)-Total			100.2		%		80-120	24-JUL-20
Cesium (Cs)-Total			100.7		%		80-120	24-JUL-20
Cobalt (Co)-Total			99.5		%		80-120	24-JUL-20
Copper (Cu)-Total			99.5		%		80-120	24-JUL-20
Iron (Fe)-Total			100.3		%		80-120	24-JUL-20
Lead (Pb)-Total			100.4		%		80-120	24-JUL-20
Lithium (Li)-Total			103.5		%		80-120	24-JUL-20
Magnesium (Mg)-Total			105.3		%		80-120	24-JUL-20
Manganese (Mn)-Total			99.4		%		80-120	24-JUL-20
Molybdenum (Mo)-Total			101.2		%		80-120	24-JUL-20
Nickel (Ni)-Total			99.0		%		80-120	24-JUL-20
Phosphorus (P)-Total			105.4		%		70-130	24-JUL-20
Potassium (K)-Total			98.7		%		80-120	24-JUL-20
Rubidium (Rb)-Total			101.6		%		80-120	24-JUL-20
Selenium (Se)-Total			102.4		%		80-120	24-JUL-20
Silicon (Si)-Total			100.4		%		60-140	24-JUL-20
Silver (Ag)-Total			99.0		%		80-120	24-JUL-20
Sodium (Na)-Total			102.9		%		80-120	24-JUL-20
Strontium (Sr)-Total			101.2		%		80-120	24-JUL-20
Sulfur (S)-Total			104.4		%		80-120	24-JUL-20
Thallium (Tl)-Total			100.1		%		80-120	24-JUL-20
Tellurium (Te)-Total			102.2		%		80-120	24-JUL-20
Thorium (Th)-Total			102.4		%		70-130	24-JUL-20
Tin (Sn)-Total			100.4		%		80-120	24-JUL-20
Titanium (Ti)-Total			98.1		%		80-120	24-JUL-20
Tungsten (W)-Total			96.0		%		80-120	24-JUL-20
Uranium (U)-Total			102.4		%		80-120	24-JUL-20
Vanadium (V)-Total			100.5		%		80-120	24-JUL-20
Zinc (Zn)-Total			97.6		%		80-120	24-JUL-20
Zirconium (Zr)-Total			102.1		%		80-120	24-JUL-20
WG3369388-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	24-JUL-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	24-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5166457							
WG3369388-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	24-JUL-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	24-JUL-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	24-JUL-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	24-JUL-20
Boron (B)-Total			<0.010		mg/L		0.01	24-JUL-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	24-JUL-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	24-JUL-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	24-JUL-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	24-JUL-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	24-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	24-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	24-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	24-JUL-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	24-JUL-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	24-JUL-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	24-JUL-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	24-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	24-JUL-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	24-JUL-20
Potassium (K)-Total			<0.050		mg/L		0.05	24-JUL-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	24-JUL-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	24-JUL-20
Silicon (Si)-Total			<0.10		mg/L		0.1	24-JUL-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	24-JUL-20
Sodium (Na)-Total			<0.050		mg/L		0.05	24-JUL-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	24-JUL-20
Sulfur (S)-Total			<0.50		mg/L		0.5	24-JUL-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	24-JUL-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	24-JUL-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	24-JUL-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	24-JUL-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	24-JUL-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	24-JUL-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5166457							
WG3369388-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	24-JUL-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	24-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	24-JUL-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	24-JUL-20
WG3369388-5 MS		WG3369388-6						
Aluminum (Al)-Total			103.9		%		70-130	24-JUL-20
Antimony (Sb)-Total			104.3		%		70-130	24-JUL-20
Arsenic (As)-Total			103.0		%		70-130	24-JUL-20
Barium (Ba)-Total			N/A	MS-B	%		-	24-JUL-20
Beryllium (Be)-Total			102.1		%		70-130	24-JUL-20
Bismuth (Bi)-Total			90.1		%		70-130	24-JUL-20
Boron (B)-Total			N/A	MS-B	%		-	24-JUL-20
Cadmium (Cd)-Total			97.0		%		70-130	24-JUL-20
Calcium (Ca)-Total			N/A	MS-B	%		-	24-JUL-20
Chromium (Cr)-Total			101.5		%		70-130	24-JUL-20
Cesium (Cs)-Total			101.8		%		70-130	24-JUL-20
Cobalt (Co)-Total			98.7		%		70-130	24-JUL-20
Copper (Cu)-Total			95.0		%		70-130	24-JUL-20
Iron (Fe)-Total			N/A	MS-B	%		-	24-JUL-20
Lead (Pb)-Total			92.7		%		70-130	24-JUL-20
Lithium (Li)-Total			98.9		%		70-130	24-JUL-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	24-JUL-20
Manganese (Mn)-Total			N/A	MS-B	%		-	24-JUL-20
Molybdenum (Mo)-Total			103.1		%		70-130	24-JUL-20
Nickel (Ni)-Total			95.9		%		70-130	24-JUL-20
Phosphorus (P)-Total			116.9		%		70-130	24-JUL-20
Potassium (K)-Total			N/A	MS-B	%		-	24-JUL-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	24-JUL-20
Selenium (Se)-Total			101.7		%		70-130	24-JUL-20
Silicon (Si)-Total			N/A	MS-B	%		-	24-JUL-20
Silver (Ag)-Total			92.7		%		70-130	24-JUL-20
Sodium (Na)-Total			N/A	MS-B	%		-	24-JUL-20
Strontium (Sr)-Total			N/A	MS-B	%		-	24-JUL-20
Sulfur (S)-Total			N/A	MS-B	%		-	24-JUL-20



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 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5166457							
WG3369388-5 MS		WG3369388-6						
Thallium (Tl)-Total			93.1		%		70-130	24-JUL-20
Tellurium (Te)-Total			95.3		%		70-130	24-JUL-20
Thorium (Th)-Total			98.4		%		70-130	24-JUL-20
Tin (Sn)-Total			100.4		%		70-130	24-JUL-20
Titanium (Ti)-Total			103.0		%		70-130	24-JUL-20
Tungsten (W)-Total			95.8		%		70-130	24-JUL-20
Uranium (U)-Total			98.8		%		70-130	24-JUL-20
Vanadium (V)-Total			105.2		%		70-130	24-JUL-20
Zinc (Zn)-Total			91.7		%		70-130	24-JUL-20
Zirconium (Zr)-Total			98.1		%		70-130	24-JUL-20
P-T-COL-WT								
	Water							
Batch	R5167529							
WG3369319-3 DUP		L2478438-1						
Phosphorus, Total		0.0963	0.0909		mg/L	5.8	20	27-JUL-20
WG3369319-2 LCS								
Phosphorus, Total			95.7		%		80-120	27-JUL-20
WG3369319-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	27-JUL-20
WG3369319-4 MS		L2478438-1						
Phosphorus, Total			71.2		%		70-130	27-JUL-20
PAH-511-WT								
	Water							
Batch	R5168250							
WG3369454-2 LCS								
1-Methylnaphthalene			91.7		%		50-140	28-JUL-20
2-Methylnaphthalene			89.1		%		50-140	28-JUL-20
Acenaphthene			103.7		%		50-140	28-JUL-20
Acenaphthylene			101.0		%		50-140	28-JUL-20
Anthracene			108.4		%		50-140	28-JUL-20
Benzo(a)anthracene			125.5		%		50-140	28-JUL-20
Benzo(a)pyrene			107.7		%		50-140	28-JUL-20
Benzo(b)fluoranthene			101.5		%		50-140	28-JUL-20
Benzo(g,h,i)perylene			109.1		%		50-140	28-JUL-20
Benzo(k)fluoranthene			103.4		%		50-140	28-JUL-20
Chrysene			120.2		%		50-140	28-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5168250							
WG3369454-2	LCS							
Dibenzo(ah)anthracene			111.3		%		50-140	28-JUL-20
Fluoranthene			109.4		%		50-140	28-JUL-20
Fluorene			104.9		%		50-140	28-JUL-20
Indeno(1,2,3-cd)pyrene			121.6		%		50-140	28-JUL-20
Naphthalene			93.1		%		50-140	28-JUL-20
Phenanthrene			113.4		%		50-140	28-JUL-20
Pyrene			113.1		%		50-140	28-JUL-20
WG3369454-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	28-JUL-20
2-Methylnaphthalene			<0.020		ug/L		0.02	28-JUL-20
Acenaphthene			<0.020		ug/L		0.02	28-JUL-20
Acenaphthylene			<0.020		ug/L		0.02	28-JUL-20
Anthracene			<0.020		ug/L		0.02	28-JUL-20
Benzo(a)anthracene			<0.020		ug/L		0.02	28-JUL-20
Benzo(a)pyrene			<0.010		ug/L		0.01	28-JUL-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	28-JUL-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	28-JUL-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	28-JUL-20
Chrysene			<0.020		ug/L		0.02	28-JUL-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	28-JUL-20
Fluoranthene			<0.020		ug/L		0.02	28-JUL-20
Fluorene			<0.020		ug/L		0.02	28-JUL-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	28-JUL-20
Naphthalene			<0.050		ug/L		0.05	28-JUL-20
Phenanthrene			<0.020		ug/L		0.02	28-JUL-20
Pyrene			<0.020		ug/L		0.02	28-JUL-20
Surrogate: d8-Naphthalene			92.7		%		60-140	28-JUL-20
Surrogate: d10-Phenanthrene			99.2		%		60-140	28-JUL-20
Surrogate: d12-Chrysene			98.3		%		60-140	28-JUL-20
Surrogate: d10-Acenaphthene			97.3		%		60-140	28-JUL-20

PCB-511-WT **Water**



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5170783							
WG3369703-2	LCS							
Aroclor 1242			122.1		%		60-140	29-JUL-20
Aroclor 1248			132.6		%		60-140	29-JUL-20
Aroclor 1254			120.0		%		60-140	29-JUL-20
Aroclor 1260			117.2		%		60-140	29-JUL-20
WG3369703-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	29-JUL-20
Aroclor 1248			<0.020		ug/L		0.02	29-JUL-20
Aroclor 1254			<0.020		ug/L		0.02	29-JUL-20
Aroclor 1260			<0.020		ug/L		0.02	29-JUL-20
Surrogate: Decachlorobiphenyl			141.7		%		50-150	29-JUL-20
Surrogate: Tetrachloro-m-xylene			76.0		%		50-150	29-JUL-20
VOC-511-HS-WT		Water						
Batch	R5168118							
WG3365814-4	DUP		WG3365814-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	28-JUL-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	28-JUL-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-JUL-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	28-JUL-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	28-JUL-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5168118							
WG3365814-4	DUP	WG3365814-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	28-JUL-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-JUL-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-JUL-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-JUL-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	28-JUL-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	28-JUL-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	28-JUL-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	28-JUL-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-JUL-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-JUL-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-JUL-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	28-JUL-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
WG3365814-1	LCS							
1,1,1,2-Tetrachloroethane			98.6		%		70-130	28-JUL-20
1,1,2,2-Tetrachloroethane			102.9		%		70-130	28-JUL-20
1,1,1-Trichloroethane			103.1		%		70-130	28-JUL-20
1,1,2-Trichloroethane			100.5		%		70-130	28-JUL-20
1,1-Dichloroethane			102.2		%		70-130	28-JUL-20
1,1-Dichloroethylene			94.0		%		70-130	28-JUL-20
1,2-Dibromoethane			100.2		%		70-130	28-JUL-20
1,2-Dichlorobenzene			99.3		%		70-130	28-JUL-20
1,2-Dichloroethane			101.0		%		70-130	28-JUL-20
1,2-Dichloropropane			100.2		%		70-130	28-JUL-20
1,3-Dichlorobenzene			99.9		%		70-130	28-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5168118							
WG3365814-1	LCS							
1,4-Dichlorobenzene			100.1		%		70-130	28-JUL-20
Acetone			108.9		%		60-140	28-JUL-20
Benzene			100.7		%		70-130	28-JUL-20
Bromodichloromethane			109.6		%		70-130	28-JUL-20
Bromoform			102.4		%		70-130	28-JUL-20
Bromomethane			119.0		%		60-140	28-JUL-20
Carbon tetrachloride			103.8		%		70-130	28-JUL-20
Chlorobenzene			101.5		%		70-130	28-JUL-20
Chloroform			104.8		%		70-130	28-JUL-20
cis-1,2-Dichloroethylene			98.0		%		70-130	28-JUL-20
cis-1,3-Dichloropropene			95.5		%		70-130	28-JUL-20
Dibromochloromethane			100.5		%		70-130	28-JUL-20
Dichlorodifluoromethane			76.3		%		50-140	28-JUL-20
Ethylbenzene			100.4		%		70-130	28-JUL-20
n-Hexane			96.1		%		70-130	28-JUL-20
m+p-Xylenes			99.8		%		70-130	28-JUL-20
Methyl Ethyl Ketone			94.6		%		60-140	28-JUL-20
Methyl Isobutyl Ketone			100.5		%		60-140	28-JUL-20
Methylene Chloride			96.2		%		70-130	28-JUL-20
MTBE			98.6		%		70-130	28-JUL-20
o-Xylene			106.8		%		70-130	28-JUL-20
Styrene			98.8		%		70-130	28-JUL-20
Tetrachloroethylene			104.6		%		70-130	28-JUL-20
Toluene			100.3		%		70-130	28-JUL-20
trans-1,2-Dichloroethylene			98.1		%		70-130	28-JUL-20
trans-1,3-Dichloropropene			102.0		%		70-130	28-JUL-20
Trichloroethylene			103.8		%		70-130	28-JUL-20
Trichlorofluoromethane			93.8		%		60-140	28-JUL-20
Vinyl chloride			97.1		%		60-140	28-JUL-20
WG3365814-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	28-JUL-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	28-JUL-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	28-JUL-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	28-JUL-20



Quality Control Report

Workorder: L2478867

Report Date: 05-AUG-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5168118							
WG3365814-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	28-JUL-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	28-JUL-20
1,2-Dibromoethane			<0.20		ug/L		0.2	28-JUL-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	28-JUL-20
1,2-Dichloroethane			<0.50		ug/L		0.5	28-JUL-20
1,2-Dichloropropane			<0.50		ug/L		0.5	28-JUL-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	28-JUL-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	28-JUL-20
Acetone			<30		ug/L		30	28-JUL-20
Benzene			<0.50		ug/L		0.5	28-JUL-20
Bromodichloromethane			<2.0		ug/L		2	28-JUL-20
Bromoform			<5.0		ug/L		5	28-JUL-20
Bromomethane			<0.50		ug/L		0.5	28-JUL-20
Carbon tetrachloride			<0.20		ug/L		0.2	28-JUL-20
Chlorobenzene			<0.50		ug/L		0.5	28-JUL-20
Chloroform			<1.0		ug/L		1	28-JUL-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	28-JUL-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	28-JUL-20
Dibromochloromethane			<2.0		ug/L		2	28-JUL-20
Dichlorodifluoromethane			<2.0		ug/L		2	28-JUL-20
Ethylbenzene			<0.50		ug/L		0.5	28-JUL-20
n-Hexane			<0.50		ug/L		0.5	28-JUL-20
m+p-Xylenes			<0.40		ug/L		0.4	28-JUL-20
Methyl Ethyl Ketone			<20		ug/L		20	28-JUL-20
Methyl Isobutyl Ketone			<20		ug/L		20	28-JUL-20
Methylene Chloride			<5.0		ug/L		5	28-JUL-20
MTBE			<2.0		ug/L		2	28-JUL-20
o-Xylene			<0.30		ug/L		0.3	28-JUL-20
Styrene			<0.50		ug/L		0.5	28-JUL-20
Tetrachloroethylene			<0.50		ug/L		0.5	28-JUL-20
Toluene			<0.50		ug/L		0.5	28-JUL-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	28-JUL-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	28-JUL-20



Quality Control Report

Workorder: L2478867

Report Date: 05-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5168118							
WG3365814-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	28-JUL-20
Trichlorofluoromethane			<5.0		ug/L		5	28-JUL-20
Vinyl chloride			<0.50		ug/L		0.5	28-JUL-20
Surrogate: 1,4-Difluorobenzene			100.7		%		70-130	28-JUL-20
Surrogate: 4-Bromofluorobenzene			100.0		%		70-130	28-JUL-20
WG3365814-5 MS		WG3365814-3						
1,1,1,2-Tetrachloroethane			98.2		%		50-140	28-JUL-20
1,1,2,2-Tetrachloroethane			115.3		%		50-140	28-JUL-20
1,1,1-Trichloroethane			102.3		%		50-140	28-JUL-20
1,1,2-Trichloroethane			99.7		%		50-140	28-JUL-20
1,1-Dichloroethane			100.6		%		50-140	28-JUL-20
1,1-Dichloroethylene			91.5		%		50-140	28-JUL-20
1,2-Dibromoethane			100.3		%		50-140	28-JUL-20
1,2-Dichlorobenzene			99.6		%		50-140	28-JUL-20
1,2-Dichloroethane			102.5		%		50-140	28-JUL-20
1,2-Dichloropropane			99.6		%		50-140	28-JUL-20
1,3-Dichlorobenzene			100.3		%		50-140	28-JUL-20
1,4-Dichlorobenzene			100.9		%		50-140	28-JUL-20
Acetone			106.8		%		50-140	28-JUL-20
Benzene			99.7		%		50-140	28-JUL-20
Bromodichloromethane			109.9		%		50-140	28-JUL-20
Bromoform			103.3		%		50-140	28-JUL-20
Bromomethane			116.0		%		50-140	28-JUL-20
Carbon tetrachloride			103.4		%		50-140	28-JUL-20
Chlorobenzene			101.4		%		50-140	28-JUL-20
Chloroform			104.7		%		50-140	28-JUL-20
cis-1,2-Dichloroethylene			98.5		%		50-140	28-JUL-20
cis-1,3-Dichloropropene			99.97		%		50-140	28-JUL-20
Dibromochloromethane			100.4		%		50-140	28-JUL-20
Dichlorodifluoromethane			70.3		%		50-140	28-JUL-20
Ethylbenzene			99.3		%		50-140	28-JUL-20
n-Hexane			91.4		%		50-140	28-JUL-20
m+p-Xylenes			99.5		%		50-140	28-JUL-20
Methyl Ethyl Ketone			97.8		%		50-140	28-JUL-20



Quality Control Report

Workorder: L2478867

Report Date: 05-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5168118							
WG3365814-5 MS		WG3365814-3						
Methyl Isobutyl Ketone			99.8		%		50-140	28-JUL-20
Methylene Chloride			95.9		%		50-140	28-JUL-20
MTBE			98.4		%		50-140	28-JUL-20
o-Xylene			106.1		%		50-140	28-JUL-20
Styrene			98.4		%		50-140	28-JUL-20
Tetrachloroethylene			104.8		%		50-140	28-JUL-20
Toluene			98.4		%		50-140	28-JUL-20
trans-1,2-Dichloroethylene			97.1		%		50-140	28-JUL-20
trans-1,3-Dichloropropene			107.4		%		50-140	28-JUL-20
Trichloroethylene			104.2		%		50-140	28-JUL-20
Trichlorofluoromethane			92.3		%		50-140	28-JUL-20
Vinyl chloride			93.4		%		50-140	28-JUL-20

Quality Control Report

Workorder: L2478867

Report Date: 05-AUG-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MBS	Surrogate recovery in Method Blank was outside ALS DQO. Moderately low-biased results in the MB do not significantly affect its purpose.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

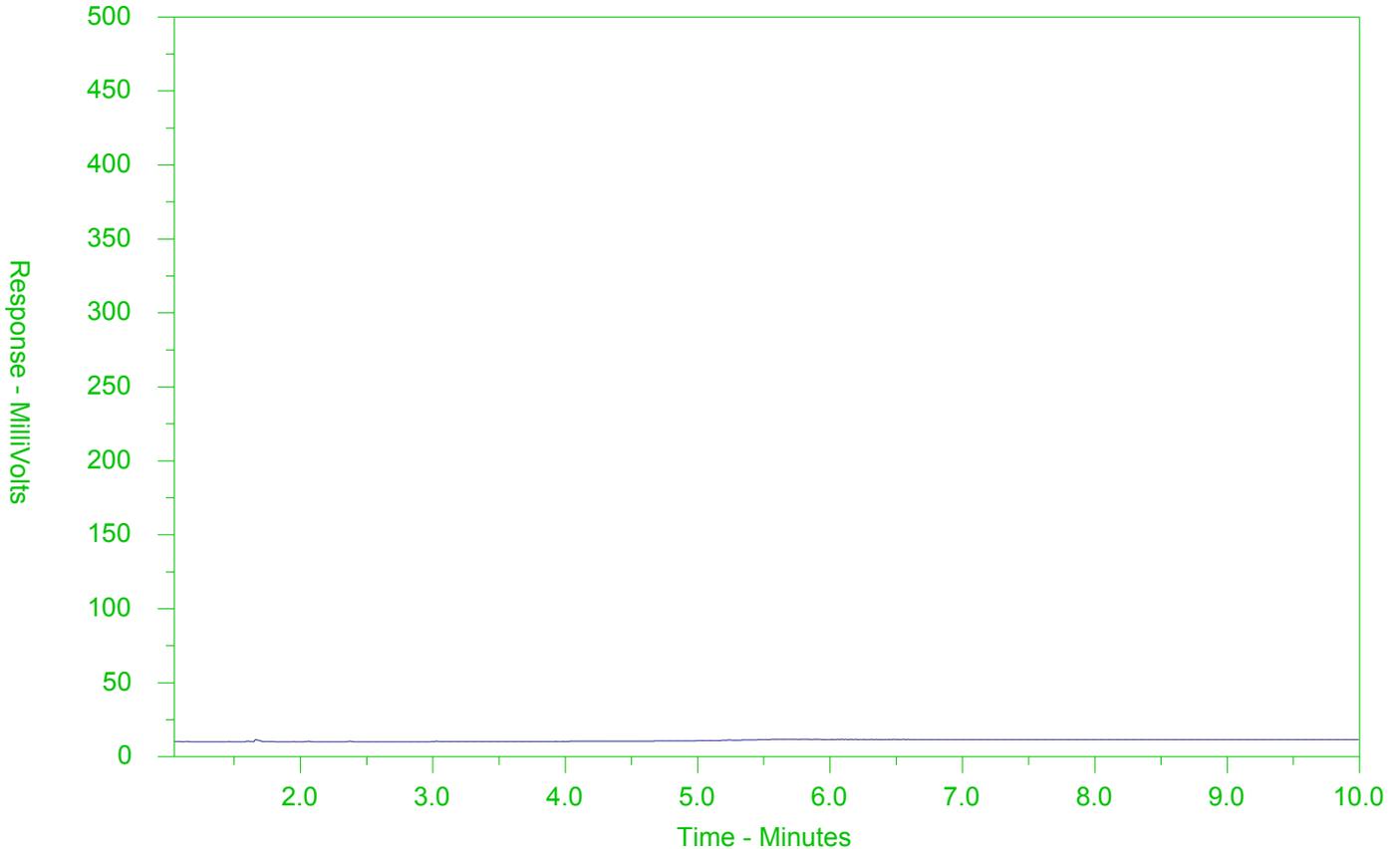
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2478867-1
 Client Sample ID: W-11210029-20200723-18



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 14-AUG-20
Report Date: 25-AUG-20 07:18 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

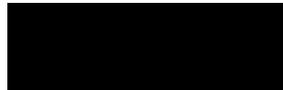
Lab Work Order #: L2488954

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2488954-1 W-11210029-20200813-24 Sampled By: CLIENT on 13-AUG-20 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0082		0.0030	mg/L	17-AUG-20	18-AUG-20	R5190740
Total Metals							
Aluminum (Al)-Total	0.0192		0.0050	mg/L	17-AUG-20	18-AUG-20	R5190768
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Arsenic (As)-Total	0.00364		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Barium (Ba)-Total	0.0779		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	17-AUG-20	18-AUG-20	R5190768
Boron (B)-Total	0.014		0.010	mg/L	17-AUG-20	18-AUG-20	R5190768
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	17-AUG-20	18-AUG-20	R5190768
Calcium (Ca)-Total	48.5		0.050	mg/L	17-AUG-20	18-AUG-20	R5190768
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	17-AUG-20	18-AUG-20	R5190768
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	17-AUG-20	18-AUG-20	R5190768
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Copper (Cu)-Total	<0.00050		0.00050	mg/L	17-AUG-20	18-AUG-20	R5190768
Iron (Fe)-Total	0.244		0.010	mg/L	17-AUG-20	18-AUG-20	R5190768
Lead (Pb)-Total	0.000083		0.000050	mg/L	17-AUG-20	18-AUG-20	R5190768
Lithium (Li)-Total	0.0032		0.0010	mg/L	17-AUG-20	18-AUG-20	R5190768
Magnesium (Mg)-Total	25.6		0.0050	mg/L	17-AUG-20	18-AUG-20	R5190768
Manganese (Mn)-Total	0.00813		0.00050	mg/L	17-AUG-20	18-AUG-20	R5190768
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		17-AUG-20	R5190209
Molybdenum (Mo)-Total	0.000655		0.000050	mg/L	17-AUG-20	18-AUG-20	R5190768
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	17-AUG-20	18-AUG-20	R5190768
Phosphorus (P)-Total	<0.050		0.050	mg/L	17-AUG-20	18-AUG-20	R5190768
Potassium (K)-Total	0.979		0.050	mg/L	17-AUG-20	18-AUG-20	R5190768
Rubidium (Rb)-Total	0.00035		0.00020	mg/L	17-AUG-20	18-AUG-20	R5190768
Selenium (Se)-Total	<0.000050		0.000050	mg/L	17-AUG-20	18-AUG-20	R5190768
Silicon (Si)-Total	7.30		0.10	mg/L	17-AUG-20	18-AUG-20	R5190768
Silver (Ag)-Total	<0.000050		0.000050	mg/L	17-AUG-20	18-AUG-20	R5190768
Sodium (Na)-Total	5.75		0.050	mg/L	17-AUG-20	18-AUG-20	R5190768
Strontium (Sr)-Total	0.348		0.0010	mg/L	17-AUG-20	18-AUG-20	R5190768
Sulfur (S)-Total	7.71		0.50	mg/L	17-AUG-20	18-AUG-20	R5190768
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	17-AUG-20	18-AUG-20	R5190768
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	17-AUG-20	18-AUG-20	R5190768
Thorium (Th)-Total	<0.00010		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Tin (Sn)-Total	<0.00010		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Titanium (Ti)-Total	0.00062		0.00030	mg/L	17-AUG-20	18-AUG-20	R5190768
Tungsten (W)-Total	<0.00010		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Uranium (U)-Total	0.000383		0.000010	mg/L	17-AUG-20	18-AUG-20	R5190768
Vanadium (V)-Total	<0.00050		0.00050	mg/L	17-AUG-20	18-AUG-20	R5190768
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	17-AUG-20	18-AUG-20	R5190768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2488954-1 W-11210029-20200813-24 Sampled By: CLIENT on 13-AUG-20 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	17-AUG-20	18-AUG-20	R5190768
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		17-AUG-20	R5190555
Volatile Organic Compounds							
Acetone	<30		30	ug/L		20-AUG-20	R5192095
Benzene	<0.50		0.50	ug/L		20-AUG-20	R5192095
Bromodichloromethane	<2.0		2.0	ug/L		20-AUG-20	R5192095
Bromoform	<5.0		5.0	ug/L		20-AUG-20	R5192095
Bromomethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
Carbon tetrachloride	<0.20		0.20	ug/L		20-AUG-20	R5192095
Chlorobenzene	<0.50		0.50	ug/L		20-AUG-20	R5192095
Dibromochloromethane	<2.0		2.0	ug/L		20-AUG-20	R5192095
Chloroform	<1.0		1.0	ug/L		20-AUG-20	R5192095
1,2-Dibromoethane	<0.20		0.20	ug/L		20-AUG-20	R5192095
1,2-Dichlorobenzene	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,3-Dichlorobenzene	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,4-Dichlorobenzene	<0.50		0.50	ug/L		20-AUG-20	R5192095
Dichlorodifluoromethane	<2.0		2.0	ug/L		20-AUG-20	R5192095
1,1-Dichloroethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,2-Dichloroethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,1-Dichloroethylene	<0.50		0.50	ug/L		20-AUG-20	R5192095
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		20-AUG-20	R5192095
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		20-AUG-20	R5192095
Methylene Chloride	<5.0		5.0	ug/L		20-AUG-20	R5192095
1,2-Dichloropropane	<0.50		0.50	ug/L		20-AUG-20	R5192095
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		20-AUG-20	R5192095
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		20-AUG-20	R5192095
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		20-AUG-20	R5192095
Ethylbenzene	<0.50		0.50	ug/L		20-AUG-20	R5192095
n-Hexane	<0.50		0.50	ug/L		20-AUG-20	R5192095
Methyl Ethyl Ketone	<20		20	ug/L		20-AUG-20	R5192095
Methyl Isobutyl Ketone	<20		20	ug/L		20-AUG-20	R5192095
MTBE	<2.0		2.0	ug/L		20-AUG-20	R5192095
Styrene	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
Tetrachloroethylene	<0.50		0.50	ug/L		20-AUG-20	R5192095
Toluene	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,1,1-Trichloroethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,1,2-Trichloroethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
Trichloroethylene	<0.50		0.50	ug/L		20-AUG-20	R5192095

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2488954-1 W-11210029-20200813-24							
Sampled By: CLIENT on 13-AUG-20							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		20-AUG-20	R5192095
Vinyl chloride	<0.50		0.50	ug/L		20-AUG-20	R5192095
o-Xylene	<0.30		0.30	ug/L		20-AUG-20	R5192095
m+p-Xylenes	<0.40		0.40	ug/L		20-AUG-20	R5192095
Xylenes (Total)	<0.50		0.50	ug/L		20-AUG-20	
Surrogate: 4-Bromofluorobenzene	97.6		70-130	%		20-AUG-20	R5192095
Surrogate: 1,4-Difluorobenzene	101.3		70-130	%		20-AUG-20	R5192095
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		20-AUG-20	R5192095
F1-BTEX	<25		25	ug/L		25-AUG-20	
F2 (C10-C16)	<100		100	ug/L	17-AUG-20	18-AUG-20	R5191073
F2-Naphth	<100		100	ug/L		25-AUG-20	
F3 (C16-C34)	<250		250	ug/L	17-AUG-20	18-AUG-20	R5191073
F3-PAH	<250		250	ug/L		25-AUG-20	
F4 (C34-C50)	<250		250	ug/L	17-AUG-20	18-AUG-20	R5191073
Total Hydrocarbons (C6-C50)	<370		370	ug/L		25-AUG-20	
Chrom. to baseline at nC50	YES				17-AUG-20	18-AUG-20	R5191073
Surrogate: 2-Bromobenzotrifluoride	91.6		60-140	%	17-AUG-20	18-AUG-20	R5191073
Surrogate: 3,4-Dichlorotoluene	84.3		60-140	%		20-AUG-20	R5192095
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Acenaphthylene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Anthracene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Benzo(a)anthracene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Benzo(a)pyrene	<0.010		0.010	ug/L	17-AUG-20	19-AUG-20	R5191755
Benzo(b)fluoranthene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Benzo(k)fluoranthene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Chrysene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Fluoranthene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Fluorene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		25-AUG-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
2-Methylnaphthalene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Naphthalene	<0.050		0.050	ug/L	17-AUG-20	19-AUG-20	R5191755
Phenanthrene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Pyrene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Surrogate: d10-Acenaphthene	113.5		60-140	%	17-AUG-20	19-AUG-20	R5191755
Surrogate: d12-Chrysene	124.8		60-140	%	17-AUG-20	19-AUG-20	R5191755

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2488954-1 W-11210029-20200813-24							
Sampled By: CLIENT on 13-AUG-20							
Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	107.9		60-140	%	17-AUG-20	19-AUG-20	R5191755
Surrogate: d10-Phenanthrene	126.5		60-140	%	17-AUG-20	19-AUG-20	R5191755
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
4-Chloroaniline	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
2-Chlorophenol	<0.30		0.30	ug/L	20-AUG-20	25-AUG-20	R5199526
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4-Dichlorophenol	<0.30		0.30	ug/L	20-AUG-20	25-AUG-20	R5199526
Diethylphthalate	<0.20		0.20	ug/L	20-AUG-20	25-AUG-20	R5199526
Dimethylphthalate	<0.20		0.20	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4-Dimethylphenol	<0.50		0.50	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4-Dinitrophenol	<1.0		1.0	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4-Dinitrotoluene	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
2,6-Dinitrotoluene	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	20-AUG-20	25-AUG-20	R5199526
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	20-AUG-20	25-AUG-20	R5199526
Pentachlorophenol	<0.50		0.50	ug/L	20-AUG-20	25-AUG-20	R5199526
Phenol	<0.50		0.50	ug/L	20-AUG-20	25-AUG-20	R5199526
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	20-AUG-20	25-AUG-20	R5199526
Surrogate: 2-Fluorobiphenyl	86.0		50-140	%	20-AUG-20	25-AUG-20	R5199526
Surrogate: Nitrobenzene d5	90.5		50-140	%	20-AUG-20	25-AUG-20	R5199526
Surrogate: p-Terphenyl d14	111.3		60-140	%	20-AUG-20	25-AUG-20	R5199526
Surrogate: 2,4,6-Tribromophenol	79.9		50-140	%	20-AUG-20	25-AUG-20	R5199526
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	18-AUG-20	18-AUG-20	R5190577
Aroclor 1248	<0.020		0.020	ug/L	18-AUG-20	18-AUG-20	R5190577
Aroclor 1254	<0.020		0.020	ug/L	18-AUG-20	18-AUG-20	R5190577
Aroclor 1260	<0.020		0.020	ug/L	18-AUG-20	18-AUG-20	R5190577
Surrogate: Decachlorobiphenyl	79.1		50-150	%	18-AUG-20	18-AUG-20	R5190577
Total PCBs	<0.040		0.040	ug/L	18-AUG-20	18-AUG-20	R5190577
Surrogate: Tetrachloro-m-xylene	76.7		50-150	%	18-AUG-20	18-AUG-20	R5190577

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Copper (Cu)-Total	MS-B	L2488954-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2488954-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2488954-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2488954-1
Matrix Spike	Zinc (Zn)-Total	MS-B	L2488954-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)

Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
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This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

HG-T-CVAA-WT Water Total Mercury in Water by CVAAS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT Water Total Metals in Water by CRC EPA 200.2/6020A (mod)
ICPMS

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT Water PAH-Calculated Parameters SW846 8270

P-T-COL-WT Water Total P in Water by Colour APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT Water PAH-O. Reg 153/04 (July 2011) SW846 3510/8270

Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT Water PCB-O. Reg 153/04 (July 2011) SW846 3510/8082

Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT Water Regulation 153 VOCs SW8260B/SW8270C

VOC-511-HS-WT Water VOC by GCMS HS O.Reg 153/04 SW846 8260
(July 2011)

Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC- Water Sum of Xylene Isomer CALCULATION
WT Concentrations

Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2488954

Report Date: 25-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5199526							
WG3387742-2	LCS							
1,2,4-Trichlorobenzene			88.9		%		50-140	25-AUG-20
2-Chlorophenol			85.9		%		50-140	25-AUG-20
2,4-Dichlorophenol			101.3		%		50-140	25-AUG-20
2,4-Dimethylphenol			72.4		%		30-130	25-AUG-20
2,4-Dinitrophenol			129.8		%		50-140	25-AUG-20
2,4-Dinitrotoluene			120.1		%		50-140	25-AUG-20
2,4,5-Trichlorophenol			112.7		%		50-140	25-AUG-20
2,4,6-Trichlorophenol			109.3		%		50-140	25-AUG-20
2,6-Dinitrotoluene			105.0		%		50-140	25-AUG-20
3,3'-Dichlorobenzidine			108.8		%		30-130	25-AUG-20
4-Chloroaniline			43.2		%		30-130	25-AUG-20
Biphenyl			98.5		%		50-140	25-AUG-20
Bis(2-chloroethyl)ether			90.4		%		50-140	25-AUG-20
Bis(2-chloroisopropyl)ether			92.4		%		50-140	25-AUG-20
Bis(2-ethylhexyl)phthalate			119.4		%		50-140	25-AUG-20
Diethylphthalate			91.8		%		50-140	25-AUG-20
Dimethylphthalate			98.7		%		50-140	25-AUG-20
Pentachlorophenol			138.0		%		50-140	25-AUG-20
Phenol			108.7		%		30-130	25-AUG-20
WG3387742-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	25-AUG-20
2-Chlorophenol			<0.30		ug/L		0.3	25-AUG-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	25-AUG-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	25-AUG-20
2,4-Dinitrophenol			<1.0		ug/L		1	25-AUG-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	25-AUG-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	25-AUG-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	25-AUG-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	25-AUG-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	25-AUG-20
4-Chloroaniline			<0.40		ug/L		0.4	25-AUG-20
Biphenyl			<0.40		ug/L		0.4	25-AUG-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	25-AUG-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	25-AUG-20



Quality Control Report

Workorder: L2488954

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5199526								
WG3387742-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	25-AUG-20
Diethylphthalate			<0.20		ug/L		0.2	25-AUG-20
Dimethylphthalate			<0.20		ug/L		0.2	25-AUG-20
Pentachlorophenol			<0.50		ug/L		0.5	25-AUG-20
Phenol			<0.50		ug/L		0.5	25-AUG-20
Surrogate: 2-Fluorobiphenyl			82.7		%		50-140	25-AUG-20
Surrogate: 2,4,6-Tribromophenol			65.0		%		50-140	25-AUG-20
Surrogate: Nitrobenzene d5			82.0		%		50-140	25-AUG-20
Surrogate: p-Terphenyl d14			127.5		%		60-140	25-AUG-20
CR-CR6-IC-WT Water								
Batch R5190555								
WG3384896-4 DUP								
Chromium, Hexavalent		WG3384896-3 <0.00050	<0.00050	RPD-NA	mg/L	N/A	20	17-AUG-20
WG3384896-2 LCS								
Chromium, Hexavalent			102.4		%		80-120	17-AUG-20
WG3384896-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	17-AUG-20
WG3384896-5 MS								
Chromium, Hexavalent		WG3384896-3	99.6		%		70-130	17-AUG-20
F1-HS-511-WT Water								
Batch R5192095								
WG3386480-4 DUP								
F1 (C6-C10)		WG3386480-3 <25	<25	RPD-NA	ug/L	N/A	30	20-AUG-20
WG3386480-1 LCS								
F1 (C6-C10)			113.6		%		80-120	19-AUG-20
WG3386480-2 MB								
F1 (C6-C10)			<25		ug/L		25	20-AUG-20
Surrogate: 3,4-Dichlorotoluene			115.5		%		60-140	20-AUG-20
WG3386480-5 MS								
F1 (C6-C10)		WG3386480-3	85.9		%		60-140	20-AUG-20
F2-F4-511-WT Water								
Batch R5191073								
WG3384676-2 LCS								
F2 (C10-C16)			103.8		%		70-130	18-AUG-20
F3 (C16-C34)			109.7		%		70-130	18-AUG-20



Quality Control Report

Workorder: L2488954

Report Date: 25-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT								
Water								
Batch R5191073								
WG3384676-2 LCS								
F4 (C34-C50)			112.0		%		70-130	18-AUG-20
WG3384676-1 MB								
F2 (C10-C16)			<100		ug/L		100	18-AUG-20
F3 (C16-C34)			<250		ug/L		250	18-AUG-20
F4 (C34-C50)			<250		ug/L		250	18-AUG-20
Surrogate: 2-Bromobenzotrifluoride			90.9		%		60-140	18-AUG-20
HG-T-CVAA-WT								
Water								
Batch R5190209								
WG3384726-3 DUP								
Mercury (Hg)-Total		L2488947-1	<0.0000050	RPD-NA	mg/L	N/A	20	17-AUG-20
WG3384726-2 LCS								
Mercury (Hg)-Total			107.0		%		80-120	17-AUG-20
WG3384726-1 MB								
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	17-AUG-20
WG3384726-4 MS								
Mercury (Hg)-Total		L2487969-1	103.7		%		70-130	17-AUG-20
MET-T-CCMS-WT								
Water								
Batch R5190768								
WG3384582-4 DUP								
Aluminum (Al)-Total		WG3384582-3	0.0193		mg/L	2.8	20	17-AUG-20
Antimony (Sb)-Total			<0.00010	RPD-NA	mg/L	N/A	20	17-AUG-20
Arsenic (As)-Total			0.00037		mg/L	0.4	20	17-AUG-20
Barium (Ba)-Total			0.00235		mg/L	2.1	20	17-AUG-20
Beryllium (Be)-Total			<0.00010	RPD-NA	mg/L	N/A	20	17-AUG-20
Bismuth (Bi)-Total			<0.000050	RPD-NA	mg/L	N/A	20	17-AUG-20
Boron (B)-Total			0.011		mg/L	6.6	20	17-AUG-20
Cadmium (Cd)-Total			<0.0000050	RPD-NA	mg/L	N/A	20	17-AUG-20
Calcium (Ca)-Total			1.75		mg/L	5.8	20	17-AUG-20
Chromium (Cr)-Total			0.00051	RPD-NA	mg/L	N/A	20	17-AUG-20
Cesium (Cs)-Total			<0.000010	RPD-NA	mg/L	N/A	20	17-AUG-20
Cobalt (Co)-Total			<0.00010	RPD-NA	mg/L	N/A	20	17-AUG-20
Copper (Cu)-Total			0.0568		mg/L	1.1	20	17-AUG-20
Iron (Fe)-Total			0.022	J	mg/L	0.005	0.02	17-AUG-20
Lead (Pb)-Total			0.000265		mg/L	5.9	20	17-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5190768							
WG3384582-4	DUP	WG3384582-3						
Lithium (Li)-Total		0.0051	0.0054		mg/L	4.9	20	17-AUG-20
Magnesium (Mg)-Total		0.354	0.354		mg/L	0.1	20	17-AUG-20
Manganese (Mn)-Total		0.00074	0.00077		mg/L	3.2	20	17-AUG-20
Molybdenum (Mo)-Total		0.000467	0.000467		mg/L	0.1	20	17-AUG-20
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	17-AUG-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	17-AUG-20
Potassium (K)-Total		0.384	0.390		mg/L	1.6	20	17-AUG-20
Rubidium (Rb)-Total		0.00020	0.00022		mg/L	11	20	17-AUG-20
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	17-AUG-20
Silicon (Si)-Total		9.60	9.17		mg/L	4.6	20	17-AUG-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	17-AUG-20
Sodium (Na)-Total		179	175		mg/L	1.8	20	17-AUG-20
Strontium (Sr)-Total		0.0054	0.0058		mg/L	7.3	20	17-AUG-20
Sulfur (S)-Total		13.8	13.1		mg/L	5.3	25	17-AUG-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	17-AUG-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	17-AUG-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	17-AUG-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-AUG-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	17-AUG-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-AUG-20
Uranium (U)-Total		0.000095	0.000105		mg/L	9.7	20	17-AUG-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	17-AUG-20
Zinc (Zn)-Total		0.0433	0.0440		mg/L	1.6	20	17-AUG-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	17-AUG-20
WG3384582-2	LCS							
Aluminum (Al)-Total			98.8		%		80-120	17-AUG-20
Antimony (Sb)-Total			97.8		%		80-120	17-AUG-20
Arsenic (As)-Total			98.6		%		80-120	17-AUG-20
Barium (Ba)-Total			98.8		%		80-120	17-AUG-20
Beryllium (Be)-Total			100.2		%		80-120	17-AUG-20
Bismuth (Bi)-Total			93.7		%		80-120	17-AUG-20
Boron (B)-Total			96.0		%		80-120	17-AUG-20
Cadmium (Cd)-Total			96.0		%		80-120	17-AUG-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5190768							
WG3384582-2	LCS							
Calcium (Ca)-Total			97.9		%		80-120	17-AUG-20
Chromium (Cr)-Total			97.8		%		80-120	17-AUG-20
Cesium (Cs)-Total			97.1		%		80-120	17-AUG-20
Cobalt (Co)-Total			97.2		%		80-120	17-AUG-20
Copper (Cu)-Total			95.6		%		80-120	17-AUG-20
Iron (Fe)-Total			99.1		%		80-120	17-AUG-20
Lead (Pb)-Total			98.1		%		80-120	17-AUG-20
Lithium (Li)-Total			99.2		%		80-120	17-AUG-20
Magnesium (Mg)-Total			104.4		%		80-120	17-AUG-20
Manganese (Mn)-Total			96.2		%		80-120	17-AUG-20
Molybdenum (Mo)-Total			94.7		%		80-120	17-AUG-20
Nickel (Ni)-Total			96.1		%		80-120	17-AUG-20
Phosphorus (P)-Total			104.4		%		70-130	17-AUG-20
Potassium (K)-Total			95.5		%		80-120	17-AUG-20
Rubidium (Rb)-Total			99.7		%		80-120	17-AUG-20
Selenium (Se)-Total			99.7		%		80-120	17-AUG-20
Silicon (Si)-Total			102.2		%		60-140	17-AUG-20
Silver (Ag)-Total			98.3		%		80-120	17-AUG-20
Sodium (Na)-Total			99.6		%		80-120	17-AUG-20
Strontium (Sr)-Total			100.3		%		80-120	17-AUG-20
Sulfur (S)-Total			101.9		%		80-120	17-AUG-20
Thallium (Tl)-Total			97.0		%		80-120	17-AUG-20
Tellurium (Te)-Total			93.4		%		80-120	17-AUG-20
Thorium (Th)-Total			97.3		%		70-130	17-AUG-20
Tin (Sn)-Total			94.0		%		80-120	17-AUG-20
Titanium (Ti)-Total			95.5		%		80-120	17-AUG-20
Tungsten (W)-Total			94.3		%		80-120	17-AUG-20
Uranium (U)-Total			99.96		%		80-120	17-AUG-20
Vanadium (V)-Total			97.7		%		80-120	17-AUG-20
Zinc (Zn)-Total			97.6		%		80-120	17-AUG-20
Zirconium (Zr)-Total			94.5		%		80-120	17-AUG-20
WG3384582-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	17-AUG-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	17-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
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 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5190768							
WG3384582-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	17-AUG-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	17-AUG-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	17-AUG-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	17-AUG-20
Boron (B)-Total			<0.010		mg/L		0.01	17-AUG-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	17-AUG-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	17-AUG-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	17-AUG-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	17-AUG-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	17-AUG-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	17-AUG-20
Iron (Fe)-Total			<0.010		mg/L		0.01	17-AUG-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	17-AUG-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	17-AUG-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	17-AUG-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	17-AUG-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	17-AUG-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	17-AUG-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	17-AUG-20
Potassium (K)-Total			<0.050		mg/L		0.05	17-AUG-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	17-AUG-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	17-AUG-20
Silicon (Si)-Total			<0.10		mg/L		0.1	17-AUG-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	17-AUG-20
Sodium (Na)-Total			<0.050		mg/L		0.05	17-AUG-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	17-AUG-20
Sulfur (S)-Total			<0.50		mg/L		0.5	17-AUG-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	17-AUG-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	17-AUG-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	17-AUG-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	17-AUG-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	17-AUG-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	17-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5190768							
WG3384582-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	17-AUG-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	17-AUG-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	17-AUG-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	17-AUG-20
WG3384582-5 MS		WG3384582-3						
Aluminum (Al)-Total			97.9		%		70-130	17-AUG-20
Antimony (Sb)-Total			97.4		%		70-130	17-AUG-20
Arsenic (As)-Total			93.7		%		70-130	17-AUG-20
Barium (Ba)-Total			92.7		%		70-130	17-AUG-20
Beryllium (Be)-Total			101.4		%		70-130	17-AUG-20
Bismuth (Bi)-Total			84.6		%		70-130	17-AUG-20
Boron (B)-Total			98.7		%		70-130	17-AUG-20
Cadmium (Cd)-Total			89.9		%		70-130	17-AUG-20
Calcium (Ca)-Total			98.9		%		70-130	17-AUG-20
Chromium (Cr)-Total			91.8		%		70-130	17-AUG-20
Cesium (Cs)-Total			97.5		%		70-130	17-AUG-20
Cobalt (Co)-Total			92.3		%		70-130	17-AUG-20
Copper (Cu)-Total			N/A	MS-B	%		-	17-AUG-20
Iron (Fe)-Total			90.5		%		70-130	17-AUG-20
Lead (Pb)-Total			90.0		%		70-130	17-AUG-20
Lithium (Li)-Total			102.2		%		70-130	17-AUG-20
Magnesium (Mg)-Total			98.7		%		70-130	17-AUG-20
Manganese (Mn)-Total			92.1		%		70-130	17-AUG-20
Molybdenum (Mo)-Total			97.2		%		70-130	17-AUG-20
Nickel (Ni)-Total			89.1		%		70-130	17-AUG-20
Phosphorus (P)-Total			101.9		%		70-130	17-AUG-20
Potassium (K)-Total			95.0		%		70-130	17-AUG-20
Rubidium (Rb)-Total			94.9		%		70-130	17-AUG-20
Selenium (Se)-Total			98.7		%		70-130	17-AUG-20
Silicon (Si)-Total			N/A	MS-B	%		-	17-AUG-20
Silver (Ag)-Total			90.4		%		70-130	17-AUG-20
Sodium (Na)-Total			N/A	MS-B	%		-	17-AUG-20
Strontium (Sr)-Total			99.2		%		70-130	17-AUG-20
Sulfur (S)-Total			N/A	MS-B	%		-	17-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5190768							
WG3384582-5 MS		WG3384582-3						
Thallium (Tl)-Total			88.7		%		70-130	17-AUG-20
Tellurium (Te)-Total			86.1		%		70-130	17-AUG-20
Thorium (Th)-Total			95.4		%		70-130	17-AUG-20
Tin (Sn)-Total			95.0		%		70-130	17-AUG-20
Titanium (Ti)-Total			96.6		%		70-130	17-AUG-20
Tungsten (W)-Total			92.6		%		70-130	17-AUG-20
Uranium (U)-Total			99.5		%		70-130	17-AUG-20
Vanadium (V)-Total			97.9		%		70-130	17-AUG-20
Zinc (Zn)-Total			N/A	MS-B	%		-	17-AUG-20
Zirconium (Zr)-Total			96.7		%		70-130	17-AUG-20
P-T-COL-WT								
	Water							
Batch	R5190740							
WG3384091-3 DUP		WG3384091-5						
Phosphorus, Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	18-AUG-20
WG3384091-2 LCS								
Phosphorus, Total			99.7		%		80-120	18-AUG-20
WG3384091-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	18-AUG-20
WG3384091-4 MS		WG3384091-5						
Phosphorus, Total			100.1		%		70-130	18-AUG-20
PAH-511-WT								
	Water							
Batch	R5191755							
WG3384676-2 LCS								
1-Methylnaphthalene			98.5		%		50-140	19-AUG-20
2-Methylnaphthalene			96.3		%		50-140	19-AUG-20
Acenaphthene			106.5		%		50-140	19-AUG-20
Acenaphthylene			99.1		%		50-140	19-AUG-20
Anthracene			95.6		%		50-140	19-AUG-20
Benzo(a)anthracene			103.0		%		50-140	19-AUG-20
Benzo(a)pyrene			96.7		%		50-140	19-AUG-20
Benzo(b)fluoranthene			92.8		%		50-140	19-AUG-20
Benzo(g,h,i)perylene			105.1		%		50-140	19-AUG-20
Benzo(k)fluoranthene			95.3		%		50-140	19-AUG-20
Chrysene			108.2		%		50-140	19-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5191755							
WG3384676-2 LCS								
Dibenzo(ah)anthracene			105.8		%		50-140	19-AUG-20
Fluoranthene			102.6		%		50-140	19-AUG-20
Fluorene			101.4		%		50-140	19-AUG-20
Indeno(1,2,3-cd)pyrene			109.9		%		50-140	19-AUG-20
Naphthalene			94.5		%		50-140	19-AUG-20
Phenanthrene			105.7		%		50-140	19-AUG-20
Pyrene			103.1		%		50-140	19-AUG-20
WG3384676-1 MB								
1-Methylnaphthalene			<0.020		ug/L		0.02	19-AUG-20
2-Methylnaphthalene			<0.020		ug/L		0.02	19-AUG-20
Acenaphthene			<0.020		ug/L		0.02	19-AUG-20
Acenaphthylene			<0.020		ug/L		0.02	19-AUG-20
Anthracene			<0.020		ug/L		0.02	19-AUG-20
Benzo(a)anthracene			<0.020		ug/L		0.02	19-AUG-20
Benzo(a)pyrene			<0.010		ug/L		0.01	19-AUG-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	19-AUG-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	19-AUG-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	19-AUG-20
Chrysene			<0.020		ug/L		0.02	19-AUG-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	19-AUG-20
Fluoranthene			<0.020		ug/L		0.02	19-AUG-20
Fluorene			<0.020		ug/L		0.02	19-AUG-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	19-AUG-20
Naphthalene			<0.050		ug/L		0.05	19-AUG-20
Phenanthrene			<0.020		ug/L		0.02	19-AUG-20
Pyrene			<0.020		ug/L		0.02	19-AUG-20
Surrogate: d8-Naphthalene			98.3		%		60-140	19-AUG-20
Surrogate: d10-Phenanthrene			106.9		%		60-140	19-AUG-20
Surrogate: d12-Chrysene			103.9		%		60-140	19-AUG-20
Surrogate: d10-Acenaphthene			104.9		%		60-140	19-AUG-20

PCB-511-WT **Water**



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5190577							
WG3384645-2	LCS							
Aroclor 1242			111.5		%		60-140	18-AUG-20
Aroclor 1248			99.4		%		60-140	18-AUG-20
Aroclor 1254			105.1		%		60-140	18-AUG-20
Aroclor 1260			82.1		%		60-140	18-AUG-20
WG3384645-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	18-AUG-20
Aroclor 1248			<0.020		ug/L		0.02	18-AUG-20
Aroclor 1254			<0.020		ug/L		0.02	18-AUG-20
Aroclor 1260			<0.020		ug/L		0.02	18-AUG-20
Surrogate: Decachlorobiphenyl			79.5		%		50-150	18-AUG-20
Surrogate: Tetrachloro-m-xylene			78.2		%		50-150	18-AUG-20
VOC-511-HS-WT		Water						
Batch	R5192095							
WG3386480-4	DUP	WG3386480-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	20-AUG-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	20-AUG-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	20-AUG-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	20-AUG-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	20-AUG-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20



Quality Control Report

Workorder: L2488954

Report Date: 25-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5192095							
WG3386480-4	DUP	WG3386480-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	20-AUG-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	20-AUG-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	20-AUG-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	20-AUG-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	20-AUG-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	20-AUG-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	20-AUG-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	20-AUG-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	20-AUG-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	20-AUG-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	20-AUG-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	20-AUG-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
WG3386480-1	LCS							
1,1,1,2-Tetrachloroethane			93.5		%		70-130	19-AUG-20
1,1,2,2-Tetrachloroethane			94.3		%		70-130	19-AUG-20
1,1,1-Trichloroethane			96.9		%		70-130	19-AUG-20
1,1,2-Trichloroethane			96.9		%		70-130	19-AUG-20
1,1-Dichloroethane			98.6		%		70-130	19-AUG-20
1,1-Dichloroethylene			92.3		%		70-130	19-AUG-20
1,2-Dibromoethane			94.4		%		70-130	19-AUG-20
1,2-Dichlorobenzene			96.3		%		70-130	19-AUG-20
1,2-Dichloroethane			96.6		%		70-130	19-AUG-20
1,2-Dichloropropane			100.1		%		70-130	19-AUG-20
1,3-Dichlorobenzene			95.9		%		70-130	19-AUG-20



Quality Control Report

Workorder: L2488954

Report Date: 25-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5192095							
WG3386480-1	LCS							
1,4-Dichlorobenzene			96.5		%		70-130	19-AUG-20
Acetone			94.8		%		60-140	19-AUG-20
Benzene			101.2		%		70-130	19-AUG-20
Bromodichloromethane			102.9		%		70-130	19-AUG-20
Bromoform			92.9		%		70-130	19-AUG-20
Bromomethane			118.3		%		60-140	19-AUG-20
Carbon tetrachloride			96.9		%		70-130	19-AUG-20
Chlorobenzene			99.95		%		70-130	19-AUG-20
Chloroform			101.1		%		70-130	19-AUG-20
cis-1,2-Dichloroethylene			97.2		%		70-130	19-AUG-20
cis-1,3-Dichloropropene			93.0		%		70-130	19-AUG-20
Dibromochloromethane			88.7		%		70-130	19-AUG-20
Dichlorodifluoromethane			86.3		%		50-140	19-AUG-20
Ethylbenzene			93.0		%		70-130	19-AUG-20
n-Hexane			95.7		%		70-130	19-AUG-20
m+p-Xylenes			92.9		%		70-130	19-AUG-20
Methyl Ethyl Ketone			98.0		%		60-140	19-AUG-20
Methyl Isobutyl Ketone			94.4		%		60-140	19-AUG-20
Methylene Chloride			99.4		%		70-130	19-AUG-20
MTBE			100.8		%		70-130	19-AUG-20
o-Xylene			101.4		%		70-130	19-AUG-20
Styrene			92.9		%		70-130	19-AUG-20
Tetrachloroethylene			97.8		%		70-130	19-AUG-20
Toluene			97.9		%		70-130	19-AUG-20
trans-1,2-Dichloroethylene			94.6		%		70-130	19-AUG-20
trans-1,3-Dichloropropene			90.8		%		70-130	19-AUG-20
Trichloroethylene			100.1		%		70-130	19-AUG-20
Trichlorofluoromethane			90.4		%		60-140	19-AUG-20
Vinyl chloride			104.8		%		60-140	19-AUG-20
WG3386480-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	20-AUG-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	20-AUG-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	20-AUG-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	20-AUG-20



Quality Control Report

Workorder: L2488954

Report Date: 25-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5192095							
WG3386480-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	20-AUG-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	20-AUG-20
1,2-Dibromoethane			<0.20		ug/L		0.2	20-AUG-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	20-AUG-20
1,2-Dichloroethane			<0.50		ug/L		0.5	20-AUG-20
1,2-Dichloropropane			<0.50		ug/L		0.5	20-AUG-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	20-AUG-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	20-AUG-20
Acetone			<30		ug/L		30	20-AUG-20
Benzene			<0.50		ug/L		0.5	20-AUG-20
Bromodichloromethane			<2.0		ug/L		2	20-AUG-20
Bromoform			<5.0		ug/L		5	20-AUG-20
Bromomethane			<0.50		ug/L		0.5	20-AUG-20
Carbon tetrachloride			<0.20		ug/L		0.2	20-AUG-20
Chlorobenzene			<0.50		ug/L		0.5	20-AUG-20
Chloroform			<1.0		ug/L		1	20-AUG-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	20-AUG-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	20-AUG-20
Dibromochloromethane			<2.0		ug/L		2	20-AUG-20
Dichlorodifluoromethane			<2.0		ug/L		2	20-AUG-20
Ethylbenzene			<0.50		ug/L		0.5	20-AUG-20
n-Hexane			<0.50		ug/L		0.5	20-AUG-20
m+p-Xylenes			<0.40		ug/L		0.4	20-AUG-20
Methyl Ethyl Ketone			<20		ug/L		20	20-AUG-20
Methyl Isobutyl Ketone			<20		ug/L		20	20-AUG-20
Methylene Chloride			<5.0		ug/L		5	20-AUG-20
MTBE			<2.0		ug/L		2	20-AUG-20
o-Xylene			<0.30		ug/L		0.3	20-AUG-20
Styrene			<0.50		ug/L		0.5	20-AUG-20
Tetrachloroethylene			<0.50		ug/L		0.5	20-AUG-20
Toluene			<0.50		ug/L		0.5	20-AUG-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	20-AUG-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	20-AUG-20



Quality Control Report

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5192095							
WG3386480-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	20-AUG-20
Trichlorofluoromethane			<5.0		ug/L		5	20-AUG-20
Vinyl chloride			<0.50		ug/L		0.5	20-AUG-20
Surrogate: 1,4-Difluorobenzene			101.5		%		70-130	20-AUG-20
Surrogate: 4-Bromofluorobenzene			99.3		%		70-130	20-AUG-20
WG3386480-5 MS		WG3386480-3						
1,1,1,2-Tetrachloroethane			93.3		%		50-140	20-AUG-20
1,1,1,2,2-Tetrachloroethane			94.4		%		50-140	20-AUG-20
1,1,1-Trichloroethane			96.3		%		50-140	20-AUG-20
1,1,2-Trichloroethane			97.2		%		50-140	20-AUG-20
1,1-Dichloroethane			98.4		%		50-140	20-AUG-20
1,1-Dichloroethylene			88.5		%		50-140	20-AUG-20
1,2-Dibromoethane			95.2		%		50-140	20-AUG-20
1,2-Dichlorobenzene			97.1		%		50-140	20-AUG-20
1,2-Dichloroethane			96.2		%		50-140	20-AUG-20
1,2-Dichloropropane			101.0		%		50-140	20-AUG-20
1,3-Dichlorobenzene			95.6		%		50-140	20-AUG-20
1,4-Dichlorobenzene			95.8		%		50-140	20-AUG-20
Acetone			106.5		%		50-140	20-AUG-20
Benzene			101.6		%		50-140	20-AUG-20
Bromodichloromethane			104.3		%		50-140	20-AUG-20
Bromoform			92.6		%		50-140	20-AUG-20
Bromomethane			110.2		%		50-140	20-AUG-20
Carbon tetrachloride			96.2		%		50-140	20-AUG-20
Chlorobenzene			98.8		%		50-140	20-AUG-20
Chloroform			102.1		%		50-140	20-AUG-20
cis-1,2-Dichloroethylene			97.8		%		50-140	20-AUG-20
cis-1,3-Dichloropropene			86.9		%		50-140	20-AUG-20
Dibromochloromethane			89.1		%		50-140	20-AUG-20
Dichlorodifluoromethane			72.5		%		50-140	20-AUG-20
Ethylbenzene			90.8		%		50-140	20-AUG-20
n-Hexane			90.9		%		50-140	20-AUG-20
m+p-Xylenes			90.1		%		50-140	20-AUG-20
Methyl Ethyl Ketone			102.9		%		50-140	20-AUG-20



Quality Control Report

Workorder: L2488954

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5192095							
WG3386480-5 MS		WG3386480-3						
Methyl Isobutyl Ketone			94.2		%		50-140	20-AUG-20
Methylene Chloride			100.1		%		50-140	20-AUG-20
MTBE			99.99		%		50-140	20-AUG-20
o-Xylene			99.6		%		50-140	20-AUG-20
Styrene			90.0		%		50-140	20-AUG-20
Tetrachloroethylene			93.2		%		50-140	20-AUG-20
Toluene			96.0		%		50-140	20-AUG-20
trans-1,2-Dichloroethylene			90.7		%		50-140	20-AUG-20
trans-1,3-Dichloropropene			82.7		%		50-140	20-AUG-20
Trichloroethylene			99.2		%		50-140	20-AUG-20
Trichlorofluoromethane			85.9		%		50-140	20-AUG-20
Vinyl chloride			95.8		%		50-140	20-AUG-20

Quality Control Report

Workorder: L2488954

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

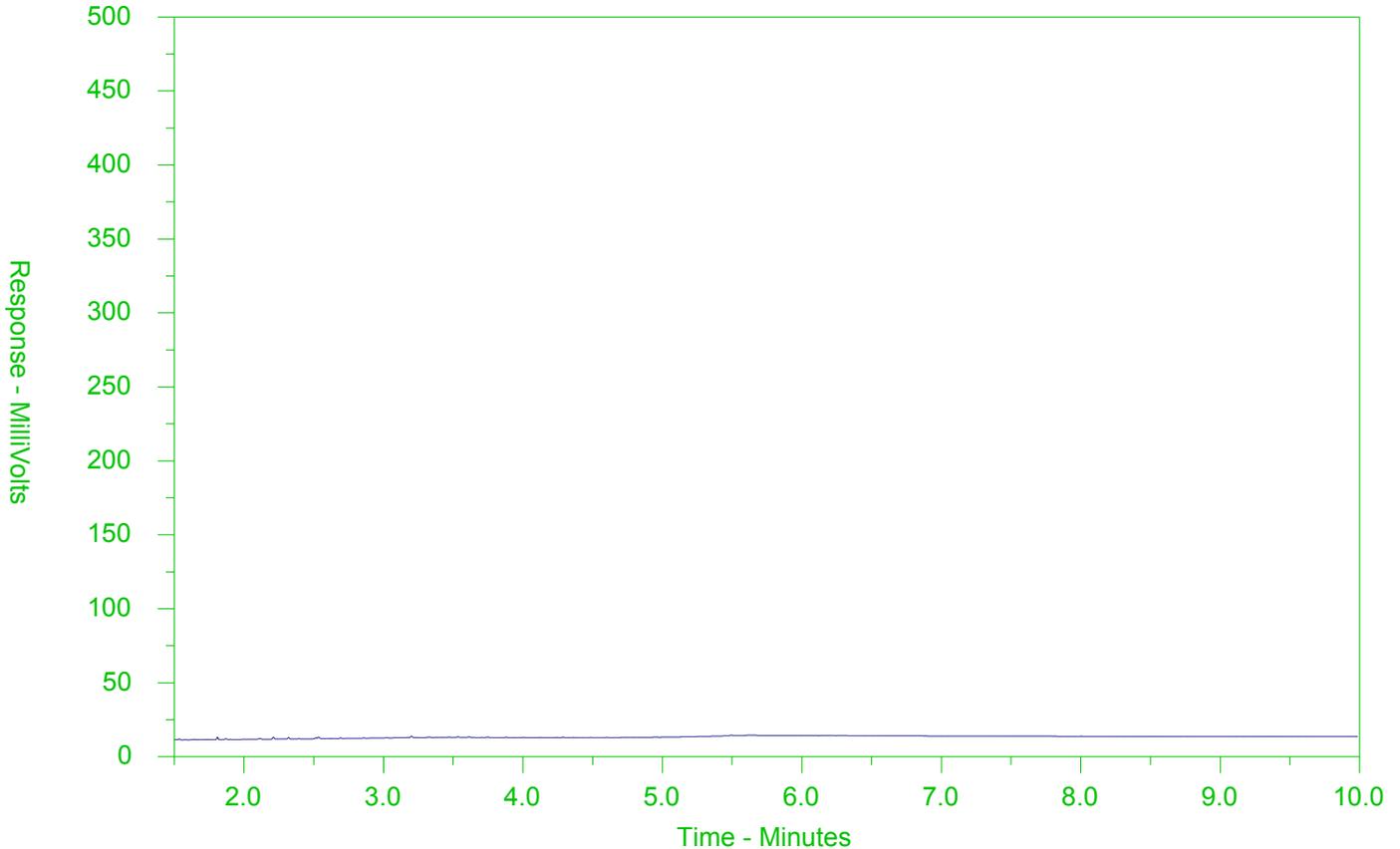
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2488954-1
 Client Sample ID: W-11210029-20200813-24



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2488954-COFC

COC Number: 17 -

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www.alsglobal.com

Report To Contact and company name below will appear on the final report		Report Distribution		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																																																													
Company: GHD LIMITED - ACCT #13791		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)		Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																																																													
Contact: Laura Ermeta		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Priority (Business Days)		Emergency		1 Business day [E - 100%]		<input type="checkbox"/>																																																							
Phone: 519-884-0510		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked		4 day [P4-20%] <input type="checkbox"/>		2 day [P2-50%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]		<input type="checkbox"/>																																																							
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm																																																													
Street: 455 Phillip St		Email 1 or Fax laura.ermeta@ghd.com		For tests that can not be performed according to the service level selected, you will be contacted.																																																													
City/Province: Waterloo, Ontario		Email 2 See PO		Analysis Request																																																													
Postal Code: N2L 3X2		Email 3		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																																													
Invoice To		Invoice Distribution		NUMBER OF CONTAINERS								SAMPLES ON HOLD								SUSPECTED HAZARD (see Special Instructions)																																													
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																																																															
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Email 1 or Fax apinvoices-735@ghd.com		Total Metals (MET-T-COMS-WT)								Total Mercury (HG-T-CVAA-WT)								Total Cr6 (CR-CR6-IC-WT)								Total Phosphorous (P-T-COL-WT)								PCBs (PCB-511-WT)								VOCs and PHCs (VOC-F-4-511-P-WT)								SVOCs (SVOC-511-GP-WT)													
Company: GHD Limited		Email 2		Oil and Gas Required Fields (client use)								AFE/Cost Center:								PO#																																													
Contact: SEE SSOW		Project Information		Major/Minor Code:								Routing Code:																																																					
ALS Account # / Quote #: 13791		Job #: 11210029		Requisitioner:								Location:																																																					
PO / AFE: 73520086		LSD:		ALS Lab Work Order # (lab use only): L2488954								ALS Contact: Rick H								Sampler:																																													
ALS Sample # (lab use only)		Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mmm-yy)		Time (hh:mm)		Sample Type		Total Metals (MET-T-COMS-WT)								Total Mercury (HG-T-CVAA-WT)								Total Cr6 (CR-CR6-IC-WT)								Total Phosphorous (P-T-COL-WT)								PCBs (PCB-511-WT)								VOCs and PHCs (VOC-F-4-511-P-WT)								SVOCs (SVOC-511-GP-WT)							
W-11210029-2200813-24								Water		R								R								R								R								R								R								R							
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		SAMPLE CONDITION AS RECEIVED (lab use only)																																																													
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																																																													
				Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																																																													
				Cooling Initiated <input type="checkbox"/>																																																													
				INITIAL COOLER TEMPERATURES °C								FINAL COOLER TEMPERATURES °C																																																					
												22.0																																																					
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)				FINAL SHIPMENT RECEPTION (lab use only)																																																											
Released by:		Date:		Time:		Received by:		Date:		Time:		Received by:		Date:		Time:																																																	
								8-14-2020		12:58																																																							

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2016 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

SIF



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 09-JUL-20
Report Date: 22-JUL-20 14:40 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2472292

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2472292-1 W-11210029-20200709-14 Sampled By: CLIENT on 09-JUL-20 @ 10:30 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	<0.0030		0.0030	mg/L	10-JUL-20	14-JUL-20	R5152717
Total Metals							
Aluminum (Al)-Total	0.0066		0.0050	mg/L	09-JUL-20	10-JUL-20	R5147581
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Arsenic (As)-Total	0.00580		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Barium (Ba)-Total	0.0653		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	09-JUL-20	10-JUL-20	R5147581
Boron (B)-Total	0.014		0.010	mg/L	09-JUL-20	10-JUL-20	R5147581
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	09-JUL-20	10-JUL-20	R5147581
Calcium (Ca)-Total	46.6		0.050	mg/L	09-JUL-20	10-JUL-20	R5147581
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	09-JUL-20	10-JUL-20	R5147581
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	09-JUL-20	10-JUL-20	R5147581
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Copper (Cu)-Total	<0.00050		0.00050	mg/L	09-JUL-20	10-JUL-20	R5147581
Iron (Fe)-Total	0.281		0.010	mg/L	09-JUL-20	10-JUL-20	R5147581
Lead (Pb)-Total	<0.000050		0.000050	mg/L	09-JUL-20	10-JUL-20	R5147581
Lithium (Li)-Total	0.0026		0.0010	mg/L	09-JUL-20	10-JUL-20	R5147581
Magnesium (Mg)-Total	27.3		0.0050	mg/L	09-JUL-20	10-JUL-20	R5147581
Manganese (Mn)-Total	0.00931		0.00050	mg/L	09-JUL-20	10-JUL-20	R5147581
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-JUL-20	R5149605
Molybdenum (Mo)-Total	0.000703		0.000050	mg/L	09-JUL-20	10-JUL-20	R5147581
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	09-JUL-20	10-JUL-20	R5147581
Phosphorus (P)-Total	<0.050		0.050	mg/L	09-JUL-20	10-JUL-20	R5147581
Potassium (K)-Total	0.995		0.050	mg/L	09-JUL-20	10-JUL-20	R5147581
Rubidium (Rb)-Total	0.00034		0.00020	mg/L	09-JUL-20	10-JUL-20	R5147581
Selenium (Se)-Total	<0.000050		0.000050	mg/L	09-JUL-20	10-JUL-20	R5147581
Silicon (Si)-Total	7.60		0.10	mg/L	09-JUL-20	10-JUL-20	R5147581
Silver (Ag)-Total	<0.000050		0.000050	mg/L	09-JUL-20	10-JUL-20	R5147581
Sodium (Na)-Total	5.88		0.050	mg/L	09-JUL-20	10-JUL-20	R5147581
Strontium (Sr)-Total	0.322		0.0010	mg/L	09-JUL-20	10-JUL-20	R5147581
Sulfur (S)-Total	7.15		0.50	mg/L	09-JUL-20	10-JUL-20	R5147581
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	09-JUL-20	10-JUL-20	R5147581
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	09-JUL-20	10-JUL-20	R5147581
Thorium (Th)-Total	<0.00010		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Tin (Sn)-Total	<0.00010		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	09-JUL-20	10-JUL-20	R5147581
Tungsten (W)-Total	<0.00010		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Uranium (U)-Total	0.000590		0.000010	mg/L	09-JUL-20	10-JUL-20	R5147581
Vanadium (V)-Total	<0.00050		0.00050	mg/L	09-JUL-20	10-JUL-20	R5147581
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	09-JUL-20	10-JUL-20	R5147581

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2472292-1 W-11210029-20200709-14 Sampled By: CLIENT on 09-JUL-20 @ 10:30 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	09-JUL-20	10-JUL-20	R5147581
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		14-JUL-20	R5153562
Volatile Organic Compounds							
Acetone	<30		30	ug/L		14-JUL-20	R5151425
Benzene	<0.50		0.50	ug/L		14-JUL-20	R5151425
Bromodichloromethane	<2.0		2.0	ug/L		14-JUL-20	R5151425
Bromoform	<5.0		5.0	ug/L		14-JUL-20	R5151425
Bromomethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
Carbon tetrachloride	<0.20		0.20	ug/L		14-JUL-20	R5151425
Chlorobenzene	<0.50		0.50	ug/L		14-JUL-20	R5151425
Dibromochloromethane	<2.0		2.0	ug/L		14-JUL-20	R5151425
Chloroform	<1.0		1.0	ug/L		14-JUL-20	R5151425
1,2-Dibromoethane	<0.20		0.20	ug/L		14-JUL-20	R5151425
1,2-Dichlorobenzene	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,3-Dichlorobenzene	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,4-Dichlorobenzene	<0.50		0.50	ug/L		14-JUL-20	R5151425
Dichlorodifluoromethane	<2.0		2.0	ug/L		14-JUL-20	R5151425
1,1-Dichloroethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,2-Dichloroethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,1-Dichloroethylene	<0.50		0.50	ug/L		14-JUL-20	R5151425
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		14-JUL-20	R5151425
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		14-JUL-20	R5151425
Methylene Chloride	<5.0		5.0	ug/L		14-JUL-20	R5151425
1,2-Dichloropropane	<0.50		0.50	ug/L		14-JUL-20	R5151425
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		14-JUL-20	R5151425
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		14-JUL-20	R5151425
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		14-JUL-20	R5151425
Ethylbenzene	<0.50		0.50	ug/L		14-JUL-20	R5151425
n-Hexane	<0.50		0.50	ug/L		14-JUL-20	R5151425
Methyl Ethyl Ketone	<20		20	ug/L		14-JUL-20	R5151425
Methyl Isobutyl Ketone	<20		20	ug/L		14-JUL-20	R5151425
MTBE	<2.0		2.0	ug/L		14-JUL-20	R5151425
Styrene	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
Tetrachloroethylene	<0.50		0.50	ug/L		14-JUL-20	R5151425
Toluene	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,1,1-Trichloroethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,1,2-Trichloroethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
Trichloroethylene	<0.50		0.50	ug/L		14-JUL-20	R5151425

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2472292-1 W-11210029-20200709-14							
Sampled By: CLIENT on 09-JUL-20 @ 10:30							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		14-JUL-20	R5151425
Vinyl chloride	<0.50		0.50	ug/L		14-JUL-20	R5151425
o-Xylene	<0.30		0.30	ug/L		14-JUL-20	R5151425
m+p-Xylenes	<0.40		0.40	ug/L		14-JUL-20	R5151425
Xylenes (Total)	<0.50		0.50	ug/L		14-JUL-20	
Surrogate: 4-Bromofluorobenzene	97.6		70-130	%		14-JUL-20	R5151425
Surrogate: 1,4-Difluorobenzene	99.4		70-130	%		14-JUL-20	R5151425
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		14-JUL-20	R5151425
F1-BTEX	<25		25	ug/L		22-JUL-20	
F2 (C10-C16)	<100		100	ug/L	09-JUL-20	10-JUL-20	R5147989
F2-Naphth	<100		100	ug/L		22-JUL-20	
F3 (C16-C34)	<250		250	ug/L	09-JUL-20	10-JUL-20	R5147989
F3-PAH	<250		250	ug/L		22-JUL-20	
F4 (C34-C50)	<250		250	ug/L	09-JUL-20	10-JUL-20	R5147989
Total Hydrocarbons (C6-C50)	<370		370	ug/L		22-JUL-20	
Chrom. to baseline at nC50	YES				09-JUL-20	10-JUL-20	R5147989
Surrogate: 2-Bromobenzotrifluoride	90.9		60-140	%	09-JUL-20	10-JUL-20	R5147989
Surrogate: 3,4-Dichlorotoluene	74.8		60-140	%		14-JUL-20	R5151425
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Acenaphthylene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Anthracene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Benzo(a)anthracene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Benzo(a)pyrene	<0.010		0.010	ug/L	09-JUL-20	14-JUL-20	R5152458
Benzo(b)fluoranthene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Benzo(k)fluoranthene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Chrysene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Fluoranthene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Fluorene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		22-JUL-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
2-Methylnaphthalene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Naphthalene	<0.050		0.050	ug/L	09-JUL-20	14-JUL-20	R5152458
Phenanthrene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Pyrene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Surrogate: d10-Acenaphthene	88.7		60-140	%	09-JUL-20	14-JUL-20	R5152458
Surrogate: d12-Chrysene	89.1		60-140	%	09-JUL-20	14-JUL-20	R5152458

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2472292-1 W-11210029-20200709-14 Sampled By: CLIENT on 09-JUL-20 @ 10:30 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	87.4		60-140	%	09-JUL-20	14-JUL-20	R5152458
Surrogate: d10-Phenanthrene	94.5		60-140	%	09-JUL-20	14-JUL-20	R5152458
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
4-Chloroaniline	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
2-Chlorophenol	<0.30		0.30	ug/L	17-JUL-20	22-JUL-20	R5158683
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4-Dichlorophenol	<0.30		0.30	ug/L	17-JUL-20	22-JUL-20	R5158683
Diethylphthalate	<0.20		0.20	ug/L	17-JUL-20	22-JUL-20	R5158683
Dimethylphthalate	<0.20		0.20	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4-Dimethylphenol	<0.50		0.50	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4-Dinitrophenol	<2.0	RRR	2.0	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4-Dinitrotoluene	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
2,6-Dinitrotoluene	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	17-JUL-20	22-JUL-20	R5158683
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	17-JUL-20	22-JUL-20	R5158683
Pentachlorophenol	<0.50		0.50	ug/L	17-JUL-20	22-JUL-20	R5158683
Phenol	<0.50		0.50	ug/L	17-JUL-20	22-JUL-20	R5158683
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	17-JUL-20	22-JUL-20	R5158683
Surrogate: 2-Fluorobiphenyl	84.1		50-140	%	17-JUL-20	22-JUL-20	R5158683
Surrogate: Nitrobenzene d5	87.1		50-140	%	17-JUL-20	22-JUL-20	R5158683
Surrogate: p-Terphenyl d14	108.1		60-140	%	17-JUL-20	22-JUL-20	R5158683
Surrogate: 2,4,6-Tribromophenol	89.3		50-140	%	17-JUL-20	22-JUL-20	R5158683
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	13-JUL-20	13-JUL-20	R5149337
Aroclor 1248	<0.020		0.020	ug/L	13-JUL-20	13-JUL-20	R5149337
Aroclor 1254	<0.020		0.020	ug/L	13-JUL-20	13-JUL-20	R5149337
Aroclor 1260	<0.020		0.020	ug/L	13-JUL-20	13-JUL-20	R5149337
Surrogate: Decachlorobiphenyl	109.1		50-150	%	13-JUL-20	13-JUL-20	R5149337
Total PCBs	<0.040		0.040	ug/L	13-JUL-20	13-JUL-20	R5149337
Surrogate: Tetrachloro-m-xylene	77.0		50-150	%	13-JUL-20	13-JUL-20	R5149337
Report Remarks : RRR: Detection limits raised due to suspected bias low results at or near the detection limit.							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	2,4-Dinitrophenol	LCS-H	L2472292-1
Matrix Spike	Aluminum (Al)-Total	MS-B	L2472292-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2472292-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2472292-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2472292-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2472292-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2472292-1
Matrix Spike	Potassium (K)-Total	MS-B	L2472292-1
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2472292-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2472292-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2472292-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2472292-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2472292-1
Matrix Spike	Titanium (Ti)-Total	MS-B	L2472292-1
Matrix Spike	Uranium (U)-Total	MS-B	L2472292-1

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.

Reference Information

3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.

4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

Reference Information

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5158683							
WG3364962-2	LCS							
1,2,4-Trichlorobenzene			79.4		%		50-140	20-JUL-20
2-Chlorophenol			78.1		%		50-140	20-JUL-20
2,4-Dichlorophenol			94.6		%		50-140	20-JUL-20
2,4-Dimethylphenol			103.8		%		30-130	20-JUL-20
2,4-Dinitrophenol			150.6	LCS-H	%		50-140	20-JUL-20
2,4-Dinitrotoluene			134.7		%		50-140	20-JUL-20
2,4,5-Trichlorophenol			107.3		%		50-140	20-JUL-20
2,4,6-Trichlorophenol			105.2		%		50-140	20-JUL-20
2,6-Dinitrotoluene			122.7		%		50-140	20-JUL-20
3,3'-Dichlorobenzidine			92.2		%		30-130	20-JUL-20
4-Chloroaniline			62.7		%		30-130	20-JUL-20
Biphenyl			86.3		%		50-140	20-JUL-20
Bis(2-chloroethyl)ether			88.9		%		50-140	20-JUL-20
Bis(2-chloroisopropyl)ether			87.6		%		50-140	20-JUL-20
Bis(2-ethylhexyl)phthalate			124.5		%		50-140	20-JUL-20
Diethylphthalate			90.8		%		50-140	20-JUL-20
Dimethylphthalate			92.6		%		50-140	20-JUL-20
Pentachlorophenol			136.4		%		50-140	20-JUL-20
Phenol			101.8		%		30-130	20-JUL-20
WG3364962-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	20-JUL-20
2-Chlorophenol			<0.30		ug/L		0.3	20-JUL-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	20-JUL-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	20-JUL-20
2,4-Dinitrophenol			<1.0		ug/L		1	20-JUL-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	20-JUL-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	20-JUL-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	20-JUL-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	20-JUL-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	20-JUL-20
4-Chloroaniline			<0.40		ug/L		0.4	20-JUL-20
Biphenyl			<0.40		ug/L		0.4	20-JUL-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	20-JUL-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	20-JUL-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT		Water						
Batch R5158683								
WG3364962-1 MB								
	Bis(2-ethylhexyl)phthalate		<2.0		ug/L		2	20-JUL-20
	Diethylphthalate		<0.20		ug/L		0.2	20-JUL-20
	Dimethylphthalate		<0.20		ug/L		0.2	20-JUL-20
	Pentachlorophenol		<0.50		ug/L		0.5	20-JUL-20
	Phenol		<0.50		ug/L		0.5	20-JUL-20
	Surrogate: 2-Fluorobiphenyl		83.8		%		50-140	20-JUL-20
	Surrogate: 2,4,6-Tribromophenol		89.7		%		50-140	20-JUL-20
	Surrogate: Nitrobenzene d5		92.7		%		50-140	20-JUL-20
	Surrogate: p-Terphenyl d14		111.6		%		60-140	20-JUL-20
CR-CR6-IC-WT		Water						
Batch R5153562								
WG3361024-4 DUP		WG3361024-3						
	Chromium, Hexavalent	<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	14-JUL-20
WG3361024-2 LCS								
	Chromium, Hexavalent		102.4		%		80-120	14-JUL-20
WG3361024-1 MB								
	Chromium, Hexavalent		<0.00050		mg/L		0.0005	14-JUL-20
WG3361024-5 MS		WG3361024-3						
	Chromium, Hexavalent		101.8		%		70-130	14-JUL-20
F1-HS-511-WT		Water						
Batch R5151425								
WG3361086-4 DUP		WG3361086-3						
	F1 (C6-C10)	<25	<25	RPD-NA	ug/L	N/A	30	14-JUL-20
WG3361086-1 LCS								
	F1 (C6-C10)		108.5		%		80-120	14-JUL-20
WG3361086-2 MB								
	F1 (C6-C10)		<25		ug/L		25	14-JUL-20
	Surrogate: 3,4-Dichlorotoluene		94.5		%		60-140	14-JUL-20
WG3361086-5 MS		WG3361086-3						
	F1 (C6-C10)		100.0		%		60-140	14-JUL-20
F2-F4-511-WT		Water						
Batch R5147989								
WG3359493-2 LCS								
	F2 (C10-C16)		113.3		%		70-130	10-JUL-20
	F3 (C16-C34)		118.4		%		70-130	10-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT								
Water								
Batch R5147989								
WG3359493-2	LCS							
F4 (C34-C50)			121.0		%		70-130	10-JUL-20
WG3359493-1	MB							
F2 (C10-C16)			<100		ug/L		100	10-JUL-20
F3 (C16-C34)			<250		ug/L		250	10-JUL-20
F4 (C34-C50)			<250		ug/L		250	10-JUL-20
Surrogate: 2-Bromobenzotrifluoride			94.3		%		60-140	10-JUL-20
HG-T-CVAA-WT								
Water								
Batch R5149605								
WG3359974-3	DUP	L2472289-4						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	13-JUL-20
WG3359974-2	LCS							
Mercury (Hg)-Total			108.0		%		80-120	13-JUL-20
WG3359974-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	13-JUL-20
WG3359974-4	MS	L2472300-1						
Mercury (Hg)-Total			102.0		%		70-130	13-JUL-20
MET-T-CCMS-WT								
Water								
Batch R5147581								
WG3359509-4	DUP	WG3359509-3						
Aluminum (Al)-Total		1.05	1.07		mg/L	1.4	20	10-JUL-20
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-20
Arsenic (As)-Total		0.00018	0.00020		mg/L	11	20	10-JUL-20
Barium (Ba)-Total		0.0178	0.0187		mg/L	4.9	20	10-JUL-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	10-JUL-20
Boron (B)-Total		0.029	0.029		mg/L	1.9	20	10-JUL-20
Cadmium (Cd)-Total		0.0000602	0.0000613		mg/L	1.8	20	10-JUL-20
Calcium (Ca)-Total		36.8	37.0		mg/L	0.6	20	10-JUL-20
Chromium (Cr)-Total		0.00123	0.00126		mg/L	2.4	20	10-JUL-20
Cesium (Cs)-Total		0.000094	0.000094		mg/L	0.3	20	10-JUL-20
Cobalt (Co)-Total		0.0102	0.0107		mg/L	4.9	20	10-JUL-20
Copper (Cu)-Total		0.00338	0.00346		mg/L	2.4	20	10-JUL-20
Iron (Fe)-Total		1.73	1.77		mg/L	2.2	20	10-JUL-20
Lead (Pb)-Total		0.000890	0.000896		mg/L	0.7	20	10-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5147581							
WG3359509-4	DUP	WG3359509-3						
Lithium (Li)-Total		0.0097	0.0094		mg/L	2.3	20	10-JUL-20
Magnesium (Mg)-Total		80.7	83.5		mg/L	3.5	20	10-JUL-20
Manganese (Mn)-Total		1.33	1.36		mg/L	2.2	20	10-JUL-20
Molybdenum (Mo)-Total		0.00155	0.00158		mg/L	2.3	20	10-JUL-20
Nickel (Ni)-Total		0.0190	0.0196		mg/L	3.1	20	10-JUL-20
Phosphorus (P)-Total		<0.050	0.051	RPD-NA	mg/L	N/A	20	10-JUL-20
Potassium (K)-Total		6.51	6.79		mg/L	4.2	20	10-JUL-20
Rubidium (Rb)-Total		0.00693	0.00696		mg/L	0.4	20	10-JUL-20
Selenium (Se)-Total		0.00182	0.00193		mg/L	5.9	20	10-JUL-20
Silicon (Si)-Total		2.58	2.58		mg/L	0.1	20	10-JUL-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	10-JUL-20
Sodium (Na)-Total		2.60	2.65		mg/L	1.9	20	10-JUL-20
Strontium (Sr)-Total		0.0468	0.0482		mg/L	2.9	20	10-JUL-20
Sulfur (S)-Total		133	137		mg/L	2.6	25	10-JUL-20
Thallium (Tl)-Total		0.000033	0.000030		mg/L	7.9	20	10-JUL-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	10-JUL-20
Thorium (Th)-Total		0.00053	0.00055		mg/L	3.9	25	10-JUL-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-20
Titanium (Ti)-Total		0.0484	0.0484		mg/L	0.1	20	10-JUL-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-20
Uranium (U)-Total		0.00126	0.00127		mg/L	1.1	20	10-JUL-20
Vanadium (V)-Total		0.00151	0.00155		mg/L	2.7	20	10-JUL-20
Zinc (Zn)-Total		0.0031	0.0030		mg/L	3.8	20	10-JUL-20
Zirconium (Zr)-Total		0.00057	0.00063		mg/L	9.3	20	10-JUL-20
WG3359509-2	LCS							
Aluminum (Al)-Total			97.6		%		80-120	10-JUL-20
Antimony (Sb)-Total			100.6		%		80-120	10-JUL-20
Arsenic (As)-Total			100.2		%		80-120	10-JUL-20
Barium (Ba)-Total			96.8		%		80-120	10-JUL-20
Beryllium (Be)-Total			95.3		%		80-120	10-JUL-20
Bismuth (Bi)-Total			97.5		%		80-120	10-JUL-20
Boron (B)-Total			94.6		%		80-120	10-JUL-20
Cadmium (Cd)-Total			99.7		%		80-120	10-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5147581							
WG3359509-2	LCS							
Calcium (Ca)-Total			96.6		%		80-120	10-JUL-20
Chromium (Cr)-Total			97.3		%		80-120	10-JUL-20
Cesium (Cs)-Total			97.6		%		80-120	10-JUL-20
Cobalt (Co)-Total			96.3		%		80-120	10-JUL-20
Copper (Cu)-Total			96.8		%		80-120	10-JUL-20
Iron (Fe)-Total			95.4		%		80-120	10-JUL-20
Lead (Pb)-Total			101.0		%		80-120	10-JUL-20
Lithium (Li)-Total			90.8		%		80-120	10-JUL-20
Magnesium (Mg)-Total			102.6		%		80-120	10-JUL-20
Manganese (Mn)-Total			97.8		%		80-120	10-JUL-20
Molybdenum (Mo)-Total			90.9		%		80-120	10-JUL-20
Nickel (Ni)-Total			96.6		%		80-120	10-JUL-20
Phosphorus (P)-Total			97.0		%		70-130	10-JUL-20
Potassium (K)-Total			93.0		%		80-120	10-JUL-20
Rubidium (Rb)-Total			99.9		%		80-120	10-JUL-20
Selenium (Se)-Total			102.9		%		80-120	10-JUL-20
Silicon (Si)-Total			95.6		%		60-140	10-JUL-20
Silver (Ag)-Total			93.1		%		80-120	10-JUL-20
Sodium (Na)-Total			97.1		%		80-120	10-JUL-20
Strontium (Sr)-Total			94.4		%		80-120	10-JUL-20
Sulfur (S)-Total			92.4		%		80-120	10-JUL-20
Thallium (Tl)-Total			99.5		%		80-120	10-JUL-20
Tellurium (Te)-Total			99.4		%		80-120	10-JUL-20
Thorium (Th)-Total			93.9		%		70-130	10-JUL-20
Tin (Sn)-Total			97.1		%		80-120	10-JUL-20
Titanium (Ti)-Total			93.5		%		80-120	10-JUL-20
Tungsten (W)-Total			101.1		%		80-120	10-JUL-20
Uranium (U)-Total			100.3		%		80-120	10-JUL-20
Vanadium (V)-Total			98.0		%		80-120	10-JUL-20
Zinc (Zn)-Total			97.8		%		80-120	10-JUL-20
Zirconium (Zr)-Total			87.2		%		80-120	10-JUL-20
WG3359509-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	10-JUL-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	10-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5147581							
WG3359509-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	10-JUL-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	10-JUL-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	10-JUL-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	10-JUL-20
Boron (B)-Total			<0.010		mg/L		0.01	10-JUL-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	10-JUL-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	10-JUL-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	10-JUL-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	10-JUL-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	10-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	10-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	10-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	10-JUL-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	10-JUL-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	10-JUL-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	10-JUL-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	10-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	10-JUL-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	10-JUL-20
Potassium (K)-Total			<0.050		mg/L		0.05	10-JUL-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	10-JUL-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	10-JUL-20
Silicon (Si)-Total			<0.10		mg/L		0.1	10-JUL-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	10-JUL-20
Sodium (Na)-Total			<0.050		mg/L		0.05	10-JUL-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	10-JUL-20
Sulfur (S)-Total			<0.50		mg/L		0.5	10-JUL-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	10-JUL-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	10-JUL-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	10-JUL-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	10-JUL-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	10-JUL-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	10-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5147581							
WG3359509-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	10-JUL-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	10-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	10-JUL-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	10-JUL-20
WG3359509-5 MS		WG3359509-3						
Aluminum (Al)-Total			N/A	MS-B	%		-	10-JUL-20
Antimony (Sb)-Total			101.7		%		70-130	10-JUL-20
Arsenic (As)-Total			104.8		%		70-130	10-JUL-20
Barium (Ba)-Total			N/A	MS-B	%		-	10-JUL-20
Beryllium (Be)-Total			90.5		%		70-130	10-JUL-20
Bismuth (Bi)-Total			94.7		%		70-130	10-JUL-20
Boron (B)-Total			88.4		%		70-130	10-JUL-20
Cadmium (Cd)-Total			108.1		%		70-130	10-JUL-20
Calcium (Ca)-Total			N/A	MS-B	%		-	10-JUL-20
Chromium (Cr)-Total			102.2		%		70-130	10-JUL-20
Cesium (Cs)-Total			100.9		%		70-130	10-JUL-20
Cobalt (Co)-Total			98.7		%		70-130	10-JUL-20
Copper (Cu)-Total			97.0		%		70-130	10-JUL-20
Iron (Fe)-Total			N/A	MS-B	%		-	10-JUL-20
Lead (Pb)-Total			96.4		%		70-130	10-JUL-20
Lithium (Li)-Total			90.8		%		70-130	10-JUL-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	10-JUL-20
Manganese (Mn)-Total			N/A	MS-B	%		-	10-JUL-20
Molybdenum (Mo)-Total			97.5		%		70-130	10-JUL-20
Nickel (Ni)-Total			93.3		%		70-130	10-JUL-20
Phosphorus (P)-Total			110.2		%		70-130	10-JUL-20
Potassium (K)-Total			N/A	MS-B	%		-	10-JUL-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	10-JUL-20
Selenium (Se)-Total			107.7		%		70-130	10-JUL-20
Silicon (Si)-Total			N/A	MS-B	%		-	10-JUL-20
Silver (Ag)-Total			93.2		%		70-130	10-JUL-20
Sodium (Na)-Total			N/A	MS-B	%		-	10-JUL-20
Strontium (Sr)-Total			N/A	MS-B	%		-	10-JUL-20
Sulfur (S)-Total			N/A	MS-B	%		-	10-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5147581							
WG3359509-5 MS		WG3359509-3						
Thallium (Tl)-Total			95.5		%		70-130	10-JUL-20
Tellurium (Te)-Total			95.4		%		70-130	10-JUL-20
Thorium (Th)-Total			97.5		%		70-130	10-JUL-20
Tin (Sn)-Total			100.5		%		70-130	10-JUL-20
Titanium (Ti)-Total			N/A	MS-B	%		-	10-JUL-20
Tungsten (W)-Total			97.0		%		70-130	10-JUL-20
Uranium (U)-Total			N/A	MS-B	%		-	10-JUL-20
Vanadium (V)-Total			105.2		%		70-130	10-JUL-20
Zinc (Zn)-Total			93.8		%		70-130	10-JUL-20
Zirconium (Zr)-Total			103.0		%		70-130	10-JUL-20
P-T-COL-WT								
	Water							
Batch	R5152717							
WG3359756-3 DUP		L2472266-2						
Phosphorus, Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	14-JUL-20
WG3359756-2 LCS								
Phosphorus, Total			96.8		%		80-120	14-JUL-20
WG3359756-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	14-JUL-20
WG3359756-4 MS		L2472266-2						
Phosphorus, Total			97.8		%		70-130	14-JUL-20
PAH-511-WT								
	Water							
Batch	R5152458							
WG3359493-2 LCS								
1-Methylnaphthalene			88.1		%		50-140	14-JUL-20
2-Methylnaphthalene			88.7		%		50-140	14-JUL-20
Acenaphthene			99.1		%		50-140	14-JUL-20
Acenaphthylene			96.3		%		50-140	14-JUL-20
Anthracene			91.3		%		50-140	14-JUL-20
Benzo(a)anthracene			98.0		%		50-140	14-JUL-20
Benzo(a)pyrene			95.1		%		50-140	14-JUL-20
Benzo(b)fluoranthene			88.7		%		50-140	14-JUL-20
Benzo(g,h,i)perylene			102.0		%		50-140	14-JUL-20
Benzo(k)fluoranthene			95.8		%		50-140	14-JUL-20
Chrysene			100.3		%		50-140	14-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5152458							
WG3359493-2	LCS							
Dibenzo(ah)anthracene			110.5		%		50-140	14-JUL-20
Fluoranthene			99.5		%		50-140	14-JUL-20
Fluorene			97.8		%		50-140	14-JUL-20
Indeno(1,2,3-cd)pyrene			102.2		%		50-140	14-JUL-20
Naphthalene			90.1		%		50-140	14-JUL-20
Phenanthrene			100.3		%		50-140	14-JUL-20
Pyrene			101.8		%		50-140	14-JUL-20
WG3359493-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	14-JUL-20
2-Methylnaphthalene			<0.020		ug/L		0.02	14-JUL-20
Acenaphthene			<0.020		ug/L		0.02	14-JUL-20
Acenaphthylene			<0.020		ug/L		0.02	14-JUL-20
Anthracene			<0.020		ug/L		0.02	14-JUL-20
Benzo(a)anthracene			<0.020		ug/L		0.02	14-JUL-20
Benzo(a)pyrene			<0.010		ug/L		0.01	14-JUL-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	14-JUL-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	14-JUL-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	14-JUL-20
Chrysene			<0.020		ug/L		0.02	14-JUL-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	14-JUL-20
Fluoranthene			<0.020		ug/L		0.02	14-JUL-20
Fluorene			<0.020		ug/L		0.02	14-JUL-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	14-JUL-20
Naphthalene			<0.050		ug/L		0.05	14-JUL-20
Phenanthrene			<0.020		ug/L		0.02	14-JUL-20
Pyrene			<0.020		ug/L		0.02	14-JUL-20
Surrogate: d8-Naphthalene			93.0		%		60-140	14-JUL-20
Surrogate: d10-Phenanthrene			97.5		%		60-140	14-JUL-20
Surrogate: d12-Chrysene			92.4		%		60-140	14-JUL-20
Surrogate: d10-Acenaphthene			93.5		%		60-140	14-JUL-20

PCB-511-WT **Water**



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5149337							
WG3359635-2	LCS							
Aroclor 1242			120.2		%		60-140	13-JUL-20
Aroclor 1248			116.5		%		60-140	13-JUL-20
Aroclor 1254			112.0		%		60-140	13-JUL-20
Aroclor 1260			89.9		%		60-140	13-JUL-20
WG3359635-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	13-JUL-20
Aroclor 1248			<0.020		ug/L		0.02	13-JUL-20
Aroclor 1254			<0.020		ug/L		0.02	13-JUL-20
Aroclor 1260			<0.020		ug/L		0.02	13-JUL-20
Surrogate: Decachlorobiphenyl			91.0		%		50-150	13-JUL-20
Surrogate: Tetrachloro-m-xylene			75.3		%		50-150	13-JUL-20
VOC-511-HS-WT		Water						
Batch	R5151425							
WG3361086-4	DUP		WG3361086-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	14-JUL-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	14-JUL-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	14-JUL-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	14-JUL-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	14-JUL-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5151425							
WG3361086-4	DUP	WG3361086-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	14-JUL-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	14-JUL-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	14-JUL-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	14-JUL-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	14-JUL-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	14-JUL-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	14-JUL-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	14-JUL-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	14-JUL-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	14-JUL-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	14-JUL-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	14-JUL-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
WG3361086-1	LCS							
1,1,1,2-Tetrachloroethane			101.1		%		70-130	14-JUL-20
1,1,2,2-Tetrachloroethane			101.1		%		70-130	14-JUL-20
1,1,1-Trichloroethane			105.1		%		70-130	14-JUL-20
1,1,2-Trichloroethane			105.3		%		70-130	14-JUL-20
1,1-Dichloroethane			104.2		%		70-130	14-JUL-20
1,1-Dichloroethylene			100.0		%		70-130	14-JUL-20
1,2-Dibromoethane			100.3		%		70-130	14-JUL-20
1,2-Dichlorobenzene			112.5		%		70-130	14-JUL-20
1,2-Dichloroethane			101.9		%		70-130	14-JUL-20
1,2-Dichloropropane			104.8		%		70-130	14-JUL-20
1,3-Dichlorobenzene			115.1		%		70-130	14-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5151425							
WG3361086-1	LCS							
1,4-Dichlorobenzene			116.0		%		70-130	14-JUL-20
Acetone			97.4		%		60-140	14-JUL-20
Benzene			106.0		%		70-130	14-JUL-20
Bromodichloromethane			111.5		%		70-130	14-JUL-20
Bromoform			101.0		%		70-130	14-JUL-20
Bromomethane			130.6		%		60-140	14-JUL-20
Carbon tetrachloride			99.2		%		70-130	14-JUL-20
Chlorobenzene			106.7		%		70-130	14-JUL-20
Chloroform			106.5		%		70-130	14-JUL-20
cis-1,2-Dichloroethylene			96.4		%		70-130	14-JUL-20
cis-1,3-Dichloropropene			105.5		%		70-130	14-JUL-20
Dibromochloromethane			94.2		%		70-130	14-JUL-20
Dichlorodifluoromethane			105.6		%		50-140	14-JUL-20
Ethylbenzene			106.9		%		70-130	14-JUL-20
n-Hexane			103.3		%		70-130	14-JUL-20
m+p-Xylenes			107.7		%		70-130	14-JUL-20
Methyl Ethyl Ketone			110.1		%		60-140	14-JUL-20
Methyl Isobutyl Ketone			106.6		%		60-140	14-JUL-20
Methylene Chloride			103.4		%		70-130	14-JUL-20
MTBE			106.0		%		70-130	14-JUL-20
o-Xylene			115.4		%		70-130	14-JUL-20
Styrene			107.8		%		70-130	14-JUL-20
Tetrachloroethylene			105.4		%		70-130	14-JUL-20
Toluene			106.3		%		70-130	14-JUL-20
trans-1,2-Dichloroethylene			101.7		%		70-130	14-JUL-20
trans-1,3-Dichloropropene			113.4		%		70-130	14-JUL-20
Trichloroethylene			105.7		%		70-130	14-JUL-20
Trichlorofluoromethane			99.3		%		60-140	14-JUL-20
Vinyl chloride			108.8		%		60-140	14-JUL-20
WG3361086-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	14-JUL-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	14-JUL-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	14-JUL-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	14-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5151425							
WG3361086-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	14-JUL-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	14-JUL-20
1,2-Dibromoethane			<0.20		ug/L		0.2	14-JUL-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	14-JUL-20
1,2-Dichloroethane			<0.50		ug/L		0.5	14-JUL-20
1,2-Dichloropropane			<0.50		ug/L		0.5	14-JUL-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	14-JUL-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	14-JUL-20
Acetone			<30		ug/L		30	14-JUL-20
Benzene			<0.50		ug/L		0.5	14-JUL-20
Bromodichloromethane			<2.0		ug/L		2	14-JUL-20
Bromoform			<5.0		ug/L		5	14-JUL-20
Bromomethane			<0.50		ug/L		0.5	14-JUL-20
Carbon tetrachloride			<0.20		ug/L		0.2	14-JUL-20
Chlorobenzene			<0.50		ug/L		0.5	14-JUL-20
Chloroform			<1.0		ug/L		1	14-JUL-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	14-JUL-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	14-JUL-20
Dibromochloromethane			<2.0		ug/L		2	14-JUL-20
Dichlorodifluoromethane			<2.0		ug/L		2	14-JUL-20
Ethylbenzene			<0.50		ug/L		0.5	14-JUL-20
n-Hexane			<0.50		ug/L		0.5	14-JUL-20
m+p-Xylenes			<0.40		ug/L		0.4	14-JUL-20
Methyl Ethyl Ketone			<20		ug/L		20	14-JUL-20
Methyl Isobutyl Ketone			<20		ug/L		20	14-JUL-20
Methylene Chloride			<5.0		ug/L		5	14-JUL-20
MTBE			<2.0		ug/L		2	14-JUL-20
o-Xylene			<0.30		ug/L		0.3	14-JUL-20
Styrene			<0.50		ug/L		0.5	14-JUL-20
Tetrachloroethylene			<0.50		ug/L		0.5	14-JUL-20
Toluene			<0.50		ug/L		0.5	14-JUL-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	14-JUL-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	14-JUL-20



Quality Control Report

Workorder: L2472292

Report Date: 22-JUL-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5151425							
WG3361086-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	14-JUL-20
Trichlorofluoromethane			<5.0		ug/L		5	14-JUL-20
Vinyl chloride			<0.50		ug/L		0.5	14-JUL-20
Surrogate: 1,4-Difluorobenzene			100.1		%		70-130	14-JUL-20
Surrogate: 4-Bromofluorobenzene			99.3		%		70-130	14-JUL-20
WG3361086-5 MS		WG3361086-3						
1,1,1,2-Tetrachloroethane			102.1		%		50-140	14-JUL-20
1,1,2,2-Tetrachloroethane			96.9		%		50-140	14-JUL-20
1,1,1-Trichloroethane			106.9		%		50-140	14-JUL-20
1,1,2-Trichloroethane			103.8		%		50-140	14-JUL-20
1,1-Dichloroethane			104.9		%		50-140	14-JUL-20
1,1-Dichloroethylene			101.7		%		50-140	14-JUL-20
1,2-Dibromoethane			97.8		%		50-140	14-JUL-20
1,2-Dichlorobenzene			109.9		%		50-140	14-JUL-20
1,2-Dichloroethane			99.8		%		50-140	14-JUL-20
1,2-Dichloropropane			103.9		%		50-140	14-JUL-20
1,3-Dichlorobenzene			112.6		%		50-140	14-JUL-20
1,4-Dichlorobenzene			112.9		%		50-140	14-JUL-20
Acetone			103.0		%		50-140	14-JUL-20
Benzene			105.6		%		50-140	14-JUL-20
Bromodichloromethane			110.6		%		50-140	14-JUL-20
Bromoform			98.3		%		50-140	14-JUL-20
Bromomethane			124.3		%		50-140	14-JUL-20
Carbon tetrachloride			101.5		%		50-140	14-JUL-20
Chlorobenzene			106.5		%		50-140	14-JUL-20
Chloroform			107.1		%		50-140	14-JUL-20
cis-1,2-Dichloroethylene			95.2		%		50-140	14-JUL-20
cis-1,3-Dichloropropene			93.0		%		50-140	14-JUL-20
Dibromochloromethane			93.7		%		50-140	14-JUL-20
Dichlorodifluoromethane			105.0		%		50-140	14-JUL-20
Ethylbenzene			108.2		%		50-140	14-JUL-20
n-Hexane			106.0		%		50-140	14-JUL-20
m+p-Xylenes			108.6		%		50-140	14-JUL-20
Methyl Ethyl Ketone			103.3		%		50-140	14-JUL-20



Quality Control Report

Workorder: L2472292

Report Date: 22-JUL-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5151425							
WG3361086-5 MS		WG3361086-3						
Methyl Isobutyl Ketone			98.1		%		50-140	14-JUL-20
Methylene Chloride			102.2		%		50-140	14-JUL-20
MTBE			104.7		%		50-140	14-JUL-20
o-Xylene			116.1		%		50-140	14-JUL-20
Styrene			106.2		%		50-140	14-JUL-20
Tetrachloroethylene			106.5		%		50-140	14-JUL-20
Toluene			107.9		%		50-140	14-JUL-20
trans-1,2-Dichloroethylene			100.6		%		50-140	14-JUL-20
trans-1,3-Dichloropropene			97.9		%		50-140	14-JUL-20
Trichloroethylene			105.8		%		50-140	14-JUL-20
Trichlorofluoromethane			101.7		%		50-140	14-JUL-20
Vinyl chloride			108.8		%		50-140	14-JUL-20

Quality Control Report

Workorder: L2472292

Report Date: 22-JUL-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

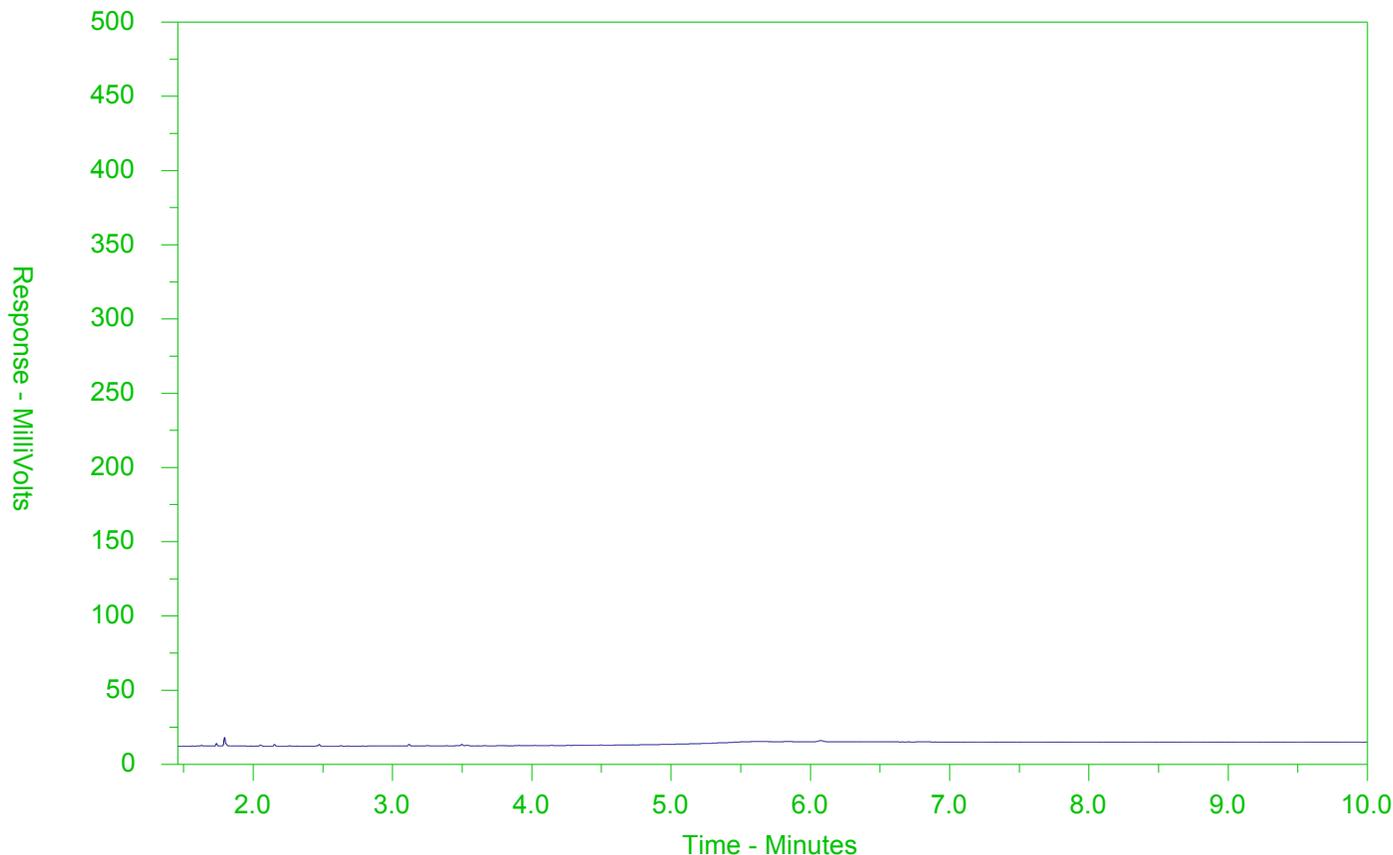
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2472292-1
 Client Sample ID: W-11210029-20200709-14



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 31-JUL-20
Report Date: 10-AUG-20 14:31 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

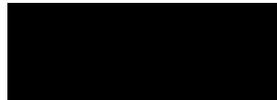
Lab Work Order #: L2482453

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2482453-1 W-11210029-20200730-20 Sampled By: CLIENT on 30-JUL-20 @ 14:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0034		0.0030	mg/L	04-AUG-20	05-AUG-20	R5174545
Total Metals							
Aluminum (Al)-Total	0.0080		0.0050	mg/L	03-AUG-20	04-AUG-20	R5174048
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Arsenic (As)-Total	0.00362		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Barium (Ba)-Total	0.0705		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	03-AUG-20	04-AUG-20	R5174048
Boron (B)-Total	0.014		0.010	mg/L	03-AUG-20	04-AUG-20	R5174048
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	03-AUG-20	04-AUG-20	R5174048
Calcium (Ca)-Total	47.8		0.050	mg/L	03-AUG-20	04-AUG-20	R5174048
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	03-AUG-20	04-AUG-20	R5174048
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	03-AUG-20	04-AUG-20	R5174048
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Copper (Cu)-Total	<0.00050		0.00050	mg/L	03-AUG-20	04-AUG-20	R5174048
Iron (Fe)-Total	0.265		0.010	mg/L	03-AUG-20	04-AUG-20	R5174048
Lead (Pb)-Total	<0.000050		0.000050	mg/L	03-AUG-20	04-AUG-20	R5174048
Lithium (Li)-Total	0.0036		0.0010	mg/L	03-AUG-20	04-AUG-20	R5174048
Magnesium (Mg)-Total	26.6		0.0050	mg/L	03-AUG-20	04-AUG-20	R5174048
Manganese (Mn)-Total	0.00761		0.00050	mg/L	03-AUG-20	04-AUG-20	R5174048
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		04-AUG-20	R5173955
Molybdenum (Mo)-Total	0.000668		0.000050	mg/L	03-AUG-20	04-AUG-20	R5174048
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	03-AUG-20	04-AUG-20	R5174048
Phosphorus (P)-Total	<0.050		0.050	mg/L	03-AUG-20	04-AUG-20	R5174048
Potassium (K)-Total	0.991		0.050	mg/L	03-AUG-20	04-AUG-20	R5174048
Rubidium (Rb)-Total	0.00038		0.00020	mg/L	03-AUG-20	04-AUG-20	R5174048
Selenium (Se)-Total	<0.000050		0.000050	mg/L	03-AUG-20	04-AUG-20	R5174048
Silicon (Si)-Total	7.43		0.10	mg/L	03-AUG-20	04-AUG-20	R5174048
Silver (Ag)-Total	<0.000050		0.000050	mg/L	03-AUG-20	04-AUG-20	R5174048
Sodium (Na)-Total	5.97		0.050	mg/L	03-AUG-20	04-AUG-20	R5174048
Strontium (Sr)-Total	0.356		0.0010	mg/L	03-AUG-20	04-AUG-20	R5174048
Sulfur (S)-Total	8.04		0.50	mg/L	03-AUG-20	04-AUG-20	R5174048
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	03-AUG-20	04-AUG-20	R5174048
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	03-AUG-20	04-AUG-20	R5174048
Thorium (Th)-Total	<0.00010		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Tin (Sn)-Total	<0.00010		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	03-AUG-20	04-AUG-20	R5174048
Tungsten (W)-Total	<0.00010		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Uranium (U)-Total	0.000397		0.000010	mg/L	03-AUG-20	04-AUG-20	R5174048
Vanadium (V)-Total	<0.00050		0.00050	mg/L	03-AUG-20	04-AUG-20	R5174048
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	03-AUG-20	04-AUG-20	R5174048

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2482453-1 W-11210029-20200730-20 Sampled By: CLIENT on 30-JUL-20 @ 14:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	03-AUG-20	04-AUG-20	R5174048
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		05-AUG-20	R5174674
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-AUG-20	R5177302
Benzene	<0.50		0.50	ug/L		10-AUG-20	R5177302
Bromodichloromethane	<2.0		2.0	ug/L		10-AUG-20	R5177302
Bromoform	<5.0		5.0	ug/L		10-AUG-20	R5177302
Bromomethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
Carbon tetrachloride	<0.20		0.20	ug/L		10-AUG-20	R5177302
Chlorobenzene	<0.50		0.50	ug/L		10-AUG-20	R5177302
Dibromochloromethane	<2.0		2.0	ug/L		10-AUG-20	R5177302
Chloroform	<1.0		1.0	ug/L		10-AUG-20	R5177302
1,2-Dibromoethane	<0.20		0.20	ug/L		10-AUG-20	R5177302
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-AUG-20	R5177302
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-AUG-20	R5177302
1,1-Dichloroethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,2-Dichloroethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-AUG-20	R5177302
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-AUG-20	R5177302
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-AUG-20	R5177302
Methylene Chloride	<5.0		5.0	ug/L		10-AUG-20	R5177302
1,2-Dichloropropane	<0.50		0.50	ug/L		10-AUG-20	R5177302
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-AUG-20	R5177302
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-AUG-20	R5177302
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-AUG-20	
Ethylbenzene	<0.50		0.50	ug/L		10-AUG-20	R5177302
n-Hexane	<0.50		0.50	ug/L		10-AUG-20	R5177302
Methyl Ethyl Ketone	<20		20	ug/L		10-AUG-20	R5177302
Methyl Isobutyl Ketone	<20		20	ug/L		10-AUG-20	R5177302
MTBE	<2.0		2.0	ug/L		10-AUG-20	R5177302
Styrene	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
Tetrachloroethylene	<0.50		0.50	ug/L		10-AUG-20	R5177302
Toluene	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
Trichloroethylene	<0.50		0.50	ug/L		10-AUG-20	R5177302

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2482453-1 W-11210029-20200730-20							
Sampled By: CLIENT on 30-JUL-20 @ 14:00							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		10-AUG-20	R5177302
Vinyl chloride	<0.50		0.50	ug/L		10-AUG-20	R5177302
o-Xylene	<0.30		0.30	ug/L		10-AUG-20	R5177302
m+p-Xylenes	<0.40		0.40	ug/L		10-AUG-20	R5177302
Xylenes (Total)	<0.50		0.50	ug/L		10-AUG-20	
Surrogate: 4-Bromofluorobenzene	100.5		70-130	%		10-AUG-20	R5177302
Surrogate: 1,4-Difluorobenzene	100.8		70-130	%		10-AUG-20	R5177302
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-AUG-20	R5177302
F1-BTEX	<25		25	ug/L		10-AUG-20	
F2 (C10-C16)	<100		100	ug/L	05-AUG-20	06-AUG-20	R5175662
F2-Naphth	<100		100	ug/L		10-AUG-20	
F3 (C16-C34)	<250		250	ug/L	05-AUG-20	06-AUG-20	R5175662
F3-PAH	<250		250	ug/L		10-AUG-20	
F4 (C34-C50)	<250		250	ug/L	05-AUG-20	06-AUG-20	R5175662
Total Hydrocarbons (C6-C50)	<370		370	ug/L		10-AUG-20	
Chrom. to baseline at nC50	YES				05-AUG-20	06-AUG-20	R5175662
Surrogate: 2-Bromobenzotrifluoride	77.2		60-140	%	05-AUG-20	06-AUG-20	R5175662
Surrogate: 3,4-Dichlorotoluene	83.4		60-140	%		10-AUG-20	R5177302
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Acenaphthylene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Anthracene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Benzo(a)anthracene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Benzo(a)pyrene	<0.010		0.010	ug/L	05-AUG-20	10-AUG-20	R5175497
Benzo(b)fluoranthene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Benzo(k)fluoranthene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Chrysene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Fluoranthene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Fluorene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		10-AUG-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
2-Methylnaphthalene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Naphthalene	<0.050		0.050	ug/L	05-AUG-20	10-AUG-20	R5175497
Phenanthrene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Pyrene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Surrogate: d10-Acenaphthene	97.3		60-140	%	05-AUG-20	10-AUG-20	R5175497
Surrogate: d12-Chrysene	84.1		60-140	%	05-AUG-20	10-AUG-20	R5175497

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2482453-1 W-11210029-20200730-20 Sampled By: CLIENT on 30-JUL-20 @ 14:00 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	94.0		60-140	%	05-AUG-20	10-AUG-20	R5175497
Surrogate: d10-Phenanthrene	94.6		60-140	%	05-AUG-20	10-AUG-20	R5175497
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
4-Chloroaniline	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
2-Chlorophenol	<0.30		0.30	ug/L	04-AUG-20	06-AUG-20	R5174850
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4-Dichlorophenol	<0.30		0.30	ug/L	04-AUG-20	06-AUG-20	R5174850
Diethylphthalate	<0.20		0.20	ug/L	04-AUG-20	06-AUG-20	R5174850
Dimethylphthalate	<0.20		0.20	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4-Dimethylphenol	<0.50		0.50	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4-Dinitrophenol	<1.0		1.0	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4-Dinitrotoluene	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
2,6-Dinitrotoluene	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	04-AUG-20	06-AUG-20	R5174850
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	04-AUG-20	06-AUG-20	R5174850
Pentachlorophenol	<0.50		0.50	ug/L	04-AUG-20	06-AUG-20	R5174850
Phenol	<0.50		0.50	ug/L	04-AUG-20	06-AUG-20	R5174850
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	04-AUG-20	06-AUG-20	R5174850
Surrogate: 2-Fluorobiphenyl	102.1		50-140	%	04-AUG-20	06-AUG-20	R5174850
Surrogate: Nitrobenzene d5	114.9		50-140	%	04-AUG-20	06-AUG-20	R5174850
Surrogate: p-Terphenyl d14	133.1		60-140	%	04-AUG-20	06-AUG-20	R5174850
Surrogate: 2,4,6-Tribromophenol	143.6	SURR-ND	50-140	%	04-AUG-20	06-AUG-20	R5174850
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	05-AUG-20	05-AUG-20	R5174435
Aroclor 1248	<0.020		0.020	ug/L	05-AUG-20	05-AUG-20	R5174435
Aroclor 1254	<0.020		0.020	ug/L	05-AUG-20	05-AUG-20	R5174435
Aroclor 1260	<0.020		0.020	ug/L	05-AUG-20	05-AUG-20	R5174435
Surrogate: Decachlorobiphenyl	109.9		50-150	%	05-AUG-20	05-AUG-20	R5174435
Total PCBs	<0.040		0.040	ug/L	05-AUG-20	05-AUG-20	R5174435
Surrogate: Tetrachloro-m-xylene	91.2		50-150	%	05-AUG-20	05-AUG-20	R5174435

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	2,4-Dinitrotoluene	LCS-H	L2482453-1
Laboratory Control Sample	Diethylphthalate	LCS-H	L2482453-1
Laboratory Control Sample	Pentachlorophenol	LCS-H	L2482453-1
Laboratory Control Sample	1,1-Dichloroethane	MES	L2482453-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2482453-1
Matrix Spike	Boron (B)-Total	MS-B	L2482453-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2482453-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2482453-1
Matrix Spike	Lithium (Li)-Total	MS-B	L2482453-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2482453-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2482453-1
Matrix Spike	Molybdenum (Mo)-Total	MS-B	L2482453-1
Matrix Spike	Potassium (K)-Total	MS-B	L2482453-1
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2482453-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2482453-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2482453-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2482453-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2482453-1
Matrix Spike	Uranium (U)-Total	MS-B	L2482453-1

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
SURR-ND	Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Reference Information

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

XYLENES-SUM-CALC- WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2482453

Report Date: 10-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5174850							
WG3375544-2	LCS							
1,2,4-Trichlorobenzene			102.8		%		50-140	06-AUG-20
2-Chlorophenol			103.6		%		50-140	06-AUG-20
2,4-Dichlorophenol			117.8		%		50-140	06-AUG-20
2,4-Dimethylphenol			115.5		%		30-130	06-AUG-20
2,4-Dinitrophenol			136.4		%		50-140	06-AUG-20
2,4-Dinitrotoluene			142.7	LCS-H	%		50-140	06-AUG-20
2,4,5-Trichlorophenol			122.5		%		50-140	06-AUG-20
2,4,6-Trichlorophenol			121.1		%		50-140	06-AUG-20
2,6-Dinitrotoluene			121.9		%		50-140	06-AUG-20
3,3'-Dichlorobenzidine			96.6		%		30-130	06-AUG-20
4-Chloroaniline			80.4		%		30-130	06-AUG-20
Biphenyl			117.1		%		50-140	06-AUG-20
Bis(2-chloroethyl)ether			119.3		%		50-140	06-AUG-20
Bis(2-chloroisopropyl)ether			135.3		%		50-140	06-AUG-20
Bis(2-ethylhexyl)phthalate			131.1		%		50-140	06-AUG-20
Diethylphthalate			142.3	LCS-H	%		50-140	06-AUG-20
Dimethylphthalate			127.8		%		50-140	06-AUG-20
Pentachlorophenol			143.5	LCS-H	%		50-140	06-AUG-20
Phenol			113.4		%		30-130	06-AUG-20
WG3375544-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	06-AUG-20
2-Chlorophenol			<0.30		ug/L		0.3	06-AUG-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	06-AUG-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	06-AUG-20
2,4-Dinitrophenol			<1.0		ug/L		1	06-AUG-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	06-AUG-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	06-AUG-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	06-AUG-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	06-AUG-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	06-AUG-20
4-Chloroaniline			<0.40		ug/L		0.4	06-AUG-20
Biphenyl			<0.40		ug/L		0.4	06-AUG-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	06-AUG-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	06-AUG-20



Quality Control Report

Workorder: L2482453

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5174850								
WG3375544-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	06-AUG-20
Diethylphthalate			<0.20		ug/L		0.2	06-AUG-20
Dimethylphthalate			<0.20		ug/L		0.2	06-AUG-20
Pentachlorophenol			<0.50		ug/L		0.5	06-AUG-20
Phenol			<0.50		ug/L		0.5	06-AUG-20
Surrogate: 2-Fluorobiphenyl			70.2		%		50-140	06-AUG-20
Surrogate: 2,4,6-Tribromophenol			69.3		%		50-140	06-AUG-20
Surrogate: Nitrobenzene d5			78.5		%		50-140	06-AUG-20
Surrogate: p-Terphenyl d14			104.3		%		60-140	06-AUG-20
CR-CR6-IC-WT Water								
Batch R5174674								
WG3375769-4 DUP								
Chromium, Hexavalent		WG3375769-3	<0.00050	RPD-NA	mg/L	N/A	20	04-AUG-20
WG3375769-2 LCS								
Chromium, Hexavalent			104.2		%		80-120	04-AUG-20
WG3375769-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	04-AUG-20
WG3375769-5 MS								
Chromium, Hexavalent		WG3375769-3	105.3		%		70-130	04-AUG-20
F1-HS-511-WT Water								
Batch R5177302								
WG3379017-4 DUP								
F1 (C6-C10)		WG3379017-3	<25	RPD-NA	ug/L	N/A	30	10-AUG-20
WG3379017-1 LCS								
F1 (C6-C10)			109.0		%		80-120	10-AUG-20
WG3379017-2 MB								
F1 (C6-C10)			<25		ug/L		25	10-AUG-20
Surrogate: 3,4-Dichlorotoluene			81.0		%		60-140	10-AUG-20
WG3379017-5 MS								
F1 (C6-C10)		WG3379017-3	97.1		%		60-140	10-AUG-20
F2-F4-511-WT Water								
Batch R5175662								
WG3376478-2 LCS								
F2 (C10-C16)			102.4		%		70-130	06-AUG-20
F3 (C16-C34)			102.9		%		70-130	06-AUG-20



Quality Control Report

Workorder: L2482453

Report Date: 10-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT								
Water								
Batch R5175662								
WG3376478-2	LCS							
F4 (C34-C50)			105.3		%		70-130	06-AUG-20
WG3376478-1	MB							
F2 (C10-C16)			<100		ug/L		100	06-AUG-20
F3 (C16-C34)			<250		ug/L		250	06-AUG-20
F4 (C34-C50)			<250		ug/L		250	06-AUG-20
Surrogate: 2-Bromobenzotrifluoride			79.7		%		60-140	06-AUG-20
HG-T-CVAA-WT								
Water								
Batch R5173955								
WG3375674-4	DUP	WG3375674-3						
Mercury (Hg)-Total		0.0000067	0.0000081		mg/L	19	20	04-AUG-20
WG3375674-2	LCS							
Mercury (Hg)-Total			108.0		%		80-120	04-AUG-20
WG3375674-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	04-AUG-20
WG3375674-6	MS	WG3375674-5						
Mercury (Hg)-Total			113.0		%		70-130	04-AUG-20
MET-T-CCMS-WT								
Water								
Batch R5174048								
WG3375503-4	DUP	WG3375503-3						
Aluminum (Al)-Total		<0.25	<0.25	RPD-NA	mg/L	N/A	20	04-AUG-20
Antimony (Sb)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-AUG-20
Arsenic (As)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-AUG-20
Barium (Ba)-Total		0.0315	0.0324		mg/L	2.7	20	04-AUG-20
Beryllium (Be)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-AUG-20
Bismuth (Bi)-Total		<0.0025	<0.0025	RPD-NA	mg/L	N/A	20	04-AUG-20
Boron (B)-Total		23.2	23.7		mg/L	1.9	20	04-AUG-20
Cadmium (Cd)-Total		<0.00025	<0.00025	RPD-NA	mg/L	N/A	20	04-AUG-20
Calcium (Ca)-Total		355	363		mg/L	2.2	20	04-AUG-20
Chromium (Cr)-Total		<0.025	<0.025	RPD-NA	mg/L	N/A	20	04-AUG-20
Cesium (Cs)-Total		<0.00050	0.00057	RPD-NA	mg/L	N/A	20	04-AUG-20
Cobalt (Co)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-AUG-20
Copper (Cu)-Total		<0.025	<0.025	RPD-NA	mg/L	N/A	20	04-AUG-20
Iron (Fe)-Total		<0.50	0.54	RPD-NA	mg/L	N/A	20	04-AUG-20
Lead (Pb)-Total		<0.0025	<0.0025	RPD-NA	mg/L	N/A	20	04-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5174048							
WG3375503-4	DUP	WG3375503-3						
Lithium (Li)-Total		0.623	0.624		mg/L	0.2	20	04-AUG-20
Magnesium (Mg)-Total		34.4	35.3		mg/L	2.6	20	04-AUG-20
Manganese (Mn)-Total		0.284	0.313		mg/L	9.7	20	04-AUG-20
Molybdenum (Mo)-Total		0.204	0.209		mg/L	2.2	20	04-AUG-20
Nickel (Ni)-Total		<0.025	<0.025	RPD-NA	mg/L	N/A	20	04-AUG-20
Phosphorus (P)-Total		<2.5	<2.5	RPD-NA	mg/L	N/A	20	04-AUG-20
Potassium (K)-Total		48.9	50.9		mg/L	4.0	20	04-AUG-20
Rubidium (Rb)-Total		0.081	0.084		mg/L	2.8	20	04-AUG-20
Selenium (Se)-Total		<0.0025	<0.0025	RPD-NA	mg/L	N/A	20	04-AUG-20
Silicon (Si)-Total		<5.0	<5.0	RPD-NA	mg/L	N/A	20	04-AUG-20
Silver (Ag)-Total		<0.0025	<0.0025	RPD-NA	mg/L	N/A	20	04-AUG-20
Sodium (Na)-Total		146	148		mg/L	1.7	20	04-AUG-20
Strontium (Sr)-Total		6.38	6.68		mg/L	4.5	20	04-AUG-20
Sulfur (S)-Total		432	442		mg/L	2.2	25	04-AUG-20
Thallium (Tl)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	04-AUG-20
Tellurium (Te)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	04-AUG-20
Thorium (Th)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	25	04-AUG-20
Tin (Sn)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-AUG-20
Titanium (Ti)-Total		<0.015	<0.015	RPD-NA	mg/L	N/A	20	04-AUG-20
Tungsten (W)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-AUG-20
Uranium (U)-Total		0.00151	0.00158		mg/L	4.7	20	04-AUG-20
Vanadium (V)-Total		<0.025	<0.025	RPD-NA	mg/L	N/A	20	04-AUG-20
Zinc (Zn)-Total		<0.15	<0.15	RPD-NA	mg/L	N/A	20	04-AUG-20
Zirconium (Zr)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	04-AUG-20
WG3375503-2	LCS							
Aluminum (Al)-Total			99.1		%		80-120	04-AUG-20
Antimony (Sb)-Total			98.6		%		80-120	04-AUG-20
Arsenic (As)-Total			97.5		%		80-120	04-AUG-20
Barium (Ba)-Total			95.7		%		80-120	04-AUG-20
Beryllium (Be)-Total			94.7		%		80-120	04-AUG-20
Bismuth (Bi)-Total			94.3		%		80-120	04-AUG-20
Boron (B)-Total			91.9		%		80-120	04-AUG-20
Cadmium (Cd)-Total			95.4		%		80-120	04-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5174048							
WG3375503-2	LCS							
Calcium (Ca)-Total			93.8		%		80-120	04-AUG-20
Chromium (Cr)-Total			97.2		%		80-120	04-AUG-20
Cesium (Cs)-Total			95.3		%		80-120	04-AUG-20
Cobalt (Co)-Total			95.5		%		80-120	04-AUG-20
Copper (Cu)-Total			94.8		%		80-120	04-AUG-20
Iron (Fe)-Total			95.4		%		80-120	04-AUG-20
Lead (Pb)-Total			96.5		%		80-120	04-AUG-20
Lithium (Li)-Total			95.7		%		80-120	04-AUG-20
Magnesium (Mg)-Total			104.3		%		80-120	04-AUG-20
Manganese (Mn)-Total			96.3		%		80-120	04-AUG-20
Molybdenum (Mo)-Total			95.0		%		80-120	04-AUG-20
Nickel (Ni)-Total			95.6		%		80-120	04-AUG-20
Phosphorus (P)-Total			105.0		%		70-130	04-AUG-20
Potassium (K)-Total			93.7		%		80-120	04-AUG-20
Rubidium (Rb)-Total			97.6		%		80-120	04-AUG-20
Selenium (Se)-Total			96.7		%		80-120	04-AUG-20
Silicon (Si)-Total			97.0		%		60-140	04-AUG-20
Silver (Ag)-Total			95.3		%		80-120	04-AUG-20
Sodium (Na)-Total			99.4		%		80-120	04-AUG-20
Strontium (Sr)-Total			98.5		%		80-120	04-AUG-20
Sulfur (S)-Total			95.3		%		80-120	04-AUG-20
Thallium (Tl)-Total			96.8		%		80-120	04-AUG-20
Tellurium (Te)-Total			90.6		%		80-120	04-AUG-20
Thorium (Th)-Total			93.0		%		70-130	04-AUG-20
Tin (Sn)-Total			93.9		%		80-120	04-AUG-20
Titanium (Ti)-Total			96.6		%		80-120	04-AUG-20
Tungsten (W)-Total			96.7		%		80-120	04-AUG-20
Uranium (U)-Total			94.6		%		80-120	04-AUG-20
Vanadium (V)-Total			98.2		%		80-120	04-AUG-20
Zinc (Zn)-Total			97.8		%		80-120	04-AUG-20
Zirconium (Zr)-Total			93.3		%		80-120	04-AUG-20
WG3375503-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	04-AUG-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	04-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5174048							
WG3375503-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	04-AUG-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	04-AUG-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	04-AUG-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	04-AUG-20
Boron (B)-Total			<0.010		mg/L		0.01	04-AUG-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	04-AUG-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	04-AUG-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	04-AUG-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	04-AUG-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	04-AUG-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	04-AUG-20
Iron (Fe)-Total			<0.010		mg/L		0.01	04-AUG-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	04-AUG-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	04-AUG-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	04-AUG-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	04-AUG-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	04-AUG-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	04-AUG-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	04-AUG-20
Potassium (K)-Total			<0.050		mg/L		0.05	04-AUG-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	04-AUG-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	04-AUG-20
Silicon (Si)-Total			<0.10		mg/L		0.1	04-AUG-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	04-AUG-20
Sodium (Na)-Total			<0.050		mg/L		0.05	04-AUG-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	04-AUG-20
Sulfur (S)-Total			<0.50		mg/L		0.5	04-AUG-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	04-AUG-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	04-AUG-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	04-AUG-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	04-AUG-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	04-AUG-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	04-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5174048							
WG3375503-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	04-AUG-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	04-AUG-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	04-AUG-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	04-AUG-20
WG3375503-5 MS		WG3375503-3						
Aluminum (Al)-Total			116.8		%		70-130	04-AUG-20
Antimony (Sb)-Total			100.7		%		70-130	04-AUG-20
Arsenic (As)-Total			102.3		%		70-130	04-AUG-20
Barium (Ba)-Total			N/A	MS-B	%		-	04-AUG-20
Beryllium (Be)-Total			90.6		%		70-130	04-AUG-20
Bismuth (Bi)-Total			96.4		%		70-130	04-AUG-20
Boron (B)-Total			N/A	MS-B	%		-	04-AUG-20
Cadmium (Cd)-Total			101.5		%		70-130	04-AUG-20
Calcium (Ca)-Total			N/A	MS-B	%		-	04-AUG-20
Chromium (Cr)-Total			100.2		%		70-130	04-AUG-20
Cesium (Cs)-Total			101.1		%		70-130	04-AUG-20
Cobalt (Co)-Total			102.1		%		70-130	04-AUG-20
Iron (Fe)-Total			N/A	MS-B	%		-	04-AUG-20
Lead (Pb)-Total			96.4		%		70-130	04-AUG-20
Lithium (Li)-Total			N/A	MS-B	%		-	04-AUG-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	04-AUG-20
Manganese (Mn)-Total			N/A	MS-B	%		-	04-AUG-20
Molybdenum (Mo)-Total			N/A	MS-B	%		-	04-AUG-20
Nickel (Ni)-Total			101.6		%		70-130	04-AUG-20
Potassium (K)-Total			N/A	MS-B	%		-	04-AUG-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	04-AUG-20
Selenium (Se)-Total			105.4		%		70-130	04-AUG-20
Silicon (Si)-Total			N/A	MS-B	%		-	04-AUG-20
Silver (Ag)-Total			99.0		%		70-130	04-AUG-20
Sodium (Na)-Total			N/A	MS-B	%		-	04-AUG-20
Strontium (Sr)-Total			N/A	MS-B	%		-	04-AUG-20
Sulfur (S)-Total			N/A	MS-B	%		-	04-AUG-20
Thallium (Tl)-Total			97.6		%		70-130	04-AUG-20
Thorium (Th)-Total			82.9		%		70-130	04-AUG-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5174048							
WG3375503-5 MS		WG3375503-3						
Tin (Sn)-Total			99.1		%		70-130	04-AUG-20
Titanium (Ti)-Total			95.8		%		70-130	04-AUG-20
Tungsten (W)-Total			101.2		%		70-130	04-AUG-20
Uranium (U)-Total			N/A	MS-B	%		-	04-AUG-20
Vanadium (V)-Total			97.9		%		70-130	04-AUG-20
Zinc (Zn)-Total			109.1		%		70-130	04-AUG-20
Zirconium (Zr)-Total			80.8		%		70-130	04-AUG-20
P-T-COL-WT								
	Water							
Batch	R5174545							
WG3375010-3 DUP		L2482453-1						
Phosphorus, Total		0.0034	0.0038		mg/L	11	20	05-AUG-20
WG3375010-2 LCS								
Phosphorus, Total			100.8		%		80-120	05-AUG-20
WG3375010-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	05-AUG-20
WG3375010-4 MS		L2482453-1						
Phosphorus, Total			99.0		%		70-130	05-AUG-20
PAH-511-WT								
	Water							
Batch	R5175497							
WG3376478-2 LCS								
1-Methylnaphthalene			104.7		%		50-140	06-AUG-20
2-Methylnaphthalene			104.1		%		50-140	06-AUG-20
Acenaphthene			122.3		%		50-140	06-AUG-20
Acenaphthylene			114.5		%		50-140	06-AUG-20
Anthracene			121.1		%		50-140	06-AUG-20
Benzo(a)anthracene			130.7		%		50-140	06-AUG-20
Benzo(a)pyrene			118.8		%		50-140	06-AUG-20
Benzo(b)fluoranthene			133.5		%		50-140	06-AUG-20
Benzo(g,h,i)perylene			134.2		%		50-140	06-AUG-20
Benzo(k)fluoranthene			125.4		%		50-140	06-AUG-20
Chrysene			134.2		%		50-140	06-AUG-20
Dibenzo(ah)anthracene			111.5		%		50-140	06-AUG-20
Fluoranthene			126.6		%		50-140	06-AUG-20
Fluorene			119.8		%		50-140	06-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT		Water						
Batch	R5175497							
WG3376478-2	LCS							
Indeno(1,2,3-cd)pyrene			134.2		%		50-140	06-AUG-20
Naphthalene			108.9		%		50-140	06-AUG-20
Phenanthrene			125.0		%		50-140	06-AUG-20
Pyrene			128.7		%		50-140	06-AUG-20
WG3376478-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	06-AUG-20
2-Methylnaphthalene			<0.020		ug/L		0.02	06-AUG-20
Acenaphthene			<0.020		ug/L		0.02	06-AUG-20
Acenaphthylene			<0.020		ug/L		0.02	06-AUG-20
Anthracene			<0.020		ug/L		0.02	06-AUG-20
Benzo(a)anthracene			<0.020		ug/L		0.02	06-AUG-20
Benzo(a)pyrene			<0.010		ug/L		0.01	06-AUG-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	06-AUG-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	06-AUG-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	06-AUG-20
Chrysene			<0.020		ug/L		0.02	06-AUG-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	06-AUG-20
Fluoranthene			<0.020		ug/L		0.02	06-AUG-20
Fluorene			<0.020		ug/L		0.02	06-AUG-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	06-AUG-20
Naphthalene			<0.050		ug/L		0.05	06-AUG-20
Phenanthrene			<0.020		ug/L		0.02	06-AUG-20
Pyrene			<0.020		ug/L		0.02	06-AUG-20
Surrogate: d8-Naphthalene			97.5		%		60-140	06-AUG-20
Surrogate: d10-Phenanthrene			96.4		%		60-140	06-AUG-20
Surrogate: d12-Chrysene			91.7		%		60-140	06-AUG-20
Surrogate: d10-Acenaphthene			98.2		%		60-140	06-AUG-20
PCB-511-WT		Water						
Batch	R5174435							
WG3375619-2	LCS							
Aroclor 1242			118.2		%		60-140	05-AUG-20
Aroclor 1248			119.8		%		60-140	05-AUG-20
Aroclor 1254			116.4		%		60-140	05-AUG-20
Aroclor 1260			93.9		%		60-140	05-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch R5174435								
WG3375619-1 MB								
Aroclor 1242			<0.020		ug/L		0.02	05-AUG-20
Aroclor 1248			<0.020		ug/L		0.02	05-AUG-20
Aroclor 1254			<0.020		ug/L		0.02	05-AUG-20
Aroclor 1260			<0.020		ug/L		0.02	05-AUG-20
Surrogate: Decachlorobiphenyl			85.6		%		50-150	05-AUG-20
Surrogate: Tetrachloro-m-xylene			85.3		%		50-150	05-AUG-20
VOC-511-HS-WT		Water						
Batch R5177302								
WG3379017-4 DUP		WG3379017-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	10-AUG-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	10-AUG-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-AUG-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-AUG-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	10-AUG-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	10-AUG-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-AUG-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-AUG-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-AUG-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5177302							
WG3379017-4	DUP	WG3379017-3						
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	10-AUG-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	10-AUG-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	10-AUG-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-AUG-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-AUG-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-AUG-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-AUG-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-AUG-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
WG3379017-1	LCS							
1,1,1,2-Tetrachloroethane			93.1		%		70-130	10-AUG-20
1,1,1,2,2-Tetrachloroethane			96.9		%		70-130	10-AUG-20
1,1,1-Trichloroethane			100.1		%		70-130	10-AUG-20
1,1,2-Trichloroethane			101.5		%		70-130	10-AUG-20
1,1-Dichloroethane			138.3	MES	%		70-130	10-AUG-20
1,1-Dichloroethylene			92.2		%		70-130	10-AUG-20
1,2-Dibromoethane			98.8		%		70-130	10-AUG-20
1,2-Dichlorobenzene			99.7		%		70-130	10-AUG-20
1,2-Dichloroethane			96.9		%		70-130	10-AUG-20
1,2-Dichloropropane			97.1		%		70-130	10-AUG-20
1,3-Dichlorobenzene			101.5		%		70-130	10-AUG-20
1,4-Dichlorobenzene			102.2		%		70-130	10-AUG-20
Acetone			114.2		%		60-140	10-AUG-20
Benzene			95.2		%		70-130	10-AUG-20
Bromodichloromethane			104.2		%		70-130	10-AUG-20
Bromoform			93.9		%		70-130	10-AUG-20



Quality Control Report

Workorder: L2482453

Report Date: 10-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5177302							
WG3379017-1	LCS							
Bromomethane			118.1		%		60-140	10-AUG-20
Carbon tetrachloride			97.3		%		70-130	10-AUG-20
Chlorobenzene			97.7		%		70-130	10-AUG-20
Chloroform			100.3		%		70-130	10-AUG-20
cis-1,2-Dichloroethylene			98.6		%		70-130	10-AUG-20
cis-1,3-Dichloropropene			95.2		%		70-130	10-AUG-20
Dibromochloromethane			94.7		%		70-130	10-AUG-20
Dichlorodifluoromethane			70.4		%		50-140	10-AUG-20
Ethylbenzene			95.4		%		70-130	10-AUG-20
n-Hexane			92.5		%		70-130	10-AUG-20
m+p-Xylenes			94.5		%		70-130	10-AUG-20
Methyl Ethyl Ketone			115.4		%		60-140	10-AUG-20
Methyl Isobutyl Ketone			101.2		%		60-140	10-AUG-20
Methylene Chloride			102.2		%		70-130	10-AUG-20
MTBE			96.9		%		70-130	10-AUG-20
o-Xylene			100.9		%		70-130	10-AUG-20
Styrene			93.9		%		70-130	10-AUG-20
Tetrachloroethylene			102.5		%		70-130	10-AUG-20
Toluene			98.2		%		70-130	10-AUG-20
trans-1,2-Dichloroethylene			96.1		%		70-130	10-AUG-20
trans-1,3-Dichloropropene			101.8		%		70-130	10-AUG-20
Trichloroethylene			100.7		%		70-130	10-AUG-20
Trichlorofluoromethane			94.9		%		60-140	10-AUG-20
Vinyl chloride			92.9		%		60-140	10-AUG-20
WG3379017-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	10-AUG-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	10-AUG-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	10-AUG-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	10-AUG-20
1,1-Dichloroethane			<0.50		ug/L		0.5	10-AUG-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	10-AUG-20
1,2-Dibromoethane			<0.20		ug/L		0.2	10-AUG-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	10-AUG-20
1,2-Dichloroethane			<0.50		ug/L		0.5	10-AUG-20



Quality Control Report

Workorder: L2482453

Report Date: 10-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5177302							
WG3379017-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	10-AUG-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	10-AUG-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	10-AUG-20
Acetone			<30		ug/L		30	10-AUG-20
Benzene			<0.50		ug/L		0.5	10-AUG-20
Bromodichloromethane			<2.0		ug/L		2	10-AUG-20
Bromoform			<5.0		ug/L		5	10-AUG-20
Bromomethane			<0.50		ug/L		0.5	10-AUG-20
Carbon tetrachloride			<0.20		ug/L		0.2	10-AUG-20
Chlorobenzene			<0.50		ug/L		0.5	10-AUG-20
Chloroform			<1.0		ug/L		1	10-AUG-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	10-AUG-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	10-AUG-20
Dibromochloromethane			<2.0		ug/L		2	10-AUG-20
Dichlorodifluoromethane			<2.0		ug/L		2	10-AUG-20
Ethylbenzene			<0.50		ug/L		0.5	10-AUG-20
n-Hexane			<0.50		ug/L		0.5	10-AUG-20
m+p-Xylenes			<0.40		ug/L		0.4	10-AUG-20
Methyl Ethyl Ketone			<20		ug/L		20	10-AUG-20
Methyl Isobutyl Ketone			<20		ug/L		20	10-AUG-20
Methylene Chloride			<5.0		ug/L		5	10-AUG-20
MTBE			<2.0		ug/L		2	10-AUG-20
o-Xylene			<0.30		ug/L		0.3	10-AUG-20
Styrene			<0.50		ug/L		0.5	10-AUG-20
Tetrachloroethylene			<0.50		ug/L		0.5	10-AUG-20
Toluene			<0.50		ug/L		0.5	10-AUG-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	10-AUG-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	10-AUG-20
Trichloroethylene			<0.50		ug/L		0.5	10-AUG-20
Trichlorofluoromethane			<5.0		ug/L		5	10-AUG-20
Vinyl chloride			<0.50		ug/L		0.5	10-AUG-20
Surrogate: 1,4-Difluorobenzene			100.3		%		70-130	10-AUG-20
Surrogate: 4-Bromofluorobenzene			98.6		%		70-130	10-AUG-20

WG3379017-5 MS

WG3379017-3



Quality Control Report

Workorder: L2482453

Report Date: 10-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5177302							
WG3379017-5 MS		WG3379017-3						
1,1,1,2-Tetrachloroethane			93.9		%		50-140	10-AUG-20
1,1,2,2-Tetrachloroethane			99.2		%		50-140	10-AUG-20
1,1,1-Trichloroethane			100.9		%		50-140	10-AUG-20
1,1,2-Trichloroethane			99.1		%		50-140	10-AUG-20
1,1-Dichloroethane			100.5		%		50-140	10-AUG-20
1,1-Dichloroethylene			90.6		%		50-140	10-AUG-20
1,2-Dibromoethane			95.8		%		50-140	10-AUG-20
1,2-Dichlorobenzene			99.5		%		50-140	10-AUG-20
1,2-Dichloroethane			92.9		%		50-140	10-AUG-20
1,2-Dichloropropane			94.9		%		50-140	10-AUG-20
1,3-Dichlorobenzene			101.7		%		50-140	10-AUG-20
1,4-Dichlorobenzene			101.8		%		50-140	10-AUG-20
Acetone			102.4		%		50-140	10-AUG-20
Benzene			94.5		%		50-140	10-AUG-20
Bromodichloromethane			102.3		%		50-140	10-AUG-20
Bromoform			92.3		%		50-140	10-AUG-20
Bromomethane			115.1		%		50-140	10-AUG-20
Carbon tetrachloride			98.8		%		50-140	10-AUG-20
Chlorobenzene			98.2		%		50-140	10-AUG-20
Chloroform			99.7		%		50-140	10-AUG-20
cis-1,2-Dichloroethylene			97.8		%		50-140	10-AUG-20
cis-1,3-Dichloropropene			91.2		%		50-140	10-AUG-20
Dibromochloromethane			93.9		%		50-140	10-AUG-20
Dichlorodifluoromethane			68.6		%		50-140	10-AUG-20
Ethylbenzene			97.5		%		50-140	10-AUG-20
n-Hexane			91.0		%		50-140	10-AUG-20
m+p-Xylenes			96.3		%		50-140	10-AUG-20
Methyl Ethyl Ketone			101.0		%		50-140	10-AUG-20
Methyl Isobutyl Ketone			92.8		%		50-140	10-AUG-20
Methylene Chloride			98.5		%		50-140	10-AUG-20
MTBE			97.3		%		50-140	10-AUG-20
o-Xylene			102.6		%		50-140	10-AUG-20
Styrene			94.2		%		50-140	10-AUG-20



Quality Control Report

Workorder: L2482453

Report Date: 10-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5177302							
WG3379017-5 MS		WG3379017-3						
Tetrachloroethylene			104.9		%		50-140	10-AUG-20
Toluene			99.3		%		50-140	10-AUG-20
trans-1,2-Dichloroethylene			94.9		%		50-140	10-AUG-20
trans-1,3-Dichloropropene			98.4		%		50-140	10-AUG-20
Trichloroethylene			100.8		%		50-140	10-AUG-20
Trichlorofluoromethane			94.1		%		50-140	10-AUG-20
Vinyl chloride			91.8		%		50-140	10-AUG-20

Quality Control Report

Workorder: L2482453

Report Date: 10-AUG-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

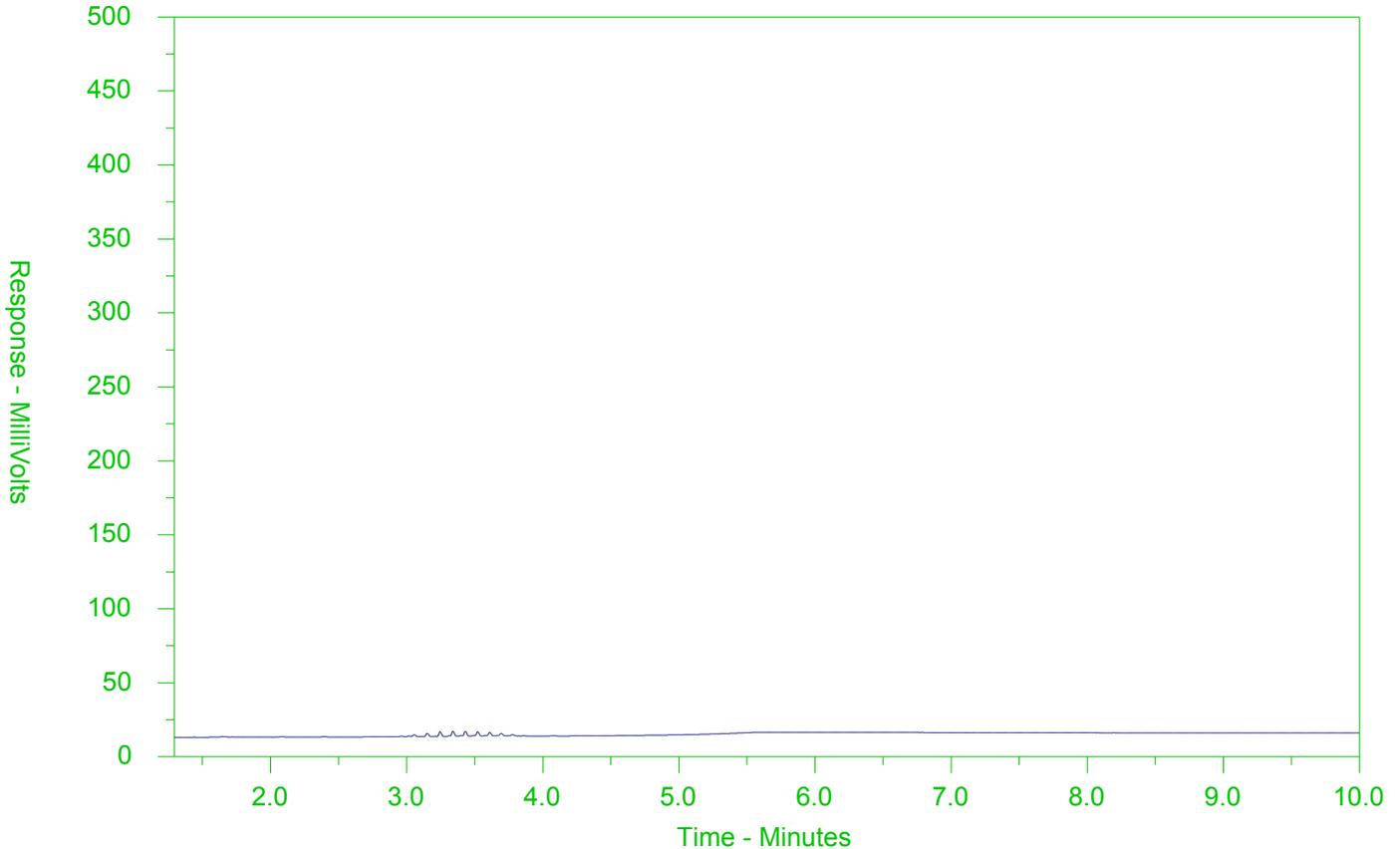
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2482453-1
 Client Sample ID: W-11210029-20200730-20



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Report To Contact and company name below will appear on the final report		Report Format /		Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)								
Company:	GHD LIMITED - ACCT #13791	Select Report Format:	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)	Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply								
Contact:	Laura Ermeta	Quality Control (QC) Report with Report	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	PRIORITY (Business Days)	4 day [P4-20%] <input type="checkbox"/>							
Phone:	519-884-0510	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked	<input type="checkbox"/>		3 day [P3-25%] <input type="checkbox"/>							
Company address below will appear on the final report		Select Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	EMERGENCY	1 Business day [E - 100%] <input type="checkbox"/>							
Street:	455 Phillip St	Email 1 or Fax	laura.ermeta@ghd.com	Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/>								
City/Province:	Waterloo, Ontario	Email 2	See PO	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm								
Postal Code:	N2L 3X2	Email 3		For tests that can not be performed according to the service level selected, you will be contacted.								
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Invoice Distribution		Analysis Request								
	Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Select Invoice Distribution:	<input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below								
Company:	GHD Limited	Email 1 or Fax	apinvoiced-735@ghd.com	NUMBER OF CONTAINERS	SAMPLES ON HOLD							
Contact:	SEE SSO	Email 2				SUSPECTED HAZARD (see Special Instructions)						
Project Information		Oil and Gas Required Fields (client use)										
ALS Account # / Quote #:	13791	AFE/Cost Center:	PO#									
Job #:	11210029	Major/Minor Code:	Routing Code:									
PO / AFE:	73520086	Requisitioner:										
LSD:		Location:										
ALS Lab Work Order # (lab use only):	L2482453	ALS Contact:	Rick H									
		Sampler:										
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)				Sample Type	Total Metals (MET-T-COMS-WT)	Total Mercury (HG-T-CVAA-WT)	Total Cr6 (CR-CR6-IC-WT)	Total Phosphorous (P-T-COL-WT)	PCBs (PCB-511-WT)
	W-11210029- 20200930 - 20	30/09/20	2pm	Water	R		R	R	R	R	R	R
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		SAMPLE CONDITION AS RECEIVED (lab use only)								
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>								
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact: Yes <input type="checkbox"/> No <input type="checkbox"/>								
				Cooling Initiated <input type="checkbox"/>								
				INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C				
								21.1				
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)				FINAL SHIPMENT RECEPTION (lab use only)						
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:	
							July 31/20	1300				



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 20-AUG-20
Report Date: 01-SEP-20 11:32 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2491984

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2491984-1 W-11210029-20200820-26 Sampled By: CLIENT on 20-AUG-20 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0038		0.0030	mg/L	21-AUG-20	24-AUG-20	R5198138
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	20-AUG-20	21-AUG-20	R5194819
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Arsenic (As)-Total	0.00280		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Barium (Ba)-Total	0.0492		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	20-AUG-20	21-AUG-20	R5194819
Boron (B)-Total	<0.010		0.010	mg/L	20-AUG-20	21-AUG-20	R5194819
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	20-AUG-20	21-AUG-20	R5194819
Calcium (Ca)-Total	68.2		0.050	mg/L	20-AUG-20	21-AUG-20	R5194819
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	20-AUG-20	21-AUG-20	R5194819
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	20-AUG-20	21-AUG-20	R5194819
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Copper (Cu)-Total	0.00222		0.00050	mg/L	20-AUG-20	21-AUG-20	R5194819
Iron (Fe)-Total	0.079		0.010	mg/L	20-AUG-20	21-AUG-20	R5194819
Lead (Pb)-Total	0.000166		0.000050	mg/L	20-AUG-20	21-AUG-20	R5194819
Lithium (Li)-Total	0.0045		0.0010	mg/L	20-AUG-20	21-AUG-20	R5194819
Magnesium (Mg)-Total	34.1		0.0050	mg/L	20-AUG-20	21-AUG-20	R5194819
Manganese (Mn)-Total	0.00968		0.00050	mg/L	20-AUG-20	21-AUG-20	R5194819
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		24-AUG-20	R5198457
Molybdenum (Mo)-Total	0.000589		0.000050	mg/L	20-AUG-20	21-AUG-20	R5194819
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	20-AUG-20	21-AUG-20	R5194819
Phosphorus (P)-Total	<0.050		0.050	mg/L	20-AUG-20	21-AUG-20	R5194819
Potassium (K)-Total	0.937		0.050	mg/L	20-AUG-20	21-AUG-20	R5194819
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	20-AUG-20	21-AUG-20	R5194819
Selenium (Se)-Total	<0.000050		0.000050	mg/L	20-AUG-20	21-AUG-20	R5194819
Silicon (Si)-Total	8.95		0.10	mg/L	20-AUG-20	21-AUG-20	R5194819
Silver (Ag)-Total	<0.000050		0.000050	mg/L	20-AUG-20	21-AUG-20	R5194819
Sodium (Na)-Total	7.88		0.050	mg/L	20-AUG-20	21-AUG-20	R5194819
Strontium (Sr)-Total	0.147		0.0010	mg/L	20-AUG-20	21-AUG-20	R5194819
Sulfur (S)-Total	20.4		0.50	mg/L	20-AUG-20	21-AUG-20	R5194819
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	20-AUG-20	21-AUG-20	R5194819
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	20-AUG-20	21-AUG-20	R5194819
Thorium (Th)-Total	<0.00010		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Tin (Sn)-Total	<0.00010		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	20-AUG-20	21-AUG-20	R5194819
Tungsten (W)-Total	<0.00010		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Uranium (U)-Total	0.000228		0.000010	mg/L	20-AUG-20	21-AUG-20	R5194819
Vanadium (V)-Total	<0.00050		0.00050	mg/L	20-AUG-20	21-AUG-20	R5194819
Zinc (Zn)-Total	0.0041		0.0030	mg/L	20-AUG-20	21-AUG-20	R5194819

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2491984-1 W-11210029-20200820-26 Sampled By: CLIENT on 20-AUG-20 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	20-AUG-20	21-AUG-20	R5194819
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		21-AUG-20	R5198664
Volatile Organic Compounds							
Acetone	<30		30	ug/L		25-AUG-20	R5199516
Benzene	<0.50		0.50	ug/L		25-AUG-20	R5199516
Bromodichloromethane	<2.0		2.0	ug/L		25-AUG-20	R5199516
Bromoform	<5.0		5.0	ug/L		25-AUG-20	R5199516
Bromomethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
Carbon tetrachloride	<0.20		0.20	ug/L		25-AUG-20	R5199516
Chlorobenzene	<0.50		0.50	ug/L		25-AUG-20	R5199516
Dibromochloromethane	<2.0		2.0	ug/L		25-AUG-20	R5199516
Chloroform	<1.0		1.0	ug/L		25-AUG-20	R5199516
1,2-Dibromoethane	<0.20		0.20	ug/L		25-AUG-20	R5199516
1,2-Dichlorobenzene	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,3-Dichlorobenzene	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,4-Dichlorobenzene	<0.50		0.50	ug/L		25-AUG-20	R5199516
Dichlorodifluoromethane	<2.0		2.0	ug/L		25-AUG-20	R5199516
1,1-Dichloroethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,2-Dichloroethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,1-Dichloroethylene	<0.50		0.50	ug/L		25-AUG-20	R5199516
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		25-AUG-20	R5199516
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		25-AUG-20	R5199516
Methylene Chloride	<5.0		5.0	ug/L		25-AUG-20	R5199516
1,2-Dichloropropane	<0.50		0.50	ug/L		25-AUG-20	R5199516
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		25-AUG-20	R5199516
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		25-AUG-20	R5199516
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		25-AUG-20	R5199516
Ethylbenzene	<0.50		0.50	ug/L		25-AUG-20	R5199516
n-Hexane	<0.50		0.50	ug/L		25-AUG-20	R5199516
Methyl Ethyl Ketone	<20		20	ug/L		25-AUG-20	R5199516
Methyl Isobutyl Ketone	<20		20	ug/L		25-AUG-20	R5199516
MTBE	<2.0		2.0	ug/L		25-AUG-20	R5199516
Styrene	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
Tetrachloroethylene	<0.50		0.50	ug/L		25-AUG-20	R5199516
Toluene	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,1,1-Trichloroethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,1,2-Trichloroethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
Trichloroethylene	<0.50		0.50	ug/L		25-AUG-20	R5199516

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2491984-1 W-11210029-20200820-26							
Sampled By: CLIENT on 20-AUG-20							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		25-AUG-20	R5199516
Vinyl chloride	<0.50		0.50	ug/L		25-AUG-20	R5199516
o-Xylene	<0.30		0.30	ug/L		25-AUG-20	R5199516
m+p-Xylenes	<0.40		0.40	ug/L		25-AUG-20	R5199516
Xylenes (Total)	<0.50		0.50	ug/L		25-AUG-20	
Surrogate: 4-Bromofluorobenzene	99.2		70-130	%		25-AUG-20	R5199516
Surrogate: 1,4-Difluorobenzene	99.6		70-130	%		25-AUG-20	R5199516
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		25-AUG-20	R5199516
F1-BTEX	<25		25	ug/L		01-SEP-20	
F2 (C10-C16)	<100		100	ug/L	21-AUG-20	24-AUG-20	R5198199
F2-Naphth	<100		100	ug/L		01-SEP-20	
F3 (C16-C34)	<250		250	ug/L	21-AUG-20	24-AUG-20	R5198199
F3-PAH	<250		250	ug/L		01-SEP-20	
F4 (C34-C50)	<250		250	ug/L	21-AUG-20	24-AUG-20	R5198199
Total Hydrocarbons (C6-C50)	<370		370	ug/L		01-SEP-20	
Chrom. to baseline at nC50	YES				21-AUG-20	24-AUG-20	R5198199
Surrogate: 2-Bromobenzotrifluoride	84.0		60-140	%	21-AUG-20	24-AUG-20	R5198199
Surrogate: 3,4-Dichlorotoluene	86.9		60-140	%		25-AUG-20	R5199516
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Acenaphthylene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Anthracene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Benzo(a)anthracene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Benzo(a)pyrene	<0.010		0.010	ug/L	23-AUG-20	25-AUG-20	R5199308
Benzo(b)fluoranthene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Benzo(k)fluoranthene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Chrysene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Fluoranthene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Fluorene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		01-SEP-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
2-Methylnaphthalene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Naphthalene	<0.050		0.050	ug/L	23-AUG-20	25-AUG-20	R5199308
Phenanthrene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Pyrene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Surrogate: d10-Acenaphthene	95.6		60-140	%	23-AUG-20	25-AUG-20	R5199308
Surrogate: d12-Chrysene	92.6		60-140	%	23-AUG-20	25-AUG-20	R5199308

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2491984-1 W-11210029-20200820-26 Sampled By: CLIENT on 20-AUG-20 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	88.7		60-140	%	23-AUG-20	25-AUG-20	R5199308
Surrogate: d10-Phenanthrene	89.2		60-140	%	23-AUG-20	25-AUG-20	R5199308
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
4-Chloroaniline	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
2-Chlorophenol	<0.30		0.30	ug/L	31-AUG-20	01-SEP-20	R5207785
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4-Dichlorophenol	<0.30		0.30	ug/L	31-AUG-20	01-SEP-20	R5207785
Diethylphthalate	0.25	RRR	0.20	ug/L	31-AUG-20	01-SEP-20	R5207785
Dimethylphthalate	<0.20		0.20	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4-Dimethylphenol	<0.50		0.50	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4-Dinitrophenol	<1.0		1.0	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4-Dinitrotoluene	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
2,6-Dinitrotoluene	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	31-AUG-20	01-SEP-20	R5207785
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	31-AUG-20	01-SEP-20	R5207785
Pentachlorophenol	<0.50		0.50	ug/L	31-AUG-20	01-SEP-20	R5207785
Phenol	<0.50		0.50	ug/L	31-AUG-20	01-SEP-20	R5207785
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	31-AUG-20	01-SEP-20	R5207785
Surrogate: 2-Fluorobiphenyl	88.5		50-140	%	31-AUG-20	01-SEP-20	R5207785
Surrogate: Nitrobenzene d5	104.0		50-140	%	31-AUG-20	01-SEP-20	R5207785
Surrogate: p-Terphenyl d14	112.0		60-140	%	31-AUG-20	01-SEP-20	R5207785
Surrogate: 2,4,6-Tribromophenol	124.7		50-140	%	31-AUG-20	01-SEP-20	R5207785
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	27-AUG-20	27-AUG-20	R5199513
Aroclor 1248	<0.020		0.020	ug/L	27-AUG-20	27-AUG-20	R5199513
Aroclor 1254	<0.020		0.020	ug/L	27-AUG-20	27-AUG-20	R5199513
Aroclor 1260	<0.020		0.020	ug/L	27-AUG-20	27-AUG-20	R5199513
Surrogate: Decachlorobiphenyl	162.2	SURR-ND	50-150	%	27-AUG-20	27-AUG-20	R5199513
Total PCBs	<0.040		0.040	ug/L	27-AUG-20	27-AUG-20	R5199513
Surrogate: Tetrachloro-m-xylene	103.9		50-150	%	27-AUG-20	27-AUG-20	R5199513
Report Remarks : RRR: Although the method blank is non-detect there is a strong peak for Diethylphthalate causing uncertainty near the detection limit, interpret as a maximum value.							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Magnesium (Mg)-Total	B	L2491984-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2491984-1
Matrix Spike	Boron (B)-Total	MS-B	L2491984-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2491984-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2491984-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2491984-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2491984-1
Matrix Spike	Potassium (K)-Total	MS-B	L2491984-1
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2491984-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2491984-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2491984-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2491984-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2491984-1
Matrix Spike	Phosphorus, Total	MS-B	L2491984-1
Matrix Spike	Vinyl chloride	MS-B	L2491984-1
Matrix Spike	cis-1,2-Dichloroethylene	MS-B	L2491984-1

Sample Parameter Qualifier key listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis
SURR-ND	Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Reference Information

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

Reference Information

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5207785							
WG3393230-2 LCS								
1,2,4-Trichlorobenzene			50.7		%		50-140	01-SEP-20
2-Chlorophenol			93.4		%		50-140	01-SEP-20
2,4-Dichlorophenol			107.1		%		50-140	01-SEP-20
2,4-Dimethylphenol			112.4		%		30-130	01-SEP-20
2,4-Dinitrophenol			110.6		%		50-140	01-SEP-20
2,4-Dinitrotoluene			134.2		%		50-140	01-SEP-20
2,4,5-Trichlorophenol			112.5		%		50-140	01-SEP-20
2,4,6-Trichlorophenol			111.1		%		50-140	01-SEP-20
2,6-Dinitrotoluene			112.3		%		50-140	01-SEP-20
3,3'-Dichlorobenzidine			87.9		%		30-130	01-SEP-20
4-Chloroaniline			74.4		%		30-130	01-SEP-20
Biphenyl			68.8		%		50-140	01-SEP-20
Bis(2-chloroethyl)ether			101.6		%		50-140	01-SEP-20
Bis(2-chloroisopropyl)ether			86.0		%		50-140	01-SEP-20
Bis(2-ethylhexyl)phthalate			129.8		%		50-140	01-SEP-20
Diethylphthalate			113.6		%		50-140	01-SEP-20
Dimethylphthalate			108.0		%		50-140	01-SEP-20
Pentachlorophenol			135.2		%		50-140	01-SEP-20
Phenol			107.7		%		30-130	01-SEP-20
WG3393230-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	01-SEP-20
2-Chlorophenol			<0.30		ug/L		0.3	01-SEP-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	01-SEP-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	01-SEP-20
2,4-Dinitrophenol			<1.0		ug/L		1	01-SEP-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	01-SEP-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	01-SEP-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	01-SEP-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	01-SEP-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	01-SEP-20
4-Chloroaniline			<0.40		ug/L		0.4	01-SEP-20
Biphenyl			<0.40		ug/L		0.4	01-SEP-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	01-SEP-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	01-SEP-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
625-511-WT Water									
Batch R5207785									
WG3393230-1 MB									
			<2.0		ug/L		2	01-SEP-20	
			<0.20		ug/L		0.2	01-SEP-20	
			<0.20		ug/L		0.2	01-SEP-20	
			<0.50		ug/L		0.5	01-SEP-20	
			<0.50		ug/L		0.5	01-SEP-20	
			120.9		%		50-140	01-SEP-20	
			91.9		%		50-140	01-SEP-20	
			118.4		%		50-140	01-SEP-20	
			126.9		%		60-140	01-SEP-20	
CR-CR6-IC-WT Water									
Batch R5198664									
WG3388497-4 DUP									
		WG3388497-3	0.00260	0.00263	mg/L	1.3	20	21-AUG-20	
WG3388497-2 LCS									
			97.4		%		80-120	21-AUG-20	
WG3388497-1 MB									
			<0.00050		mg/L		0.0005	21-AUG-20	
WG3388497-5 MS									
		WG3388497-3	95.6		%		70-130	21-AUG-20	
F1-HS-511-WT Water									
Batch R5199516									
WG3389487-4 DUP									
		WG3389487-3	<25	<25	ug/L	RPD-NA	N/A	30	25-AUG-20
WG3389487-1 LCS									
			99.1		%		80-120	24-AUG-20	
WG3389487-2 MB									
			<25		ug/L		25	25-AUG-20	
			106.1		%		60-140	25-AUG-20	
WG3389487-5 MS									
		WG3389487-3	73.4		%		60-140	25-AUG-20	
F2-F4-511-WT Water									
Batch R5198199									
WG3388197-2 LCS									
			89.8		%		70-130	24-AUG-20	
			98.2		%		70-130	24-AUG-20	



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
F2-F4-511-WT									
Water									
Batch R5198199									
WG3388197-2 LCS									
F4 (C34-C50)			108.7		%		70-130	24-AUG-20	
WG3388197-1 MB									
F2 (C10-C16)			<100		ug/L		100	24-AUG-20	
F3 (C16-C34)			<250		ug/L		250	24-AUG-20	
F4 (C34-C50)			<250		ug/L		250	24-AUG-20	
Surrogate: 2-Bromobenzotrifluoride			65.7		%		60-140	24-AUG-20	
HG-T-CVAA-WT									
Water									
Batch R5198457									
WG3388657-4 DUP									
Mercury (Hg)-Total		WG3388657-3	<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	24-AUG-20
WG3388657-2 LCS									
Mercury (Hg)-Total			117.0		%		80-120	24-AUG-20	
WG3388657-1 MB									
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	24-AUG-20	
WG3388657-6 MS									
Mercury (Hg)-Total		WG3388657-5	105.4		%		70-130	24-AUG-20	
MET-T-CCMS-WT									
Water									
Batch R5194819									
WG3388104-4 DUP									
Aluminum (Al)-Total		WG3388104-3	0.0106	0.0108		mg/L	2.0	20	21-AUG-20
Antimony (Sb)-Total			0.00035	0.00034		mg/L	1.5	20	21-AUG-20
Arsenic (As)-Total			0.00076	0.00073		mg/L	4.0	20	21-AUG-20
Barium (Ba)-Total			0.104	0.104		mg/L	0.4	20	21-AUG-20
Beryllium (Be)-Total			<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-AUG-20
Bismuth (Bi)-Total			<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-AUG-20
Boron (B)-Total			0.067	0.067		mg/L	0.1	20	21-AUG-20
Cadmium (Cd)-Total			0.0000084	0.0000097		mg/L	14	20	21-AUG-20
Calcium (Ca)-Total			47.1	46.5		mg/L	1.1	20	21-AUG-20
Chromium (Cr)-Total			<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-AUG-20
Cesium (Cs)-Total			0.000156	0.000154		mg/L	0.9	20	21-AUG-20
Cobalt (Co)-Total			0.00053	0.00052		mg/L	3.1	20	21-AUG-20
Copper (Cu)-Total			<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-AUG-20
Iron (Fe)-Total			0.162	0.154		mg/L	4.6	20	21-AUG-20
Lead (Pb)-Total			<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5194819							
WG3388104-4	DUP	WG3388104-3						
Lithium (Li)-Total		0.0058	0.0058		mg/L	0.2	20	21-AUG-20
Magnesium (Mg)-Total		14.6	14.3		mg/L	1.9	20	21-AUG-20
Manganese (Mn)-Total		0.140	0.138		mg/L	1.5	20	21-AUG-20
Molybdenum (Mo)-Total		0.00394	0.00398		mg/L	1.1	20	21-AUG-20
Nickel (Ni)-Total		0.00218	0.00219		mg/L	0.4	20	21-AUG-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	21-AUG-20
Potassium (K)-Total		3.72	3.35		mg/L	10	20	21-AUG-20
Rubidium (Rb)-Total		0.00606	0.00587		mg/L	3.3	20	21-AUG-20
Selenium (Se)-Total		0.000120	0.000122		mg/L	1.5	20	21-AUG-20
Silicon (Si)-Total		2.40	2.38		mg/L	0.7	20	21-AUG-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-AUG-20
Sodium (Na)-Total		46.8	46.4		mg/L	1.0	20	21-AUG-20
Strontium (Sr)-Total		0.312	0.308		mg/L	1.5	20	21-AUG-20
Sulfur (S)-Total		25.8	25.6		mg/L	0.7	25	21-AUG-20
Thallium (Tl)-Total		0.000019	0.000019		mg/L	2.7	20	21-AUG-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	21-AUG-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	21-AUG-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-AUG-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	21-AUG-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-AUG-20
Uranium (U)-Total		0.000056	0.000058		mg/L	2.1	20	21-AUG-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-AUG-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	21-AUG-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	21-AUG-20
WG3388104-2	LCS							
Aluminum (Al)-Total			104.4		%		80-120	21-AUG-20
Antimony (Sb)-Total			100.1		%		80-120	21-AUG-20
Arsenic (As)-Total			100.4		%		80-120	21-AUG-20
Barium (Ba)-Total			100.5		%		80-120	21-AUG-20
Beryllium (Be)-Total			103.5		%		80-120	21-AUG-20
Bismuth (Bi)-Total			98.8		%		80-120	21-AUG-20
Boron (B)-Total			100.7		%		80-120	21-AUG-20
Cadmium (Cd)-Total			101.8		%		80-120	21-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5194819							
WG3388104-2	LCS							
Calcium (Ca)-Total			101.6		%		80-120	21-AUG-20
Chromium (Cr)-Total			102.1		%		80-120	21-AUG-20
Cesium (Cs)-Total			97.3		%		80-120	21-AUG-20
Cobalt (Co)-Total			99.5		%		80-120	21-AUG-20
Copper (Cu)-Total			100.2		%		80-120	21-AUG-20
Iron (Fe)-Total			96.7		%		80-120	21-AUG-20
Lead (Pb)-Total			101.4		%		80-120	21-AUG-20
Lithium (Li)-Total			106.6		%		80-120	21-AUG-20
Magnesium (Mg)-Total			106.7		%		80-120	21-AUG-20
Manganese (Mn)-Total			102.2		%		80-120	21-AUG-20
Molybdenum (Mo)-Total			100.8		%		80-120	21-AUG-20
Nickel (Ni)-Total			100.5		%		80-120	21-AUG-20
Phosphorus (P)-Total			105.0		%		70-130	21-AUG-20
Potassium (K)-Total			101.8		%		80-120	21-AUG-20
Rubidium (Rb)-Total			100.6		%		80-120	21-AUG-20
Selenium (Se)-Total			101.6		%		80-120	21-AUG-20
Silicon (Si)-Total			104.6		%		60-140	21-AUG-20
Silver (Ag)-Total			97.5		%		80-120	21-AUG-20
Sodium (Na)-Total			107.2		%		80-120	21-AUG-20
Strontium (Sr)-Total			97.0		%		80-120	21-AUG-20
Sulfur (S)-Total			96.4		%		80-120	21-AUG-20
Thallium (Tl)-Total			96.1		%		80-120	21-AUG-20
Tellurium (Te)-Total			96.4		%		80-120	21-AUG-20
Thorium (Th)-Total			97.1		%		70-130	21-AUG-20
Tin (Sn)-Total			97.2		%		80-120	21-AUG-20
Titanium (Ti)-Total			99.99		%		80-120	21-AUG-20
Tungsten (W)-Total			101.5		%		80-120	21-AUG-20
Uranium (U)-Total			98.4		%		80-120	21-AUG-20
Vanadium (V)-Total			102.4		%		80-120	21-AUG-20
Zinc (Zn)-Total			101.4		%		80-120	21-AUG-20
Zirconium (Zr)-Total			95.3		%		80-120	21-AUG-20
WG3388104-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	21-AUG-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	21-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5194819							
WG3388104-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	21-AUG-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	21-AUG-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	21-AUG-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	21-AUG-20
Boron (B)-Total			<0.010		mg/L		0.01	21-AUG-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	21-AUG-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	21-AUG-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	21-AUG-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	21-AUG-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	21-AUG-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	21-AUG-20
Iron (Fe)-Total			<0.010		mg/L		0.01	21-AUG-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	21-AUG-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	21-AUG-20
Magnesium (Mg)-Total			0.0066	B	mg/L		0.005	21-AUG-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	21-AUG-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	21-AUG-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	21-AUG-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	21-AUG-20
Potassium (K)-Total			<0.050		mg/L		0.05	21-AUG-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	21-AUG-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	21-AUG-20
Silicon (Si)-Total			<0.10		mg/L		0.1	21-AUG-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	21-AUG-20
Sodium (Na)-Total			<0.050		mg/L		0.05	21-AUG-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	21-AUG-20
Sulfur (S)-Total			<0.50		mg/L		0.5	21-AUG-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	21-AUG-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	21-AUG-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	21-AUG-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	21-AUG-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	21-AUG-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	21-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5194819							
WG3388104-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	21-AUG-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	21-AUG-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	21-AUG-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	21-AUG-20
WG3388104-5 MS		WG3388104-3						
Aluminum (Al)-Total			97.8		%		70-130	21-AUG-20
Antimony (Sb)-Total			100.9		%		70-130	21-AUG-20
Arsenic (As)-Total			97.2		%		70-130	21-AUG-20
Barium (Ba)-Total			N/A	MS-B	%		-	21-AUG-20
Beryllium (Be)-Total			99.0		%		70-130	21-AUG-20
Bismuth (Bi)-Total			90.0		%		70-130	21-AUG-20
Boron (B)-Total			N/A	MS-B	%		-	21-AUG-20
Cadmium (Cd)-Total			97.1		%		70-130	21-AUG-20
Calcium (Ca)-Total			N/A	MS-B	%		-	21-AUG-20
Chromium (Cr)-Total			98.6		%		70-130	21-AUG-20
Cesium (Cs)-Total			92.1		%		70-130	21-AUG-20
Cobalt (Co)-Total			93.2		%		70-130	21-AUG-20
Copper (Cu)-Total			95.1		%		70-130	21-AUG-20
Iron (Fe)-Total			N/A	MS-B	%		-	21-AUG-20
Lead (Pb)-Total			91.7		%		70-130	21-AUG-20
Lithium (Li)-Total			94.7		%		70-130	21-AUG-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	21-AUG-20
Manganese (Mn)-Total			N/A	MS-B	%		-	21-AUG-20
Molybdenum (Mo)-Total			97.2		%		70-130	21-AUG-20
Nickel (Ni)-Total			94.2		%		70-130	21-AUG-20
Phosphorus (P)-Total			99.4		%		70-130	21-AUG-20
Potassium (K)-Total			N/A	MS-B	%		-	21-AUG-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	21-AUG-20
Selenium (Se)-Total			99.8		%		70-130	21-AUG-20
Silicon (Si)-Total			N/A	MS-B	%		-	21-AUG-20
Silver (Ag)-Total			91.3		%		70-130	21-AUG-20
Sodium (Na)-Total			N/A	MS-B	%		-	21-AUG-20
Strontium (Sr)-Total			N/A	MS-B	%		-	21-AUG-20
Sulfur (S)-Total			N/A	MS-B	%		-	21-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5194819							
WG3388104-5 MS		WG3388104-3						
Thallium (Tl)-Total			89.5		%		70-130	21-AUG-20
Tellurium (Te)-Total			92.4		%		70-130	21-AUG-20
Thorium (Th)-Total			89.5		%		70-130	21-AUG-20
Tin (Sn)-Total			93.7		%		70-130	21-AUG-20
Titanium (Ti)-Total			95.6		%		70-130	21-AUG-20
Tungsten (W)-Total			96.3		%		70-130	21-AUG-20
Uranium (U)-Total			91.9		%		70-130	21-AUG-20
Vanadium (V)-Total			99.5		%		70-130	21-AUG-20
Zinc (Zn)-Total			95.7		%		70-130	21-AUG-20
Zirconium (Zr)-Total			91.0		%		70-130	21-AUG-20
P-T-COL-WT								
	Water							
Batch	R5198138							
WG3387257-3 DUP		L2491529-1						
Phosphorus, Total		0.232	0.223		mg/L	3.7	20	24-AUG-20
WG3387257-2 LCS								
Phosphorus, Total			96.9		%		80-120	24-AUG-20
WG3387257-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	24-AUG-20
WG3387257-4 MS		L2491529-1						
Phosphorus, Total			N/A	MS-B	%		-	24-AUG-20
PAH-511-WT								
	Water							
Batch	R5199308							
WG3389415-2 LCS								
1-Methylnaphthalene			94.2		%		50-140	24-AUG-20
2-Methylnaphthalene			88.0		%		50-140	24-AUG-20
Acenaphthene			100.7		%		50-140	24-AUG-20
Acenaphthylene			98.1		%		50-140	24-AUG-20
Anthracene			107.4		%		50-140	24-AUG-20
Benzo(a)anthracene			106.0		%		50-140	24-AUG-20
Benzo(a)pyrene			95.8		%		50-140	24-AUG-20
Benzo(b)fluoranthene			82.2		%		50-140	24-AUG-20
Benzo(g,h,i)perylene			98.3		%		50-140	24-AUG-20
Benzo(k)fluoranthene			88.9		%		50-140	24-AUG-20
Chrysene			111.6		%		50-140	24-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5199308							
WG3389415-2	LCS							
Dibenzo(ah)anthracene			101.3		%		50-140	24-AUG-20
Fluoranthene			101.7		%		50-140	24-AUG-20
Fluorene			100.0		%		50-140	24-AUG-20
Indeno(1,2,3-cd)pyrene			109.3		%		50-140	24-AUG-20
Naphthalene			94.3		%		50-140	24-AUG-20
Phenanthrene			103.4		%		50-140	24-AUG-20
Pyrene			103.7		%		50-140	24-AUG-20
WG3389415-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	24-AUG-20
2-Methylnaphthalene			<0.020		ug/L		0.02	24-AUG-20
Acenaphthene			<0.020		ug/L		0.02	24-AUG-20
Acenaphthylene			<0.020		ug/L		0.02	24-AUG-20
Anthracene			<0.020		ug/L		0.02	24-AUG-20
Benzo(a)anthracene			<0.020		ug/L		0.02	24-AUG-20
Benzo(a)pyrene			<0.010		ug/L		0.01	24-AUG-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	24-AUG-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	24-AUG-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	24-AUG-20
Chrysene			<0.020		ug/L		0.02	24-AUG-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	24-AUG-20
Fluoranthene			<0.020		ug/L		0.02	24-AUG-20
Fluorene			<0.020		ug/L		0.02	24-AUG-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	24-AUG-20
Naphthalene			<0.050		ug/L		0.05	24-AUG-20
Phenanthrene			<0.020		ug/L		0.02	24-AUG-20
Pyrene			<0.020		ug/L		0.02	24-AUG-20
Surrogate: d8-Naphthalene			95.0		%		60-140	24-AUG-20
Surrogate: d10-Phenanthrene			103.6		%		60-140	24-AUG-20
Surrogate: d12-Chrysene			107.3		%		60-140	24-AUG-20
Surrogate: d10-Acenaphthene			105.9		%		60-140	24-AUG-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5199513							
WG3387743-2	LCS							
Aroclor 1242			105.9		%		60-140	25-AUG-20
Aroclor 1248			96.9		%		60-140	25-AUG-20
Aroclor 1254			99.2		%		60-140	25-AUG-20
Aroclor 1260			81.1		%		60-140	25-AUG-20
WG3387743-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	25-AUG-20
Aroclor 1248			<0.020		ug/L		0.02	25-AUG-20
Aroclor 1254			<0.020		ug/L		0.02	25-AUG-20
Aroclor 1260			<0.020		ug/L		0.02	25-AUG-20
Surrogate: Decachlorobiphenyl			118.0		%		50-150	25-AUG-20
Surrogate: Tetrachloro-m-xylene			90.0		%		50-150	25-AUG-20
VOC-511-HS-WT		Water						
Batch	R5199516							
WG3389487-4	DUP		WG3389487-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,1-Dichloroethane		0.53	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	25-AUG-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	25-AUG-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-AUG-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	25-AUG-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	25-AUG-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5199516							
WG3389487-4	DUP	WG3389487-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	25-AUG-20
cis-1,2-Dichloroethylene		131	129		ug/L	1.1	30	25-AUG-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-AUG-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-AUG-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-AUG-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	25-AUG-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	25-AUG-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	25-AUG-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	25-AUG-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-AUG-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-AUG-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
trans-1,2-Dichloroethylene		1.70	1.66		ug/L	2.4	30	25-AUG-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-AUG-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	25-AUG-20
Vinyl chloride		855	854		ug/L	0.1	30	25-AUG-20
WG3389487-1	LCS							
1,1,1,2-Tetrachloroethane			96.3		%		70-130	24-AUG-20
1,1,2,2-Tetrachloroethane			95.1		%		70-130	24-AUG-20
1,1,1-Trichloroethane			96.9		%		70-130	24-AUG-20
1,1,2-Trichloroethane			97.0		%		70-130	24-AUG-20
1,1-Dichloroethane			98.9		%		70-130	24-AUG-20
1,1-Dichloroethylene			92.9		%		70-130	24-AUG-20
1,2-Dibromoethane			99.2		%		70-130	24-AUG-20
1,2-Dichlorobenzene			95.5		%		70-130	24-AUG-20
1,2-Dichloroethane			100.2		%		70-130	24-AUG-20
1,2-Dichloropropane			99.5		%		70-130	24-AUG-20
1,3-Dichlorobenzene			93.0		%		70-130	24-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5199516							
WG3389487-1	LCS							
1,4-Dichlorobenzene			93.1		%		70-130	24-AUG-20
Acetone			114.1		%		60-140	24-AUG-20
Benzene			99.1		%		70-130	24-AUG-20
Bromodichloromethane			105.4		%		70-130	24-AUG-20
Bromoform			98.1		%		70-130	24-AUG-20
Bromomethane			111.5		%		60-140	24-AUG-20
Carbon tetrachloride			96.9		%		70-130	24-AUG-20
Chlorobenzene			95.4		%		70-130	24-AUG-20
Chloroform			101.0		%		70-130	24-AUG-20
cis-1,2-Dichloroethylene			91.5		%		70-130	24-AUG-20
cis-1,3-Dichloropropene			88.5		%		70-130	24-AUG-20
Dibromochloromethane			95.8		%		70-130	24-AUG-20
Dichlorodifluoromethane			86.1		%		50-140	24-AUG-20
Ethylbenzene			93.3		%		70-130	24-AUG-20
n-Hexane			94.5		%		70-130	24-AUG-20
m+p-Xylenes			93.2		%		70-130	24-AUG-20
Methyl Ethyl Ketone			106.2		%		60-140	24-AUG-20
Methyl Isobutyl Ketone			98.8		%		60-140	24-AUG-20
Methylene Chloride			99.6		%		70-130	24-AUG-20
MTBE			94.6		%		70-130	24-AUG-20
o-Xylene			101.2		%		70-130	24-AUG-20
Styrene			96.4		%		70-130	24-AUG-20
Tetrachloroethylene			97.3		%		70-130	24-AUG-20
Toluene			94.1		%		70-130	24-AUG-20
trans-1,2-Dichloroethylene			92.9		%		70-130	24-AUG-20
trans-1,3-Dichloropropene			100.2		%		70-130	24-AUG-20
Trichloroethylene			98.2		%		70-130	24-AUG-20
Trichlorofluoromethane			89.7		%		60-140	24-AUG-20
Vinyl chloride			101.4		%		60-140	24-AUG-20
WG3389487-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	25-AUG-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	25-AUG-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	25-AUG-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	25-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5199516							
WG3389487-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	25-AUG-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	25-AUG-20
1,2-Dibromoethane			<0.20		ug/L		0.2	25-AUG-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	25-AUG-20
1,2-Dichloroethane			<0.50		ug/L		0.5	25-AUG-20
1,2-Dichloropropane			<0.50		ug/L		0.5	25-AUG-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	25-AUG-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	25-AUG-20
Acetone			<30		ug/L		30	25-AUG-20
Benzene			<0.50		ug/L		0.5	25-AUG-20
Bromodichloromethane			<2.0		ug/L		2	25-AUG-20
Bromoform			<5.0		ug/L		5	25-AUG-20
Bromomethane			<0.50		ug/L		0.5	25-AUG-20
Carbon tetrachloride			<0.20		ug/L		0.2	25-AUG-20
Chlorobenzene			<0.50		ug/L		0.5	25-AUG-20
Chloroform			<1.0		ug/L		1	25-AUG-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	25-AUG-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	25-AUG-20
Dibromochloromethane			<2.0		ug/L		2	25-AUG-20
Dichlorodifluoromethane			<2.0		ug/L		2	25-AUG-20
Ethylbenzene			<0.50		ug/L		0.5	25-AUG-20
n-Hexane			<0.50		ug/L		0.5	25-AUG-20
m+p-Xylenes			<0.40		ug/L		0.4	25-AUG-20
Methyl Ethyl Ketone			<20		ug/L		20	25-AUG-20
Methyl Isobutyl Ketone			<20		ug/L		20	25-AUG-20
Methylene Chloride			<5.0		ug/L		5	25-AUG-20
MTBE			<2.0		ug/L		2	25-AUG-20
o-Xylene			<0.30		ug/L		0.3	25-AUG-20
Styrene			<0.50		ug/L		0.5	25-AUG-20
Tetrachloroethylene			<0.50		ug/L		0.5	25-AUG-20
Toluene			<0.50		ug/L		0.5	25-AUG-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	25-AUG-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	25-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5199516							
WG3389487-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	25-AUG-20
Trichlorofluoromethane			<5.0		ug/L		5	25-AUG-20
Vinyl chloride			<0.50		ug/L		0.5	25-AUG-20
Surrogate: 1,4-Difluorobenzene			100.1		%		70-130	25-AUG-20
Surrogate: 4-Bromofluorobenzene			99.6		%		70-130	25-AUG-20
WG3389487-5 MS		WG3389487-3						
1,1,1,2-Tetrachloroethane			96.3		%		50-140	25-AUG-20
1,1,1,2-Tetrachloroethane			81.5		%		50-140	25-AUG-20
1,1,1-Trichloroethane			100.4		%		50-140	25-AUG-20
1,1,2-Trichloroethane			89.0		%		50-140	25-AUG-20
1,1-Dichloroethane			97.8		%		50-140	25-AUG-20
1,1-Dichloroethylene			92.3		%		50-140	25-AUG-20
1,2-Dibromoethane			88.8		%		50-140	25-AUG-20
1,2-Dichlorobenzene			95.7		%		50-140	25-AUG-20
1,2-Dichloroethane			90.7		%		50-140	25-AUG-20
1,2-Dichloropropane			95.1		%		50-140	25-AUG-20
1,3-Dichlorobenzene			97.1		%		50-140	25-AUG-20
1,4-Dichlorobenzene			95.5		%		50-140	25-AUG-20
Acetone			97.5		%		50-140	25-AUG-20
Benzene			97.5		%		50-140	25-AUG-20
Bromodichloromethane			100.7		%		50-140	25-AUG-20
Bromoform			87.7		%		50-140	25-AUG-20
Bromomethane			104.4		%		50-140	25-AUG-20
Carbon tetrachloride			101.4		%		50-140	25-AUG-20
Chlorobenzene			95.2		%		50-140	25-AUG-20
Chloroform			100.0		%		50-140	25-AUG-20
cis-1,2-Dichloroethylene			N/A	MS-B	%		-	25-AUG-20
cis-1,3-Dichloropropene			80.8		%		50-140	25-AUG-20
Dibromochloromethane			89.6		%		50-140	25-AUG-20
Dichlorodifluoromethane			76.5		%		50-140	25-AUG-20
Ethylbenzene			96.9		%		50-140	25-AUG-20
n-Hexane			94.2		%		50-140	25-AUG-20
m+p-Xylenes			96.1		%		50-140	25-AUG-20
Methyl Ethyl Ketone			83.9		%		50-140	25-AUG-20



Quality Control Report

Workorder: L2491984

Report Date: 01-SEP-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5199516							
WG3389487-5 MS		WG3389487-3						
Methyl Isobutyl Ketone			77.5		%		50-140	25-AUG-20
Methylene Chloride			93.7		%		50-140	25-AUG-20
MTBE			94.6		%		50-140	25-AUG-20
o-Xylene			103.5		%		50-140	25-AUG-20
Styrene			94.2		%		50-140	25-AUG-20
Tetrachloroethylene			102.7		%		50-140	25-AUG-20
Toluene			96.2		%		50-140	25-AUG-20
trans-1,2-Dichloroethylene			90.4		%		50-140	25-AUG-20
trans-1,3-Dichloropropene			91.3		%		50-140	25-AUG-20
Trichloroethylene			100.3		%		50-140	25-AUG-20
Trichlorofluoromethane			90.7		%		50-140	25-AUG-20
Vinyl chloride			N/A	MS-B	%		-	25-AUG-20

Quality Control Report

Workorder: L2491984

Report Date: 01-SEP-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 16 of 16

Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

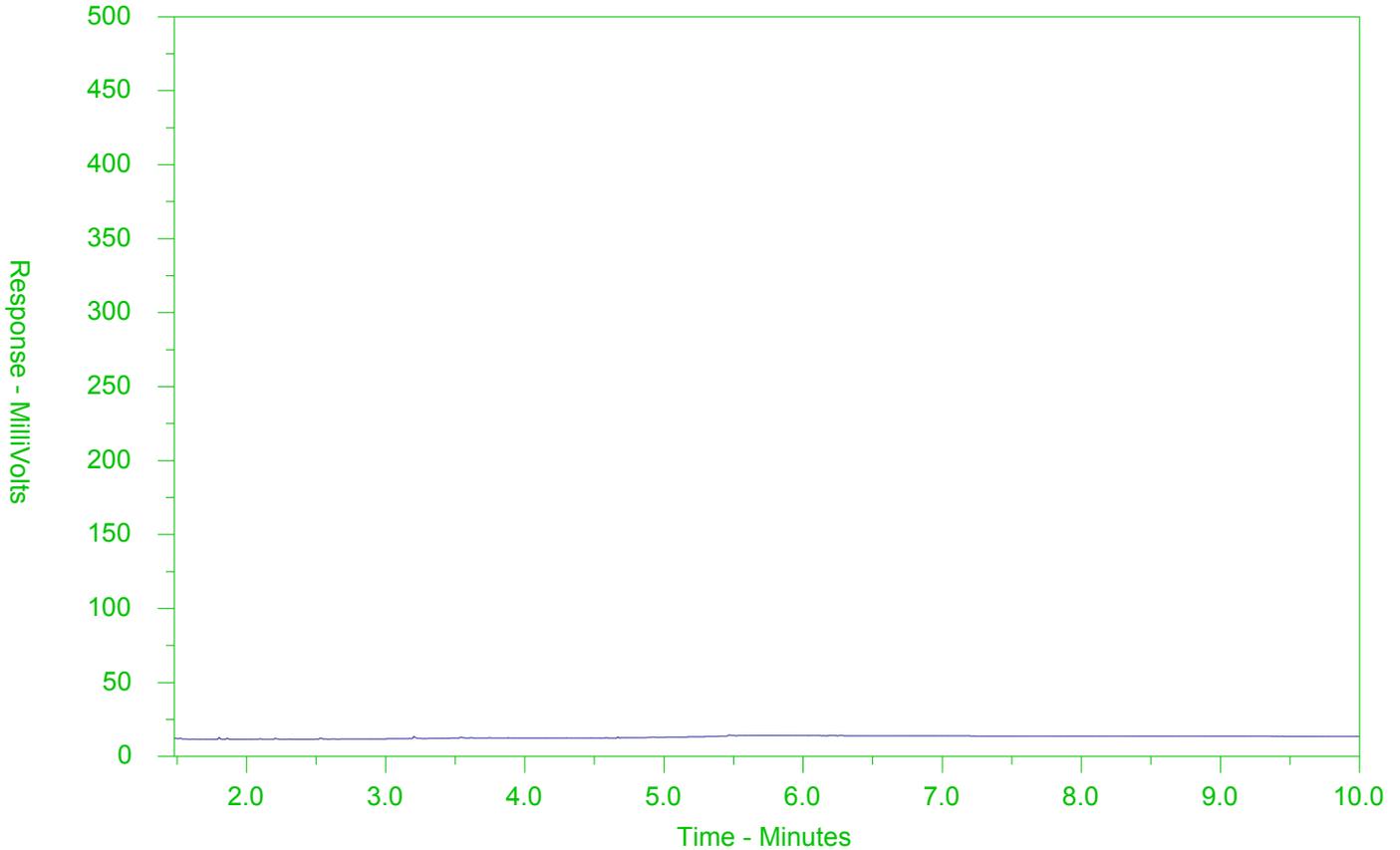
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2491984-1
 Client Sample ID: W-11210029-20200820-26



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 01-OCT-20
Report Date: 08-OCT-20 11:20 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2511128

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

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ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2511128-1 W-11210029-20201001-38 Sampled By: ERIC on 01-OCT-20 @ 11:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0058		0.0030	mg/L	02-OCT-20	06-OCT-20	R5247658
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	02-OCT-20	02-OCT-20	R5244026
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Arsenic (As)-Total	0.0111		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Barium (Ba)-Total	0.0514		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	02-OCT-20	02-OCT-20	R5244026
Boron (B)-Total	<0.010		0.010	mg/L	02-OCT-20	02-OCT-20	R5244026
Cadmium (Cd)-Total	0.0000068		0.0000050	mg/L	02-OCT-20	02-OCT-20	R5244026
Calcium (Ca)-Total	69.3		0.050	mg/L	02-OCT-20	02-OCT-20	R5244026
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	02-OCT-20	02-OCT-20	R5244026
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	02-OCT-20	02-OCT-20	R5244026
Cobalt (Co)-Total	0.00032		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Copper (Cu)-Total	0.00293		0.00050	mg/L	02-OCT-20	02-OCT-20	R5244026
Iron (Fe)-Total	1.76		0.010	mg/L	02-OCT-20	02-OCT-20	R5244026
Lead (Pb)-Total	0.000959		0.000050	mg/L	02-OCT-20	02-OCT-20	R5244026
Lithium (Li)-Total	0.0039		0.0010	mg/L	02-OCT-20	02-OCT-20	R5244026
Magnesium (Mg)-Total	32.1		0.0050	mg/L	02-OCT-20	02-OCT-20	R5244026
Manganese (Mn)-Total	0.0112		0.00050	mg/L	02-OCT-20	02-OCT-20	R5244026
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		02-OCT-20	R5244025
Molybdenum (Mo)-Total	0.000567		0.000050	mg/L	02-OCT-20	02-OCT-20	R5244026
Nickel (Ni)-Total	0.0125		0.00050	mg/L	02-OCT-20	02-OCT-20	R5244026
Phosphorus (P)-Total	<0.050		0.050	mg/L	02-OCT-20	02-OCT-20	R5244026
Potassium (K)-Total	0.986		0.050	mg/L	02-OCT-20	02-OCT-20	R5244026
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	02-OCT-20	02-OCT-20	R5244026
Selenium (Se)-Total	<0.000050		0.000050	mg/L	02-OCT-20	02-OCT-20	R5244026
Silicon (Si)-Total	9.16		0.10	mg/L	02-OCT-20	02-OCT-20	R5244026
Silver (Ag)-Total	<0.000050		0.000050	mg/L	02-OCT-20	02-OCT-20	R5244026
Sodium (Na)-Total	7.73		0.050	mg/L	02-OCT-20	02-OCT-20	R5244026
Strontium (Sr)-Total	0.154		0.0010	mg/L	02-OCT-20	02-OCT-20	R5244026
Sulfur (S)-Total	19.5		0.50	mg/L	02-OCT-20	02-OCT-20	R5244026
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	02-OCT-20	02-OCT-20	R5244026
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	02-OCT-20	02-OCT-20	R5244026
Thorium (Th)-Total	<0.00010		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Tin (Sn)-Total	0.00018		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	02-OCT-20	02-OCT-20	R5244026
Tungsten (W)-Total	<0.00010		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Uranium (U)-Total	0.000260		0.000010	mg/L	02-OCT-20	02-OCT-20	R5244026
Vanadium (V)-Total	<0.00050		0.00050	mg/L	02-OCT-20	02-OCT-20	R5244026
Zinc (Zn)-Total	0.346		0.0030	mg/L	02-OCT-20	02-OCT-20	R5244026

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2511128-1 W-11210029-20201001-38 Sampled By: ERIC on 01-OCT-20 @ 11:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	02-OCT-20	02-OCT-20	R5244026
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		02-OCT-20	R5245109
Volatile Organic Compounds							
Acetone	<30		30	ug/L		05-OCT-20	R5244888
Benzene	<0.50		0.50	ug/L		05-OCT-20	R5244888
Bromodichloromethane	<2.0		2.0	ug/L		05-OCT-20	R5244888
Bromoform	<5.0		5.0	ug/L		05-OCT-20	R5244888
Bromomethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
Carbon tetrachloride	<0.20		0.20	ug/L		05-OCT-20	R5244888
Chlorobenzene	<0.50		0.50	ug/L		05-OCT-20	R5244888
Dibromochloromethane	<2.0		2.0	ug/L		05-OCT-20	R5244888
Chloroform	<1.0		1.0	ug/L		05-OCT-20	R5244888
1,2-Dibromoethane	<0.20		0.20	ug/L		05-OCT-20	R5244888
1,2-Dichlorobenzene	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,3-Dichlorobenzene	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,4-Dichlorobenzene	<0.50		0.50	ug/L		05-OCT-20	R5244888
Dichlorodifluoromethane	<2.0		2.0	ug/L		05-OCT-20	R5244888
1,1-Dichloroethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,2-Dichloroethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,1-Dichloroethylene	<0.50		0.50	ug/L		05-OCT-20	R5244888
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		05-OCT-20	R5244888
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		05-OCT-20	R5244888
Methylene Chloride	<5.0		5.0	ug/L		05-OCT-20	R5244888
1,2-Dichloropropane	<0.50		0.50	ug/L		05-OCT-20	R5244888
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		05-OCT-20	R5244888
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		05-OCT-20	R5244888
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		05-OCT-20	
Ethylbenzene	<0.50		0.50	ug/L		05-OCT-20	R5244888
n-Hexane	<0.50		0.50	ug/L		05-OCT-20	R5244888
Methyl Ethyl Ketone	<20		20	ug/L		05-OCT-20	R5244888
Methyl Isobutyl Ketone	<20		20	ug/L		05-OCT-20	R5244888
MTBE	<2.0		2.0	ug/L		05-OCT-20	R5244888
Styrene	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
Tetrachloroethylene	<0.50		0.50	ug/L		05-OCT-20	R5244888
Toluene	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,1,1-Trichloroethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,1,2-Trichloroethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
Trichloroethylene	<0.50		0.50	ug/L		05-OCT-20	R5244888

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2511128-1 W-11210029-20201001-38							
Sampled By: ERIC on 01-OCT-20 @ 11:00							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		05-OCT-20	R5244888
Vinyl chloride	<0.50		0.50	ug/L		05-OCT-20	R5244888
o-Xylene	<0.30		0.30	ug/L		05-OCT-20	R5244888
m+p-Xylenes	<0.40		0.40	ug/L		05-OCT-20	R5244888
Xylenes (Total)	<0.50		0.50	ug/L		05-OCT-20	
Surrogate: 4-Bromofluorobenzene	103.4		70-130	%		05-OCT-20	R5244888
Surrogate: 1,4-Difluorobenzene	101.6		70-130	%		05-OCT-20	R5244888
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		07-OCT-20	R5251188
F1-BTEX	<25		25	ug/L		08-OCT-20	
F2 (C10-C16)	<100		100	ug/L	02-OCT-20	05-OCT-20	R5245136
F2-Naphth	<100		100	ug/L		08-OCT-20	
F3 (C16-C34)	<250		250	ug/L	02-OCT-20	05-OCT-20	R5245136
F3-PAH	<250		250	ug/L		08-OCT-20	
F4 (C34-C50)	<250		250	ug/L	02-OCT-20	05-OCT-20	R5245136
Total Hydrocarbons (C6-C50)	<370		370	ug/L		08-OCT-20	
Chrom. to baseline at nC50	YES				02-OCT-20	05-OCT-20	R5245136
Surrogate: 2-Bromobenzotrifluoride	89.1		60-140	%	02-OCT-20	05-OCT-20	R5245136
Surrogate: 3,4-Dichlorotoluene	100.1		60-140	%		07-OCT-20	R5251188
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Acenaphthylene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Anthracene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Benzo(a)anthracene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Benzo(a)pyrene	<0.010		0.010	ug/L	02-OCT-20	08-OCT-20	R5243881
Benzo(b)fluoranthene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Benzo(k)fluoranthene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Chrysene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Fluoranthene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Fluorene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		08-OCT-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
2-Methylnaphthalene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Naphthalene	<0.050		0.050	ug/L	02-OCT-20	08-OCT-20	R5243881
Phenanthrene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Pyrene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Surrogate: d10-Acenaphthene	99.0		60-140	%	02-OCT-20	08-OCT-20	R5243881
Surrogate: d12-Chrysene	92.5		60-140	%	02-OCT-20	08-OCT-20	R5243881

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2511128-1 W-11210029-20201001-38							
Sampled By: ERIC on 01-OCT-20 @ 11:00							
Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	96.4		60-140	%	02-OCT-20	08-OCT-20	R5243881
Surrogate: d10-Phenanthrene	100.1		60-140	%	02-OCT-20	08-OCT-20	R5243881
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
4-Chloroaniline	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
2-Chlorophenol	<0.30		0.30	ug/L	02-OCT-20	05-OCT-20	R5244183
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4-Dichlorophenol	<0.30		0.30	ug/L	02-OCT-20	05-OCT-20	R5244183
Diethylphthalate	<0.20		0.20	ug/L	02-OCT-20	05-OCT-20	R5244183
Dimethylphthalate	<0.20		0.20	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4-Dimethylphenol	<0.50		0.50	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4-Dinitrophenol	<1.0		1.0	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4-Dinitrotoluene	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
2,6-Dinitrotoluene	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		05-OCT-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	02-OCT-20	05-OCT-20	R5244183
Pentachlorophenol	<2.0	RRR	2.0	ug/L	02-OCT-20	05-OCT-20	R5244183
Phenol	<0.50		0.50	ug/L	02-OCT-20	05-OCT-20	R5244183
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	02-OCT-20	05-OCT-20	R5244183
Surrogate: 2-Fluorobiphenyl	104.5		50-140	%	02-OCT-20	05-OCT-20	R5244183
Surrogate: Nitrobenzene d5	111.0		50-140	%	02-OCT-20	05-OCT-20	R5244183
Surrogate: p-Terphenyl d14	104.5		60-140	%	02-OCT-20	05-OCT-20	R5244183
Surrogate: 2,4,6-Tribromophenol	112.4		50-140	%	02-OCT-20	05-OCT-20	R5244183
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	02-OCT-20	02-OCT-20	R5243953
Aroclor 1248	<0.020		0.020	ug/L	02-OCT-20	02-OCT-20	R5243953
Aroclor 1254	<0.020		0.020	ug/L	02-OCT-20	02-OCT-20	R5243953
Aroclor 1260	<0.020		0.020	ug/L	02-OCT-20	02-OCT-20	R5243953
Surrogate: Decachlorobiphenyl	137.0		50-150	%	02-OCT-20	02-OCT-20	R5243953
Total PCBs	<0.040		0.040	ug/L	02-OCT-20	02-OCT-20	R5243953
Surrogate: Tetrachloro-m-xylene	70.7		50-150	%	02-OCT-20	02-OCT-20	R5243953
Report Remarks : RRR: Detection limit raised due to suspected bias low results at or near the detection limit.							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Total	MS-B	L2511128-1
Matrix Spike	Boron (B)-Total	MS-B	L2511128-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2511128-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2511128-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2511128-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2511128-1
Matrix Spike	Potassium (K)-Total	MS-B	L2511128-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2511128-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2511128-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2511128-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2511128-1
Matrix Spike	Uranium (U)-Total	MS-B	L2511128-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Reference Information

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
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Reference Information

WT

ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:**GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2511128

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5244183							
WG3416467-2	LCS							
1,2,4-Trichlorobenzene			88.0		%		50-140	02-OCT-20
2-Chlorophenol			85.3		%		50-140	02-OCT-20
2,4-Dichlorophenol			92.5		%		50-140	02-OCT-20
2,4-Dimethylphenol			84.3		%		30-130	02-OCT-20
2,4-Dinitrophenol			82.8		%		50-140	02-OCT-20
2,4-Dinitrotoluene			116.9		%		50-140	02-OCT-20
2,4,5-Trichlorophenol			107.2		%		50-140	02-OCT-20
2,4,6-Trichlorophenol			103.3		%		50-140	02-OCT-20
2,6-Dinitrotoluene			107.3		%		50-140	02-OCT-20
3,3'-Dichlorobenzidine			96.1		%		30-130	02-OCT-20
4-Chloroaniline			89.7		%		30-130	02-OCT-20
Biphenyl			95.2		%		50-140	02-OCT-20
Bis(2-chloroethyl)ether			93.0		%		50-140	02-OCT-20
Bis(2-chloroisopropyl)ether			91.2		%		50-140	02-OCT-20
Bis(2-ethylhexyl)phthalate			104.5		%		50-140	02-OCT-20
Diethylphthalate			91.9		%		50-140	02-OCT-20
Dimethylphthalate			93.8		%		50-140	02-OCT-20
Pentachlorophenol			89.1		%		50-140	02-OCT-20
Phenol			98.8		%		30-130	02-OCT-20
WG3416467-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	02-OCT-20
2-Chlorophenol			<0.30		ug/L		0.3	02-OCT-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	02-OCT-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	02-OCT-20
2,4-Dinitrophenol			<1.0		ug/L		1	02-OCT-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	02-OCT-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	02-OCT-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	02-OCT-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	02-OCT-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	02-OCT-20
4-Chloroaniline			<0.40		ug/L		0.4	02-OCT-20
Biphenyl			<0.40		ug/L		0.4	02-OCT-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	02-OCT-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	02-OCT-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5244183								
WG3416467-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	02-OCT-20
Diethylphthalate			<0.20		ug/L		0.2	02-OCT-20
Dimethylphthalate			<0.20		ug/L		0.2	02-OCT-20
Pentachlorophenol			<0.50		ug/L		0.5	02-OCT-20
Phenol			<0.50		ug/L		0.5	02-OCT-20
Surrogate: 2-Fluorobiphenyl			87.5		%		50-140	02-OCT-20
Surrogate: 2,4,6-Tribromophenol			89.7		%		50-140	02-OCT-20
Surrogate: Nitrobenzene d5			95.1		%		50-140	02-OCT-20
Surrogate: p-Terphenyl d14			105.8		%		60-140	02-OCT-20
CR-CR6-IC-WT Water								
Batch R5245109								
WG3417242-4 DUP								
Chromium, Hexavalent		WG3417242-3	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-20
WG3417242-2 LCS								
Chromium, Hexavalent			102.5		%		80-120	02-OCT-20
WG3417242-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	02-OCT-20
WG3417242-5 MS								
Chromium, Hexavalent		WG3417242-3	99.4		%		70-130	02-OCT-20
F1-HS-511-WT Water								
Batch R5251188								
WG3419822-1 LCS								
F1 (C6-C10)			97.3		%		80-120	07-OCT-20
WG3419822-2 MB								
F1 (C6-C10)			<25		ug/L		25	07-OCT-20
Surrogate: 3,4-Dichlorotoluene			116.3		%		60-140	07-OCT-20
F2-F4-511-WT Water								
Batch R5245136								
WG3416713-2 LCS								
F2 (C10-C16)			98.9		%		70-130	05-OCT-20
F3 (C16-C34)			103.7		%		70-130	05-OCT-20
F4 (C34-C50)			106.8		%		70-130	05-OCT-20
WG3416713-1 MB								
F2 (C10-C16)			<100		ug/L		100	05-OCT-20
F3 (C16-C34)			<250		ug/L		250	05-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT								
Water								
Batch R5245136								
WG3416713-1 MB								
F4 (C34-C50)			<250		ug/L		250	05-OCT-20
Surrogate: 2-Bromobenzotrifluoride			82.4		%		60-140	05-OCT-20
HG-T-CVAA-WT								
Water								
Batch R5244025								
WG3417002-3 DUP								
Mercury (Hg)-Total		L2511170-1 <0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	02-OCT-20
WG3417002-2 LCS								
Mercury (Hg)-Total			106.0		%		80-120	02-OCT-20
WG3417002-1 MB								
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	02-OCT-20
WG3417002-4 MS								
Mercury (Hg)-Total		L2510587-1	100.0		%		70-130	02-OCT-20
MET-T-CCMS-WT								
Water								
Batch R5244026								
WG3416819-4 DUP								
Aluminum (Al)-Total		WG3416819-3 0.214	0.209		mg/L	2.0	20	02-OCT-20
Antimony (Sb)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-20
Arsenic (As)-Total		0.0018	0.0018		mg/L	1.2	20	02-OCT-20
Barium (Ba)-Total		0.0887	0.0860		mg/L	3.1	20	02-OCT-20
Beryllium (Be)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-20
Bismuth (Bi)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-20
Boron (B)-Total		0.12	0.12		mg/L	1.3	20	02-OCT-20
Cadmium (Cd)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	02-OCT-20
Calcium (Ca)-Total		199	193		mg/L	3.2	20	02-OCT-20
Chromium (Cr)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-OCT-20
Cesium (Cs)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-20
Cobalt (Co)-Total		0.0619	0.0612		mg/L	1.1	20	02-OCT-20
Copper (Cu)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-OCT-20
Iron (Fe)-Total		2.49	2.42		mg/L	3.1	20	02-OCT-20
Lead (Pb)-Total		0.00054	0.00052		mg/L	3.6	20	02-OCT-20
Lithium (Li)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	02-OCT-20
Magnesium (Mg)-Total		98.4	96.4		mg/L	2.0	20	02-OCT-20
Manganese (Mn)-Total		2.50	2.46		mg/L	1.7	20	02-OCT-20
Molybdenum (Mo)-Total		0.00207	0.00189		mg/L	9.1	20	02-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5244026							
WG3416819-4	DUP	WG3416819-3						
Nickel (Ni)-Total		0.0084	0.0079		mg/L	7.3	20	02-OCT-20
Phosphorus (P)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	02-OCT-20
Potassium (K)-Total		3.84	3.75		mg/L	2.2	20	02-OCT-20
Rubidium (Rb)-Total		0.0036	0.0034		mg/L	3.9	20	02-OCT-20
Selenium (Se)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-20
Silicon (Si)-Total		7.6	7.5		mg/L	1.6	20	02-OCT-20
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-20
Sodium (Na)-Total		132	132		mg/L	0.6	20	02-OCT-20
Strontium (Sr)-Total		1.40	1.41		mg/L	1.1	20	02-OCT-20
Sulfur (S)-Total		162	159		mg/L	2.1	25	02-OCT-20
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-20
Tellurium (Te)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	02-OCT-20
Thorium (Th)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	25	02-OCT-20
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-20
Titanium (Ti)-Total		0.0066	0.0066		mg/L	0.3	20	02-OCT-20
Tungsten (W)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-20
Uranium (U)-Total		0.0163	0.0159		mg/L	2.9	20	02-OCT-20
Vanadium (V)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-OCT-20
Zinc (Zn)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	02-OCT-20
Zirconium (Zr)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	02-OCT-20
WG3416819-2	LCS							
Aluminum (Al)-Total			102.6		%		80-120	02-OCT-20
Antimony (Sb)-Total			100.4		%		80-120	02-OCT-20
Arsenic (As)-Total			97.6		%		80-120	02-OCT-20
Barium (Ba)-Total			98.7		%		80-120	02-OCT-20
Beryllium (Be)-Total			103.4		%		80-120	02-OCT-20
Bismuth (Bi)-Total			98.5		%		80-120	02-OCT-20
Boron (B)-Total			100.1		%		80-120	02-OCT-20
Cadmium (Cd)-Total			94.2		%		80-120	02-OCT-20
Calcium (Ca)-Total			99.9		%		80-120	02-OCT-20
Chromium (Cr)-Total			97.8		%		80-120	02-OCT-20
Cesium (Cs)-Total			97.5		%		80-120	02-OCT-20
Cobalt (Co)-Total			97.2		%		80-120	02-OCT-20



Quality Control Report

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5244026							
WG3416819-2	LCS							
Copper (Cu)-Total			96.9		%		80-120	02-OCT-20
Iron (Fe)-Total			98.8		%		80-120	02-OCT-20
Lead (Pb)-Total			99.4		%		80-120	02-OCT-20
Lithium (Li)-Total			103.9		%		80-120	02-OCT-20
Magnesium (Mg)-Total			102.0		%		80-120	02-OCT-20
Manganese (Mn)-Total			99.3		%		80-120	02-OCT-20
Molybdenum (Mo)-Total			99.7		%		80-120	02-OCT-20
Nickel (Ni)-Total			98.5		%		80-120	02-OCT-20
Phosphorus (P)-Total			106.1		%		70-130	02-OCT-20
Potassium (K)-Total			99.7		%		80-120	02-OCT-20
Rubidium (Rb)-Total			98.6		%		80-120	02-OCT-20
Selenium (Se)-Total			96.7		%		80-120	02-OCT-20
Silicon (Si)-Total			101.9		%		60-140	02-OCT-20
Silver (Ag)-Total			98.6		%		80-120	02-OCT-20
Sodium (Na)-Total			103.8		%		80-120	02-OCT-20
Strontium (Sr)-Total			102.8		%		80-120	02-OCT-20
Sulfur (S)-Total			96.1		%		80-120	02-OCT-20
Thallium (Tl)-Total			99.7		%		80-120	02-OCT-20
Tellurium (Te)-Total			91.6		%		80-120	02-OCT-20
Thorium (Th)-Total			98.0		%		70-130	02-OCT-20
Tin (Sn)-Total			93.9		%		80-120	02-OCT-20
Titanium (Ti)-Total			97.6		%		80-120	02-OCT-20
Tungsten (W)-Total			97.3		%		80-120	02-OCT-20
Uranium (U)-Total			101.1		%		80-120	02-OCT-20
Vanadium (V)-Total			99.9		%		80-120	02-OCT-20
Zinc (Zn)-Total			96.4		%		80-120	02-OCT-20
Zirconium (Zr)-Total			95.4		%		80-120	02-OCT-20
WG3416819-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	02-OCT-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	02-OCT-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5244026							
WG3416819-1	MB							
Boron (B)-Total			<0.010		mg/L		0.01	02-OCT-20
Cadmium (Cd)-Total			<0.000050		mg/L		0.000005	02-OCT-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	02-OCT-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	02-OCT-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	02-OCT-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	02-OCT-20
Iron (Fe)-Total			<0.010		mg/L		0.01	02-OCT-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	02-OCT-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	02-OCT-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	02-OCT-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	02-OCT-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	02-OCT-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	02-OCT-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	02-OCT-20
Potassium (K)-Total			<0.050		mg/L		0.05	02-OCT-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	02-OCT-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	02-OCT-20
Silicon (Si)-Total			<0.10		mg/L		0.1	02-OCT-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	02-OCT-20
Sodium (Na)-Total			<0.050		mg/L		0.05	02-OCT-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	02-OCT-20
Sulfur (S)-Total			<0.50		mg/L		0.5	02-OCT-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	02-OCT-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	02-OCT-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	02-OCT-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	02-OCT-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	02-OCT-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	02-OCT-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	02-OCT-20
WG3416819-5	MS	WG3416819-6						



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5244026							
WG3416819-5 MS		WG3416819-6						
Aluminum (Al)-Total			90.8		%		70-130	02-OCT-20
Antimony (Sb)-Total			98.9		%		70-130	02-OCT-20
Arsenic (As)-Total			95.3		%		70-130	02-OCT-20
Barium (Ba)-Total			N/A	MS-B	%		-	02-OCT-20
Beryllium (Be)-Total			105.1		%		70-130	02-OCT-20
Bismuth (Bi)-Total			97.6		%		70-130	02-OCT-20
Boron (B)-Total			N/A	MS-B	%		-	02-OCT-20
Cadmium (Cd)-Total			97.1		%		70-130	02-OCT-20
Calcium (Ca)-Total			N/A	MS-B	%		-	02-OCT-20
Chromium (Cr)-Total			96.0		%		70-130	02-OCT-20
Cesium (Cs)-Total			100.3		%		70-130	02-OCT-20
Cobalt (Co)-Total			93.1		%		70-130	02-OCT-20
Copper (Cu)-Total			96.7		%		70-130	02-OCT-20
Iron (Fe)-Total			N/A	MS-B	%		-	02-OCT-20
Lead (Pb)-Total			96.4		%		70-130	02-OCT-20
Lithium (Li)-Total			101.8		%		70-130	02-OCT-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	02-OCT-20
Manganese (Mn)-Total			N/A	MS-B	%		-	02-OCT-20
Molybdenum (Mo)-Total			98.6		%		70-130	02-OCT-20
Nickel (Ni)-Total			95.9		%		70-130	02-OCT-20
Phosphorus (P)-Total			110.2		%		70-130	02-OCT-20
Potassium (K)-Total			N/A	MS-B	%		-	02-OCT-20
Rubidium (Rb)-Total			100.4		%		70-130	02-OCT-20
Silicon (Si)-Total			N/A	MS-B	%		-	02-OCT-20
Silver (Ag)-Total			99.0		%		70-130	02-OCT-20
Sodium (Na)-Total			N/A	MS-B	%		-	02-OCT-20
Strontium (Sr)-Total			N/A	MS-B	%		-	02-OCT-20
Sulfur (S)-Total			N/A	MS-B	%		-	02-OCT-20
Thallium (Tl)-Total			97.8		%		70-130	02-OCT-20
Tellurium (Te)-Total			72.3		%		70-130	02-OCT-20
Thorium (Th)-Total			89.0		%		70-130	02-OCT-20
Tin (Sn)-Total			95.1		%		70-130	02-OCT-20
Titanium (Ti)-Total			89.4		%		70-130	02-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5244026							
WG3416819-5 MS		WG3416819-6						
Tungsten (W)-Total			98.0		%		70-130	02-OCT-20
Uranium (U)-Total			N/A	MS-B	%		-	02-OCT-20
Vanadium (V)-Total			98.0		%		70-130	02-OCT-20
Zinc (Zn)-Total			88.2		%		70-130	02-OCT-20
Zirconium (Zr)-Total			81.4		%		70-130	02-OCT-20
P-T-COL-WT								
	Water							
Batch	R5247658							
WG3416832-3 DUP		L2511128-1						
Phosphorus, Total		0.0058	0.0062		mg/L	6.6	20	06-OCT-20
WG3416832-2 LCS								
Phosphorus, Total			101.8		%		80-120	06-OCT-20
WG3416832-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	06-OCT-20
WG3416832-4 MS		L2511128-1						
Phosphorus, Total			91.3		%		70-130	06-OCT-20
PAH-511-WT								
	Water							
Batch	R5243881							
WG3416713-2 LCS								
1-Methylnaphthalene			110.2		%		50-140	02-OCT-20
2-Methylnaphthalene			109.4		%		50-140	02-OCT-20
Acenaphthene			119.0		%		50-140	02-OCT-20
Acenaphthylene			111.8		%		50-140	02-OCT-20
Anthracene			109.8		%		50-140	02-OCT-20
Benzo(a)anthracene			119.9		%		50-140	02-OCT-20
Benzo(a)pyrene			106.2		%		50-140	02-OCT-20
Benzo(b)fluoranthene			107.5		%		50-140	02-OCT-20
Benzo(g,h,i)perylene			118.3		%		50-140	02-OCT-20
Benzo(k)fluoranthene			109.2		%		50-140	02-OCT-20
Chrysene			115.8		%		50-140	02-OCT-20
Dibenzo(ah)anthracene			119.9		%		50-140	02-OCT-20
Fluoranthene			119.1		%		50-140	02-OCT-20
Fluorene			113.7		%		50-140	02-OCT-20
Indeno(1,2,3-cd)pyrene			131.8		%		50-140	02-OCT-20
Naphthalene			115.0		%		50-140	02-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT		Water						
Batch	R5243881							
WG3416713-2	LCS							
Phenanthrene			119.0		%		50-140	02-OCT-20
Pyrene			120.6		%		50-140	02-OCT-20
WG3416713-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	02-OCT-20
2-Methylnaphthalene			<0.020		ug/L		0.02	02-OCT-20
Acenaphthene			<0.020		ug/L		0.02	02-OCT-20
Acenaphthylene			<0.020		ug/L		0.02	02-OCT-20
Anthracene			<0.020		ug/L		0.02	02-OCT-20
Benzo(a)anthracene			<0.020		ug/L		0.02	02-OCT-20
Benzo(a)pyrene			<0.010		ug/L		0.01	02-OCT-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	02-OCT-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	02-OCT-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	02-OCT-20
Chrysene			<0.020		ug/L		0.02	02-OCT-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	02-OCT-20
Fluoranthene			<0.020		ug/L		0.02	02-OCT-20
Fluorene			<0.020		ug/L		0.02	02-OCT-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	02-OCT-20
Naphthalene			<0.050		ug/L		0.05	02-OCT-20
Phenanthrene			<0.020		ug/L		0.02	02-OCT-20
Pyrene			<0.020		ug/L		0.02	02-OCT-20
Surrogate: d8-Naphthalene			100.1		%		60-140	02-OCT-20
Surrogate: d10-Phenanthrene			94.6		%		60-140	02-OCT-20
Surrogate: d12-Chrysene			85.4		%		60-140	02-OCT-20
Surrogate: d10-Acenaphthene			97.1		%		60-140	02-OCT-20
PCB-511-WT		Water						
Batch	R5243953							
WG3416718-2	LCS							
Aroclor 1242			98.8		%		60-140	02-OCT-20
Aroclor 1248			87.8		%		60-140	02-OCT-20
Aroclor 1254			108.7		%		60-140	02-OCT-20
Aroclor 1260			108.4		%		60-140	02-OCT-20
WG3416718-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	02-OCT-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5243953							
WG3416718-1 MB								
Aroclor 1248			<0.020		ug/L		0.02	02-OCT-20
Aroclor 1254			<0.020		ug/L		0.02	02-OCT-20
Aroclor 1260			<0.020		ug/L		0.02	02-OCT-20
Surrogate: Decachlorobiphenyl			137.0		%		50-150	02-OCT-20
Surrogate: Tetrachloro-m-xylene			91.8		%		50-150	02-OCT-20
VOC-511-HS-WT		Water						
Batch	R5244888							
WG3416991-4 DUP		WG3416991-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	05-OCT-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	05-OCT-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-OCT-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	05-OCT-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	05-OCT-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	05-OCT-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	05-OCT-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-OCT-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-OCT-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5244888							
WG3416991-4	DUP	WG3416991-3						
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	05-OCT-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	05-OCT-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	05-OCT-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	05-OCT-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-OCT-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	05-OCT-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	05-OCT-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	05-OCT-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
WG3416991-1	LCS							
1,1,1,2-Tetrachloroethane			96.8		%		70-130	05-OCT-20
1,1,1,2-Tetrachloroethane			99.98		%		70-130	05-OCT-20
1,1,1-Trichloroethane			96.6		%		70-130	05-OCT-20
1,1,2-Trichloroethane			99.3		%		70-130	05-OCT-20
1,1-Dichloroethane			103.4		%		70-130	05-OCT-20
1,1-Dichloroethylene			96.8		%		70-130	05-OCT-20
1,2-Dibromoethane			96.7		%		70-130	05-OCT-20
1,2-Dichlorobenzene			102.3		%		70-130	05-OCT-20
1,2-Dichloroethane			94.7		%		70-130	05-OCT-20
1,2-Dichloropropane			95.1		%		70-130	05-OCT-20
1,3-Dichlorobenzene			99.2		%		70-130	05-OCT-20
1,4-Dichlorobenzene			102.5		%		70-130	05-OCT-20
Acetone			114.3		%		60-140	05-OCT-20
Benzene			102.4		%		70-130	05-OCT-20
Bromodichloromethane			101.8		%		70-130	05-OCT-20
Bromoform			104.1		%		70-130	05-OCT-20
Bromomethane			125.9		%		60-140	05-OCT-20



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 455 PHILLIP STREET
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 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5244888							
WG3416991-1	LCS							
Carbon tetrachloride			96.1		%		70-130	05-OCT-20
Chlorobenzene			101.6		%		70-130	05-OCT-20
Chloroform			102.9		%		70-130	05-OCT-20
cis-1,2-Dichloroethylene			94.6		%		70-130	05-OCT-20
cis-1,3-Dichloropropene			94.2		%		70-130	05-OCT-20
Dibromochloromethane			96.7		%		70-130	05-OCT-20
Dichlorodifluoromethane			97.3		%		50-140	05-OCT-20
Ethylbenzene			101.1		%		70-130	05-OCT-20
n-Hexane			101.7		%		70-130	05-OCT-20
m+p-Xylenes			101.1		%		70-130	05-OCT-20
Methyl Ethyl Ketone			108.7		%		60-140	05-OCT-20
Methyl Isobutyl Ketone			95.9		%		60-140	05-OCT-20
Methylene Chloride			94.3		%		70-130	05-OCT-20
MTBE			102.1		%		70-130	05-OCT-20
o-Xylene			109.0		%		70-130	05-OCT-20
Styrene			102.5		%		70-130	05-OCT-20
Tetrachloroethylene			101.4		%		70-130	05-OCT-20
Toluene			96.6		%		70-130	05-OCT-20
trans-1,2-Dichloroethylene			95.5		%		70-130	05-OCT-20
trans-1,3-Dichloropropene			98.7		%		70-130	05-OCT-20
Trichloroethylene			100.0		%		70-130	05-OCT-20
Trichlorofluoromethane			97.1		%		60-140	05-OCT-20
Vinyl chloride			110.1		%		60-140	05-OCT-20
WG3416991-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	05-OCT-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	05-OCT-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	05-OCT-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	05-OCT-20
1,1-Dichloroethane			<0.50		ug/L		0.5	05-OCT-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	05-OCT-20
1,2-Dibromoethane			<0.20		ug/L		0.2	05-OCT-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	05-OCT-20
1,2-Dichloroethane			<0.50		ug/L		0.5	05-OCT-20
1,2-Dichloropropane			<0.50		ug/L		0.5	05-OCT-20



Quality Control Report

Workorder: L2511128

Report Date: 08-OCT-20

Page 13 of 16

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5244888							
WG3416991-2 MB								
1,3-Dichlorobenzene			<0.50		ug/L		0.5	05-OCT-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	05-OCT-20
Acetone			<30		ug/L		30	05-OCT-20
Benzene			<0.50		ug/L		0.5	05-OCT-20
Bromodichloromethane			<2.0		ug/L		2	05-OCT-20
Bromoform			<5.0		ug/L		5	05-OCT-20
Bromomethane			<0.50		ug/L		0.5	05-OCT-20
Carbon tetrachloride			<0.20		ug/L		0.2	05-OCT-20
Chlorobenzene			<0.50		ug/L		0.5	05-OCT-20
Chloroform			<1.0		ug/L		1	05-OCT-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	05-OCT-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	05-OCT-20
Dibromochloromethane			<2.0		ug/L		2	05-OCT-20
Dichlorodifluoromethane			<2.0		ug/L		2	05-OCT-20
Ethylbenzene			<0.50		ug/L		0.5	05-OCT-20
n-Hexane			<0.50		ug/L		0.5	05-OCT-20
m+p-Xylenes			<0.40		ug/L		0.4	05-OCT-20
Methyl Ethyl Ketone			<20		ug/L		20	05-OCT-20
Methyl Isobutyl Ketone			<20		ug/L		20	05-OCT-20
Methylene Chloride			<5.0		ug/L		5	05-OCT-20
MTBE			<2.0		ug/L		2	05-OCT-20
o-Xylene			<0.30		ug/L		0.3	05-OCT-20
Styrene			<0.50		ug/L		0.5	05-OCT-20
Tetrachloroethylene			<0.50		ug/L		0.5	05-OCT-20
Toluene			<0.50		ug/L		0.5	05-OCT-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	05-OCT-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	05-OCT-20
Trichloroethylene			<0.50		ug/L		0.5	05-OCT-20
Trichlorofluoromethane			<5.0		ug/L		5	05-OCT-20
Vinyl chloride			<0.50		ug/L		0.5	05-OCT-20
Surrogate: 1,4-Difluorobenzene			101.5		%		70-130	05-OCT-20
Surrogate: 4-Bromofluorobenzene			103.1		%		70-130	05-OCT-20
WG3416991-5 MS		WG3416991-3						
1,1,1,2-Tetrachloroethane			95.8		%		50-140	05-OCT-20



Quality Control Report

Workorder: L2511128

Report Date: 08-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5244888							
WG3416991-5 MS		WG3416991-3						
1,1,2,2-Tetrachloroethane			75.7		%		50-140	05-OCT-20
1,1,1-Trichloroethane			97.2		%		50-140	05-OCT-20
1,1,2-Trichloroethane			95.6		%		50-140	05-OCT-20
1,1-Dichloroethane			101.4		%		50-140	05-OCT-20
1,1-Dichloroethylene			96.2		%		50-140	05-OCT-20
1,2-Dibromoethane			91.5		%		50-140	05-OCT-20
1,2-Dichlorobenzene			102.9		%		50-140	05-OCT-20
1,2-Dichloroethane			90.1		%		50-140	05-OCT-20
1,2-Dichloropropane			94.2		%		50-140	05-OCT-20
1,3-Dichlorobenzene			110.1		%		50-140	05-OCT-20
1,4-Dichlorobenzene			111.4		%		50-140	05-OCT-20
Acetone			96.3		%		50-140	05-OCT-20
Benzene			102.0		%		50-140	05-OCT-20
Bromodichloromethane			100.9		%		50-140	05-OCT-20
Bromoform			95.5		%		50-140	05-OCT-20
Bromomethane			120.5		%		50-140	05-OCT-20
Carbon tetrachloride			97.0		%		50-140	05-OCT-20
Chlorobenzene			101.3		%		50-140	05-OCT-20
Chloroform			102.5		%		50-140	05-OCT-20
cis-1,2-Dichloroethylene			93.5		%		50-140	05-OCT-20
cis-1,3-Dichloropropene			92.6		%		50-140	05-OCT-20
Dibromochloromethane			94.2		%		50-140	05-OCT-20
Dichlorodifluoromethane			88.1		%		50-140	05-OCT-20
Ethylbenzene			102.0		%		50-140	05-OCT-20
n-Hexane			100.6		%		50-140	05-OCT-20
m+p-Xylenes			102.2		%		50-140	05-OCT-20
Methyl Ethyl Ketone			93.7		%		50-140	05-OCT-20
Methyl Isobutyl Ketone			88.4		%		50-140	05-OCT-20
Methylene Chloride			91.0		%		50-140	05-OCT-20
MTBE			102.3		%		50-140	05-OCT-20
o-Xylene			109.0		%		50-140	05-OCT-20
Styrene			101.6		%		50-140	05-OCT-20
Tetrachloroethylene			103.1		%		50-140	05-OCT-20



Quality Control Report

Workorder: L2511128

Report Date: 08-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5244888							
WG3416991-5 MS		WG3416991-3						
Toluene			97.3		%		50-140	05-OCT-20
trans-1,2-Dichloroethylene			95.5		%		50-140	05-OCT-20
trans-1,3-Dichloropropene			95.6		%		50-140	05-OCT-20
Trichloroethylene			100.6		%		50-140	05-OCT-20
Trichlorofluoromethane			95.8		%		50-140	05-OCT-20
Vinyl chloride			105.8		%		50-140	05-OCT-20

Quality Control Report

Workorder: L2511128

Report Date: 08-OCT-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

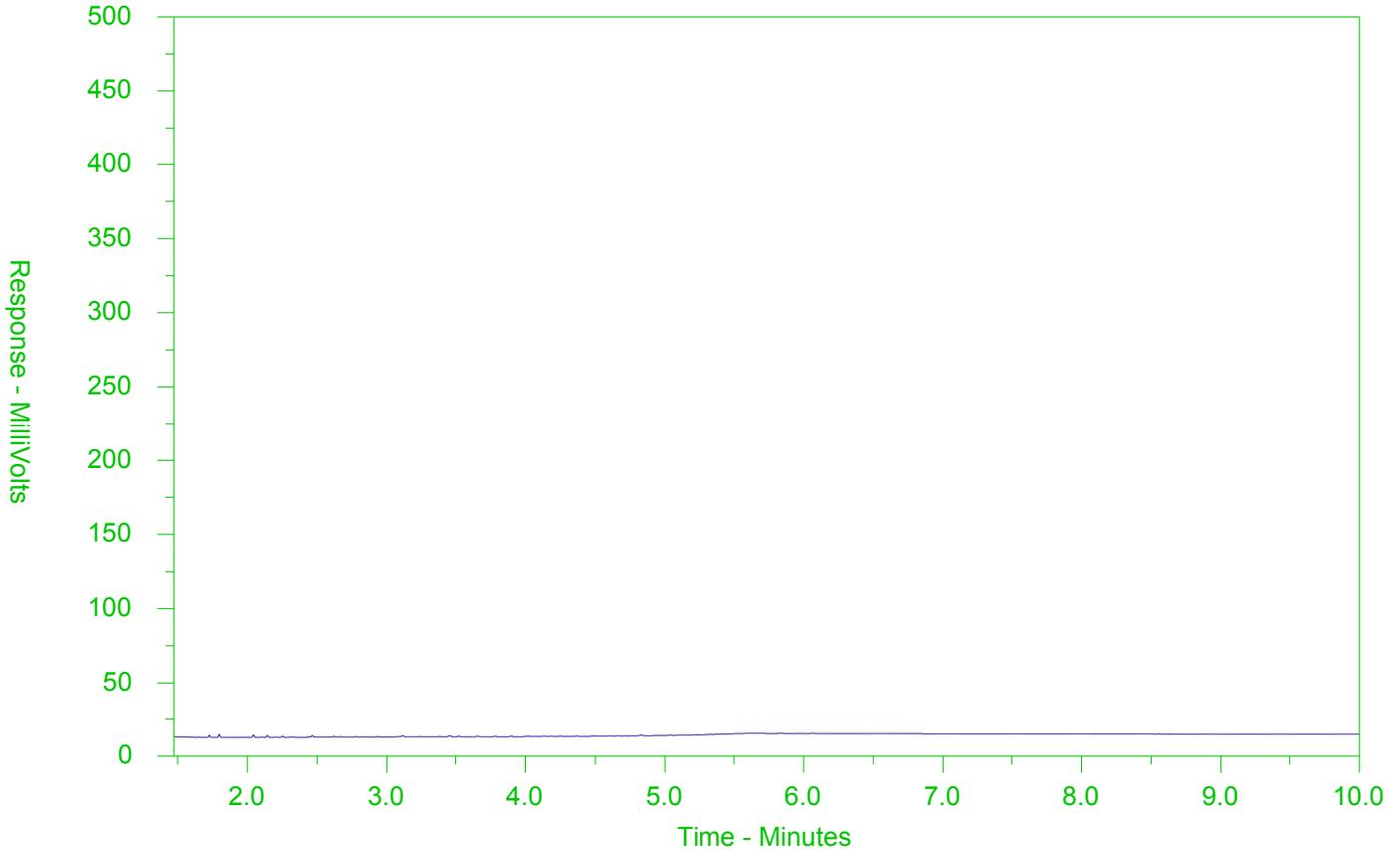
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2511128-1
 Client Sample ID: W-11210029-20201001-38



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2511128-COFC

COC Number: 17 -

Page of

www.alsglobal.com

Report To		Report Format		- Contact your AM to confirm all E&P TATs (surcharges may apply)																																																																												
Company:	GHD LIMITED - ACCT #13791	Select Report Format:	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)	Regular [R]	<input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																																																																											
Contact:	Laura Ermeta	Quality Control (QC) Report with Report	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	4 day [P4-20%]	<input type="checkbox"/>																																																																											
Phone:	519-884-0510	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked		3 day [P3-25%]	<input type="checkbox"/>																																																																											
Company address below will appear on the final report		Select Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	2 day [P2-50%]	<input type="checkbox"/>																																																																											
Street:	455 Phillip St	Email 1 or Fax	laura.ermeta@ghd.com	EMERGENCY 1 Business day [E - 100%] <input type="checkbox"/>																																																																												
City/Province:	Waterloo, Ontario	Email 2	See PO	Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/>																																																																												
Postal Code:	N2L 3X2	Email 3		Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm																																																																												
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Invoice Distribution		For tests that can not be performed according to the service level selected, you will be contacted.																																																																												
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Select Invoice Distribution:	<input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	Analysis Request																																																																												
Company:	GHD Limited	Email 1 or Fax	apinvoices-735@ghd.com	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																																																												
Contact:	SEE SSOV	Email 2		<table border="1"> <tr> <td rowspan="8">NUMBER OF CONTAINERS</td> <td>Total Metals (MET-T-CCMS-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td rowspan="8">SAMPLES ON HOLD</td> <td rowspan="8">SUSPECTED HAZARD (see Special Instructions)</td> </tr> <tr> <td>Total Mercury (HG-T-CVAA-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total Cr6 (CR-CR6-IC-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total Phosphorous (P-T-COL-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PCBs (PCB-511-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>VOCs and PHCs (VOC.F1-F4-511-P-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SVOCs (SVOC-511-GP-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		NUMBER OF CONTAINERS	Total Metals (MET-T-CCMS-WT)									SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)	Total Mercury (HG-T-CVAA-WT)									Total Cr6 (CR-CR6-IC-WT)									Total Phosphorous (P-T-COL-WT)									PCBs (PCB-511-WT)									VOCs and PHCs (VOC.F1-F4-511-P-WT)									SVOCs (SVOC-511-GP-WT)																	
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	SVOCs (SVOC-511-GP-WT)																																																																															
Project Information		Oil and Gas Required Fields (client use)																																																																														
ALS Account # / Quote #:	13791	AFE/Cost Center:	PO#																																																																													
Job #:	11210029	Major/Minor Code:	Routing Code:																																																																													
PO / AFE:	73520086	Requisitioner:																																																																														
LSD:		Location:																																																																														
ALS Lab Work Order # (lab use only):	L2511128	ALS Contact:	Rick H	Sampler:	ERIC																																																																											
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type																																																																												
	W-11210029-001-38	01/10/20	1100AM	Water																																																																												
Drinking Water (DW) Samples ¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		SAMPLE CONDITION AS RECEIVED (lab use only)																																																																												
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																																																																												
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																																																																												
				Cooling Initiated <input type="checkbox"/>																																																																												
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SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)																																																																												
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REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JAN 2018 PRINT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 08-OCT-20
Report Date: 15-OCT-20 10:27 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2514428

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2514428-1 W-11210029-20201008-40 Sampled By: ERIC on 08-OCT-20 @ 10:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0063		0.0030	mg/L	09-OCT-20	13-OCT-20	R5253467
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	09-OCT-20	13-OCT-20	R5253130
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Arsenic (As)-Total	0.00501		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Barium (Ba)-Total	0.0511		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	09-OCT-20	13-OCT-20	R5253130
Boron (B)-Total	<0.010		0.010	mg/L	09-OCT-20	13-OCT-20	R5253130
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	09-OCT-20	13-OCT-20	R5253130
Calcium (Ca)-Total	71.7		0.050	mg/L	09-OCT-20	13-OCT-20	R5253130
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	09-OCT-20	13-OCT-20	R5253130
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	09-OCT-20	13-OCT-20	R5253130
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Copper (Cu)-Total	<0.00050		0.00050	mg/L	09-OCT-20	13-OCT-20	R5253130
Iron (Fe)-Total	0.387		0.010	mg/L	09-OCT-20	13-OCT-20	R5253130
Lead (Pb)-Total	0.000055		0.000050	mg/L	09-OCT-20	13-OCT-20	R5253130
Lithium (Li)-Total	0.0040		0.0010	mg/L	09-OCT-20	13-OCT-20	R5253130
Magnesium (Mg)-Total	33.9		0.0050	mg/L	09-OCT-20	13-OCT-20	R5253130
Manganese (Mn)-Total	0.0110		0.00050	mg/L	09-OCT-20	13-OCT-20	R5253130
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		09-OCT-20	R5252246
Molybdenum (Mo)-Total	0.000544		0.000050	mg/L	09-OCT-20	13-OCT-20	R5253130
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	09-OCT-20	13-OCT-20	R5253130
Phosphorus (P)-Total	<0.050		0.050	mg/L	09-OCT-20	13-OCT-20	R5253130
Potassium (K)-Total	0.980		0.050	mg/L	09-OCT-20	13-OCT-20	R5253130
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	09-OCT-20	13-OCT-20	R5253130
Selenium (Se)-Total	<0.000050		0.000050	mg/L	09-OCT-20	13-OCT-20	R5253130
Silicon (Si)-Total	8.70		0.10	mg/L	09-OCT-20	13-OCT-20	R5253130
Silver (Ag)-Total	<0.000050		0.000050	mg/L	09-OCT-20	13-OCT-20	R5253130
Sodium (Na)-Total	8.20		0.050	mg/L	09-OCT-20	13-OCT-20	R5253130
Strontium (Sr)-Total	0.147		0.0010	mg/L	09-OCT-20	13-OCT-20	R5253130
Sulfur (S)-Total	19.3		0.50	mg/L	09-OCT-20	13-OCT-20	R5253130
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	09-OCT-20	13-OCT-20	R5253130
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	09-OCT-20	13-OCT-20	R5253130
Thorium (Th)-Total	<0.00010		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Tin (Sn)-Total	<0.00010		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	09-OCT-20	13-OCT-20	R5253130
Tungsten (W)-Total	<0.00010		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Uranium (U)-Total	0.000254		0.000010	mg/L	09-OCT-20	13-OCT-20	R5253130
Vanadium (V)-Total	<0.00050		0.00050	mg/L	09-OCT-20	13-OCT-20	R5253130
Zinc (Zn)-Total	0.0063		0.0030	mg/L	09-OCT-20	13-OCT-20	R5253130

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2514428-1 W-11210029-20201008-40 Sampled By: ERIC on 08-OCT-20 @ 10:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	09-OCT-20	13-OCT-20	R5253130
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		09-OCT-20	R5253209
Volatile Organic Compounds							
Acetone	<30		30	ug/L		13-OCT-20	R5253112
Benzene	<0.50		0.50	ug/L		13-OCT-20	R5253112
Bromodichloromethane	<2.0		2.0	ug/L		13-OCT-20	R5253112
Bromoform	<5.0		5.0	ug/L		13-OCT-20	R5253112
Bromomethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
Carbon tetrachloride	<0.20		0.20	ug/L		13-OCT-20	R5253112
Chlorobenzene	<0.50		0.50	ug/L		13-OCT-20	R5253112
Dibromochloromethane	<2.0		2.0	ug/L		13-OCT-20	R5253112
Chloroform	<1.0		1.0	ug/L		13-OCT-20	R5253112
1,2-Dibromoethane	<0.20		0.20	ug/L		13-OCT-20	R5253112
1,2-Dichlorobenzene	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,3-Dichlorobenzene	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,4-Dichlorobenzene	<0.50		0.50	ug/L		13-OCT-20	R5253112
Dichlorodifluoromethane	<2.0		2.0	ug/L		13-OCT-20	R5253112
1,1-Dichloroethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,2-Dichloroethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,1-Dichloroethylene	<0.50		0.50	ug/L		13-OCT-20	R5253112
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		13-OCT-20	R5253112
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		13-OCT-20	R5253112
Methylene Chloride	<5.0		5.0	ug/L		13-OCT-20	R5253112
1,2-Dichloropropane	<0.50		0.50	ug/L		13-OCT-20	R5253112
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		13-OCT-20	R5253112
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		13-OCT-20	R5253112
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		13-OCT-20	
Ethylbenzene	<0.50		0.50	ug/L		13-OCT-20	R5253112
n-Hexane	<0.50		0.50	ug/L		13-OCT-20	R5253112
Methyl Ethyl Ketone	<20		20	ug/L		13-OCT-20	R5253112
Methyl Isobutyl Ketone	<20		20	ug/L		13-OCT-20	R5253112
MTBE	<2.0		2.0	ug/L		13-OCT-20	R5253112
Styrene	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
Tetrachloroethylene	<0.50		0.50	ug/L		13-OCT-20	R5253112
Toluene	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,1,1-Trichloroethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,1,2-Trichloroethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
Trichloroethylene	<0.50		0.50	ug/L		13-OCT-20	R5253112

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2514428-1 W-11210029-20201008-40 Sampled By: ERIC on 08-OCT-20 @ 10:00 Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		13-OCT-20	R5253112
Vinyl chloride	<0.50		0.50	ug/L		13-OCT-20	R5253112
o-Xylene	<0.30		0.30	ug/L		13-OCT-20	R5253112
m+p-Xylenes	<0.40		0.40	ug/L		13-OCT-20	R5253112
Xylenes (Total)	<0.50		0.50	ug/L		13-OCT-20	
Surrogate: 4-Bromofluorobenzene	102.2		70-130	%		13-OCT-20	R5253112
Surrogate: 1,4-Difluorobenzene	100.9		70-130	%		13-OCT-20	R5253112
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		13-OCT-20	R5253112
F1-BTEX	<25		25	ug/L		15-OCT-20	
F2 (C10-C16)	<100		100	ug/L	09-OCT-20	13-OCT-20	R5253236
F2-Naphth	<100		100	ug/L		15-OCT-20	
F3 (C16-C34)	<250		250	ug/L	09-OCT-20	13-OCT-20	R5253236
F3-PAH	<250		250	ug/L		15-OCT-20	
F4 (C34-C50)	<250		250	ug/L	09-OCT-20	13-OCT-20	R5253236
Total Hydrocarbons (C6-C50)	<370		370	ug/L		15-OCT-20	
Chrom. to baseline at nC50	YES				09-OCT-20	13-OCT-20	R5253236
Surrogate: 2-Bromobenzotrifluoride	86.0		60-140	%	09-OCT-20	13-OCT-20	R5253236
Surrogate: 3,4-Dichlorotoluene	104.1		60-140	%		13-OCT-20	R5253112
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Acenaphthylene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Anthracene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Benzo(a)anthracene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Benzo(a)pyrene	<0.010		0.010	ug/L	09-OCT-20	15-OCT-20	R5252409
Benzo(b)fluoranthene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Benzo(k)fluoranthene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Chrysene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Fluoranthene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Fluorene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		15-OCT-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
2-Methylnaphthalene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Naphthalene	<0.050		0.050	ug/L	09-OCT-20	15-OCT-20	R5252409
Phenanthrene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Pyrene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Surrogate: d10-Acenaphthene	101.8		60-140	%	09-OCT-20	15-OCT-20	R5252409
Surrogate: d12-Chrysene	95.1		60-140	%	09-OCT-20	15-OCT-20	R5252409

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2514428-1 W-11210029-20201008-40 Sampled By: ERIC on 08-OCT-20 @ 10:00 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	97.7		60-140	%	09-OCT-20	15-OCT-20	R5252409
Surrogate: d10-Phenanthrene	106.6		60-140	%	09-OCT-20	15-OCT-20	R5252409
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
4-Chloroaniline	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
2-Chlorophenol	<0.30		0.30	ug/L	09-OCT-20	15-OCT-20	R5253218
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4-Dichlorophenol	<0.30		0.30	ug/L	09-OCT-20	15-OCT-20	R5253218
Diethylphthalate	<0.20		0.20	ug/L	09-OCT-20	15-OCT-20	R5253218
Dimethylphthalate	<0.20		0.20	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4-Dimethylphenol	<0.50		0.50	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4-Dinitrophenol	<1.0		1.0	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4-Dinitrotoluene	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
2,6-Dinitrotoluene	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	09-OCT-20	15-OCT-20	R5253218
Bis(2-ethylhexyl)phthalate	2.3		2.0	ug/L	09-OCT-20	15-OCT-20	R5253218
Pentachlorophenol	<0.50		0.50	ug/L	09-OCT-20	15-OCT-20	R5253218
Phenol	<0.50		0.50	ug/L	09-OCT-20	15-OCT-20	R5253218
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	09-OCT-20	15-OCT-20	R5253218
Surrogate: 2-Fluorobiphenyl	82.7		50-140	%	09-OCT-20	15-OCT-20	R5253218
Surrogate: Nitrobenzene d5	99.9		50-140	%	09-OCT-20	15-OCT-20	R5253218
Surrogate: p-Terphenyl d14	100.5		60-140	%	09-OCT-20	15-OCT-20	R5253218
Surrogate: 2,4,6-Tribromophenol	90.1		50-140	%	09-OCT-20	15-OCT-20	R5253218
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	14-OCT-20	14-OCT-20	R5254140
Aroclor 1248	<0.020		0.020	ug/L	14-OCT-20	14-OCT-20	R5254140
Aroclor 1254	<0.020		0.020	ug/L	14-OCT-20	14-OCT-20	R5254140
Aroclor 1260	<0.020		0.020	ug/L	14-OCT-20	14-OCT-20	R5254140
Surrogate: Decachlorobiphenyl	118.2		50-150	%	14-OCT-20	14-OCT-20	R5254140
Total PCBs	<0.040		0.040	ug/L	14-OCT-20	14-OCT-20	R5254140
Surrogate: Tetrachloro-m-xylene	86.7		50-150	%	14-OCT-20	14-OCT-20	R5254140

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	F1 (C6-C10)	LCS-L	L2514428-1
Matrix Spike	Aluminum (Al)-Total	MS-B	L2514428-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2514428-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2514428-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2514428-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2514428-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2514428-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2514428-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2514428-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2514428-1
Matrix Spike	Uranium (U)-Total	MS-B	L2514428-1

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-L	Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Reference Information

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
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Reference Information

WT

ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:**GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2514428

Report Date: 15-OCT-20

Page 1 of 16

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5253218							
WG3421997-2 LCS								
1,2,4-Trichlorobenzene			86.7		%		50-140	13-OCT-20
2-Chlorophenol			89.8		%		50-140	13-OCT-20
2,4-Dichlorophenol			94.2		%		50-140	13-OCT-20
2,4-Dimethylphenol			102.3		%		30-130	13-OCT-20
2,4-Dinitrophenol			127.6		%		50-140	13-OCT-20
2,4-Dinitrotoluene			130.4		%		50-140	13-OCT-20
2,4,5-Trichlorophenol			103.1		%		50-140	13-OCT-20
2,4,6-Trichlorophenol			101.6		%		50-140	13-OCT-20
2,6-Dinitrotoluene			112.5		%		50-140	13-OCT-20
3,3'-Dichlorobenzidine			90.8		%		30-130	13-OCT-20
4-Chloroaniline			79.7		%		30-130	13-OCT-20
Biphenyl			100.5		%		50-140	13-OCT-20
Bis(2-chloroethyl)ether			101.5		%		50-140	13-OCT-20
Bis(2-chloroisopropyl)ether			99.3		%		50-140	13-OCT-20
Bis(2-ethylhexyl)phthalate			133.9		%		50-140	13-OCT-20
Diethylphthalate			100.3		%		50-140	13-OCT-20
Dimethylphthalate			99.4		%		50-140	13-OCT-20
Pentachlorophenol			106.6		%		50-140	13-OCT-20
Phenol			102.9		%		30-130	13-OCT-20
WG3421997-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	13-OCT-20
2-Chlorophenol			<0.30		ug/L		0.3	13-OCT-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	13-OCT-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	13-OCT-20
2,4-Dinitrophenol			<1.0		ug/L		1	13-OCT-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	13-OCT-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	13-OCT-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	13-OCT-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	13-OCT-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	13-OCT-20
4-Chloroaniline			<0.40		ug/L		0.4	13-OCT-20
Biphenyl			<0.40		ug/L		0.4	13-OCT-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	13-OCT-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	13-OCT-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5253218								
WG3421997-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	13-OCT-20
Diethylphthalate			<0.20		ug/L		0.2	13-OCT-20
Dimethylphthalate			<0.20		ug/L		0.2	13-OCT-20
Pentachlorophenol			<0.50		ug/L		0.5	13-OCT-20
Phenol			<0.50		ug/L		0.5	13-OCT-20
Surrogate: 2-Fluorobiphenyl			84.5		%		50-140	13-OCT-20
Surrogate: 2,4,6-Tribromophenol			83.0		%		50-140	13-OCT-20
Surrogate: Nitrobenzene d5			98.7		%		50-140	13-OCT-20
Surrogate: p-Terphenyl d14			116.3		%		60-140	13-OCT-20
CR-CR6-IC-WT Water								
Batch R5253209								
WG3422017-4 DUP								
Chromium, Hexavalent		WG3422017-3 <0.00050	<0.00050	RPD-NA	mg/L	N/A	20	09-OCT-20
WG3422017-2 LCS								
Chromium, Hexavalent			99.6		%		80-120	09-OCT-20
WG3422017-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	09-OCT-20
WG3422017-5 MS								
Chromium, Hexavalent		WG3422017-3	97.1		%		70-130	09-OCT-20
F1-HS-511-WT Water								
Batch R5253112								
WG3421565-4 DUP								
F1 (C6-C10)		WG3421565-3 <25	<25	RPD-NA	ug/L	N/A	30	13-OCT-20
WG3421565-1 LCS								
F1 (C6-C10)			74.6	LCS-L	%		80-120	09-OCT-20
WG3421565-2 MB								
F1 (C6-C10)			<25		ug/L		25	09-OCT-20
Surrogate: 3,4-Dichlorotoluene			74.2		%		60-140	09-OCT-20
WG3421565-5 MS								
F1 (C6-C10)		WG3421565-3	85.2		%		60-140	13-OCT-20
F2-F4-511-WT Water								
Batch R5253236								
WG3421558-2 LCS								
F2 (C10-C16)			96.4		%		70-130	13-OCT-20
F3 (C16-C34)			97.8		%		70-130	13-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch R5253236								
WG3421558-2	LCS							
F4 (C34-C50)			102.9		%		70-130	13-OCT-20
WG3421558-1	MB							
F2 (C10-C16)			<100		ug/L		100	13-OCT-20
F3 (C16-C34)			<250		ug/L		250	13-OCT-20
F4 (C34-C50)			<250		ug/L		250	13-OCT-20
Surrogate: 2-Bromobenzotrifluoride			89.9		%		60-140	13-OCT-20
HG-T-CVAA-WT		Water						
Batch R5252246								
WG3421770-4	DUP	WG3421770-3						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	09-OCT-20
WG3421770-2	LCS							
Mercury (Hg)-Total			99.5		%		80-120	09-OCT-20
WG3421770-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	09-OCT-20
WG3421770-6	MS	WG3421770-5						
Mercury (Hg)-Total			96.6		%		70-130	09-OCT-20
MET-T-CCMS-WT		Water						
Batch R5253130								
WG3421493-4	DUP	WG3421493-3						
Aluminum (Al)-Total		0.149	0.156		mg/L	4.4	20	09-OCT-20
Antimony (Sb)-Total		0.00017	0.00016		mg/L	3.8	20	09-OCT-20
Arsenic (As)-Total		0.00065	0.00064		mg/L	1.6	20	09-OCT-20
Barium (Ba)-Total		0.0210	0.0210		mg/L	0.0	20	09-OCT-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	09-OCT-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	09-OCT-20
Boron (B)-Total		0.021	0.021		mg/L	0.2	20	09-OCT-20
Cadmium (Cd)-Total		0.0000149	0.0000151		mg/L	1.3	20	09-OCT-20
Calcium (Ca)-Total		28.6	28.4		mg/L	1.0	20	09-OCT-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	09-OCT-20
Cesium (Cs)-Total		0.000025	0.000024		mg/L	4.1	20	09-OCT-20
Cobalt (Co)-Total		0.00010	0.00010		mg/L	1.0	20	09-OCT-20
Copper (Cu)-Total		0.00130	0.00121		mg/L	7.0	20	09-OCT-20
Iron (Fe)-Total		0.197	0.199		mg/L	1.1	20	09-OCT-20
Lead (Pb)-Total		0.000303	0.000312		mg/L	2.8	20	09-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5253130							
WG3421493-4	DUP	WG3421493-3						
Lithium (Li)-Total		0.0018	0.0019		mg/L	3.2	20	09-OCT-20
Magnesium (Mg)-Total		8.28	8.30		mg/L	0.2	20	09-OCT-20
Manganese (Mn)-Total		0.00779	0.00772		mg/L	0.9	20	09-OCT-20
Molybdenum (Mo)-Total		0.00210	0.00208		mg/L	0.8	20	09-OCT-20
Nickel (Ni)-Total		0.00064	0.00060		mg/L	7.0	20	09-OCT-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	09-OCT-20
Potassium (K)-Total		1.30	1.32		mg/L	2.0	20	09-OCT-20
Rubidium (Rb)-Total		0.00145	0.00152		mg/L	4.3	20	09-OCT-20
Selenium (Se)-Total		0.000125	0.000114		mg/L	8.7	20	09-OCT-20
Silicon (Si)-Total		1.09	1.09		mg/L	0.4	20	09-OCT-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	09-OCT-20
Sodium (Na)-Total		14.1	14.0		mg/L	0.5	20	09-OCT-20
Strontium (Sr)-Total		0.139	0.141		mg/L	1.3	20	09-OCT-20
Sulfur (S)-Total		6.07	6.00		mg/L	1.2	25	09-OCT-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	09-OCT-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	09-OCT-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	09-OCT-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	09-OCT-20
Titanium (Ti)-Total		0.00288	0.00303		mg/L	5.2	20	09-OCT-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	09-OCT-20
Uranium (U)-Total		0.000289	0.000286		mg/L	1.1	20	09-OCT-20
Vanadium (V)-Total		0.00069	0.00069		mg/L	0.2	20	09-OCT-20
Zinc (Zn)-Total		0.0045	0.0044		mg/L	1.6	20	09-OCT-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	09-OCT-20
WG3421493-2	LCS							
Aluminum (Al)-Total			102.0		%		80-120	09-OCT-20
Antimony (Sb)-Total			99.9		%		80-120	09-OCT-20
Arsenic (As)-Total			100.9		%		80-120	09-OCT-20
Barium (Ba)-Total			98.5		%		80-120	09-OCT-20
Beryllium (Be)-Total			101.4		%		80-120	09-OCT-20
Bismuth (Bi)-Total			97.1		%		80-120	09-OCT-20
Boron (B)-Total			100.2		%		80-120	09-OCT-20
Cadmium (Cd)-Total			101.6		%		80-120	09-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5253130							
WG3421493-2	LCS							
Calcium (Ca)-Total			99.7		%		80-120	09-OCT-20
Chromium (Cr)-Total			99.9		%		80-120	09-OCT-20
Cesium (Cs)-Total			99.9		%		80-120	09-OCT-20
Cobalt (Co)-Total			99.8		%		80-120	09-OCT-20
Copper (Cu)-Total			99.9		%		80-120	09-OCT-20
Iron (Fe)-Total			101.0		%		80-120	09-OCT-20
Lead (Pb)-Total			98.1		%		80-120	09-OCT-20
Lithium (Li)-Total			101.4		%		80-120	09-OCT-20
Magnesium (Mg)-Total			104.7		%		80-120	09-OCT-20
Manganese (Mn)-Total			101.2		%		80-120	09-OCT-20
Molybdenum (Mo)-Total			98.4		%		80-120	09-OCT-20
Nickel (Ni)-Total			100.2		%		80-120	09-OCT-20
Phosphorus (P)-Total			111.0		%		70-130	09-OCT-20
Potassium (K)-Total			96.9		%		80-120	09-OCT-20
Rubidium (Rb)-Total			100.9		%		80-120	09-OCT-20
Selenium (Se)-Total			100.2		%		80-120	09-OCT-20
Silicon (Si)-Total			99.5		%		60-140	09-OCT-20
Silver (Ag)-Total			97.7		%		80-120	09-OCT-20
Sodium (Na)-Total			103.3		%		80-120	09-OCT-20
Strontium (Sr)-Total			101.7		%		80-120	09-OCT-20
Sulfur (S)-Total			101.9		%		80-120	09-OCT-20
Thallium (Tl)-Total			99.99		%		80-120	09-OCT-20
Tellurium (Te)-Total			99.4		%		80-120	09-OCT-20
Thorium (Th)-Total			100.1		%		70-130	09-OCT-20
Tin (Sn)-Total			95.4		%		80-120	09-OCT-20
Titanium (Ti)-Total			97.7		%		80-120	09-OCT-20
Tungsten (W)-Total			93.5		%		80-120	09-OCT-20
Uranium (U)-Total			102.0		%		80-120	09-OCT-20
Vanadium (V)-Total			101.7		%		80-120	09-OCT-20
Zinc (Zn)-Total			98.0		%		80-120	09-OCT-20
Zirconium (Zr)-Total			97.3		%		80-120	09-OCT-20
WG3421493-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	09-OCT-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	09-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5253130							
WG3421493-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	09-OCT-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	09-OCT-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	09-OCT-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	09-OCT-20
Boron (B)-Total			<0.010		mg/L		0.01	09-OCT-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	09-OCT-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	09-OCT-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	09-OCT-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	09-OCT-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	09-OCT-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	09-OCT-20
Iron (Fe)-Total			<0.010		mg/L		0.01	09-OCT-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	09-OCT-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	09-OCT-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	09-OCT-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	09-OCT-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	09-OCT-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	09-OCT-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	09-OCT-20
Potassium (K)-Total			<0.050		mg/L		0.05	09-OCT-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	09-OCT-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	09-OCT-20
Silicon (Si)-Total			<0.10		mg/L		0.1	09-OCT-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	09-OCT-20
Sodium (Na)-Total			<0.050		mg/L		0.05	09-OCT-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	09-OCT-20
Sulfur (S)-Total			<0.50		mg/L		0.5	09-OCT-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	09-OCT-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	09-OCT-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	09-OCT-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	09-OCT-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	09-OCT-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	09-OCT-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5253130							
WG3421493-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	09-OCT-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	09-OCT-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	09-OCT-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	09-OCT-20
WG3421493-5 MS		WG3421493-3						
Aluminum (Al)-Total			N/A	MS-B	%		-	09-OCT-20
Antimony (Sb)-Total			98.7		%		70-130	09-OCT-20
Arsenic (As)-Total			99.1		%		70-130	09-OCT-20
Barium (Ba)-Total			N/A	MS-B	%		-	09-OCT-20
Beryllium (Be)-Total			100.2		%		70-130	09-OCT-20
Bismuth (Bi)-Total			91.9		%		70-130	09-OCT-20
Boron (B)-Total			99.0		%		70-130	09-OCT-20
Cadmium (Cd)-Total			98.4		%		70-130	09-OCT-20
Calcium (Ca)-Total			N/A	MS-B	%		-	09-OCT-20
Chromium (Cr)-Total			99.6		%		70-130	09-OCT-20
Cesium (Cs)-Total			97.6		%		70-130	09-OCT-20
Cobalt (Co)-Total			97.7		%		70-130	09-OCT-20
Copper (Cu)-Total			97.1		%		70-130	09-OCT-20
Iron (Fe)-Total			N/A	MS-B	%		-	09-OCT-20
Lead (Pb)-Total			93.3		%		70-130	09-OCT-20
Lithium (Li)-Total			99.9		%		70-130	09-OCT-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	09-OCT-20
Manganese (Mn)-Total			94.9		%		70-130	09-OCT-20
Molybdenum (Mo)-Total			95.6		%		70-130	09-OCT-20
Nickel (Ni)-Total			96.5		%		70-130	09-OCT-20
Phosphorus (P)-Total			106.4		%		70-130	09-OCT-20
Potassium (K)-Total			97.4		%		70-130	09-OCT-20
Rubidium (Rb)-Total			102.4		%		70-130	09-OCT-20
Selenium (Se)-Total			97.8		%		70-130	09-OCT-20
Silicon (Si)-Total			N/A	MS-B	%		-	09-OCT-20
Silver (Ag)-Total			92.3		%		70-130	09-OCT-20
Sodium (Na)-Total			N/A	MS-B	%		-	09-OCT-20
Strontium (Sr)-Total			N/A	MS-B	%		-	09-OCT-20
Sulfur (S)-Total			N/A	MS-B	%		-	09-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5253130							
WG3421493-5 MS		WG3421493-3						
Thallium (Tl)-Total			94.5		%		70-130	09-OCT-20
Tellurium (Te)-Total			88.5		%		70-130	09-OCT-20
Thorium (Th)-Total			95.6		%		70-130	09-OCT-20
Tin (Sn)-Total			92.0		%		70-130	09-OCT-20
Titanium (Ti)-Total			96.3		%		70-130	09-OCT-20
Tungsten (W)-Total			91.8		%		70-130	09-OCT-20
Uranium (U)-Total			N/A	MS-B	%		-	09-OCT-20
Vanadium (V)-Total			101.4		%		70-130	09-OCT-20
Zinc (Zn)-Total			94.7		%		70-130	09-OCT-20
Zirconium (Zr)-Total			81.4		%		70-130	09-OCT-20
P-T-COL-WT								
	Water							
Batch	R5253467							
WG3421424-3 DUP		L2514428-1						
Phosphorus, Total		0.0063	0.0045	J	mg/L	0.0019	0.006	13-OCT-20
WG3421424-2 LCS								
Phosphorus, Total			102.0		%		80-120	13-OCT-20
WG3421424-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	13-OCT-20
WG3421424-4 MS		L2514428-1						
Phosphorus, Total			110.7		%		70-130	13-OCT-20
PAH-511-WT								
	Water							
Batch	R5252409							
WG3421558-2 LCS								
1-Methylnaphthalene			74.2		%		50-140	09-OCT-20
2-Methylnaphthalene			70.7		%		50-140	09-OCT-20
Acenaphthene			86.6		%		50-140	09-OCT-20
Acenaphthylene			85.9		%		50-140	09-OCT-20
Anthracene			88.6		%		50-140	09-OCT-20
Benzo(a)anthracene			109.0		%		50-140	09-OCT-20
Benzo(a)pyrene			86.0		%		50-140	09-OCT-20
Benzo(b)fluoranthene			103.3		%		50-140	09-OCT-20
Benzo(g,h,i)perylene			73.0		%		50-140	09-OCT-20
Benzo(k)fluoranthene			84.2		%		50-140	09-OCT-20
Chrysene			89.2		%		50-140	09-OCT-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5252409							
WG3421558-2	LCS							
Dibenzo(ah)anthracene			70.6		%		50-140	09-OCT-20
Fluoranthene			90.2		%		50-140	09-OCT-20
Fluorene			88.4		%		50-140	09-OCT-20
Indeno(1,2,3-cd)pyrene			81.1		%		50-140	09-OCT-20
Naphthalene			71.1		%		50-140	09-OCT-20
Phenanthrene			97.0		%		50-140	09-OCT-20
Pyrene			90.6		%		50-140	09-OCT-20
WG3421558-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	09-OCT-20
2-Methylnaphthalene			<0.020		ug/L		0.02	09-OCT-20
Acenaphthene			<0.020		ug/L		0.02	09-OCT-20
Acenaphthylene			<0.020		ug/L		0.02	09-OCT-20
Anthracene			<0.020		ug/L		0.02	09-OCT-20
Benzo(a)anthracene			<0.020		ug/L		0.02	09-OCT-20
Benzo(a)pyrene			<0.010		ug/L		0.01	09-OCT-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	09-OCT-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	09-OCT-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	09-OCT-20
Chrysene			<0.020		ug/L		0.02	09-OCT-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	09-OCT-20
Fluoranthene			<0.020		ug/L		0.02	09-OCT-20
Fluorene			<0.020		ug/L		0.02	09-OCT-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	09-OCT-20
Naphthalene			<0.050		ug/L		0.05	09-OCT-20
Phenanthrene			<0.020		ug/L		0.02	09-OCT-20
Pyrene			<0.020		ug/L		0.02	09-OCT-20
Surrogate: d8-Naphthalene			101.5		%		60-140	09-OCT-20
Surrogate: d10-Phenanthrene			116.7		%		60-140	09-OCT-20
Surrogate: d12-Chrysene			100.9		%		60-140	09-OCT-20
Surrogate: d10-Acenaphthene			109.7		%		60-140	09-OCT-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5254140							
WG3421539-2	LCS							
Aroclor 1242			86.3		%		60-140	14-OCT-20
Aroclor 1248			83.9		%		60-140	14-OCT-20
Aroclor 1254			87.2		%		60-140	14-OCT-20
Aroclor 1260			86.4		%		60-140	14-OCT-20
WG3421539-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	14-OCT-20
Aroclor 1248			<0.020		ug/L		0.02	14-OCT-20
Aroclor 1254			<0.020		ug/L		0.02	14-OCT-20
Aroclor 1260			<0.020		ug/L		0.02	14-OCT-20
Surrogate: Decachlorobiphenyl			107.1		%		50-150	14-OCT-20
Surrogate: Tetrachloro-m-xylene			81.6		%		50-150	14-OCT-20
VOC-511-HS-WT		Water						
Batch	R5253112							
WG3421565-4	DUP		WG3421565-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	13-OCT-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	13-OCT-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	13-OCT-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	13-OCT-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	13-OCT-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5253112							
WG3421565-4	DUP	WG3421565-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	13-OCT-20
cis-1,2-Dichloroethylene		2.84	2.81		ug/L	1.1	30	13-OCT-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	13-OCT-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	13-OCT-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	13-OCT-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	13-OCT-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	13-OCT-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	13-OCT-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	13-OCT-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	13-OCT-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	13-OCT-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	13-OCT-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	13-OCT-20
Vinyl chloride		6.93	6.83		ug/L	1.5	30	13-OCT-20
WG3421565-1	LCS							
1,1,1,2-Tetrachloroethane			92.8		%		70-130	09-OCT-20
1,1,2,2-Tetrachloroethane			102.5		%		70-130	09-OCT-20
1,1,1-Trichloroethane			97.8		%		70-130	09-OCT-20
1,1,2-Trichloroethane			98.2		%		70-130	09-OCT-20
1,1-Dichloroethane			101.4		%		70-130	09-OCT-20
1,1-Dichloroethylene			94.0		%		70-130	09-OCT-20
1,2-Dibromoethane			96.0		%		70-130	09-OCT-20
1,2-Dichlorobenzene			100.1		%		70-130	09-OCT-20
1,2-Dichloroethane			102.6		%		70-130	09-OCT-20
1,2-Dichloropropane			102.1		%		70-130	09-OCT-20
1,3-Dichlorobenzene			100.5		%		70-130	09-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5253112							
WG3421565-1	LCS							
1,4-Dichlorobenzene			100.5		%		70-130	09-OCT-20
Acetone			109.9		%		60-140	09-OCT-20
Benzene			100.8		%		70-130	09-OCT-20
Bromodichloromethane			110.1		%		70-130	09-OCT-20
Bromoform			103.8		%		70-130	09-OCT-20
Bromomethane			122.6		%		60-140	09-OCT-20
Carbon tetrachloride			97.9		%		70-130	09-OCT-20
Chlorobenzene			94.5		%		70-130	09-OCT-20
Chloroform			103.3		%		70-130	09-OCT-20
cis-1,2-Dichloroethylene			97.1		%		70-130	09-OCT-20
cis-1,3-Dichloropropene			102.4		%		70-130	09-OCT-20
Dibromochloromethane			93.9		%		70-130	09-OCT-20
Dichlorodifluoromethane			89.4		%		50-140	09-OCT-20
Ethylbenzene			91.1		%		70-130	09-OCT-20
n-Hexane			94.9		%		70-130	09-OCT-20
m+p-Xylenes			91.7		%		70-130	09-OCT-20
Methyl Ethyl Ketone			113.5		%		60-140	09-OCT-20
Methyl Isobutyl Ketone			104.9		%		60-140	09-OCT-20
Methylene Chloride			102.2		%		70-130	09-OCT-20
MTBE			107.3		%		70-130	09-OCT-20
o-Xylene			99.96		%		70-130	09-OCT-20
Styrene			94.8		%		70-130	09-OCT-20
Tetrachloroethylene			91.0		%		70-130	09-OCT-20
Toluene			91.1		%		70-130	09-OCT-20
trans-1,2-Dichloroethylene			96.3		%		70-130	09-OCT-20
trans-1,3-Dichloropropene			100.4		%		70-130	09-OCT-20
Trichloroethylene			99.5		%		70-130	09-OCT-20
Trichlorofluoromethane			91.4		%		60-140	09-OCT-20
Vinyl chloride			105.6		%		60-140	09-OCT-20
WG3421565-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	09-OCT-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	09-OCT-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	09-OCT-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	09-OCT-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5253112							
WG3421565-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	09-OCT-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	09-OCT-20
1,2-Dibromoethane			<0.20		ug/L		0.2	09-OCT-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	09-OCT-20
1,2-Dichloroethane			<0.50		ug/L		0.5	09-OCT-20
1,2-Dichloropropane			<0.50		ug/L		0.5	09-OCT-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	09-OCT-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	09-OCT-20
Acetone			<30		ug/L		30	09-OCT-20
Benzene			<0.50		ug/L		0.5	09-OCT-20
Bromodichloromethane			<2.0		ug/L		2	09-OCT-20
Bromoform			<5.0		ug/L		5	09-OCT-20
Bromomethane			<0.50		ug/L		0.5	09-OCT-20
Carbon tetrachloride			<0.20		ug/L		0.2	09-OCT-20
Chlorobenzene			<0.50		ug/L		0.5	09-OCT-20
Chloroform			<1.0		ug/L		1	09-OCT-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	09-OCT-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	09-OCT-20
Dibromochloromethane			<2.0		ug/L		2	09-OCT-20
Dichlorodifluoromethane			<2.0		ug/L		2	09-OCT-20
Ethylbenzene			<0.50		ug/L		0.5	09-OCT-20
n-Hexane			<0.50		ug/L		0.5	09-OCT-20
m+p-Xylenes			<0.40		ug/L		0.4	09-OCT-20
Methyl Ethyl Ketone			<20		ug/L		20	09-OCT-20
Methyl Isobutyl Ketone			<20		ug/L		20	09-OCT-20
Methylene Chloride			<5.0		ug/L		5	09-OCT-20
MTBE			<2.0		ug/L		2	09-OCT-20
o-Xylene			<0.30		ug/L		0.3	09-OCT-20
Styrene			<0.50		ug/L		0.5	09-OCT-20
Tetrachloroethylene			<0.50		ug/L		0.5	09-OCT-20
Toluene			<0.50		ug/L		0.5	09-OCT-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	09-OCT-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	09-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5253112							
WG3421565-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	09-OCT-20
Trichlorofluoromethane			<5.0		ug/L		5	09-OCT-20
Vinyl chloride			<0.50		ug/L		0.5	09-OCT-20
Surrogate: 1,4-Difluorobenzene			101.6		%		70-130	09-OCT-20
Surrogate: 4-Bromofluorobenzene			103.8		%		70-130	09-OCT-20
WG3421565-5 MS		WG3421565-3						
1,1,1,2-Tetrachloroethane			93.3		%		50-140	13-OCT-20
1,1,2,2-Tetrachloroethane			73.2		%		50-140	13-OCT-20
1,1,1-Trichloroethane			98.7		%		50-140	13-OCT-20
1,1,2-Trichloroethane			92.0		%		50-140	13-OCT-20
1,1-Dichloroethane			100.6		%		50-140	13-OCT-20
1,1-Dichloroethylene			93.9		%		50-140	13-OCT-20
1,2-Dibromoethane			87.8		%		50-140	13-OCT-20
1,2-Dichlorobenzene			99.2		%		50-140	13-OCT-20
1,2-Dichloroethane			95.0		%		50-140	13-OCT-20
1,2-Dichloropropane			99.1		%		50-140	13-OCT-20
1,3-Dichlorobenzene			111.2		%		50-140	13-OCT-20
1,4-Dichlorobenzene			109.5		%		50-140	13-OCT-20
Acetone			80.9		%		50-140	13-OCT-20
Benzene			99.7		%		50-140	13-OCT-20
Bromodichloromethane			105.7		%		50-140	13-OCT-20
Bromoform			89.7		%		50-140	13-OCT-20
Bromomethane			116.8		%		50-140	13-OCT-20
Carbon tetrachloride			98.7		%		50-140	13-OCT-20
Chlorobenzene			94.6		%		50-140	13-OCT-20
Chloroform			101.8		%		50-140	13-OCT-20
cis-1,2-Dichloroethylene			96.0		%		50-140	13-OCT-20
cis-1,3-Dichloropropene			91.9		%		50-140	13-OCT-20
Dibromochloromethane			88.0		%		50-140	13-OCT-20
Dichlorodifluoromethane			83.1		%		50-140	13-OCT-20
Ethylbenzene			93.7		%		50-140	13-OCT-20
n-Hexane			94.9		%		50-140	13-OCT-20
m+p-Xylenes			93.8		%		50-140	13-OCT-20
Methyl Ethyl Ketone			80.6		%		50-140	13-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5253112							
WG3421565-5 MS		WG3421565-3						
Methyl Isobutyl Ketone			72.5		%		50-140	13-OCT-20
Methylene Chloride			98.2		%		50-140	13-OCT-20
MTBE			107.3		%		50-140	13-OCT-20
o-Xylene			101.6		%		50-140	13-OCT-20
Styrene			94.3		%		50-140	13-OCT-20
Tetrachloroethylene			92.6		%		50-140	13-OCT-20
Toluene			92.5		%		50-140	13-OCT-20
trans-1,2-Dichloroethylene			94.9		%		50-140	13-OCT-20
trans-1,3-Dichloropropene			89.3		%		50-140	13-OCT-20
Trichloroethylene			98.8		%		50-140	13-OCT-20
Trichlorofluoromethane			91.6		%		50-140	13-OCT-20
Vinyl chloride			104.0		%		50-140	13-OCT-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-L	Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

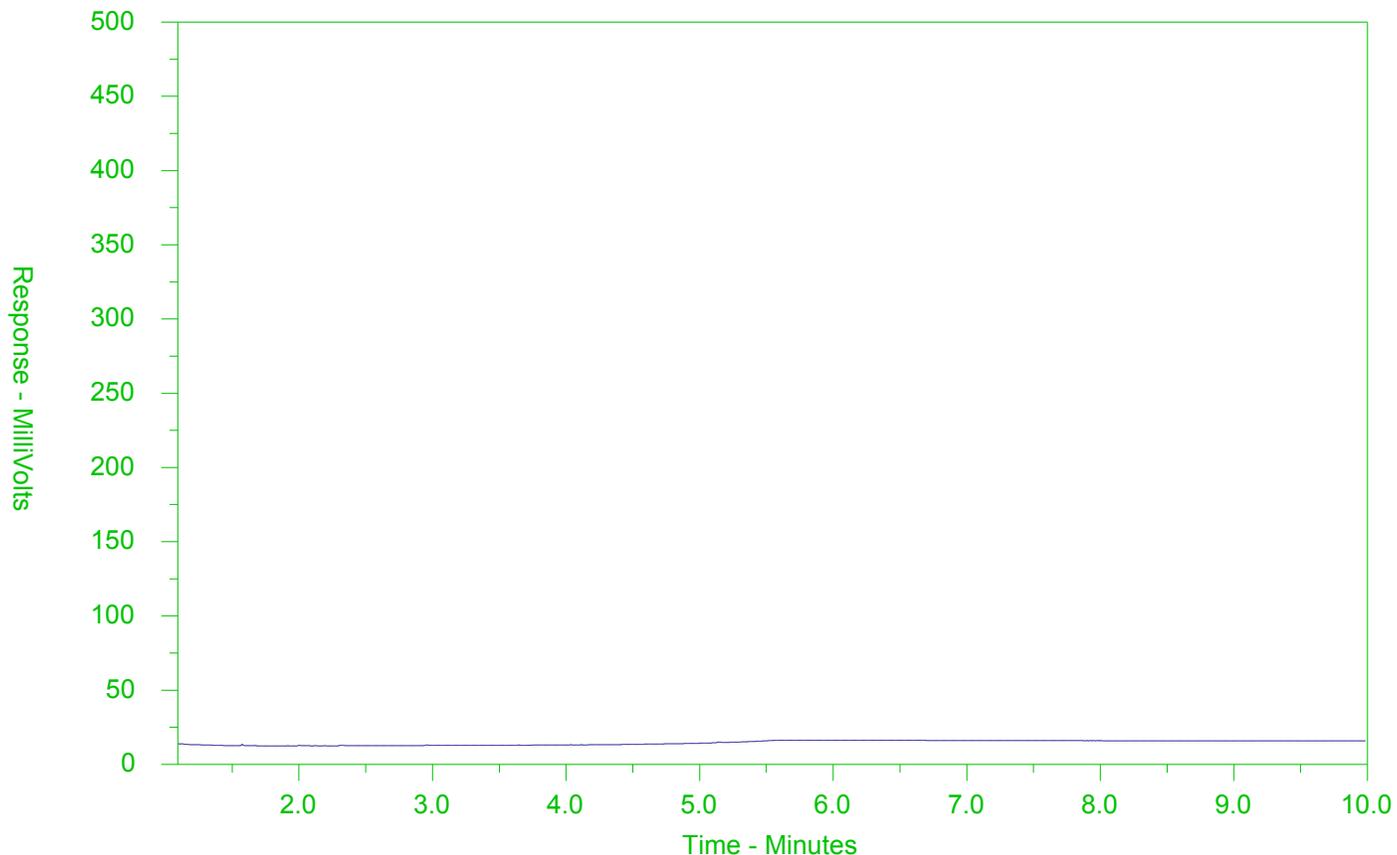
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2514428-1
 Client Sample ID: W-11210029-20201008-40



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytica Request Form

Canada Toll Free: 1 800 668 9878



L2514428-COFC

COC Number: 17 -

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Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)											
Company: GHD LIMITED - ACCT #13791		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply											
Contact: Laura Ermeta		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)		4 day [P4-20%] <input type="checkbox"/>		EMERGENCY		1 Business day [E - 100%] <input type="checkbox"/>					
Phone: 519-884-0510		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			3 day [P3-25%] <input type="checkbox"/>		2 day [P2-50%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/>							
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Date and Time Required for all E&P TATs:					dd-mmm-yy hh:mm						
Street: 455 Phillip St		Email 1 or Fax: laura.ermeta@ghd.com			For tests that can not be performed according to the service level selected, you will be contacted.											
City/Province: Waterloo, Ontario		Email 2: See PO			Analysis Request											
Postal Code: N2L 3X2		Email 3:			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below											
Invoice To		Invoice Distribution			NUMBER OF CONTAINERS											
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Total Metals (MET-T-COMS-WT)											
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Email 1 or Fax: apinvoices-735@ghd.com			Total Mercury (HG-T-CVAA-WT)											
Company: GHD Limited		Email 2:			Total Cr6 (CR-CR6-C-WT)											
Contact: SEE SOW		Email 3:			Total Phosphorous (P-T-COL-WT)											
Project Information		Oil and Gas Required Fields (client use)			PCBs (PCB-511-WT)											
ALS Account # / Quote #: 13791		AFE/Cost Center: PO#			VOCs and PHCs (VOC-F1-F4-511-P-WT)											
Job #: 11210029		Major/Minor Code: Routing Code:			SVOCs (SVOCC-511-GP-WT)											
PO / AFE: 73520086		Requisitioner:														
LSD:		Location:														
ALS Lab Work Order # (lab use only): 2514428		ALS Contact: Rick H			Sampler: ER											
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)			Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Total Metals (MET-T-COMS-WT)	Total Mercury (HG-T-CVAA-WT)	Total Cr6 (CR-CR6-C-WT)	Total Phosphorous (P-T-COL-WT)	PCBs (PCB-511-WT)	VOCs and PHCs (VOC-F1-F4-511-P-WT)	SVOCs (SVOCC-511-GP-WT)	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
W-11210029-3021008-40				08/10/20	1000AM	Water	12	R	R	R	R	R	R	R		
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)											
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>											
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input checked="" type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>											
					Cooling Initiated <input type="checkbox"/>											
					INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C						
										9.2						
SHIPMENT RELEASE (client use)				INITIAL SHIPMENT RECEPTION (lab use only)				FINAL SHIPMENT RECEPTION (lab use only)								
Date: OCT 8/20		Time: 1000AM		Received by:		Date:		Received by:		Date: OCT 9/20		Time: 1400				



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 15-OCT-20
Report Date: 21-OCT-20 14:22 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

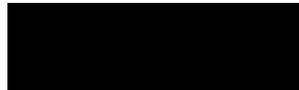
Lab Work Order #: L2517112

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2517112-1 W-11210029-20201015-42 Sampled By: CLIENT on 15-OCT-20 @ 11:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0042		0.0030	mg/L	19-OCT-20	20-OCT-20	R5258678
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	16-OCT-20	16-OCT-20	R5255771
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Arsenic (As)-Total	0.00535		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Barium (Ba)-Total	0.0537		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	16-OCT-20	16-OCT-20	R5255771
Boron (B)-Total	<0.010		0.010	mg/L	16-OCT-20	16-OCT-20	R5255771
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	16-OCT-20	16-OCT-20	R5255771
Calcium (Ca)-Total	70.5		0.050	mg/L	16-OCT-20	16-OCT-20	R5255771
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	16-OCT-20	16-OCT-20	R5255771
Chromium (Cr)-Total	0.00083		0.00050	mg/L	16-OCT-20	16-OCT-20	R5255771
Cobalt (Co)-Total	0.00011		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Copper (Cu)-Total	<0.00050		0.00050	mg/L	16-OCT-20	16-OCT-20	R5255771
Iron (Fe)-Total	0.520		0.010	mg/L	16-OCT-20	16-OCT-20	R5255771
Lead (Pb)-Total	0.000072		0.000050	mg/L	16-OCT-20	16-OCT-20	R5255771
Lithium (Li)-Total	0.0030		0.0010	mg/L	16-OCT-20	16-OCT-20	R5255771
Magnesium (Mg)-Total	33.3		0.0050	mg/L	16-OCT-20	16-OCT-20	R5255771
Manganese (Mn)-Total	0.0106		0.00050	mg/L	16-OCT-20	16-OCT-20	R5255771
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-OCT-20	R5256890
Molybdenum (Mo)-Total	0.000586		0.000050	mg/L	16-OCT-20	16-OCT-20	R5255771
Nickel (Ni)-Total	0.00139		0.00050	mg/L	16-OCT-20	16-OCT-20	R5255771
Phosphorus (P)-Total	<0.050		0.050	mg/L	16-OCT-20	16-OCT-20	R5255771
Potassium (K)-Total	0.930		0.050	mg/L	16-OCT-20	16-OCT-20	R5255771
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	16-OCT-20	16-OCT-20	R5255771
Selenium (Se)-Total	<0.000050		0.000050	mg/L	16-OCT-20	16-OCT-20	R5255771
Silicon (Si)-Total	9.13		0.10	mg/L	16-OCT-20	16-OCT-20	R5255771
Silver (Ag)-Total	<0.000050		0.000050	mg/L	16-OCT-20	16-OCT-20	R5255771
Sodium (Na)-Total	7.64		0.050	mg/L	16-OCT-20	16-OCT-20	R5255771
Strontium (Sr)-Total	0.150		0.0010	mg/L	16-OCT-20	16-OCT-20	R5255771
Sulfur (S)-Total	20.7		0.50	mg/L	16-OCT-20	16-OCT-20	R5255771
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	16-OCT-20	16-OCT-20	R5255771
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	16-OCT-20	16-OCT-20	R5255771
Thorium (Th)-Total	<0.00010		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Tin (Sn)-Total	<0.00010		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	16-OCT-20	16-OCT-20	R5255771
Tungsten (W)-Total	<0.00010		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Uranium (U)-Total	0.000247		0.000010	mg/L	16-OCT-20	16-OCT-20	R5255771
Vanadium (V)-Total	<0.00050		0.00050	mg/L	16-OCT-20	16-OCT-20	R5255771
Zinc (Zn)-Total	0.0142		0.0030	mg/L	16-OCT-20	16-OCT-20	R5255771

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2517112-1 W-11210029-20201015-42 Sampled By: CLIENT on 15-OCT-20 @ 11:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	16-OCT-20	16-OCT-20	R5255771
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		16-OCT-20	R5255928
Volatile Organic Compounds							
Acetone	<30		30	ug/L		21-OCT-20	R5260301
Benzene	<0.50		0.50	ug/L		21-OCT-20	R5260301
Bromodichloromethane	<2.0		2.0	ug/L		21-OCT-20	R5260301
Bromoform	<5.0		5.0	ug/L		21-OCT-20	R5260301
Bromomethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
Carbon tetrachloride	<0.20		0.20	ug/L		21-OCT-20	R5260301
Chlorobenzene	<0.50		0.50	ug/L		21-OCT-20	R5260301
Dibromochloromethane	<2.0		2.0	ug/L		21-OCT-20	R5260301
Chloroform	<1.0		1.0	ug/L		21-OCT-20	R5260301
1,2-Dibromoethane	<0.20		0.20	ug/L		21-OCT-20	R5260301
1,2-Dichlorobenzene	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,3-Dichlorobenzene	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,4-Dichlorobenzene	<0.50		0.50	ug/L		21-OCT-20	R5260301
Dichlorodifluoromethane	<2.0		2.0	ug/L		21-OCT-20	R5260301
1,1-Dichloroethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,2-Dichloroethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,1-Dichloroethylene	<0.50		0.50	ug/L		21-OCT-20	R5260301
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		21-OCT-20	R5260301
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		21-OCT-20	R5260301
Methylene Chloride	<5.0		5.0	ug/L		21-OCT-20	R5260301
1,2-Dichloropropane	<0.50		0.50	ug/L		21-OCT-20	R5260301
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		21-OCT-20	R5260301
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		21-OCT-20	R5260301
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		21-OCT-20	R5260301
Ethylbenzene	<0.50		0.50	ug/L		21-OCT-20	R5260301
n-Hexane	<0.50		0.50	ug/L		21-OCT-20	R5260301
Methyl Ethyl Ketone	<20		20	ug/L		21-OCT-20	R5260301
Methyl Isobutyl Ketone	<20		20	ug/L		21-OCT-20	R5260301
MTBE	<2.0		2.0	ug/L		21-OCT-20	R5260301
Styrene	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
Tetrachloroethylene	<0.50		0.50	ug/L		21-OCT-20	R5260301
Toluene	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,1,1-Trichloroethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,1,2-Trichloroethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
Trichloroethylene	<0.50		0.50	ug/L		21-OCT-20	R5260301

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2517112-1 W-11210029-20201015-42							
Sampled By: CLIENT on 15-OCT-20 @ 11:00							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		21-OCT-20	R5260301
Vinyl chloride	<0.50		0.50	ug/L		21-OCT-20	R5260301
o-Xylene	<0.30		0.30	ug/L		21-OCT-20	R5260301
m+p-Xylenes	<0.40		0.40	ug/L		21-OCT-20	R5260301
Xylenes (Total)	<0.50		0.50	ug/L		21-OCT-20	
Surrogate: 4-Bromofluorobenzene	100.9		70-130	%		21-OCT-20	R5260301
Surrogate: 1,4-Difluorobenzene	100.9		70-130	%		21-OCT-20	R5260301
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		21-OCT-20	R5260301
F1-BTEX	<25		25	ug/L		21-OCT-20	
F2 (C10-C16)	<100		100	ug/L	16-OCT-20	19-OCT-20	R5257133
F2-Naphth	<100		100	ug/L		21-OCT-20	
F3 (C16-C34)	<250		250	ug/L	16-OCT-20	19-OCT-20	R5257133
F3-PAH	<250		250	ug/L		21-OCT-20	
F4 (C34-C50)	<250		250	ug/L	16-OCT-20	19-OCT-20	R5257133
Total Hydrocarbons (C6-C50)	<370		370	ug/L		21-OCT-20	
Chrom. to baseline at nC50	YES				16-OCT-20	19-OCT-20	R5257133
Surrogate: 2-Bromobenzotrifluoride	79.9		60-140	%	16-OCT-20	19-OCT-20	R5257133
Surrogate: 3,4-Dichlorotoluene	90.0		60-140	%		21-OCT-20	R5260301
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Acenaphthylene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Anthracene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Benzo(a)anthracene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Benzo(a)pyrene	<0.010		0.010	ug/L	16-OCT-20	21-OCT-20	R5256807
Benzo(b)fluoranthene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Benzo(k)fluoranthene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Chrysene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Fluoranthene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Fluorene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		21-OCT-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
2-Methylnaphthalene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Naphthalene	<0.050		0.050	ug/L	16-OCT-20	21-OCT-20	R5256807
Phenanthrene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Pyrene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Surrogate: d10-Acenaphthene	94.4		60-140	%	16-OCT-20	21-OCT-20	R5256807
Surrogate: d12-Chrysene	93.0		60-140	%	16-OCT-20	21-OCT-20	R5256807

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2517112-1 W-11210029-20201015-42							
Sampled By: CLIENT on 15-OCT-20 @ 11:00							
Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	91.1		60-140	%	16-OCT-20	21-OCT-20	R5256807
Surrogate: d10-Phenanthrene	94.9		60-140	%	16-OCT-20	21-OCT-20	R5256807
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
4-Chloroaniline	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
2-Chlorophenol	<0.30		0.30	ug/L	16-OCT-20	21-OCT-20	R5259272
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4-Dichlorophenol	<0.30		0.30	ug/L	16-OCT-20	21-OCT-20	R5259272
Diethylphthalate	<0.20		0.20	ug/L	16-OCT-20	21-OCT-20	R5259272
Dimethylphthalate	<0.20		0.20	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4-Dimethylphenol	<0.50		0.50	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4-Dinitrophenol	<1.0		1.0	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4-Dinitrotoluene	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
2,6-Dinitrotoluene	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	16-OCT-20	21-OCT-20	R5259272
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	16-OCT-20	21-OCT-20	R5259272
Pentachlorophenol	<0.50		0.50	ug/L	16-OCT-20	21-OCT-20	R5259272
Phenol	<0.50		0.50	ug/L	16-OCT-20	21-OCT-20	R5259272
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	16-OCT-20	21-OCT-20	R5259272
Surrogate: 2-Fluorobiphenyl	92.9		50-140	%	16-OCT-20	21-OCT-20	R5259272
Surrogate: Nitrobenzene d5	101.8		50-140	%	16-OCT-20	21-OCT-20	R5259272
Surrogate: p-Terphenyl d14	103.0		60-140	%	16-OCT-20	21-OCT-20	R5259272
Surrogate: 2,4,6-Tribromophenol	106.1		50-140	%	16-OCT-20	21-OCT-20	R5259272
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	20-OCT-20	20-OCT-20	R5257916
Aroclor 1248	<0.020		0.020	ug/L	20-OCT-20	20-OCT-20	R5257916
Aroclor 1254	<0.020		0.020	ug/L	20-OCT-20	20-OCT-20	R5257916
Aroclor 1260	<0.020		0.020	ug/L	20-OCT-20	20-OCT-20	R5257916
Surrogate: Decachlorobiphenyl	124.7		50-150	%	20-OCT-20	20-OCT-20	R5257916
Total PCBs	<0.040		0.040	ug/L	20-OCT-20	20-OCT-20	R5257916
Surrogate: Tetrachloro-m-xylene	89.0		50-150	%	20-OCT-20	20-OCT-20	R5257916

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Total	MS-B	L2517112-1
Matrix Spike	Boron (B)-Total	MS-B	L2517112-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2517112-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2517112-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2517112-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2517112-1
Matrix Spike	Potassium (K)-Total	MS-B	L2517112-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2517112-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2517112-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2517112-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2517112-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5259272							
WG3425274-2	LCS							
1,2,4-Trichlorobenzene			94.9		%		50-140	20-OCT-20
2-Chlorophenol			85.9		%		50-140	20-OCT-20
2,4-Dichlorophenol			97.2		%		50-140	20-OCT-20
2,4-Dimethylphenol			81.5		%		30-130	20-OCT-20
2,4-Dinitrophenol			98.0		%		50-140	20-OCT-20
2,4-Dinitrotoluene			107.9		%		50-140	20-OCT-20
2,4,5-Trichlorophenol			106.0		%		50-140	20-OCT-20
2,4,6-Trichlorophenol			99.2		%		50-140	20-OCT-20
2,6-Dinitrotoluene			95.9		%		50-140	20-OCT-20
3,3'-Dichlorobenzidine			87.1		%		30-130	20-OCT-20
4-Chloroaniline			81.5		%		30-130	20-OCT-20
Biphenyl			98.1		%		50-140	20-OCT-20
Bis(2-chloroethyl)ether			96.6		%		50-140	20-OCT-20
Bis(2-chloroisopropyl)ether			90.5		%		50-140	20-OCT-20
Bis(2-ethylhexyl)phthalate			111.3		%		50-140	20-OCT-20
Diethylphthalate			98.1		%		50-140	20-OCT-20
Dimethylphthalate			93.8		%		50-140	20-OCT-20
Pentachlorophenol			111.7		%		50-140	20-OCT-20
Phenol			103.9		%		30-130	20-OCT-20
WG3425274-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	20-OCT-20
2-Chlorophenol			<0.30		ug/L		0.3	20-OCT-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	20-OCT-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	20-OCT-20
2,4-Dinitrophenol			<1.0		ug/L		1	20-OCT-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	20-OCT-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	20-OCT-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	20-OCT-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	20-OCT-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	20-OCT-20
4-Chloroaniline			<0.40		ug/L		0.4	20-OCT-20
Biphenyl			<0.40		ug/L		0.4	20-OCT-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	20-OCT-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	20-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5259272								
WG3425274-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	20-OCT-20
Diethylphthalate			<0.20		ug/L		0.2	20-OCT-20
Dimethylphthalate			<0.20		ug/L		0.2	20-OCT-20
Pentachlorophenol			<0.50		ug/L		0.5	20-OCT-20
Phenol			<0.50		ug/L		0.5	20-OCT-20
Surrogate: 2-Fluorobiphenyl			96.4		%		50-140	20-OCT-20
Surrogate: 2,4,6-Tribromophenol			80.5		%		50-140	20-OCT-20
Surrogate: Nitrobenzene d5			100.6		%		50-140	20-OCT-20
Surrogate: p-Terphenyl d14			130.3		%		60-140	20-OCT-20
CR-CR6-IC-WT Water								
Batch R5255928								
WG3426296-4 DUP								
Chromium, Hexavalent		WG3426296-3	<0.00050	RPD-NA	mg/L	N/A	20	16-OCT-20
WG3426296-2 LCS								
Chromium, Hexavalent			101.4		%		80-120	16-OCT-20
WG3426296-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	16-OCT-20
WG3426296-5 MS								
Chromium, Hexavalent		WG3426296-3	99.1		%		70-130	16-OCT-20
F1-HS-511-WT Water								
Batch R5260301								
WG3427874-4 DUP								
F1 (C6-C10)		WG3427874-3	<25	RPD-NA	ug/L	N/A	30	21-OCT-20
WG3427874-1 LCS								
F1 (C6-C10)			82.7		%		80-120	21-OCT-20
WG3427874-2 MB								
F1 (C6-C10)			<25		ug/L		25	21-OCT-20
Surrogate: 3,4-Dichlorotoluene			90.9		%		60-140	21-OCT-20
WG3427874-5 MS								
F1 (C6-C10)		WG3427874-3	89.0		%		60-140	21-OCT-20
F2-F4-511-WT Water								
Batch R5257133								
WG3425649-2 LCS								
F2 (C10-C16)			93.8		%		70-130	19-OCT-20
F3 (C16-C34)			98.4		%		70-130	19-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
F2-F4-511-WT									
Water									
Batch R5257133									
WG3425649-2 LCS									
F4 (C34-C50)			107.1		%		70-130	19-OCT-20	
WG3425649-1 MB									
F2 (C10-C16)			<100		ug/L		100	19-OCT-20	
F3 (C16-C34)			<250		ug/L		250	19-OCT-20	
F4 (C34-C50)			<250		ug/L		250	19-OCT-20	
Surrogate: 2-Bromobenzotrifluoride			74.1		%		60-140	19-OCT-20	
HG-T-CVAA-WT									
Water									
Batch R5256890									
WG3426102-4 DUP									
Mercury (Hg)-Total		WG3426102-3	<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	19-OCT-20
WG3426102-2 LCS									
Mercury (Hg)-Total			114.0		%		80-120	19-OCT-20	
WG3426102-1 MB									
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	19-OCT-20	
WG3426102-6 MS									
Mercury (Hg)-Total		WG3426102-5	115.2		%		70-130	19-OCT-20	
MET-T-CCMS-WT									
Water									
Batch R5255771									
WG3425624-4 DUP									
Aluminum (Al)-Total		WG3425624-3	0.0066	0.0063		mg/L	5.1	20	16-OCT-20
Antimony (Sb)-Total			0.00049	0.00049		mg/L	1.2	20	16-OCT-20
Arsenic (As)-Total			0.00039	0.00043		mg/L	11	20	16-OCT-20
Barium (Ba)-Total			0.128	0.130		mg/L	1.4	20	16-OCT-20
Beryllium (Be)-Total			<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	16-OCT-20
Bismuth (Bi)-Total			<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	16-OCT-20
Boron (B)-Total			0.053	0.053		mg/L	1.0	20	16-OCT-20
Cadmium (Cd)-Total			0.0000087	0.0000065	J	mg/L	0.0000022	0.00001	16-OCT-20
Calcium (Ca)-Total			46.2	45.7		mg/L	1.1	20	16-OCT-20
Chromium (Cr)-Total			<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	16-OCT-20
Cesium (Cs)-Total			0.000036	0.000033		mg/L	6.7	20	16-OCT-20
Cobalt (Co)-Total			0.00055	0.00054		mg/L	1.6	20	16-OCT-20
Copper (Cu)-Total			<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	16-OCT-20
Iron (Fe)-Total			0.104	0.103		mg/L	1.2	20	16-OCT-20
Lead (Pb)-Total			<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	16-OCT-20



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Client: GHD Limited (Waterloo)
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 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5255771							
WG3425624-4	DUP	WG3425624-3						
Lithium (Li)-Total		0.0043	0.0042		mg/L	1.1	20	16-OCT-20
Magnesium (Mg)-Total		12.1	12.4		mg/L	2.5	20	16-OCT-20
Manganese (Mn)-Total		0.0289	0.0283		mg/L	1.9	20	16-OCT-20
Molybdenum (Mo)-Total		0.00473	0.00468		mg/L	1.1	20	16-OCT-20
Nickel (Ni)-Total		0.00180	0.00179		mg/L	0.1	20	16-OCT-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	16-OCT-20
Potassium (K)-Total		3.31	3.39		mg/L	2.4	20	16-OCT-20
Rubidium (Rb)-Total		0.00325	0.00323		mg/L	0.5	20	16-OCT-20
Selenium (Se)-Total		0.000079	0.000071		mg/L	11	20	16-OCT-20
Silicon (Si)-Total		1.94	1.94		mg/L	0.1	20	16-OCT-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	16-OCT-20
Sodium (Na)-Total		38.1	38.4		mg/L	0.7	20	16-OCT-20
Strontium (Sr)-Total		0.275	0.271		mg/L	1.4	20	16-OCT-20
Sulfur (S)-Total		26.2	26.0		mg/L	0.9	25	16-OCT-20
Thallium (Tl)-Total		0.000012	0.000012		mg/L	5.8	20	16-OCT-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	16-OCT-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	16-OCT-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	16-OCT-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	16-OCT-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	16-OCT-20
Uranium (U)-Total		0.000024	0.000025		mg/L	1.2	20	16-OCT-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	16-OCT-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	16-OCT-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	16-OCT-20
WG3425624-2	LCS							
Aluminum (Al)-Total			100.2		%		80-120	16-OCT-20
Antimony (Sb)-Total			100.8		%		80-120	16-OCT-20
Arsenic (As)-Total			97.5		%		80-120	16-OCT-20
Barium (Ba)-Total			105.5		%		80-120	16-OCT-20
Beryllium (Be)-Total			92.7		%		80-120	16-OCT-20
Bismuth (Bi)-Total			100.8		%		80-120	16-OCT-20
Boron (B)-Total			92.2		%		80-120	16-OCT-20
Cadmium (Cd)-Total			99.7		%		80-120	16-OCT-20



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 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5255771							
WG3425624-2	LCS							
Calcium (Ca)-Total			98.7		%		80-120	16-OCT-20
Chromium (Cr)-Total			94.6		%		80-120	16-OCT-20
Cesium (Cs)-Total			98.9		%		80-120	16-OCT-20
Cobalt (Co)-Total			95.9		%		80-120	16-OCT-20
Copper (Cu)-Total			94.4		%		80-120	16-OCT-20
Iron (Fe)-Total			95.1		%		80-120	16-OCT-20
Lead (Pb)-Total			104.3		%		80-120	16-OCT-20
Lithium (Li)-Total			92.8		%		80-120	16-OCT-20
Magnesium (Mg)-Total			101.4		%		80-120	16-OCT-20
Manganese (Mn)-Total			98.2		%		80-120	16-OCT-20
Molybdenum (Mo)-Total			99.7		%		80-120	16-OCT-20
Nickel (Ni)-Total			95.1		%		80-120	16-OCT-20
Phosphorus (P)-Total			101.3		%		70-130	16-OCT-20
Potassium (K)-Total			91.8		%		80-120	16-OCT-20
Rubidium (Rb)-Total			98.5		%		80-120	16-OCT-20
Selenium (Se)-Total			95.1		%		80-120	16-OCT-20
Silicon (Si)-Total			98.9		%		60-140	16-OCT-20
Silver (Ag)-Total			97.4		%		80-120	16-OCT-20
Sodium (Na)-Total			93.9		%		80-120	16-OCT-20
Strontium (Sr)-Total			101.6		%		80-120	16-OCT-20
Sulfur (S)-Total			91.3		%		80-120	16-OCT-20
Thallium (Tl)-Total			103.7		%		80-120	16-OCT-20
Tellurium (Te)-Total			96.0		%		80-120	16-OCT-20
Thorium (Th)-Total			101.3		%		70-130	16-OCT-20
Tin (Sn)-Total			98.7		%		80-120	16-OCT-20
Titanium (Ti)-Total			94.7		%		80-120	16-OCT-20
Tungsten (W)-Total			100.2		%		80-120	16-OCT-20
Uranium (U)-Total			104.8		%		80-120	16-OCT-20
Vanadium (V)-Total			98.3		%		80-120	16-OCT-20
Zinc (Zn)-Total			95.0		%		80-120	16-OCT-20
Zirconium (Zr)-Total			94.5		%		80-120	16-OCT-20
WG3425624-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	16-OCT-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	16-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5255771							
WG3425624-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	16-OCT-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	16-OCT-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	16-OCT-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	16-OCT-20
Boron (B)-Total			<0.010		mg/L		0.01	16-OCT-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	16-OCT-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	16-OCT-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	16-OCT-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	16-OCT-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	16-OCT-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	16-OCT-20
Iron (Fe)-Total			<0.010		mg/L		0.01	16-OCT-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	16-OCT-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	16-OCT-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	16-OCT-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	16-OCT-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	16-OCT-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	16-OCT-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	16-OCT-20
Potassium (K)-Total			<0.050		mg/L		0.05	16-OCT-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	16-OCT-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	16-OCT-20
Silicon (Si)-Total			<0.10		mg/L		0.1	16-OCT-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	16-OCT-20
Sodium (Na)-Total			<0.050		mg/L		0.05	16-OCT-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	16-OCT-20
Sulfur (S)-Total			<0.50		mg/L		0.5	16-OCT-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	16-OCT-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	16-OCT-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	16-OCT-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	16-OCT-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	16-OCT-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	16-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5255771							
WG3425624-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	16-OCT-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	16-OCT-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	16-OCT-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	16-OCT-20
WG3425624-5 MS		WG3425624-3						
Aluminum (Al)-Total			99.3		%		70-130	16-OCT-20
Antimony (Sb)-Total			103.4		%		70-130	16-OCT-20
Arsenic (As)-Total			100.6		%		70-130	16-OCT-20
Barium (Ba)-Total			N/A	MS-B	%		-	16-OCT-20
Beryllium (Be)-Total			91.3		%		70-130	16-OCT-20
Bismuth (Bi)-Total			95.3		%		70-130	16-OCT-20
Boron (B)-Total			N/A	MS-B	%		-	16-OCT-20
Cadmium (Cd)-Total			100.3		%		70-130	16-OCT-20
Calcium (Ca)-Total			N/A	MS-B	%		-	16-OCT-20
Chromium (Cr)-Total			98.0		%		70-130	16-OCT-20
Cesium (Cs)-Total			99.99		%		70-130	16-OCT-20
Cobalt (Co)-Total			96.5		%		70-130	16-OCT-20
Copper (Cu)-Total			95.8		%		70-130	16-OCT-20
Iron (Fe)-Total			N/A	MS-B	%		-	16-OCT-20
Lead (Pb)-Total			97.0		%		70-130	16-OCT-20
Lithium (Li)-Total			90.3		%		70-130	16-OCT-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	16-OCT-20
Manganese (Mn)-Total			N/A	MS-B	%		-	16-OCT-20
Molybdenum (Mo)-Total			100.1		%		70-130	16-OCT-20
Nickel (Ni)-Total			93.7		%		70-130	16-OCT-20
Phosphorus (P)-Total			100.0		%		70-130	16-OCT-20
Potassium (K)-Total			N/A	MS-B	%		-	16-OCT-20
Rubidium (Rb)-Total			94.4		%		70-130	16-OCT-20
Selenium (Se)-Total			97.9		%		70-130	16-OCT-20
Silicon (Si)-Total			N/A	MS-B	%		-	16-OCT-20
Silver (Ag)-Total			94.6		%		70-130	16-OCT-20
Sodium (Na)-Total			N/A	MS-B	%		-	16-OCT-20
Strontium (Sr)-Total			N/A	MS-B	%		-	16-OCT-20
Sulfur (S)-Total			N/A	MS-B	%		-	16-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5255771							
WG3425624-5 MS		WG3425624-3						
Thallium (Tl)-Total			94.9		%		70-130	16-OCT-20
Tellurium (Te)-Total			97.4		%		70-130	16-OCT-20
Thorium (Th)-Total			98.4		%		70-130	16-OCT-20
Tin (Sn)-Total			99.2		%		70-130	16-OCT-20
Titanium (Ti)-Total			96.0		%		70-130	16-OCT-20
Tungsten (W)-Total			98.5		%		70-130	16-OCT-20
Uranium (U)-Total			101.0		%		70-130	16-OCT-20
Vanadium (V)-Total			101.8		%		70-130	16-OCT-20
Zinc (Zn)-Total			92.0		%		70-130	16-OCT-20
Zirconium (Zr)-Total			94.7		%		70-130	16-OCT-20
P-T-COL-WT								
	Water							
Batch	R5258678							
WG3425662-3 DUP		L2517112-1						
Phosphorus, Total		0.0042	0.0049		mg/L	16	20	20-OCT-20
WG3425662-2 LCS								
Phosphorus, Total			99.4		%		80-120	20-OCT-20
WG3425662-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	20-OCT-20
WG3425662-4 MS		L2517112-1						
Phosphorus, Total			91.0		%		70-130	20-OCT-20
PAH-511-WT								
	Water							
Batch	R5256807							
WG3425649-2 LCS								
1-Methylnaphthalene			87.0		%		50-140	19-OCT-20
2-Methylnaphthalene			85.3		%		50-140	19-OCT-20
Acenaphthene			95.3		%		50-140	19-OCT-20
Acenaphthylene			94.8		%		50-140	19-OCT-20
Anthracene			102.6		%		50-140	19-OCT-20
Benzo(a)anthracene			118.5		%		50-140	19-OCT-20
Benzo(a)pyrene			89.2		%		50-140	19-OCT-20
Benzo(b)fluoranthene			72.2		%		50-140	19-OCT-20
Benzo(g,h,i)perylene			92.6		%		50-140	19-OCT-20
Benzo(k)fluoranthene			76.6		%		50-140	19-OCT-20
Chrysene			105.0		%		50-140	19-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5256807							
WG3425649-2	LCS							
Dibenzo(ah)anthracene			97.7		%		50-140	19-OCT-20
Fluoranthene			97.2		%		50-140	19-OCT-20
Fluorene			96.5		%		50-140	19-OCT-20
Indeno(1,2,3-cd)pyrene			116.6		%		50-140	19-OCT-20
Naphthalene			82.8		%		50-140	19-OCT-20
Phenanthrene			97.0		%		50-140	19-OCT-20
Pyrene			99.8		%		50-140	19-OCT-20
WG3425649-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	19-OCT-20
2-Methylnaphthalene			<0.020		ug/L		0.02	19-OCT-20
Acenaphthene			<0.020		ug/L		0.02	19-OCT-20
Acenaphthylene			<0.020		ug/L		0.02	19-OCT-20
Anthracene			<0.020		ug/L		0.02	19-OCT-20
Benzo(a)anthracene			<0.020		ug/L		0.02	19-OCT-20
Benzo(a)pyrene			<0.010		ug/L		0.01	19-OCT-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	19-OCT-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	19-OCT-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	19-OCT-20
Chrysene			<0.020		ug/L		0.02	19-OCT-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	19-OCT-20
Fluoranthene			<0.020		ug/L		0.02	19-OCT-20
Fluorene			<0.020		ug/L		0.02	19-OCT-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	19-OCT-20
Naphthalene			<0.050		ug/L		0.05	19-OCT-20
Phenanthrene			<0.020		ug/L		0.02	19-OCT-20
Pyrene			<0.020		ug/L		0.02	19-OCT-20
Surrogate: d8-Naphthalene			89.3		%		60-140	19-OCT-20
Surrogate: d10-Phenanthrene			90.9		%		60-140	19-OCT-20
Surrogate: d12-Chrysene			92.3		%		60-140	19-OCT-20
Surrogate: d10-Acenaphthene			93.4		%		60-140	19-OCT-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5257916							
WG3425722-2	LCS							
Aroclor 1242			94.8		%		60-140	20-OCT-20
Aroclor 1248			87.4		%		60-140	20-OCT-20
Aroclor 1254			96.1		%		60-140	20-OCT-20
Aroclor 1260			101.4		%		60-140	20-OCT-20
WG3425722-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	20-OCT-20
Aroclor 1248			<0.020		ug/L		0.02	20-OCT-20
Aroclor 1254			<0.020		ug/L		0.02	20-OCT-20
Aroclor 1260			<0.020		ug/L		0.02	20-OCT-20
Surrogate: Decachlorobiphenyl			117.2		%		50-150	20-OCT-20
Surrogate: Tetrachloro-m-xylene			75.9		%		50-150	20-OCT-20
VOC-511-HS-WT		Water						
Batch	R5260301							
WG3427874-4	DUP		WG3427874-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	21-OCT-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	21-OCT-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	21-OCT-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	21-OCT-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	21-OCT-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5260301							
WG3427874-4	DUP	WG3427874-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	21-OCT-20
cis-1,2-Dichloroethylene		4.19	3.96		ug/L	5.6	30	21-OCT-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	21-OCT-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	21-OCT-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	21-OCT-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	21-OCT-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	21-OCT-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	21-OCT-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	21-OCT-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	21-OCT-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	21-OCT-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	21-OCT-20
Trichloroethylene		2.11	2.02		ug/L	4.4	30	21-OCT-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	21-OCT-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
WG3427874-1	LCS							
1,1,1,2-Tetrachloroethane			93.2		%		70-130	21-OCT-20
1,1,2,2-Tetrachloroethane			102.9		%		70-130	21-OCT-20
1,1,1-Trichloroethane			104.9		%		70-130	21-OCT-20
1,1,2-Trichloroethane			94.2		%		70-130	21-OCT-20
1,1-Dichloroethane			88.9		%		70-130	21-OCT-20
1,1-Dichloroethylene			101.4		%		70-130	21-OCT-20
1,2-Dibromoethane			91.7		%		70-130	21-OCT-20
1,2-Dichlorobenzene			99.9		%		70-130	21-OCT-20
1,2-Dichloroethane			102.1		%		70-130	21-OCT-20
1,2-Dichloropropane			104.6		%		70-130	21-OCT-20
1,3-Dichlorobenzene			105.6		%		70-130	21-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5260301							
WG3427874-1	LCS							
1,4-Dichlorobenzene			104.3		%		70-130	21-OCT-20
Acetone			108.0		%		60-140	21-OCT-20
Benzene			105.0		%		70-130	21-OCT-20
Bromodichloromethane			118.8		%		70-130	21-OCT-20
Bromoform			101.6		%		70-130	21-OCT-20
Bromomethane			136.8		%		60-140	21-OCT-20
Carbon tetrachloride			103.5		%		70-130	21-OCT-20
Chlorobenzene			95.0		%		70-130	21-OCT-20
Chloroform			107.1		%		70-130	21-OCT-20
cis-1,2-Dichloroethylene			109.8		%		70-130	21-OCT-20
cis-1,3-Dichloropropene			98.4		%		70-130	21-OCT-20
Dibromochloromethane			88.9		%		70-130	21-OCT-20
Dichlorodifluoromethane			118.6		%		50-140	21-OCT-20
Ethylbenzene			95.9		%		70-130	21-OCT-20
n-Hexane			105.1		%		70-130	21-OCT-20
m+p-Xylenes			95.7		%		70-130	21-OCT-20
Methyl Ethyl Ketone			103.3		%		60-140	21-OCT-20
Methyl Isobutyl Ketone			105.8		%		60-140	21-OCT-20
Methylene Chloride			103.5		%		70-130	21-OCT-20
MTBE			108.7		%		70-130	21-OCT-20
o-Xylene			102.3		%		70-130	21-OCT-20
Styrene			91.6		%		70-130	21-OCT-20
Tetrachloroethylene			96.5		%		70-130	21-OCT-20
Toluene			97.2		%		70-130	21-OCT-20
trans-1,2-Dichloroethylene			99.6		%		70-130	21-OCT-20
trans-1,3-Dichloropropene			92.4		%		70-130	21-OCT-20
Trichloroethylene			106.7		%		70-130	21-OCT-20
Trichlorofluoromethane			99.8		%		60-140	21-OCT-20
Vinyl chloride			117.6		%		60-140	21-OCT-20
WG3427874-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	21-OCT-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	21-OCT-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	21-OCT-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	21-OCT-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5260301							
WG3427874-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	21-OCT-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	21-OCT-20
1,2-Dibromoethane			<0.20		ug/L		0.2	21-OCT-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	21-OCT-20
1,2-Dichloroethane			<0.50		ug/L		0.5	21-OCT-20
1,2-Dichloropropane			<0.50		ug/L		0.5	21-OCT-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	21-OCT-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	21-OCT-20
Acetone			<30		ug/L		30	21-OCT-20
Benzene			<0.50		ug/L		0.5	21-OCT-20
Bromodichloromethane			<2.0		ug/L		2	21-OCT-20
Bromoform			<5.0		ug/L		5	21-OCT-20
Bromomethane			<0.50		ug/L		0.5	21-OCT-20
Carbon tetrachloride			<0.20		ug/L		0.2	21-OCT-20
Chlorobenzene			<0.50		ug/L		0.5	21-OCT-20
Chloroform			<1.0		ug/L		1	21-OCT-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	21-OCT-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	21-OCT-20
Dibromochloromethane			<2.0		ug/L		2	21-OCT-20
Dichlorodifluoromethane			<2.0		ug/L		2	21-OCT-20
Ethylbenzene			<0.50		ug/L		0.5	21-OCT-20
n-Hexane			<0.50		ug/L		0.5	21-OCT-20
m+p-Xylenes			<0.40		ug/L		0.4	21-OCT-20
Methyl Ethyl Ketone			<20		ug/L		20	21-OCT-20
Methyl Isobutyl Ketone			<20		ug/L		20	21-OCT-20
Methylene Chloride			<5.0		ug/L		5	21-OCT-20
MTBE			<2.0		ug/L		2	21-OCT-20
o-Xylene			<0.30		ug/L		0.3	21-OCT-20
Styrene			<0.50		ug/L		0.5	21-OCT-20
Tetrachloroethylene			<0.50		ug/L		0.5	21-OCT-20
Toluene			<0.50		ug/L		0.5	21-OCT-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	21-OCT-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	21-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5260301							
WG3427874-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	21-OCT-20
Trichlorofluoromethane			<5.0		ug/L		5	21-OCT-20
Vinyl chloride			<0.50		ug/L		0.5	21-OCT-20
Surrogate: 1,4-Difluorobenzene			102.2		%		70-130	21-OCT-20
Surrogate: 4-Bromofluorobenzene			102.7		%		70-130	21-OCT-20
WG3427874-5 MS		WG3427874-3						
1,1,1,2-Tetrachloroethane			92.3		%		50-140	21-OCT-20
1,1,2,2-Tetrachloroethane			98.7		%		50-140	21-OCT-20
1,1,1-Trichloroethane			106.1		%		50-140	21-OCT-20
1,1,2-Trichloroethane			90.4		%		50-140	21-OCT-20
1,1-Dichloroethane			88.0		%		50-140	21-OCT-20
1,1-Dichloroethylene			100.1		%		50-140	21-OCT-20
1,2-Dibromoethane			86.9		%		50-140	21-OCT-20
1,2-Dichlorobenzene			100.2		%		50-140	21-OCT-20
1,2-Dichloroethane			98.5		%		50-140	21-OCT-20
1,2-Dichloropropane			103.5		%		50-140	21-OCT-20
1,3-Dichlorobenzene			111.3		%		50-140	21-OCT-20
1,4-Dichlorobenzene			107.8		%		50-140	21-OCT-20
Acetone			103.2		%		50-140	21-OCT-20
Benzene			104.8		%		50-140	21-OCT-20
Bromodichloromethane			117.1		%		50-140	21-OCT-20
Bromoform			96.0		%		50-140	21-OCT-20
Bromomethane			128.9		%		50-140	21-OCT-20
Carbon tetrachloride			105.1		%		50-140	21-OCT-20
Chlorobenzene			94.7		%		50-140	21-OCT-20
Chloroform			107.1		%		50-140	21-OCT-20
cis-1,2-Dichloroethylene			109.0		%		50-140	21-OCT-20
cis-1,3-Dichloropropene			94.9		%		50-140	21-OCT-20
Dibromochloromethane			85.9		%		50-140	21-OCT-20
Dichlorodifluoromethane			103.2		%		50-140	21-OCT-20
Ethylbenzene			97.6		%		50-140	21-OCT-20
n-Hexane			104.4		%		50-140	21-OCT-20
m+p-Xylenes			97.5		%		50-140	21-OCT-20
Methyl Ethyl Ketone			99.8		%		50-140	21-OCT-20



Quality Control Report

Workorder: L2517112

Report Date: 21-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5260301							
WG3427874-5 MS		WG3427874-3						
Methyl Isobutyl Ketone			98.9		%		50-140	21-OCT-20
Methylene Chloride			101.0		%		50-140	21-OCT-20
MTBE			108.0		%		50-140	21-OCT-20
o-Xylene			102.9		%		50-140	21-OCT-20
Styrene			90.5		%		50-140	21-OCT-20
Tetrachloroethylene			98.6		%		50-140	21-OCT-20
Toluene			98.1		%		50-140	21-OCT-20
trans-1,2-Dichloroethylene			98.9		%		50-140	21-OCT-20
trans-1,3-Dichloropropene			87.9		%		50-140	21-OCT-20
Trichloroethylene			107.6		%		50-140	21-OCT-20
Trichlorofluoromethane			97.5		%		50-140	21-OCT-20
Vinyl chloride			109.6		%		50-140	21-OCT-20

Quality Control Report

Workorder: L2517112

Report Date: 21-OCT-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 16 of 16

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

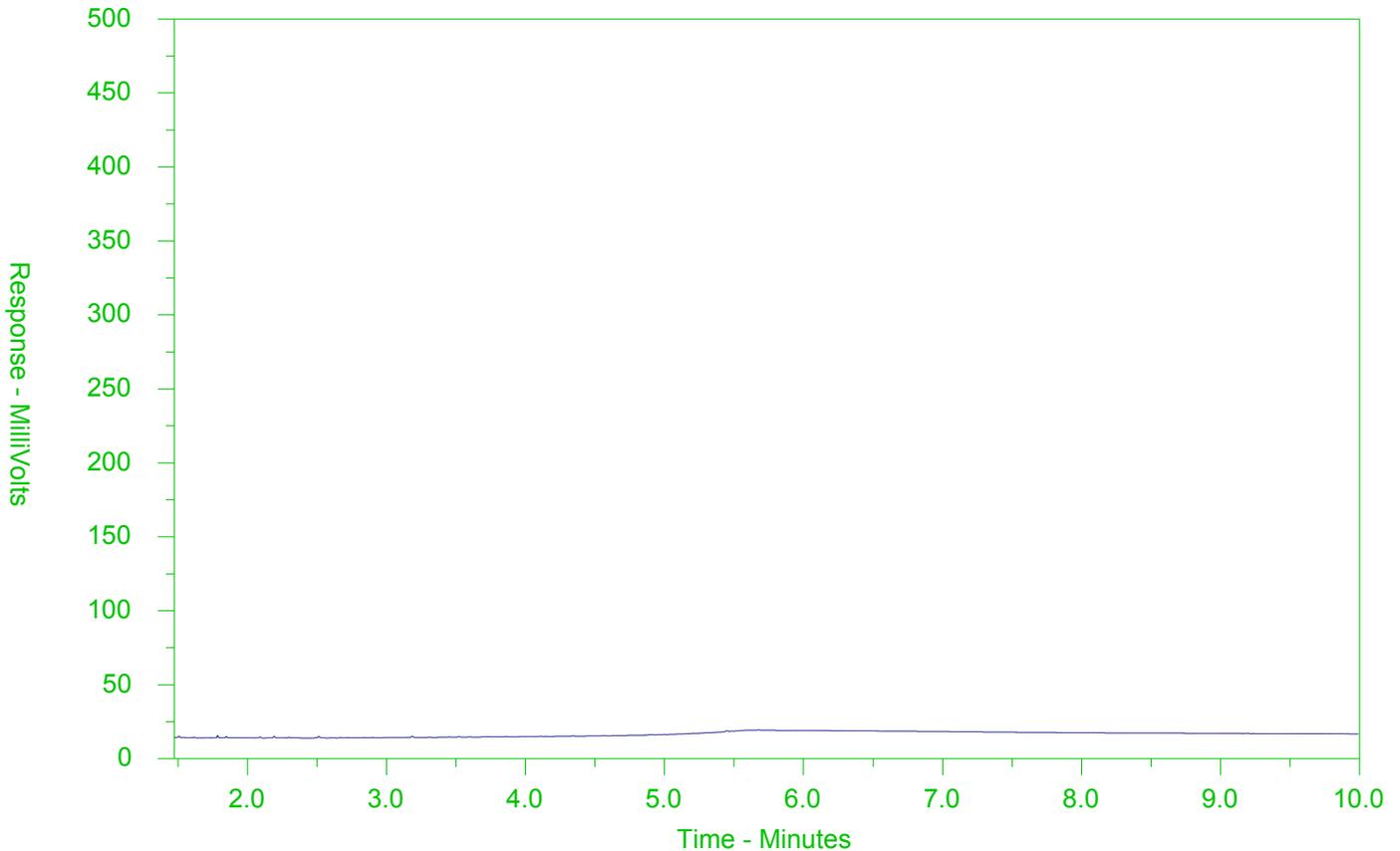
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2517112-1
 Client Sample ID: W-11210029-20201015-42



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 22-OCT-20
Report Date: 29-OCT-20 09:36 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2520323

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2520323-1 W-11210029-20201022-44 Sampled By: ERIC on 22-OCT-20 @ 11:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0062		0.0030	mg/L	23-OCT-20	26-OCT-20	R5268583
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	23-OCT-20	23-OCT-20	R5267102
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Arsenic (As)-Total	0.00548		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Barium (Ba)-Total	0.0523		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	23-OCT-20	23-OCT-20	R5267102
Boron (B)-Total	<0.010		0.010	mg/L	23-OCT-20	23-OCT-20	R5267102
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	23-OCT-20	23-OCT-20	R5267102
Calcium (Ca)-Total	74.8		0.050	mg/L	23-OCT-20	23-OCT-20	R5267102
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	23-OCT-20	23-OCT-20	R5267102
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	23-OCT-20	23-OCT-20	R5267102
Cobalt (Co)-Total	0.00019		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Copper (Cu)-Total	0.00166		0.00050	mg/L	23-OCT-20	23-OCT-20	R5267102
Iron (Fe)-Total	0.432		0.010	mg/L	23-OCT-20	23-OCT-20	R5267102
Lead (Pb)-Total	0.000647		0.000050	mg/L	23-OCT-20	23-OCT-20	R5267102
Lithium (Li)-Total	0.0042		0.0010	mg/L	23-OCT-20	23-OCT-20	R5267102
Magnesium (Mg)-Total	34.3		0.0050	mg/L	23-OCT-20	23-OCT-20	R5267102
Manganese (Mn)-Total	0.0107		0.00050	mg/L	23-OCT-20	23-OCT-20	R5267102
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		24-OCT-20	R5268046
Molybdenum (Mo)-Total	0.000580		0.000050	mg/L	23-OCT-20	23-OCT-20	R5267102
Nickel (Ni)-Total	0.00301		0.00050	mg/L	23-OCT-20	23-OCT-20	R5267102
Phosphorus (P)-Total	<0.050		0.050	mg/L	23-OCT-20	23-OCT-20	R5267102
Potassium (K)-Total	1.02		0.050	mg/L	23-OCT-20	23-OCT-20	R5267102
Rubidium (Rb)-Total	0.00021		0.00020	mg/L	23-OCT-20	23-OCT-20	R5267102
Selenium (Se)-Total	<0.000050		0.000050	mg/L	23-OCT-20	23-OCT-20	R5267102
Silicon (Si)-Total	9.29		0.10	mg/L	23-OCT-20	23-OCT-20	R5267102
Silver (Ag)-Total	<0.000050		0.000050	mg/L	23-OCT-20	23-OCT-20	R5267102
Sodium (Na)-Total	8.04		0.050	mg/L	23-OCT-20	23-OCT-20	R5267102
Strontium (Sr)-Total	0.153		0.0010	mg/L	23-OCT-20	23-OCT-20	R5267102
Sulfur (S)-Total	20.3		0.50	mg/L	23-OCT-20	23-OCT-20	R5267102
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	23-OCT-20	23-OCT-20	R5267102
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	23-OCT-20	23-OCT-20	R5267102
Thorium (Th)-Total	<0.00010		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Tin (Sn)-Total	0.00017		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	23-OCT-20	23-OCT-20	R5267102
Tungsten (W)-Total	<0.00010		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Uranium (U)-Total	0.000264		0.000010	mg/L	23-OCT-20	23-OCT-20	R5267102
Vanadium (V)-Total	<0.00050		0.00050	mg/L	23-OCT-20	23-OCT-20	R5267102
Zinc (Zn)-Total	0.0082		0.0030	mg/L	23-OCT-20	23-OCT-20	R5267102

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2520323-1 W-11210029-20201022-44 Sampled By: ERIC on 22-OCT-20 @ 11:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	23-OCT-20	23-OCT-20	R5267102
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		26-OCT-20	R5269203
Volatile Organic Compounds							
Acetone	<30		30	ug/L		28-OCT-20	R5269892
Benzene	<0.50		0.50	ug/L		28-OCT-20	R5269892
Bromodichloromethane	<2.0		2.0	ug/L		28-OCT-20	R5269892
Bromoform	<5.0		5.0	ug/L		28-OCT-20	R5269892
Bromomethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
Carbon tetrachloride	<0.20		0.20	ug/L		28-OCT-20	R5269892
Chlorobenzene	<0.50		0.50	ug/L		28-OCT-20	R5269892
Dibromochloromethane	<2.0		2.0	ug/L		28-OCT-20	R5269892
Chloroform	<1.0		1.0	ug/L		28-OCT-20	R5269892
1,2-Dibromoethane	<0.20		0.20	ug/L		28-OCT-20	R5269892
1,2-Dichlorobenzene	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,3-Dichlorobenzene	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,4-Dichlorobenzene	<0.50		0.50	ug/L		28-OCT-20	R5269892
Dichlorodifluoromethane	<2.0		2.0	ug/L		28-OCT-20	R5269892
1,1-Dichloroethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,2-Dichloroethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,1-Dichloroethylene	<0.50		0.50	ug/L		28-OCT-20	R5269892
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		28-OCT-20	R5269892
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		28-OCT-20	R5269892
Methylene Chloride	<5.0		5.0	ug/L		28-OCT-20	R5269892
1,2-Dichloropropane	<0.50		0.50	ug/L		28-OCT-20	R5269892
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		28-OCT-20	R5269892
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		28-OCT-20	R5269892
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		28-OCT-20	
Ethylbenzene	<0.50		0.50	ug/L		28-OCT-20	R5269892
n-Hexane	<0.50		0.50	ug/L		28-OCT-20	R5269892
Methyl Ethyl Ketone	<20		20	ug/L		28-OCT-20	R5269892
Methyl Isobutyl Ketone	<20		20	ug/L		28-OCT-20	R5269892
MTBE	<2.0		2.0	ug/L		28-OCT-20	R5269892
Styrene	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
Tetrachloroethylene	<0.50		0.50	ug/L		28-OCT-20	R5269892
Toluene	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,1,1-Trichloroethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,1,2-Trichloroethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
Trichloroethylene	<0.50		0.50	ug/L		28-OCT-20	R5269892

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2520323-1 W-11210029-20201022-44 Sampled By: ERIC on 22-OCT-20 @ 11:00 Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		28-OCT-20	R5269892
Vinyl chloride	<0.50		0.50	ug/L		28-OCT-20	R5269892
o-Xylene	<0.30		0.30	ug/L		28-OCT-20	R5269892
m+p-Xylenes	<0.40		0.40	ug/L		28-OCT-20	R5269892
Xylenes (Total)	<0.50		0.50	ug/L		28-OCT-20	
Surrogate: 4-Bromofluorobenzene	96.9		70-130	%		28-OCT-20	R5269892
Surrogate: 1,4-Difluorobenzene	98.6		70-130	%		28-OCT-20	R5269892
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		28-OCT-20	R5269892
F1-BTEX	<25		25	ug/L		29-OCT-20	
F2 (C10-C16)	<100		100	ug/L	22-OCT-20	23-OCT-20	R5266144
F2-Naphth	<100		100	ug/L		29-OCT-20	
F3 (C16-C34)	<250		250	ug/L	22-OCT-20	23-OCT-20	R5266144
F3-PAH	<250		250	ug/L		29-OCT-20	
F4 (C34-C50)	<250		250	ug/L	22-OCT-20	23-OCT-20	R5266144
Total Hydrocarbons (C6-C50)	<370		370	ug/L		29-OCT-20	
Chrom. to baseline at nC50	YES				22-OCT-20	23-OCT-20	R5266144
Surrogate: 2-Bromobenzotrifluoride	91.9		60-140	%	22-OCT-20	23-OCT-20	R5266144
Surrogate: 3,4-Dichlorotoluene	88.5		60-140	%		28-OCT-20	R5269892
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Acenaphthylene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Anthracene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Benzo(a)anthracene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Benzo(a)pyrene	<0.010		0.010	ug/L	22-OCT-20	29-OCT-20	R5270502
Benzo(b)fluoranthene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Benzo(k)fluoranthene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Chrysene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Fluoranthene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Fluorene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		29-OCT-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
2-Methylnaphthalene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Naphthalene	<0.050		0.050	ug/L	22-OCT-20	29-OCT-20	R5270502
Phenanthrene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Pyrene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Surrogate: d10-Acenaphthene	98.5		60-140	%	22-OCT-20	29-OCT-20	R5270502
Surrogate: d12-Chrysene	74.3		60-140	%	22-OCT-20	29-OCT-20	R5270502

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2520323-1 W-11210029-20201022-44 Sampled By: ERIC on 22-OCT-20 @ 11:00 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	98.1		60-140	%	22-OCT-20	29-OCT-20	R5270502
Surrogate: d10-Phenanthrene	101.4		60-140	%	22-OCT-20	29-OCT-20	R5270502
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
4-Chloroaniline	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
2-Chlorophenol	<0.30		0.30	ug/L	23-OCT-20	28-OCT-20	R5268448
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4-Dichlorophenol	<0.30		0.30	ug/L	23-OCT-20	28-OCT-20	R5268448
Diethylphthalate	<0.20		0.20	ug/L	23-OCT-20	28-OCT-20	R5268448
Dimethylphthalate	<0.20		0.20	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4-Dimethylphenol	<0.50		0.50	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4-Dinitrophenol	<1.0		1.0	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4-Dinitrotoluene	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
2,6-Dinitrotoluene	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	23-OCT-20	29-OCT-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	23-OCT-20	28-OCT-20	R5268448
Pentachlorophenol	<0.50		0.50	ug/L	23-OCT-20	28-OCT-20	R5268448
Phenol	<0.50		0.50	ug/L	23-OCT-20	28-OCT-20	R5268448
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	23-OCT-20	28-OCT-20	R5268448
Surrogate: 2-Fluorobiphenyl	82.8		50-140	%	23-OCT-20	28-OCT-20	R5268448
Surrogate: Nitrobenzene d5	99.6		50-140	%	23-OCT-20	28-OCT-20	R5268448
Surrogate: p-Terphenyl d14	88.9		60-140	%	23-OCT-20	28-OCT-20	R5268448
Surrogate: 2,4,6-Tribromophenol	100.9		50-140	%	23-OCT-20	28-OCT-20	R5268448
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	28-OCT-20	28-OCT-20	R5270076
Aroclor 1248	<0.020		0.020	ug/L	28-OCT-20	28-OCT-20	R5270076
Aroclor 1254	<0.020		0.020	ug/L	28-OCT-20	28-OCT-20	R5270076
Aroclor 1260	<0.020		0.020	ug/L	28-OCT-20	28-OCT-20	R5270076
Surrogate: Decachlorobiphenyl	137.2		50-150	%	28-OCT-20	28-OCT-20	R5270076
Total PCBs	<0.040		0.040	ug/L	28-OCT-20	28-OCT-20	R5270076
Surrogate: Tetrachloro-m-xylene	86.1		50-150	%	28-OCT-20	28-OCT-20	R5270076

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	2,4-Dinitrophenol	LCS-H	L2520323-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2520323-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2520323-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2520323-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2520323-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2520323-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2520323-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2520323-1

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Reference Information

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2520323

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5268448							
WG3430650-2	LCS							
1,2,4-Trichlorobenzene			53.0		%		50-140	26-OCT-20
2-Chlorophenol			74.2		%		50-140	26-OCT-20
2,4-Dichlorophenol			88.8		%		50-140	26-OCT-20
2,4-Dimethylphenol			91.8		%		30-130	26-OCT-20
2,4-Dinitrophenol			141.8	LCS-H	%		50-140	26-OCT-20
2,4-Dinitrotoluene			104.4		%		50-140	26-OCT-20
2,4,5-Trichlorophenol			93.3		%		50-140	26-OCT-20
2,4,6-Trichlorophenol			92.6		%		50-140	26-OCT-20
2,6-Dinitrotoluene			96.6		%		50-140	26-OCT-20
3,3'-Dichlorobenzidine			82.4		%		30-130	26-OCT-20
4-Chloroaniline			82.0		%		30-130	26-OCT-20
Biphenyl			63.7		%		50-140	26-OCT-20
Bis(2-chloroethyl)ether			80.7		%		50-140	26-OCT-20
Bis(2-chloroisopropyl)ether			72.4		%		50-140	26-OCT-20
Bis(2-ethylhexyl)phthalate			99.5		%		50-140	26-OCT-20
Diethylphthalate			86.0		%		50-140	26-OCT-20
Dimethylphthalate			85.8		%		50-140	26-OCT-20
Pentachlorophenol			104.8		%		50-140	26-OCT-20
Phenol			108.1		%		30-130	26-OCT-20
WG3430650-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	26-OCT-20
2-Chlorophenol			<0.30		ug/L		0.3	26-OCT-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	26-OCT-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	26-OCT-20
2,4-Dinitrophenol			<1.0		ug/L		1	26-OCT-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	26-OCT-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	26-OCT-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	26-OCT-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	26-OCT-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	26-OCT-20
4-Chloroaniline			<0.40		ug/L		0.4	26-OCT-20
Biphenyl			<0.40		ug/L		0.4	26-OCT-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	26-OCT-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	26-OCT-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5268448								
WG3430650-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	26-OCT-20
Diethylphthalate			<0.20		ug/L		0.2	26-OCT-20
Dimethylphthalate			<0.20		ug/L		0.2	26-OCT-20
Pentachlorophenol			<0.50		ug/L		0.5	26-OCT-20
Phenol			<0.50		ug/L		0.5	26-OCT-20
Surrogate: 2-Fluorobiphenyl			78.5		%		50-140	26-OCT-20
Surrogate: 2,4,6-Tribromophenol			80.7		%		50-140	26-OCT-20
Surrogate: Nitrobenzene d5			83.4		%		50-140	26-OCT-20
Surrogate: p-Terphenyl d14			95.7		%		60-140	26-OCT-20
CR-CR6-IC-WT Water								
Batch R5269203								
WG3431955-3 DUP								
Chromium, Hexavalent		L2517387-1	<0.00050	RPD-NA	mg/L	N/A	20	26-OCT-20
WG3431955-2 LCS								
Chromium, Hexavalent			101.8		%		80-120	26-OCT-20
WG3431955-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	26-OCT-20
WG3431955-4 MS								
Chromium, Hexavalent		L2517387-1	100.0		%		70-130	26-OCT-20
F1-HS-511-WT Water								
Batch R5269892								
WG3433456-4 DUP								
F1 (C6-C10)		WG3433456-3	<25	RPD-NA	ug/L	N/A	30	28-OCT-20
WG3433456-1 LCS								
F1 (C6-C10)			114.7		%		80-120	28-OCT-20
WG3433456-2 MB								
F1 (C6-C10)			<25		ug/L		25	28-OCT-20
Surrogate: 3,4-Dichlorotoluene			105.2		%		60-140	28-OCT-20
WG3433456-5 MS								
F1 (C6-C10)		WG3433456-3	96.4		%		60-140	28-OCT-20
F2-F4-511-WT Water								
Batch R5266144								
WG3430360-2 LCS								
F2 (C10-C16)			96.4		%		70-130	23-OCT-20
F3 (C16-C34)			100.8		%		70-130	23-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
F2-F4-511-WT									
Water									
Batch R5266144									
WG3430360-2 LCS									
F4 (C34-C50)			111.5		%		70-130	23-OCT-20	
WG3430360-1 MB									
F2 (C10-C16)			<100		ug/L		100	23-OCT-20	
F3 (C16-C34)			<250		ug/L		250	23-OCT-20	
F4 (C34-C50)			<250		ug/L		250	23-OCT-20	
Surrogate: 2-Bromobenzotrifluoride			87.4		%		60-140	23-OCT-20	
HG-T-CVAA-WT									
Water									
Batch R5268046									
WG3431020-4 DUP									
Mercury (Hg)-Total		WG3431020-3	<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	24-OCT-20
WG3431020-2 LCS									
Mercury (Hg)-Total			105.0		%		80-120	24-OCT-20	
WG3431020-1 MB									
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	24-OCT-20	
WG3431020-6 MS									
Mercury (Hg)-Total		WG3431020-5	102.5		%		70-130	24-OCT-20	
MET-T-CCMS-WT									
Water									
Batch R5267102									
WG3430569-4 DUP									
Aluminum (Al)-Total		WG3430569-3	<0.0060	0.0197	RPD-NA	mg/L	N/A	20	23-OCT-20
Antimony (Sb)-Total			<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-OCT-20
Arsenic (As)-Total			0.00056	0.00055		mg/L	0.8	20	23-OCT-20
Barium (Ba)-Total			0.0221	0.0219		mg/L	1.2	20	23-OCT-20
Beryllium (Be)-Total			<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-OCT-20
Bismuth (Bi)-Total			<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	23-OCT-20
Boron (B)-Total			0.015	0.016		mg/L	3.8	20	23-OCT-20
Cadmium (Cd)-Total			<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	23-OCT-20
Calcium (Ca)-Total			50.4	51.4		mg/L	1.9	20	23-OCT-20
Chromium (Cr)-Total			<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	23-OCT-20
Cesium (Cs)-Total			<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	23-OCT-20
Cobalt (Co)-Total			<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-OCT-20
Copper (Cu)-Total			0.00112	0.00165	J	mg/L	0.00053	0.001	23-OCT-20
Iron (Fe)-Total			0.023	0.022		mg/L	2.6	20	23-OCT-20
Lead (Pb)-Total			0.000215	0.000210		mg/L	2.2	20	23-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5267102							
WG3430569-4	DUP	WG3430569-3						
Lithium (Li)-Total		0.0027	0.0028		mg/L	3.7	20	23-OCT-20
Magnesium (Mg)-Total		16.0	16.1		mg/L	1.2	20	23-OCT-20
Manganese (Mn)-Total		0.00663	0.00675		mg/L	1.9	20	23-OCT-20
Molybdenum (Mo)-Total		0.000185	0.000192		mg/L	3.9	20	23-OCT-20
Nickel (Ni)-Total		<0.00050	0.00157	RPD-NA	mg/L	N/A	20	23-OCT-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	23-OCT-20
Potassium (K)-Total		0.937	0.934		mg/L	0.3	20	23-OCT-20
Rubidium (Rb)-Total		0.00047	0.00042		mg/L	13	20	23-OCT-20
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	23-OCT-20
Silicon (Si)-Total		5.75	5.81		mg/L	1.0	20	23-OCT-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	23-OCT-20
Sodium (Na)-Total		5.04	5.04		mg/L	0.0	20	23-OCT-20
Strontium (Sr)-Total		0.196	0.200		mg/L	2.4	20	23-OCT-20
Sulfur (S)-Total		20.9	20.8		mg/L	0.3	25	23-OCT-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	23-OCT-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	23-OCT-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	23-OCT-20
Tin (Sn)-Total		0.00011	<0.00010	RPD-NA	mg/L	N/A	20	23-OCT-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	23-OCT-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-OCT-20
Uranium (U)-Total		0.000107	0.000109		mg/L	1.9	20	23-OCT-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	23-OCT-20
Zinc (Zn)-Total		0.0034	0.0032		mg/L	8.1	20	23-OCT-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	23-OCT-20
WG3430569-2	LCS							
Aluminum (Al)-Total			102.1		%		80-120	23-OCT-20
Antimony (Sb)-Total			103.1		%		80-120	23-OCT-20
Arsenic (As)-Total			102.3		%		80-120	23-OCT-20
Barium (Ba)-Total			100.7		%		80-120	23-OCT-20
Beryllium (Be)-Total			101.3		%		80-120	23-OCT-20
Bismuth (Bi)-Total			100.2		%		80-120	23-OCT-20
Boron (B)-Total			99.4		%		80-120	23-OCT-20
Cadmium (Cd)-Total			99.6		%		80-120	23-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5267102							
WG3430569-2	LCS							
Calcium (Ca)-Total			99.7		%		80-120	23-OCT-20
Chromium (Cr)-Total			100.9		%		80-120	23-OCT-20
Cesium (Cs)-Total			98.7		%		80-120	23-OCT-20
Cobalt (Co)-Total			100.3		%		80-120	23-OCT-20
Copper (Cu)-Total			100.5		%		80-120	23-OCT-20
Iron (Fe)-Total			102.4		%		80-120	23-OCT-20
Lead (Pb)-Total			101.2		%		80-120	23-OCT-20
Lithium (Li)-Total			104.1		%		80-120	23-OCT-20
Magnesium (Mg)-Total			104.8		%		80-120	23-OCT-20
Manganese (Mn)-Total			102.5		%		80-120	23-OCT-20
Molybdenum (Mo)-Total			99.2		%		80-120	23-OCT-20
Nickel (Ni)-Total			99.8		%		80-120	23-OCT-20
Phosphorus (P)-Total			110.6		%		70-130	23-OCT-20
Potassium (K)-Total			97.9		%		80-120	23-OCT-20
Rubidium (Rb)-Total			97.3		%		80-120	23-OCT-20
Selenium (Se)-Total			98.6		%		80-120	23-OCT-20
Silicon (Si)-Total			98.8		%		60-140	23-OCT-20
Silver (Ag)-Total			103.0		%		80-120	23-OCT-20
Sodium (Na)-Total			102.4		%		80-120	23-OCT-20
Strontium (Sr)-Total			104.4		%		80-120	23-OCT-20
Sulfur (S)-Total			100.3		%		80-120	23-OCT-20
Thallium (Tl)-Total			101.6		%		80-120	23-OCT-20
Tellurium (Te)-Total			97.8		%		80-120	23-OCT-20
Thorium (Th)-Total			101.3		%		70-130	23-OCT-20
Tin (Sn)-Total			97.2		%		80-120	23-OCT-20
Titanium (Ti)-Total			99.0		%		80-120	23-OCT-20
Tungsten (W)-Total			99.0		%		80-120	23-OCT-20
Uranium (U)-Total			102.3		%		80-120	23-OCT-20
Vanadium (V)-Total			101.7		%		80-120	23-OCT-20
Zinc (Zn)-Total			98.3		%		80-120	23-OCT-20
Zirconium (Zr)-Total			97.6		%		80-120	23-OCT-20
WG3430569-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	23-OCT-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	23-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5267102							
WG3430569-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	23-OCT-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	23-OCT-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	23-OCT-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	23-OCT-20
Boron (B)-Total			<0.010		mg/L		0.01	23-OCT-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	23-OCT-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	23-OCT-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	23-OCT-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	23-OCT-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	23-OCT-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	23-OCT-20
Iron (Fe)-Total			<0.010		mg/L		0.01	23-OCT-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	23-OCT-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	23-OCT-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	23-OCT-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	23-OCT-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	23-OCT-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	23-OCT-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	23-OCT-20
Potassium (K)-Total			<0.050		mg/L		0.05	23-OCT-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	23-OCT-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	23-OCT-20
Silicon (Si)-Total			<0.10		mg/L		0.1	23-OCT-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	23-OCT-20
Sodium (Na)-Total			<0.050		mg/L		0.05	23-OCT-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	23-OCT-20
Sulfur (S)-Total			<0.50		mg/L		0.5	23-OCT-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	23-OCT-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	23-OCT-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	23-OCT-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	23-OCT-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	23-OCT-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	23-OCT-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5267102							
WG3430569-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	23-OCT-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	23-OCT-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	23-OCT-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	23-OCT-20
WG3430569-5 MS		WG3430569-3						
Aluminum (Al)-Total			101.2		%		70-130	23-OCT-20
Antimony (Sb)-Total			104.6		%		70-130	23-OCT-20
Arsenic (As)-Total			103.5		%		70-130	23-OCT-20
Barium (Ba)-Total			N/A	MS-B	%		-	23-OCT-20
Beryllium (Be)-Total			99.8		%		70-130	23-OCT-20
Bismuth (Bi)-Total			97.7		%		70-130	23-OCT-20
Boron (B)-Total			101.5		%		70-130	23-OCT-20
Cadmium (Cd)-Total			103.0		%		70-130	23-OCT-20
Calcium (Ca)-Total			N/A	MS-B	%		-	23-OCT-20
Chromium (Cr)-Total			100.8		%		70-130	23-OCT-20
Cesium (Cs)-Total			99.7		%		70-130	23-OCT-20
Cobalt (Co)-Total			100.1		%		70-130	23-OCT-20
Copper (Cu)-Total			96.4		%		70-130	23-OCT-20
Iron (Fe)-Total			101.0		%		70-130	23-OCT-20
Lead (Pb)-Total			99.2		%		70-130	23-OCT-20
Lithium (Li)-Total			99.8		%		70-130	23-OCT-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	23-OCT-20
Manganese (Mn)-Total			97.4		%		70-130	23-OCT-20
Molybdenum (Mo)-Total			100.1		%		70-130	23-OCT-20
Nickel (Ni)-Total			97.8		%		70-130	23-OCT-20
Phosphorus (P)-Total			102.6		%		70-130	23-OCT-20
Potassium (K)-Total			97.5		%		70-130	23-OCT-20
Rubidium (Rb)-Total			100.7		%		70-130	23-OCT-20
Selenium (Se)-Total			101.9		%		70-130	23-OCT-20
Silicon (Si)-Total			N/A	MS-B	%		-	23-OCT-20
Silver (Ag)-Total			99.4		%		70-130	23-OCT-20
Sodium (Na)-Total			N/A	MS-B	%		-	23-OCT-20
Strontium (Sr)-Total			N/A	MS-B	%		-	23-OCT-20
Sulfur (S)-Total			N/A	MS-B	%		-	23-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5267102							
WG3430569-5 MS		WG3430569-3						
Thallium (Tl)-Total			99.6		%		70-130	23-OCT-20
Tellurium (Te)-Total			87.8		%		70-130	23-OCT-20
Thorium (Th)-Total			102.9		%		70-130	23-OCT-20
Tin (Sn)-Total			97.8		%		70-130	23-OCT-20
Titanium (Ti)-Total			99.0		%		70-130	23-OCT-20
Tungsten (W)-Total			99.9		%		70-130	23-OCT-20
Uranium (U)-Total			106.6		%		70-130	23-OCT-20
Vanadium (V)-Total			104.1		%		70-130	23-OCT-20
Zinc (Zn)-Total			93.5		%		70-130	23-OCT-20
Zirconium (Zr)-Total			96.1		%		70-130	23-OCT-20
P-T-COL-WT								
	Water							
Batch	R5268583							
WG3430485-3 DUP		L2520205-1						
Phosphorus, Total		0.0505	0.0490		mg/L	3.0	20	26-OCT-20
WG3430485-2 LCS								
Phosphorus, Total			100.5		%		80-120	26-OCT-20
WG3430485-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	26-OCT-20
WG3430485-4 MS		L2520205-1						
Phosphorus, Total			94.5		%		70-130	26-OCT-20
PAH-511-WT								
	Water							
Batch	R5270502							
WG3430360-2 LCS								
1-Methylnaphthalene			81.2		%		50-140	29-OCT-20
2-Methylnaphthalene			80.2		%		50-140	29-OCT-20
Acenaphthene			95.3		%		50-140	29-OCT-20
Acenaphthylene			94.3		%		50-140	29-OCT-20
Anthracene			89.6		%		50-140	29-OCT-20
Benzo(a)anthracene			93.6		%		50-140	29-OCT-20
Benzo(a)pyrene			90.5		%		50-140	29-OCT-20
Benzo(b)fluoranthene			68.2		%		50-140	29-OCT-20
Benzo(g,h,i)perylene			96.4		%		50-140	29-OCT-20
Benzo(k)fluoranthene			91.6		%		50-140	29-OCT-20
Chrysene			104.5		%		50-140	29-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5270502							
WG3430360-2	LCS							
Dibenzo(ah)anthracene			92.6		%		50-140	29-OCT-20
Fluoranthene			98.4		%		50-140	29-OCT-20
Fluorene			93.1		%		50-140	29-OCT-20
Indeno(1,2,3-cd)pyrene			112.1		%		50-140	29-OCT-20
Naphthalene			76.7		%		50-140	29-OCT-20
Phenanthrene			97.3		%		50-140	29-OCT-20
Pyrene			101.4		%		50-140	29-OCT-20
WG3430360-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	29-OCT-20
2-Methylnaphthalene			<0.020		ug/L		0.02	29-OCT-20
Acenaphthene			<0.020		ug/L		0.02	29-OCT-20
Acenaphthylene			<0.020		ug/L		0.02	29-OCT-20
Anthracene			<0.020		ug/L		0.02	29-OCT-20
Benzo(a)anthracene			<0.020		ug/L		0.02	29-OCT-20
Benzo(a)pyrene			<0.010		ug/L		0.01	29-OCT-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	29-OCT-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	29-OCT-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	29-OCT-20
Chrysene			<0.020		ug/L		0.02	29-OCT-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	29-OCT-20
Fluoranthene			<0.020		ug/L		0.02	29-OCT-20
Fluorene			<0.020		ug/L		0.02	29-OCT-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	29-OCT-20
Naphthalene			<0.050		ug/L		0.05	29-OCT-20
Phenanthrene			<0.020		ug/L		0.02	29-OCT-20
Pyrene			<0.020		ug/L		0.02	29-OCT-20
Surrogate: d8-Naphthalene			90.7		%		60-140	29-OCT-20
Surrogate: d10-Phenanthrene			103.1		%		60-140	29-OCT-20
Surrogate: d12-Chrysene			82.2		%		60-140	29-OCT-20
Surrogate: d10-Acenaphthene			98.1		%		60-140	29-OCT-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5270076							
WG3430655-2	LCS							
Aroclor 1242			100.7		%		60-140	28-OCT-20
Aroclor 1248			107.1		%		60-140	28-OCT-20
Aroclor 1254			110.0		%		60-140	28-OCT-20
Aroclor 1260			110.5		%		60-140	28-OCT-20
WG3430655-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	28-OCT-20
Aroclor 1248			<0.020		ug/L		0.02	28-OCT-20
Aroclor 1254			<0.020		ug/L		0.02	28-OCT-20
Aroclor 1260			<0.020		ug/L		0.02	28-OCT-20
Surrogate: Decachlorobiphenyl			142.9		%		50-150	28-OCT-20
Surrogate: Tetrachloro-m-xylene			87.7		%		50-150	28-OCT-20
VOC-511-HS-WT		Water						
Batch	R5269892							
WG3433456-4	DUP	WG3433456-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	28-OCT-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	28-OCT-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-OCT-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	28-OCT-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	28-OCT-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5269892							
WG3433456-4	DUP	WG3433456-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	28-OCT-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-OCT-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-OCT-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-OCT-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	28-OCT-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	28-OCT-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	28-OCT-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	28-OCT-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-OCT-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-OCT-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-OCT-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	28-OCT-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
WG3433456-1	LCS							
1,1,1,2-Tetrachloroethane			93.4		%		70-130	28-OCT-20
1,1,2,2-Tetrachloroethane			94.8		%		70-130	28-OCT-20
1,1,1-Trichloroethane			98.4		%		70-130	28-OCT-20
1,1,2-Trichloroethane			98.1		%		70-130	28-OCT-20
1,1-Dichloroethane			104.0		%		70-130	28-OCT-20
1,1-Dichloroethylene			102.9		%		70-130	28-OCT-20
1,2-Dibromoethane			95.6		%		70-130	28-OCT-20
1,2-Dichlorobenzene			99.8		%		70-130	28-OCT-20
1,2-Dichloroethane			100.4		%		70-130	28-OCT-20
1,2-Dichloropropane			106.7		%		70-130	28-OCT-20
1,3-Dichlorobenzene			96.6		%		70-130	28-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5269892							
WG3433456-1	LCS							
1,4-Dichlorobenzene			98.0		%		70-130	28-OCT-20
Acetone			103.0		%		60-140	28-OCT-20
Benzene			105.0		%		70-130	28-OCT-20
Bromodichloromethane			110.3		%		70-130	28-OCT-20
Bromoform			92.0		%		70-130	28-OCT-20
Bromomethane			135.6		%		60-140	28-OCT-20
Carbon tetrachloride			95.8		%		70-130	28-OCT-20
Chlorobenzene			96.1		%		70-130	28-OCT-20
Chloroform			105.6		%		70-130	28-OCT-20
cis-1,2-Dichloroethylene			101.2		%		70-130	28-OCT-20
cis-1,3-Dichloropropene			100.7		%		70-130	28-OCT-20
Dibromochloromethane			89.0		%		70-130	28-OCT-20
Dichlorodifluoromethane			120.9		%		50-140	28-OCT-20
Ethylbenzene			96.4		%		70-130	28-OCT-20
n-Hexane			101.7		%		70-130	28-OCT-20
m+p-Xylenes			96.3		%		70-130	28-OCT-20
Methyl Ethyl Ketone			98.6		%		60-140	28-OCT-20
Methyl Isobutyl Ketone			98.4		%		60-140	28-OCT-20
Methylene Chloride			105.3		%		70-130	28-OCT-20
MTBE			101.7		%		70-130	28-OCT-20
o-Xylene			103.1		%		70-130	28-OCT-20
Styrene			94.1		%		70-130	28-OCT-20
Tetrachloroethylene			95.4		%		70-130	28-OCT-20
Toluene			92.6		%		70-130	28-OCT-20
trans-1,2-Dichloroethylene			98.3		%		70-130	28-OCT-20
trans-1,3-Dichloropropene			94.8		%		70-130	28-OCT-20
Trichloroethylene			99.9		%		70-130	28-OCT-20
Trichlorofluoromethane			103.6		%		60-140	28-OCT-20
Vinyl chloride			129.7		%		60-140	28-OCT-20
WG3433456-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	28-OCT-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	28-OCT-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	28-OCT-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	28-OCT-20



Quality Control Report

Workorder: L2520323

Report Date: 29-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5269892							
WG3433456-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	28-OCT-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	28-OCT-20
1,2-Dibromoethane			<0.20		ug/L		0.2	28-OCT-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	28-OCT-20
1,2-Dichloroethane			<0.50		ug/L		0.5	28-OCT-20
1,2-Dichloropropane			<0.50		ug/L		0.5	28-OCT-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	28-OCT-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	28-OCT-20
Acetone			<30		ug/L		30	28-OCT-20
Benzene			<0.50		ug/L		0.5	28-OCT-20
Bromodichloromethane			<2.0		ug/L		2	28-OCT-20
Bromoform			<5.0		ug/L		5	28-OCT-20
Bromomethane			<0.50		ug/L		0.5	28-OCT-20
Carbon tetrachloride			<0.20		ug/L		0.2	28-OCT-20
Chlorobenzene			<0.50		ug/L		0.5	28-OCT-20
Chloroform			<1.0		ug/L		1	28-OCT-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	28-OCT-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	28-OCT-20
Dibromochloromethane			<2.0		ug/L		2	28-OCT-20
Dichlorodifluoromethane			<2.0		ug/L		2	28-OCT-20
Ethylbenzene			<0.50		ug/L		0.5	28-OCT-20
n-Hexane			<0.50		ug/L		0.5	28-OCT-20
m+p-Xylenes			<0.40		ug/L		0.4	28-OCT-20
Methyl Ethyl Ketone			<20		ug/L		20	28-OCT-20
Methyl Isobutyl Ketone			<20		ug/L		20	28-OCT-20
Methylene Chloride			<5.0		ug/L		5	28-OCT-20
MTBE			<2.0		ug/L		2	28-OCT-20
o-Xylene			<0.30		ug/L		0.3	28-OCT-20
Styrene			<0.50		ug/L		0.5	28-OCT-20
Tetrachloroethylene			<0.50		ug/L		0.5	28-OCT-20
Toluene			<0.50		ug/L		0.5	28-OCT-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	28-OCT-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	28-OCT-20



Quality Control Report

Workorder: L2520323

Report Date: 29-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5269892							
WG3433456-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	28-OCT-20
Trichlorofluoromethane			<5.0		ug/L		5	28-OCT-20
Vinyl chloride			<0.50		ug/L		0.5	28-OCT-20
Surrogate: 1,4-Difluorobenzene			99.4		%		70-130	28-OCT-20
Surrogate: 4-Bromofluorobenzene			99.0		%		70-130	28-OCT-20
WG3433456-5 MS		WG3433456-3						
1,1,1,2-Tetrachloroethane			94.1		%		50-140	28-OCT-20
1,1,2,2-Tetrachloroethane			98.8		%		50-140	28-OCT-20
1,1,1-Trichloroethane			98.2		%		50-140	28-OCT-20
1,1,2-Trichloroethane			101.3		%		50-140	28-OCT-20
1,1-Dichloroethane			105.3		%		50-140	28-OCT-20
1,1-Dichloroethylene			101.1		%		50-140	28-OCT-20
1,2-Dibromoethane			99.4		%		50-140	28-OCT-20
1,2-Dichlorobenzene			98.9		%		50-140	28-OCT-20
1,2-Dichloroethane			104.2		%		50-140	28-OCT-20
1,2-Dichloropropane			109.7		%		50-140	28-OCT-20
1,3-Dichlorobenzene			93.8		%		50-140	28-OCT-20
1,4-Dichlorobenzene			95.2		%		50-140	28-OCT-20
Acetone			119.4		%		50-140	28-OCT-20
Benzene			104.8		%		50-140	28-OCT-20
Bromodichloromethane			114.1		%		50-140	28-OCT-20
Bromoform			94.2		%		50-140	28-OCT-20
Bromomethane			132.0		%		50-140	28-OCT-20
Carbon tetrachloride			94.5		%		50-140	28-OCT-20
Chlorobenzene			95.8		%		50-140	28-OCT-20
Chloroform			107.5		%		50-140	28-OCT-20
cis-1,2-Dichloroethylene			102.3		%		50-140	28-OCT-20
cis-1,3-Dichloropropene			98.0		%		50-140	28-OCT-20
Dibromochloromethane			90.4		%		50-140	28-OCT-20
Dichlorodifluoromethane			110.1		%		50-140	28-OCT-20
Ethylbenzene			94.9		%		50-140	28-OCT-20
n-Hexane			99.1		%		50-140	28-OCT-20
m+p-Xylenes			94.4		%		50-140	28-OCT-20
Methyl Ethyl Ketone			110.0		%		50-140	28-OCT-20



Quality Control Report

Workorder: L2520323

Report Date: 29-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5269892							
WG3433456-5 MS		WG3433456-3						
Methyl Isobutyl Ketone			105.1		%		50-140	28-OCT-20
Methylene Chloride			107.5		%		50-140	28-OCT-20
MTBE			101.5		%		50-140	28-OCT-20
o-Xylene			101.8		%		50-140	28-OCT-20
Styrene			92.3		%		50-140	28-OCT-20
Tetrachloroethylene			91.9		%		50-140	28-OCT-20
Toluene			91.9		%		50-140	28-OCT-20
trans-1,2-Dichloroethylene			95.6		%		50-140	28-OCT-20
trans-1,3-Dichloropropene			91.2		%		50-140	28-OCT-20
Trichloroethylene			98.5		%		50-140	28-OCT-20
Trichlorofluoromethane			101.6		%		50-140	28-OCT-20
Vinyl chloride			124.9		%		50-140	28-OCT-20

Quality Control Report

Workorder: L2520323

Report Date: 29-OCT-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

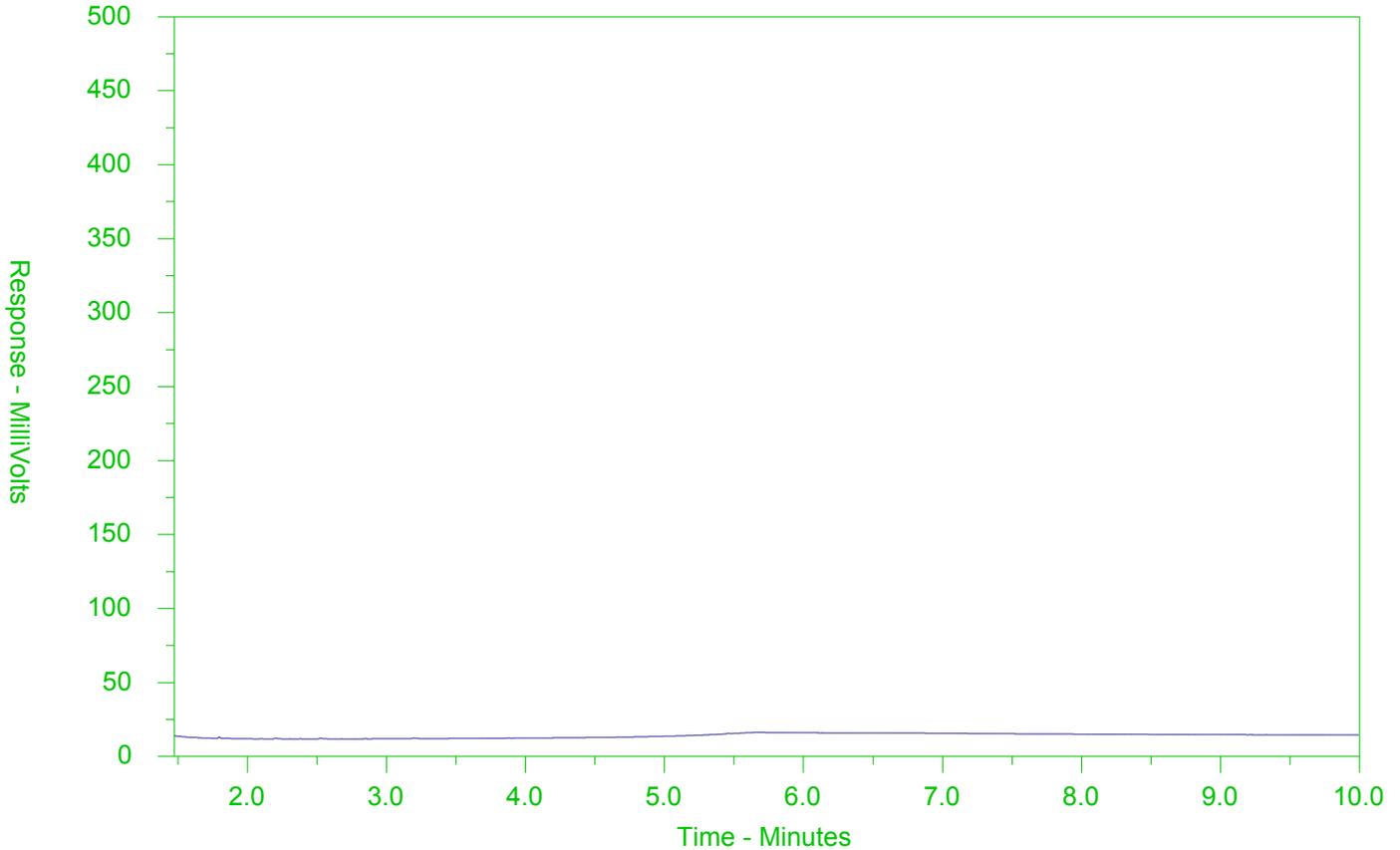
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2520323-1
 Client Sample ID: W-11210029-20201022-44



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2520323-COFC

Number: 17 -

Page of

www.alsglobal.com

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																																																				
Company: GHD LIMITED - ACCT #13791		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply					EMERGENCY																																															
Contact: Laura Ermeta		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			4 day [P4-20%] <input type="checkbox"/>		1 Business day [E - 100%] <input type="checkbox"/>																																																		
Phone: 519-884-0510		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			3 day [P3-25%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200%] <input type="checkbox"/>																																																		
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			2 day [P2-50%] <input type="checkbox"/>		(Laboratory opening fees may apply)																																																		
Street: 455 Phillip St		Email 1 or Fax laura.ermeta@ghd.com			Date and Time Required for all E&P TATs:					dd-mmm-yy hh:mm																																															
City/Province: Waterloo, Ontario		Email 2 See PO			For tests that can not be performed according to the service level selected, you will be contacted.																																																				
Postal Code: N2L 3X2		Email 3			Analysis Request																																																				
Invoice To		Invoice Distribution			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																																				
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																																																							
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Email 1 or Fax apinvoices-735@ghd.com			NUMBER OF CONTAINERS																																																				
Company: GHD Limited		Email 2																																																							
Contact: SEE SSOW		Location:			SAMPLES ON HOLD																																																				
Project Information		Oil and Gas Required Fields (client use)																																																							
ALS Account # / Quote #: 13791		AFE/Cost Center:		PO#		SUSPECTED HAZARD (see Special Instructions)																																																			
Job #: 11210029		Major/Minor Code:		Routing Code:																																																					
PO / AFE: 73520086		Requisitioner:		ALS Contact: Rick H		<table border="1"> <tr> <th>Total Metals (MET-T-CCMS-WT)</th> <th>Total Mercury (HG-T-CVAA-WT)</th> <th>Total Cr6 (CR-CR6-IC-WT)</th> <th>Total Phosphorous (P-T-COL-WT)</th> <th>PCBs (PCB-511-WT)</th> <th>VOCs and PHCs (VOC-F1-F4-511-P-WT)</th> <th>SVOCs (SVOC-511-GP-WT)</th> <th></th> </tr> <tr> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td></td> </tr> </table>										Total Metals (MET-T-CCMS-WT)	Total Mercury (HG-T-CVAA-WT)	Total Cr6 (CR-CR6-IC-WT)	Total Phosphorous (P-T-COL-WT)	PCBs (PCB-511-WT)	VOCs and PHCs (VOC-F1-F4-511-P-WT)	SVOCs (SVOC-511-GP-WT)															R	R	R	R	R	R	R														
Total Metals (MET-T-CCMS-WT)	Total Mercury (HG-T-CVAA-WT)	Total Cr6 (CR-CR6-IC-WT)	Total Phosphorous (P-T-COL-WT)	PCBs (PCB-511-WT)	VOCs and PHCs (VOC-F1-F4-511-P-WT)											SVOCs (SVOC-511-GP-WT)																																									
R	R	R	R	R	R	R																																																			
LSD:		ALS Lab Work Order # (lab use only): L2520323		Sampler: ERK																																																					
ALS Sample # (lab use only)		Sample Identification and/or Coordinates (This description will appear on the report)			Date (dd-mmm-yy)		Time (hh:mm)		Sample Type																																																
		W-11210029-20201022-44			20/10/20		1100AM		Water																																																
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)																																																							
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		SAMPLE CONDITION AS RECEIVED (lab use only)																																																							
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Frozen <input type="checkbox"/>					SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																																																		
		Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/>					Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																																																		
		Cooling Initiated <input type="checkbox"/>																																																							
		INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C																																																		
							6-9																																																		
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)					FINAL SHIPMENT RECEPTION (lab use only)																																																		
Released by: [Signature]		Date: Oct 20/20		Time: 1100AM		Received by: [Signature]		Date: 10/22/20		Time: 1445																																															

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JAN 2016 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 29-OCT-20
Report Date: 05-NOV-20 13:46 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2523350

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2523350-1 W-11210029-20201029-46 Sampled By: EC on 29-OCT-20 @ 11:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0063		0.0030	mg/L	03-NOV-20	04-NOV-20	R5277776
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	30-OCT-20	30-OCT-20	R5272145
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Arsenic (As)-Total	0.00555		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Barium (Ba)-Total	0.0487		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	30-OCT-20	30-OCT-20	R5272145
Boron (B)-Total	<0.010		0.010	mg/L	30-OCT-20	30-OCT-20	R5272145
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	30-OCT-20	30-OCT-20	R5272145
Calcium (Ca)-Total	66.1		0.050	mg/L	30-OCT-20	30-OCT-20	R5272145
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	30-OCT-20	30-OCT-20	R5272145
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	30-OCT-20	30-OCT-20	R5272145
Cobalt (Co)-Total	0.00011		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Copper (Cu)-Total	0.00058		0.00050	mg/L	30-OCT-20	30-OCT-20	R5272145
Iron (Fe)-Total	0.478		0.010	mg/L	30-OCT-20	30-OCT-20	R5272145
Lead (Pb)-Total	0.000135		0.000050	mg/L	30-OCT-20	30-OCT-20	R5272145
Lithium (Li)-Total	0.0033		0.0010	mg/L	30-OCT-20	30-OCT-20	R5272145
Magnesium (Mg)-Total	31.9		0.0050	mg/L	30-OCT-20	30-OCT-20	R5272145
Manganese (Mn)-Total	0.00995		0.00050	mg/L	30-OCT-20	30-OCT-20	R5272145
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		30-OCT-20	R5271805
Molybdenum (Mo)-Total	0.000563		0.000050	mg/L	30-OCT-20	30-OCT-20	R5272145
Nickel (Ni)-Total	0.00198		0.00050	mg/L	30-OCT-20	30-OCT-20	R5272145
Phosphorus (P)-Total	<0.050		0.050	mg/L	30-OCT-20	30-OCT-20	R5272145
Potassium (K)-Total	0.967		0.050	mg/L	30-OCT-20	30-OCT-20	R5272145
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	30-OCT-20	30-OCT-20	R5272145
Selenium (Se)-Total	<0.000050		0.000050	mg/L	30-OCT-20	30-OCT-20	R5272145
Silicon (Si)-Total	8.47		0.10	mg/L	30-OCT-20	30-OCT-20	R5272145
Silver (Ag)-Total	<0.000050		0.000050	mg/L	30-OCT-20	30-OCT-20	R5272145
Sodium (Na)-Total	7.71		0.050	mg/L	30-OCT-20	30-OCT-20	R5272145
Strontium (Sr)-Total	0.144		0.0010	mg/L	30-OCT-20	30-OCT-20	R5272145
Sulfur (S)-Total	17.7		0.50	mg/L	30-OCT-20	30-OCT-20	R5272145
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	30-OCT-20	30-OCT-20	R5272145
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	30-OCT-20	30-OCT-20	R5272145
Thorium (Th)-Total	<0.00010		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Tin (Sn)-Total	<0.00010		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	30-OCT-20	30-OCT-20	R5272145
Tungsten (W)-Total	<0.00010		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Uranium (U)-Total	0.000268		0.000010	mg/L	30-OCT-20	30-OCT-20	R5272145
Vanadium (V)-Total	<0.00050		0.00050	mg/L	30-OCT-20	30-OCT-20	R5272145
Zinc (Zn)-Total	0.0091		0.0030	mg/L	30-OCT-20	30-OCT-20	R5272145

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2523350-1 W-11210029-20201029-46 Sampled By: EC on 29-OCT-20 @ 11:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	30-OCT-20	30-OCT-20	R5272145
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		30-OCT-20	R5272795
Volatile Organic Compounds							
Acetone	<30		30	ug/L		04-NOV-20	R5275576
Benzene	<0.50		0.50	ug/L		04-NOV-20	R5275576
Bromodichloromethane	<2.0		2.0	ug/L		04-NOV-20	R5275576
Bromoform	<5.0		5.0	ug/L		04-NOV-20	R5275576
Bromomethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
Carbon tetrachloride	<0.20		0.20	ug/L		04-NOV-20	R5275576
Chlorobenzene	<0.50		0.50	ug/L		04-NOV-20	R5275576
Dibromochloromethane	<2.0		2.0	ug/L		04-NOV-20	R5275576
Chloroform	<1.0		1.0	ug/L		04-NOV-20	R5275576
1,2-Dibromoethane	<0.20		0.20	ug/L		04-NOV-20	R5275576
1,2-Dichlorobenzene	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,3-Dichlorobenzene	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,4-Dichlorobenzene	<0.50		0.50	ug/L		04-NOV-20	R5275576
Dichlorodifluoromethane	<2.0		2.0	ug/L		04-NOV-20	R5275576
1,1-Dichloroethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,2-Dichloroethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,1-Dichloroethylene	<0.50		0.50	ug/L		04-NOV-20	R5275576
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		04-NOV-20	R5275576
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		04-NOV-20	R5275576
Methylene Chloride	<5.0		5.0	ug/L		04-NOV-20	R5275576
1,2-Dichloropropane	<0.50		0.50	ug/L		04-NOV-20	R5275576
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		04-NOV-20	R5275576
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		04-NOV-20	R5275576
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		04-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		04-NOV-20	R5275576
n-Hexane	<0.50		0.50	ug/L		04-NOV-20	R5275576
Methyl Ethyl Ketone	<20		20	ug/L		04-NOV-20	R5275576
Methyl Isobutyl Ketone	<20		20	ug/L		04-NOV-20	R5275576
MTBE	<2.0		2.0	ug/L		04-NOV-20	R5275576
Styrene	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
Tetrachloroethylene	<0.50		0.50	ug/L		04-NOV-20	R5275576
Toluene	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,1,1-Trichloroethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,1,2-Trichloroethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
Trichloroethylene	<0.50		0.50	ug/L		04-NOV-20	R5275576

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2523350-1 W-11210029-20201029-46 Sampled By: EC on 29-OCT-20 @ 11:00 Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		04-NOV-20	R5275576
Vinyl chloride	<0.50		0.50	ug/L		04-NOV-20	R5275576
o-Xylene	<0.30		0.30	ug/L		04-NOV-20	R5275576
m+p-Xylenes	<0.40		0.40	ug/L		04-NOV-20	R5275576
Xylenes (Total)	<0.50		0.50	ug/L		04-NOV-20	
Surrogate: 4-Bromofluorobenzene	98.9		70-130	%		04-NOV-20	R5275576
Surrogate: 1,4-Difluorobenzene	100.4		70-130	%		04-NOV-20	R5275576
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		04-NOV-20	R5275576
F1-BTEX	<25		25	ug/L		05-NOV-20	
F2 (C10-C16)	<100		100	ug/L	30-OCT-20	02-NOV-20	R5272677
F2-Naphth	<100		100	ug/L		05-NOV-20	
F3 (C16-C34)	<250		250	ug/L	30-OCT-20	02-NOV-20	R5272677
F3-PAH	<250		250	ug/L		05-NOV-20	
F4 (C34-C50)	<250		250	ug/L	30-OCT-20	02-NOV-20	R5272677
Total Hydrocarbons (C6-C50)	<370		370	ug/L		05-NOV-20	
Chrom. to baseline at nC50	YES				30-OCT-20	02-NOV-20	R5272677
Surrogate: 2-Bromobenzotrifluoride	85.9		60-140	%	30-OCT-20	02-NOV-20	R5272677
Surrogate: 3,4-Dichlorotoluene	100.1		60-140	%		04-NOV-20	R5275576
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Acenaphthylene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Anthracene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Benzo(a)anthracene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Benzo(a)pyrene	<0.010		0.010	ug/L	30-OCT-20	05-NOV-20	R5272925
Benzo(b)fluoranthene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Benzo(k)fluoranthene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Chrysene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Fluoranthene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Fluorene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		05-NOV-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
2-Methylnaphthalene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Naphthalene	<0.050		0.050	ug/L	30-OCT-20	05-NOV-20	R5272925
Phenanthrene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Pyrene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Surrogate: d10-Acenaphthene	88.4		60-140	%	30-OCT-20	05-NOV-20	R5272925
Surrogate: d12-Chrysene	87.3		60-140	%	30-OCT-20	05-NOV-20	R5272925

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2523350-1 W-11210029-20201029-46 Sampled By: EC on 29-OCT-20 @ 11:00 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	87.0		60-140	%	30-OCT-20	05-NOV-20	R5272925
Surrogate: d10-Phenanthrene	86.3		60-140	%	30-OCT-20	05-NOV-20	R5272925
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
4-Chloroaniline	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
2-Chlorophenol	<0.30		0.30	ug/L	30-OCT-20	02-NOV-20	R5272627
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4-Dichlorophenol	<0.30		0.30	ug/L	30-OCT-20	02-NOV-20	R5272627
Diethylphthalate	<0.20		0.20	ug/L	30-OCT-20	02-NOV-20	R5272627
Dimethylphthalate	<0.20		0.20	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4-Dimethylphenol	<0.50		0.50	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4-Dinitrophenol	<1.0		1.0	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4-Dinitrotoluene	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
2,6-Dinitrotoluene	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	30-OCT-20	02-NOV-20	R5272627
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	30-OCT-20	02-NOV-20	R5272627
Pentachlorophenol	<0.50		0.50	ug/L	30-OCT-20	02-NOV-20	R5272627
Phenol	<0.50		0.50	ug/L	30-OCT-20	02-NOV-20	R5272627
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	30-OCT-20	02-NOV-20	R5272627
Surrogate: 2-Fluorobiphenyl	78.2		50-140	%	30-OCT-20	02-NOV-20	R5272627
Surrogate: Nitrobenzene d5	81.6		50-140	%	30-OCT-20	02-NOV-20	R5272627
Surrogate: p-Terphenyl d14	95.1		60-140	%	30-OCT-20	02-NOV-20	R5272627
Surrogate: 2,4,6-Tribromophenol	90.5		50-140	%	30-OCT-20	02-NOV-20	R5272627
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	04-NOV-20	04-NOV-20	R5278318
Aroclor 1248	<0.020		0.020	ug/L	04-NOV-20	04-NOV-20	R5278318
Aroclor 1254	<0.020		0.020	ug/L	04-NOV-20	04-NOV-20	R5278318
Aroclor 1260	<0.020		0.020	ug/L	04-NOV-20	04-NOV-20	R5278318
Surrogate: Decachlorobiphenyl	97.7		50-150	%	04-NOV-20	04-NOV-20	R5278318
Total PCBs	<0.040		0.040	ug/L	04-NOV-20	04-NOV-20	R5278318
Surrogate: Tetrachloro-m-xylene	86.4		50-150	%	04-NOV-20	04-NOV-20	R5278318

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	Benzo(a)anthracene	LCS-H	L2523350-1
Laboratory Control Sample	Chrysene	LCS-H	L2523350-1
Laboratory Control Sample	Methyl Ethyl Ketone	MES	L2523350-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2523350-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2523350-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2523350-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2523350-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2523350-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2523350-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2523350-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2523350-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2523350-1
Matrix Spike	Uranium (U)-Total	MS-B	L2523350-1
Laboratory Control Sample	1,2,4-Trichlorobenzene	RRQC	L2523350-1
Comments:	RRQC: Recoveries are outside ALS control limits. Associated non-detect sample results have not been affected.		
Laboratory Control Sample	Biphenyl	RRQC	L2523350-1
Comments:	RRQC: Recoveries are outside ALS control limits. Associated non-detect sample results have not been affected.		

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRQC	Refer to report remarks for information regarding this QC result.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.

Reference Information

3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Reference Information

Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2523350

Report Date: 05-NOV-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5272627							
WG3435473-2	LCS							
1,2,4-Trichlorobenzene			35.2	RRQC	%		50-140	02-NOV-20
2-Chlorophenol			92.0		%		50-140	02-NOV-20
2,4-Dichlorophenol			95.0		%		50-140	02-NOV-20
2,4-Dimethylphenol			103.2		%		30-130	02-NOV-20
2,4-Dinitrophenol			131.1		%		50-140	02-NOV-20
2,4-Dinitrotoluene			112.1		%		50-140	02-NOV-20
2,4,5-Trichlorophenol			101.4		%		50-140	02-NOV-20
2,4,6-Trichlorophenol			99.0		%		50-140	02-NOV-20
2,6-Dinitrotoluene			89.0		%		50-140	02-NOV-20
3,3'-Dichlorobenzidine			94.3		%		30-130	02-NOV-20
4-Chloroaniline			57.2		%		30-130	02-NOV-20
Biphenyl			45.6	RRQC	%		50-140	02-NOV-20
Bis(2-chloroethyl)ether			110.5		%		50-140	02-NOV-20
Bis(2-chloroisopropyl)ether			75.8		%		50-140	02-NOV-20
Bis(2-ethylhexyl)phthalate			99.4		%		50-140	02-NOV-20
Diethylphthalate			97.5		%		50-140	02-NOV-20
Dimethylphthalate			88.1		%		50-140	02-NOV-20
Pentachlorophenol			114.5		%		50-140	02-NOV-20
Phenol			111.0		%		30-130	02-NOV-20
COMMENTS: RRQC: Recoveries are outside ALS control limits. Associated non-detect sample results have not been affected.								
WG3435473-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	02-NOV-20
2-Chlorophenol			<0.30		ug/L		0.3	02-NOV-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	02-NOV-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	02-NOV-20
2,4-Dinitrophenol			<1.0		ug/L		1	02-NOV-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	02-NOV-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	02-NOV-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	02-NOV-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	02-NOV-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	02-NOV-20
4-Chloroaniline			<0.40		ug/L		0.4	02-NOV-20
Biphenyl			<0.40		ug/L		0.4	02-NOV-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	02-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT Water								
Batch R5272677								
WG3435471-2 LCS								
F2 (C10-C16)			97.7		%		70-130	02-NOV-20
F3 (C16-C34)			107.3		%		70-130	02-NOV-20
F4 (C34-C50)			105.1		%		70-130	02-NOV-20
WG3435471-1 MB								
F2 (C10-C16)			<100		ug/L		100	02-NOV-20
F3 (C16-C34)			<250		ug/L		250	02-NOV-20
F4 (C34-C50)			<250		ug/L		250	02-NOV-20
Surrogate: 2-Bromobenzotrifluoride			87.6		%		60-140	02-NOV-20
HG-T-CVAA-WT Water								
Batch R5271805								
WG3435611-3 DUP								
Mercury (Hg)-Total		L2522001-1	<0.0000050	RPD-NA	mg/L	N/A	20	30-OCT-20
WG3435611-2 LCS								
Mercury (Hg)-Total			109.0		%		80-120	30-OCT-20
WG3435611-1 MB								
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	30-OCT-20
WG3435611-4 MS								
Mercury (Hg)-Total		L2522001-2	108.1		%		70-130	30-OCT-20
MET-T-CCMS-WT Water								
Batch R5272145								
WG3435426-4 DUP								
Aluminum (Al)-Total		WG3435426-3	0.0370		mg/L	0.0	20	30-OCT-20
Antimony (Sb)-Total			<0.00010	RPD-NA	mg/L	N/A	20	30-OCT-20
Arsenic (As)-Total			0.00030		mg/L	5.1	20	30-OCT-20
Barium (Ba)-Total			0.0364		mg/L	1.7	20	30-OCT-20
Beryllium (Be)-Total			<0.00010	RPD-NA	mg/L	N/A	20	30-OCT-20
Bismuth (Bi)-Total			<0.000050	RPD-NA	mg/L	N/A	20	30-OCT-20
Boron (B)-Total			0.010	RPD-NA	mg/L	N/A	20	30-OCT-20
Cadmium (Cd)-Total			0.0000056	RPD-NA	mg/L	N/A	20	30-OCT-20
Calcium (Ca)-Total			39.0		mg/L	1.4	20	30-OCT-20
Chromium (Cr)-Total			<0.00050	RPD-NA	mg/L	N/A	20	30-OCT-20
Cesium (Cs)-Total			<0.000010	RPD-NA	mg/L	N/A	20	30-OCT-20
Cobalt (Co)-Total			<0.00010	RPD-NA	mg/L	N/A	20	30-OCT-20
Copper (Cu)-Total			0.00583		mg/L	1.1	20	30-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5272145							
WG3435426-4	DUP	WG3435426-3						
Iron (Fe)-Total		0.074	0.074		mg/L	0.4	20	30-OCT-20
Lead (Pb)-Total		0.000245	0.000248		mg/L	1.1	20	30-OCT-20
Lithium (Li)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	30-OCT-20
Magnesium (Mg)-Total		4.48	4.38		mg/L	2.3	20	30-OCT-20
Manganese (Mn)-Total		0.0233	0.0234		mg/L	0.2	20	30-OCT-20
Molybdenum (Mo)-Total		0.00615	0.00633		mg/L	2.9	20	30-OCT-20
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	30-OCT-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	30-OCT-20
Potassium (K)-Total		1.22	1.23		mg/L	0.2	20	30-OCT-20
Rubidium (Rb)-Total		0.00131	0.00142		mg/L	8.6	20	30-OCT-20
Selenium (Se)-Total		0.000067	0.000076		mg/L	13	20	30-OCT-20
Silicon (Si)-Total		1.31	1.32		mg/L	1.4	20	30-OCT-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	30-OCT-20
Sodium (Na)-Total		23.2	22.8		mg/L	1.7	20	30-OCT-20
Strontium (Sr)-Total		0.127	0.129		mg/L	1.6	20	30-OCT-20
Sulfur (S)-Total		3.71	3.62		mg/L	2.4	25	30-OCT-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	30-OCT-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	30-OCT-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	30-OCT-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	30-OCT-20
Titanium (Ti)-Total		0.00116	0.00097		mg/L	17	20	30-OCT-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	30-OCT-20
Uranium (U)-Total		0.000276	0.000283		mg/L	2.5	20	30-OCT-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	30-OCT-20
Zinc (Zn)-Total		0.0056	0.0057		mg/L	2.5	20	30-OCT-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	30-OCT-20
WG3435426-2	LCS							
Aluminum (Al)-Total			90.6		%		80-120	30-OCT-20
Antimony (Sb)-Total			99.3		%		80-120	30-OCT-20
Arsenic (As)-Total			98.5		%		80-120	30-OCT-20
Barium (Ba)-Total			96.2		%		80-120	30-OCT-20
Beryllium (Be)-Total			92.8		%		80-120	30-OCT-20
Bismuth (Bi)-Total			97.2		%		80-120	30-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5272145							
WG3435426-2	LCS							
Boron (B)-Total			93.0		%		80-120	30-OCT-20
Cadmium (Cd)-Total			96.8		%		80-120	30-OCT-20
Calcium (Ca)-Total			95.9		%		80-120	30-OCT-20
Chromium (Cr)-Total			98.0		%		80-120	30-OCT-20
Cesium (Cs)-Total			94.5		%		80-120	30-OCT-20
Cobalt (Co)-Total			93.3		%		80-120	30-OCT-20
Copper (Cu)-Total			93.5		%		80-120	30-OCT-20
Iron (Fe)-Total			91.8		%		80-120	30-OCT-20
Lead (Pb)-Total			98.9		%		80-120	30-OCT-20
Lithium (Li)-Total			89.9		%		80-120	30-OCT-20
Magnesium (Mg)-Total			92.3		%		80-120	30-OCT-20
Manganese (Mn)-Total			95.8		%		80-120	30-OCT-20
Molybdenum (Mo)-Total			94.3		%		80-120	30-OCT-20
Nickel (Ni)-Total			93.1		%		80-120	30-OCT-20
Phosphorus (P)-Total			100.6		%		70-130	30-OCT-20
Potassium (K)-Total			93.1		%		80-120	30-OCT-20
Rubidium (Rb)-Total			96.9		%		80-120	30-OCT-20
Selenium (Se)-Total			96.9		%		80-120	30-OCT-20
Silicon (Si)-Total			91.0		%		60-140	30-OCT-20
Silver (Ag)-Total			97.5		%		80-120	30-OCT-20
Sodium (Na)-Total			94.0		%		80-120	30-OCT-20
Strontium (Sr)-Total			92.2		%		80-120	30-OCT-20
Sulfur (S)-Total			91.8		%		80-120	30-OCT-20
Thallium (Tl)-Total			97.1		%		80-120	30-OCT-20
Tellurium (Te)-Total			90.2		%		80-120	30-OCT-20
Thorium (Th)-Total			94.7		%		70-130	30-OCT-20
Tin (Sn)-Total			96.4		%		80-120	30-OCT-20
Titanium (Ti)-Total			88.0		%		80-120	30-OCT-20
Tungsten (W)-Total			97.8		%		80-120	30-OCT-20
Uranium (U)-Total			96.3		%		80-120	30-OCT-20
Vanadium (V)-Total			95.3		%		80-120	30-OCT-20
Zinc (Zn)-Total			97.3		%		80-120	30-OCT-20
Zirconium (Zr)-Total			93.6		%		80-120	30-OCT-20

WG3435426-1 MB



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5272145							
WG3435426-1 MB								
Aluminum (Al)-Total			<0.0050		mg/L		0.005	30-OCT-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Boron (B)-Total			<0.010		mg/L		0.01	30-OCT-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	30-OCT-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	30-OCT-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	30-OCT-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	30-OCT-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	30-OCT-20
Iron (Fe)-Total			<0.010		mg/L		0.01	30-OCT-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	30-OCT-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	30-OCT-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	30-OCT-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	30-OCT-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	30-OCT-20
Potassium (K)-Total			<0.050		mg/L		0.05	30-OCT-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	30-OCT-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Silicon (Si)-Total			<0.10		mg/L		0.1	30-OCT-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Sodium (Na)-Total			<0.050		mg/L		0.05	30-OCT-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	30-OCT-20
Sulfur (S)-Total			<0.50		mg/L		0.5	30-OCT-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	30-OCT-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	30-OCT-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	30-OCT-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5272145							
WG3435426-1 MB								
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	30-OCT-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	30-OCT-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	30-OCT-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	30-OCT-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	30-OCT-20
WG3435426-5 MS		WG3435426-3						
Aluminum (Al)-Total			84.4		%		70-130	30-OCT-20
Antimony (Sb)-Total			96.1		%		70-130	30-OCT-20
Arsenic (As)-Total			96.3		%		70-130	30-OCT-20
Barium (Ba)-Total			N/A	MS-B	%		-	30-OCT-20
Beryllium (Be)-Total			89.5		%		70-130	30-OCT-20
Bismuth (Bi)-Total			92.8		%		70-130	30-OCT-20
Boron (B)-Total			87.7		%		70-130	30-OCT-20
Cadmium (Cd)-Total			92.9		%		70-130	30-OCT-20
Calcium (Ca)-Total			N/A	MS-B	%		-	30-OCT-20
Chromium (Cr)-Total			93.5		%		70-130	30-OCT-20
Cesium (Cs)-Total			92.6		%		70-130	30-OCT-20
Cobalt (Co)-Total			92.7		%		70-130	30-OCT-20
Copper (Cu)-Total			90.1		%		70-130	30-OCT-20
Iron (Fe)-Total			N/A	MS-B	%		-	30-OCT-20
Lead (Pb)-Total			90.8		%		70-130	30-OCT-20
Lithium (Li)-Total			87.9		%		70-130	30-OCT-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	30-OCT-20
Manganese (Mn)-Total			N/A	MS-B	%		-	30-OCT-20
Molybdenum (Mo)-Total			93.6		%		70-130	30-OCT-20
Nickel (Ni)-Total			91.5		%		70-130	30-OCT-20
Phosphorus (P)-Total			89.7		%		70-130	30-OCT-20
Potassium (K)-Total			89.0		%		70-130	30-OCT-20
Rubidium (Rb)-Total			94.2		%		70-130	30-OCT-20
Selenium (Se)-Total			95.3		%		70-130	30-OCT-20
Silicon (Si)-Total			N/A	MS-B	%		-	30-OCT-20
Silver (Ag)-Total			91.0		%		70-130	30-OCT-20
Sodium (Na)-Total			N/A	MS-B	%		-	30-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5272145							
WG3435426-5 MS		WG3435426-3						
Strontium (Sr)-Total			N/A	MS-B	%		-	30-OCT-20
Sulfur (S)-Total			N/A	MS-B	%		-	30-OCT-20
Thallium (Tl)-Total			90.8		%		70-130	30-OCT-20
Tellurium (Te)-Total			87.3		%		70-130	30-OCT-20
Thorium (Th)-Total			87.6		%		70-130	30-OCT-20
Tin (Sn)-Total			93.5		%		70-130	30-OCT-20
Titanium (Ti)-Total			84.7		%		70-130	30-OCT-20
Tungsten (W)-Total			94.5		%		70-130	30-OCT-20
Uranium (U)-Total			N/A	MS-B	%		-	30-OCT-20
Vanadium (V)-Total			94.1		%		70-130	30-OCT-20
Zinc (Zn)-Total			90.2		%		70-130	30-OCT-20
Zirconium (Zr)-Total			81.9		%		70-130	30-OCT-20
P-T-COL-WT								
	Water							
Batch	R5277776							
WG3435894-3 DUP		L2523350-1						
Phosphorus, Total		0.0063	0.0055		mg/L	13	20	04-NOV-20
WG3435894-2 LCS								
Phosphorus, Total			96.3		%		80-120	04-NOV-20
WG3435894-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	04-NOV-20
WG3435894-4 MS		L2523350-1						
Phosphorus, Total			94.8		%		70-130	04-NOV-20
PAH-511-WT								
	Water							
Batch	R5272925							
WG3435471-2 LCS								
1-Methylnaphthalene			89.9		%		50-140	02-NOV-20
2-Methylnaphthalene			92.2		%		50-140	02-NOV-20
Acenaphthene			98.5		%		50-140	02-NOV-20
Acenaphthylene			95.9		%		50-140	02-NOV-20
Anthracene			127.6		%		50-140	02-NOV-20
Benzo(a)anthracene			181.0	LCS-H	%		50-140	02-NOV-20
Benzo(a)pyrene			95.0		%		50-140	02-NOV-20
Benzo(b)fluoranthene			106.0		%		50-140	02-NOV-20
Benzo(g,h,i)perylene			119.8		%		50-140	02-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5272925							
WG3435471-2 LCS								
Benzo(k)fluoranthene			85.9		%		50-140	02-NOV-20
Chrysene			142.8	LCS-H	%		50-140	02-NOV-20
Dibenzo(ah)anthracene			105.4		%		50-140	02-NOV-20
Fluoranthene			101.9		%		50-140	02-NOV-20
Fluorene			102.0		%		50-140	02-NOV-20
Indeno(1,2,3-cd)pyrene			124.5		%		50-140	02-NOV-20
Naphthalene			97.7		%		50-140	02-NOV-20
Phenanthrene			133.6		%		50-140	02-NOV-20
Pyrene			105.7		%		50-140	02-NOV-20
WG3435471-1 MB								
1-Methylnaphthalene			<0.020		ug/L		0.02	02-NOV-20
2-Methylnaphthalene			<0.020		ug/L		0.02	02-NOV-20
Acenaphthene			<0.020		ug/L		0.02	02-NOV-20
Acenaphthylene			<0.020		ug/L		0.02	02-NOV-20
Anthracene			<0.020		ug/L		0.02	02-NOV-20
Benzo(a)anthracene			<0.020		ug/L		0.02	02-NOV-20
Benzo(a)pyrene			<0.010		ug/L		0.01	02-NOV-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	02-NOV-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	02-NOV-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	02-NOV-20
Chrysene			<0.020		ug/L		0.02	02-NOV-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	02-NOV-20
Fluoranthene			<0.020		ug/L		0.02	02-NOV-20
Fluorene			<0.020		ug/L		0.02	02-NOV-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	02-NOV-20
Naphthalene			<0.050		ug/L		0.05	02-NOV-20
Phenanthrene			<0.020		ug/L		0.02	02-NOV-20
Pyrene			<0.020		ug/L		0.02	02-NOV-20
Surrogate: d8-Naphthalene			106.6		%		60-140	02-NOV-20
Surrogate: d10-Phenanthrene			99.2		%		60-140	02-NOV-20
Surrogate: d12-Chrysene			104.4		%		60-140	02-NOV-20
Surrogate: d10-Acenaphthene			94.6		%		60-140	02-NOV-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5278318							
WG3435482-2	LCS							
Aroclor 1242			101.5		%		60-140	04-NOV-20
Aroclor 1248			100.8		%		60-140	04-NOV-20
Aroclor 1254			108.6		%		60-140	04-NOV-20
Aroclor 1260			110.5		%		60-140	04-NOV-20
WG3435482-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	04-NOV-20
Aroclor 1248			<0.020		ug/L		0.02	04-NOV-20
Aroclor 1254			<0.020		ug/L		0.02	04-NOV-20
Aroclor 1260			<0.020		ug/L		0.02	04-NOV-20
Surrogate: Decachlorobiphenyl			76.3		%		50-150	04-NOV-20
Surrogate: Tetrachloro-m-xylene			80.3		%		50-150	04-NOV-20
VOC-511-HS-WT		Water						
Batch	R5275576							
WG3437544-4	DUP		WG3437544-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	04-NOV-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	04-NOV-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	04-NOV-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	04-NOV-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	04-NOV-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5275576							
WG3437544-4	DUP	WG3437544-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	04-NOV-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	04-NOV-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	04-NOV-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	04-NOV-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	04-NOV-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	04-NOV-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	04-NOV-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	04-NOV-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	04-NOV-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	04-NOV-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	04-NOV-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	04-NOV-20
Vinyl chloride		1.37	1.25		ug/L	9.2	30	04-NOV-20
WG3437544-1	LCS							
1,1,1,2-Tetrachloroethane			94.9		%		70-130	03-NOV-20
1,1,2,2-Tetrachloroethane			118.3		%		70-130	03-NOV-20
1,1,1-Trichloroethane			96.3		%		70-130	03-NOV-20
1,1,2-Trichloroethane			107.1		%		70-130	03-NOV-20
1,1-Dichloroethane			99.4		%		70-130	03-NOV-20
1,1-Dichloroethylene			92.4		%		70-130	03-NOV-20
1,2-Dibromoethane			108.8		%		70-130	03-NOV-20
1,2-Dichlorobenzene			99.5		%		70-130	03-NOV-20
1,2-Dichloroethane			115.2		%		70-130	03-NOV-20
1,2-Dichloropropane			108.0		%		70-130	03-NOV-20
1,3-Dichlorobenzene			96.4		%		70-130	03-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5275576							
WG3437544-1	LCS							
1,4-Dichlorobenzene			97.9		%		70-130	03-NOV-20
Benzene			103.5		%		70-130	03-NOV-20
Bromodichloromethane			119.3		%		70-130	03-NOV-20
Bromoform			115.3		%		70-130	03-NOV-20
Bromomethane			132.9		%		60-140	03-NOV-20
Carbon tetrachloride			96.3		%		70-130	03-NOV-20
Chlorobenzene			95.8		%		70-130	03-NOV-20
Chloroform			107.9		%		70-130	03-NOV-20
cis-1,2-Dichloroethylene			104.2		%		70-130	03-NOV-20
cis-1,3-Dichloropropene			108.3		%		70-130	03-NOV-20
Dibromochloromethane			101.8		%		70-130	03-NOV-20
Dichlorodifluoromethane			109.2		%		50-140	03-NOV-20
Ethylbenzene			85.3		%		70-130	03-NOV-20
n-Hexane			90.7		%		70-130	03-NOV-20
m+p-Xylenes			86.1		%		70-130	03-NOV-20
Methyl Ethyl Ketone			143.2	MES	%		60-140	03-NOV-20
Methyl Isobutyl Ketone			137.3		%		60-140	03-NOV-20
Methylene Chloride			110.2		%		70-130	03-NOV-20
MTBE			100.5		%		70-130	03-NOV-20
o-Xylene			95.3		%		70-130	03-NOV-20
Styrene			92.6		%		70-130	03-NOV-20
Tetrachloroethylene			87.7		%		70-130	03-NOV-20
Toluene			89.1		%		70-130	03-NOV-20
trans-1,2-Dichloroethylene			93.8		%		70-130	03-NOV-20
trans-1,3-Dichloropropene			103.6		%		70-130	03-NOV-20
Trichloroethylene			102.2		%		70-130	03-NOV-20
Trichlorofluoromethane			94.2		%		60-140	03-NOV-20
Vinyl chloride			113.9		%		60-140	03-NOV-20
WG3437544-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	03-NOV-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	03-NOV-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	03-NOV-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	03-NOV-20
1,1-Dichloroethane			<0.50		ug/L		0.5	03-NOV-20



Quality Control Report

Workorder: L2523350

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5275576							
WG3437544-2 MB								
1,1-Dichloroethylene			<0.50		ug/L		0.5	03-NOV-20
1,2-Dibromoethane			<0.20		ug/L		0.2	03-NOV-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	03-NOV-20
1,2-Dichloroethane			<0.50		ug/L		0.5	03-NOV-20
1,2-Dichloropropane			<0.50		ug/L		0.5	03-NOV-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	03-NOV-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	03-NOV-20
Acetone			<30		ug/L		30	03-NOV-20
Benzene			<0.50		ug/L		0.5	03-NOV-20
Bromodichloromethane			<2.0		ug/L		2	03-NOV-20
Bromoform			<5.0		ug/L		5	03-NOV-20
Bromomethane			<0.50		ug/L		0.5	03-NOV-20
Carbon tetrachloride			<0.20		ug/L		0.2	03-NOV-20
Chlorobenzene			<0.50		ug/L		0.5	03-NOV-20
Chloroform			<1.0		ug/L		1	03-NOV-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	03-NOV-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	03-NOV-20
Dibromochloromethane			<2.0		ug/L		2	03-NOV-20
Dichlorodifluoromethane			<2.0		ug/L		2	03-NOV-20
Ethylbenzene			<0.50		ug/L		0.5	03-NOV-20
n-Hexane			<0.50		ug/L		0.5	03-NOV-20
m+p-Xylenes			<0.40		ug/L		0.4	03-NOV-20
Methyl Ethyl Ketone			<20		ug/L		20	03-NOV-20
Methyl Isobutyl Ketone			<20		ug/L		20	03-NOV-20
Methylene Chloride			<5.0		ug/L		5	03-NOV-20
MTBE			<2.0		ug/L		2	03-NOV-20
o-Xylene			<0.30		ug/L		0.3	03-NOV-20
Styrene			<0.50		ug/L		0.5	03-NOV-20
Tetrachloroethylene			<0.50		ug/L		0.5	03-NOV-20
Toluene			<0.50		ug/L		0.5	03-NOV-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	03-NOV-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	03-NOV-20
Trichloroethylene			<0.50		ug/L		0.5	03-NOV-20



Quality Control Report

Workorder: L2523350

Report Date: 05-NOV-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5275576							
WG3437544-2 MB								
Trichlorofluoromethane			<5.0		ug/L		5	03-NOV-20
Vinyl chloride			<0.50		ug/L		0.5	03-NOV-20
Surrogate: 1,4-Difluorobenzene			100.8		%		70-130	03-NOV-20
Surrogate: 4-Bromofluorobenzene			100.8		%		70-130	03-NOV-20
WG3437544-5 MS		WG3437544-3						
1,1,1,2-Tetrachloroethane			92.2		%		50-140	04-NOV-20
1,1,1,2,2-Tetrachloroethane			97.9		%		50-140	04-NOV-20
1,1,1-Trichloroethane			98.5		%		50-140	04-NOV-20
1,1,2-Trichloroethane			97.3		%		50-140	04-NOV-20
1,1-Dichloroethane			97.2		%		50-140	04-NOV-20
1,1-Dichloroethylene			94.8		%		50-140	04-NOV-20
1,2-Dibromoethane			97.4		%		50-140	04-NOV-20
1,2-Dichlorobenzene			98.3		%		50-140	04-NOV-20
1,2-Dichloroethane			102.5		%		50-140	04-NOV-20
1,2-Dichloropropane			101.6		%		50-140	04-NOV-20
1,3-Dichlorobenzene			100.7		%		50-140	04-NOV-20
1,4-Dichlorobenzene			100.9		%		50-140	04-NOV-20
Acetone			117.6		%		50-140	04-NOV-20
Benzene			101.4		%		50-140	04-NOV-20
Bromodichloromethane			109.4		%		50-140	04-NOV-20
Bromoform			99.1		%		50-140	04-NOV-20
Bromomethane			126.8		%		50-140	04-NOV-20
Carbon tetrachloride			99.6		%		50-140	04-NOV-20
Chlorobenzene			95.3		%		50-140	04-NOV-20
Chloroform			103.9		%		50-140	04-NOV-20
cis-1,2-Dichloroethylene			100.7		%		50-140	04-NOV-20
cis-1,3-Dichloropropene			101.8		%		50-140	04-NOV-20
Dibromochloromethane			92.9		%		50-140	04-NOV-20
Dichlorodifluoromethane			104.2		%		50-140	04-NOV-20
Ethylbenzene			88.9		%		50-140	04-NOV-20
n-Hexane			96.1		%		50-140	04-NOV-20
m+p-Xylenes			89.3		%		50-140	04-NOV-20
Methyl Ethyl Ketone			110.0		%		50-140	04-NOV-20
Methyl Isobutyl Ketone			105.6		%		50-140	04-NOV-20



Quality Control Report

Workorder: L2523350

Report Date: 05-NOV-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5275576							
WG3437544-5 MS		WG3437544-3						
Methylene Chloride			103.0		%		50-140	04-NOV-20
MTBE			100.3		%		50-140	04-NOV-20
o-Xylene			96.4		%		50-140	04-NOV-20
Styrene			90.1		%		50-140	04-NOV-20
Tetrachloroethylene			94.8		%		50-140	04-NOV-20
Toluene			91.9		%		50-140	04-NOV-20
trans-1,2-Dichloroethylene			94.6		%		50-140	04-NOV-20
trans-1,3-Dichloropropene			94.8		%		50-140	04-NOV-20
Trichloroethylene			104.1		%		50-140	04-NOV-20
Trichlorofluoromethane			96.6		%		50-140	04-NOV-20
Vinyl chloride			112.9		%		50-140	04-NOV-20

Quality Control Report

Workorder: L2523350

Report Date: 05-NOV-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
RRQC	Refer to report remarks for information regarding this QC result.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

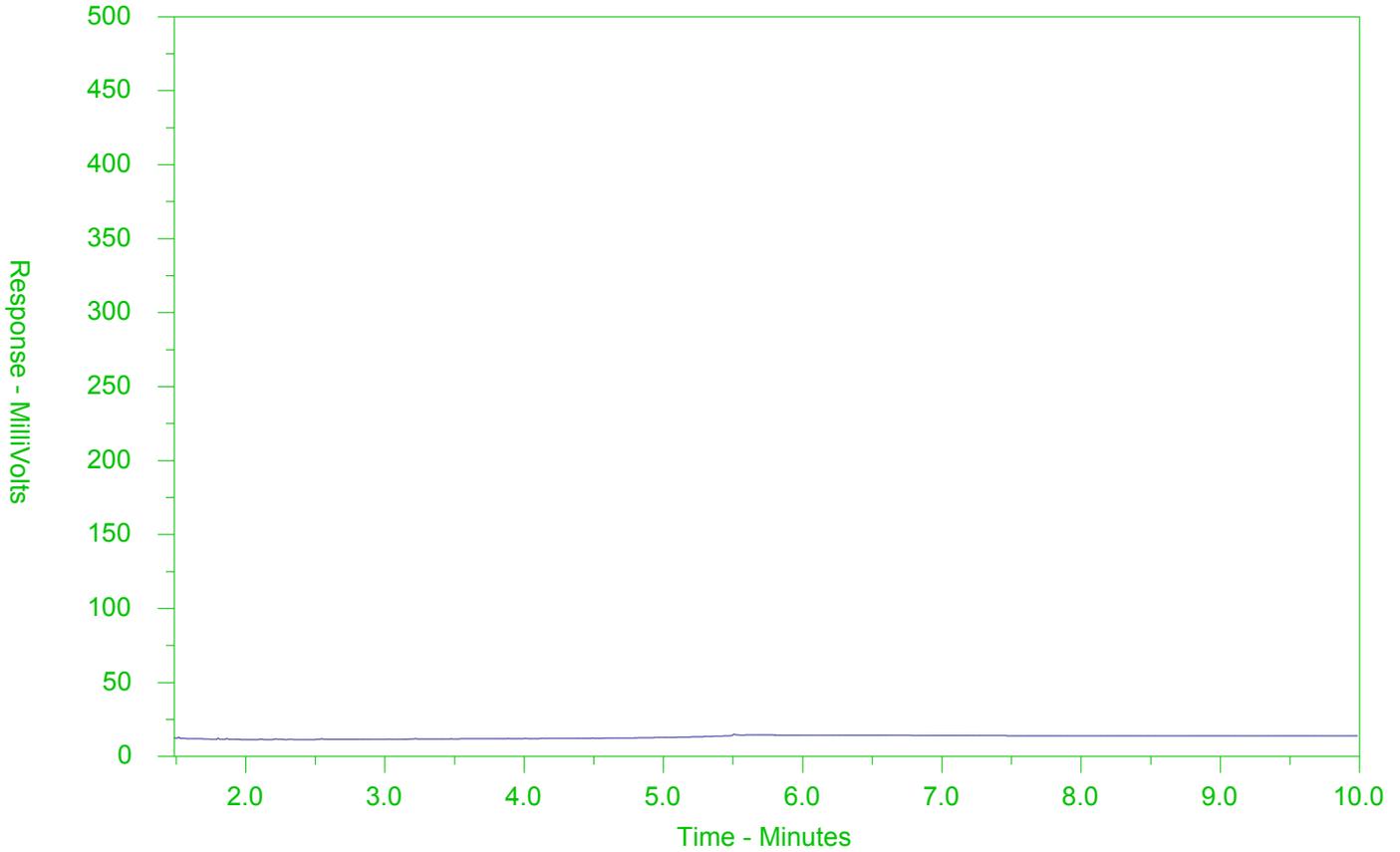
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2523350-1
 Client Sample ID: W-11210029-20201029-46



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 05-NOV-20
Report Date: 12-NOV-20 11:51 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2526411

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2526411-1 W-11210029-20201105- 48 Sampled By: ERIC on 05-NOV-20 @ 10:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0056		0.0030	mg/L	06-NOV-20	09-NOV-20	R5282679
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	06-NOV-20	06-NOV-20	R5281806
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Arsenic (As)-Total	0.00561		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Barium (Ba)-Total	0.0480		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	06-NOV-20	06-NOV-20	R5281806
Boron (B)-Total	<0.010		0.010	mg/L	06-NOV-20	06-NOV-20	R5281806
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	06-NOV-20	06-NOV-20	R5281806
Calcium (Ca)-Total	72.4		0.050	mg/L	06-NOV-20	06-NOV-20	R5281806
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	06-NOV-20	06-NOV-20	R5281806
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	06-NOV-20	06-NOV-20	R5281806
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Copper (Cu)-Total	<0.00050		0.00050	mg/L	06-NOV-20	06-NOV-20	R5281806
Iron (Fe)-Total	0.386		0.010	mg/L	06-NOV-20	06-NOV-20	R5281806
Lead (Pb)-Total	<0.000050		0.000050	mg/L	06-NOV-20	06-NOV-20	R5281806
Lithium (Li)-Total	0.0041		0.0010	mg/L	06-NOV-20	06-NOV-20	R5281806
Magnesium (Mg)-Total	31.8		0.0050	mg/L	06-NOV-20	06-NOV-20	R5281806
Manganese (Mn)-Total	0.00918		0.00050	mg/L	06-NOV-20	06-NOV-20	R5281806
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		06-NOV-20	R5281790
Molybdenum (Mo)-Total	0.000531		0.000050	mg/L	06-NOV-20	06-NOV-20	R5281806
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	06-NOV-20	06-NOV-20	R5281806
Phosphorus (P)-Total	<0.050		0.050	mg/L	06-NOV-20	06-NOV-20	R5281806
Potassium (K)-Total	0.921		0.050	mg/L	06-NOV-20	06-NOV-20	R5281806
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	06-NOV-20	06-NOV-20	R5281806
Selenium (Se)-Total	<0.000050		0.000050	mg/L	06-NOV-20	06-NOV-20	R5281806
Silicon (Si)-Total	8.25		0.10	mg/L	06-NOV-20	06-NOV-20	R5281806
Silver (Ag)-Total	<0.000050		0.000050	mg/L	06-NOV-20	06-NOV-20	R5281806
Sodium (Na)-Total	7.51		0.050	mg/L	06-NOV-20	06-NOV-20	R5281806
Strontium (Sr)-Total	0.147		0.0010	mg/L	06-NOV-20	06-NOV-20	R5281806
Sulfur (S)-Total	19.1		0.50	mg/L	06-NOV-20	06-NOV-20	R5281806
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	06-NOV-20	06-NOV-20	R5281806
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	06-NOV-20	06-NOV-20	R5281806
Thorium (Th)-Total	<0.00010		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Tin (Sn)-Total	<0.00010		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	06-NOV-20	06-NOV-20	R5281806
Tungsten (W)-Total	<0.00010		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Uranium (U)-Total	0.000261		0.000010	mg/L	06-NOV-20	06-NOV-20	R5281806
Vanadium (V)-Total	<0.00050		0.00050	mg/L	06-NOV-20	06-NOV-20	R5281806
Zinc (Zn)-Total	0.0030		0.0030	mg/L	06-NOV-20	06-NOV-20	R5281806

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2526411-1 W-11210029-20201105- 48 Sampled By: ERIC on 05-NOV-20 @ 10:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	06-NOV-20	06-NOV-20	R5281806
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		06-NOV-20	R5282667
Volatile Organic Compounds							
Acetone	<30		30	ug/L		12-NOV-20	R5283972
Benzene	<0.50		0.50	ug/L		12-NOV-20	R5283972
Bromodichloromethane	<2.0		2.0	ug/L		12-NOV-20	R5283972
Bromoform	<5.0		5.0	ug/L		12-NOV-20	R5283972
Bromomethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
Carbon tetrachloride	<0.20		0.20	ug/L		12-NOV-20	R5283972
Chlorobenzene	<0.50		0.50	ug/L		12-NOV-20	R5283972
Dibromochloromethane	<2.0		2.0	ug/L		12-NOV-20	R5283972
Chloroform	<1.0		1.0	ug/L		12-NOV-20	R5283972
1,2-Dibromoethane	<0.20		0.20	ug/L		12-NOV-20	R5283972
1,2-Dichlorobenzene	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,3-Dichlorobenzene	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,4-Dichlorobenzene	<0.50		0.50	ug/L		12-NOV-20	R5283972
Dichlorodifluoromethane	<2.0		2.0	ug/L		12-NOV-20	R5283972
1,1-Dichloroethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,2-Dichloroethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,1-Dichloroethylene	<0.50		0.50	ug/L		12-NOV-20	R5283972
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		12-NOV-20	R5283972
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		12-NOV-20	R5283972
Methylene Chloride	<5.0		5.0	ug/L		12-NOV-20	R5283972
1,2-Dichloropropane	<0.50		0.50	ug/L		12-NOV-20	R5283972
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		12-NOV-20	R5283972
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		12-NOV-20	R5283972
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		12-NOV-20	R5283972
Ethylbenzene	<0.50		0.50	ug/L		12-NOV-20	R5283972
n-Hexane	<0.50		0.50	ug/L		12-NOV-20	R5283972
Methyl Ethyl Ketone	<20		20	ug/L		12-NOV-20	R5283972
Methyl Isobutyl Ketone	<20		20	ug/L		12-NOV-20	R5283972
MTBE	<2.0		2.0	ug/L		12-NOV-20	R5283972
Styrene	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
Tetrachloroethylene	<0.50		0.50	ug/L		12-NOV-20	R5283972
Toluene	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,1,1-Trichloroethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,1,2-Trichloroethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
Trichloroethylene	<0.50		0.50	ug/L		12-NOV-20	R5283972

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2526411-1 W-11210029-20201105- 48							
Sampled By: ERIC on 05-NOV-20 @ 10:00							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		12-NOV-20	R5283972
Vinyl chloride	<0.50		0.50	ug/L		12-NOV-20	R5283972
o-Xylene	<0.30		0.30	ug/L		12-NOV-20	R5283972
m+p-Xylenes	<0.40		0.40	ug/L		12-NOV-20	R5283972
Xylenes (Total)	<0.50		0.50	ug/L		12-NOV-20	
Surrogate: 4-Bromofluorobenzene	97.7		70-130	%		12-NOV-20	R5283972
Surrogate: 1,4-Difluorobenzene	100.7		70-130	%		12-NOV-20	R5283972
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		12-NOV-20	R5283972
F1-BTEX	<25		25	ug/L		12-NOV-20	
F2 (C10-C16)	<100		100	ug/L	05-NOV-20	06-NOV-20	R5281702
F2-Naphth	<100		100	ug/L		12-NOV-20	
F3 (C16-C34)	<250		250	ug/L	05-NOV-20	06-NOV-20	R5281702
F3-PAH	<250		250	ug/L		12-NOV-20	
F4 (C34-C50)	<250		250	ug/L	05-NOV-20	06-NOV-20	R5281702
Total Hydrocarbons (C6-C50)	<370		370	ug/L		12-NOV-20	
Chrom. to baseline at nC50	YES				05-NOV-20	06-NOV-20	R5281702
Surrogate: 2-Bromobenzotrifluoride	96.6		60-140	%	05-NOV-20	06-NOV-20	R5281702
Surrogate: 3,4-Dichlorotoluene	85.0		60-140	%		12-NOV-20	R5283972
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Acenaphthylene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Anthracene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Benzo(a)anthracene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Benzo(a)pyrene	<0.010		0.010	ug/L	05-NOV-20	12-NOV-20	R5281608
Benzo(b)fluoranthene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Benzo(k)fluoranthene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Chrysene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Fluoranthene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Fluorene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		12-NOV-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
2-Methylnaphthalene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Naphthalene	<0.050		0.050	ug/L	05-NOV-20	12-NOV-20	R5281608
Phenanthrene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Pyrene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Surrogate: d10-Acenaphthene	99.0		60-140	%	05-NOV-20	12-NOV-20	R5281608
Surrogate: d12-Chrysene	77.4		60-140	%	05-NOV-20	12-NOV-20	R5281608

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2526411-1 W-11210029-20201105- 48							
Sampled By: ERIC on 05-NOV-20 @ 10:00							
Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	101.2		60-140	%	05-NOV-20	12-NOV-20	R5281608
Surrogate: d10-Phenanthrene	101.4		60-140	%	05-NOV-20	12-NOV-20	R5281608
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
4-Chloroaniline	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
2-Chlorophenol	<0.30		0.30	ug/L	06-NOV-20	12-NOV-20	R5283503
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4-Dichlorophenol	<0.30		0.30	ug/L	06-NOV-20	12-NOV-20	R5283503
Diethylphthalate	<0.20		0.20	ug/L	06-NOV-20	12-NOV-20	R5283503
Dimethylphthalate	<0.20		0.20	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4-Dimethylphenol	<0.50		0.50	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4-Dinitrophenol	<1.0		1.0	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4-Dinitrotoluene	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
2,6-Dinitrotoluene	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		12-NOV-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	06-NOV-20	12-NOV-20	R5283503
Pentachlorophenol	<0.50		0.50	ug/L	06-NOV-20	12-NOV-20	R5283503
Phenol	<0.50		0.50	ug/L	06-NOV-20	12-NOV-20	R5283503
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	06-NOV-20	12-NOV-20	R5283503
Surrogate: 2-Fluorobiphenyl	89.3		50-140	%	06-NOV-20	12-NOV-20	R5283503
Surrogate: Nitrobenzene d5	95.8		50-140	%	06-NOV-20	12-NOV-20	R5283503
Surrogate: p-Terphenyl d14	89.8		60-140	%	06-NOV-20	12-NOV-20	R5283503
Surrogate: 2,4,6-Tribromophenol	98.2		50-140	%	06-NOV-20	12-NOV-20	R5283503
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	10-NOV-20	10-NOV-20	R5282775
Aroclor 1248	<0.020		0.020	ug/L	10-NOV-20	10-NOV-20	R5282775
Aroclor 1254	<0.020		0.020	ug/L	10-NOV-20	10-NOV-20	R5282775
Aroclor 1260	<0.020		0.020	ug/L	10-NOV-20	10-NOV-20	R5282775
Surrogate: Decachlorobiphenyl	105.4		50-150	%	10-NOV-20	10-NOV-20	R5282775
Total PCBs	<0.040		0.040	ug/L	10-NOV-20	10-NOV-20	R5282775
Surrogate: Tetrachloro-m-xylene	89.0		50-150	%	10-NOV-20	10-NOV-20	R5282775

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Total	MS-B	L2526411-1
Matrix Spike	Boron (B)-Total	MS-B	L2526411-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2526411-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2526411-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2526411-1
Matrix Spike	Potassium (K)-Total	MS-B	L2526411-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2526411-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2526411-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2526411-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2526411-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2526411

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5283503							
WG3440218-2	LCS							
1,2,4-Trichlorobenzene			61.5		%		50-140	10-NOV-20
2-Chlorophenol			83.1		%		50-140	10-NOV-20
2,4-Dichlorophenol			96.9		%		50-140	10-NOV-20
2,4-Dimethylphenol			94.6		%		30-130	10-NOV-20
2,4-Dinitrophenol			94.3		%		50-140	10-NOV-20
2,4-Dinitrotoluene			107.9		%		50-140	10-NOV-20
2,4,5-Trichlorophenol			99.5		%		50-140	10-NOV-20
2,4,6-Trichlorophenol			97.8		%		50-140	10-NOV-20
2,6-Dinitrotoluene			94.6		%		50-140	10-NOV-20
3,3'-Dichlorobenzidine			73.2		%		30-130	10-NOV-20
4-Chloroaniline			57.9		%		30-130	10-NOV-20
Biphenyl			82.4		%		50-140	10-NOV-20
Bis(2-chloroethyl)ether			89.7		%		50-140	10-NOV-20
Bis(2-chloroisopropyl)ether			84.2		%		50-140	10-NOV-20
Bis(2-ethylhexyl)phthalate			99.9		%		50-140	10-NOV-20
Diethylphthalate			96.1		%		50-140	10-NOV-20
Dimethylphthalate			90.9		%		50-140	10-NOV-20
Pentachlorophenol			108.9		%		50-140	10-NOV-20
Phenol			109.9		%		30-130	10-NOV-20
WG3440218-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	10-NOV-20
2-Chlorophenol			<0.30		ug/L		0.3	10-NOV-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	10-NOV-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	10-NOV-20
2,4-Dinitrophenol			<1.0		ug/L		1	10-NOV-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	10-NOV-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	10-NOV-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	10-NOV-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	10-NOV-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	10-NOV-20
4-Chloroaniline			<0.40		ug/L		0.4	10-NOV-20
Biphenyl			<0.40		ug/L		0.4	10-NOV-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	10-NOV-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	10-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
625-511-WT Water									
Batch R5283503									
WG3440218-1 MB									
			<2.0		ug/L		2	10-NOV-20	
			<0.20		ug/L		0.2	10-NOV-20	
			<0.20		ug/L		0.2	10-NOV-20	
			<0.50		ug/L		0.5	10-NOV-20	
			<0.50		ug/L		0.5	10-NOV-20	
			85.3		%		50-140	10-NOV-20	
			82.1		%		50-140	10-NOV-20	
			89.3		%		50-140	10-NOV-20	
			113.7		%		60-140	10-NOV-20	
CR-CR6-IC-WT Water									
Batch R5282667									
WG3440824-4 DUP									
		WG3440824-3	0.00073	0.00072	mg/L	0.6	20	06-NOV-20	
WG3440824-2 LCS									
			101.4		%		80-120	06-NOV-20	
WG3440824-1 MB									
			<0.00050		mg/L		0.0005	06-NOV-20	
WG3440824-5 MS									
		WG3440824-3	101.6		%		70-130	06-NOV-20	
F1-HS-511-WT Water									
Batch R5283972									
WG3439321-4 DUP									
		WG3439321-3	<25	<25	RPD-NA	ug/L	N/A	30	12-NOV-20
WG3439321-1 LCS									
			103.9		%		80-120	12-NOV-20	
WG3439321-2 MB									
			<25		ug/L		25	12-NOV-20	
			96.3		%		60-140	12-NOV-20	
WG3439321-5 MS									
		WG3439321-3	96.8		%		60-140	12-NOV-20	
F2-F4-511-WT Water									
Batch R5281702									
WG3440004-2 LCS									
			94.4		%		70-130	06-NOV-20	
			93.5		%		70-130	06-NOV-20	



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
F2-F4-511-WT									
Water									
Batch R5281702									
WG3440004-2 LCS									
F4 (C34-C50)			116.7		%		70-130	06-NOV-20	
WG3440004-1 MB									
F2 (C10-C16)			<100		ug/L		100	06-NOV-20	
F3 (C16-C34)			<250		ug/L		250	06-NOV-20	
F4 (C34-C50)			<250		ug/L		250	06-NOV-20	
Surrogate: 2-Bromobenzotrifluoride			88.4		%		60-140	06-NOV-20	
HG-T-CVAA-WT									
Water									
Batch R5281790									
WG3440407-4 DUP									
Mercury (Hg)-Total		WG3440407-3	<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	06-NOV-20
WG3440407-2 LCS									
Mercury (Hg)-Total			111.0		%		80-120	06-NOV-20	
WG3440407-1 MB									
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	06-NOV-20	
WG3440407-6 MS									
Mercury (Hg)-Total		WG3440407-5	106.8		%		70-130	06-NOV-20	
MET-T-CCMS-WT									
Water									
Batch R5281806									
WG3440194-4 DUP									
Aluminum (Al)-Total		WG3440194-3	0.0189	0.0171		mg/L	10	20	06-NOV-20
Antimony (Sb)-Total			0.00059	0.00059		mg/L	0.5	20	06-NOV-20
Arsenic (As)-Total			0.00030	0.00031		mg/L	1.6	20	06-NOV-20
Barium (Ba)-Total			0.130	0.129		mg/L	0.2	20	06-NOV-20
Beryllium (Be)-Total			<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	06-NOV-20
Bismuth (Bi)-Total			<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	06-NOV-20
Boron (B)-Total			0.061	0.062		mg/L	1.4	20	06-NOV-20
Cadmium (Cd)-Total			0.0000061	<0.0000050	RPD-NA	mg/L	N/A	20	06-NOV-20
Calcium (Ca)-Total			44.9	46.2		mg/L	3.0	20	06-NOV-20
Chromium (Cr)-Total			<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	06-NOV-20
Cesium (Cs)-Total			0.000066	0.000067		mg/L	2.7	20	06-NOV-20
Cobalt (Co)-Total			0.00047	0.00046		mg/L	0.9	20	06-NOV-20
Copper (Cu)-Total			<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	06-NOV-20
Iron (Fe)-Total			0.104	0.102		mg/L	2.0	20	06-NOV-20
Lead (Pb)-Total			<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	06-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5281806							
WG3440194-4	DUP	WG3440194-3						
Lithium (Li)-Total		0.0055	0.0055		mg/L	1.0	20	06-NOV-20
Magnesium (Mg)-Total		12.1	12.1		mg/L	0.3	20	06-NOV-20
Manganese (Mn)-Total		0.384	0.380		mg/L	1.2	20	06-NOV-20
Molybdenum (Mo)-Total		0.00418	0.00428		mg/L	2.4	20	06-NOV-20
Nickel (Ni)-Total		0.00233	0.00229		mg/L	2.1	20	06-NOV-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	06-NOV-20
Potassium (K)-Total		3.93	3.81		mg/L	3.2	20	06-NOV-20
Rubidium (Rb)-Total		0.00518	0.00514		mg/L	0.9	20	06-NOV-20
Selenium (Se)-Total		0.000081	0.000088		mg/L	8.1	20	06-NOV-20
Silicon (Si)-Total		1.31	1.29		mg/L	1.2	20	06-NOV-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	06-NOV-20
Sodium (Na)-Total		38.9	40.2		mg/L	3.1	20	06-NOV-20
Strontium (Sr)-Total		0.321	0.320		mg/L	0.2	20	06-NOV-20
Sulfur (S)-Total		30.7	30.0		mg/L	2.4	25	06-NOV-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	06-NOV-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	06-NOV-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	06-NOV-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	06-NOV-20
Titanium (Ti)-Total		0.00035	0.00040		mg/L	12	20	06-NOV-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	06-NOV-20
Uranium (U)-Total		0.000024	0.000022		mg/L	9.0	20	06-NOV-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	06-NOV-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	06-NOV-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	06-NOV-20
WG3440194-2	LCS							
Aluminum (Al)-Total			97.9		%		80-120	06-NOV-20
Antimony (Sb)-Total			100.0		%		80-120	06-NOV-20
Arsenic (As)-Total			98.2		%		80-120	06-NOV-20
Barium (Ba)-Total			99.8		%		80-120	06-NOV-20
Beryllium (Be)-Total			98.9		%		80-120	06-NOV-20
Bismuth (Bi)-Total			98.1		%		80-120	06-NOV-20
Boron (B)-Total			98.2		%		80-120	06-NOV-20
Cadmium (Cd)-Total			104.2		%		80-120	06-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5281806							
WG3440194-2	LCS							
Calcium (Ca)-Total			98.5		%		80-120	06-NOV-20
Chromium (Cr)-Total			98.1		%		80-120	06-NOV-20
Cesium (Cs)-Total			100.3		%		80-120	06-NOV-20
Cobalt (Co)-Total			99.4		%		80-120	06-NOV-20
Copper (Cu)-Total			97.5		%		80-120	06-NOV-20
Iron (Fe)-Total			97.5		%		80-120	06-NOV-20
Lead (Pb)-Total			100.2		%		80-120	06-NOV-20
Lithium (Li)-Total			109.4		%		80-120	06-NOV-20
Magnesium (Mg)-Total			104.4		%		80-120	06-NOV-20
Manganese (Mn)-Total			97.0		%		80-120	06-NOV-20
Molybdenum (Mo)-Total			99.4		%		80-120	06-NOV-20
Nickel (Ni)-Total			99.2		%		80-120	06-NOV-20
Phosphorus (P)-Total			104.5		%		70-130	06-NOV-20
Potassium (K)-Total			95.8		%		80-120	06-NOV-20
Rubidium (Rb)-Total			102.2		%		80-120	06-NOV-20
Selenium (Se)-Total			98.5		%		80-120	06-NOV-20
Silicon (Si)-Total			95.9		%		60-140	06-NOV-20
Silver (Ag)-Total			98.9		%		80-120	06-NOV-20
Sodium (Na)-Total			99.2		%		80-120	06-NOV-20
Strontium (Sr)-Total			100.2		%		80-120	06-NOV-20
Sulfur (S)-Total			90.9		%		80-120	06-NOV-20
Thallium (Tl)-Total			100.2		%		80-120	06-NOV-20
Tellurium (Te)-Total			96.3		%		80-120	06-NOV-20
Thorium (Th)-Total			100.0		%		70-130	06-NOV-20
Tin (Sn)-Total			98.7		%		80-120	06-NOV-20
Titanium (Ti)-Total			94.7		%		80-120	06-NOV-20
Tungsten (W)-Total			98.4		%		80-120	06-NOV-20
Uranium (U)-Total			102.3		%		80-120	06-NOV-20
Vanadium (V)-Total			99.9		%		80-120	06-NOV-20
Zinc (Zn)-Total			97.0		%		80-120	06-NOV-20
Zirconium (Zr)-Total			94.7		%		80-120	06-NOV-20
WG3440194-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	06-NOV-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	06-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5281806							
WG3440194-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	06-NOV-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	06-NOV-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	06-NOV-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	06-NOV-20
Boron (B)-Total			<0.010		mg/L		0.01	06-NOV-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	06-NOV-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	06-NOV-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	06-NOV-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	06-NOV-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	06-NOV-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	06-NOV-20
Iron (Fe)-Total			<0.010		mg/L		0.01	06-NOV-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	06-NOV-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	06-NOV-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	06-NOV-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	06-NOV-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	06-NOV-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	06-NOV-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	06-NOV-20
Potassium (K)-Total			<0.050		mg/L		0.05	06-NOV-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	06-NOV-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	06-NOV-20
Silicon (Si)-Total			<0.10		mg/L		0.1	06-NOV-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	06-NOV-20
Sodium (Na)-Total			<0.050		mg/L		0.05	06-NOV-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	06-NOV-20
Sulfur (S)-Total			<0.50		mg/L		0.5	06-NOV-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	06-NOV-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	06-NOV-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	06-NOV-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	06-NOV-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	06-NOV-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	06-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5281806							
WG3440194-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	06-NOV-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	06-NOV-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	06-NOV-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	06-NOV-20
WG3440194-5 MS		WG3440194-6						
Aluminum (Al)-Total			96.0		%		70-130	06-NOV-20
Antimony (Sb)-Total			99.8		%		70-130	06-NOV-20
Arsenic (As)-Total			99.6		%		70-130	06-NOV-20
Barium (Ba)-Total			N/A	MS-B	%		-	06-NOV-20
Beryllium (Be)-Total			96.1		%		70-130	06-NOV-20
Bismuth (Bi)-Total			93.3		%		70-130	06-NOV-20
Boron (B)-Total			N/A	MS-B	%		-	06-NOV-20
Cadmium (Cd)-Total			100.4		%		70-130	06-NOV-20
Calcium (Ca)-Total			N/A	MS-B	%		-	06-NOV-20
Chromium (Cr)-Total			98.3		%		70-130	06-NOV-20
Cesium (Cs)-Total			98.9		%		70-130	06-NOV-20
Cobalt (Co)-Total			95.9		%		70-130	06-NOV-20
Copper (Cu)-Total			95.3		%		70-130	06-NOV-20
Iron (Fe)-Total			90.8		%		70-130	06-NOV-20
Lead (Pb)-Total			92.8		%		70-130	06-NOV-20
Lithium (Li)-Total			95.8		%		70-130	06-NOV-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	06-NOV-20
Manganese (Mn)-Total			N/A	MS-B	%		-	06-NOV-20
Molybdenum (Mo)-Total			99.5		%		70-130	06-NOV-20
Nickel (Ni)-Total			94.2		%		70-130	06-NOV-20
Phosphorus (P)-Total			100.6		%		70-130	06-NOV-20
Potassium (K)-Total			N/A	MS-B	%		-	06-NOV-20
Rubidium (Rb)-Total			90.5		%		70-130	06-NOV-20
Selenium (Se)-Total			98.0		%		70-130	06-NOV-20
Silicon (Si)-Total			N/A	MS-B	%		-	06-NOV-20
Silver (Ag)-Total			93.2		%		70-130	06-NOV-20
Sodium (Na)-Total			N/A	MS-B	%		-	06-NOV-20
Strontium (Sr)-Total			N/A	MS-B	%		-	06-NOV-20
Sulfur (S)-Total			N/A	MS-B	%		-	06-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5281806							
WG3440194-5 MS		WG3440194-6						
Thallium (Tl)-Total			92.2		%		70-130	06-NOV-20
Tellurium (Te)-Total			92.1		%		70-130	06-NOV-20
Thorium (Th)-Total			95.9		%		70-130	06-NOV-20
Tin (Sn)-Total			97.5		%		70-130	06-NOV-20
Titanium (Ti)-Total			94.6		%		70-130	06-NOV-20
Tungsten (W)-Total			95.7		%		70-130	06-NOV-20
Uranium (U)-Total			98.1		%		70-130	06-NOV-20
Vanadium (V)-Total			100.4		%		70-130	06-NOV-20
Zinc (Zn)-Total			91.7		%		70-130	06-NOV-20
Zirconium (Zr)-Total			94.4		%		70-130	06-NOV-20
P-T-COL-WT								
	Water							
Batch	R5282679							
WG3439262-3 DUP		L2526324-1						
Phosphorus, Total		0.0476	0.0460		mg/L	3.4	20	09-NOV-20
WG3439262-2 LCS								
Phosphorus, Total			94.4		%		80-120	09-NOV-20
WG3439262-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	09-NOV-20
WG3439262-4 MS		L2526324-1						
Phosphorus, Total			90.1		%		70-130	09-NOV-20
PAH-511-WT								
	Water							
Batch	R5281608							
WG3440004-2 LCS								
1-Methylnaphthalene			92.6		%		50-140	12-NOV-20
2-Methylnaphthalene			94.4		%		50-140	12-NOV-20
Acenaphthene			118.6		%		50-140	12-NOV-20
Acenaphthylene			117.0		%		50-140	12-NOV-20
Anthracene			123.0		%		50-140	12-NOV-20
Benzo(a)anthracene			136.6		%		50-140	12-NOV-20
Benzo(a)pyrene			126.1		%		50-140	12-NOV-20
Benzo(b)fluoranthene			118.0		%		50-140	12-NOV-20
Benzo(g,h,i)perylene			125.3		%		50-140	12-NOV-20
Benzo(k)fluoranthene			120.6		%		50-140	12-NOV-20
Chrysene			130.1		%		50-140	12-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5281608							
WG3440004-2	LCS							
Dibenzo(ah)anthracene			128.9		%		50-140	12-NOV-20
Fluoranthene			134.7		%		50-140	12-NOV-20
Fluorene			117.1		%		50-140	12-NOV-20
Indeno(1,2,3-cd)pyrene			135.3		%		50-140	12-NOV-20
Naphthalene			104.4		%		50-140	12-NOV-20
Phenanthrene			127.8		%		50-140	12-NOV-20
Pyrene			134.4		%		50-140	12-NOV-20
WG3440004-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	12-NOV-20
2-Methylnaphthalene			<0.020		ug/L		0.02	12-NOV-20
Acenaphthene			<0.020		ug/L		0.02	12-NOV-20
Acenaphthylene			<0.020		ug/L		0.02	12-NOV-20
Anthracene			<0.020		ug/L		0.02	12-NOV-20
Benzo(a)anthracene			<0.020		ug/L		0.02	12-NOV-20
Benzo(a)pyrene			<0.010		ug/L		0.01	12-NOV-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	12-NOV-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	12-NOV-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	12-NOV-20
Chrysene			<0.020		ug/L		0.02	12-NOV-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	12-NOV-20
Fluoranthene			<0.020		ug/L		0.02	12-NOV-20
Fluorene			<0.020		ug/L		0.02	12-NOV-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	12-NOV-20
Naphthalene			<0.050		ug/L		0.05	12-NOV-20
Phenanthrene			<0.020		ug/L		0.02	12-NOV-20
Pyrene			<0.020		ug/L		0.02	12-NOV-20
Surrogate: d8-Naphthalene			104.5		%		60-140	12-NOV-20
Surrogate: d10-Phenanthrene			103.6		%		60-140	12-NOV-20
Surrogate: d12-Chrysene			90.8		%		60-140	12-NOV-20
Surrogate: d10-Acenaphthene			103.8		%		60-140	12-NOV-20

PCB-511-WT **Water**



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5282775							
WG3440256-2	LCS							
Aroclor 1242			106.0		%		60-140	09-NOV-20
Aroclor 1248			92.7		%		60-140	09-NOV-20
Aroclor 1254			120.2		%		60-140	09-NOV-20
Aroclor 1260			115.4		%		60-140	09-NOV-20
WG3440256-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	09-NOV-20
Aroclor 1248			<0.020		ug/L		0.02	09-NOV-20
Aroclor 1254			<0.020		ug/L		0.02	09-NOV-20
Aroclor 1260			<0.020		ug/L		0.02	09-NOV-20
Surrogate: Decachlorobiphenyl			132.6		%		50-150	09-NOV-20
Surrogate: Tetrachloro-m-xylene			86.8		%		50-150	09-NOV-20
VOC-511-HS-WT		Water						
Batch	R5283972							
WG3439321-4	DUP		WG3439321-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	12-NOV-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	12-NOV-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	12-NOV-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	12-NOV-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	12-NOV-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5283972							
WG3439321-4	DUP	WG3439321-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	12-NOV-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	12-NOV-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	12-NOV-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	12-NOV-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	12-NOV-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	12-NOV-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	12-NOV-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	12-NOV-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	12-NOV-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	12-NOV-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	12-NOV-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	12-NOV-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
WG3439321-1	LCS							
1,1,1,2-Tetrachloroethane			92.5		%		70-130	12-NOV-20
1,1,2,2-Tetrachloroethane			105.6		%		70-130	12-NOV-20
1,1,1-Trichloroethane			103.2		%		70-130	12-NOV-20
1,1,2-Trichloroethane			100.8		%		70-130	12-NOV-20
1,1-Dichloroethane			107.5		%		70-130	12-NOV-20
1,1-Dichloroethylene			103.3		%		70-130	12-NOV-20
1,2-Dibromoethane			102.1		%		70-130	12-NOV-20
1,2-Dichlorobenzene			101.1		%		70-130	12-NOV-20
1,2-Dichloroethane			111.9		%		70-130	12-NOV-20
1,2-Dichloropropane			109.9		%		70-130	12-NOV-20
1,3-Dichlorobenzene			104.7		%		70-130	12-NOV-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5283972							
WG3439321-1	LCS							
1,4-Dichlorobenzene			106.5		%		70-130	12-NOV-20
Acetone			116.6		%		60-140	12-NOV-20
Benzene			108.0		%		70-130	12-NOV-20
Bromodichloromethane			116.7		%		70-130	12-NOV-20
Bromoform			100.7		%		70-130	12-NOV-20
Bromomethane			133.8		%		60-140	12-NOV-20
Carbon tetrachloride			102.5		%		70-130	12-NOV-20
Chlorobenzene			98.9		%		70-130	12-NOV-20
Chloroform			105.1		%		70-130	12-NOV-20
cis-1,2-Dichloroethylene			106.0		%		70-130	12-NOV-20
cis-1,3-Dichloropropene			103.7		%		70-130	12-NOV-20
Dibromochloromethane			98.5		%		70-130	12-NOV-20
Dichlorodifluoromethane			120.9		%		50-140	12-NOV-20
Ethylbenzene			100.0		%		70-130	12-NOV-20
n-Hexane			105.7		%		70-130	12-NOV-20
m+p-Xylenes			100.3		%		70-130	12-NOV-20
Methyl Ethyl Ketone			112.5		%		60-140	12-NOV-20
Methyl Isobutyl Ketone			114.5		%		60-140	12-NOV-20
Methylene Chloride			113.7		%		70-130	12-NOV-20
MTBE			104.7		%		70-130	12-NOV-20
o-Xylene			105.8		%		70-130	12-NOV-20
Styrene			96.6		%		70-130	12-NOV-20
Tetrachloroethylene			106.2		%		70-130	12-NOV-20
Toluene			101.4		%		70-130	12-NOV-20
trans-1,2-Dichloroethylene			105.9		%		70-130	12-NOV-20
trans-1,3-Dichloropropene			101.5		%		70-130	12-NOV-20
Trichloroethylene			104.3		%		70-130	12-NOV-20
Trichlorofluoromethane			102.4		%		60-140	12-NOV-20
Vinyl chloride			120.2		%		60-140	12-NOV-20
WG3439321-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	12-NOV-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	12-NOV-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	12-NOV-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	12-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5283972							
WG3439321-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	12-NOV-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	12-NOV-20
1,2-Dibromoethane			<0.20		ug/L		0.2	12-NOV-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	12-NOV-20
1,2-Dichloroethane			<0.50		ug/L		0.5	12-NOV-20
1,2-Dichloropropane			<0.50		ug/L		0.5	12-NOV-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	12-NOV-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	12-NOV-20
Acetone			<30		ug/L		30	12-NOV-20
Benzene			<0.50		ug/L		0.5	12-NOV-20
Bromodichloromethane			<2.0		ug/L		2	12-NOV-20
Bromoform			<5.0		ug/L		5	12-NOV-20
Bromomethane			<0.50		ug/L		0.5	12-NOV-20
Carbon tetrachloride			<0.20		ug/L		0.2	12-NOV-20
Chlorobenzene			<0.50		ug/L		0.5	12-NOV-20
Chloroform			<1.0		ug/L		1	12-NOV-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	12-NOV-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	12-NOV-20
Dibromochloromethane			<2.0		ug/L		2	12-NOV-20
Dichlorodifluoromethane			<2.0		ug/L		2	12-NOV-20
Ethylbenzene			<0.50		ug/L		0.5	12-NOV-20
n-Hexane			<0.50		ug/L		0.5	12-NOV-20
m+p-Xylenes			<0.40		ug/L		0.4	12-NOV-20
Methyl Ethyl Ketone			<20		ug/L		20	12-NOV-20
Methyl Isobutyl Ketone			<20		ug/L		20	12-NOV-20
Methylene Chloride			<5.0		ug/L		5	12-NOV-20
MTBE			<2.0		ug/L		2	12-NOV-20
o-Xylene			<0.30		ug/L		0.3	12-NOV-20
Styrene			<0.50		ug/L		0.5	12-NOV-20
Tetrachloroethylene			<0.50		ug/L		0.5	12-NOV-20
Toluene			<0.50		ug/L		0.5	12-NOV-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	12-NOV-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	12-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5283972							
WG3439321-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	12-NOV-20
Trichlorofluoromethane			<5.0		ug/L		5	12-NOV-20
Vinyl chloride			<0.50		ug/L		0.5	12-NOV-20
Surrogate: 1,4-Difluorobenzene			99.8		%		70-130	12-NOV-20
Surrogate: 4-Bromofluorobenzene			100.0		%		70-130	12-NOV-20
WG3439321-5 MS		WG3439321-3						
1,1,1,2-Tetrachloroethane			93.4		%		50-140	12-NOV-20
1,1,2,2-Tetrachloroethane			98.1		%		50-140	12-NOV-20
1,1,1-Trichloroethane			106.5		%		50-140	12-NOV-20
1,1,2-Trichloroethane			102.4		%		50-140	12-NOV-20
1,1-Dichloroethane			119.1		%		50-140	12-NOV-20
1,1-Dichloroethylene			103.8		%		50-140	12-NOV-20
1,2-Dibromoethane			103.7		%		50-140	12-NOV-20
1,2-Dichlorobenzene			100.9		%		50-140	12-NOV-20
1,2-Dichloroethane			112.0		%		50-140	12-NOV-20
1,2-Dichloropropane			110.1		%		50-140	12-NOV-20
1,3-Dichlorobenzene			105.2		%		50-140	12-NOV-20
1,4-Dichlorobenzene			105.8		%		50-140	12-NOV-20
Acetone			126.6		%		50-140	12-NOV-20
Benzene			110.6		%		50-140	12-NOV-20
Bromodichloromethane			117.7		%		50-140	12-NOV-20
Bromoform			97.3		%		50-140	12-NOV-20
Bromomethane			131.0		%		50-140	12-NOV-20
Carbon tetrachloride			105.9		%		50-140	12-NOV-20
Chlorobenzene			98.9		%		50-140	12-NOV-20
Chloroform			109.1		%		50-140	12-NOV-20
cis-1,2-Dichloroethylene			108.3		%		50-140	12-NOV-20
cis-1,3-Dichloropropene			97.4		%		50-140	12-NOV-20
Dibromochloromethane			99.0		%		50-140	12-NOV-20
Dichlorodifluoromethane			114.9		%		50-140	12-NOV-20
Ethylbenzene			100.1		%		50-140	12-NOV-20
n-Hexane			103.9		%		50-140	12-NOV-20
m+p-Xylenes			99.3		%		50-140	12-NOV-20
Methyl Ethyl Ketone			115.0		%		50-140	12-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5283972							
WG3439321-5 MS		WG3439321-3						
Methyl Isobutyl Ketone			107.4		%		50-140	12-NOV-20
Methylene Chloride			117.0		%		50-140	12-NOV-20
MTBE			104.2		%		50-140	12-NOV-20
o-Xylene			105.3		%		50-140	12-NOV-20
Styrene			94.0		%		50-140	12-NOV-20
Tetrachloroethylene			105.9		%		50-140	12-NOV-20
Toluene			105.1		%		50-140	12-NOV-20
trans-1,2-Dichloroethylene			104.8		%		50-140	12-NOV-20
trans-1,3-Dichloropropene			94.4		%		50-140	12-NOV-20
Trichloroethylene			106.5		%		50-140	12-NOV-20
Trichlorofluoromethane			103.2		%		50-140	12-NOV-20
Vinyl chloride			115.4		%		50-140	12-NOV-20

Quality Control Report

Workorder: L2526411

Report Date: 12-NOV-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

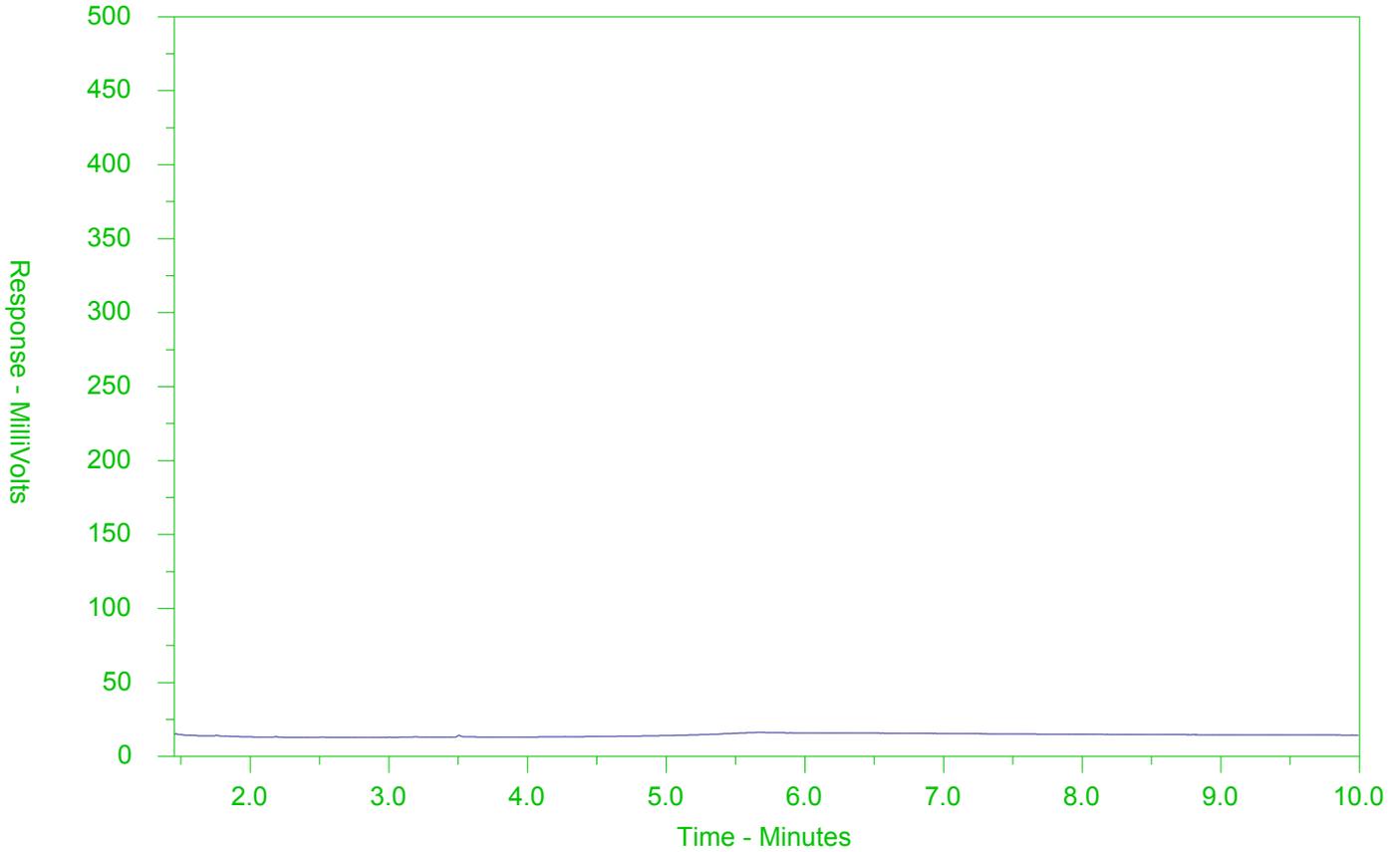
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2526411-1
 Client Sample ID: W-11210029-20201105- 48



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2526411-COFC

DC Number: 17 -

Page of

www.alsglobal.com

Report To Contact and company name below will appear on the final report Company: GHD LIMITED - ACCT #13791 Contact: Laura Ermeta Phone: 519-884-0510 Company address below will appear on the final report Street: 455 Phillip St City/Province: Waterloo, Ontario Postal Code: N2L 3X2		Report Format / Dis Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: laura.ermeta@ghd.com Email 2: See PO Email 3:		.act your AM to confirm all E&P TATs (surcharges may apply) Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply PRIORITY (Business Days) 4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> EMERGENCY 1 Business day [E - 100%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/> Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm For tests that can not be performed according to the service level selected, you will be contacted.																																							
Invoice To Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Company: GHD Limited Contact: SEE SSOW		Invoice Distribution Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: apinvoices-735@ghd.com Email 2:		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below <table border="1"> <tr> <th>NUMBER OF CONTAINERS</th> <th>Total Metals (MET-T-CCMS-WT)</th> <th>Total Mercury (HG-T-CVAA-WT)</th> <th>Total Cr6 (CR-CR6-C-WT)</th> <th>Total Phosphorus (P-T-COL-WT)</th> <th>PCBs (PCB-511-WT)</th> <th>VOCs and PHCs (VOC.F1-F4-511-P-WT)</th> <th>SVOcs (SVOc-511-GP-WT)</th> <th></th> </tr> <tr> <td>2</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td></td> </tr> </table>		NUMBER OF CONTAINERS	Total Metals (MET-T-CCMS-WT)	Total Mercury (HG-T-CVAA-WT)	Total Cr6 (CR-CR6-C-WT)	Total Phosphorus (P-T-COL-WT)	PCBs (PCB-511-WT)	VOCs and PHCs (VOC.F1-F4-511-P-WT)	SVOcs (SVOc-511-GP-WT)												2	R	R	R	R	R	R	R											
NUMBER OF CONTAINERS	Total Metals (MET-T-CCMS-WT)	Total Mercury (HG-T-CVAA-WT)	Total Cr6 (CR-CR6-C-WT)	Total Phosphorus (P-T-COL-WT)	PCBs (PCB-511-WT)	VOCs and PHCs (VOC.F1-F4-511-P-WT)	SVOcs (SVOc-511-GP-WT)																																				
2	R	R	R	R	R	R	R																																				
Project Information ALS Account # / Quote #: 13791 Job #: 11210029 PO / AFE: 73520086 LSD:		Oil and Gas Required Fields (client use) AFE/Cost Center: PO# Major/Minor Code: Routing Code: Requisitioner: Location:		ALS Lab Work Order # (lab use only): L2526411 ALS Contact: Rick H Sampler: Eric																																							
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type																																							
	W-11210029-20001105-48	05/11/20	1000AM	Water																																							
Drinking Water (DW) Samples¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: 8.5 FINAL COOLER TEMPERATURES °C:																																							
SHIPMENT RELEASE (client use) Released by: [Signature] Date: Nov 5/20 Time: 1100AM		INITIAL SHIPMENT RECEPTION (lab use only) Received by: [Signature] Date: Nov 5 Time: 2:30pm		FINAL SHIPMENT RECEPTION (lab use only) Received by: [Signature] Date: Nov 5 Time: 2:30pm																																							



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 12-NOV-20
Report Date: 19-NOV-20 10:18 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

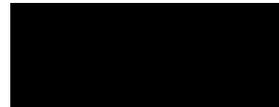
Lab Work Order #: L2528910

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2528910-1 W-11210029-20201112-50 Sampled By: ERIC on 12-NOV-20 @ 11:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0057		0.0030	mg/L	13-NOV-20	16-NOV-20	R5285998
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	13-NOV-20	16-NOV-20	R5285205
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Arsenic (As)-Total	0.00656		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Barium (Ba)-Total	0.0571		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	13-NOV-20	16-NOV-20	R5285205
Boron (B)-Total	<0.010		0.010	mg/L	13-NOV-20	16-NOV-20	R5285205
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	13-NOV-20	16-NOV-20	R5285205
Calcium (Ca)-Total	73.0		0.050	mg/L	13-NOV-20	16-NOV-20	R5285205
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	13-NOV-20	16-NOV-20	R5285205
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	13-NOV-20	16-NOV-20	R5285205
Cobalt (Co)-Total	0.00011		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Copper (Cu)-Total	<0.00050		0.00050	mg/L	13-NOV-20	16-NOV-20	R5285205
Iron (Fe)-Total	0.620		0.010	mg/L	13-NOV-20	16-NOV-20	R5285205
Lead (Pb)-Total	0.000103		0.000050	mg/L	13-NOV-20	16-NOV-20	R5285205
Lithium (Li)-Total	0.0033		0.0010	mg/L	13-NOV-20	16-NOV-20	R5285205
Magnesium (Mg)-Total	34.0		0.0050	mg/L	13-NOV-20	16-NOV-20	R5285205
Manganese (Mn)-Total	0.0114		0.00050	mg/L	13-NOV-20	16-NOV-20	R5285205
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-NOV-20	R5285133
Molybdenum (Mo)-Total	0.000599		0.000050	mg/L	13-NOV-20	16-NOV-20	R5285205
Nickel (Ni)-Total	0.00089		0.00050	mg/L	13-NOV-20	16-NOV-20	R5285205
Phosphorus (P)-Total	<0.050		0.050	mg/L	13-NOV-20	16-NOV-20	R5285205
Potassium (K)-Total	1.04		0.050	mg/L	13-NOV-20	16-NOV-20	R5285205
Rubidium (Rb)-Total	0.00023		0.00020	mg/L	13-NOV-20	16-NOV-20	R5285205
Selenium (Se)-Total	<0.000050		0.000050	mg/L	13-NOV-20	16-NOV-20	R5285205
Silicon (Si)-Total	9.29		0.10	mg/L	13-NOV-20	16-NOV-20	R5285205
Silver (Ag)-Total	<0.000050		0.000050	mg/L	13-NOV-20	16-NOV-20	R5285205
Sodium (Na)-Total	8.03		0.050	mg/L	13-NOV-20	16-NOV-20	R5285205
Strontium (Sr)-Total	0.160		0.0010	mg/L	13-NOV-20	16-NOV-20	R5285205
Sulfur (S)-Total	19.9		0.50	mg/L	13-NOV-20	16-NOV-20	R5285205
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	13-NOV-20	16-NOV-20	R5285205
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	13-NOV-20	16-NOV-20	R5285205
Thorium (Th)-Total	<0.00010		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Tin (Sn)-Total	<0.00010		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	13-NOV-20	16-NOV-20	R5285205
Tungsten (W)-Total	<0.00010		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Uranium (U)-Total	0.000264		0.000010	mg/L	13-NOV-20	16-NOV-20	R5285205
Vanadium (V)-Total	<0.00050		0.00050	mg/L	13-NOV-20	16-NOV-20	R5285205
Zinc (Zn)-Total	0.0393		0.0030	mg/L	13-NOV-20	16-NOV-20	R5285205

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2528910-1 W-11210029-20201112-50 Sampled By: ERIC on 12-NOV-20 @ 11:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	13-NOV-20	16-NOV-20	R5285205
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		13-NOV-20	R5286043
Volatile Organic Compounds							
Acetone	<30		30	ug/L		18-NOV-20	R5287809
Benzene	<0.50		0.50	ug/L		18-NOV-20	R5287809
Bromodichloromethane	<2.0		2.0	ug/L		18-NOV-20	R5287809
Bromoform	<5.0		5.0	ug/L		18-NOV-20	R5287809
Bromomethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
Carbon tetrachloride	<0.20		0.20	ug/L		18-NOV-20	R5287809
Chlorobenzene	<0.50		0.50	ug/L		18-NOV-20	R5287809
Dibromochloromethane	<2.0		2.0	ug/L		18-NOV-20	R5287809
Chloroform	<1.0		1.0	ug/L		18-NOV-20	R5287809
1,2-Dibromoethane	<0.20		0.20	ug/L		18-NOV-20	R5287809
1,2-Dichlorobenzene	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,3-Dichlorobenzene	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,4-Dichlorobenzene	<0.50		0.50	ug/L		18-NOV-20	R5287809
Dichlorodifluoromethane	<2.0		2.0	ug/L		18-NOV-20	R5287809
1,1-Dichloroethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,2-Dichloroethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,1-Dichloroethylene	<0.50		0.50	ug/L		18-NOV-20	R5287809
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		18-NOV-20	R5287809
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		18-NOV-20	R5287809
Methylene Chloride	<5.0		5.0	ug/L		18-NOV-20	R5287809
1,2-Dichloropropane	<0.50		0.50	ug/L		18-NOV-20	R5287809
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		18-NOV-20	R5287809
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		18-NOV-20	R5287809
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		18-NOV-20	R5287809
Ethylbenzene	<0.50		0.50	ug/L		18-NOV-20	R5287809
n-Hexane	<0.50		0.50	ug/L		18-NOV-20	R5287809
Methyl Ethyl Ketone	<20		20	ug/L		18-NOV-20	R5287809
Methyl Isobutyl Ketone	<20		20	ug/L		18-NOV-20	R5287809
MTBE	<2.0		2.0	ug/L		18-NOV-20	R5287809
Styrene	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
Tetrachloroethylene	<0.50		0.50	ug/L		18-NOV-20	R5287809
Toluene	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,1,1-Trichloroethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,1,2-Trichloroethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
Trichloroethylene	<0.50		0.50	ug/L		18-NOV-20	R5287809

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2528910-1 W-11210029-20201112-50							
Sampled By: ERIC on 12-NOV-20 @ 11:00							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		18-NOV-20	R5287809
Vinyl chloride	<0.50		0.50	ug/L		18-NOV-20	R5287809
o-Xylene	<0.30		0.30	ug/L		18-NOV-20	R5287809
m+p-Xylenes	<0.40		0.40	ug/L		18-NOV-20	R5287809
Xylenes (Total)	<0.50		0.50	ug/L		18-NOV-20	
Surrogate: 4-Bromofluorobenzene	85.5		70-130	%		18-NOV-20	R5287809
Surrogate: 1,4-Difluorobenzene	100.4		70-130	%		18-NOV-20	R5287809
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		18-NOV-20	R5287809
F1-BTEX	<25		25	ug/L		18-NOV-20	
F2 (C10-C16)	<100		100	ug/L	13-NOV-20	16-NOV-20	R5286366
F2-Naphth	<100		100	ug/L		18-NOV-20	
F3 (C16-C34)	<250		250	ug/L	13-NOV-20	16-NOV-20	R5286366
F3-PAH	<250		250	ug/L		18-NOV-20	
F4 (C34-C50)	<250		250	ug/L	13-NOV-20	16-NOV-20	R5286366
Total Hydrocarbons (C6-C50)	<370		370	ug/L		18-NOV-20	
Chrom. to baseline at nC50	YES				13-NOV-20	16-NOV-20	R5286366
Surrogate: 2-Bromobenzotrifluoride	85.1		60-140	%	13-NOV-20	16-NOV-20	R5286366
Surrogate: 3,4-Dichlorotoluene	103.4		60-140	%		18-NOV-20	R5287809
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Acenaphthylene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Anthracene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Benzo(a)anthracene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Benzo(a)pyrene	<0.010		0.010	ug/L	13-NOV-20	18-NOV-20	R5287457
Benzo(b)fluoranthene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Benzo(k)fluoranthene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Chrysene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Fluoranthene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Fluorene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		18-NOV-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
2-Methylnaphthalene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Naphthalene	<0.050		0.050	ug/L	13-NOV-20	18-NOV-20	R5287457
Phenanthrene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Pyrene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Surrogate: d10-Acenaphthene	90.0		60-140	%	13-NOV-20	18-NOV-20	R5287457
Surrogate: d12-Chrysene	110.6		60-140	%	13-NOV-20	18-NOV-20	R5287457

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2528910-1 W-11210029-20201112-50							
Sampled By: ERIC on 12-NOV-20 @ 11:00							
Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	95.7		60-140	%	13-NOV-20	18-NOV-20	R5287457
Surrogate: d10-Phenanthrene	92.8		60-140	%	13-NOV-20	18-NOV-20	R5287457
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
4-Chloroaniline	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
2-Chlorophenol	<0.30		0.30	ug/L	16-NOV-20	17-NOV-20	R5286558
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4-Dichlorophenol	<0.30		0.30	ug/L	16-NOV-20	17-NOV-20	R5286558
Diethylphthalate	<0.20		0.20	ug/L	16-NOV-20	17-NOV-20	R5286558
Dimethylphthalate	<0.20		0.20	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4-Dimethylphenol	<0.50		0.50	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4-Dinitrophenol	<1.0		1.0	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4-Dinitrotoluene	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
2,6-Dinitrotoluene	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	16-NOV-20	17-NOV-20	R5286558
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	16-NOV-20	17-NOV-20	R5286558
Pentachlorophenol	<0.50		0.50	ug/L	16-NOV-20	17-NOV-20	R5286558
Phenol	<0.50		0.50	ug/L	16-NOV-20	17-NOV-20	R5286558
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	16-NOV-20	17-NOV-20	R5286558
Surrogate: 2-Fluorobiphenyl	88.2		50-140	%	16-NOV-20	17-NOV-20	R5286558
Surrogate: Nitrobenzene d5	97.8		50-140	%	16-NOV-20	17-NOV-20	R5286558
Surrogate: p-Terphenyl d14	98.7		60-140	%	16-NOV-20	17-NOV-20	R5286558
Surrogate: 2,4,6-Tribromophenol	111.2		50-140	%	16-NOV-20	17-NOV-20	R5286558
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	17-NOV-20	17-NOV-20	R5287018
Aroclor 1248	<0.020		0.020	ug/L	17-NOV-20	17-NOV-20	R5287018
Aroclor 1254	<0.020		0.020	ug/L	17-NOV-20	17-NOV-20	R5287018
Aroclor 1260	<0.020		0.020	ug/L	17-NOV-20	17-NOV-20	R5287018
Surrogate: Decachlorobiphenyl	146.5		50-150	%	17-NOV-20	17-NOV-20	R5287018
Total PCBs	<0.040		0.040	ug/L	17-NOV-20	17-NOV-20	R5287018
Surrogate: Tetrachloro-m-xylene	85.7		50-150	%	17-NOV-20	17-NOV-20	R5287018

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Total	MS-B	L2528910-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2528910-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2528910-1
Matrix Spike	Potassium (K)-Total	MS-B	L2528910-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2528910-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2528910-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2528910-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2528910-1
Laboratory Control Sample	1,2,4-Trichlorobenzene	RRQC	L2528910-1

Comments: RRQC: Recoveries are outside ALS control limits. Detection limits in associated samples have been raised accordingly if affected by the low analyte recovery.

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRQC	Refer to report remarks for information regarding this QC result.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)

Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
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This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG

Reference Information

must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Reference Information

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2528910

Report Date: 19-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5286558							
WG3444233-2	LCS							
1,2,4-Trichlorobenzene			40.1	RRQC	%		50-140	17-NOV-20
2-Chlorophenol			65.9		%		50-140	17-NOV-20
2,4-Dichlorophenol			76.6		%		50-140	17-NOV-20
2,4-Dimethylphenol			71.4		%		30-130	17-NOV-20
2,4-Dinitrophenol			86.9		%		50-140	17-NOV-20
2,4-Dinitrotoluene			89.5		%		50-140	17-NOV-20
2,4,5-Trichlorophenol			81.2		%		50-140	17-NOV-20
2,4,6-Trichlorophenol			79.0		%		50-140	17-NOV-20
2,6-Dinitrotoluene			82.1		%		50-140	17-NOV-20
3,3'-Dichlorobenzidine			68.0		%		30-130	17-NOV-20
4-Chloroaniline			73.9		%		30-130	17-NOV-20
Biphenyl			62.7		%		50-140	17-NOV-20
Bis(2-chloroethyl)ether			72.5		%		50-140	17-NOV-20
Bis(2-chloroisopropyl)ether			66.3		%		50-140	17-NOV-20
Bis(2-ethylhexyl)phthalate			91.9		%		50-140	17-NOV-20
Diethylphthalate			76.0		%		50-140	17-NOV-20
Dimethylphthalate			74.9		%		50-140	17-NOV-20
Pentachlorophenol			104.7		%		50-140	17-NOV-20
Phenol			103.7		%		30-130	17-NOV-20

COMMENTS: RRQC: Recoveries are outside ALS control limits. Detection limits in associated samples have been raised accordingly if affected by the low analyte recovery.

WG3444233-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	17-NOV-20
2-Chlorophenol			<0.30		ug/L		0.3	17-NOV-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	17-NOV-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	17-NOV-20
2,4-Dinitrophenol			<1.0		ug/L		1	17-NOV-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	17-NOV-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	17-NOV-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	17-NOV-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	17-NOV-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	17-NOV-20
4-Chloroaniline			<0.40		ug/L		0.4	17-NOV-20
Biphenyl			<0.40		ug/L		0.4	17-NOV-20



Quality Control Report

Workorder: L2528910

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5286558								
WG3444233-1 MB								
			<0.40		ug/L		0.4	17-NOV-20
			<0.40		ug/L		0.4	17-NOV-20
			<2.0		ug/L		2	17-NOV-20
			<0.20		ug/L		0.2	17-NOV-20
			<0.20		ug/L		0.2	17-NOV-20
			<0.50		ug/L		0.5	17-NOV-20
			<0.50		ug/L		0.5	17-NOV-20
			82.8		%		50-140	17-NOV-20
			78.4		%		50-140	17-NOV-20
			89.5		%		50-140	17-NOV-20
			118.0		%		60-140	17-NOV-20
CR-CR6-IC-WT Water								
Batch R5286043								
WG3444647-4 DUP								
		WG3444647-3	<0.00050	RPD-NA	mg/L	N/A	20	13-NOV-20
WG3444647-2 LCS								
			99.9		%		80-120	13-NOV-20
WG3444647-1 MB								
			<0.00050		mg/L		0.0005	13-NOV-20
WG3444647-5 MS								
		WG3444647-3	97.2		%		70-130	13-NOV-20
F1-HS-511-WT Water								
Batch R5287809								
WG3447009-4 DUP								
		WG3447009-3	<25	RPD-NA	ug/L	N/A	30	18-NOV-20
WG3447009-1 LCS								
			103.5		%		80-120	18-NOV-20
WG3447009-2 MB								
			<25		ug/L		25	18-NOV-20
			126.9		%		60-140	18-NOV-20
WG3447009-5 MS								
		WG3447009-3	88.2		%		60-140	18-NOV-20
F2-F4-511-WT Water								



Quality Control Report

Workorder: L2528910

Report Date: 19-NOV-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT Water								
Batch R5286366								
WG3444222-2 LCS								
F2 (C10-C16)			105.5		%		70-130	16-NOV-20
F3 (C16-C34)			103.0		%		70-130	16-NOV-20
F4 (C34-C50)			110.5		%		70-130	16-NOV-20
WG3444222-1 MB								
F2 (C10-C16)			<100		ug/L		100	16-NOV-20
F3 (C16-C34)			<250		ug/L		250	16-NOV-20
F4 (C34-C50)			<250		ug/L		250	16-NOV-20
Surrogate: 2-Bromobenzotrifluoride			84.0		%		60-140	16-NOV-20
HG-T-CVAA-WT Water								
Batch R5285133								
WG3444277-3 DUP L2527922-5								
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	13-NOV-20
WG3444277-2 LCS								
Mercury (Hg)-Total			114.0		%		80-120	13-NOV-20
WG3444277-1 MB								
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	13-NOV-20
WG3444277-4 MS L2528322-1								
Mercury (Hg)-Total			119.1		%		70-130	13-NOV-20
MET-T-CCMS-WT Water								
Batch R5285205								
WG3444181-4 DUP WG3444181-3								
Aluminum (Al)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	13-NOV-20
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	13-NOV-20
Arsenic (As)-Total		<0.00010	0.00010	RPD-NA	mg/L	N/A	20	13-NOV-20
Barium (Ba)-Total		0.0138	0.0138		mg/L	0.0	20	13-NOV-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	13-NOV-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	13-NOV-20
Boron (B)-Total		0.033	0.033		mg/L	0.4	20	13-NOV-20
Cadmium (Cd)-Total		0.0000108	0.0000097		mg/L	11	20	13-NOV-20
Calcium (Ca)-Total		88.2	87.7		mg/L	0.6	20	13-NOV-20
Chromium (Cr)-Total		0.00070	0.00065		mg/L	7.5	20	13-NOV-20
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	13-NOV-20
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	13-NOV-20
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	13-NOV-20



Quality Control Report

Workorder: L2528910

Report Date: 19-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5285205							
WG3444181-4	DUP	WG3444181-3						
Iron (Fe)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	13-NOV-20
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	13-NOV-20
Lithium (Li)-Total		0.0011	0.0011		mg/L	4.2	20	13-NOV-20
Magnesium (Mg)-Total		16.9	16.7		mg/L	1.7	20	13-NOV-20
Manganese (Mn)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	13-NOV-20
Molybdenum (Mo)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	13-NOV-20
Nickel (Ni)-Total		0.00094	0.00088		mg/L	7.2	20	13-NOV-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	13-NOV-20
Potassium (K)-Total		2.72	2.69		mg/L	1.1	20	13-NOV-20
Rubidium (Rb)-Total		0.00079	0.00077		mg/L	3.0	20	13-NOV-20
Selenium (Se)-Total		0.000230	0.000249		mg/L	8.0	20	13-NOV-20
Silicon (Si)-Total		3.35	3.26		mg/L	2.5	20	13-NOV-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	13-NOV-20
Sodium (Na)-Total		83.8	83.6		mg/L	0.1	20	13-NOV-20
Strontium (Sr)-Total		0.150	0.155		mg/L	3.1	20	13-NOV-20
Sulfur (S)-Total		8.17	7.87		mg/L	3.7	25	13-NOV-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	13-NOV-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	13-NOV-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	13-NOV-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	13-NOV-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	13-NOV-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	13-NOV-20
Uranium (U)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	13-NOV-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	13-NOV-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	13-NOV-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	13-NOV-20
WG3444181-2	LCS							
Aluminum (Al)-Total			100.6		%		80-120	13-NOV-20
Antimony (Sb)-Total			97.8		%		80-120	13-NOV-20
Arsenic (As)-Total			105.5		%		80-120	13-NOV-20
Barium (Ba)-Total			108.9		%		80-120	13-NOV-20
Beryllium (Be)-Total			90.2		%		80-120	13-NOV-20
Bismuth (Bi)-Total			98.4		%		80-120	13-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5285205							
WG3444181-2	LCS							
Boron (B)-Total			85.0		%		80-120	13-NOV-20
Cadmium (Cd)-Total			104.0		%		80-120	13-NOV-20
Calcium (Ca)-Total			95.0		%		80-120	13-NOV-20
Chromium (Cr)-Total			102.8		%		80-120	13-NOV-20
Cesium (Cs)-Total			101.3		%		80-120	13-NOV-20
Cobalt (Co)-Total			100.7		%		80-120	13-NOV-20
Copper (Cu)-Total			100.4		%		80-120	13-NOV-20
Iron (Fe)-Total			98.0		%		80-120	13-NOV-20
Lead (Pb)-Total			99.2		%		80-120	13-NOV-20
Lithium (Li)-Total			83.7		%		80-120	13-NOV-20
Magnesium (Mg)-Total			100.6		%		80-120	13-NOV-20
Manganese (Mn)-Total			104.3		%		80-120	13-NOV-20
Molybdenum (Mo)-Total			98.0		%		80-120	13-NOV-20
Nickel (Ni)-Total			98.9		%		80-120	13-NOV-20
Phosphorus (P)-Total			110.6		%		70-130	13-NOV-20
Potassium (K)-Total			101.0		%		80-120	13-NOV-20
Rubidium (Rb)-Total			111.0		%		80-120	13-NOV-20
Selenium (Se)-Total			97.6		%		80-120	13-NOV-20
Silicon (Si)-Total			97.6		%		60-140	13-NOV-20
Silver (Ag)-Total			97.9		%		80-120	13-NOV-20
Sodium (Na)-Total			103.6		%		80-120	13-NOV-20
Strontium (Sr)-Total			104.8		%		80-120	13-NOV-20
Sulfur (S)-Total			96.7		%		80-120	13-NOV-20
Thallium (Tl)-Total			101.3		%		80-120	13-NOV-20
Tellurium (Te)-Total			93.2		%		80-120	13-NOV-20
Thorium (Th)-Total			100.7		%		70-130	13-NOV-20
Tin (Sn)-Total			93.5		%		80-120	13-NOV-20
Titanium (Ti)-Total			96.5		%		80-120	13-NOV-20
Tungsten (W)-Total			96.3		%		80-120	13-NOV-20
Uranium (U)-Total			102.0		%		80-120	13-NOV-20
Vanadium (V)-Total			103.2		%		80-120	13-NOV-20
Zinc (Zn)-Total			98.2		%		80-120	13-NOV-20
Zirconium (Zr)-Total			96.3		%		80-120	13-NOV-20
WG3444181-1	MB							



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5285205							
WG3444181-1 MB								
Aluminum (Al)-Total			<0.0050		mg/L		0.005	13-NOV-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	13-NOV-20
Boron (B)-Total			<0.010		mg/L		0.01	13-NOV-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	13-NOV-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	13-NOV-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	13-NOV-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	13-NOV-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	13-NOV-20
Iron (Fe)-Total			<0.010		mg/L		0.01	13-NOV-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	13-NOV-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	13-NOV-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	13-NOV-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	13-NOV-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	13-NOV-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	13-NOV-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	13-NOV-20
Potassium (K)-Total			<0.050		mg/L		0.05	13-NOV-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	13-NOV-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	13-NOV-20
Silicon (Si)-Total			<0.10		mg/L		0.1	13-NOV-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	13-NOV-20
Sodium (Na)-Total			<0.050		mg/L		0.05	13-NOV-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	13-NOV-20
Sulfur (S)-Total			<0.50		mg/L		0.5	13-NOV-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	13-NOV-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	13-NOV-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	13-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5285205							
WG3444181-1 MB								
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	13-NOV-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	13-NOV-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	13-NOV-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	13-NOV-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	13-NOV-20
WG3444181-5 MS		WG3444181-3						
Aluminum (Al)-Total			106.1		%		70-130	13-NOV-20
Antimony (Sb)-Total			104.1		%		70-130	13-NOV-20
Arsenic (As)-Total			105.4		%		70-130	13-NOV-20
Barium (Ba)-Total			N/A	MS-B	%		-	13-NOV-20
Beryllium (Be)-Total			102.2		%		70-130	13-NOV-20
Bismuth (Bi)-Total			96.3		%		70-130	13-NOV-20
Boron (B)-Total			94.2		%		70-130	13-NOV-20
Cadmium (Cd)-Total			101.5		%		70-130	13-NOV-20
Calcium (Ca)-Total			N/A	MS-B	%		-	13-NOV-20
Chromium (Cr)-Total			102.7		%		70-130	13-NOV-20
Cesium (Cs)-Total			106.5		%		70-130	13-NOV-20
Cobalt (Co)-Total			99.1		%		70-130	13-NOV-20
Copper (Cu)-Total			94.6		%		70-130	13-NOV-20
Iron (Fe)-Total			100.6		%		70-130	13-NOV-20
Lead (Pb)-Total			98.5		%		70-130	13-NOV-20
Lithium (Li)-Total			100.0		%		70-130	13-NOV-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	13-NOV-20
Manganese (Mn)-Total			105.4		%		70-130	13-NOV-20
Molybdenum (Mo)-Total			108.5		%		70-130	13-NOV-20
Nickel (Ni)-Total			96.1		%		70-130	13-NOV-20
Phosphorus (P)-Total			113.7		%		70-130	13-NOV-20
Potassium (K)-Total			N/A	MS-B	%		-	13-NOV-20
Rubidium (Rb)-Total			106.3		%		70-130	13-NOV-20
Selenium (Se)-Total			97.8		%		70-130	13-NOV-20
Silicon (Si)-Total			N/A	MS-B	%		-	13-NOV-20
Silver (Ag)-Total			96.4		%		70-130	13-NOV-20
Sodium (Na)-Total			N/A	MS-B	%		-	13-NOV-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5285205							
WG3444181-5 MS		WG3444181-3						
Strontium (Sr)-Total			N/A	MS-B	%		-	13-NOV-20
Sulfur (S)-Total			N/A	MS-B	%		-	13-NOV-20
Thallium (Tl)-Total			99.99		%		70-130	13-NOV-20
Tellurium (Te)-Total			89.0		%		70-130	13-NOV-20
Thorium (Th)-Total			106.2		%		70-130	13-NOV-20
Tin (Sn)-Total			99.7		%		70-130	13-NOV-20
Titanium (Ti)-Total			105.8		%		70-130	13-NOV-20
Tungsten (W)-Total			100.9		%		70-130	13-NOV-20
Uranium (U)-Total			107.5		%		70-130	13-NOV-20
Vanadium (V)-Total			107.3		%		70-130	13-NOV-20
Zinc (Zn)-Total			91.9		%		70-130	13-NOV-20
Zirconium (Zr)-Total			105.9		%		70-130	13-NOV-20
P-T-COL-WT								
	Water							
Batch	R5285998							
WG3444246-3 DUP		L2528880-2						
Phosphorus, Total		0.0337	0.0340		mg/L	0.9	20	16-NOV-20
WG3444246-2 LCS								
Phosphorus, Total			93.9		%		80-120	16-NOV-20
WG3444246-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	16-NOV-20
WG3444246-4 MS		L2528880-2						
Phosphorus, Total			105.5		%		70-130	16-NOV-20
PAH-511-WT								
	Water							
Batch	R5287457							
WG3444222-2 LCS								
1-Methylnaphthalene			88.6		%		50-140	18-NOV-20
2-Methylnaphthalene			85.9		%		50-140	18-NOV-20
Acenaphthene			102.0		%		50-140	18-NOV-20
Acenaphthylene			93.2		%		50-140	18-NOV-20
Anthracene			81.5		%		50-140	18-NOV-20
Benzo(a)anthracene			89.1		%		50-140	18-NOV-20
Benzo(a)pyrene			85.1		%		50-140	18-NOV-20
Benzo(b)fluoranthene			78.6		%		50-140	18-NOV-20
Benzo(g,h,i)perylene			90.8		%		50-140	18-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5287457							
WG3444222-2 LCS								
Benzo(k)fluoranthene			88.9		%		50-140	18-NOV-20
Chrysene			101.9		%		50-140	18-NOV-20
Dibenzo(ah)anthracene			93.9		%		50-140	18-NOV-20
Fluoranthene			94.3		%		50-140	18-NOV-20
Fluorene			87.7		%		50-140	18-NOV-20
Indeno(1,2,3-cd)pyrene			98.7		%		50-140	18-NOV-20
Naphthalene			88.3		%		50-140	18-NOV-20
Phenanthrene			91.0		%		50-140	18-NOV-20
Pyrene			92.6		%		50-140	18-NOV-20
WG3444222-1 MB								
1-Methylnaphthalene			<0.020		ug/L		0.02	18-NOV-20
2-Methylnaphthalene			<0.020		ug/L		0.02	18-NOV-20
Acenaphthene			<0.020		ug/L		0.02	18-NOV-20
Acenaphthylene			<0.020		ug/L		0.02	18-NOV-20
Anthracene			<0.020		ug/L		0.02	18-NOV-20
Benzo(a)anthracene			<0.020		ug/L		0.02	18-NOV-20
Benzo(a)pyrene			<0.010		ug/L		0.01	18-NOV-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	18-NOV-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	18-NOV-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	18-NOV-20
Chrysene			<0.020		ug/L		0.02	18-NOV-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	18-NOV-20
Fluoranthene			<0.020		ug/L		0.02	18-NOV-20
Fluorene			<0.020		ug/L		0.02	18-NOV-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	18-NOV-20
Naphthalene			<0.050		ug/L		0.05	18-NOV-20
Phenanthrene			<0.020		ug/L		0.02	18-NOV-20
Pyrene			<0.020		ug/L		0.02	18-NOV-20
Surrogate: d8-Naphthalene			106.5		%		60-140	18-NOV-20
Surrogate: d10-Phenanthrene			100.5		%		60-140	18-NOV-20
Surrogate: d12-Chrysene			121.3		%		60-140	18-NOV-20
Surrogate: d10-Acenaphthene			100.5		%		60-140	18-NOV-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5287018							
WG3444212-2	LCS							
Aroclor 1242			95.3		%		60-140	17-NOV-20
Aroclor 1248			86.9		%		60-140	17-NOV-20
Aroclor 1254			81.9		%		60-140	17-NOV-20
Aroclor 1260			70.4		%		60-140	17-NOV-20
WG3444212-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	17-NOV-20
Aroclor 1248			<0.020		ug/L		0.02	17-NOV-20
Aroclor 1254			<0.020		ug/L		0.02	17-NOV-20
Aroclor 1260			<0.020		ug/L		0.02	17-NOV-20
Surrogate: Decachlorobiphenyl			115.5		%		50-150	17-NOV-20
Surrogate: Tetrachloro-m-xylene			82.1		%		50-150	17-NOV-20
VOC-511-HS-WT		Water						
Batch	R5287809							
WG3447009-4	DUP	WG3447009-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	18-NOV-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	18-NOV-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	18-NOV-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	18-NOV-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	18-NOV-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5287809							
WG3447009-4	DUP	WG3447009-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	18-NOV-20
cis-1,2-Dichloroethylene		1.48	1.40		ug/L	5.6	30	18-NOV-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	18-NOV-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	18-NOV-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	18-NOV-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	18-NOV-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	18-NOV-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	18-NOV-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	18-NOV-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	18-NOV-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	18-NOV-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	18-NOV-20
Trichloroethylene		2.66	2.50		ug/L	6.2	30	18-NOV-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	18-NOV-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
WG3447009-1	LCS							
1,1,1,2-Tetrachloroethane			100.6		%		70-130	18-NOV-20
1,1,2,2-Tetrachloroethane			94.7		%		70-130	18-NOV-20
1,1,1-Trichloroethane			100.2		%		70-130	18-NOV-20
1,1,2-Trichloroethane			94.1		%		70-130	18-NOV-20
1,1-Dichloroethane			93.6		%		70-130	18-NOV-20
1,1-Dichloroethylene			101.2		%		70-130	18-NOV-20
1,2-Dibromoethane			93.4		%		70-130	18-NOV-20
1,2-Dichlorobenzene			100.4		%		70-130	18-NOV-20
1,2-Dichloroethane			93.5		%		70-130	18-NOV-20
1,2-Dichloropropane			92.4		%		70-130	18-NOV-20
1,3-Dichlorobenzene			100.4		%		70-130	18-NOV-20



Quality Control Report

Workorder: L2528910

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5287809							
WG3447009-1	LCS							
1,4-Dichlorobenzene			99.98		%		70-130	18-NOV-20
Acetone			97.5		%		60-140	18-NOV-20
Benzene			96.2		%		70-130	18-NOV-20
Bromodichloromethane			102.7		%		70-130	18-NOV-20
Bromoform			104.0		%		70-130	18-NOV-20
Bromomethane			95.9		%		60-140	18-NOV-20
Carbon tetrachloride			105.4		%		70-130	18-NOV-20
Chlorobenzene			91.0		%		70-130	18-NOV-20
Chloroform			101.6		%		70-130	18-NOV-20
cis-1,2-Dichloroethylene			102.0		%		70-130	18-NOV-20
cis-1,3-Dichloropropene			95.4		%		70-130	18-NOV-20
Dibromochloromethane			95.6		%		70-130	18-NOV-20
Dichlorodifluoromethane			99.6		%		50-140	18-NOV-20
Ethylbenzene			94.8		%		70-130	18-NOV-20
n-Hexane			92.4		%		70-130	18-NOV-20
m+p-Xylenes			91.5		%		70-130	18-NOV-20
Methyl Ethyl Ketone			99.2		%		60-140	18-NOV-20
Methyl Isobutyl Ketone			87.2		%		60-140	18-NOV-20
Methylene Chloride			100.2		%		70-130	18-NOV-20
MTBE			99.97		%		70-130	18-NOV-20
o-Xylene			96.4		%		70-130	18-NOV-20
Styrene			95.8		%		70-130	18-NOV-20
Tetrachloroethylene			99.4		%		70-130	18-NOV-20
Toluene			90.9		%		70-130	18-NOV-20
trans-1,2-Dichloroethylene			100.1		%		70-130	18-NOV-20
trans-1,3-Dichloropropene			97.1		%		70-130	18-NOV-20
Trichloroethylene			95.3		%		70-130	18-NOV-20
Trichlorofluoromethane			98.7		%		60-140	18-NOV-20
Vinyl chloride			99.8		%		60-140	18-NOV-20
WG3447009-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	18-NOV-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	18-NOV-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	18-NOV-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	18-NOV-20



Quality Control Report

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5287809							
WG3447009-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	18-NOV-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	18-NOV-20
1,2-Dibromoethane			<0.20		ug/L		0.2	18-NOV-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	18-NOV-20
1,2-Dichloroethane			<0.50		ug/L		0.5	18-NOV-20
1,2-Dichloropropane			<0.50		ug/L		0.5	18-NOV-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	18-NOV-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	18-NOV-20
Acetone			<30		ug/L		30	18-NOV-20
Benzene			<0.50		ug/L		0.5	18-NOV-20
Bromodichloromethane			<2.0		ug/L		2	18-NOV-20
Bromoform			<5.0		ug/L		5	18-NOV-20
Bromomethane			<0.50		ug/L		0.5	18-NOV-20
Carbon tetrachloride			<0.20		ug/L		0.2	18-NOV-20
Chlorobenzene			<0.50		ug/L		0.5	18-NOV-20
Chloroform			<1.0		ug/L		1	18-NOV-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	18-NOV-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	18-NOV-20
Dibromochloromethane			<2.0		ug/L		2	18-NOV-20
Dichlorodifluoromethane			<2.0		ug/L		2	18-NOV-20
Ethylbenzene			<0.50		ug/L		0.5	18-NOV-20
n-Hexane			<0.50		ug/L		0.5	18-NOV-20
m+p-Xylenes			<0.40		ug/L		0.4	18-NOV-20
Methyl Ethyl Ketone			<20		ug/L		20	18-NOV-20
Methyl Isobutyl Ketone			<20		ug/L		20	18-NOV-20
Methylene Chloride			<5.0		ug/L		5	18-NOV-20
MTBE			<2.0		ug/L		2	18-NOV-20
o-Xylene			<0.30		ug/L		0.3	18-NOV-20
Styrene			<0.50		ug/L		0.5	18-NOV-20
Tetrachloroethylene			<0.50		ug/L		0.5	18-NOV-20
Toluene			<0.50		ug/L		0.5	18-NOV-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	18-NOV-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	18-NOV-20



Quality Control Report

Workorder: L2528910

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5287809							
WG3447009-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	18-NOV-20
Trichlorofluoromethane			<5.0		ug/L		5	18-NOV-20
Vinyl chloride			<0.50		ug/L		0.5	18-NOV-20
Surrogate: 1,4-Difluorobenzene			101.0		%		70-130	18-NOV-20
Surrogate: 4-Bromofluorobenzene			86.4		%		70-130	18-NOV-20
WG3447009-5 MS		WG3447009-3						
1,1,1,2-Tetrachloroethane			98.6		%		50-140	18-NOV-20
1,1,2,2-Tetrachloroethane			99.2		%		50-140	18-NOV-20
1,1,1-Trichloroethane			98.3		%		50-140	18-NOV-20
1,1,2-Trichloroethane			92.9		%		50-140	18-NOV-20
1,1-Dichloroethane			92.4		%		50-140	18-NOV-20
1,1-Dichloroethylene			98.4		%		50-140	18-NOV-20
1,2-Dibromoethane			92.5		%		50-140	18-NOV-20
1,2-Dichlorobenzene			98.3		%		50-140	18-NOV-20
1,2-Dichloroethane			93.1		%		50-140	18-NOV-20
1,2-Dichloropropane			91.1		%		50-140	18-NOV-20
1,3-Dichlorobenzene			97.7		%		50-140	18-NOV-20
1,4-Dichlorobenzene			97.7		%		50-140	18-NOV-20
Acetone			92.9		%		50-140	18-NOV-20
Benzene			94.8		%		50-140	18-NOV-20
Bromodichloromethane			101.6		%		50-140	18-NOV-20
Bromoform			104.0		%		50-140	18-NOV-20
Bromomethane			92.2		%		50-140	18-NOV-20
Carbon tetrachloride			103.0		%		50-140	18-NOV-20
Chlorobenzene			89.0		%		50-140	18-NOV-20
Chloroform			100.6		%		50-140	18-NOV-20
cis-1,2-Dichloroethylene			100.6		%		50-140	18-NOV-20
cis-1,3-Dichloropropene			93.5		%		50-140	18-NOV-20
Dibromochloromethane			93.6		%		50-140	18-NOV-20
Dichlorodifluoromethane			88.5		%		50-140	18-NOV-20
Ethylbenzene			92.3		%		50-140	18-NOV-20
n-Hexane			89.2		%		50-140	18-NOV-20
m+p-Xylenes			89.2		%		50-140	18-NOV-20
Methyl Ethyl Ketone			87.9		%		50-140	18-NOV-20



Quality Control Report

Workorder: L2528910

Report Date: 19-NOV-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5287809							
WG3447009-5 MS		WG3447009-3						
Methyl Isobutyl Ketone			85.4		%		50-140	18-NOV-20
Methylene Chloride			99.2		%		50-140	18-NOV-20
MTBE			98.0		%		50-140	18-NOV-20
o-Xylene			93.8		%		50-140	18-NOV-20
Styrene			92.9		%		50-140	18-NOV-20
Tetrachloroethylene			97.0		%		50-140	18-NOV-20
Toluene			88.9		%		50-140	18-NOV-20
trans-1,2-Dichloroethylene			98.1		%		50-140	18-NOV-20
trans-1,3-Dichloropropene			94.8		%		50-140	18-NOV-20
Trichloroethylene			92.7		%		50-140	18-NOV-20
Trichlorofluoromethane			95.4		%		50-140	18-NOV-20
Vinyl chloride			95.0		%		50-140	18-NOV-20

Quality Control Report

Workorder: L2528910

Report Date: 19-NOV-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
RRQC	Refer to report remarks for information regarding this QC result.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

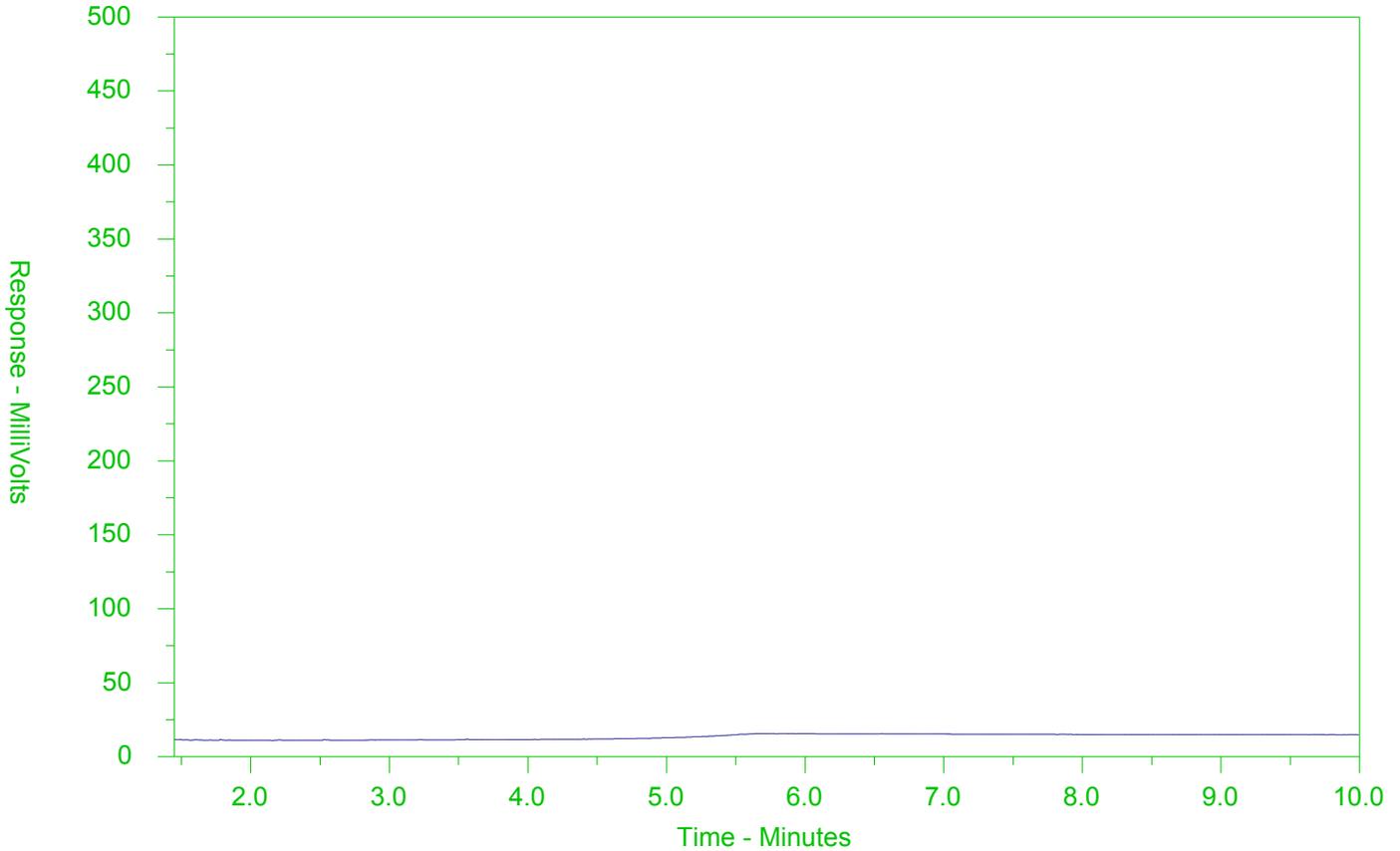
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2528910-1
 Client Sample ID: W-11210029-20201112-50



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 19-NOV-20
Report Date: 25-NOV-20 12:43 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2531509

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2531509-1 W-11210029-20201119-52 Sampled By: ERIC on 19-NOV-20 @ 09:30 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0294		0.0030	mg/L	20-NOV-20	23-NOV-20	R5294456
Total Metals							
Aluminum (Al)-Total	0.576		0.0050	mg/L	20-NOV-20	20-NOV-20	R5291178
Antimony (Sb)-Total	0.00023		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Arsenic (As)-Total	0.00108		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Barium (Ba)-Total	0.0253		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	20-NOV-20	20-NOV-20	R5291178
Boron (B)-Total	0.019		0.010	mg/L	20-NOV-20	20-NOV-20	R5291178
Cadmium (Cd)-Total	0.0000226		0.0000050	mg/L	20-NOV-20	20-NOV-20	R5291178
Calcium (Ca)-Total	38.6		0.050	mg/L	20-NOV-20	20-NOV-20	R5291178
Cesium (Cs)-Total	0.000060		0.000010	mg/L	20-NOV-20	20-NOV-20	R5291178
Chromium (Cr)-Total	0.00115		0.00050	mg/L	20-NOV-20	20-NOV-20	R5291178
Cobalt (Co)-Total	0.00035		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Copper (Cu)-Total	0.00217		0.00050	mg/L	20-NOV-20	20-NOV-20	R5291178
Iron (Fe)-Total	0.690		0.010	mg/L	20-NOV-20	20-NOV-20	R5291178
Lead (Pb)-Total	0.00182		0.000050	mg/L	20-NOV-20	20-NOV-20	R5291178
Lithium (Li)-Total	<0.0010		0.0010	mg/L	20-NOV-20	20-NOV-20	R5291178
Magnesium (Mg)-Total	8.28		0.0050	mg/L	20-NOV-20	20-NOV-20	R5291178
Manganese (Mn)-Total	0.0324		0.00050	mg/L	20-NOV-20	20-NOV-20	R5291178
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		20-NOV-20	R5291523
Molybdenum (Mo)-Total	0.00298		0.000050	mg/L	20-NOV-20	20-NOV-20	R5291178
Nickel (Ni)-Total	0.00132		0.00050	mg/L	20-NOV-20	20-NOV-20	R5291178
Phosphorus (P)-Total	<0.050		0.050	mg/L	20-NOV-20	20-NOV-20	R5291178
Potassium (K)-Total	2.96		0.050	mg/L	20-NOV-20	20-NOV-20	R5291178
Rubidium (Rb)-Total	0.00118		0.00020	mg/L	20-NOV-20	20-NOV-20	R5291178
Selenium (Se)-Total	0.000121		0.000050	mg/L	20-NOV-20	20-NOV-20	R5291178
Silicon (Si)-Total	1.26		0.10	mg/L	20-NOV-20	20-NOV-20	R5291178
Silver (Ag)-Total	<0.000050		0.000050	mg/L	20-NOV-20	20-NOV-20	R5291178
Sodium (Na)-Total	34.8		0.050	mg/L	20-NOV-20	20-NOV-20	R5291178
Strontium (Sr)-Total	0.111		0.0010	mg/L	20-NOV-20	20-NOV-20	R5291178
Sulfur (S)-Total	7.87		0.50	mg/L	20-NOV-20	20-NOV-20	R5291178
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	20-NOV-20	20-NOV-20	R5291178
Thallium (Tl)-Total	0.000010		0.000010	mg/L	20-NOV-20	20-NOV-20	R5291178
Thorium (Th)-Total	<0.00010		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Tin (Sn)-Total	0.00011		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Titanium (Ti)-Total	0.0175		0.00030	mg/L	20-NOV-20	20-NOV-20	R5291178
Tungsten (W)-Total	<0.00010		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Uranium (U)-Total	0.000653		0.000010	mg/L	20-NOV-20	20-NOV-20	R5291178
Vanadium (V)-Total	0.00156		0.00050	mg/L	20-NOV-20	20-NOV-20	R5291178
Zinc (Zn)-Total	0.0084		0.0030	mg/L	20-NOV-20	20-NOV-20	R5291178

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2531509-1 W-11210029-20201119-52 Sampled By: ERIC on 19-NOV-20 @ 09:30 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	0.00029		0.00020	mg/L	20-NOV-20	20-NOV-20	R5291178
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		20-NOV-20	R5294067
Volatile Organic Compounds							
Acetone	<30		30	ug/L		25-NOV-20	R5297311
Benzene	<0.50		0.50	ug/L		25-NOV-20	R5297311
Bromodichloromethane	<2.0		2.0	ug/L		25-NOV-20	R5297311
Bromoform	<5.0		5.0	ug/L		25-NOV-20	R5297311
Bromomethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
Carbon tetrachloride	<0.20		0.20	ug/L		25-NOV-20	R5297311
Chlorobenzene	<0.50		0.50	ug/L		25-NOV-20	R5297311
Dibromochloromethane	<2.0		2.0	ug/L		25-NOV-20	R5297311
Chloroform	<1.0		1.0	ug/L		25-NOV-20	R5297311
1,2-Dibromoethane	<0.20		0.20	ug/L		25-NOV-20	R5297311
1,2-Dichlorobenzene	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,3-Dichlorobenzene	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,4-Dichlorobenzene	<0.50		0.50	ug/L		25-NOV-20	R5297311
Dichlorodifluoromethane	<2.0		2.0	ug/L		25-NOV-20	R5297311
1,1-Dichloroethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,2-Dichloroethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,1-Dichloroethylene	<0.50		0.50	ug/L		25-NOV-20	R5297311
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		25-NOV-20	R5297311
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		25-NOV-20	R5297311
Methylene Chloride	<5.0		5.0	ug/L		25-NOV-20	R5297311
1,2-Dichloropropane	<0.50		0.50	ug/L		25-NOV-20	R5297311
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		25-NOV-20	R5297311
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		25-NOV-20	R5297311
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		25-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		25-NOV-20	R5297311
n-Hexane	<0.50		0.50	ug/L		25-NOV-20	R5297311
Methyl Ethyl Ketone	<20		20	ug/L		25-NOV-20	R5297311
Methyl Isobutyl Ketone	<20		20	ug/L		25-NOV-20	R5297311
MTBE	<2.0		2.0	ug/L		25-NOV-20	R5297311
Styrene	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
Tetrachloroethylene	<0.50		0.50	ug/L		25-NOV-20	R5297311
Toluene	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,1,1-Trichloroethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,1,2-Trichloroethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
Trichloroethylene	<0.50		0.50	ug/L		25-NOV-20	R5297311

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2531509-1 W-11210029-20201119-52 Sampled By: ERIC on 19-NOV-20 @ 09:30 Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		25-NOV-20	R5297311
Vinyl chloride	<0.50		0.50	ug/L		25-NOV-20	R5297311
o-Xylene	<0.30		0.30	ug/L		25-NOV-20	R5297311
m+p-Xylenes	<0.40		0.40	ug/L		25-NOV-20	R5297311
Xylenes (Total)	<0.50		0.50	ug/L		25-NOV-20	
Surrogate: 4-Bromofluorobenzene	99.0		70-130	%		25-NOV-20	R5297311
Surrogate: 1,4-Difluorobenzene	102.7		70-130	%		25-NOV-20	R5297311
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		25-NOV-20	R5297311
F1-BTEX	<25		25	ug/L		25-NOV-20	
F2 (C10-C16)	<100		100	ug/L	20-NOV-20	23-NOV-20	R5292320
F2-Naphth	<100		100	ug/L		25-NOV-20	
F3 (C16-C34)	<250		250	ug/L	20-NOV-20	23-NOV-20	R5292320
F3-PAH	<250		250	ug/L		25-NOV-20	
F4 (C34-C50)	<250		250	ug/L	20-NOV-20	23-NOV-20	R5292320
Total Hydrocarbons (C6-C50)	<370		370	ug/L		25-NOV-20	
Chrom. to baseline at nC50	YES				20-NOV-20	23-NOV-20	R5292320
Surrogate: 2-Bromobenzotrifluoride	90.2		60-140	%	20-NOV-20	23-NOV-20	R5292320
Surrogate: 3,4-Dichlorotoluene	100.4		60-140	%		25-NOV-20	R5297311
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Acenaphthylene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Anthracene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Benzo(a)anthracene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Benzo(a)pyrene	<0.010		0.010	ug/L	20-NOV-20	24-NOV-20	R5296896
Benzo(b)fluoranthene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Benzo(k)fluoranthene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Chrysene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Fluoranthene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Fluorene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		24-NOV-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
2-Methylnaphthalene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Naphthalene	<0.050		0.050	ug/L	20-NOV-20	24-NOV-20	R5296896
Phenanthrene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Pyrene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Surrogate: d10-Acenaphthene	95.4		60-140	%	20-NOV-20	24-NOV-20	R5296896
Surrogate: d12-Chrysene	89.7		60-140	%	20-NOV-20	24-NOV-20	R5296896

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2531509-1 W-11210029-20201119-52 Sampled By: ERIC on 19-NOV-20 @ 09:30 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	101.2		60-140	%	20-NOV-20	24-NOV-20	R5296896
Surrogate: d10-Phenanthrene	98.8		60-140	%	20-NOV-20	24-NOV-20	R5296896
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
4-Chloroaniline	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
2-Chlorophenol	<0.30		0.30	ug/L	20-NOV-20	23-NOV-20	R5295017
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4-Dichlorophenol	<0.30		0.30	ug/L	20-NOV-20	23-NOV-20	R5295017
Diethylphthalate	<0.20		0.20	ug/L	20-NOV-20	23-NOV-20	R5295017
Dimethylphthalate	<0.20		0.20	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4-Dimethylphenol	<0.50		0.50	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4-Dinitrophenol	<1.0		1.0	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4-Dinitrotoluene	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
2,6-Dinitrotoluene	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		23-NOV-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	20-NOV-20	23-NOV-20	R5295017
Pentachlorophenol	<0.50		0.50	ug/L	20-NOV-20	23-NOV-20	R5295017
Phenol	<0.50		0.50	ug/L	20-NOV-20	23-NOV-20	R5295017
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	20-NOV-20	23-NOV-20	R5295017
Surrogate: 2-Fluorobiphenyl	86.0		50-140	%	20-NOV-20	23-NOV-20	R5295017
Surrogate: Nitrobenzene d5	88.0		50-140	%	20-NOV-20	23-NOV-20	R5295017
Surrogate: p-Terphenyl d14	87.3		60-140	%	20-NOV-20	23-NOV-20	R5295017
Surrogate: 2,4,6-Tribromophenol	65.0		50-140	%	20-NOV-20	23-NOV-20	R5295017
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	20-NOV-20	20-NOV-20	R5292639
Aroclor 1248	<0.020		0.020	ug/L	20-NOV-20	20-NOV-20	R5292639
Aroclor 1254	<0.020		0.020	ug/L	20-NOV-20	20-NOV-20	R5292639
Aroclor 1260	<0.020		0.020	ug/L	20-NOV-20	20-NOV-20	R5292639
Surrogate: Decachlorobiphenyl	125.1		50-150	%	20-NOV-20	20-NOV-20	R5292639
Total PCBs	<0.040		0.040	ug/L	20-NOV-20	20-NOV-20	R5292639
Surrogate: Tetrachloro-m-xylene	80.0		50-150	%	20-NOV-20	20-NOV-20	R5292639

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Total	MS-B	L2531509-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2531509-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2531509-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2531509-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2531509-1
Matrix Spike	Potassium (K)-Total	MS-B	L2531509-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2531509-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2531509-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2531509-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2531509-1
Matrix Spike	Uranium (U)-Total	MS-B	L2531509-1
Matrix Spike	Zinc (Zn)-Total	MS-B	L2531509-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental

Reference Information

Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Reference Information

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2531509

Report Date: 25-NOV-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5295017							
WG3448601-2	LCS							
1,2,4-Trichlorobenzene			62.7		%		50-140	23-NOV-20
2-Chlorophenol			82.7		%		50-140	23-NOV-20
2,4-Dichlorophenol			94.3		%		50-140	23-NOV-20
2,4-Dimethylphenol			99.4		%		30-130	23-NOV-20
2,4-Dinitrophenol			133.9		%		50-140	23-NOV-20
2,4-Dinitrotoluene			117.2		%		50-140	23-NOV-20
2,4,5-Trichlorophenol			101.4		%		50-140	23-NOV-20
2,4,6-Trichlorophenol			99.2		%		50-140	23-NOV-20
2,6-Dinitrotoluene			105.3		%		50-140	23-NOV-20
3,3'-Dichlorobenzidine			84.4		%		30-130	23-NOV-20
4-Chloroaniline			70.6		%		30-130	23-NOV-20
Biphenyl			82.5		%		50-140	23-NOV-20
Bis(2-chloroethyl)ether			91.6		%		50-140	23-NOV-20
Bis(2-chloroisopropyl)ether			86.5		%		50-140	23-NOV-20
Bis(2-ethylhexyl)phthalate			84.5		%		50-140	23-NOV-20
Diethylphthalate			98.5		%		50-140	23-NOV-20
Dimethylphthalate			99.2		%		50-140	23-NOV-20
Pentachlorophenol			127.0		%		50-140	23-NOV-20
Phenol			106.4		%		30-130	23-NOV-20
WG3448601-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	23-NOV-20
2-Chlorophenol			<0.30		ug/L		0.3	23-NOV-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	23-NOV-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	23-NOV-20
2,4-Dinitrophenol			<1.0		ug/L		1	23-NOV-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	23-NOV-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	23-NOV-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	23-NOV-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	23-NOV-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	23-NOV-20
4-Chloroaniline			<0.40		ug/L		0.4	23-NOV-20
Biphenyl			<0.40		ug/L		0.4	23-NOV-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	23-NOV-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	23-NOV-20



Quality Control Report

Workorder: L2531509

Report Date: 25-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
625-511-WT Water									
Batch R5295017									
WG3448601-1 MB									
			<2.0		ug/L		2	23-NOV-20	
			<0.20		ug/L		0.2	23-NOV-20	
			<0.20		ug/L		0.2	23-NOV-20	
			<0.50		ug/L		0.5	23-NOV-20	
			<0.50		ug/L		0.5	23-NOV-20	
			84.6		%		50-140	23-NOV-20	
			78.3		%		50-140	23-NOV-20	
			84.5		%		50-140	23-NOV-20	
			82.5		%		60-140	23-NOV-20	
CR-CR6-IC-WT Water									
Batch R5294067									
WG3448825-4 DUP									
		WG3448825-3	0.00117	0.00115	mg/L	1.5	20	20-NOV-20	
WG3448825-2 LCS									
			97.5		%		80-120	20-NOV-20	
WG3448825-1 MB									
			<0.00050		mg/L		0.0005	20-NOV-20	
WG3448825-5 MS									
		WG3448825-3	95.7		%		70-130	20-NOV-20	
F1-HS-511-WT Water									
Batch R5297311									
WG3450642-4 DUP									
		WG3450642-3	<25	<25	RPD-NA	ug/L	N/A	30	25-NOV-20
WG3450642-1 LCS									
			114.7		%		80-120	25-NOV-20	
WG3450642-2 MB									
			<25		ug/L		25	25-NOV-20	
			112.8		%		60-140	25-NOV-20	
WG3450642-5 MS									
		WG3450642-3	91.8		%		60-140	25-NOV-20	
F2-F4-511-WT Water									
Batch R5292320									
WG3448597-2 LCS									
			104.1		%		70-130	20-NOV-20	
			108.7		%		70-130	20-NOV-20	



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
F2-F4-511-WT									
Water									
Batch R5292320									
WG3448597-2 LCS									
F4 (C34-C50)			101.2		%		70-130	20-NOV-20	
WG3448597-1 MB									
F2 (C10-C16)			<100		ug/L		100	20-NOV-20	
F3 (C16-C34)			<250		ug/L		250	20-NOV-20	
F4 (C34-C50)			<250		ug/L		250	20-NOV-20	
Surrogate: 2-Bromobenzotrifluoride			80.1		%		60-140	20-NOV-20	
HG-T-CVAA-WT									
Water									
Batch R5291523									
WG3448714-4 DUP									
Mercury (Hg)-Total		WG3448714-3	<0.0000050	0.0000052	RPD-NA	mg/L	N/A	20	20-NOV-20
WG3448714-2 LCS									
Mercury (Hg)-Total			113.0		%		80-120	20-NOV-20	
WG3448714-1 MB									
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	20-NOV-20	
WG3448714-6 MS									
Mercury (Hg)-Total		WG3448714-5	103.5		%		70-130	20-NOV-20	
MET-T-CCMS-WT									
Water									
Batch R5291178									
WG3448570-4 DUP									
Aluminum (Al)-Total		WG3448570-3	<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	20-NOV-20
Antimony (Sb)-Total			<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	20-NOV-20
Arsenic (As)-Total			0.00083	0.00086		mg/L	4.1	20	20-NOV-20
Barium (Ba)-Total			0.224	0.225		mg/L	0.5	20	20-NOV-20
Beryllium (Be)-Total			<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	20-NOV-20
Bismuth (Bi)-Total			<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	20-NOV-20
Boron (B)-Total			0.031	0.030		mg/L	2.0	20	20-NOV-20
Cadmium (Cd)-Total			<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	20-NOV-20
Calcium (Ca)-Total			97.8	97.6		mg/L	0.2	20	20-NOV-20
Chromium (Cr)-Total			<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	20-NOV-20
Cesium (Cs)-Total			<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	20-NOV-20
Cobalt (Co)-Total			<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	20-NOV-20
Copper (Cu)-Total			<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	20-NOV-20
Iron (Fe)-Total			1.82	1.82		mg/L	0.0	20	20-NOV-20
Lead (Pb)-Total			0.000141	0.000134		mg/L	5.4	20	20-NOV-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5291178							
WG3448570-4	DUP	WG3448570-3						
Lithium (Li)-Total		0.0048	0.0046		mg/L	4.0	20	20-NOV-20
Magnesium (Mg)-Total		27.3	27.2		mg/L	0.3	20	20-NOV-20
Manganese (Mn)-Total		0.0474	0.0473		mg/L	0.3	20	20-NOV-20
Molybdenum (Mo)-Total		0.000604	0.000587		mg/L	3.0	20	20-NOV-20
Nickel (Ni)-Total		0.00060	0.00074	J	mg/L	0.00014	0.001	20-NOV-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	20-NOV-20
Potassium (K)-Total		8.27	8.34		mg/L	0.9	20	20-NOV-20
Rubidium (Rb)-Total		0.00103	0.00096		mg/L	7.3	20	20-NOV-20
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	20-NOV-20
Silicon (Si)-Total		6.43	6.32		mg/L	1.7	20	20-NOV-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	20-NOV-20
Sodium (Na)-Total		25.1	25.0		mg/L	0.3	20	20-NOV-20
Strontium (Sr)-Total		0.829	0.827		mg/L	0.3	20	20-NOV-20
Sulfur (S)-Total		15.2	15.0		mg/L	1.1	25	20-NOV-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	20-NOV-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	20-NOV-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	20-NOV-20
Tin (Sn)-Total		<0.00010	0.00013	RPD-NA	mg/L	N/A	20	20-NOV-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	20-NOV-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	20-NOV-20
Uranium (U)-Total		0.000453	0.000440		mg/L	2.8	20	20-NOV-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	20-NOV-20
Zinc (Zn)-Total		0.0383	0.0373		mg/L	2.6	20	20-NOV-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	20-NOV-20
WG3448570-2	LCS							
Aluminum (Al)-Total			103.7		%		80-120	20-NOV-20
Antimony (Sb)-Total			104.1		%		80-120	20-NOV-20
Arsenic (As)-Total			105.8		%		80-120	20-NOV-20
Barium (Ba)-Total			104.2		%		80-120	20-NOV-20
Beryllium (Be)-Total			99.4		%		80-120	20-NOV-20
Bismuth (Bi)-Total			102.3		%		80-120	20-NOV-20
Boron (B)-Total			98.0		%		80-120	20-NOV-20
Cadmium (Cd)-Total			104.6		%		80-120	20-NOV-20



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 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5291178							
WG3448570-2	LCS							
Calcium (Ca)-Total			99.8		%		80-120	20-NOV-20
Chromium (Cr)-Total			104.4		%		80-120	20-NOV-20
Cesium (Cs)-Total			103.8		%		80-120	20-NOV-20
Cobalt (Co)-Total			103.3		%		80-120	20-NOV-20
Copper (Cu)-Total			104.5		%		80-120	20-NOV-20
Iron (Fe)-Total			103.8		%		80-120	20-NOV-20
Lead (Pb)-Total			103.5		%		80-120	20-NOV-20
Lithium (Li)-Total			97.2		%		80-120	20-NOV-20
Magnesium (Mg)-Total			107.6		%		80-120	20-NOV-20
Manganese (Mn)-Total			105.4		%		80-120	20-NOV-20
Molybdenum (Mo)-Total			101.5		%		80-120	20-NOV-20
Nickel (Ni)-Total			104.3		%		80-120	20-NOV-20
Phosphorus (P)-Total			109.6		%		70-130	20-NOV-20
Potassium (K)-Total			101.6		%		80-120	20-NOV-20
Rubidium (Rb)-Total			103.2		%		80-120	20-NOV-20
Selenium (Se)-Total			101.4		%		80-120	20-NOV-20
Silicon (Si)-Total			96.1		%		60-140	20-NOV-20
Silver (Ag)-Total			100.5		%		80-120	20-NOV-20
Sodium (Na)-Total			105.9		%		80-120	20-NOV-20
Strontium (Sr)-Total			100.5		%		80-120	20-NOV-20
Sulfur (S)-Total			96.5		%		80-120	20-NOV-20
Thallium (Tl)-Total			105.2		%		80-120	20-NOV-20
Tellurium (Te)-Total			102.1		%		80-120	20-NOV-20
Thorium (Th)-Total			104.7		%		70-130	20-NOV-20
Tin (Sn)-Total			99.98		%		80-120	20-NOV-20
Titanium (Ti)-Total			99.2		%		80-120	20-NOV-20
Tungsten (W)-Total			101.5		%		80-120	20-NOV-20
Uranium (U)-Total			108.2		%		80-120	20-NOV-20
Vanadium (V)-Total			105.5		%		80-120	20-NOV-20
Zinc (Zn)-Total			101.3		%		80-120	20-NOV-20
Zirconium (Zr)-Total			95.4		%		80-120	20-NOV-20
WG3448570-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	20-NOV-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	20-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5291178							
WG3448570-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	20-NOV-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	20-NOV-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	20-NOV-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	20-NOV-20
Boron (B)-Total			<0.010		mg/L		0.01	20-NOV-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	20-NOV-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	20-NOV-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	20-NOV-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	20-NOV-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	20-NOV-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	20-NOV-20
Iron (Fe)-Total			<0.010		mg/L		0.01	20-NOV-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	20-NOV-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	20-NOV-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	20-NOV-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	20-NOV-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	20-NOV-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	20-NOV-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	20-NOV-20
Potassium (K)-Total			<0.050		mg/L		0.05	20-NOV-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	20-NOV-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	20-NOV-20
Silicon (Si)-Total			<0.10		mg/L		0.1	20-NOV-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	20-NOV-20
Sodium (Na)-Total			<0.050		mg/L		0.05	20-NOV-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	20-NOV-20
Sulfur (S)-Total			<0.50		mg/L		0.5	20-NOV-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	20-NOV-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	20-NOV-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	20-NOV-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	20-NOV-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	20-NOV-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	20-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5291178							
WG3448570-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	20-NOV-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	20-NOV-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	20-NOV-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	20-NOV-20
WG3448570-5 MS		WG3448570-3						
Aluminum (Al)-Total			99.2		%		70-130	20-NOV-20
Antimony (Sb)-Total			106.5		%		70-130	20-NOV-20
Arsenic (As)-Total			103.3		%		70-130	20-NOV-20
Barium (Ba)-Total			N/A	MS-B	%		-	20-NOV-20
Beryllium (Be)-Total			100.4		%		70-130	20-NOV-20
Bismuth (Bi)-Total			94.8		%		70-130	20-NOV-20
Boron (B)-Total			97.2		%		70-130	20-NOV-20
Cadmium (Cd)-Total			102.0		%		70-130	20-NOV-20
Calcium (Ca)-Total			N/A	MS-B	%		-	20-NOV-20
Chromium (Cr)-Total			101.4		%		70-130	20-NOV-20
Cesium (Cs)-Total			105.5		%		70-130	20-NOV-20
Cobalt (Co)-Total			98.9		%		70-130	20-NOV-20
Copper (Cu)-Total			94.7		%		70-130	20-NOV-20
Iron (Fe)-Total			N/A	MS-B	%		-	20-NOV-20
Lead (Pb)-Total			97.7		%		70-130	20-NOV-20
Lithium (Li)-Total			97.4		%		70-130	20-NOV-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	20-NOV-20
Manganese (Mn)-Total			N/A	MS-B	%		-	20-NOV-20
Molybdenum (Mo)-Total			104.2		%		70-130	20-NOV-20
Nickel (Ni)-Total			97.9		%		70-130	20-NOV-20
Phosphorus (P)-Total			105.7		%		70-130	20-NOV-20
Potassium (K)-Total			N/A	MS-B	%		-	20-NOV-20
Rubidium (Rb)-Total			101.1		%		70-130	20-NOV-20
Selenium (Se)-Total			91.1		%		70-130	20-NOV-20
Silicon (Si)-Total			N/A	MS-B	%		-	20-NOV-20
Silver (Ag)-Total			98.0		%		70-130	20-NOV-20
Sodium (Na)-Total			N/A	MS-B	%		-	20-NOV-20
Strontium (Sr)-Total			N/A	MS-B	%		-	20-NOV-20
Sulfur (S)-Total			N/A	MS-B	%		-	20-NOV-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5291178							
WG3448570-5 MS		WG3448570-3						
Thallium (Tl)-Total			99.2		%		70-130	20-NOV-20
Tellurium (Te)-Total			89.5		%		70-130	20-NOV-20
Thorium (Th)-Total			105.3		%		70-130	20-NOV-20
Tin (Sn)-Total			102.1		%		70-130	20-NOV-20
Titanium (Ti)-Total			101.0		%		70-130	20-NOV-20
Tungsten (W)-Total			100.9		%		70-130	20-NOV-20
Uranium (U)-Total			N/A	MS-B	%		-	20-NOV-20
Vanadium (V)-Total			105.3		%		70-130	20-NOV-20
Zinc (Zn)-Total			N/A	MS-B	%		-	20-NOV-20
Zirconium (Zr)-Total			97.0		%		70-130	20-NOV-20
P-T-COL-WT								
	Water							
Batch	R5294456							
WG3448628-3 DUP		L2531285-9						
Phosphorus, Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	23-NOV-20
WG3448628-2 LCS								
Phosphorus, Total			95.1		%		80-120	23-NOV-20
WG3448628-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	23-NOV-20
WG3448628-4 MS		L2531285-9						
Phosphorus, Total			97.9		%		70-130	23-NOV-20
PAH-511-WT								
	Water							
Batch	R5296896							
WG3448597-2 LCS								
1-Methylnaphthalene			81.4		%		50-140	24-NOV-20
2-Methylnaphthalene			79.0		%		50-140	24-NOV-20
Acenaphthene			98.2		%		50-140	24-NOV-20
Acenaphthylene			90.2		%		50-140	24-NOV-20
Anthracene			78.4		%		50-140	24-NOV-20
Benzo(a)anthracene			85.0		%		50-140	24-NOV-20
Benzo(a)pyrene			81.8		%		50-140	24-NOV-20
Benzo(b)fluoranthene			77.3		%		50-140	24-NOV-20
Benzo(g,h,i)perylene			98.3		%		50-140	24-NOV-20
Benzo(k)fluoranthene			85.8		%		50-140	24-NOV-20
Chrysene			91.7		%		50-140	24-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5296896							
WG3448597-2	LCS							
Dibenzo(ah)anthracene			87.9		%		50-140	24-NOV-20
Fluoranthene			91.3		%		50-140	24-NOV-20
Fluorene			81.8		%		50-140	24-NOV-20
Indeno(1,2,3-cd)pyrene			106.2		%		50-140	24-NOV-20
Naphthalene			82.7		%		50-140	24-NOV-20
Phenanthrene			88.3		%		50-140	24-NOV-20
Pyrene			91.7		%		50-140	24-NOV-20
WG3448597-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	24-NOV-20
2-Methylnaphthalene			<0.020		ug/L		0.02	24-NOV-20
Acenaphthene			<0.020		ug/L		0.02	24-NOV-20
Acenaphthylene			<0.020		ug/L		0.02	24-NOV-20
Anthracene			<0.020		ug/L		0.02	24-NOV-20
Benzo(a)anthracene			<0.020		ug/L		0.02	24-NOV-20
Benzo(a)pyrene			<0.010		ug/L		0.01	24-NOV-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	24-NOV-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	24-NOV-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	24-NOV-20
Chrysene			<0.020		ug/L		0.02	24-NOV-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	24-NOV-20
Fluoranthene			<0.020		ug/L		0.02	24-NOV-20
Fluorene			<0.020		ug/L		0.02	24-NOV-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	24-NOV-20
Naphthalene			<0.050		ug/L		0.05	24-NOV-20
Phenanthrene			<0.020		ug/L		0.02	24-NOV-20
Pyrene			<0.020		ug/L		0.02	24-NOV-20
Surrogate: d8-Naphthalene			100.7		%		60-140	24-NOV-20
Surrogate: d10-Phenanthrene			97.6		%		60-140	24-NOV-20
Surrogate: d12-Chrysene			89.4		%		60-140	24-NOV-20
Surrogate: d10-Acenaphthene			92.7		%		60-140	24-NOV-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5292639							
WG3448603-2	LCS							
Aroclor 1242			101.4		%		60-140	20-NOV-20
Aroclor 1248			91.4		%		60-140	20-NOV-20
Aroclor 1254			92.1		%		60-140	20-NOV-20
Aroclor 1260			76.1		%		60-140	20-NOV-20
WG3448603-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	20-NOV-20
Aroclor 1248			<0.020		ug/L		0.02	20-NOV-20
Aroclor 1254			<0.020		ug/L		0.02	20-NOV-20
Aroclor 1260			<0.020		ug/L		0.02	20-NOV-20
Surrogate: Decachlorobiphenyl			126.4		%		50-150	20-NOV-20
Surrogate: Tetrachloro-m-xylene			74.8		%		50-150	20-NOV-20
VOC-511-HS-WT		Water						
Batch	R5297311							
WG3450642-4	DUP		WG3450642-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	25-NOV-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	25-NOV-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-NOV-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	25-NOV-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	25-NOV-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5297311							
WG3450642-4	DUP	WG3450642-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	25-NOV-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-NOV-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-NOV-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-NOV-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	25-NOV-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	25-NOV-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	25-NOV-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	25-NOV-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-NOV-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-NOV-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-NOV-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	25-NOV-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
WG3450642-1	LCS							
1,1,1,2-Tetrachloroethane			103.2		%		70-130	25-NOV-20
1,1,1,2,2-Tetrachloroethane			93.7		%		70-130	25-NOV-20
1,1,1-Trichloroethane			101.1		%		70-130	25-NOV-20
1,1,2-Trichloroethane			110.0		%		70-130	25-NOV-20
1,1-Dichloroethane			105.4		%		70-130	25-NOV-20
1,1-Dichloroethylene			93.8		%		70-130	25-NOV-20
1,2-Dibromoethane			110.4		%		70-130	25-NOV-20
1,2-Dichlorobenzene			99.3		%		70-130	25-NOV-20
1,2-Dichloroethane			91.9		%		70-130	25-NOV-20
1,2-Dichloropropane			94.3		%		70-130	25-NOV-20
1,3-Dichlorobenzene			95.4		%		70-130	25-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5297311							
WG3450642-1	LCS							
1,4-Dichlorobenzene			94.8		%		70-130	25-NOV-20
Acetone			106.6		%		60-140	25-NOV-20
Benzene			96.1		%		70-130	25-NOV-20
Bromodichloromethane			96.8		%		70-130	25-NOV-20
Bromoform			114.1		%		70-130	25-NOV-20
Bromomethane			114.2		%		60-140	25-NOV-20
Carbon tetrachloride			103.4		%		70-130	25-NOV-20
Chlorobenzene			96.7		%		70-130	25-NOV-20
Chloroform			102.5		%		70-130	25-NOV-20
cis-1,2-Dichloroethylene			105.0		%		70-130	25-NOV-20
cis-1,3-Dichloropropene			85.0		%		70-130	25-NOV-20
Dibromochloromethane			106.3		%		70-130	25-NOV-20
Dichlorodifluoromethane			136.3		%		50-140	25-NOV-20
Ethylbenzene			93.1		%		70-130	25-NOV-20
n-Hexane			95.9		%		70-130	25-NOV-20
m+p-Xylenes			91.2		%		70-130	25-NOV-20
Methyl Ethyl Ketone			114.2		%		60-140	25-NOV-20
Methyl Isobutyl Ketone			80.2		%		60-140	25-NOV-20
Methylene Chloride			105.4		%		70-130	25-NOV-20
MTBE			100.2		%		70-130	25-NOV-20
o-Xylene			98.3		%		70-130	25-NOV-20
Styrene			90.7		%		70-130	25-NOV-20
Tetrachloroethylene			105.3		%		70-130	25-NOV-20
Toluene			99.0		%		70-130	25-NOV-20
trans-1,2-Dichloroethylene			95.3		%		70-130	25-NOV-20
trans-1,3-Dichloropropene			101.9		%		70-130	25-NOV-20
Trichloroethylene			98.8		%		70-130	25-NOV-20
Trichlorofluoromethane			112.4		%		60-140	25-NOV-20
Vinyl chloride			126.3		%		60-140	25-NOV-20
WG3450642-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	25-NOV-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	25-NOV-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	25-NOV-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	25-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5297311							
WG3450642-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	25-NOV-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	25-NOV-20
1,2-Dibromoethane			<0.20		ug/L		0.2	25-NOV-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	25-NOV-20
1,2-Dichloroethane			<0.50		ug/L		0.5	25-NOV-20
1,2-Dichloropropane			<0.50		ug/L		0.5	25-NOV-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	25-NOV-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	25-NOV-20
Acetone			<30		ug/L		30	25-NOV-20
Benzene			<0.50		ug/L		0.5	25-NOV-20
Bromodichloromethane			<2.0		ug/L		2	25-NOV-20
Bromoform			<5.0		ug/L		5	25-NOV-20
Bromomethane			<0.50		ug/L		0.5	25-NOV-20
Carbon tetrachloride			<0.20		ug/L		0.2	25-NOV-20
Chlorobenzene			<0.50		ug/L		0.5	25-NOV-20
Chloroform			<1.0		ug/L		1	25-NOV-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	25-NOV-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	25-NOV-20
Dibromochloromethane			<2.0		ug/L		2	25-NOV-20
Dichlorodifluoromethane			<2.0		ug/L		2	25-NOV-20
Ethylbenzene			<0.50		ug/L		0.5	25-NOV-20
n-Hexane			<0.50		ug/L		0.5	25-NOV-20
m+p-Xylenes			<0.40		ug/L		0.4	25-NOV-20
Methyl Ethyl Ketone			<20		ug/L		20	25-NOV-20
Methyl Isobutyl Ketone			<20		ug/L		20	25-NOV-20
Methylene Chloride			<5.0		ug/L		5	25-NOV-20
MTBE			<2.0		ug/L		2	25-NOV-20
o-Xylene			<0.30		ug/L		0.3	25-NOV-20
Styrene			<0.50		ug/L		0.5	25-NOV-20
Tetrachloroethylene			<0.50		ug/L		0.5	25-NOV-20
Toluene			<0.50		ug/L		0.5	25-NOV-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	25-NOV-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	25-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5297311							
WG3450642-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	25-NOV-20
Trichlorofluoromethane			<5.0		ug/L		5	25-NOV-20
Vinyl chloride			<0.50		ug/L		0.5	25-NOV-20
Surrogate: 1,4-Difluorobenzene			100.9		%		70-130	25-NOV-20
Surrogate: 4-Bromofluorobenzene			96.0		%		70-130	25-NOV-20
WG3450642-5 MS		WG3450642-3						
1,1,1,2-Tetrachloroethane			103.5		%		50-140	25-NOV-20
1,1,1,2-Tetrachloroethane			95.6		%		50-140	25-NOV-20
1,1,1-Trichloroethane			102.2		%		50-140	25-NOV-20
1,1,2-Trichloroethane			108.9		%		50-140	25-NOV-20
1,1-Dichloroethane			106.0		%		50-140	25-NOV-20
1,1-Dichloroethylene			92.3		%		50-140	25-NOV-20
1,2-Dibromoethane			107.3		%		50-140	25-NOV-20
1,2-Dichlorobenzene			98.9		%		50-140	25-NOV-20
1,2-Dichloroethane			92.6		%		50-140	25-NOV-20
1,2-Dichloropropane			95.0		%		50-140	25-NOV-20
1,3-Dichlorobenzene			95.3		%		50-140	25-NOV-20
1,4-Dichlorobenzene			95.0		%		50-140	25-NOV-20
Acetone			108.5		%		50-140	25-NOV-20
Benzene			96.8		%		50-140	25-NOV-20
Bromodichloromethane			99.0		%		50-140	25-NOV-20
Bromoform			114.7		%		50-140	25-NOV-20
Bromomethane			107.3		%		50-140	25-NOV-20
Carbon tetrachloride			104.9		%		50-140	25-NOV-20
Chlorobenzene			96.9		%		50-140	25-NOV-20
Chloroform			104.3		%		50-140	25-NOV-20
cis-1,2-Dichloroethylene			104.8		%		50-140	25-NOV-20
cis-1,3-Dichloropropene			83.9		%		50-140	25-NOV-20
Dibromochloromethane			105.4		%		50-140	25-NOV-20
Dichlorodifluoromethane			116.9		%		50-140	25-NOV-20
Ethylbenzene			92.3		%		50-140	25-NOV-20
n-Hexane			92.9		%		50-140	25-NOV-20
m+p-Xylenes			91.5		%		50-140	25-NOV-20
Methyl Ethyl Ketone			105.9		%		50-140	25-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5297311							
WG3450642-5 MS		WG3450642-3						
Methyl Isobutyl Ketone			78.0		%		50-140	25-NOV-20
Methylene Chloride			105.9		%		50-140	25-NOV-20
MTBE			99.9		%		50-140	25-NOV-20
o-Xylene			97.5		%		50-140	25-NOV-20
Styrene			89.3		%		50-140	25-NOV-20
Tetrachloroethylene			105.0		%		50-140	25-NOV-20
Toluene			97.3		%		50-140	25-NOV-20
trans-1,2-Dichloroethylene			95.0		%		50-140	25-NOV-20
trans-1,3-Dichloropropene			96.8		%		50-140	25-NOV-20
Trichloroethylene			100.5		%		50-140	25-NOV-20
Trichlorofluoromethane			108.1		%		50-140	25-NOV-20
Vinyl chloride			115.7		%		50-140	25-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

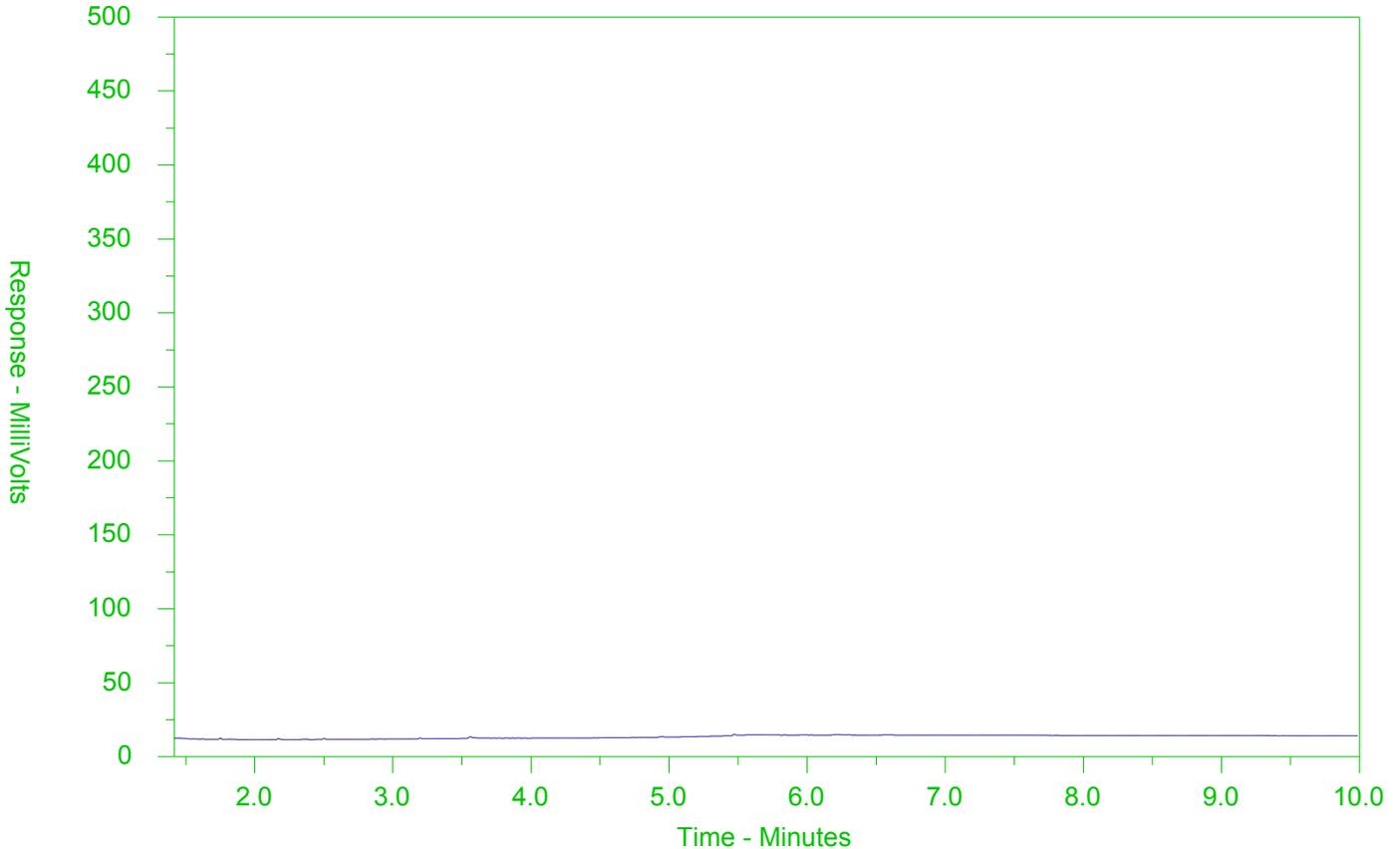
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2531509-1
 Client Sample ID: W-11210029-20201119-52



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2531509-COFC

COC Number: 17 -

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www.alsglobal.com

Report To Contact and company name below will appear on the final report		Report Format / Distribution		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)										
Company:	GHD LIMITED - ACCT #13791	Select Report Format:	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)	Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply										
Contact:	Laura Ermeta	Quality Control (QC) Report with Report	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	PRIORITY (Business Days)	4 day [P4-20%]	<input type="checkbox"/>	EMERGENCY	1 Business day [E - 100%]	<input type="checkbox"/>					
Phone:	519-884-0510	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			3 day [P3-25%]	<input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]	<input type="checkbox"/>					
Company address below will appear on the final report		Select Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		2 day [P2-50%]	<input type="checkbox"/>								
Street:	455 Phillip St	Email 1 or Fax	laura.ermeta@ghd.com	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm										
City/Province:	Waterloo, Ontario	Email 2	See PO	For tests that can not be performed according to the service level selected, you will be contacted.										
Postal Code:	N2L 3X2	Email 3		Analysis Request										
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Invoice Distribution		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below										
	Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Select Invoice Distribution:	<input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	NUMBER OF CONTAINERS							SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)		
Company:	GHD Limited	Email 1 or Fax	apinvoices-735@ghd.com		Total Metals (MET-T-COMS-WT)									
Contact:	SEE SSOW	Email 2			Total Mercury (HG-T-CVAA-WT)									
Project Information		Oil and Gas Required Fields (client use)			Total Cr6 (CR-CR6-IC-WT)									
ALS Account # / Quote #:	13791	AFE/Cost Center:	PO#		Total Phosphorous (P-T-COL-WT)									
Job #:	11210029	Major/Minor Code:	Routing Code:		PCBs (PCB-511-WT)									
PO / AFE:	73520086	Requisitioner:			VOCs and PHCs (VOC-F1-F4-511-P-WT)									
LSD:		Location:			SVOCs (SVOC-511-GP-WT)									
ALS Lab Work Order # (lab use only):	L2531509	ALS Contact:	Rick H											
		Sampler:	ERIC											
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type										
	W-11210029-20201119-52	19/11/20	930AM	Water	12	R	R	R	R	R	R			
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		SAMPLE CONDITION AS RECEIVED (lab use only)										
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>										
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>										
				Cooling Initiated <input type="checkbox"/>										
				INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C							
							62							
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)										
Released by:	Date: 2020 11/20	Time: 1100	Received by:	Date:	Time:	Received by:	Date: 11/19/20	Time: 1400						



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 26-NOV-20
Report Date: 03-DEC-20 11:08 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2534021

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2534021-1 W-11210029-20201126-54 Sampled By: ERIC on 26-NOV-20 @ 10:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0049		0.0030	mg/L	30-NOV-20	01-DEC-20	R5300346
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	27-NOV-20	27-NOV-20	R5299085
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Arsenic (As)-Total	0.00556		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Barium (Ba)-Total	0.0536		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-NOV-20	27-NOV-20	R5299085
Boron (B)-Total	<0.010		0.010	mg/L	27-NOV-20	27-NOV-20	R5299085
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	27-NOV-20	27-NOV-20	R5299085
Calcium (Ca)-Total	67.4		0.050	mg/L	27-NOV-20	27-NOV-20	R5299085
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	27-NOV-20	27-NOV-20	R5299085
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	27-NOV-20	27-NOV-20	R5299085
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Copper (Cu)-Total	<0.00050		0.00050	mg/L	27-NOV-20	27-NOV-20	R5299085
Iron (Fe)-Total	0.403		0.010	mg/L	27-NOV-20	27-NOV-20	R5299085
Lead (Pb)-Total	<0.000050		0.000050	mg/L	27-NOV-20	27-NOV-20	R5299085
Lithium (Li)-Total	0.0039		0.0010	mg/L	27-NOV-20	27-NOV-20	R5299085
Magnesium (Mg)-Total	32.3		0.0050	mg/L	27-NOV-20	27-NOV-20	R5299085
Manganese (Mn)-Total	0.00994		0.00050	mg/L	27-NOV-20	27-NOV-20	R5299085
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-NOV-20	R5298846
Molybdenum (Mo)-Total	0.000601		0.000050	mg/L	27-NOV-20	27-NOV-20	R5299085
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	27-NOV-20	27-NOV-20	R5299085
Phosphorus (P)-Total	<0.050		0.050	mg/L	27-NOV-20	27-NOV-20	R5299085
Potassium (K)-Total	0.984		0.050	mg/L	27-NOV-20	27-NOV-20	R5299085
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	27-NOV-20	27-NOV-20	R5299085
Selenium (Se)-Total	<0.000050		0.000050	mg/L	27-NOV-20	27-NOV-20	R5299085
Silicon (Si)-Total	9.01		0.10	mg/L	27-NOV-20	27-NOV-20	R5299085
Silver (Ag)-Total	<0.000050		0.000050	mg/L	27-NOV-20	27-NOV-20	R5299085
Sodium (Na)-Total	7.42		0.050	mg/L	27-NOV-20	27-NOV-20	R5299085
Strontium (Sr)-Total	0.155		0.0010	mg/L	27-NOV-20	27-NOV-20	R5299085
Sulfur (S)-Total	20.6		0.50	mg/L	27-NOV-20	27-NOV-20	R5299085
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	27-NOV-20	27-NOV-20	R5299085
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	27-NOV-20	27-NOV-20	R5299085
Thorium (Th)-Total	<0.00010		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Tin (Sn)-Total	<0.00010		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	27-NOV-20	27-NOV-20	R5299085
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Uranium (U)-Total	0.000241		0.000010	mg/L	27-NOV-20	27-NOV-20	R5299085
Vanadium (V)-Total	<0.00050		0.00050	mg/L	27-NOV-20	27-NOV-20	R5299085
Zinc (Zn)-Total	0.0037		0.0030	mg/L	27-NOV-20	27-NOV-20	R5299085

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2534021-1 W-11210029-20201126-54 Sampled By: ERIC on 26-NOV-20 @ 10:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	27-NOV-20	27-NOV-20	R5299085
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		27-NOV-20	R5299541
Volatile Organic Compounds							
Acetone	<30		30	ug/L		01-DEC-20	R5300163
Benzene	<0.50		0.50	ug/L		01-DEC-20	R5300163
Bromodichloromethane	<2.0		2.0	ug/L		01-DEC-20	R5300163
Bromoform	<5.0		5.0	ug/L		01-DEC-20	R5300163
Bromomethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
Carbon tetrachloride	<0.20		0.20	ug/L		01-DEC-20	R5300163
Chlorobenzene	<0.50		0.50	ug/L		01-DEC-20	R5300163
Dibromochloromethane	<2.0		2.0	ug/L		01-DEC-20	R5300163
Chloroform	<1.0		1.0	ug/L		01-DEC-20	R5300163
1,2-Dibromoethane	<0.20		0.20	ug/L		01-DEC-20	R5300163
1,2-Dichlorobenzene	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,3-Dichlorobenzene	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,4-Dichlorobenzene	<0.50		0.50	ug/L		01-DEC-20	R5300163
Dichlorodifluoromethane	<2.0		2.0	ug/L		01-DEC-20	R5300163
1,1-Dichloroethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,2-Dichloroethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,1-Dichloroethylene	<0.50		0.50	ug/L		01-DEC-20	R5300163
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		01-DEC-20	R5300163
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		01-DEC-20	R5300163
Methylene Chloride	<5.0		5.0	ug/L		01-DEC-20	R5300163
1,2-Dichloropropane	<0.50		0.50	ug/L		01-DEC-20	R5300163
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		01-DEC-20	R5300163
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		01-DEC-20	R5300163
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		01-DEC-20	R5300163
Ethylbenzene	<0.50		0.50	ug/L		01-DEC-20	R5300163
n-Hexane	<0.50		0.50	ug/L		01-DEC-20	R5300163
Methyl Ethyl Ketone	<20		20	ug/L		01-DEC-20	R5300163
Methyl Isobutyl Ketone	<20		20	ug/L		01-DEC-20	R5300163
MTBE	<2.0		2.0	ug/L		01-DEC-20	R5300163
Styrene	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
Tetrachloroethylene	<0.50		0.50	ug/L		01-DEC-20	R5300163
Toluene	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,1,1-Trichloroethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,1,2-Trichloroethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
Trichloroethylene	<0.50		0.50	ug/L		01-DEC-20	R5300163

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2534021-1 W-11210029-20201126-54							
Sampled By: ERIC on 26-NOV-20 @ 10:00							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		01-DEC-20	R5300163
Vinyl chloride	<0.50		0.50	ug/L		01-DEC-20	R5300163
o-Xylene	<0.30		0.30	ug/L		01-DEC-20	R5300163
m+p-Xylenes	<0.40		0.40	ug/L		01-DEC-20	R5300163
Xylenes (Total)	<0.50		0.50	ug/L		01-DEC-20	
Surrogate: 4-Bromofluorobenzene	93.1		70-130	%		01-DEC-20	R5300163
Surrogate: 1,4-Difluorobenzene	102.3		70-130	%		01-DEC-20	R5300163
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		01-DEC-20	R5300163
F1-BTEX	<25		25	ug/L		03-DEC-20	
F2 (C10-C16)	<100		100	ug/L	27-NOV-20	30-NOV-20	R5299714
F2-Naphth	<100		100	ug/L		03-DEC-20	
F3 (C16-C34)	<250		250	ug/L	27-NOV-20	30-NOV-20	R5299714
F3-PAH	<250		250	ug/L		03-DEC-20	
F4 (C34-C50)	<250		250	ug/L	27-NOV-20	30-NOV-20	R5299714
Total Hydrocarbons (C6-C50)	<370		370	ug/L		03-DEC-20	
Chrom. to baseline at nC50	YES				27-NOV-20	30-NOV-20	R5299714
Surrogate: 2-Bromobenzotrifluoride	91.5		60-140	%	27-NOV-20	30-NOV-20	R5299714
Surrogate: 3,4-Dichlorotoluene	87.2		60-140	%		01-DEC-20	R5300163
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Acenaphthylene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Anthracene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Benzo(a)anthracene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Benzo(a)pyrene	<0.010		0.010	ug/L	27-NOV-20	02-DEC-20	R5304677
Benzo(b)fluoranthene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Benzo(k)fluoranthene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Chrysene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Fluoranthene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Fluorene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		03-DEC-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
2-Methylnaphthalene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Naphthalene	<0.050		0.050	ug/L	27-NOV-20	02-DEC-20	R5304677
Phenanthrene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Pyrene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Surrogate: d10-Acenaphthene	83.2		60-140	%	27-NOV-20	02-DEC-20	R5304677
Surrogate: d12-Chrysene	92.9		60-140	%	27-NOV-20	02-DEC-20	R5304677

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2534021-1 W-11210029-20201126-54 Sampled By: ERIC on 26-NOV-20 @ 10:00 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	78.5		60-140	%	27-NOV-20	02-DEC-20	R5304677
Surrogate: d10-Phenanthrene	90.0		60-140	%	27-NOV-20	02-DEC-20	R5304677
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
4-Chloroaniline	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
2-Chlorophenol	<0.30		0.30	ug/L	27-NOV-20	03-DEC-20	R5304582
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4-Dichlorophenol	<0.30		0.30	ug/L	27-NOV-20	03-DEC-20	R5304582
Diethylphthalate	<0.20		0.20	ug/L	27-NOV-20	03-DEC-20	R5304582
Dimethylphthalate	<0.20		0.20	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4-Dimethylphenol	<0.50		0.50	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4-Dinitrophenol	<1.0		1.0	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4-Dinitrotoluene	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
2,6-Dinitrotoluene	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		03-DEC-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	27-NOV-20	03-DEC-20	R5304582
Pentachlorophenol	<0.50		0.50	ug/L	27-NOV-20	03-DEC-20	R5304582
Phenol	<0.50		0.50	ug/L	27-NOV-20	03-DEC-20	R5304582
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	27-NOV-20	03-DEC-20	R5304582
Surrogate: 2-Fluorobiphenyl	99.1		50-140	%	27-NOV-20	03-DEC-20	R5304582
Surrogate: Nitrobenzene d5	103.8		50-140	%	27-NOV-20	03-DEC-20	R5304582
Surrogate: p-Terphenyl d14	113.2		60-140	%	27-NOV-20	03-DEC-20	R5304582
Surrogate: 2,4,6-Tribromophenol	111.3		50-140	%	27-NOV-20	03-DEC-20	R5304582
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	02-DEC-20	02-DEC-20	R5299149
Aroclor 1248	<0.020		0.020	ug/L	02-DEC-20	02-DEC-20	R5299149
Aroclor 1254	<0.020		0.020	ug/L	02-DEC-20	02-DEC-20	R5299149
Aroclor 1260	<0.020		0.020	ug/L	02-DEC-20	02-DEC-20	R5299149
Surrogate: Decachlorobiphenyl	108.0		50-150	%	02-DEC-20	02-DEC-20	R5299149
Total PCBs	<0.040		0.040	ug/L	02-DEC-20	02-DEC-20	R5299149
Surrogate: Tetrachloro-m-xylene	80.3		50-150	%	02-DEC-20	02-DEC-20	R5299149

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	2,4-Dinitrophenol	LCS-H	L2534021-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2534021-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2534021-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2534021-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2534021-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2534021-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2534021-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2534021-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2534021-1
Matrix Spike	Uranium (U)-Total	MS-B	L2534021-1

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG

Reference Information

must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Reference Information

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5304582							
WG3452815-2	LCS							
1,2,4-Trichlorobenzene			56.1		%		50-140	03-DEC-20
2-Chlorophenol			85.9		%		50-140	03-DEC-20
2,4-Dichlorophenol			99.3		%		50-140	03-DEC-20
2,4-Dimethylphenol			80.2		%		30-130	03-DEC-20
2,4-Dinitrophenol			156.6	LCS-H	%		50-140	03-DEC-20
2,4-Dinitrotoluene			107.6		%		50-140	03-DEC-20
2,4,5-Trichlorophenol			108.8		%		50-140	03-DEC-20
2,4,6-Trichlorophenol			106.8		%		50-140	03-DEC-20
2,6-Dinitrotoluene			101.0		%		50-140	03-DEC-20
3,3'-Dichlorobenzidine			78.2		%		30-130	03-DEC-20
4-Chloroaniline			80.1		%		30-130	03-DEC-20
Biphenyl			63.6		%		50-140	03-DEC-20
Bis(2-chloroethyl)ether			97.8		%		50-140	03-DEC-20
Bis(2-chloroisopropyl)ether			78.6		%		50-140	03-DEC-20
Bis(2-ethylhexyl)phthalate			82.3		%		50-140	03-DEC-20
Diethylphthalate			89.7		%		50-140	03-DEC-20
Dimethylphthalate			95.4		%		50-140	03-DEC-20
Pentachlorophenol			132.6		%		50-140	03-DEC-20
Phenol			105.2		%		30-130	03-DEC-20
WG3452815-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	03-DEC-20
2-Chlorophenol			<0.30		ug/L		0.3	03-DEC-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	03-DEC-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	03-DEC-20
2,4-Dinitrophenol			<1.0		ug/L		1	03-DEC-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	03-DEC-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	03-DEC-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	03-DEC-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	03-DEC-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	03-DEC-20
4-Chloroaniline			<0.40		ug/L		0.4	03-DEC-20
Biphenyl			<0.40		ug/L		0.4	03-DEC-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	03-DEC-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	03-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5304582								
WG3452815-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	03-DEC-20
Diethylphthalate			<0.20		ug/L		0.2	03-DEC-20
Dimethylphthalate			<0.20		ug/L		0.2	03-DEC-20
Pentachlorophenol			<0.50		ug/L		0.5	03-DEC-20
Phenol			<0.50		ug/L		0.5	03-DEC-20
Surrogate: 2-Fluorobiphenyl			77.7		%		50-140	03-DEC-20
Surrogate: 2,4,6-Tribromophenol			62.8		%		50-140	03-DEC-20
Surrogate: Nitrobenzene d5			81.0		%		50-140	03-DEC-20
Surrogate: p-Terphenyl d14			99.9		%		60-140	03-DEC-20
CR-CR6-IC-WT Water								
Batch R5299541								
WG3452864-4 DUP								
Chromium, Hexavalent		WG3452864-3	<0.00050	RPD-NA	mg/L	N/A	20	27-NOV-20
WG3452864-2 LCS								
Chromium, Hexavalent			98.7		%		80-120	27-NOV-20
WG3452864-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	27-NOV-20
WG3452864-5 MS								
Chromium, Hexavalent		WG3452864-3	99.2		%		70-130	27-NOV-20
F1-HS-511-WT Water								
Batch R5300163								
WG3454412-4 DUP								
F1 (C6-C10)		WG3454412-3	<25	RPD-NA	ug/L	N/A	30	01-DEC-20
WG3454412-1 LCS								
F1 (C6-C10)			96.5		%		80-120	01-DEC-20
WG3454412-2 MB								
F1 (C6-C10)			<25		ug/L		25	01-DEC-20
Surrogate: 3,4-Dichlorotoluene			105.3		%		60-140	01-DEC-20
WG3454412-5 MS								
F1 (C6-C10)		WG3454412-3	90.3		%		60-140	01-DEC-20
F2-F4-511-WT Water								
Batch R5299714								
WG3452822-2 LCS								
F2 (C10-C16)			106.0		%		70-130	30-NOV-20
F3 (C16-C34)			109.3		%		70-130	30-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT								
Water								
Batch R5299714								
WG3452822-2 LCS								
F4 (C34-C50)			104.6		%		70-130	30-NOV-20
WG3452822-1 MB								
F2 (C10-C16)			<100		ug/L		100	30-NOV-20
F3 (C16-C34)			<250		ug/L		250	30-NOV-20
F4 (C34-C50)			<250		ug/L		250	30-NOV-20
Surrogate: 2-Bromobenzotrifluoride			52.3	SURQC	%		60-140	30-NOV-20
HG-T-CVAA-WT								
Water								
Batch R5298846								
WG3452978-3 DUP								
Mercury (Hg)-Total		L2533785-1	<0.0000050	RPD-NA	mg/L	N/A	20	27-NOV-20
WG3452978-2 LCS								
Mercury (Hg)-Total			100.0		%		80-120	27-NOV-20
WG3452978-1 MB								
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	27-NOV-20
WG3452978-4 MS								
Mercury (Hg)-Total		L2533785-2	98.6		%		70-130	27-NOV-20
MET-T-CCMS-WT								
Water								
Batch R5299085								
WG3452769-4 DUP								
Aluminum (Al)-Total		WG3452769-3	<0.050	RPD-NA	mg/L	N/A	20	27-NOV-20
Antimony (Sb)-Total			<0.0010	RPD-NA	mg/L	N/A	20	27-NOV-20
Arsenic (As)-Total			<0.0010	RPD-NA	mg/L	N/A	20	27-NOV-20
Barium (Ba)-Total			0.363		mg/L	1.0	20	27-NOV-20
Beryllium (Be)-Total			<0.0010	RPD-NA	mg/L	N/A	20	27-NOV-20
Bismuth (Bi)-Total			<0.00050	RPD-NA	mg/L	N/A	20	27-NOV-20
Boron (B)-Total			<0.10	RPD-NA	mg/L	N/A	20	27-NOV-20
Cadmium (Cd)-Total			<0.000050	RPD-NA	mg/L	N/A	20	27-NOV-20
Calcium (Ca)-Total			93.8		mg/L	0.3	20	27-NOV-20
Chromium (Cr)-Total			<0.0050	RPD-NA	mg/L	N/A	20	27-NOV-20
Cesium (Cs)-Total			<0.00010	RPD-NA	mg/L	N/A	20	27-NOV-20
Cobalt (Co)-Total			<0.0010	RPD-NA	mg/L	N/A	20	27-NOV-20
Copper (Cu)-Total			<0.0050	RPD-NA	mg/L	N/A	20	27-NOV-20
Iron (Fe)-Total			1.73		mg/L	1.6	20	27-NOV-20
Lead (Pb)-Total			<0.00050	RPD-NA	mg/L	N/A	20	27-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5299085							
WG3452769-4	DUP	WG3452769-3						
Lithium (Li)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	27-NOV-20
Magnesium (Mg)-Total		23.2	23.9		mg/L	3.2	20	27-NOV-20
Manganese (Mn)-Total		0.0155	0.0156		mg/L	0.6	20	27-NOV-20
Molybdenum (Mo)-Total		0.00183	0.00181		mg/L	0.9	20	27-NOV-20
Nickel (Ni)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	27-NOV-20
Phosphorus (P)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	27-NOV-20
Potassium (K)-Total		2.02	2.11		mg/L	4.4	20	27-NOV-20
Rubidium (Rb)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	27-NOV-20
Selenium (Se)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	27-NOV-20
Silicon (Si)-Total		3.8	3.9		mg/L	2.7	20	27-NOV-20
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	27-NOV-20
Sodium (Na)-Total		62.6	63.4		mg/L	1.2	20	27-NOV-20
Strontium (Sr)-Total		6.88	6.90		mg/L	0.3	20	27-NOV-20
Sulfur (S)-Total		<5.0	<5.0	RPD-NA	mg/L	N/A	25	27-NOV-20
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	27-NOV-20
Tellurium (Te)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	27-NOV-20
Thorium (Th)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	25	27-NOV-20
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	27-NOV-20
Titanium (Ti)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	27-NOV-20
Tungsten (W)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	27-NOV-20
Uranium (U)-Total		0.00081	0.00085		mg/L	4.7	20	27-NOV-20
Vanadium (V)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	27-NOV-20
Zinc (Zn)-Total		0.592	0.608		mg/L	2.7	20	27-NOV-20
Zirconium (Zr)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	27-NOV-20
WG3452769-2	LCS							
Aluminum (Al)-Total			103.4		%		80-120	27-NOV-20
Antimony (Sb)-Total			105.7		%		80-120	27-NOV-20
Arsenic (As)-Total			102.0		%		80-120	27-NOV-20
Barium (Ba)-Total			107.8		%		80-120	27-NOV-20
Beryllium (Be)-Total			102.6		%		80-120	27-NOV-20
Bismuth (Bi)-Total			96.0		%		80-120	27-NOV-20
Boron (B)-Total			99.5		%		80-120	27-NOV-20
Cadmium (Cd)-Total			99.9		%		80-120	27-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5299085							
WG3452769-2	LCS							
Calcium (Ca)-Total			99.8		%		80-120	27-NOV-20
Chromium (Cr)-Total			99.0		%		80-120	27-NOV-20
Cesium (Cs)-Total			101.8		%		80-120	27-NOV-20
Cobalt (Co)-Total			98.3		%		80-120	27-NOV-20
Copper (Cu)-Total			97.1		%		80-120	27-NOV-20
Iron (Fe)-Total			98.7		%		80-120	27-NOV-20
Lead (Pb)-Total			96.2		%		80-120	27-NOV-20
Lithium (Li)-Total			103.9		%		80-120	27-NOV-20
Magnesium (Mg)-Total			103.3		%		80-120	27-NOV-20
Manganese (Mn)-Total			102.1		%		80-120	27-NOV-20
Molybdenum (Mo)-Total			102.9		%		80-120	27-NOV-20
Nickel (Ni)-Total			98.4		%		80-120	27-NOV-20
Phosphorus (P)-Total			103.2		%		70-130	27-NOV-20
Potassium (K)-Total			102.8		%		80-120	27-NOV-20
Rubidium (Rb)-Total			99.3		%		80-120	27-NOV-20
Selenium (Se)-Total			101.5		%		80-120	27-NOV-20
Silicon (Si)-Total			109.1		%		60-140	27-NOV-20
Silver (Ag)-Total			101.7		%		80-120	27-NOV-20
Sodium (Na)-Total			98.4		%		80-120	27-NOV-20
Strontium (Sr)-Total			103.2		%		80-120	27-NOV-20
Sulfur (S)-Total			105.5		%		80-120	27-NOV-20
Thallium (Tl)-Total			96.1		%		80-120	27-NOV-20
Tellurium (Te)-Total			101.3		%		80-120	27-NOV-20
Thorium (Th)-Total			95.3		%		70-130	27-NOV-20
Tin (Sn)-Total			102.1		%		80-120	27-NOV-20
Titanium (Ti)-Total			100.0		%		80-120	27-NOV-20
Tungsten (W)-Total			98.8		%		80-120	27-NOV-20
Uranium (U)-Total			96.6		%		80-120	27-NOV-20
Vanadium (V)-Total			103.0		%		80-120	27-NOV-20
Zinc (Zn)-Total			97.3		%		80-120	27-NOV-20
Zirconium (Zr)-Total			100.5		%		80-120	27-NOV-20
WG3452769-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	27-NOV-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	27-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5299085							
WG3452769-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	27-NOV-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	27-NOV-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	27-NOV-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	27-NOV-20
Boron (B)-Total			<0.010		mg/L		0.01	27-NOV-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	27-NOV-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	27-NOV-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	27-NOV-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	27-NOV-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	27-NOV-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	27-NOV-20
Iron (Fe)-Total			<0.010		mg/L		0.01	27-NOV-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	27-NOV-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	27-NOV-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	27-NOV-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	27-NOV-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	27-NOV-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	27-NOV-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	27-NOV-20
Potassium (K)-Total			<0.050		mg/L		0.05	27-NOV-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	27-NOV-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	27-NOV-20
Silicon (Si)-Total			<0.10		mg/L		0.1	27-NOV-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	27-NOV-20
Sodium (Na)-Total			<0.050		mg/L		0.05	27-NOV-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	27-NOV-20
Sulfur (S)-Total			<0.50		mg/L		0.5	27-NOV-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	27-NOV-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	27-NOV-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	27-NOV-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	27-NOV-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	27-NOV-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	27-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5299085							
WG3452769-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	27-NOV-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	27-NOV-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	27-NOV-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	27-NOV-20
WG3452769-5 MS		WG3452769-6						
Aluminum (Al)-Total			103.3		%		70-130	27-NOV-20
Antimony (Sb)-Total			99.4		%		70-130	27-NOV-20
Arsenic (As)-Total			101.3		%		70-130	27-NOV-20
Barium (Ba)-Total			N/A	MS-B	%		-	27-NOV-20
Beryllium (Be)-Total			96.7		%		70-130	27-NOV-20
Bismuth (Bi)-Total			95.5		%		70-130	27-NOV-20
Boron (B)-Total			93.9		%		70-130	27-NOV-20
Cadmium (Cd)-Total			100.4		%		70-130	27-NOV-20
Calcium (Ca)-Total			N/A	MS-B	%		-	27-NOV-20
Chromium (Cr)-Total			102.9		%		70-130	27-NOV-20
Cesium (Cs)-Total			97.2		%		70-130	27-NOV-20
Cobalt (Co)-Total			96.7		%		70-130	27-NOV-20
Copper (Cu)-Total			94.7		%		70-130	27-NOV-20
Iron (Fe)-Total			N/A	MS-B	%		-	27-NOV-20
Lead (Pb)-Total			97.5		%		70-130	27-NOV-20
Lithium (Li)-Total			88.4		%		70-130	27-NOV-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	27-NOV-20
Manganese (Mn)-Total			N/A	MS-B	%		-	27-NOV-20
Molybdenum (Mo)-Total			95.7		%		70-130	27-NOV-20
Nickel (Ni)-Total			95.3		%		70-130	27-NOV-20
Phosphorus (P)-Total			107.6		%		70-130	27-NOV-20
Potassium (K)-Total			99.8		%		70-130	27-NOV-20
Rubidium (Rb)-Total			109.6		%		70-130	27-NOV-20
Silicon (Si)-Total			N/A	MS-B	%		-	27-NOV-20
Silver (Ag)-Total			95.9		%		70-130	27-NOV-20
Sodium (Na)-Total			N/A	MS-B	%		-	27-NOV-20
Strontium (Sr)-Total			N/A	MS-B	%		-	27-NOV-20
Sulfur (S)-Total			116.1		%		70-130	27-NOV-20
Thallium (Tl)-Total			97.0		%		70-130	27-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5299085							
WG3452769-5 MS		WG3452769-6						
Tellurium (Te)-Total			92.8		%		70-130	27-NOV-20
Thorium (Th)-Total			87.0		%		70-130	27-NOV-20
Tin (Sn)-Total			96.9		%		70-130	27-NOV-20
Titanium (Ti)-Total			111.4		%		70-130	27-NOV-20
Tungsten (W)-Total			98.2		%		70-130	27-NOV-20
Uranium (U)-Total			N/A	MS-B	%		-	27-NOV-20
Vanadium (V)-Total			102.6		%		70-130	27-NOV-20
Zinc (Zn)-Total			95.9		%		70-130	27-NOV-20
Zirconium (Zr)-Total			92.0		%		70-130	27-NOV-20
P-T-COL-WT								
	Water							
Batch	R5300346							
WG3453467-3 DUP		L2534021-1						
Phosphorus, Total		0.0049	0.0044		mg/L	8.8	20	01-DEC-20
WG3453467-2 LCS								
Phosphorus, Total			96.2		%		80-120	01-DEC-20
WG3453467-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	01-DEC-20
WG3453467-4 MS		L2534021-1						
Phosphorus, Total			105.1		%		70-130	01-DEC-20
PAH-511-WT								
	Water							
Batch	R5304677							
WG3452822-2 LCS								
1-Methylnaphthalene			81.9		%		50-140	02-DEC-20
2-Methylnaphthalene			80.7		%		50-140	02-DEC-20
Acenaphthene			90.8		%		50-140	02-DEC-20
Acenaphthylene			87.4		%		50-140	02-DEC-20
Anthracene			84.7		%		50-140	02-DEC-20
Benzo(a)anthracene			97.5		%		50-140	02-DEC-20
Benzo(a)pyrene			84.6		%		50-140	02-DEC-20
Benzo(b)fluoranthene			82.3		%		50-140	02-DEC-20
Benzo(g,h,i)perylene			91.9		%		50-140	02-DEC-20
Benzo(k)fluoranthene			87.9		%		50-140	02-DEC-20
Chrysene			87.4		%		50-140	02-DEC-20
Dibenzo(ah)anthracene			94.0		%		50-140	02-DEC-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT		Water						
Batch	R5304677							
WG3452822-2	LCS							
Fluoranthene			94.2		%		50-140	02-DEC-20
Fluorene			93.4		%		50-140	02-DEC-20
Indeno(1,2,3-cd)pyrene			106.2		%		50-140	02-DEC-20
Naphthalene			84.6		%		50-140	02-DEC-20
Phenanthrene			94.8		%		50-140	02-DEC-20
Pyrene			93.8		%		50-140	02-DEC-20
WG3452822-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	02-DEC-20
2-Methylnaphthalene			<0.020		ug/L		0.02	02-DEC-20
Acenaphthene			<0.020		ug/L		0.02	02-DEC-20
Acenaphthylene			<0.020		ug/L		0.02	02-DEC-20
Anthracene			<0.020		ug/L		0.02	02-DEC-20
Benzo(a)anthracene			<0.020		ug/L		0.02	02-DEC-20
Benzo(a)pyrene			<0.010		ug/L		0.01	02-DEC-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	02-DEC-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	02-DEC-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	02-DEC-20
Chrysene			<0.020		ug/L		0.02	02-DEC-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	02-DEC-20
Fluoranthene			<0.020		ug/L		0.02	02-DEC-20
Fluorene			<0.020		ug/L		0.02	02-DEC-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	02-DEC-20
Naphthalene			<0.050		ug/L		0.05	02-DEC-20
Phenanthrene			<0.020		ug/L		0.02	02-DEC-20
Pyrene			<0.020		ug/L		0.02	02-DEC-20
Surrogate: d8-Naphthalene			97.3		%		60-140	02-DEC-20
Surrogate: d10-Phenanthrene			103		%		60-140	02-DEC-20
Surrogate: d12-Chrysene			104.8		%		60-140	02-DEC-20
Surrogate: d10-Acenaphthene			102.2		%		60-140	02-DEC-20
PCB-511-WT		Water						
Batch	R5299149							
WG3452848-2	LCS							
Aroclor 1242			103.3		%		60-140	27-NOV-20
Aroclor 1248			86.9		%		60-140	27-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5299149							
WG3452848-2	LCS							
Aroclor 1254			98.4		%		60-140	27-NOV-20
Aroclor 1260			91.1		%		60-140	27-NOV-20
WG3452848-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	27-NOV-20
Aroclor 1248			<0.020		ug/L		0.02	27-NOV-20
Aroclor 1254			<0.020		ug/L		0.02	27-NOV-20
Aroclor 1260			<0.020		ug/L		0.02	27-NOV-20
Surrogate: Decachlorobiphenyl			82.5		%		50-150	27-NOV-20
Surrogate: Tetrachloro-m-xylene			73.8		%		50-150	27-NOV-20
VOC-511-HS-WT		Water						
Batch	R5300163							
WG3454412-4	DUP		WG3454412-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	01-DEC-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	01-DEC-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	01-DEC-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	01-DEC-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	01-DEC-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	01-DEC-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5300163							
WG3454412-4	DUP	WG3454412-3						
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	01-DEC-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	01-DEC-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	01-DEC-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	01-DEC-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	01-DEC-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	01-DEC-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	01-DEC-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	01-DEC-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	01-DEC-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	01-DEC-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	01-DEC-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
WG3454412-1	LCS							
1,1,1,2-Tetrachloroethane			95.1		%		70-130	01-DEC-20
1,1,2,2-Tetrachloroethane			88.9		%		70-130	01-DEC-20
1,1,1-Trichloroethane			99.6		%		70-130	01-DEC-20
1,1,2-Trichloroethane			93.2		%		70-130	01-DEC-20
1,1-Dichloroethane			96.1		%		70-130	01-DEC-20
1,1-Dichloroethylene			97.3		%		70-130	01-DEC-20
1,2-Dibromoethane			92.4		%		70-130	01-DEC-20
1,2-Dichlorobenzene			102.8		%		70-130	01-DEC-20
1,2-Dichloroethane			92.7		%		70-130	01-DEC-20
1,2-Dichloropropane			96.7		%		70-130	01-DEC-20
1,3-Dichlorobenzene			99.0		%		70-130	01-DEC-20
1,4-Dichlorobenzene			98.1		%		70-130	01-DEC-20
Acetone			99.4		%		60-140	01-DEC-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5300163							
WG3454412-1	LCS							
Benzene			95.3		%		70-130	01-DEC-20
Bromodichloromethane			101.4		%		70-130	01-DEC-20
Bromoform			94.2		%		70-130	01-DEC-20
Bromomethane			90.3		%		60-140	01-DEC-20
Carbon tetrachloride			102.6		%		70-130	01-DEC-20
Chlorobenzene			98.9		%		70-130	01-DEC-20
Chloroform			98.5		%		70-130	01-DEC-20
cis-1,2-Dichloroethylene			98.2		%		70-130	01-DEC-20
cis-1,3-Dichloropropene			90.0		%		70-130	01-DEC-20
Dibromochloromethane			91.0		%		70-130	01-DEC-20
Dichlorodifluoromethane			73.2		%		50-140	01-DEC-20
Ethylbenzene			98.7		%		70-130	01-DEC-20
n-Hexane			92.2		%		70-130	01-DEC-20
m+p-Xylenes			100.7		%		70-130	01-DEC-20
Methyl Ethyl Ketone			95.4		%		60-140	01-DEC-20
Methyl Isobutyl Ketone			87.2		%		60-140	01-DEC-20
Methylene Chloride			96.0		%		70-130	01-DEC-20
MTBE			102.6		%		70-130	01-DEC-20
o-Xylene			108.0		%		70-130	01-DEC-20
Styrene			98.2		%		70-130	01-DEC-20
Tetrachloroethylene			95.3		%		70-130	01-DEC-20
Toluene			96.6		%		70-130	01-DEC-20
trans-1,2-Dichloroethylene			95.7		%		70-130	01-DEC-20
trans-1,3-Dichloropropene			91.6		%		70-130	01-DEC-20
Trichloroethylene			99.5		%		70-130	01-DEC-20
Trichlorofluoromethane			98.3		%		60-140	01-DEC-20
Vinyl chloride			95.8		%		60-140	01-DEC-20
WG3454412-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	01-DEC-20
1,1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	01-DEC-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	01-DEC-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	01-DEC-20
1,1-Dichloroethane			<0.50		ug/L		0.5	01-DEC-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	01-DEC-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5300163							
WG3454412-2 MB								
1,2-Dibromoethane			<0.20		ug/L		0.2	01-DEC-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	01-DEC-20
1,2-Dichloroethane			<0.50		ug/L		0.5	01-DEC-20
1,2-Dichloropropane			<0.50		ug/L		0.5	01-DEC-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	01-DEC-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	01-DEC-20
Acetone			<30		ug/L		30	01-DEC-20
Benzene			<0.50		ug/L		0.5	01-DEC-20
Bromodichloromethane			<2.0		ug/L		2	01-DEC-20
Bromoform			<5.0		ug/L		5	01-DEC-20
Bromomethane			<0.50		ug/L		0.5	01-DEC-20
Carbon tetrachloride			<0.20		ug/L		0.2	01-DEC-20
Chlorobenzene			<0.50		ug/L		0.5	01-DEC-20
Chloroform			<1.0		ug/L		1	01-DEC-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	01-DEC-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	01-DEC-20
Dibromochloromethane			<2.0		ug/L		2	01-DEC-20
Dichlorodifluoromethane			<2.0		ug/L		2	01-DEC-20
Ethylbenzene			<0.50		ug/L		0.5	01-DEC-20
n-Hexane			<0.50		ug/L		0.5	01-DEC-20
m+p-Xylenes			<0.40		ug/L		0.4	01-DEC-20
Methyl Ethyl Ketone			<20		ug/L		20	01-DEC-20
Methyl Isobutyl Ketone			<20		ug/L		20	01-DEC-20
Methylene Chloride			<5.0		ug/L		5	01-DEC-20
MTBE			<2.0		ug/L		2	01-DEC-20
o-Xylene			<0.30		ug/L		0.3	01-DEC-20
Styrene			<0.50		ug/L		0.5	01-DEC-20
Tetrachloroethylene			<0.50		ug/L		0.5	01-DEC-20
Toluene			<0.50		ug/L		0.5	01-DEC-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	01-DEC-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	01-DEC-20
Trichloroethylene			<0.50		ug/L		0.5	01-DEC-20
Trichlorofluoromethane			<5.0		ug/L		5	01-DEC-20



Quality Control Report

Workorder: L2534021

Report Date: 03-DEC-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5300163							
WG3454412-2 MB								
Vinyl chloride			<0.50		ug/L		0.5	01-DEC-20
Surrogate: 1,4-Difluorobenzene			102.1		%		70-130	01-DEC-20
Surrogate: 4-Bromofluorobenzene			93.4		%		70-130	01-DEC-20
WG3454412-5 MS		WG3454412-3						
1,1,1,2-Tetrachloroethane			97.2		%		50-140	01-DEC-20
1,1,2,2-Tetrachloroethane			72.3		%		50-140	01-DEC-20
1,1,1-Trichloroethane			100.6		%		50-140	01-DEC-20
1,1,2-Trichloroethane			91.9		%		50-140	01-DEC-20
1,1-Dichloroethane			96.9		%		50-140	01-DEC-20
1,1-Dichloroethylene			94.8		%		50-140	01-DEC-20
1,2-Dibromoethane			89.3		%		50-140	01-DEC-20
1,2-Dichlorobenzene			101.9		%		50-140	01-DEC-20
1,2-Dichloroethane			92.8		%		50-140	01-DEC-20
1,2-Dichloropropane			97.9		%		50-140	01-DEC-20
1,3-Dichlorobenzene			110.2		%		50-140	01-DEC-20
1,4-Dichlorobenzene			106.4		%		50-140	01-DEC-20
Acetone			89.2		%		50-140	01-DEC-20
Benzene			95.8		%		50-140	01-DEC-20
Bromodichloromethane			102.8		%		50-140	01-DEC-20
Bromoform			89.2		%		50-140	01-DEC-20
Bromomethane			87.0		%		50-140	01-DEC-20
Carbon tetrachloride			102.9		%		50-140	01-DEC-20
Chlorobenzene			98.7		%		50-140	01-DEC-20
Chloroform			99.7		%		50-140	01-DEC-20
cis-1,2-Dichloroethylene			98.1		%		50-140	01-DEC-20
cis-1,3-Dichloropropene			88.7		%		50-140	01-DEC-20
Dibromochloromethane			89.8		%		50-140	01-DEC-20
Dichlorodifluoromethane			64.1		%		50-140	01-DEC-20
Ethylbenzene			99.4		%		50-140	01-DEC-20
n-Hexane			89.7		%		50-140	01-DEC-20
m+p-Xylenes			100.9		%		50-140	01-DEC-20
Methyl Ethyl Ketone			84.0		%		50-140	01-DEC-20
Methyl Isobutyl Ketone			75.1		%		50-140	01-DEC-20
Methylene Chloride			95.9		%		50-140	01-DEC-20



Quality Control Report

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5300163							
WG3454412-5 MS		WG3454412-3						
MTBE			102.9		%		50-140	01-DEC-20
o-Xylene			108.6		%		50-140	01-DEC-20
Styrene			98.8		%		50-140	01-DEC-20
Tetrachloroethylene			94.1		%		50-140	01-DEC-20
Toluene			95.4		%		50-140	01-DEC-20
trans-1,2-Dichloroethylene			94.2		%		50-140	01-DEC-20
trans-1,3-Dichloropropene			89.7		%		50-140	01-DEC-20
Trichloroethylene			99.9		%		50-140	01-DEC-20
Trichlorofluoromethane			95.3		%		50-140	01-DEC-20
Vinyl chloride			90.4		%		50-140	01-DEC-20

Quality Control Report

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
SURQC	Surrogate recovery marginally exceeded DQO in QC sample (MB, LCS, RM, or MS). Surrogates are less important for QC samples than for test samples. Refer to regular (non-surrogate) analyte results in affected QC sample for assessment of potential impacts to those analytes.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

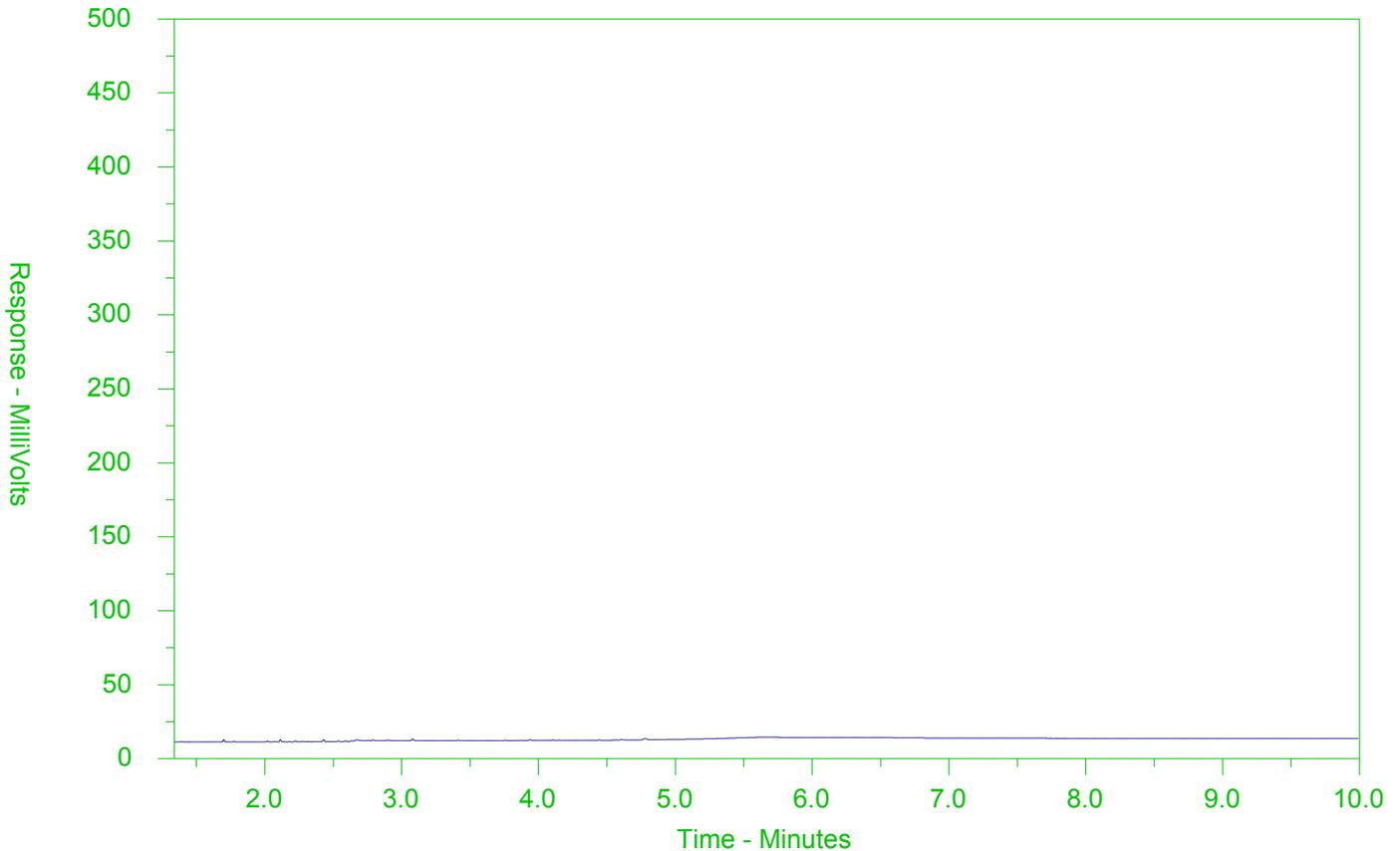
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2534021-1
 Client Sample ID: W-11210029-20201126-54



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

Gary Lagos
Gary.Lagos@ghd.com
519.589.9018

www.ghd.com

Appendix C

MECP Comments on the HIA Report and Responses

Memorandum

Date: January 25, 2021

To: Lynnette Armour, Senior Environmental Officer – Guelph District Office

From: Pam Grande, Hydrogeologist – West Central Region

Re: **Review of Hydrogeological Impact Assessment in support of ECAs for Waste Processing and Industrial Sewage Works (Stormwater) for Badger Hydrovac and Daylighting Services Facility**

In preparation of this memorandum I have reviewed the following document:

- Report titled: Hydrogeologic Impact Assessment for the Badger Hydrovac and Daylighting Services Facility (in Support of an ECA). Prepared for 2374868 Ontario Inc. by GHD (dated December 16, 2020).

I have also referred to the following documents in the course of this review:

- Report titled: Stormwater Management Plan Application for an Industrial Sewage Works – Stormwater Environmental Compliance Approval. Prepared for 2374868 Ontario Inc. by GHD (dated December 21, 2020).
- Pre-Consultation Summary. Prepared for 2374868 Ontario Inc. by GHD (emailed to MECP on October 15, 2020).

Background:

I have reviewed the Hydrogeological Impact Assessment report prepared by GHD for the site located at 6678 Wellington Road 34, Wellington County. The Hydrogeological Impact Assessment report was prepared in support of Environmental Compliance Approvals (ECA) applications for Waste Processing and Industrial Sewage Works - Stormwater. I previously provided preliminary comments to the Guelph District Office regarding the Pre-Consultation Summary document prepared by GHD and submitted to the MECP via email on October 5, 2020.

2374868 Ontario Inc. operates a hydrovac soil processing facility at the site under the trade name Badger Hydrovac and Daylighting Services (Badger). Badger dispatches trucks to and from the facility to perform hydrovac services at multiple sites across Southern Ontario. Hydrovac services involve removing subsurface soils by mixing soil with potable water to develop a liquid soil slurry

that is pumped into the trucks and then transported to the site for processing. The wet soil is stockpiled at the site and the water drains off the soil by gravity drainage.

The property where the site is located is divided by zoning into two sections: a northern section zoned as Extractive Industrial and a southern section zoned as Agriculture. The southern one third of the property is currently used for an equestrian stable and riding grounds. The northern two thirds of the property is currently an aggregate pit rehabilitation area under Ministry of Natural Resources and Forestry (MNRF) Aggregate Resources Act (ARA) license No. 20085 operated by Capital Paving Inc. (Wellington Pit #5). Badger's site facility and operations are situated within the northern section zoned for extraction.

The adjacent land use to the west is an aggregate extraction pit (part of the ARA license No. 20085), to the north is agricultural land, to the east is forested conservation land owned by the County of Wellington, and to the south across Wellington Road 34 are residential and agricultural lands.

Soil Processing:

Based on the available information, pending sampling and analysis, the majority of dried stockpiled soil is used for rehabilitation/filling of the former aggregate pit in accordance with the approved ARA licence rehabilitation plan. Badger has been conducting sampling of stockpiled soil on a weekly basis since 2014 as part of the screening protocol for soil processing. According to the information provided, Badger's hydrovac services are not conducted at sites with known soil or groundwater impacts. Badger staff screen soils in the field for visual and olfactory evidence of contamination. In general, soil is not retained on site for longer than 5 weeks at any time, and soils that exceed the MECP's Table 1 – Full Depth Background Site Condition Standards for Residential/ Parkland/ Institutional/ Industrial/ Commercial/ Community Property Use for Coarse Textured Soils, are segregated and transported to an off-site MECP permitted disposal facility.

Existing Site Drainage:

The existing drainage system for the site consists of a vegetated swale which runs east to west and drains into an on-site stormwater management (SWM) pond located at the west-central property boundary. The swale and pond collect the drainage from the soil stockpiles in addition to overland stormwater runoff in the area. Figure 3 of the Storm Water Management report displays the catchment delineation areas at the property. There is also a natural pond located in the northern area of the site which collects overland runoff in that area of the property. There are no direct point source discharges of stormwater or outfalls from the property to off-site areas. It is noted that Badger is not proposing any new drainage works for the site. Badger will be submitting the application to obtain an ECA for sewage works for the existing SWM system at the site (vegetated swale and SWM pond).

Comments and Recommendations:

The intent of the proceeding review is to provide comments and recommendations regarding the above referenced document from a hydrogeological perspective to the Guelph District Office. The following review comments may be forwarded to the technical consultant.

Hydrogeological Setting:

1. The site is situated with Horseshoe Moraines physiographic region. MNRF mapping identified surficial geology at the site to be ice-contact stratified deposits of a mixture of sand, gravel, silt, sandy silt and some clay/silt layers/seams. Conceptually, GHD has described three hydrostratigraphic units at the site: an upper water bearing ice-contact stratified unit where the water table aquifer is found, a deeper overburden aquifer which may be present separated by a confining unit of silt and/or clay deposits, and an underlying bedrock aquifer comprised of the Guelph Formation. According to MECP GIS mapping, the thickness of overburden in the area is approximately 22 to 33 metres.
2. The consultant installed three monitoring wells in the overburden to evaluate whether there is an impact to the water table aquifer as a result of the soil drainage operations and to determine hydraulic characteristics of the site overburden soils. GHD installed two monitoring wells downgradient of the site operations, MW1-20 and MW2-20, and one monitoring well upgradient (background) of the site operations, MW3-20. According to borehole log information, the monitoring wells were installed at depths between 12.2 to 14.3. meters below ground surface within the ice-contact stratified deposits. GHD describes surficial native soils as consisting of layers of sandy silt, silty sand and sand in borehole logs which was consistent with MNRF surficial geology mapping.

The depth to water table was reported to be approximately 7 to 10 metres below ground surface at the site. GHD interpreted that the shallow groundwater flow direction within the overburden to the south-southwest towards. GHD estimated the geometric mean hydraulic conductivity to be 5.8×10^{-4} cm/sec from in situ testing and predicted vertical hydraulic conductivity of 5.8×10^{-5} cm/sec . The average groundwater flow velocity was estimated to be 11 metres/year.

3. On-site surface water features include a vegetated swale which drains to the west to the on-site SWM pond. According to MNRF mapping, the site surficial soils infiltration rate is considered high, and therefore, there is a lower potential for runoff. Site conditions support MNRF mapping and indicate a prevalence of sand and gravels deposits in the shallow overburden and a several metre depth to the water table below grade. As the SWM pond does not have an outlet, it is inferred that the water is lost primarily through infiltration to the subsurface and to a lesser extent by evapotranspiration.

Potential Receptors:

4. Residents within the Township of Puslinch rely on groundwater wells for potable drinking water as the area is not serviced by municipal water supply. The deep overburden and shallow bedrock aquifers are the significant sources of water supply for domestic water wells in the area. The consultant conducted a desktop private water well survey, and completed on-site reconnaissance to confirm water wells on the property. GHD prepared a separate Water Well Record Search Update memorandum included in Appendix D of the Hydrogeological Impact Assessment report. GHD concluded that there are two active

water wells on the property (WWR# 6705884 and WWR# 670620). WWR# 6705884 is identified as an agricultural well for livestock screened in the deep overburden at 30.8 metres below ground surface. WWR# 670620 is identified as the “site supply well” and is completed as an open hole in bedrock at 24.1 metres below ground surface. GHD indicated that the site supply well is used primarily to fill hydrovac trucks for use at sites.

GHD did not conduct a door-to-door private water well survey for the residential properties and relied on the MECP WWR database for well installation information. GHD concluded there are approximately 13 off-site private WWRs within a 200 metre radius around the property boundary, which extends approximately 500 metres from the area of Badger’s site operations. In general, the WWRs indicated that the private wells were for potable purposes and are screened within the deep overburden or shallow bedrock aquifer at depths ranging from 26.8 metres to 59.1 metres from the ground surface. Although, the current use status of the private water wells were not verified by GHD with the residents, the fact that there is no municipal supply would suggest that some or possibly all of the resident rely on these wells for potable water supply.

5. The regional bedrock aquifer unit within the Guelph Formation is utilized by the City of Cambridge and the City of Guelph for municipal water supply. It is noted that the subject property is located within the Well Head Protection Area (WHPA) – D of the City of Cambridge’s Hespeler and Pinebush well fields, representing the 25 year time of travel for a contaminant to reach the well field. The Hespeler and Pinebush well fields are located about 3.8 and 4.7 kilometres southwest of the property, respectively.

Groundwater Impact Assessment:

6. GHD provided groundwater sampling analysis results in Table 4.1 of the hydrogeological impact assessment report for MW1-20, MW2-20 and MW3-20, for sampling events conducted in November and December 2020. GHD provided groundwater sampling analysis results for site supply wells WWR# 6705884 and WWR# 670620 from three sampling events conducted during July and August 2020 in Tables 4.2 and 4.3 of the hydrogeological impact assessment report. On-site groundwater samples were analyzed for general chemistry, total and dissolved metals, volatile organic compounds (VOCs), semi-volatiles/ polycyclic aromatic hydrocarbons/base neutral extractables (SVOCs/PAHs/BNAS), total petroleum hydrocarbons (TPH) (F1 to F4), polychlorinated biphenyls (PCBs), and oil and grease. Results of the on-site groundwater sampling analysis were reported to be below Ontario Drinking Water Quality Standards and Table 2 – Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Coarse Textured Soils.
7. GHD provided surface water sampling results from the SWM pond from January 2017 to November 2020 in Table 4.4 of the hydrogeological impact assessment report. Surface water samples were analyzed for metals, VOCs, TPH (F1 to F4), and SVOCs/PAHs/BNAS. No exceedances of Provincial Water Quality Objectives (PWQOs) or Table 2 potable groundwater standards were reported.

8. GHD provided stockpiled soil sampling results from January 2017 to November 2020 in Table 1 of the Pre-Consultation Summary document. The consultant indicated that they reviewed 65 soil sample results during this sampling period and compared them to Table 1 Full Depth Background Site Condition for Coarse Textured Soils. GHD stated that there were a few slight exceedances of Table 1 soil standards over the period of sampling.
9. GHD concluded that the operations at the site are not impacting either shallow or deep groundwater based on the on-site groundwater and surface water sampling results. The consultant concluded that in absence of impacts at the on-site wells, which are directly downgradient of the site operations, the likelihood for impact to off-site private water wells is very low. Based on the information provided, this is a reasonable conclusion in my opinion.

Proposed Monitoring Program:

10. GHD proposed the following monitoring program to be conducted at the site:
 - a. *Groundwater sampling of MW1-20, MW2-20, and MW3-20, and two on-Site supply wells be monitored once per year for SVOCs/PAHs only.*
 - b. *Surface water sampling of the operations pond be monitored once per year for SVOCs/PAHs only.*
 - c. *Groundwater levels be monitored in MW1-20, MW2-20, and MW3-20 four times per year.*
 - d. *It is also proposed that a monitoring program report be prepared every 5 years and provided to MECP.*

The proposed monitoring plan is reasonable, however I recommend that the groundwater and surface water sampling be conducted at a higher frequency for the first two years to assess the seasonal changes in groundwater quality and quantity at the site. I also recommend that the parameter list be expanded to also include: VOCs, TPH and metals, in addition to SVOCs/PAHs. This will ensure that there is a comprehensive set of monitoring data for the site. I recommend that the proposed monitoring program be conducted at the site for a period of two years after which time a monitoring report shall be submitted to the MECP for review. The monitoring report should include a summary of soil stockpile sampling results over the two-year period. The monitoring report must be prepared by a Qualified Person (Hydrogeologist or Professional Engineer with relevant expertise) and include analysis and interpretation of all of the monitoring data and an updated assessment of the potential for environmental impact and a technical opinion on whether continued monitoring is necessary.

Limitations:

The purpose of the preceding review is to provide advice to the Ministry of the Environment regarding subsurface conditions based on the information provided in the above referenced documents. The conclusions, opinions and recommendations of the reviewer are based on information provided by others, except where otherwise specifically

noted. The Ministry cannot guarantee that the information that has been provided by others is accurate or complete. A lack of specific comment by the reviewer is not to be construed as endorsing the content or views expressed in the reviewed material.

I trust that this hydrogeological review is sufficient for your purposes. If you have any further comments or questions, please feel free to contact me by phone at (905) 521-7671 or by e-mail at pamela.grande@ontario.ca.

Original signed by

Pamela Grande, M.Sc., P.Geo.
Hydrogeologist

cc: Belinda Koblik, WCR Water Supervisor



February 1, 2021

Reference No. 11210029

Ms. Lynnette Armour
Senior Environmental Officer
Ontario Ministry of the Environment, Conservation and Parks
1 Stone Road West
Guelph, Ontario
N1G 4Y2

Dear Ms. Armour:

**Re: Response to MECP Technical Review Comments
Badger Daylighting & Hydrovac Services
6678 Wellington Road 34, Cambridge, Ontario (Site or Facility)**

GHD Limited (GHD) has prepared this letter, on behalf of 2374868 Ontario Inc., to provide responses to the above-referenced comments which were received in a memorandum dated January 21, 2021. The memorandum provides the MECP West Central Region's technical review of the Hydrogeological Impact Assessment (GHD, December 2020) submitted in support of ECAs for Waste Processing and Industrial Sewage Works (Stormwater) for the Facility. The review also includes the review of the Stormwater Management Plan (GHD, December 2021) and a pre-consultation summary (GHD, October 2020).

The MECP's technical reviewed provide general concurrence with the information provided in the three submittals. Based on this review, the MECP District Office requested that a response be provided to the review comments and that the response would satisfy and complete the ECA pre-consultation requirements. Therefore, 2374868 Ontario Inc./GHD also have completed the preparation of the ECA applications and this response is included in the applications. Copies of the ECA applications also are being submitted to the MECP Guelph District Office.

For convenience, the MECP's review and comments on the Proposed Monitoring Program provided in the Hydrogeological Impact Assessment Report are copied in italics below and 2374868 Ontario Inc./GHD's responses follow.

Comment

10. *GHD proposed the following monitoring program to be conducted at the site:*
 - a) *Groundwater sampling of MW1-20, MW2-20, and MW3-20, and two on-Site supply wells be monitored once per year for SVOCs/PAHs only.*
 - b) *Surface water sampling of the operations pond be monitored once per year for SVOCs/PAHs only.*
 - c) *Groundwater levels be monitored in MW1-20, MW2-20, and MW3-20 four times per year.*
 - d) *It is also proposed that a monitoring program report be prepared every 5 years and provided to MECP.*



The proposed monitoring plan is reasonable, however I recommend that the groundwater and surface water sampling be conducted at a higher frequency for the first two years to assess the seasonal changes in groundwater quality and quantity at the site. I also recommend that the parameter list be expanded to also include: VOCs, TPH and metals, in addition to SVOCs/PAHs. This will ensure that there is a comprehensive set of monitoring data for the site. I recommend that the proposed monitoring program be conducted at the site for a period of two years after which time a monitoring report shall be submitted to the MECP for review. The monitoring report should include a summary of soil stockpile sampling results over the two-year period. The monitoring report must be prepared by a Qualified Person (Hydrogeologist or Professional Engineer with relevant expertise) and include analysis and interpretation of all of the monitoring data and an updated assessment of the potential for environmental impact and a technical opinion on whether continued monitoring is necessary.

Response

The monitoring program will be revised to include at a minimum monthly surface water sampling and quarterly groundwater sampling. VOCs, TPH and metals also will be added to the monitoring parameter list. After two years of monitoring a monitoring report will be prepared by a Qualified Professional which will provide a review of the data, the soil stockpiling data, an assessment of the potential for environmental impact and an opinion on whether continued monitoring is necessary. Soil and surface water sampling is currently ongoing and the groundwater monitoring program will start upon issuance of final ECAs or sooner at 2374868 Ontario Inc.'s discretion.

Please contact the undersigned if you have any questions.

Sincerely,

GHD



Fred K. Taylor, P. Eng., QP

FT/cb/1

cc: Frank Ertl, Badger Hydrovacing
Gary Lagos, GHD

Appendix D

Hydrologic Model Input and Output Files

Modelling Existing Conditions at 2374868 Ontario Inc. in Wellington County, Ontario

```
[OPTIONS]
;;Options          Value
;-----
FLOW_UNITS        CMS
INFILTRATION      HORTON
FLOW_ROUTING      DYNWAVE
LINK_OFFSETS      DEPTH
MIN_SLOPE         0
ALLOW_PONDING     NO
SKIP_STEADY_STATE NO
START_DATE        12/14/2020
START_TIME        00:00:00
REPORT_START_DATE 12/14/2020
REPORT_START_TIME 00:00:00
END_DATE          12/24/2020
END_TIME          00:00:00
SWEEP_START       01/01
SWEEP_END         12/31
DRY_DAYS          0
REPORT_STEP       00:01:00
WET_STEP          00:05:00
DRY_STEP          00:05:00
ROUTING_STEP      5
RULE_STEP         00:00:00
INERTIAL_DAMPING  PARTIAL
NORMAL_FLOW_LIMITED BOTH
FORCE_MAIN_EQUATION H-W
VARIABLE_STEP     0.75
LENGTHENING_STEP 0
MIN_SURFAREA     0
MAX_TRIALS        8
HEAD_TOLERANCE   0.0015
SYS_FLOW_TOL     5
LAT_FLOW_TOL     5
MINIMUM_STEP     0.5
THREADS          2
```

```
[EVAPORATION]
;;Type          Parameters
;-----
CONSTANT       0.0
DRY_ONLY       NO
```

```
[RAINGAGES]
;;
;;Name          Rain Type    Time   Snow   Data
;-----
;-----
SCS_Type_II_108.0mm_25-Year INTENSITY 0:15  1.0   TIMESERIES SCS_Type_II_108.0mm_25-Year
SCS_Type_II_120.0mm_50-Year INTENSITY 0:15  1.0   TIMESERIES SCS_Type_II_120.0mm_50-Year
SCS_Type_II_131.7mm_100-Year INTENSITY 0:15  1.0   TIMESERIES SCS_Type_II_131.7mm_100-Year
SCS_Type_II_60.1mm_2-Year INTENSITY 0:15  1.0   TIMESERIES SCS_Type_II_60.1mm_2-Year
SCS_Type_II_79.4mm_5-Year INTENSITY 0:15  1.0   TIMESERIES SCS_Type_II_79.4mm_5-Year
SCS_Type_II_92.1mm_10-Year INTENSITY 0:15  1.0   TIMESERIES SCS_Type_II_92.1mm_10-Year
```

```
[SUBCATCHMENTS]
;;
;;Name          Raingage      Outlet      Total Area   Pcnt. Imperv   Width   Pcnt. Slope   Curb Length   Snow Pack
;-----
;-----
A101            SCS_Type_II_60.1mm_2-Year J1           2.1578      3             92.609      0.6         0
A102            SCS_Type_II_60.1mm_2-Year J1           3.7199      0             119.611     4.4         0
A103            SCS_Type_II_60.1mm_2-Year Pond           6.8533      0             117.754     7.7         0
```

```
[SUBAREAS]
;;Subcatchment  N-Imperv   N-Perv     S-Imperv   S-Perv     PctZero    RouteTo    PctRouted
;-----
;-----
A101            0.013      0.24       2.5        5           25         OUTLET
A102            0.013      0.24       2.5        5           25         OUTLET
A103            0.013      0.24       2.5        5           25         OUTLET
```

```
[INFILTRATION]
;;Subcatchment  MaxRate    MinRate    Decay      DryTime    MaxInfil
;-----
;-----
A101            76.2       29.97      4           7           0
A102            76.2       29.97      4           7           0
A103            76.2       29.97      4           7           0
```

```
[JUNCTIONS]
;;
;;Name          Invert Elev.    Max. Depth   Init. Depth   Surcharge Depth   Poned Area
;-----
;-----
J1              320       1         0           0           0           0
```

J2 315 1 0 0 0

[OUTFALLS]

```
;;
;;Name      Invert      Outfall      Stage/Table      Tide
            Elev.       Type         Time Series     Gate Route To
-----
OF1         312.75      FREE         NO
```

[STORAGE]

```
;;
;;Name      Invert      Max.      Init.      Storage      Curve      Evap.
            Elev.       Depth     Depth     Curve        Params     Frac.
Infiltration parameters
-----
Pond        306         6.75      3          TABULAR      Pond        0         0
```

[CONDUITS]

```
;;
;;Name      Inlet      Outlet      Length      Manning      Inlet      Outlet      Init.      Max.
            Node      Node         Length      N            Offset     Offset     Flow      Flow
-----
C1          J1         J2          259.963     0.035        0          0          0          0
C2          J2         Pond        62.057      0.035        0          3          0          0
C3          Pond       OF1         62.953      0.013        6.75       0          0          0
```

[XSECTIONS]

```
;;Link      Shape      Geom1      Geom2      Geom3      Geom4      Barrels
-----
C1          TRAPEZOIDAL 0.5        2.5        3          3          1
C2          TRAPEZOIDAL 0.5        2.5        3          3          1
C3          CIRCULAR    1          0          0          0          1
```

[LOSSES]

```
;;Link      Inlet      Outlet      Average      Flap Gate      SeepageRate
-----
```

[CURVES]

```
;;Name      Type      X-Value      Y-Value
-----
Pond        Storage  0            557.65
Pond        Storage  0.25         1612.55
Pond        Storage  0.5          2054.09
Pond        Storage  0.75         2377.35
Pond        Storage  1            2680.36
Pond        Storage  1.25         2962.13
Pond        Storage  1.5          3228.01
Pond        Storage  1.75         3505
Pond        Storage  2            3796.64
Pond        Storage  2.25         4135.53
Pond        Storage  2.5          4539.54
Pond        Storage  2.75         5008.67
Pond        Storage  3            5542.92
Pond        Storage  3.25         6257.42
Pond        Storage  3.5          7018.79
Pond        Storage  3.75         7452.46
Pond        Storage  4            7910.46
Pond        Storage  4.25         8257.16
Pond        Storage  4.5          8613.42
Pond        Storage  4.75         8938.36
Pond        Storage  5            9271.18
Pond        Storage  5.25         9613.69
Pond        Storage  5.5          9963.99
Pond        Storage  5.75         10340.57
Pond        Storage  6            10729.41
Pond        Storage  6.25         11144.04
Pond        Storage  6.5          11574.24
Pond        Storage  6.75         12368.73
```

[TIMESERIES]

```
;;Name      Date      Time      Value
-----
;SCS_Type_II_108.0mm design storm, total rainfall = 108.0 mm, rain units = mm/hr.
SCS_Type_II_108.0mm_25-Year 0:00 1.188
SCS_Type_II_108.0mm_25-Year 0:15 1.188
SCS_Type_II_108.0mm_25-Year 0:30 1.188
SCS_Type_II_108.0mm_25-Year 0:45 1.188
SCS_Type_II_108.0mm_25-Year 1:00 1.188
SCS_Type_II_108.0mm_25-Year 1:15 1.188
SCS_Type_II_108.0mm_25-Year 1:30 1.188
SCS_Type_II_108.0mm_25-Year 1:45 1.188
SCS_Type_II_108.0mm_25-Year 2:00 1.404
SCS_Type_II_108.0mm_25-Year 2:15 1.404
SCS_Type_II_108.0mm_25-Year 2:30 1.404
SCS_Type_II_108.0mm_25-Year 2:45 1.404
SCS_Type_II_108.0mm_25-Year 3:00 1.404
```

SCS_Type_II_108.0mm_25-Year	3:15	1.404
SCS_Type_II_108.0mm_25-Year	3:30	1.404
SCS_Type_II_108.0mm_25-Year	3:45	1.404
SCS_Type_II_108.0mm_25-Year	4:00	1.728
SCS_Type_II_108.0mm_25-Year	4:15	1.728
SCS_Type_II_108.0mm_25-Year	4:30	1.728
SCS_Type_II_108.0mm_25-Year	4:45	1.728
SCS_Type_II_108.0mm_25-Year	5:00	1.728
SCS_Type_II_108.0mm_25-Year	5:15	1.728
SCS_Type_II_108.0mm_25-Year	5:30	1.728
SCS_Type_II_108.0mm_25-Year	5:45	1.728
SCS_Type_II_108.0mm_25-Year	6:00	1.944
SCS_Type_II_108.0mm_25-Year	6:15	1.944
SCS_Type_II_108.0mm_25-Year	6:30	1.944
SCS_Type_II_108.0mm_25-Year	6:45	1.944
SCS_Type_II_108.0mm_25-Year	7:00	2.376
SCS_Type_II_108.0mm_25-Year	7:15	2.376
SCS_Type_II_108.0mm_25-Year	7:30	2.376
SCS_Type_II_108.0mm_25-Year	7:45	2.376
SCS_Type_II_108.0mm_25-Year	8:00	2.808
SCS_Type_II_108.0mm_25-Year	8:15	2.808
SCS_Type_II_108.0mm_25-Year	8:30	3.024
SCS_Type_II_108.0mm_25-Year	8:45	3.024
SCS_Type_II_108.0mm_25-Year	9:00	3.456
SCS_Type_II_108.0mm_25-Year	9:15	3.456
SCS_Type_II_108.0mm_25-Year	9:30	3.888
SCS_Type_II_108.0mm_25-Year	9:45	3.888
SCS_Type_II_108.0mm_25-Year	10:00	4.968
SCS_Type_II_108.0mm_25-Year	10:15	4.968
SCS_Type_II_108.0mm_25-Year	10:30	6.696
SCS_Type_II_108.0mm_25-Year	10:45	6.696
SCS_Type_II_108.0mm_25-Year	11:00	10.368
SCS_Type_II_108.0mm_25-Year	11:15	10.368
SCS_Type_II_108.0mm_25-Year	11:30	31.968
SCS_Type_II_108.0mm_25-Year	11:45	132.192
SCS_Type_II_108.0mm_25-Year	12:00	15.552
SCS_Type_II_108.0mm_25-Year	12:15	15.552
SCS_Type_II_108.0mm_25-Year	12:30	7.992
SCS_Type_II_108.0mm_25-Year	12:45	7.992
SCS_Type_II_108.0mm_25-Year	13:00	5.832
SCS_Type_II_108.0mm_25-Year	13:15	5.832
SCS_Type_II_108.0mm_25-Year	13:30	4.536
SCS_Type_II_108.0mm_25-Year	13:45	4.536
SCS_Type_II_108.0mm_25-Year	14:00	3.24
SCS_Type_II_108.0mm_25-Year	14:15	3.24
SCS_Type_II_108.0mm_25-Year	14:30	3.24
SCS_Type_II_108.0mm_25-Year	14:45	3.24
SCS_Type_II_108.0mm_25-Year	15:00	3.24
SCS_Type_II_108.0mm_25-Year	15:15	3.24
SCS_Type_II_108.0mm_25-Year	15:30	3.24
SCS_Type_II_108.0mm_25-Year	15:45	3.24
SCS_Type_II_108.0mm_25-Year	16:00	1.944
SCS_Type_II_108.0mm_25-Year	16:15	1.944
SCS_Type_II_108.0mm_25-Year	16:30	1.944
SCS_Type_II_108.0mm_25-Year	16:45	1.944
SCS_Type_II_108.0mm_25-Year	17:00	1.944
SCS_Type_II_108.0mm_25-Year	17:15	1.944
SCS_Type_II_108.0mm_25-Year	17:30	1.944
SCS_Type_II_108.0mm_25-Year	17:45	1.944
SCS_Type_II_108.0mm_25-Year	18:00	1.944
SCS_Type_II_108.0mm_25-Year	18:15	1.944
SCS_Type_II_108.0mm_25-Year	18:30	1.944
SCS_Type_II_108.0mm_25-Year	18:45	1.944
SCS_Type_II_108.0mm_25-Year	19:00	1.944
SCS_Type_II_108.0mm_25-Year	19:15	1.944
SCS_Type_II_108.0mm_25-Year	19:30	1.944
SCS_Type_II_108.0mm_25-Year	19:45	1.944
SCS_Type_II_108.0mm_25-Year	20:00	1.296
SCS_Type_II_108.0mm_25-Year	20:15	1.296
SCS_Type_II_108.0mm_25-Year	20:30	1.296
SCS_Type_II_108.0mm_25-Year	20:45	1.296
SCS_Type_II_108.0mm_25-Year	21:00	1.296
SCS_Type_II_108.0mm_25-Year	21:15	1.296
SCS_Type_II_108.0mm_25-Year	21:30	1.296
SCS_Type_II_108.0mm_25-Year	21:45	1.296
SCS_Type_II_108.0mm_25-Year	22:00	1.296
SCS_Type_II_108.0mm_25-Year	22:15	1.296
SCS_Type_II_108.0mm_25-Year	22:30	1.296
SCS_Type_II_108.0mm_25-Year	22:45	1.296
SCS_Type_II_108.0mm_25-Year	23:00	1.296
SCS_Type_II_108.0mm_25-Year	23:15	1.296
SCS_Type_II_108.0mm_25-Year	23:30	1.296
SCS_Type_II_108.0mm_25-Year	23:45	1.296

;SCS_Type_II_120.0mm design storm, total rainfall = 120.0 mm, rain units = mm/hr.

SCS_Type_II_120.0mm_50-Year	0:00	1.32
SCS_Type_II_120.0mm_50-Year	0:15	1.32
SCS_Type_II_120.0mm_50-Year	0:30	1.32
SCS_Type_II_120.0mm_50-Year	0:45	1.32
SCS_Type_II_120.0mm_50-Year	1:00	1.32
SCS_Type_II_120.0mm_50-Year	1:15	1.32
SCS_Type_II_120.0mm_50-Year	1:30	1.32
SCS_Type_II_120.0mm_50-Year	1:45	1.32
SCS_Type_II_120.0mm_50-Year	2:00	1.56
SCS_Type_II_120.0mm_50-Year	2:15	1.56
SCS_Type_II_120.0mm_50-Year	2:30	1.56
SCS_Type_II_120.0mm_50-Year	2:45	1.56
SCS_Type_II_120.0mm_50-Year	3:00	1.56
SCS_Type_II_120.0mm_50-Year	3:15	1.56
SCS_Type_II_120.0mm_50-Year	3:30	1.56
SCS_Type_II_120.0mm_50-Year	3:45	1.56
SCS_Type_II_120.0mm_50-Year	4:00	1.92
SCS_Type_II_120.0mm_50-Year	4:15	1.92
SCS_Type_II_120.0mm_50-Year	4:30	1.92
SCS_Type_II_120.0mm_50-Year	4:45	1.92
SCS_Type_II_120.0mm_50-Year	5:00	1.92
SCS_Type_II_120.0mm_50-Year	5:15	1.92
SCS_Type_II_120.0mm_50-Year	5:30	1.92
SCS_Type_II_120.0mm_50-Year	5:45	1.92
SCS_Type_II_120.0mm_50-Year	6:00	2.16
SCS_Type_II_120.0mm_50-Year	6:15	2.16
SCS_Type_II_120.0mm_50-Year	6:30	2.16
SCS_Type_II_120.0mm_50-Year	6:45	2.16
SCS_Type_II_120.0mm_50-Year	7:00	2.64
SCS_Type_II_120.0mm_50-Year	7:15	2.64
SCS_Type_II_120.0mm_50-Year	7:30	2.64
SCS_Type_II_120.0mm_50-Year	7:45	2.64
SCS_Type_II_120.0mm_50-Year	8:00	3.12
SCS_Type_II_120.0mm_50-Year	8:15	3.12
SCS_Type_II_120.0mm_50-Year	8:30	3.36
SCS_Type_II_120.0mm_50-Year	8:45	3.36
SCS_Type_II_120.0mm_50-Year	9:00	3.84
SCS_Type_II_120.0mm_50-Year	9:15	3.84
SCS_Type_II_120.0mm_50-Year	9:30	4.32
SCS_Type_II_120.0mm_50-Year	9:45	4.32
SCS_Type_II_120.0mm_50-Year	10:00	5.52
SCS_Type_II_120.0mm_50-Year	10:15	5.52
SCS_Type_II_120.0mm_50-Year	10:30	7.44
SCS_Type_II_120.0mm_50-Year	10:45	7.44
SCS_Type_II_120.0mm_50-Year	11:00	11.52
SCS_Type_II_120.0mm_50-Year	11:15	11.52
SCS_Type_II_120.0mm_50-Year	11:30	35.52
SCS_Type_II_120.0mm_50-Year	11:45	146.88
SCS_Type_II_120.0mm_50-Year	12:00	17.28
SCS_Type_II_120.0mm_50-Year	12:15	17.28
SCS_Type_II_120.0mm_50-Year	12:30	8.88
SCS_Type_II_120.0mm_50-Year	12:45	8.88
SCS_Type_II_120.0mm_50-Year	13:00	6.48
SCS_Type_II_120.0mm_50-Year	13:15	6.48
SCS_Type_II_120.0mm_50-Year	13:30	5.04
SCS_Type_II_120.0mm_50-Year	13:45	5.04
SCS_Type_II_120.0mm_50-Year	14:00	3.6
SCS_Type_II_120.0mm_50-Year	14:15	3.6
SCS_Type_II_120.0mm_50-Year	14:30	3.6
SCS_Type_II_120.0mm_50-Year	14:45	3.6
SCS_Type_II_120.0mm_50-Year	15:00	3.6
SCS_Type_II_120.0mm_50-Year	15:15	3.6
SCS_Type_II_120.0mm_50-Year	15:30	3.6
SCS_Type_II_120.0mm_50-Year	15:45	3.6
SCS_Type_II_120.0mm_50-Year	16:00	2.16
SCS_Type_II_120.0mm_50-Year	16:15	2.16
SCS_Type_II_120.0mm_50-Year	16:30	2.16
SCS_Type_II_120.0mm_50-Year	16:45	2.16
SCS_Type_II_120.0mm_50-Year	17:00	2.16
SCS_Type_II_120.0mm_50-Year	17:15	2.16
SCS_Type_II_120.0mm_50-Year	17:30	2.16
SCS_Type_II_120.0mm_50-Year	17:45	2.16
SCS_Type_II_120.0mm_50-Year	18:00	2.16
SCS_Type_II_120.0mm_50-Year	18:15	2.16
SCS_Type_II_120.0mm_50-Year	18:30	2.16
SCS_Type_II_120.0mm_50-Year	18:45	2.16
SCS_Type_II_120.0mm_50-Year	19:00	2.16
SCS_Type_II_120.0mm_50-Year	19:15	2.16
SCS_Type_II_120.0mm_50-Year	19:30	2.16
SCS_Type_II_120.0mm_50-Year	19:45	2.16
SCS_Type_II_120.0mm_50-Year	20:00	1.44
SCS_Type_II_120.0mm_50-Year	20:15	1.44
SCS_Type_II_120.0mm_50-Year	20:30	1.44
SCS_Type_II_120.0mm_50-Year	20:45	1.44
SCS_Type_II_120.0mm_50-Year	21:00	1.44

SCS_Type_II_120.0mm_50-Year	21:15	1.44
SCS_Type_II_120.0mm_50-Year	21:30	1.44
SCS_Type_II_120.0mm_50-Year	21:45	1.44
SCS_Type_II_120.0mm_50-Year	22:00	1.44
SCS_Type_II_120.0mm_50-Year	22:15	1.44
SCS_Type_II_120.0mm_50-Year	22:30	1.44
SCS_Type_II_120.0mm_50-Year	22:45	1.44
SCS_Type_II_120.0mm_50-Year	23:00	1.44
SCS_Type_II_120.0mm_50-Year	23:15	1.44
SCS_Type_II_120.0mm_50-Year	23:30	1.44
SCS_Type_II_120.0mm_50-Year	23:45	1.44

;SCS_Type_II_131.7mm design storm, total rainfall = 131.7 mm, rain units = mm/hr.

SCS_Type_II_131.7mm_100-Year	0:00	1.449
SCS_Type_II_131.7mm_100-Year	0:15	1.449
SCS_Type_II_131.7mm_100-Year	0:30	1.449
SCS_Type_II_131.7mm_100-Year	0:45	1.449
SCS_Type_II_131.7mm_100-Year	1:00	1.449
SCS_Type_II_131.7mm_100-Year	1:15	1.449
SCS_Type_II_131.7mm_100-Year	1:30	1.449
SCS_Type_II_131.7mm_100-Year	1:45	1.449
SCS_Type_II_131.7mm_100-Year	2:00	1.712
SCS_Type_II_131.7mm_100-Year	2:15	1.712
SCS_Type_II_131.7mm_100-Year	2:30	1.712
SCS_Type_II_131.7mm_100-Year	2:45	1.712
SCS_Type_II_131.7mm_100-Year	3:00	1.712
SCS_Type_II_131.7mm_100-Year	3:15	1.712
SCS_Type_II_131.7mm_100-Year	3:30	1.712
SCS_Type_II_131.7mm_100-Year	3:45	1.712
SCS_Type_II_131.7mm_100-Year	4:00	2.107
SCS_Type_II_131.7mm_100-Year	4:15	2.107
SCS_Type_II_131.7mm_100-Year	4:30	2.107
SCS_Type_II_131.7mm_100-Year	4:45	2.107
SCS_Type_II_131.7mm_100-Year	5:00	2.107
SCS_Type_II_131.7mm_100-Year	5:15	2.107
SCS_Type_II_131.7mm_100-Year	5:30	2.107
SCS_Type_II_131.7mm_100-Year	5:45	2.107
SCS_Type_II_131.7mm_100-Year	6:00	2.371
SCS_Type_II_131.7mm_100-Year	6:15	2.371
SCS_Type_II_131.7mm_100-Year	6:30	2.371
SCS_Type_II_131.7mm_100-Year	6:45	2.371
SCS_Type_II_131.7mm_100-Year	7:00	2.897
SCS_Type_II_131.7mm_100-Year	7:15	2.897
SCS_Type_II_131.7mm_100-Year	7:30	2.897
SCS_Type_II_131.7mm_100-Year	7:45	2.897
SCS_Type_II_131.7mm_100-Year	8:00	3.424
SCS_Type_II_131.7mm_100-Year	8:15	3.424
SCS_Type_II_131.7mm_100-Year	8:30	3.688
SCS_Type_II_131.7mm_100-Year	8:45	3.688
SCS_Type_II_131.7mm_100-Year	9:00	4.214
SCS_Type_II_131.7mm_100-Year	9:15	4.214
SCS_Type_II_131.7mm_100-Year	9:30	4.741
SCS_Type_II_131.7mm_100-Year	9:45	4.741
SCS_Type_II_131.7mm_100-Year	10:00	6.058
SCS_Type_II_131.7mm_100-Year	10:15	6.058
SCS_Type_II_131.7mm_100-Year	10:30	8.165
SCS_Type_II_131.7mm_100-Year	10:45	8.165
SCS_Type_II_131.7mm_100-Year	11:00	12.643
SCS_Type_II_131.7mm_100-Year	11:15	12.643
SCS_Type_II_131.7mm_100-Year	11:30	38.983
SCS_Type_II_131.7mm_100-Year	11:45	161.201
SCS_Type_II_131.7mm_100-Year	12:00	18.965
SCS_Type_II_131.7mm_100-Year	12:15	18.965
SCS_Type_II_131.7mm_100-Year	12:30	9.746
SCS_Type_II_131.7mm_100-Year	12:45	9.746
SCS_Type_II_131.7mm_100-Year	13:00	7.112
SCS_Type_II_131.7mm_100-Year	13:15	7.112
SCS_Type_II_131.7mm_100-Year	13:30	5.531
SCS_Type_II_131.7mm_100-Year	13:45	5.531
SCS_Type_II_131.7mm_100-Year	14:00	3.951
SCS_Type_II_131.7mm_100-Year	14:15	3.951
SCS_Type_II_131.7mm_100-Year	14:30	3.951
SCS_Type_II_131.7mm_100-Year	14:45	3.951
SCS_Type_II_131.7mm_100-Year	15:00	3.951
SCS_Type_II_131.7mm_100-Year	15:15	3.951
SCS_Type_II_131.7mm_100-Year	15:30	3.951
SCS_Type_II_131.7mm_100-Year	15:45	3.951
SCS_Type_II_131.7mm_100-Year	16:00	2.371
SCS_Type_II_131.7mm_100-Year	16:15	2.371
SCS_Type_II_131.7mm_100-Year	16:30	2.371
SCS_Type_II_131.7mm_100-Year	16:45	2.371
SCS_Type_II_131.7mm_100-Year	17:00	2.371
SCS_Type_II_131.7mm_100-Year	17:15	2.371
SCS_Type_II_131.7mm_100-Year	17:30	2.371
SCS_Type_II_131.7mm_100-Year	17:45	2.371

SCS_Type_II_131.7mm_100-Year	18:00	2.371
SCS_Type_II_131.7mm_100-Year	18:15	2.371
SCS_Type_II_131.7mm_100-Year	18:30	2.371
SCS_Type_II_131.7mm_100-Year	18:45	2.371
SCS_Type_II_131.7mm_100-Year	19:00	2.371
SCS_Type_II_131.7mm_100-Year	19:15	2.371
SCS_Type_II_131.7mm_100-Year	19:30	2.371
SCS_Type_II_131.7mm_100-Year	19:45	2.371
SCS_Type_II_131.7mm_100-Year	20:00	1.58
SCS_Type_II_131.7mm_100-Year	20:15	1.58
SCS_Type_II_131.7mm_100-Year	20:30	1.58
SCS_Type_II_131.7mm_100-Year	20:45	1.58
SCS_Type_II_131.7mm_100-Year	21:00	1.58
SCS_Type_II_131.7mm_100-Year	21:15	1.58
SCS_Type_II_131.7mm_100-Year	21:30	1.58
SCS_Type_II_131.7mm_100-Year	21:45	1.58
SCS_Type_II_131.7mm_100-Year	22:00	1.58
SCS_Type_II_131.7mm_100-Year	22:15	1.58
SCS_Type_II_131.7mm_100-Year	22:30	1.58
SCS_Type_II_131.7mm_100-Year	22:45	1.58
SCS_Type_II_131.7mm_100-Year	23:00	1.58
SCS_Type_II_131.7mm_100-Year	23:15	1.58
SCS_Type_II_131.7mm_100-Year	23:30	1.58
SCS_Type_II_131.7mm_100-Year	23:45	1.58

;SCS_Type_II_60.1mm design storm, total rainfall = 60.1 mm, rain units = mm/hr.

SCS_Type_II_60.1mm_2-Year	0:00	0.661
SCS_Type_II_60.1mm_2-Year	0:15	0.661
SCS_Type_II_60.1mm_2-Year	0:30	0.661
SCS_Type_II_60.1mm_2-Year	0:45	0.661
SCS_Type_II_60.1mm_2-Year	1:00	0.661
SCS_Type_II_60.1mm_2-Year	1:15	0.661
SCS_Type_II_60.1mm_2-Year	1:30	0.661
SCS_Type_II_60.1mm_2-Year	1:45	0.661
SCS_Type_II_60.1mm_2-Year	2:00	0.781
SCS_Type_II_60.1mm_2-Year	2:15	0.781
SCS_Type_II_60.1mm_2-Year	2:30	0.781
SCS_Type_II_60.1mm_2-Year	2:45	0.781
SCS_Type_II_60.1mm_2-Year	3:00	0.781
SCS_Type_II_60.1mm_2-Year	3:15	0.781
SCS_Type_II_60.1mm_2-Year	3:30	0.781
SCS_Type_II_60.1mm_2-Year	3:45	0.781
SCS_Type_II_60.1mm_2-Year	4:00	0.962
SCS_Type_II_60.1mm_2-Year	4:15	0.962
SCS_Type_II_60.1mm_2-Year	4:30	0.962
SCS_Type_II_60.1mm_2-Year	4:45	0.962
SCS_Type_II_60.1mm_2-Year	5:00	0.962
SCS_Type_II_60.1mm_2-Year	5:15	0.962
SCS_Type_II_60.1mm_2-Year	5:30	0.962
SCS_Type_II_60.1mm_2-Year	5:45	0.962
SCS_Type_II_60.1mm_2-Year	6:00	1.082
SCS_Type_II_60.1mm_2-Year	6:15	1.082
SCS_Type_II_60.1mm_2-Year	6:30	1.082
SCS_Type_II_60.1mm_2-Year	6:45	1.082
SCS_Type_II_60.1mm_2-Year	7:00	1.322
SCS_Type_II_60.1mm_2-Year	7:15	1.322
SCS_Type_II_60.1mm_2-Year	7:30	1.322
SCS_Type_II_60.1mm_2-Year	7:45	1.322
SCS_Type_II_60.1mm_2-Year	8:00	1.563
SCS_Type_II_60.1mm_2-Year	8:15	1.563
SCS_Type_II_60.1mm_2-Year	8:30	1.683
SCS_Type_II_60.1mm_2-Year	8:45	1.683
SCS_Type_II_60.1mm_2-Year	9:00	1.923
SCS_Type_II_60.1mm_2-Year	9:15	1.923
SCS_Type_II_60.1mm_2-Year	9:30	2.164
SCS_Type_II_60.1mm_2-Year	9:45	2.164
SCS_Type_II_60.1mm_2-Year	10:00	2.765
SCS_Type_II_60.1mm_2-Year	10:15	2.765
SCS_Type_II_60.1mm_2-Year	10:30	3.726
SCS_Type_II_60.1mm_2-Year	10:45	3.726
SCS_Type_II_60.1mm_2-Year	11:00	5.77
SCS_Type_II_60.1mm_2-Year	11:15	5.77
SCS_Type_II_60.1mm_2-Year	11:30	17.79
SCS_Type_II_60.1mm_2-Year	11:45	73.562
SCS_Type_II_60.1mm_2-Year	12:00	8.654
SCS_Type_II_60.1mm_2-Year	12:15	8.654
SCS_Type_II_60.1mm_2-Year	12:30	4.447
SCS_Type_II_60.1mm_2-Year	12:45	4.447
SCS_Type_II_60.1mm_2-Year	13:00	3.245
SCS_Type_II_60.1mm_2-Year	13:15	3.245
SCS_Type_II_60.1mm_2-Year	13:30	2.524
SCS_Type_II_60.1mm_2-Year	13:45	2.524
SCS_Type_II_60.1mm_2-Year	14:00	1.803
SCS_Type_II_60.1mm_2-Year	14:15	1.803
SCS_Type_II_60.1mm_2-Year	14:30	1.803

SCS_Type_II_60.1mm_2-Year	14:45	1.803
SCS_Type_II_60.1mm_2-Year	15:00	1.803
SCS_Type_II_60.1mm_2-Year	15:15	1.803
SCS_Type_II_60.1mm_2-Year	15:30	1.803
SCS_Type_II_60.1mm_2-Year	15:45	1.803
SCS_Type_II_60.1mm_2-Year	16:00	1.082
SCS_Type_II_60.1mm_2-Year	16:15	1.082
SCS_Type_II_60.1mm_2-Year	16:30	1.082
SCS_Type_II_60.1mm_2-Year	16:45	1.082
SCS_Type_II_60.1mm_2-Year	17:00	1.082
SCS_Type_II_60.1mm_2-Year	17:15	1.082
SCS_Type_II_60.1mm_2-Year	17:30	1.082
SCS_Type_II_60.1mm_2-Year	17:45	1.082
SCS_Type_II_60.1mm_2-Year	18:00	1.082
SCS_Type_II_60.1mm_2-Year	18:15	1.082
SCS_Type_II_60.1mm_2-Year	18:30	1.082
SCS_Type_II_60.1mm_2-Year	18:45	1.082
SCS_Type_II_60.1mm_2-Year	19:00	1.082
SCS_Type_II_60.1mm_2-Year	19:15	1.082
SCS_Type_II_60.1mm_2-Year	19:30	1.082
SCS_Type_II_60.1mm_2-Year	19:45	1.082
SCS_Type_II_60.1mm_2-Year	20:00	0.721
SCS_Type_II_60.1mm_2-Year	20:15	0.721
SCS_Type_II_60.1mm_2-Year	20:30	0.721
SCS_Type_II_60.1mm_2-Year	20:45	0.721
SCS_Type_II_60.1mm_2-Year	21:00	0.721
SCS_Type_II_60.1mm_2-Year	21:15	0.721
SCS_Type_II_60.1mm_2-Year	21:30	0.721
SCS_Type_II_60.1mm_2-Year	21:45	0.721
SCS_Type_II_60.1mm_2-Year	22:00	0.721
SCS_Type_II_60.1mm_2-Year	22:15	0.721
SCS_Type_II_60.1mm_2-Year	22:30	0.721
SCS_Type_II_60.1mm_2-Year	22:45	0.721
SCS_Type_II_60.1mm_2-Year	23:00	0.721
SCS_Type_II_60.1mm_2-Year	23:15	0.721
SCS_Type_II_60.1mm_2-Year	23:30	0.721
SCS_Type_II_60.1mm_2-Year	23:45	0.721

;SCS_Type_II_79.4mm design storm, total rainfall = 79.4 mm, rain units = mm/hr.

SCS_Type_II_79.4mm_5-Year	0:00	0.873
SCS_Type_II_79.4mm_5-Year	0:15	0.873
SCS_Type_II_79.4mm_5-Year	0:30	0.873
SCS_Type_II_79.4mm_5-Year	0:45	0.873
SCS_Type_II_79.4mm_5-Year	1:00	0.873
SCS_Type_II_79.4mm_5-Year	1:15	0.873
SCS_Type_II_79.4mm_5-Year	1:30	0.873
SCS_Type_II_79.4mm_5-Year	1:45	0.873
SCS_Type_II_79.4mm_5-Year	2:00	1.032
SCS_Type_II_79.4mm_5-Year	2:15	1.032
SCS_Type_II_79.4mm_5-Year	2:30	1.032
SCS_Type_II_79.4mm_5-Year	2:45	1.032
SCS_Type_II_79.4mm_5-Year	3:00	1.032
SCS_Type_II_79.4mm_5-Year	3:15	1.032
SCS_Type_II_79.4mm_5-Year	3:30	1.032
SCS_Type_II_79.4mm_5-Year	3:45	1.032
SCS_Type_II_79.4mm_5-Year	4:00	1.27
SCS_Type_II_79.4mm_5-Year	4:15	1.27
SCS_Type_II_79.4mm_5-Year	4:30	1.27
SCS_Type_II_79.4mm_5-Year	4:45	1.27
SCS_Type_II_79.4mm_5-Year	5:00	1.27
SCS_Type_II_79.4mm_5-Year	5:15	1.27
SCS_Type_II_79.4mm_5-Year	5:30	1.27
SCS_Type_II_79.4mm_5-Year	5:45	1.27
SCS_Type_II_79.4mm_5-Year	6:00	1.429
SCS_Type_II_79.4mm_5-Year	6:15	1.429
SCS_Type_II_79.4mm_5-Year	6:30	1.429
SCS_Type_II_79.4mm_5-Year	6:45	1.429
SCS_Type_II_79.4mm_5-Year	7:00	1.747
SCS_Type_II_79.4mm_5-Year	7:15	1.747
SCS_Type_II_79.4mm_5-Year	7:30	1.747
SCS_Type_II_79.4mm_5-Year	7:45	1.747
SCS_Type_II_79.4mm_5-Year	8:00	2.064
SCS_Type_II_79.4mm_5-Year	8:15	2.064
SCS_Type_II_79.4mm_5-Year	8:30	2.223
SCS_Type_II_79.4mm_5-Year	8:45	2.223
SCS_Type_II_79.4mm_5-Year	9:00	2.541
SCS_Type_II_79.4mm_5-Year	9:15	2.541
SCS_Type_II_79.4mm_5-Year	9:30	2.858
SCS_Type_II_79.4mm_5-Year	9:45	2.858
SCS_Type_II_79.4mm_5-Year	10:00	3.652
SCS_Type_II_79.4mm_5-Year	10:15	3.652
SCS_Type_II_79.4mm_5-Year	10:30	4.923
SCS_Type_II_79.4mm_5-Year	10:45	4.923
SCS_Type_II_79.4mm_5-Year	11:00	7.622
SCS_Type_II_79.4mm_5-Year	11:15	7.622

SCS_Type_II_79.4mm_5-Year	11:30	23.502
SCS_Type_II_79.4mm_5-Year	11:45	97.186
SCS_Type_II_79.4mm_5-Year	12:00	11.434
SCS_Type_II_79.4mm_5-Year	12:15	11.434
SCS_Type_II_79.4mm_5-Year	12:30	5.876
SCS_Type_II_79.4mm_5-Year	12:45	5.876
SCS_Type_II_79.4mm_5-Year	13:00	4.288
SCS_Type_II_79.4mm_5-Year	13:15	4.288
SCS_Type_II_79.4mm_5-Year	13:30	3.335
SCS_Type_II_79.4mm_5-Year	13:45	3.335
SCS_Type_II_79.4mm_5-Year	14:00	2.382
SCS_Type_II_79.4mm_5-Year	14:15	2.382
SCS_Type_II_79.4mm_5-Year	14:30	2.382
SCS_Type_II_79.4mm_5-Year	14:45	2.382
SCS_Type_II_79.4mm_5-Year	15:00	2.382
SCS_Type_II_79.4mm_5-Year	15:15	2.382
SCS_Type_II_79.4mm_5-Year	15:30	2.382
SCS_Type_II_79.4mm_5-Year	15:45	2.382
SCS_Type_II_79.4mm_5-Year	16:00	1.429
SCS_Type_II_79.4mm_5-Year	16:15	1.429
SCS_Type_II_79.4mm_5-Year	16:30	1.429
SCS_Type_II_79.4mm_5-Year	16:45	1.429
SCS_Type_II_79.4mm_5-Year	17:00	1.429
SCS_Type_II_79.4mm_5-Year	17:15	1.429
SCS_Type_II_79.4mm_5-Year	17:30	1.429
SCS_Type_II_79.4mm_5-Year	17:45	1.429
SCS_Type_II_79.4mm_5-Year	18:00	1.429
SCS_Type_II_79.4mm_5-Year	18:15	1.429
SCS_Type_II_79.4mm_5-Year	18:30	1.429
SCS_Type_II_79.4mm_5-Year	18:45	1.429
SCS_Type_II_79.4mm_5-Year	19:00	1.429
SCS_Type_II_79.4mm_5-Year	19:15	1.429
SCS_Type_II_79.4mm_5-Year	19:30	1.429
SCS_Type_II_79.4mm_5-Year	19:45	1.429
SCS_Type_II_79.4mm_5-Year	20:00	0.953
SCS_Type_II_79.4mm_5-Year	20:15	0.953
SCS_Type_II_79.4mm_5-Year	20:30	0.953
SCS_Type_II_79.4mm_5-Year	20:45	0.953
SCS_Type_II_79.4mm_5-Year	21:00	0.953
SCS_Type_II_79.4mm_5-Year	21:15	0.953
SCS_Type_II_79.4mm_5-Year	21:30	0.953
SCS_Type_II_79.4mm_5-Year	21:45	0.953
SCS_Type_II_79.4mm_5-Year	22:00	0.953
SCS_Type_II_79.4mm_5-Year	22:15	0.953
SCS_Type_II_79.4mm_5-Year	22:30	0.953
SCS_Type_II_79.4mm_5-Year	22:45	0.953
SCS_Type_II_79.4mm_5-Year	23:00	0.953
SCS_Type_II_79.4mm_5-Year	23:15	0.953
SCS_Type_II_79.4mm_5-Year	23:30	0.953
SCS_Type_II_79.4mm_5-Year	23:45	0.953

;SCS_Type_II_92.1mm design storm, total rainfall = 92.1 mm, rain units = mm/hr.

SCS_Type_II_92.1mm_10-Year	0:00	1.013
SCS_Type_II_92.1mm_10-Year	0:15	1.013
SCS_Type_II_92.1mm_10-Year	0:30	1.013
SCS_Type_II_92.1mm_10-Year	0:45	1.013
SCS_Type_II_92.1mm_10-Year	1:00	1.013
SCS_Type_II_92.1mm_10-Year	1:15	1.013
SCS_Type_II_92.1mm_10-Year	1:30	1.013
SCS_Type_II_92.1mm_10-Year	1:45	1.013
SCS_Type_II_92.1mm_10-Year	2:00	1.197
SCS_Type_II_92.1mm_10-Year	2:15	1.197
SCS_Type_II_92.1mm_10-Year	2:30	1.197
SCS_Type_II_92.1mm_10-Year	2:45	1.197
SCS_Type_II_92.1mm_10-Year	3:00	1.197
SCS_Type_II_92.1mm_10-Year	3:15	1.197
SCS_Type_II_92.1mm_10-Year	3:30	1.197
SCS_Type_II_92.1mm_10-Year	3:45	1.197
SCS_Type_II_92.1mm_10-Year	4:00	1.474
SCS_Type_II_92.1mm_10-Year	4:15	1.474
SCS_Type_II_92.1mm_10-Year	4:30	1.474
SCS_Type_II_92.1mm_10-Year	4:45	1.474
SCS_Type_II_92.1mm_10-Year	5:00	1.474
SCS_Type_II_92.1mm_10-Year	5:15	1.474
SCS_Type_II_92.1mm_10-Year	5:30	1.474
SCS_Type_II_92.1mm_10-Year	5:45	1.474
SCS_Type_II_92.1mm_10-Year	6:00	1.658
SCS_Type_II_92.1mm_10-Year	6:15	1.658
SCS_Type_II_92.1mm_10-Year	6:30	1.658
SCS_Type_II_92.1mm_10-Year	6:45	1.658
SCS_Type_II_92.1mm_10-Year	7:00	2.026
SCS_Type_II_92.1mm_10-Year	7:15	2.026
SCS_Type_II_92.1mm_10-Year	7:30	2.026
SCS_Type_II_92.1mm_10-Year	7:45	2.026
SCS_Type_II_92.1mm_10-Year	8:00	2.395

SCS_Type_II_92.1mm_10-Year	8:15	2.395
SCS_Type_II_92.1mm_10-Year	8:30	2.579
SCS_Type_II_92.1mm_10-Year	8:45	2.579
SCS_Type_II_92.1mm_10-Year	9:00	2.947
SCS_Type_II_92.1mm_10-Year	9:15	2.947
SCS_Type_II_92.1mm_10-Year	9:30	3.316
SCS_Type_II_92.1mm_10-Year	9:45	3.316
SCS_Type_II_92.1mm_10-Year	10:00	4.237
SCS_Type_II_92.1mm_10-Year	10:15	4.237
SCS_Type_II_92.1mm_10-Year	10:30	5.71
SCS_Type_II_92.1mm_10-Year	10:45	5.71
SCS_Type_II_92.1mm_10-Year	11:00	8.842
SCS_Type_II_92.1mm_10-Year	11:15	8.842
SCS_Type_II_92.1mm_10-Year	11:30	27.262
SCS_Type_II_92.1mm_10-Year	11:45	112.73
SCS_Type_II_92.1mm_10-Year	12:00	13.262
SCS_Type_II_92.1mm_10-Year	12:15	13.262
SCS_Type_II_92.1mm_10-Year	12:30	6.815
SCS_Type_II_92.1mm_10-Year	12:45	6.815
SCS_Type_II_92.1mm_10-Year	13:00	4.973
SCS_Type_II_92.1mm_10-Year	13:15	4.973
SCS_Type_II_92.1mm_10-Year	13:30	3.868
SCS_Type_II_92.1mm_10-Year	13:45	3.868
SCS_Type_II_92.1mm_10-Year	14:00	2.763
SCS_Type_II_92.1mm_10-Year	14:15	2.763
SCS_Type_II_92.1mm_10-Year	14:30	2.763
SCS_Type_II_92.1mm_10-Year	14:45	2.763
SCS_Type_II_92.1mm_10-Year	15:00	2.763
SCS_Type_II_92.1mm_10-Year	15:15	2.763
SCS_Type_II_92.1mm_10-Year	15:30	2.763
SCS_Type_II_92.1mm_10-Year	15:45	2.763
SCS_Type_II_92.1mm_10-Year	16:00	1.658
SCS_Type_II_92.1mm_10-Year	16:15	1.658
SCS_Type_II_92.1mm_10-Year	16:30	1.658
SCS_Type_II_92.1mm_10-Year	16:45	1.658
SCS_Type_II_92.1mm_10-Year	17:00	1.658
SCS_Type_II_92.1mm_10-Year	17:15	1.658
SCS_Type_II_92.1mm_10-Year	17:30	1.658
SCS_Type_II_92.1mm_10-Year	17:45	1.658
SCS_Type_II_92.1mm_10-Year	18:00	1.658
SCS_Type_II_92.1mm_10-Year	18:15	1.658
SCS_Type_II_92.1mm_10-Year	18:30	1.658
SCS_Type_II_92.1mm_10-Year	18:45	1.658
SCS_Type_II_92.1mm_10-Year	19:00	1.658
SCS_Type_II_92.1mm_10-Year	19:15	1.658
SCS_Type_II_92.1mm_10-Year	19:30	1.658
SCS_Type_II_92.1mm_10-Year	19:45	1.658
SCS_Type_II_92.1mm_10-Year	20:00	1.105
SCS_Type_II_92.1mm_10-Year	20:15	1.105
SCS_Type_II_92.1mm_10-Year	20:30	1.105
SCS_Type_II_92.1mm_10-Year	20:45	1.105
SCS_Type_II_92.1mm_10-Year	21:00	1.105
SCS_Type_II_92.1mm_10-Year	21:15	1.105
SCS_Type_II_92.1mm_10-Year	21:30	1.105
SCS_Type_II_92.1mm_10-Year	21:45	1.105
SCS_Type_II_92.1mm_10-Year	22:00	1.105
SCS_Type_II_92.1mm_10-Year	22:15	1.105
SCS_Type_II_92.1mm_10-Year	22:30	1.105
SCS_Type_II_92.1mm_10-Year	22:45	1.105
SCS_Type_II_92.1mm_10-Year	23:00	1.105
SCS_Type_II_92.1mm_10-Year	23:15	1.105
SCS_Type_II_92.1mm_10-Year	23:30	1.105
SCS_Type_II_92.1mm_10-Year	23:45	1.105

[REPORT]
INPUT YES
CONTROLS NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS 559932.735516301 4810753.41347309 560499.854650692 4811371.56003721
UNITS Meters

[COORDINATES]
; ;Node X-Coord Y-Coord
; ;-----
; ;
J1 560405.636 4811081.541
J2 560146.326 4811095.893
OF1 560049.444 4811020.459
Pond 560105.366 4811049.312

```

[VERTICES]
;;Link      X-Coord      Y-Coord
;;-----
C1          560270.923   4811084.402

```

```

[POLYGONS]
;;Subcatchment X-Coord      Y-Coord
;;-----
A101          560441.3     4811101.498
A101          560445.526   4811087.608
A101          560458.452   4811055.579
A101          560459.783   4811033.856
A101          560466.569   4811011.955
A101          560470.176   4810989.799
A101          560474.077   4810985.533
A101          560464.792   4810982.053
A101          560445.732   4810979.165
A101          560434.137   4810979.967
A101          560420.945   4810981.434
A101          560401.209   4810977.86
A101          560378.072   4810973.578
A101          560310.497   4810958.483
A101          560297.938   4810965.389
A101          560291.654   4810982.087
A101          560289.213   4810984.477
A101          560288.139   4810997.447
A101          560282.169   4811010.459
A101          560274.099   4811022.752
A101          560273.585   4811022.708
A101          560259.299   4811021.492
A101          560257.149   4811032.901
A101          560262.997   4811052.025
A101          560279.684   4811054.057
A101          560297.261   4811055.133
A101          560299.225   4811058.35
A101          560299.261   4811066.207
A101          560307.797   4811076.795
A101          560331.79    4811084.789
A101          560357.042   4811092.304
A101          560370.699   4811094.189
A101          560377.855   4811093.251
A101          560398.302   4811089.603
A101          560413.714   4811094.478
A101          560410.201   4811114.254
A101          560412.306   4811121.629
A101          560434.289   4811128.101
A101          560434.428   4811128.115
A101          560434.264   4811127.72
A101          560437.468   4811114.093
A101          560441.3     4811101.498
A102          560257.149   4811032.901
A102          560259.299   4811021.492
A102          560240.409   4811019.884
A102          560199.021   4811013.915
A102          560191.22    4811022.244
A102          560181.432   4811043.388
A102          560156.955   4811083.764
A102          560151.063   4811088.144
A102          560139.33    4811091.072
A102          560140.746   4811092.378
A102          560139.785   4811092.506
A102          560147.932   4811124.075
A102          560151.385   4811150.352
A102          560158.041   4811171.934
A102          560174.517   4811214.6
A102          560194.285   4811242.597
A102          560197.031   4811244.985
A102          560200.953   4811218.446
A102          560211.632   4811204.827
A102          560253.235   4811190.546
A102          560350.464   4811188.709
A102          560424.58    4811192.64
A102          560440.415   4811142.517
A102          560434.428   4811128.115
A102          560434.289   4811128.101
A102          560412.306   4811121.629
A102          560410.201   4811114.254
A102          560413.714   4811094.478
A102          560398.302   4811089.603
A102          560377.855   4811093.251
A102          560370.699   4811094.189
A102          560357.042   4811092.304
A102          560331.79    4811084.789
A102          560307.797   4811076.795
A102          560299.261   4811066.207

```

A102	560299.225	4811058.35
A102	560297.261	4811055.133
A102	560279.684	4811054.057
A102	560262.997	4811052.025
A102	560257.149	4811032.901
A103	560288.139	4810997.447
A103	560289.213	4810984.477
A103	560287.299	4810986.35
A103	560278.852	4810990.803
A103	560272.712	4810991.427
A103	560264.782	4810988.866
A103	560238.804	4810975.327
A103	560223.01	4810967.892
A103	560218.98	4810963.804
A103	560217.836	4810955.284
A103	560218.286	4810950.425
A103	560222.465	4810937.9
A103	560223.35	4810929.804
A103	560215.032	4810905.01
A103	560206.554	4810898.045
A103	560187.935	4810888.154
A103	560172.21	4810873.02
A103	560164.272	4810851.066
A103	560162.783	4810835.654
A103	560162.496	4810822.278
A103	560159.398	4810804.826
A103	560154.602	4810795.462
A103	560148.959	4810789.739
A103	560135.206	4810781.511
A103	560043.003	4811074.378
A103	559958.514	4811343.462
A103	559967.773	4811341.585
A103	560088.87	4811301.905
A103	560148.962	4811270.532
A103	560196.996	4811245.219
A103	560197.031	4811244.985
A103	560194.285	4811242.597
A103	560174.517	4811214.6
A103	560158.041	4811171.934
A103	560151.385	4811150.352
A103	560147.932	4811124.075
A103	560139.785	4811092.506
A103	560140.746	4811092.378
A103	560139.33	4811091.072
A103	560151.063	4811088.144
A103	560156.955	4811083.764
A103	560181.432	4811043.388
A103	560191.22	4811022.244
A103	560199.021	4811013.915
A103	560240.409	4811019.884
A103	560274.099	4811022.752
A103	560282.169	4811010.459
A103	560288.139	4810997.447

[SYMBOLS]

; ;Gage X-Coord Y-Coord
 ; ;-----

 WARNING 04: minimum elevation drop used for Conduit C3

 Element Count

Number of rain gages 6
 Number of subcatchments ... 3
 Number of nodes 4
 Number of links 3
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
SCS_Type_II_108.0mm_25-Year	SCS_Type_II_108.0mm_25-Year	INTENSITY	15 min.
SCS_Type_II_120.0mm_50-Year	SCS_Type_II_120.0mm_50-Year	INTENSITY	15 min.
SCS_Type_II_131.7mm_100-Year	SCS_Type_II_131.7mm_100-Year	INTENSITY	15 min.
SCS_Type_II_60.1mm_2-Year	SCS_Type_II_60.1mm_2-Year	INTENSITY	15 min.
SCS_Type_II_79.4mm_5-Year	SCS_Type_II_79.4mm_5-Year	INTENSITY	15 min.
SCS_Type_II_92.1mm_10-Year	SCS_Type_II_92.1mm_10-Year	INTENSITY	15 min.

 Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A101	2.16	92.61	3.00	0.6000	SCS_Type_II_60.1mm_2-Year	J1
A102	3.72	119.61	0.00	4.4000	SCS_Type_II_60.1mm_2-Year	J1
A103	6.85	117.75	0.00	7.7000	SCS_Type_II_60.1mm_2-Year	Pond

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	320.00	1.00	0.0	
J2	JUNCTION	315.00	1.00	0.0	
OF1	OUTFALL	312.75	1.00	0.0	
Pond	STORAGE	306.00	6.75	0.0	

 Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	J2	CONDUIT	260.0	1.9237	0.0350
C2	J2	Pond	CONDUIT	62.1	9.7140	0.0350
C3	Pond	OF1	CONDUIT	63.0	0.0005	0.0130

 Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	3.96
C2	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	8.90
C3	CIRCULAR	1.00	0.79	0.25	1.00	1	0.05

 NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

 Analysis Options

Flow Units CMS

Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
 Infiltration Method HORTON
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 12/14/2020 00:00:00
 Ending Date 12/24/2020 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:05:00
 Dry Time Step 00:05:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 m

	Volume hectare-m	Depth mm
Runoff Quantity Continuity		
Total Precipitation	0.765	60.100
Evaporation Loss	0.000	0.000
Infiltration Loss	0.760	59.694
Surface Runoff	0.005	0.409
Final Storage	0.000	0.010
Continuity Error (%)	-0.021	

	Volume hectare-m	Volume 10 ⁶ ltr
Flow Routing Continuity		
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.005	0.052
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.974	9.737
Final Stored Volume	0.979	9.789
Continuity Error (%)	0.000	

Highest Continuity Errors
 Node J2 (1.13%)

Time-Step Critical Elements
 None

Highest Flow Instability Indexes
 All links are stable.

Routing Time Step Summary
 Minimum Time Step : 4.50 sec
 Average Time Step : 5.00 sec
 Maximum Time Step : 5.00 sec
 Percent in Steady State : 0.00
 Average Iterations per Step : 2.00
 Percent Not Converging : 0.00

Subcatchment Runoff Summary

Peak Runoff	Runoff Coeff	Total Precip	Total Runon	Total Evap	Total Infil	Imperv Runoff	Perv Runoff	Total Runoff	Total Runoff
Subcatchment	CMS	mm	mm	mm	mm	mm	mm	mm	10^6 ltr
A101	0.02	60.10	0.00	0.00	58.23	1.75	0.07	1.82	0.04
A102	0.030	60.10	0.00	0.00	59.97	0.00	0.15	0.15	0.01
A103	0.002	60.10	0.00	0.00	60.01	0.00	0.11	0.11	0.01
	0.002								

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.03	320.03	0 12:02	0.03
J2	JUNCTION	0.00	0.01	315.01	0 12:05	0.01
OF1	OUTFALL	0.00	0.00	312.75	0 00:00	0.00
Pond	STORAGE	3.01	3.01	309.01	9 00:32	3.01

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.029	0.029	0 12:00	0.0448	0.0448	-0.092
J2	JUNCTION	0.000	0.021	0 12:01	0	0.0449	1.144
OF1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000 ltr
Pond	STORAGE	0.016	0.027	0 12:00	0.00721	9.79	0.002

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Pond	9.786	22	0	0	9.789	22	9 00:32	0.000

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000

 System 0.00 0.000 0.000 0.000

 Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.021	0 12:01	0.41	0.01	0.04
C2	CONDUIT	0.017	0 12:05	0.50	0.00	0.03
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00

 Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	0.80	0.04	0.00	0.16	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.00	0.80	0.00	0.15	0.00	0.00	0.05	0.95	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

 Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Dec 18 09:12:00 2020
 Analysis ended on: Fri Dec 18 09:12:02 2020
 Total elapsed time: 00:00:02

 WARNING 04: minimum elevation drop used for Conduit C3

 Element Count

Number of rain gages 6
 Number of subcatchments ... 3
 Number of nodes 4
 Number of links 3
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
SCS_Type_II_108.0mm_25-Year	SCS_Type_II_108.0mm_25-Year	INTENSITY	15 min.
SCS_Type_II_120.0mm_50-Year	SCS_Type_II_120.0mm_50-Year	INTENSITY	15 min.
SCS_Type_II_131.7mm_100-Year	SCS_Type_II_131.7mm_100-Year	INTENSITY	15 min.
SCS_Type_II_60.1mm_2-Year	SCS_Type_II_60.1mm_2-Year	INTENSITY	15 min.
SCS_Type_II_79.4mm_5-Year	SCS_Type_II_79.4mm_5-Year	INTENSITY	15 min.
SCS_Type_II_92.1mm_10-Year	SCS_Type_II_92.1mm_10-Year	INTENSITY	15 min.

 Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A101	2.16	92.61	3.00	0.6000	SCS_Type_II_79.4mm_5-Year	J1
A102	3.72	119.61	0.00	4.4000	SCS_Type_II_79.4mm_5-Year	J1
A103	6.85	117.75	0.00	7.7000	SCS_Type_II_79.4mm_5-Year	Pond

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	320.00	1.00	0.0	
J2	JUNCTION	315.00	1.00	0.0	
OF1	OUTFALL	312.75	1.00	0.0	
Pond	STORAGE	306.00	6.75	0.0	

 Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	J2	CONDUIT	260.0	1.9237	0.0350
C2	J2	Pond	CONDUIT	62.1	9.7140	0.0350
C3	Pond	OF1	CONDUIT	63.0	0.0005	0.0130

 Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	3.96
C2	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	8.90
C3	CIRCULAR	1.00	0.79	0.25	1.00	1	0.05

 NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

 Analysis Options

Flow Units CMS

Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
 Infiltration Method HORTON
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 12/14/2020 00:00:00
 Ending Date 12/24/2020 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:05:00
 Dry Time Step 00:05:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 m

	Volume hectare-m	Depth mm
Runoff Quantity Continuity		
Total Precipitation	1.011	79.398
Evaporation Loss	0.000	0.000
Infiltration Loss	0.993	77.976
Surface Runoff	0.018	1.441
Final Storage	0.000	0.010
Continuity Error (%)	-0.036	

	Volume hectare-m	Volume 10 ⁶ ltr
Flow Routing Continuity		
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.018	0.183
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.974	9.737
Final Stored Volume	0.992	9.920
Continuity Error (%)	-0.001	

Highest Continuity Errors
 Node J2 (1.61%)

Time-Step Critical Elements
 None

Highest Flow Instability Indexes
 All links are stable.

Routing Time Step Summary
 Minimum Time Step : 4.50 sec
 Average Time Step : 5.00 sec
 Maximum Time Step : 5.00 sec
 Percent in Steady State : 0.00
 Average Iterations per Step : 2.00
 Percent Not Converging : 0.00

Subcatchment Runoff Summary

Peak Runoff	Runoff Coeff	Total Precip	Total Runon	Total Evap	Total Infil	Imperv Runoff	Perv Runoff	Total Runoff	Total Runoff
Subcatchment	CMS	mm	mm	mm	mm	mm	mm	mm	10^6 ltr
A101	0.03	79.40	0.00	0.00	76.32	2.33	0.72	3.05	0.07
A102	0.038	79.40	0.00	0.00	78.10	0.00	1.34	1.34	0.05
A103	0.06	79.40	0.00	0.00	78.43	0.00	0.99	0.99	0.07
	0.017								
	0.012								

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.06	320.06	0 12:02	0.06
J2	JUNCTION	0.00	0.03	315.03	0 12:05	0.03
OF1	OUTFALL	0.00	0.00	312.75	0 00:00	0.00
Pond	STORAGE	3.03	3.03	309.03	9 05:06	3.03

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.089	0.089	0 12:00	0.115	0.115	-0.092
J2	JUNCTION	0.000	0.072	0 12:02	0	0.116	1.640
OF1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000
Pond	STORAGE	0.073	0.120	0 12:03	0.068	9.92	0.007

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Pond	9.909	23	0	0	9.918	23	9 05:06	0.000

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000

 System 0.00 0.000 0.000 0.000

 Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.072	0 12:02	0.66	0.02	0.08
C2	CONDUIT	0.065	0 12:05	0.84	0.01	0.06
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00

 Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl	
C1	1.00	0.80	0.04	0.00	0.16	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.00	0.80	0.00	0.15	0.00	0.00	0.05	0.95	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

 Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Dec 18 09:20:40 2020
 Analysis ended on: Fri Dec 18 09:20:41 2020
 Total elapsed time: 00:00:01

 WARNING 04: minimum elevation drop used for Conduit C3

 Element Count

Number of rain gages 6
 Number of subcatchments ... 3
 Number of nodes 4
 Number of links 3
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
SCS_Type_II_108.0mm_25-Year	SCS_Type_II_108.0mm_25-Year	INTENSITY	15 min.
SCS_Type_II_120.0mm_50-Year	SCS_Type_II_120.0mm_50-Year	INTENSITY	15 min.
SCS_Type_II_131.7mm_100-Year	SCS_Type_II_131.7mm_100-Year	INTENSITY	15 min.
SCS_Type_II_60.1mm_2-Year	SCS_Type_II_60.1mm_2-Year	INTENSITY	15 min.
SCS_Type_II_79.4mm_5-Year	SCS_Type_II_79.4mm_5-Year	INTENSITY	15 min.
SCS_Type_II_92.1mm_10-Year	SCS_Type_II_92.1mm_10-Year	INTENSITY	15 min.

 Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A101	2.16	92.61	3.00	0.6000	SCS_Type_II_92.1mm_10-Year	J1
A102	3.72	119.61	0.00	4.4000	SCS_Type_II_92.1mm_10-Year	J1
A103	6.85	117.75	0.00	7.7000	SCS_Type_II_92.1mm_10-Year	Pond

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	320.00	1.00	0.0	
J2	JUNCTION	315.00	1.00	0.0	
OF1	OUTFALL	312.75	1.00	0.0	
Pond	STORAGE	306.00	6.75	0.0	

 Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	J2	CONDUIT	260.0	1.9237	0.0350
C2	J2	Pond	CONDUIT	62.1	9.7140	0.0350
C3	Pond	OF1	CONDUIT	63.0	0.0005	0.0130

 Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	3.96
C2	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	8.90
C3	CIRCULAR	1.00	0.79	0.25	1.00	1	0.05

 NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

 Analysis Options

Flow Units CMS

Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
 Infiltration Method HORTON
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 12/14/2020 00:00:00
 Ending Date 12/24/2020 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:05:00
 Dry Time Step 00:05:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 m

	Volume hectare-m	Depth mm
Runoff Quantity Continuity		
Total Precipitation	1.173	92.100
Evaporation Loss	0.000	0.000
Infiltration Loss	1.138	89.394
Surface Runoff	0.035	2.740
Final Storage	0.000	0.010
Continuity Error (%)	-0.047	

	Volume hectare-m	Volume 10 ⁶ ltr
Flow Routing Continuity		
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.035	0.349
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.974	9.737
Final Stored Volume	1.009	10.086
Continuity Error (%)	-0.003	

Highest Continuity Errors
 Node J2 (1.47%)

Time-Step Critical Elements
 None

Highest Flow Instability Indexes
 All links are stable.

Routing Time Step Summary
 Minimum Time Step : 4.50 sec
 Average Time Step : 5.00 sec
 Maximum Time Step : 5.00 sec
 Percent in Steady State : 0.00
 Average Iterations per Step : 2.00
 Percent Not Converging : 0.00

Subcatchment Runoff Summary

Peak Runoff	Runoff Coeff	Total Precip	Total Runon	Total Evap	Total Infil	Imperv Runoff	Perv Runoff	Total Runoff	Total Runoff
Subcatchment	CMS	mm	mm	mm	mm	mm	mm	mm	10^6 ltr
A101	0.05	92.10	0.00	0.00	87.76	2.71	1.61	4.32	0.09
A102	0.047	92.10	0.00	0.00	89.30	0.00	2.86	2.86	0.11
A103	0.031	92.10	0.00	0.00	89.96	0.00	2.18	2.18	0.15
	0.12								

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.08	320.08	0 12:02	0.08
J2	JUNCTION	0.00	0.04	315.04	0 12:05	0.04
OF1	OUTFALL	0.00	0.00	312.75	0 00:00	0.00
Pond	STORAGE	3.06	3.06	309.06	9 10:24	3.06

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.140	0.140	0 12:00	0.199	0.199	-0.081
J2	JUNCTION	0.000	0.120	0 12:02	0	0.2	1.493
OF1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000
Pond	STORAGE	0.122	0.213	0 12:03	0.149	10.1	0.020

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Pond	10.064	23	0	0	10.082	23	9 10:24	0.000

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000

 System 0.00 0.000 0.000 0.000

 Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.120	0 12:02	0.79	0.03	0.12
C2	CONDUIT	0.112	0 12:05	1.03	0.01	0.08
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00

 Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	0.80	0.04	0.00	0.16	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.00	0.80	0.00	0.15	0.00	0.00	0.05	0.95	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

 Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Dec 18 09:21:15 2020
 Analysis ended on: Fri Dec 18 09:21:16 2020
 Total elapsed time: 00:00:01

 WARNING 04: minimum elevation drop used for Conduit C3

 Element Count

Number of rain gages 6
 Number of subcatchments ... 3
 Number of nodes 4
 Number of links 3
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
SCS_Type_II_108.0mm_25-Year	SCS_Type_II_108.0mm_25-Year	INTENSITY	15 min.
SCS_Type_II_120.0mm_50-Year	SCS_Type_II_120.0mm_50-Year	INTENSITY	15 min.
SCS_Type_II_131.7mm_100-Year	SCS_Type_II_131.7mm_100-Year	INTENSITY	15 min.
SCS_Type_II_60.1mm_2-Year	SCS_Type_II_60.1mm_2-Year	INTENSITY	15 min.
SCS_Type_II_79.4mm_5-Year	SCS_Type_II_79.4mm_5-Year	INTENSITY	15 min.
SCS_Type_II_92.1mm_10-Year	SCS_Type_II_92.1mm_10-Year	INTENSITY	15 min.

 Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A101	2.16	92.61	3.00	0.6000	SCS_Type_II_108.0mm_25-Year	J1
A102	3.72	119.61	0.00	4.4000	SCS_Type_II_108.0mm_25-Year	J1
A103	6.85	117.75	0.00	7.7000	SCS_Type_II_108.0mm_25-Year	Pond

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	320.00	1.00	0.0	
J2	JUNCTION	315.00	1.00	0.0	
OF1	OUTFALL	312.75	1.00	0.0	
Pond	STORAGE	306.00	6.75	0.0	

 Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	J2	CONDUIT	260.0	1.9237	0.0350
C2	J2	Pond	CONDUIT	62.1	9.7140	0.0350
C3	Pond	OF1	CONDUIT	63.0	0.0005	0.0130

 Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	3.96
C2	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	8.90
C3	CIRCULAR	1.00	0.79	0.25	1.00	1	0.05

 NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

 Analysis Options

Flow Units CMS

Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
 Infiltration Method HORTON
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 12/14/2020 00:00:00
 Ending Date 12/24/2020 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:05:00
 Dry Time Step 00:05:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 m

	Volume hectare-m	Depth mm
Runoff Quantity Continuity		
Total Precipitation	1.375	108.000
Evaporation Loss	0.000	0.000
Infiltration Loss	1.312	103.036
Surface Runoff	0.064	5.022
Final Storage	0.000	0.010
Continuity Error (%)	-0.063	

	Volume hectare-m	Volume 10 ⁶ ltr
Flow Routing Continuity		
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.064	0.639
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.974	9.737
Final Stored Volume	1.038	10.377
Continuity Error (%)	-0.007	

Highest Continuity Errors
 Node J2 (1.21%)

Time-Step Critical Elements
 None

Highest Flow Instability Indexes
 All links are stable.

Routing Time Step Summary
 Minimum Time Step : 4.50 sec
 Average Time Step : 5.00 sec
 Maximum Time Step : 5.00 sec
 Percent in Steady State : 0.00
 Average Iterations per Step : 2.00
 Percent Not Converging : 0.00

Subcatchment Runoff Summary

Peak Runoff	Runoff Coeff	Total Precip	Total Runon	Total Evap	Total Infil	Imperv Runoff	Perv Runoff	Total Runoff	Total Runoff
Subcatchment	CMS	mm	mm	mm	mm	mm	mm	mm	10^6 ltr
A101	0.07	108.00	0.00	0.00	101.54	3.19	3.26	6.45	0.14
A102	0.15	108.00	0.00	0.00	102.59	0.00	5.49	5.49	0.20
A103	0.19	108.00	0.00	0.00	103.75	0.00	4.32	4.32	0.30

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.10	320.10	0 12:02	0.10
J2	JUNCTION	0.00	0.06	315.06	0 12:04	0.06
OF1	OUTFALL	0.00	0.00	312.75	0 00:00	0.00
Pond	STORAGE	3.10	3.11	309.11	9 16:38	3.11

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.213	0.213	0 12:00	0.344	0.344	-0.070
J2	JUNCTION	0.000	0.191	0 12:02	0	0.344	1.225
OF1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000
Pond	STORAGE	0.195	0.351	0 12:03	0.296	10.4	0.048

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Pond	10.336	24	0	0	10.368	24	9 16:38	0.000

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000

 System 0.00 0.000 0.000 0.000

 Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.191	0 12:02	0.92	0.05	0.15
C2	CONDUIT	0.181	0 12:04	1.23	0.02	0.12
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00

 Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	0.80	0.04	0.00	0.16	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.01	0.80	0.00	0.15	0.00	0.00	0.04	0.95	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

 Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Dec 18 09:21:55 2020
 Analysis ended on: Fri Dec 18 09:21:58 2020
 Total elapsed time: 00:00:03

 WARNING 04: minimum elevation drop used for Conduit C3

 Element Count

Number of rain gages 6
 Number of subcatchments ... 3
 Number of nodes 4
 Number of links 3
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
SCS_Type_II_108.0mm_25-Year	SCS_Type_II_108.0mm_25-Year	INTENSITY	15 min.
SCS_Type_II_120.0mm_50-Year	SCS_Type_II_120.0mm_50-Year	INTENSITY	15 min.
SCS_Type_II_131.7mm_100-Year	SCS_Type_II_131.7mm_100-Year	INTENSITY	15 min.
SCS_Type_II_60.1mm_2-Year	SCS_Type_II_60.1mm_2-Year	INTENSITY	15 min.
SCS_Type_II_79.4mm_5-Year	SCS_Type_II_79.4mm_5-Year	INTENSITY	15 min.
SCS_Type_II_92.1mm_10-Year	SCS_Type_II_92.1mm_10-Year	INTENSITY	15 min.

 Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A101	2.16	92.61	3.00	0.6000	SCS_Type_II_120.0mm_50-Year	J1
A102	3.72	119.61	0.00	4.4000	SCS_Type_II_120.0mm_50-Year	J1
A103	6.85	117.75	0.00	7.7000	SCS_Type_II_120.0mm_50-Year	Pond

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	320.00	1.00	0.0	
J2	JUNCTION	315.00	1.00	0.0	
OF1	OUTFALL	312.75	1.00	0.0	
Pond	STORAGE	306.00	6.75	0.0	

 Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	J2	CONDUIT	260.0	1.9237	0.0350
C2	J2	Pond	CONDUIT	62.1	9.7140	0.0350
C3	Pond	OF1	CONDUIT	63.0	0.0005	0.0130

 Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	3.96
C2	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	8.90
C3	CIRCULAR	1.00	0.79	0.25	1.00	1	0.05

 NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

 Analysis Options

Flow Units CMS

Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
 Infiltration Method HORTON
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 12/14/2020 00:00:00
 Ending Date 12/24/2020 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:05:00
 Dry Time Step 00:05:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 m

	Volume hectare-m	Depth mm
Runoff Quantity Continuity		
Total Precipitation	1.528	120.000
Evaporation Loss	0.000	0.000
Infiltration Loss	1.431	112.402
Surface Runoff	0.098	7.680
Final Storage	0.000	0.010
Continuity Error (%)	-0.076	

	Volume hectare-m	Volume 10 ⁶ ltr
Flow Routing Continuity		
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.098	0.978
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.974	9.737
Final Stored Volume	1.072	10.716
Continuity Error (%)	-0.013	

Highest Continuity Errors
 Node J2 (1.04%)

Time-Step Critical Elements
 None

Highest Flow Instability Indexes
 All links are stable.

Routing Time Step Summary
 Minimum Time Step : 4.50 sec
 Average Time Step : 5.00 sec
 Maximum Time Step : 5.00 sec
 Percent in Steady State : 0.00
 Average Iterations per Step : 2.00
 Percent Not Converging : 0.00

Subcatchment Runoff Summary

Peak Runoff	Runoff Coeff	Total Precip	Total Runon	Total Evap	Total Infil	Imperv Runoff	Perv Runoff	Total Runoff	Total Runoff
Subcatchment	CMS	mm	mm	mm	mm	mm	mm	mm	10^6 ltr
A101	0.09	120.00	0.00	0.00	111.17	3.55	5.29	8.84	0.19
A102	0.074	120.00	0.00	0.00	111.60	0.00	8.52	8.52	0.32
A103	0.071	120.00	0.00	0.00	113.23	0.00	6.86	6.86	0.47
	0.27								

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.12	320.12	0 12:02	0.12
J2	JUNCTION	0.00	0.07	315.07	0 12:04	0.07
OF1	OUTFALL	0.00	0.00	312.75	0 00:00	0.00
Pond	STORAGE	3.16	3.17	309.17	9 12:44	3.17

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.289	0.289	0 12:00	0.508	0.508	-0.060
J2	JUNCTION	0.000	0.265	0 12:02	0	0.508	1.056
OF1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000
Pond	STORAGE	0.272	0.498	0 12:03	0.47	10.7	0.085

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Pond	10.652	24	0	0	10.701	24	9 12:44	0.000

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000

 System 0.00 0.000 0.000 0.000

 Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.265	0 12:02	1.03	0.07	0.19
C2	CONDUIT	0.255	0 12:04	1.40	0.03	0.18
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00

 Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	0.80	0.04	0.00	0.16	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.00	0.80	0.00	0.15	0.00	0.00	0.05	0.95	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

 Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Dec 18 09:22:58 2020
 Analysis ended on: Fri Dec 18 09:23:00 2020
 Total elapsed time: 00:00:02

 WARNING 04: minimum elevation drop used for Conduit C3

 Element Count

Number of rain gages 6
 Number of subcatchments ... 3
 Number of nodes 4
 Number of links 3
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
SCS_Type_II_108.0mm_25-Year	SCS_Type_II_108.0mm_25-Year	INTENSITY	15 min.
SCS_Type_II_120.0mm_50-Year	SCS_Type_II_120.0mm_50-Year	INTENSITY	15 min.
SCS_Type_II_131.7mm_100-Year	SCS_Type_II_131.7mm_100-Year	INTENSITY	15 min.
SCS_Type_II_60.1mm_2-Year	SCS_Type_II_60.1mm_2-Year	INTENSITY	15 min.
SCS_Type_II_79.4mm_5-Year	SCS_Type_II_79.4mm_5-Year	INTENSITY	15 min.
SCS_Type_II_92.1mm_10-Year	SCS_Type_II_92.1mm_10-Year	INTENSITY	15 min.

 Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A101	2.16	92.61	3.00	0.6000	SCS_Type_II_131.7mm_100-Year	J1
A102	3.72	119.61	0.00	4.4000	SCS_Type_II_131.7mm_100-Year	J1
A103	6.85	117.75	0.00	7.7000	SCS_Type_II_131.7mm_100-Year	Pond

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	320.00	1.00	0.0	
J2	JUNCTION	315.00	1.00	0.0	
OF1	OUTFALL	312.75	1.00	0.0	
Pond	STORAGE	306.00	6.75	0.0	

 Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	J2	CONDUIT	260.0	1.9237	0.0350
C2	J2	Pond	CONDUIT	62.1	9.7140	0.0350
C3	Pond	OF1	CONDUIT	63.0	0.0005	0.0130

 Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	3.96
C2	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	8.90
C3	CIRCULAR	1.00	0.79	0.25	1.00	1	0.05

 NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

 Analysis Options

Flow Units CMS

Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
 Infiltration Method HORTON
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 12/14/2020 00:00:00
 Ending Date 12/24/2020 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:05:00
 Dry Time Step 00:05:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 m

```

*****
Volume      Depth
Runoff Quantity Continuity  hectare-m      mm
*****
Total Precipitation ..... 1.677          131.699
Evaporation Loss ..... 0.000          0.000
Infiltration Loss ..... 1.541          121.076
Surface Runoff ..... 0.137          10.724
Final Storage ..... 0.000          0.010
Continuity Error (%) ..... -0.083
  
```

```

*****
Volume      Volume
Flow Routing Continuity  hectare-m      10^6 ltr
*****
Dry Weather Inflow ..... 0.000          0.000
Wet Weather Inflow ..... 0.137          1.365
Groundwater Inflow ..... 0.000          0.000
RDII Inflow ..... 0.000          0.000
External Inflow ..... 0.000          0.000
External Outflow ..... 0.000          0.000
Flooding Loss ..... 0.000          0.000
Evaporation Loss ..... 0.000          0.000
Exfiltration Loss ..... 0.000          0.000
Initial Stored Volume .... 0.974          9.737
Final Stored Volume ..... 1.110          11.104
Continuity Error (%) ..... -0.020
  
```

 Time-Step Critical Elements

 None

 Highest Flow Instability Indexes

 All links are stable.

```

*****
Routing Time Step Summary
*****
Minimum Time Step      : 4.50 sec
Average Time Step      : 5.00 sec
Maximum Time Step      : 5.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00
  
```

 Subcatchment Runoff Summary

```

-----
Peak Runoff          Total      Total      Total      Total      Imperv      Perv      Total      Total
Runoff Coeff        Precip     Runon     Evap     Infil     Runoff     Runoff     Runoff     Runoff
  
```

Subcatchment	mm	mm	mm	mm	mm	mm	mm	mm	10 ⁶ ltr
CMS									
A101	131.70	0.00	0.00	120.12	3.90	7.70	11.60		0.25
0.11 0.088									
A102	131.70	0.00	0.00	119.92	0.00	11.92	11.92		0.44
0.26 0.091									
A103	131.70	0.00	0.00	122.00	0.00	9.80	9.80		0.67
0.35 0.074									

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.14	320.14	0 12:01	0.14
J2	JUNCTION	0.00	0.08	315.08	0 12:03	0.08
OF1	OUTFALL	0.00	0.00	312.75	0 00:00	0.00
Pond	STORAGE	3.22	3.23	309.23	9 15:14	3.23

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10 ⁶ ltr	Total Inflow Volume 10 ⁶ ltr	Flow Balance Error Percent
J1	JUNCTION	0.371	0.371	0 12:00	0.694	0.694	-0.055
J2	JUNCTION	0.000	0.344	0 12:02	0	0.694	0.912
OF1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000 ltr
Pond	STORAGE	0.355	0.656	0 12:02	0.671	11.1	0.131

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Pond	11.013	25	0	0	11.082	25	9 15:14	0.000

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10 ⁶ ltr
OF1	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.344	0 12:02	1.13	0.09	0.22
C2	CONDUIT	0.333	0 12:03	1.54	0.04	0.24
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00

Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl	
C1	1.00	0.80	0.04	0.00	0.16	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.01	0.80	0.00	0.15	0.00	0.00	0.04	0.95	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Dec 18 09:23:34 2020
Analysis ended on: Fri Dec 18 09:23:35 2020
Total elapsed time: 00:00:01



about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

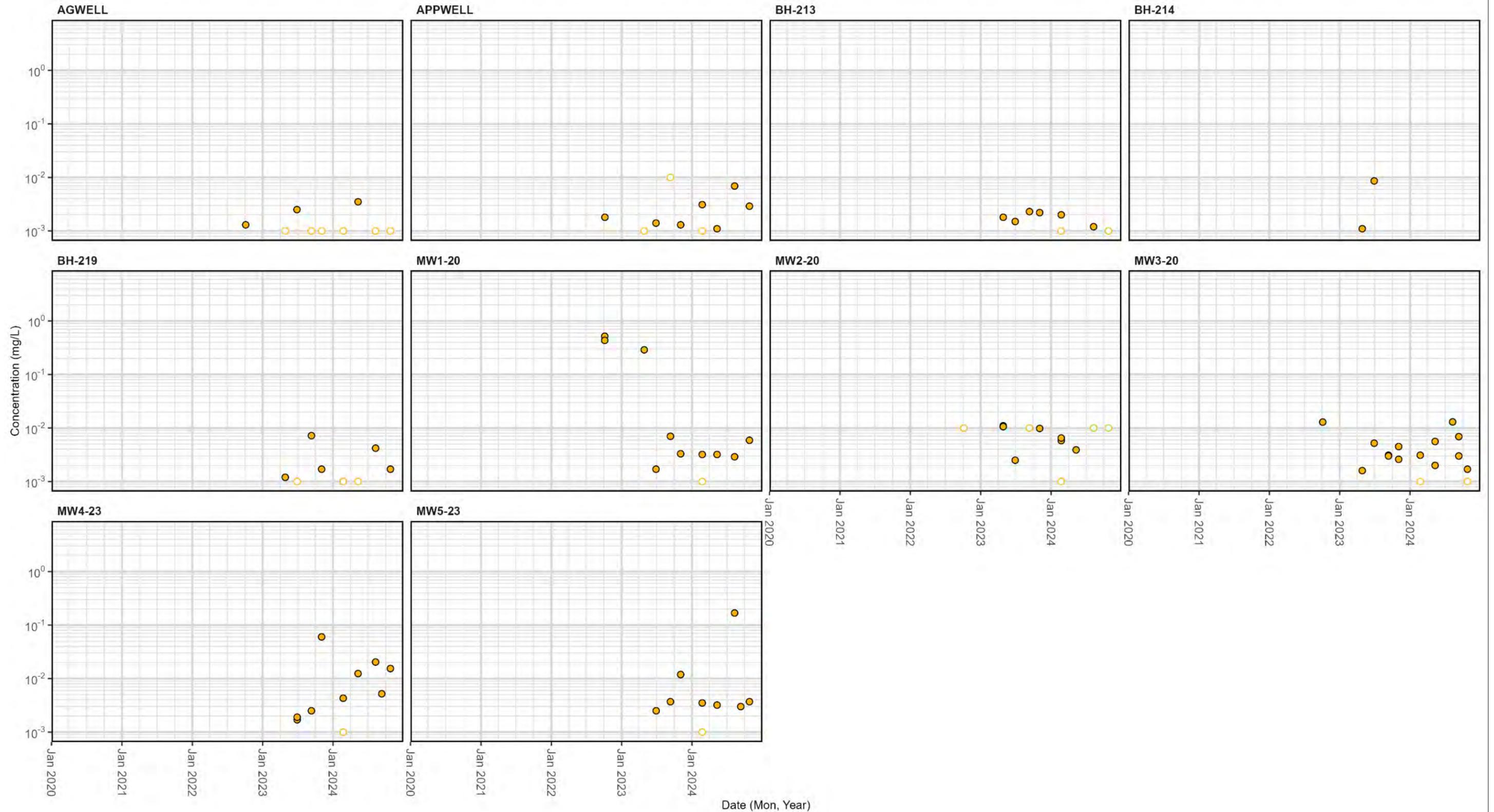
Nishant Patel, EIT
Nishant.Patel@ghd.com
519.340.3842

www.ghd.com

Appendix I

Concentration vs. Time Plots

Aluminum



LEGEND
 ● DISSOLVED CONCENTRATION (mg/L)
 ○ NON-DETECT CONCENTRATION VALUE (mg/L)

NOTE:
 BH-213 AND BH-219 MEASURE BACKGROUND CONDITIONS

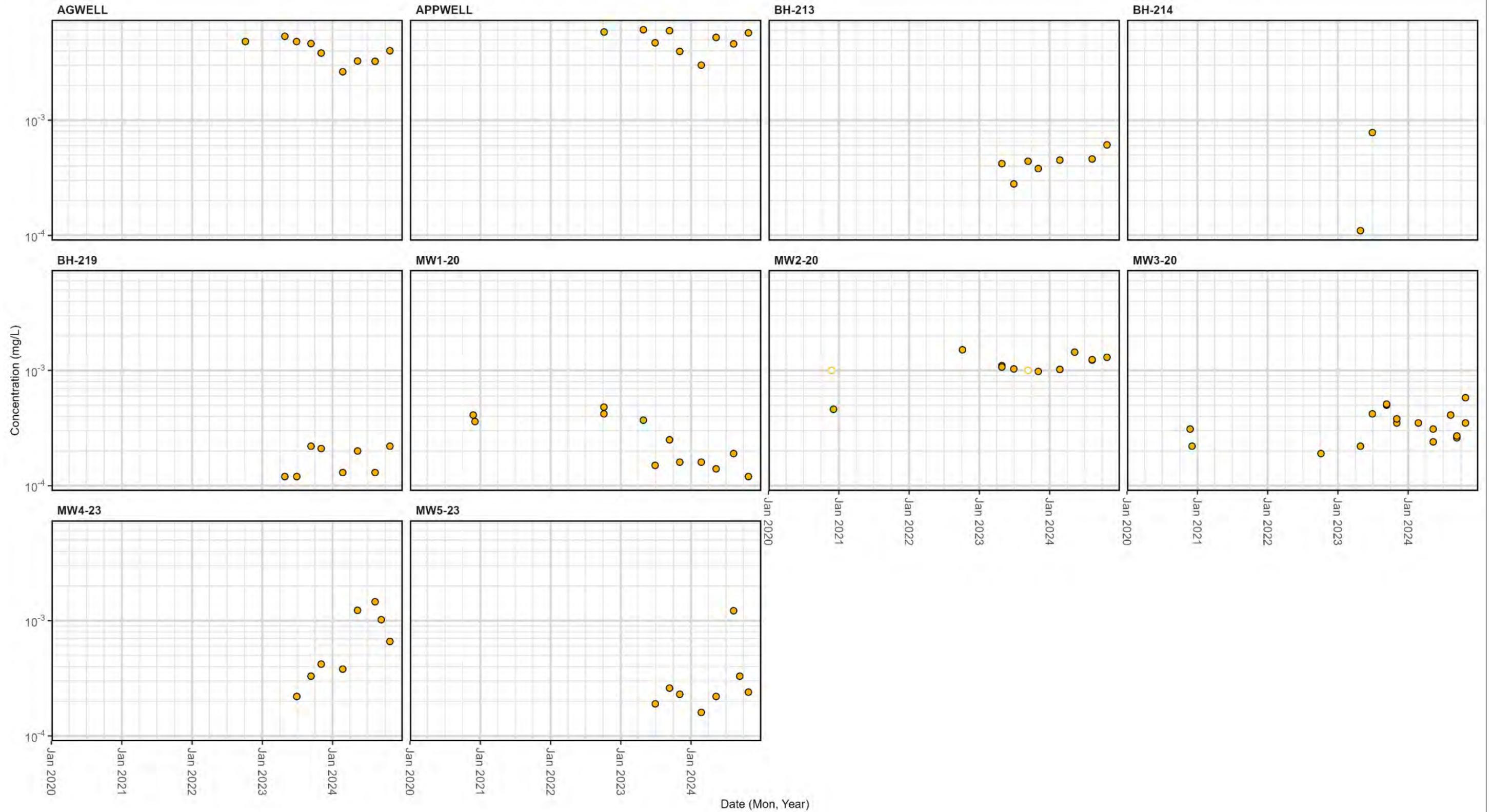


2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON
**HISTORICAL ALUMINUM
 CONCENTRATION PROFILES
 AT SITE AREA MONITORING WELLS**

Project No. 11210029
 Date March 2025

APPENDIX I.1

Arsenic



LEGEND
 ● DISSOLVED CONCENTRATION (mg/L)
 ○ NON-DETECT CONCENTRATION VALUE (mg/L)

NOTE:
 BH-213 AND BH-219 MEASURE BACKGROUND CONDITIONS

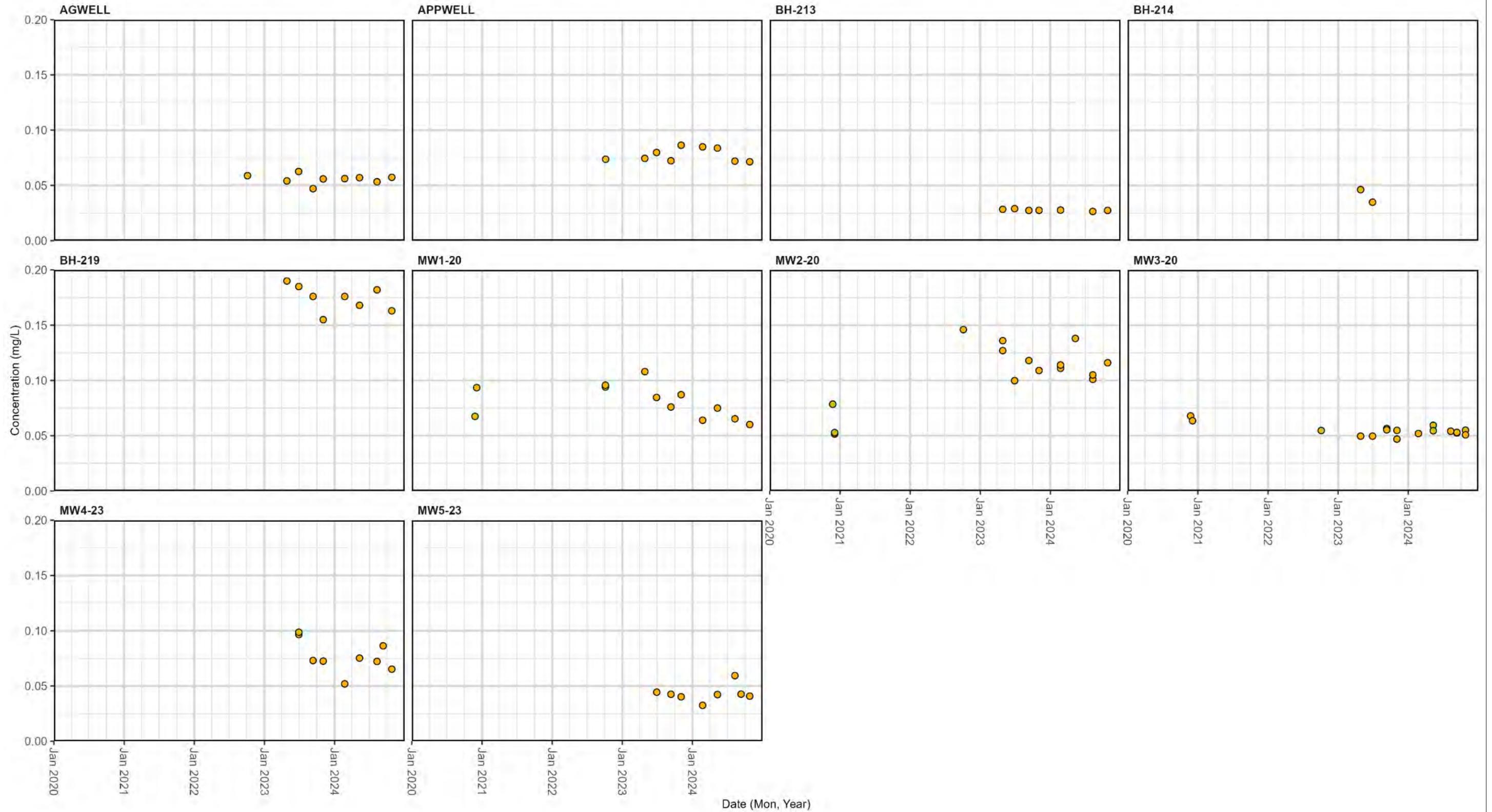


2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON
**HISTORICAL ARSENIC
 CONCENTRATION PROFILES
 AT SITE AREA MONITORING WELLS**

Project No. 11210029
 Date March 2025

APPENDIX I.2

Barium



LEGEND
 ● DISSOLVED CONCENTRATION (mg/L)
 ○ NON-DETECT CONCENTRATION VALUE (mg/L)

NOTE:
 BH-213 AND BH-219 MEASURE BACKGROUND CONDITIONS

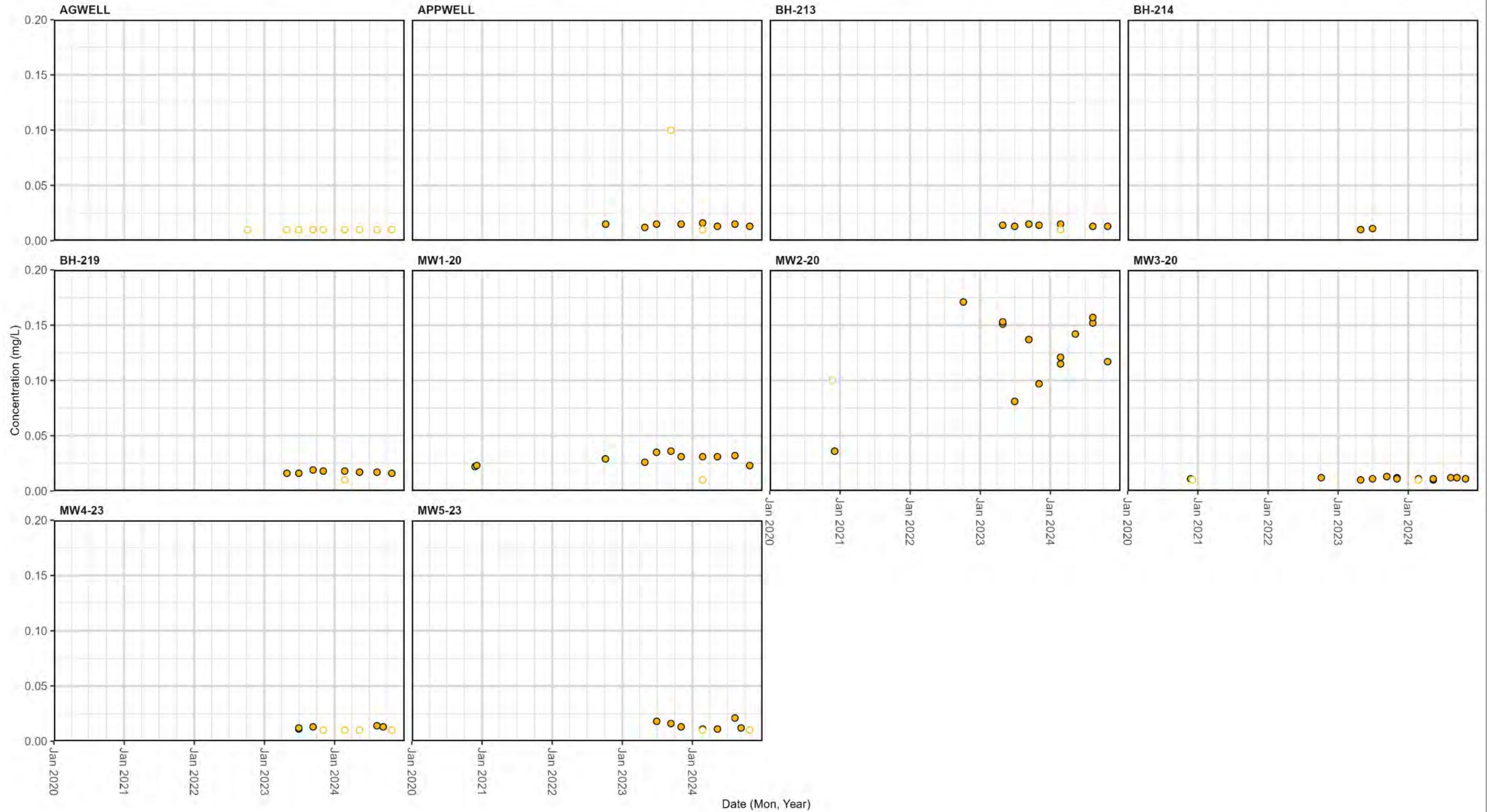


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 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON
**HISTORICAL BARIUM
 CONCENTRATION PROFILES
 AT SITE AREA MONITORING WELLS**

Project No. 11210029
 Date March 2025

APPENDIX I.3

Boron



LEGEND
 ● DISSOLVED CONCENTRATION (mg/L)
 ○ NON-DETECT CONCENTRATION VALUE (mg/L)

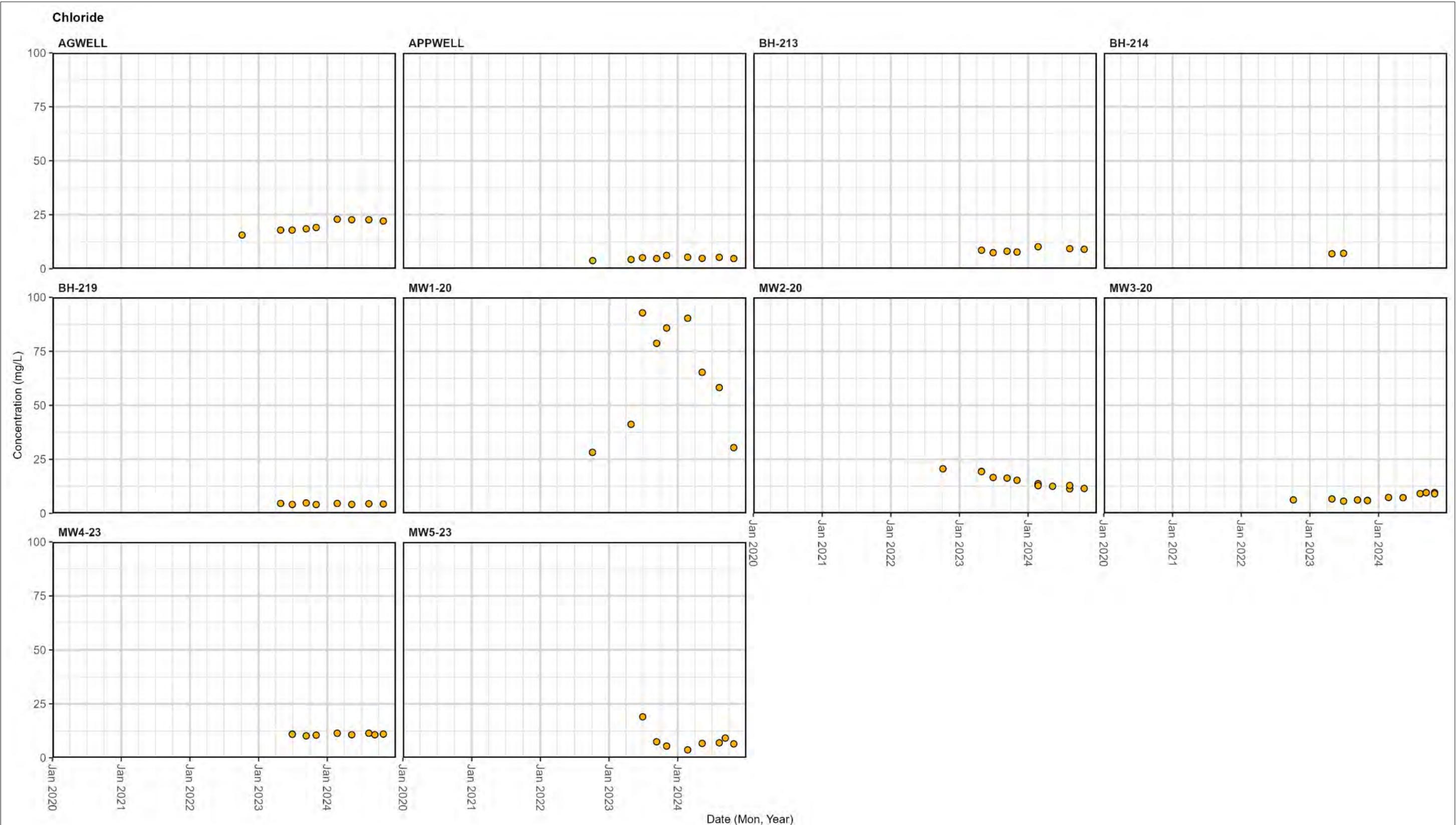
NOTE:
 BH-213 AND BH-219 MEASURE BACKGROUND CONDITIONS



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 6678 WELLINGTON ROAD 34
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**HISTORICAL BORON
 CONCENTRATION PROFILES
 AT SITE AREA MONITORING WELLS**

Project No. 11210029
 Date March 2025

APPENDIX I.4



LEGEND
 ● DISSOLVED CONCENTRATION (mg/L)
 ○ NON-DETECT CONCENTRATION VALUE (mg/L)

NOTE:
 BH-213 AND BH-219 MEASURE BACKGROUND CONDITIONS

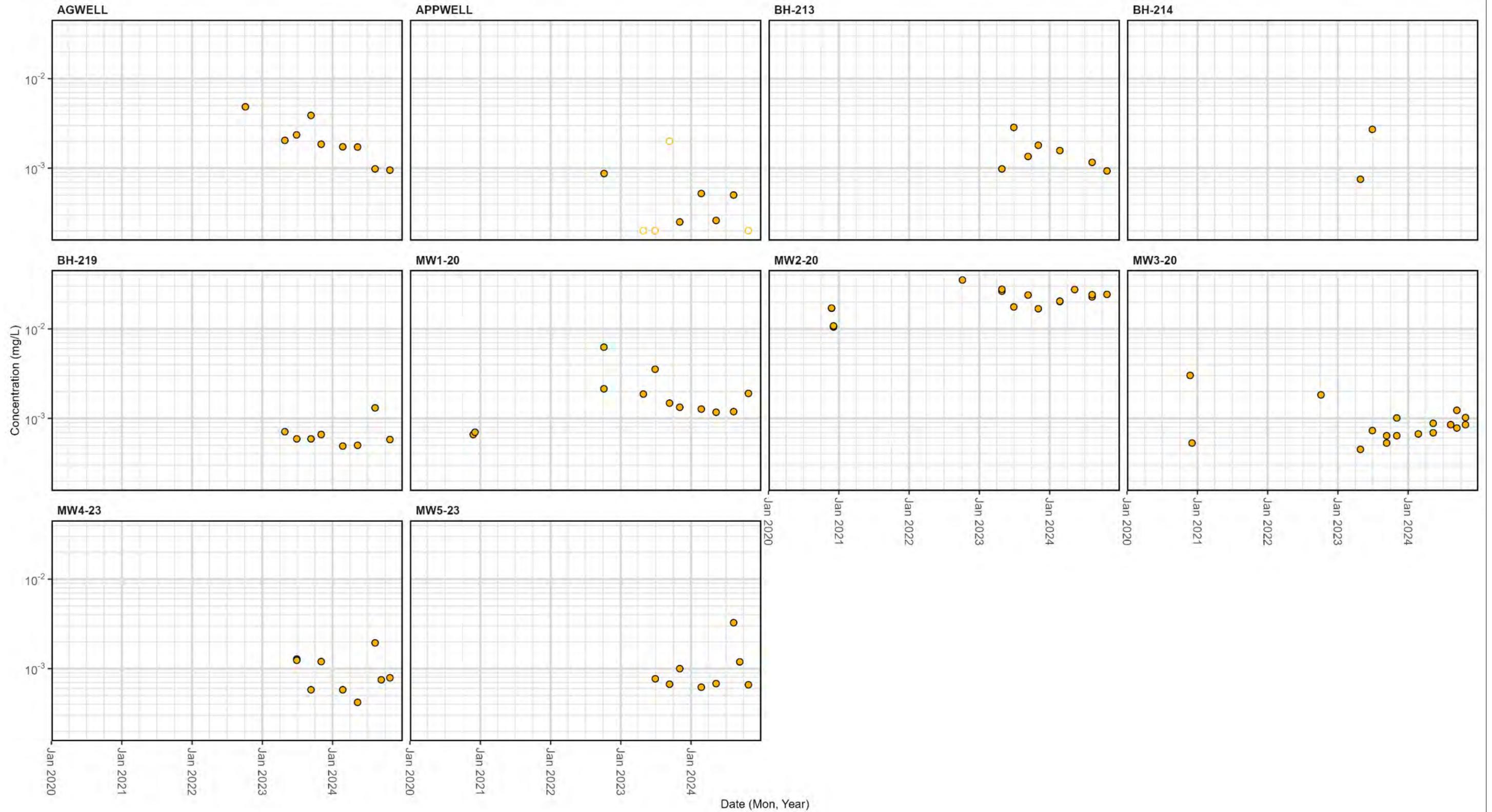


2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON
**HISTORICAL CHLORIDE
 CONCENTRATION PROFILES
 AT SITE AREA MONITORING WELLS**

Project No. 11210029
 Date March 2025

APPENDIX I.5

Copper



LEGEND
 ● DISSOLVED CONCENTRATION (mg/L)
 ○ NON-DETECT CONCENTRATION VALUE (mg/L)

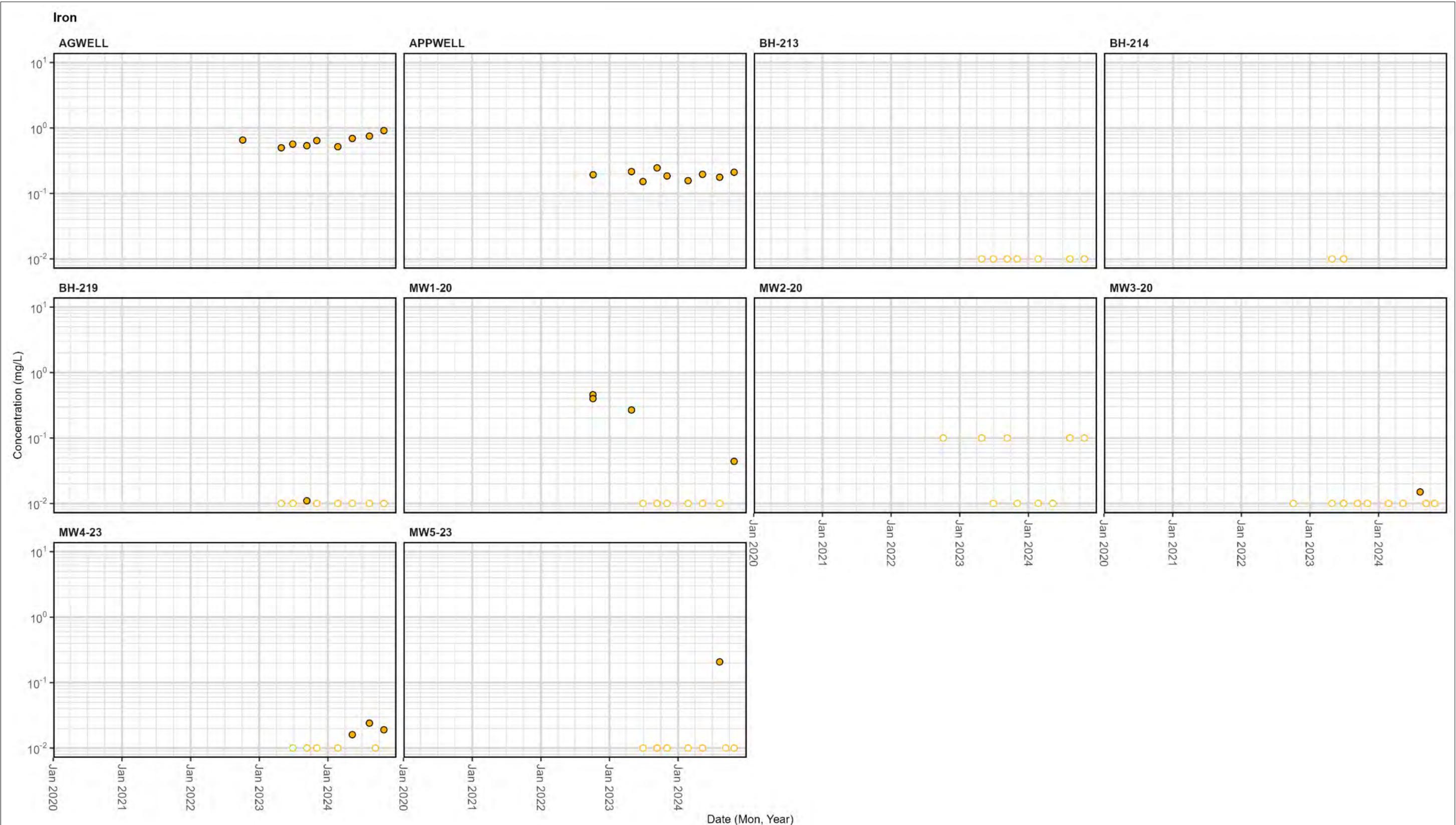
NOTE:
 BH-213 AND BH-219 MEASURE BACKGROUND CONDITIONS



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 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON
**HISTORICAL COPPER
 CONCENTRATION PROFILES
 AT SITE AREA MONITORING WELLS**

Project No. 11210029
 Date March 2025

APPENDIX I.6



LEGEND

- DISSOLVED CONCENTRATION (mg/L)
- NON-DETECT CONCENTRATION VALUE (mg/L)

NOTE:

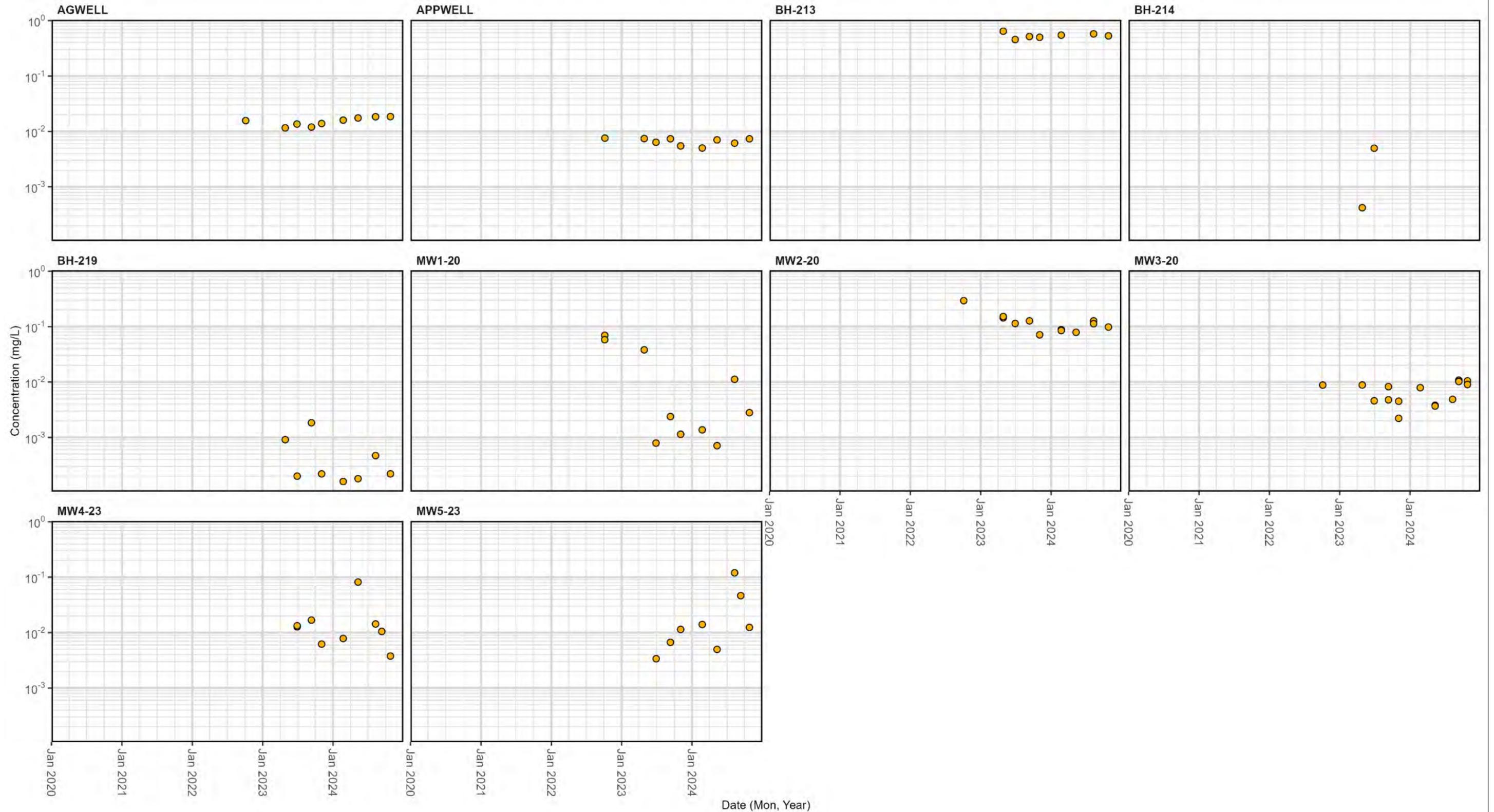
BH-213 AND BH-219 MEASURE BACKGROUND CONDITIONS



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 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON
**HISTORICAL IRON
 CONCENTRATION PROFILES
 AT SITE AREA MONITORING WELLS**

Project No. 11210029
 Date March 2025

Manganese



LEGEND
 ● DISSOLVED CONCENTRATION (mg/L)
 ○ NON-DETECT CONCENTRATION VALUE (mg/L)

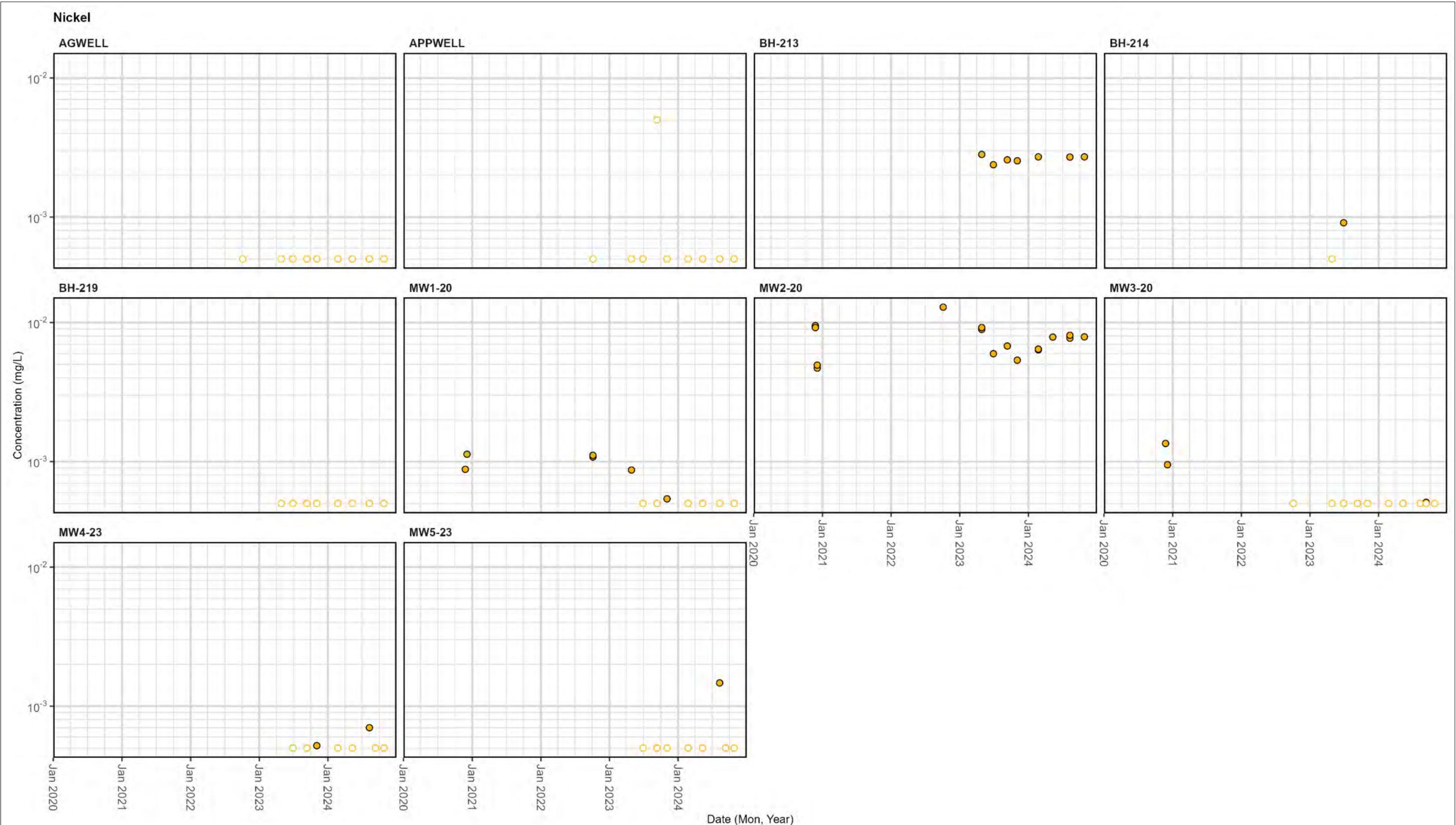
NOTE:
 BH-213 AND BH-219 MEASURE BACKGROUND CONDITIONS



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 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON
**HISTORICAL MANGANESE
 CONCENTRATION PROFILES
 AT SITE AREA MONITORING WELLS**

Project No. 11210029
 Date March 2025

APPENDIX I.8



LEGEND

- DISSOLVED CONCENTRATION (mg/L)
- NON-DETECT CONCENTRATION VALUE (mg/L)

NOTE:

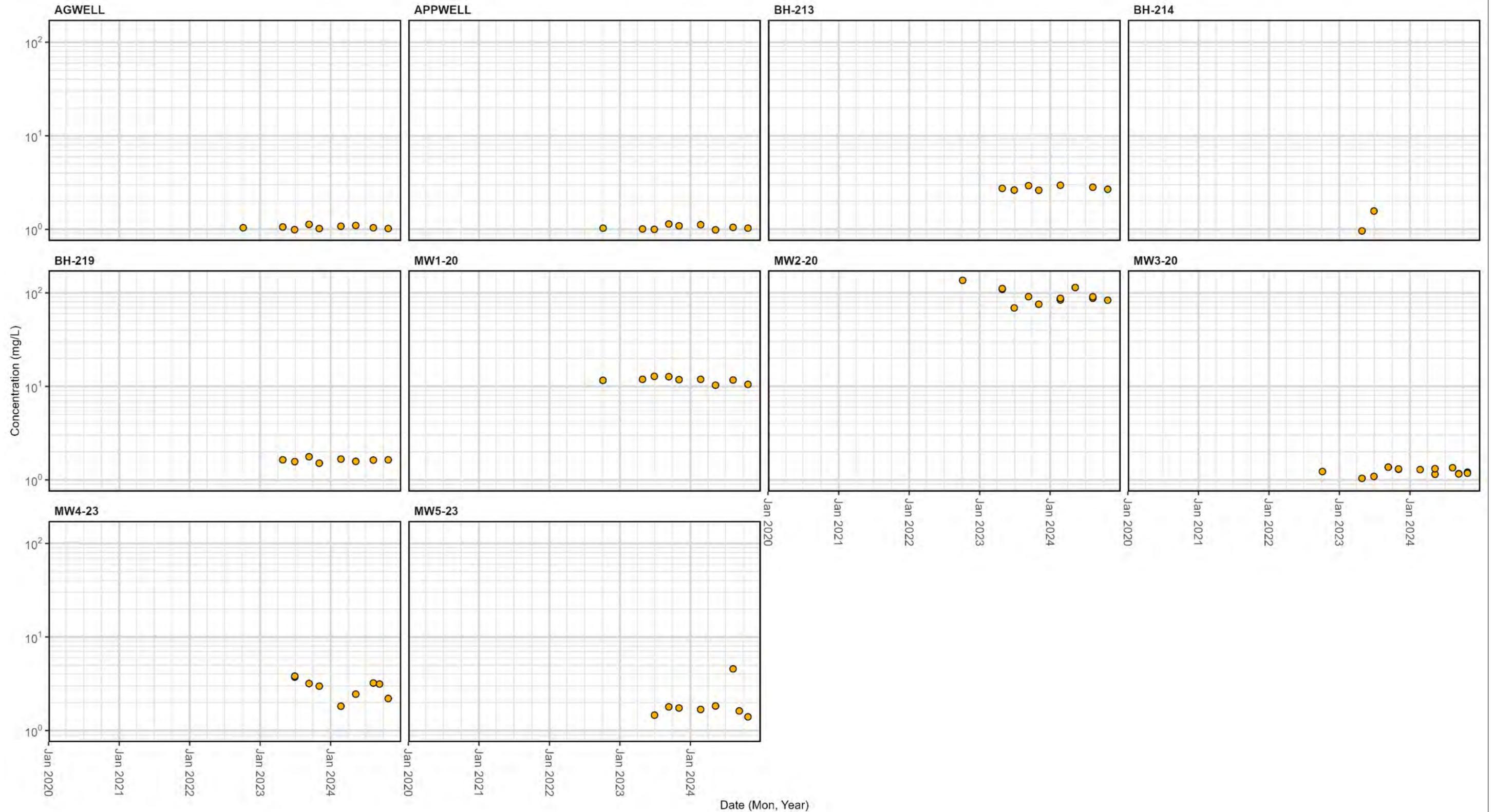
BH-213 AND BH-219 MEASURE BACKGROUND CONDITIONS



2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON
**HISTORICAL NICKEL
 CONCENTRATION PROFILES
 AT SITE AREA MONITORING WELLS**

Project No. 11210029
 Date March 2025

Potassium



LEGEND

- DISSOLVED CONCENTRATION (mg/L)
- NON-DETECT CONCENTRATION VALUE (mg/L)

NOTE:

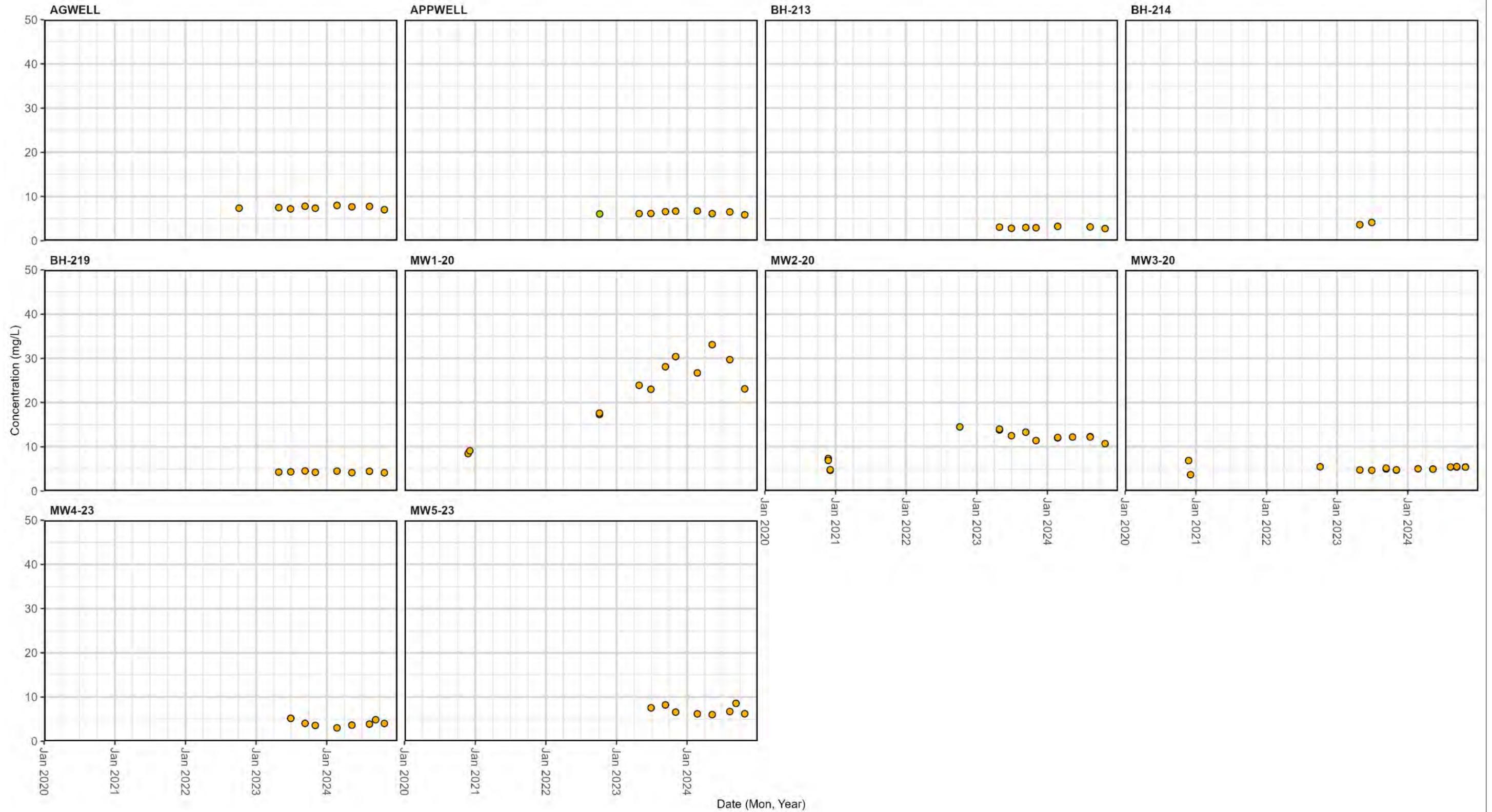
BH-213 AND BH-219 MEASURE BACKGROUND CONDITIONS



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 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON
**HISTORICAL POTASSIUM
 CONCENTRATION PROFILES
 AT SITE AREA MONITORING WELLS**

Project No. 11210029
 Date March 2025

Sodium



LEGEND
 ● DISSOLVED CONCENTRATION (mg/L)
 ○ NON-DETECT CONCENTRATION VALUE (mg/L)

NOTE:
 BH-213 AND BH-219 MEASURE BACKGROUND CONDITIONS

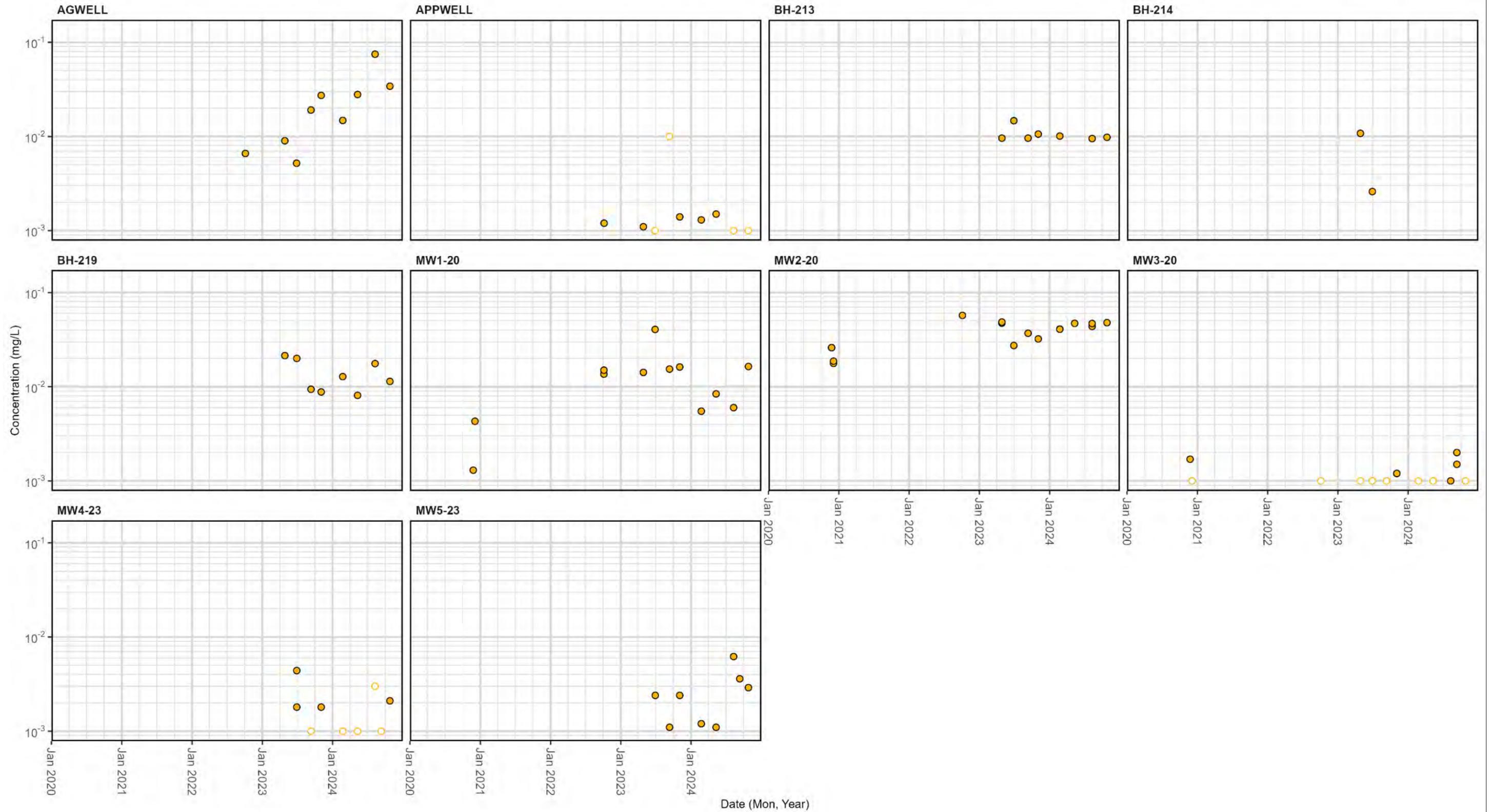


2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON
**HISTORICAL SODIUM
 CONCENTRATION PROFILES
 AT SITE AREA MONITORING WELLS**

Project No. 11210029
 Date March 2025

APPENDIX I.11

Zinc



LEGEND
 ● DISSOLVED CONCENTRATION (mg/L)
 ○ NON-DETECT CONCENTRATION VALUE (mg/L)

NOTE:
 BH-213 AND BH-219 MEASURE BACKGROUND CONDITIONS



2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON
**HISTORICAL ZINC
 CONCENTRATION PROFILES
 AT SITE AREA MONITORING WELLS**

Project No. 11210029
 Date March 2025

APPENDIX I.12



ghd.com

→ **The Power of Commitment**

Our ref: 11210029-LTR-13

09 June 2025

Mr. Frank Ertl
2374868 Ontario Inc.
6678 Wellington Road 34
Cambridge, Ontario
N3C 2V4

**Response to Source Water Protection - Hydro-Vac Truck Disposal Area Zoning Amendment: 6678
County Road 34, Puslinch Township**

Dear Mr. Ertl

On behalf of 2374868 Ontario Inc., GHD Limited (GHD) has prepared this letter to provide responses to the Wellington Source Water Protection comments form/checklist with the Pre-Consultation Comments Summary. GHD has no technical disagreements with any of the designations listed on the form with the exception of Section 4 as it relates to the Issues Contributing Area (ICA): Chloride designation.

The County of Wellington Official Plan (revised May 2025) indicates that the Site is outside an ICA as seen in Attachment A.1 and with the Site location mapped in Attachment A.2.

We should further note that the GRCA provides geographical information system (GIS) mapping through their Grand River Information Network (GRIN) that includes Source Water Protection (SWP) mapping of Issues Contributing Areas. This mapping includes the following disclaimer:

'Information made available is not intended to constitute advice nor is it to be used as a substitute for specific advice from a licensed professional. You should not act, or refrain from acting, based upon the Information without independently verifying the information and, as necessary, obtaining professional advice regarding your particular facts and circumstances.' The disclaimer goes on to state that *'The Information provided is for information purposes only. The Grand River Conservation Authority (GRCA) assumes no responsibility for the correctness of the Information, nor liability to any User of such Information, regardless of the purpose'*. The GRIN disclaimer is included as Attachment A.3.

Additionally, the figure provided by the Reviewer with the ICA designation includes the following disclaimer:

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

In light of the disclaimers that note that the mapping referenced by the Reviewer should not be relied upon without independently verifying the information, the Consultant has reviewed the recently updated and binding Official Plan, which includes recent mapping that shows that the Site is not within an ICA.

Additionally, although not required until submission of the Site Plan Application, as noted in the checklist, the following items also have already been completed by the Proponent:

Liquid Fuel Handling/Storage Spill Response Plan (>250L) (Provided in Design and Operations Report included in responses to Harden Environmental comments on pre-consultation application)

Chemical/Waste Management Storage Spill Response Plan (Provided in Design and Operations Report included in responses to Harden Environmental comments on pre-consultation application)

Hydrogeological Assessment Report (Provided in responses to Harden Environmental comments on pre-consultation application). As noted in the report no salt or other chemical substances are used at the Site for winter maintenance, so this also addresses the Winter Maintenance Plan requirement. Drinking Water Threats also are fully addressed by the Report. The Report also includes evaluations of the Groundwater Monitoring Program that has been in place for over 10 years and is required by the MECP Waste ECA.

Section 3: Documentation required to be provided by the owner or their agents

	ZBA Application	Site Plan Application	Not Required
Appendix A: Contact & Proposal Information	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drinking Water Threats Disclosure Report	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Liquid Fuel Handling/Storage Spill Response Plan (>250L)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Winter Maintenance Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Chemical/ Waste Management Storage Spill Response Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hydrogeological Assessment Report	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water Balance Assessment Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Recharge Infiltration Measures	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Flow Meter Installation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Groundwater Monitoring Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

If you have any questions regarding GHD’s response to the Reviewer’s comments, please feel free to contact the undersigned.

Regards,
GHD Limited



Fred Taylor
Principal
+1 519 340-4222
fred.taylor@ghd.com



Dan Puddephatt, M.Sc., P.Geo. (Limited)
Senior Hydrogeologist
+1 519 741-7919
dan.puddephatt@ghd.com

Encl.

Attachments

Attachment A.1

Where Significant Drinking Water Threat Policies Apply

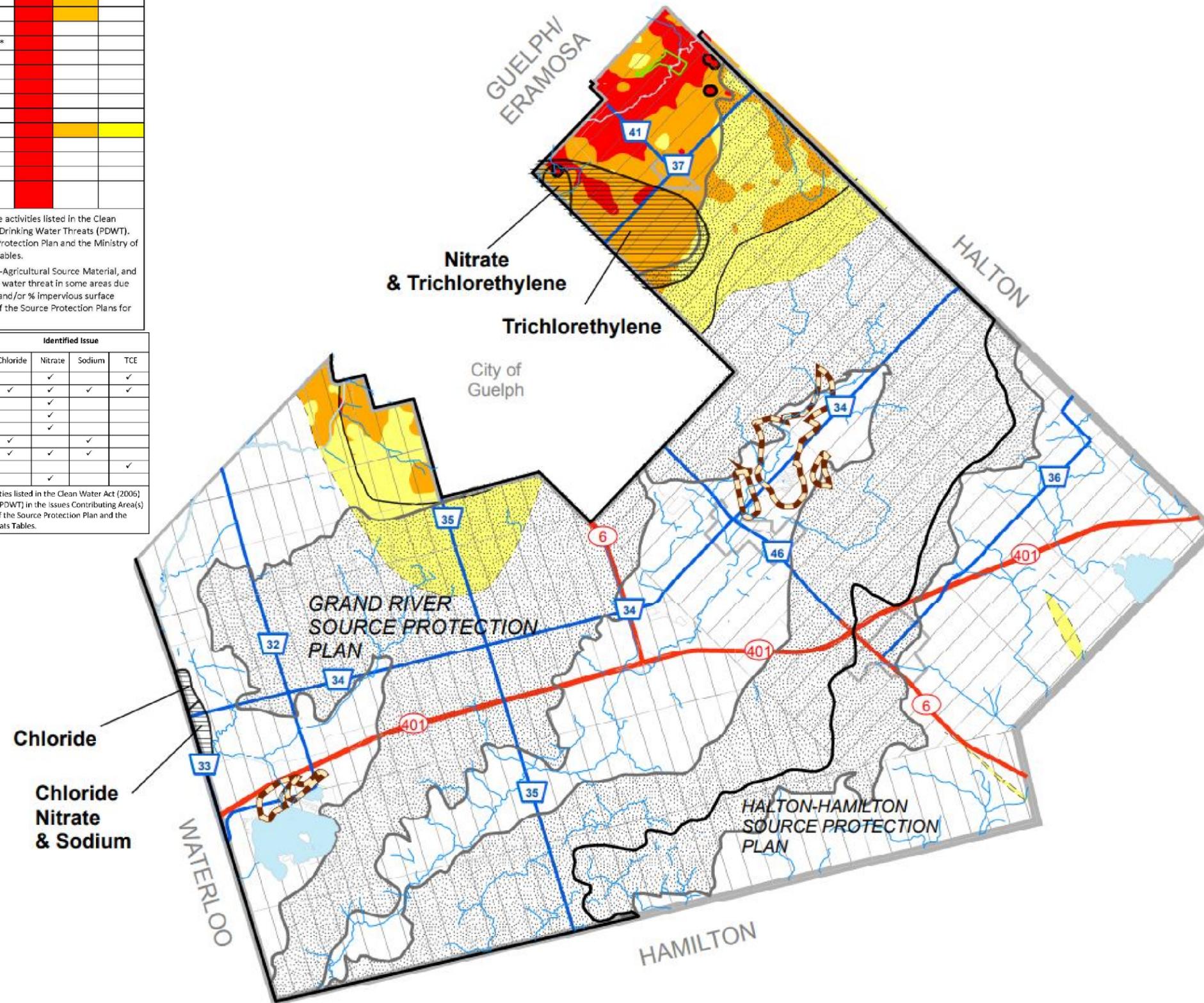
Significant Drinking Water Threat Policy Categories	Vulnerability Scores on Map		
	10	8	2,4,6
1. Waste Disposal	10		
2. Sewage Systems		8	
3, 4. Agricultural Source Material			
6, 7. Non-Agricultural Source Material*			
8, 9. Commercial Fertilizer*			
10, 11. Pesticide			
12, 13. Road Salt*			
14. Storage of Snow			
15. Fuel			
16. DNAPLs			2,4,6
17. Organic Solvents			
18. Aircraft De-icing			
21. Livestock Area			
Local Threat	10		

Note: This table provides a summary of the activities listed in the Clean Water Act (2006) that apply as Prescribed Drinking Water Threats (PDWT). For details refer to the text of the Source Protection Plan and the Ministry of the Environment Drinking Water Threats Tables.

*Application of Commercial Fertilizer, Non-Agricultural Source Material, and Road Salt may not be a significant drinking water threat in some areas due to the % managed land, livestock density, and/or % impervious surface calculations for these areas. See the text of the Source Protection Plans for further details.

Significant Drinking Water Threat Policy Categories	Identified Issue			
	Chloride	Nitrate	Sodium	TCE
1. Waste Disposal		✓		✓
2. Sewage Systems	✓	✓	✓	✓
3, 4. Agricultural Source Material		✓		
6, 7. Non-Agricultural Source Material		✓		
8, 9. Commercial Fertilizer		✓		
12, 13. Road Salt	✓		✓	
14. Storage of Snow	✓	✓	✓	
16. DNAPLs				✓
21. Livestock Area		✓		

Note: This table provides a summary of the activities listed in the Clean Water Act (2006) that apply as Prescribed Drinking Water Threats (PDWT) in the Issues Contributing Area(s) shown on this map. For details refer to the text of the Source Protection Plan and the Ministry of the Environment Drinking Water Threats Tables.



Sourcewater Protection

PUSLINCH

Legend

Source Protection Plan Boundary

Paris Galt Moraine Policy Area

Wellhead Protection Area

A

B

C

Vulnerability Score

10

8

2,4,6

Issues Contributing Area

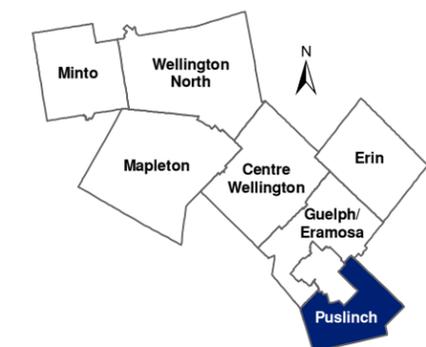
Paris Galt Moraine Policy Area

Intake Protection Zone

Private Communal System Policy Area

Please note that the Source Protection Plans are amended from time to time and for an up to date list of SPP's specific land use policies, the reader should consult the specific SPP.

These areas can be viewed in greater detail at: <http://www.wellington.ca/en/discover/maps.asp>
Click on the "Sourcewater Protection" button.



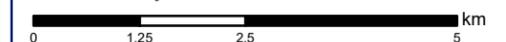
Produced by: County of Wellington Planning & Development Department

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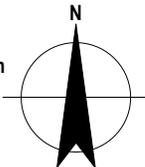
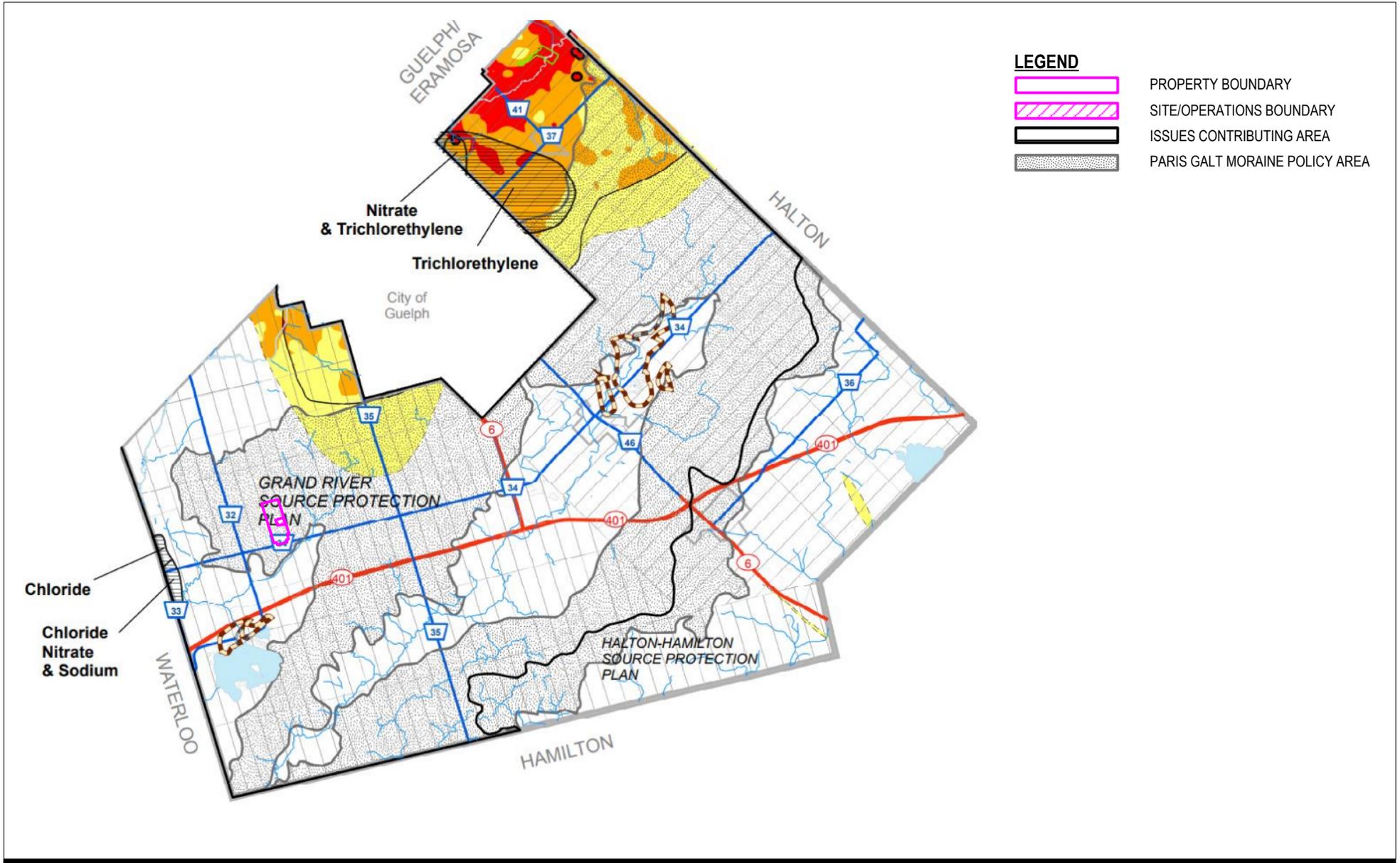
Sources:
County of Wellington 2024,
Ministry of Natural Resources and Forestry,
Grand River Conservation Authority,
Halton Conservation Authority,
Hamilton Conservation Area.
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Last Revised: July 2024



Attachment A.2



2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON
COUNTY OF WELLINGTON OFFICIAL PLAN
ISSUES CONTRIBUTING AREAS AND
PARIS GALT MORAINES POLICY AREA

Project No. 11210029
 Date March 2025

FIGURE 3.3

Attachment A.3



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Our ref: 11210029

11 June 2025

Frank Ertl
2374868 Ontario Inc.
6678 Wellington Road 34
Cambridge ON N3C 2V4

Response to Peer Review Comments on Pre-Consultation Request to Support a Temporary Use Zoning By-Law Amendment at 6678 Wellington Rd. 34, Township of Puslinch

Dear Frank Ertl,

GHD Limited (GHD) has prepared this letter, on behalf of 2374868 Ontario Inc. to provide responses to the February 14, 2025 letter from Dougan Ecology (Dougan). GHD previously completed an Environmental Impact Assessment (EIA) in 2022 to support a Zoning By-law Amendment located at 6678 Wellington Rd 34, Township of Puslinch. This application was refused by the Township of Wellington, and the Client is now proposing a Temporary Use By-law Amendment for a portion of the Site. The Temporary Use By-law Amendment would extend for a period of 3 years, with a possible extension of up to 10 years with Council approval.

Dougan Ecology (Dougan) provided comments on the pre-consultation request for the Temporary Use By-law Amendment, letter dated February 14, 2025. GHD has prepared this letter addendum to address Dougan's comments relating to the proposed temporary use for the Site and including any additional information as required. Dougan's request was to *demonstrate natural heritage policy compliance and address potential direct, indirect and cumulative impacts to the natural heritage features*. This addendum is intended to supplement GHD's existing EIA (August, 2022).

As identified in the EIA (GHD, 2022) the proposed use for the Site was for the continued use of Hydrovac services within the existing facility on the Subject Lands. The proposed Temporary Use By-law Amendment will be for the liquid waste storage to support the Hydrovac services. The proposed temporary use for a portion of the Site is the same as the permanent use as previously proposed.

There have been slight modifications to the Operational Area which would include a minor extension to the south and a reduction in the northwest corner. This minor modification to the operational area will not change the existing impact assessment as discussed in the EIA (GHD, 2022) and **Attachment A**. The modifications will be within the disturbed area and will not encroach into or closer to any natural heritage features or habitat for significant species as previously discussed. The updated Concept Plan has been included as **Attachment B**.

The update from permanent to temporary use would have a similar impact on the natural heritage features and functions over 3-6 years of use as it would for a permanent use. GHD has provided an updated impact assessment to address the direct and indirect impacts of the eastern woodland (**Attachment A**) based on the outstanding comments on the EIA (GHD, 2022) from Dougan's letter dated March 14, 2023 from Todd Fell and Christina Olar. Impacts associated with all other natural heritage features will remain as discussed in the EIA (GHD, August 2022) with the proposed permanent use as liquid storage to support the hydrovac facility to temporary use. The temporary use would allow for restoration and enhancement efforts to occur when the operation ceases and is recommended to be within the former Operational Area as shown in **Appendix B**.

Additional recommendations have been made to implement restoration and enhancement measures to occur immediately after the operation ceases. The recommended enhancement measures would include similar enhancement measures as provided in the EIA (GHD, August 2022) for the setback areas, which would include seeding within disturbed areas within the former Operational Area with a native seed mix in accordance with Appendix G of the EIA report (GHD, August 2022). In addition, any silt/temporary exclusion fencing as implemented in Attachment 3 of **Attachment B**, shall be removed once the operations cease in order to promote natural corridors and connectivity across the Subject Lands.

As cumulative impacts were not discussed within the EIA (GHD, 2022) or mentioned within the updated impact table in **Attachment A**, a discussion has been included here. Cumulative effects can be identified as changes to the environment that are caused by a combination of human actions over time. In context of the Subject Lands, this Site is currently in operation as a hydrovac facility, with the existing adjacent operating aggregate extraction pit to the west. The proposed Concept and Operation Plan will occupy lands that are the subject of the proposed temporary use by-law amendment, are currently being used for the hydrovac facility and are currently disturbed. No natural areas are proposed to be disturbed. With the temporary use of this Site proposed for 3 years, with a potential for up to 10 years, rehabilitation and enhancement efforts as discussed above can mitigate for any cumulative effects that may occur as a result of the liquid waste storage to support the hydrovac activities.

As the proposed temporary use for a portion of the Site is the same as the permanent use as previously proposed, policy compliance as discussed in the EIA (GHD, August 2022) remains the same.

Please contact the undersigned if you have any questions or require further project support.

Regards



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Attachments

Attachment A

**Response to Comments
(GHD, February 20, 2024)**

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Our ref: 11210029

February 20, 2024

Lynn Banks
Development and Legislative Coordinator
Township of Puslinch
7404 Wellington Rd. 34
Puslinch, Ontario N0B 2J0

Response to Peer Review Comment items 4, 6 & 7 on an Environmental Impact Assessment in Support of a Zoning By-Law Amendment at 6678 Wellington Rd. 34, Township of Puslinch

Dear Lynn,

Please find enclosed our responses to Dougan & Associates (Dougan) regarding their review of GHD Limited (GHD)'s Environmental Impact Assessment (EIA) (GHD, 2022) in support of a Zoning Bylaw Amendment. GHD had prepared an updated EIA and response to comments on March 7, 2023. Dougan's original comments were dated August 10, 2022.

Responses are to comments outlined in the March 14, 2023 letter from Todd Fell and Christina Olar of Dougan and Associates addressed to Lynn Banks, Development and Legislative Coordinator, Township of Puslinch. This response is prepared to address the natural heritage items 4, 6 & 7 of Dougan's second set of comments in relation to the original comments provided to GHD. All other comments were considered planning related and will be addressed separately with other planning related items. Dougan's comments appear in **Table 1** below and are followed by GHD's responses.

Please contact the undersigned if you have any questions or require further project support.

Regards



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Table 1 Dougan & Associates Comments and GHD Responses

Item #	Peer Review Comment: June 29, 2022	Comment Addressed in EIA dated August 10, 2022? (Y/N)	Additional Comments and Clarifications (Dougan & Assoc.) March 14, 2023	GHD Response February 16, 2024
4	<p><i>(For EIS-Zoning Bylaw Amendment)-</i> The report identifies two ponds adjacent to wooded areas representing potential amphibian habitat. Please characterize the potential presence of amphibian habitat and assess the potential impacts and associated mitigation measures for proposed land uses and activities</p>	<p>Partially, discussed sections 5.2.2 and Table 2. See additional comment.</p>	<p>Table 2 notes that “Marsh Monitoring surveys were not completed for the Subject Lands, however these ponds may provide suitable habitat for breeding amphibians in the absence of surveys.” We are in agreement with this statement. Potential impacts (including any indirect impacts) and mitigation strategies related to amphibian breeding SWH are not discussed in the EIS. Please provide a clear impact assessment and mitigation strategies regarding potential amphibian breeding SWH.</p>	<p>Sections 4.2.5 and Table 2 of the EIA identify the potential presence of amphibian habitat on site within the ponds located on the northern limits of the Study Area. GHD adopted the precautionary principle (i.e., we assumed amphibians were present). Section 3.2.1 of the EIA characterizes the vegetation communities that may afford amphibian breeding habitat which included the open aquatic (OAO) ELC code. These aquatic communities were identified on the northern limits of the Study Area; one pond (OAO) within the Subject Lands (approximately 200 metres (m) from the operational boundary); the other pond (OAO) north of the Subject Lands over >200 meters from operation area (Refer to Attachment A (Figure 2) for community locations).</p> <p>Potential direct and indirect impacts may include vehicle/amphibian interactions (direct) and potential effects on water quality or quantity (indirect). However, minimal impacts are anticipated on the amphibian breeding within the Study Area due to the distance from the operational area, an alternative/preferred pathway for travel, adjacent land uses and proposed mitigation to be implemented.</p> <p>The ponds will remain outside of the operational area for the hydrovac facility located a minimum of 200 m away. As indicated in the Significant Wildlife Habitat Ecoregion Criteria Schedule 6E the habitat for amphibian woodland breeding may include up to 230 m from the suitable pond. There is potential for vehicle interaction (direct impacts) to occur within the outer 30 m of this extent however based on adjacent land use and available alternate/preferred pathways for travel (woodlands and thicket to the east, agricultural lands for the balance), the impact to amphibian movement into the operational area at this distance is low.</p> <p>The alternative/preferred pathway for movement of amphibians between the wetland and the closest woodland would be the travel corridor utilized most frequently by amphibian species potentially using the ponds. The travel corridor would include portions of the CUT1 and the woodlands directly to the east (FOM2-2, FOC1-2). There may also be potential for amphibian movement between ponds, utilizing a similar corridor to the woodlands identified east of the Subject Lands. The remaining adjacent lands to the north, west and south of the ponds are active agricultural lands. Although the hay crop may provide temporary foraging habitat for amphibians, these lands are harvested on a regular basis. A monoculture crop is absent of cover, that may provide important protection from predators. However, with active agricultural fields comprising of most of this area, amphibian within these fields would be low and the impacts anticipated to be minimal.</p> <p>Although the impacts are anticipated to be limited, heavy duty silt fencing erosion and sediment control (ESC) measure is proposed to be installed and maintained as exclusion fencing along the northern limits of the operational area to minimize any vehicle interactions with amphibian movement.</p>

Item #	Peer Review Comment: June 29, 2022	Comment Addressed in EIA dated August 10, 2022? (Y/N)	Additional Comments and Clarifications (Dougan & Assoc.) March 14, 2023	GHD Response February 16, 2024
				<p>Potential indirect impacts may include negative impacts to the water quality or water quantity of the breeding amphibian habitat. The ponds are 200 m from the operational area. No siltation or runoff of deleterious substances are anticipated. Silt fencing is proposed along the northern limits of the operational area and are outside of the limits of disturbance. The runoff of water from the operational area are directed towards the stormwater management pond directly to the west of the operational limits.</p> <p>In summary, no negative impacts are anticipated on the amphibian breeding habitat as a result of the hydrovac facility based on the distance from the operation area, available alternative/preferred pathways and proposed ESC mitigation.</p>
6	<p>Please provide a figure showing the limit of disturbance for all activities in relation to natural heritage constraints and applicable buffers. Please include proposed mitigation including buffers and sedimentation and erosion control measures.</p>	<p>Partially; provided in Figure 3. See additional comments related to Figure 3.</p>	<p>Figure 3 identifies the proposed extraction area and a 10 m buffer to the Oil Well Bog Little Tract ANSI. Given the significance of the feature (Significant Woodland, Greenlands, ANSI) and its function as candidate and confirmed SWH, additional rationale is requested to support the recommended 10 m woodland buffer and fencing is sufficient, including an assessment of potential indirect impacts.</p> <p>Figure 3 does not show a buffer or other mitigative measures (e.g. silt fencing, permanent fencing) applied to the FOD5 community in the southwest portion of the study area. This feature is included in the Township's Environmental Protection Overlay, and based on the ELC description, it appears this woodland is of relatively high quality and contains a high proportion of native species. It is unclear if this</p>	<p>Existing literature as documented within the Ecological Buffer Guideline Review by Beacon Environmental (2012).¹ indicates that the most readily measurable effects of immediate human disturbance (i.e., waste disposal, landscaping, construction) on woodlands occurs within the first 10 – 20 m, with most severe impacts within 10 m. Based on the Subject Lands existing topographical features (i.e. berm), elevation differences and current land uses the 10 m buffer was rationalized to be most appropriate to provide adequate protection of the woodlands.</p> <p>A large berm, with a significant elevation drop to the operational area exists along the eastern boundary of the property. This vegetative berm provides a physical barrier to all activities occurring as part of the hydrovac operation. Based on the topography of the site currently the berm elevation drops significantly with approximately a 5 m elevation difference from the ground elevation of the adjacent property. Retaining the vegetated berm and narrow transition meadow abutting the eastern woodland will provide suitable protection to the tree health and woodland communities. Any potential runoff or silt/sediment released as a result of the operational activities will be contained on the operational, west side of the berm. To afford protection to the rooting area of the largest trees, a 10-metre buffer has been recommended. This distance would be inclusive of the vegetated berm area. The EIA recommends that the limited buffer area currently void of vegetation be seeded with native herbaceous seed. This will provide additional support from ESC and enhance the diversity of herbaceous species within the Subject Lands.</p> <p>Implementing greater than a 10 m buffer would not provide any additional protection to the woodland feature if preserved based on the topographical differences (much lower to the east with an established, steep and stable drop at the property line demarked with a page wire fence). With the on-going operations, no evidence of degradation to the forest edge including, wind blow, abundance of invasive species, sediment encroachment have been observed to date.</p>

¹ Beacon Environmental Ltd. 2012. Ecological Buffer Guideline Review (December 2012). 130 pp

Item #	Peer Review Comment: June 29, 2022	Comment Addressed in EIA dated August 10, 2022? (Y/N)	Additional Comments and Clarifications (Dougan & Assoc.) March 14, 2023	GHD Response February 16, 2024
			<p>woodland has been assessed for significance. Please provide an assessment of the FOD5 woodland significance, describe potential impacts, and, where applicable, proposed mitigation strategies to demonstrate no negative impact to the feature or its ecological functions.</p>	<p>To further explore the potential impacts (direct and indirect) on the ecological features and functions of the eastern woodland, we have outlined the features and functions of the woodland, potential impacts and mitigation in Attachment B.</p> <p>The size of the southwest forest (FOD5) is less than 1 ha. The land covered by woodlands in Wellington County is greater than 5 percent, which requires a woodland to be a minimum of 4 ha be considered significant. The southwestern woodland does not meet this criterion.</p> <p>In Section 4.2.1 of the EIA GHD indicated that the forest is less than 4 ha in size and would not meet the criteria listed in the County of Wellington Official Plan for significance. Based on it's size (of less than 1 ha), it also would not meet criteria from the Natural Heritage Reference Manual (2005) which are used to inform municipal natural heritage polices.</p> <p>The woodland does not contain interior habitat and is not in close proximity to significant natural features (190 m from ANSI), or fish habitat. The woodland is not part of the County's identified Greenlands system and does not provide a linkage function, nor did it contain any uncommon characteristics. It also does not provide economically valuable products or other special services. Although there was a high diversity of native species, dominated by sugar maple, the woodlot did not meet the threshold criteria of 4 ha in size.</p> <p>Additionally, this woodlot is not part of the Township's Environmental Protection overlay as identified within the Township of Puslinch's Zoning By-law Schedule A (2018) and Explore Wellington GIS viewer (Wellington County, viewed on November 13, 2023). The woodland however was identified as containing habitat for Significant Wildlife Habitat (bat maternity colonies-potential and Special Concern and Rare Wildlife species-eastern wood-pewee) as identified in the EIA, therefore GHD recommends the retention of the woodland. Five potential bat cavity trees were identified within this woodland. These will remain intact with no disturbance, removal proposed. Bat boxes were identified within this woodlot which are considered bat habitat enhancement measures.</p> <p>One special concern species (eastern wood-pewee) was identified within the southwest woodlot. Habitat for this species is not anticipated to be impacted in any way. No woodland removal or encroachment is proposed or expected. Based on the existing operation of the hydrovac facility and the presence of eastern wood-pewee, the truck noise from the operations has not impacted on the presence of the birds within this small woodlot. The continued use will not further impact on this species.</p> <p>Potential direct impacts on this woodland could include tree harm or mortality or sediment/material encroachment as a result of the operations. This woodland contains significant topographical variations that begin immediately along the borders of the community with a 2:1 slope descent into a large bowl-like land inundation. This provides an immediate physical constraint to truck movement or encroachment into the woodland. A small berm exists along the western limits of the woodland which acts</p>

Item #	Peer Review Comment: June 29, 2022	Comment Addressed in EIA dated August 10, 2022? (Y/N)	Additional Comments and Clarifications (Dougan & Assoc.) March 14, 2023	GHD Response February 16, 2024
				<p>as a physical barrier to the woodland. GHD would recommend several concrete barriers to be placed along the eastern limits of FOD5 and the berm edge (when present), to further distinguish the woodland boundary to ensure the continued preservation of this feature (Attachment C). Additionally, GHD recommends Heavy-Duty Silt fencing be installed along the limits of this FOD5 woodland in the southwest corner of the Subject Lands. With the implementation of the above mitigation measures, no negative impacts are anticipated on the ecological functions of this woodland.</p>
7	<p>The EIS Report identifies wildlife habitat in adjacent significant woodlands. The potential for conflict with wildlife entering an active construction site has not been addressed. Please identify mitigation measures to exclude wildlife from construction zones as well as the protocols for workers to follow if wildlife, especially SAR, are encountered.</p>	<p>Partially; Figure 3 and section 5.2.6.2. See additional comment.</p>	<p>While silt and permanent fencing is recommended along the eastern boundary of the site, it is recommended that permanent wildlife exclusion fencing be installed along the entire operational perimeter to prevent wildlife entering the operational area from the ANSI and/or southwest woodlot during construction and during the operational phase. Additionally, the EIS should provide recommended timing for installation of fencing. To prevent construction and post-construction wildlife mortality, it is recommended that silt and permanent fencing be installed pre-construction.</p>	<p>The EIA was amended in response to the original comment to include mitigation measures for wildlife and the protocols for site staff to follow if species at risk are encountered in the operational area.</p> <p>Based on the findings of the EIA and the identified uses of the Subject Lands and surrounding area, the erection of permanent fencing along the entire operational perimeter would not necessarily enhance the protection of wildlife. As detailed in the EIA a number of other wildlife were noted including mostly small mammals (eastern cottontail (<i>Sylvilagus floridanus</i>), common raccoon (<i>Procyon lotor</i>) and eastern gray squirrel (<i>Sciurus carolinensis</i>), one amphibian, green frog (<i>Lithobates clamitans</i>) and one large mammal, white-tailed deer (<i>Odocoileus virginianus</i>). In addition to the presence of wildlife, Significant Wildlife Habitat for amphibian breeding (woodland) and deer overwintering (Stratum II) were identified. The installation of heavy-duty sediment and erosion control fencing around the east, north and portion of the west perimeter of the operation limits (Attachment C) would act as exclusion fencing and protect any potential direct impacts associated with truck encounters which may cause injury or mortality to any of the above-mentioned species. The main corridors for amphibian and mammal movement are to the east within the ANSI/natural area. With the site operations occurring daily, aggregate pit to the west and limited natural features (woodland/watercourse) within the operational boundary or to the west, amphibian and mammal wildlife movement across the Subject Lands is anticipated to be limited.</p> <p>Sign of some deer use within the central FOD5 forest was evident during field investigations, however winter deer use would most commonly occur within the eastern forest based on the forest habitat characteristics and as a deer yard was identified in the eastern forest area through MNR mapping. The eastern forest provides cover and food during the winter months, where the central FOD5 community is lacking those. Permanent fencing has been proposed along the 10-meter buffer of the operational area to reinforce this barrier, however the elevation difference in most areas along the eastern border of the property along the operational limits provides a physical barrier for deer currently. The vehicle speeds in this area are limited to 5 kilometres (km) an hour, with signs posted along the access route. No impacts to deer are anticipated to occur as a result of vehicle interactions and the low speeds the trucks are moving around the facility. The erection of permanent fencing around the</p>

Item #	Peer Review Comment: June 29, 2022	Comment Addressed in EIA dated August 10, 2022? (Y/N)	Additional Comments and Clarifications (Dougan & Assoc.) March 14, 2023	GHD Response February 16, 2024
				<p>entire operational area could potentially minimize any movement to the small number of deer that may use the central FOD5 woodland for temporary cover.</p> <p>We recommend that functioning heavy duty sediment and erosion control fencing be installed along the limits of key locations along the operational area adjacent the eastern, south-western woodlots as well as the northern operational boundary prior to before April 1 or after October 1 of any given year. The ESC fencing will also act as exclusion fencing for small mammals, amphibians and reptiles that may attempt to enter the operational area. This will limit vehicle interactions (injury or death). The fencing shall be inspected regularly and maintained as needed and should remain in place for the duration of the operations and replaced or repaired in a timely fashion, as needed. The locations identified for silt fencing/exclusion fencing include the northern and eastern perimeter of the operational area. ESC fencing will also be installed and maintained along FOD5/operational area limit border. This, in conjunction with the permanent 6-foot fence along the eastern forest buffer, will provide sufficient separation between the operations and natural habitats to mitigate impacts to wildlife from site operations. The mitigation fencing is identified on Figure 3, within Attachment C.</p>

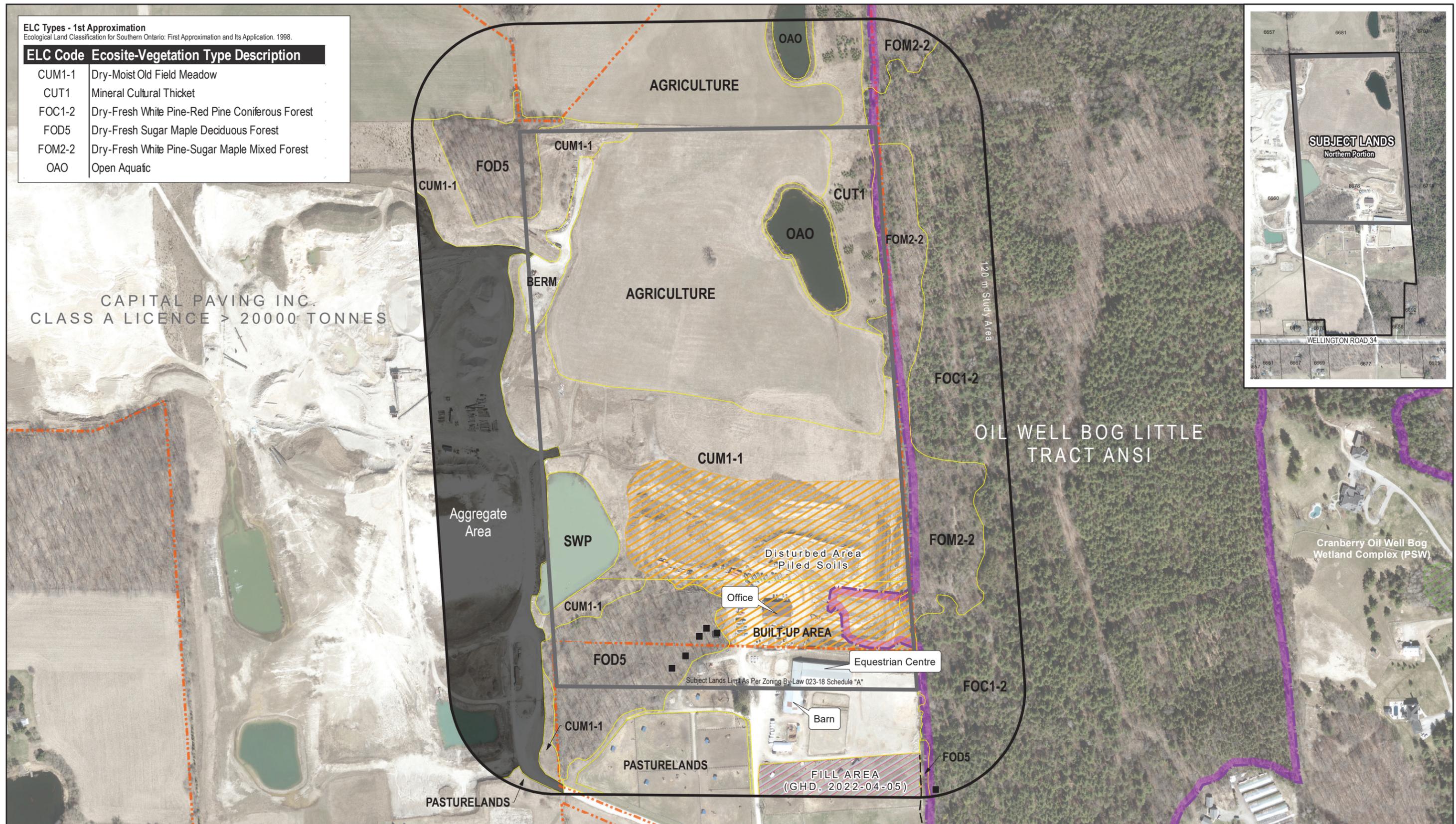
Attachments

Attachment 1

Figure 2

ELC Types - 1st Approximation
Ecological Land Classification for Southern Ontario: First Approximation and Its Application, 1998.

ELC Code	Ecosite-Vegetation Type Description
CUM1-1	Dry-Moist Old Field Meadow
CUT1	Mineral Cultural Thicket
FOC1-2	Dry-Fresh White Pine-Red Pine Coniferous Forest
FOD5	Dry-Fresh Sugar Maple Deciduous Forest
FOM2-2	Dry-Fresh White Pine-Sugar Maple Mixed Forest
OAO	Open Aquatic



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Legend

Cavity Trees (GHD 2022-04-05)	Aggregate Site Authorized - Active	Evaluated-Provincial
Subject Lands - Southern Portion	Aggregate Area	Not-Evaluated or Unknown
120 m Study Area	Fill Area (GHD, 2022-04-05)	
Vegetation Communities	Disturbed Area, Piled Soils	
ANSI		

1 cm = 40 meters
0 25 50 75 100
Meters
Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N
Paper Size ANSI B



2374868 Ontario Inc.
6678 Wellington Road 34, Puslinch, ON
Puslinch Township
County of Wellington

Environmental Impact Assessment
Vegetation Communities & Natural Features

Project No. 11210029
Revision No.
Date May 9, 2022

Figure 2

Q:\GIS\PROJECTS\11210000s\11210029\Layouts\202204_EIA002\11210029_202204_EIA002_GIS002 - Vegetation Communities and Natural Features.mxd
Print date: 09 May 2022 - 11:10

Data source: © Township of Puslinch, 2020.

Attachment 2

Impact Assessment

Features and functions of the woodland, potential impacts and mitigation		
Ecological feature or Function of eastern forest	Potential Impact (direct and indirect)	Proposed mitigation/rationale
Habitat for woodland area sensitive species (red-breasted nuthatch)	<ul style="list-style-type: none"> - Noise disturbance (indirect) - Dust (indirect) 	<p><u>Habitat avoidance:</u> No woodland removal is proposed.</p> <p><u>Setback:</u> Implement a 10-meter buffer off the eastern woodland (habitat for the red-breasted nuthatch)</p> <ul style="list-style-type: none"> - Existing berm provides additional protection from dust with Site works at approximately 5 m lower in elevation. - <u>No change in land-use,</u> current activities on-going therefore no increase in noise/dust levels for the Subject Lands. - No current impacts or degradation of the woodland observed based on current field conditions.
Wildlife habitat (small mammals)	<ul style="list-style-type: none"> - Noise (indirect) - Edge effect (indirect) - Dust (indirect) - Mortality due to truck interactions (direct) 	<p><u>Maintaining Land Use:</u> No change in land-use, current activities on-going therefore no change or increase in noise levels to the Subject Lands.</p> <p><u>Habitat avoidance:</u> No woodland removal proposed.</p> <p><u>Setback:</u> Implement a 10-meter vegetated buffer off the eastern woodland</p> <p><u>Exclusionary measures:</u> Heavy-duty ESC fencing will be implemented and act as exclusion fencing along the eastern forest, in addition to permanent chain link fencing (6-foot fence) along the 10 m buffer of the eastern forest. Attachment B identifies the location of exclusionary measures.</p>
SWH (deer winter congregation area)	<ul style="list-style-type: none"> - Barrier to deer migration to wintering habitat (indirect) 	<p><u>Low Quality Habitat:</u> Subject Lands are not identified as a main corridor for wildlife movement due to the existing land uses in the immediate area (hydrovac operation and aggregate pit), with the lack of cover and foraging habitat within the operational area and adjacent aggregate pit.</p> <p><u>Habitat avoidance:</u> No habitat removal is proposed, the hydrovac activities are on-going with no new works proposed.</p> <p><u>Avoidance of permanent barriers:</u> no permanent barriers being erected with the exception along the eastern edge of the berm buffer adjacent the existing stable and steep elevation drop to the forest and ANSI east of the Subject Lands (existing barrier).</p>

Features and functions of the woodland, potential impacts and mitigation		
SWH (potential for bat maternity colonies)	<ul style="list-style-type: none"> – potential disruption to suitable bat trees through possible vehicle encroachment in eastern woodland 	<p><u>Habitat avoidance</u>: no loss of vegetation, no forest clearing nor removal of suitable snag/cavity.</p> <p><u>Exclusionary Measures</u>: ESC fencing installed along the eastern woodland boundary.</p> <ul style="list-style-type: none"> – Permanent six-foot fencing proposed along 10-meter buffer of east forest and ANSI.
Special Concern species (eastern wood-pewee)	<ul style="list-style-type: none"> – Habitat Loss (direct) – Habitat encroachment (direct/indirect) – Habitat degradation (noise/dust) (indirect) 	<p><u>Habitat avoidance</u>: No loss of vegetation/forest clearing.</p> <p><u>Exclusionary Measures</u>: Permanent six-foot fencing proposed along the 10 m buffer from the east forest and ANSI.</p> <p><u>No change in land-use</u>: Current activities on-going therefore no increase in noise/dust levels for the Subject Lands.</p> <ul style="list-style-type: none"> – No current impacts or degradation of the woodland observed based on current field conditions.
Water quality protection (Provincially Significant Wetland)	<ul style="list-style-type: none"> – Degradation to water quantity and/or quality (indirect) 	<p><u>No change in land-use</u>: current activities on-going therefore runoff will be maintained.</p> <p><u>Feature Avoidance</u>: No woodland removal.</p>
Regional Life Science ANSI	<ul style="list-style-type: none"> – Loss of landform features (direct) – Degradation in landform features (indirect) 	<p><u>Feature Avoidance</u>: ANSI protected in its entirety. No removal of landform features proposed.</p> <p><u>No change in land-use</u>: Slope and vegetation adjacent the ANSI and on the east side berm are stable.</p> <p><u>Exclusion and Erosion Control Measures</u>: Permanent six-foot fencing proposed along the 10-meter buffer of woodland.</p> <p>Heavy Duty silt fencing proposed along the eastern limits of the forest.</p>

Attachment 3

Figure 3



Legend

-  Operational Boundary
-  120 m Study Area
-  Subject Lands - Southern Portion
-  Constraint Communities
-  Concrete Barrier
-  Silt Fencing/Exclusion Fencing
-  Permanent Fencing (10 m Setback from Forest Community)

1 cm = 12 meters

0 12 24 36

Meters

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N
Paper Size ANSI B



2374868 ONTARIO INC.
6678 Wellington Road 34, Puslinch, ON
Puslinch Township
County of Wellington

ENVIRONMENTAL IMPACT ASSESSMENT
Operational Limit, Constraints & Mitigation

Project No. 11210029
Revision No.
Date Feb 16, 2024

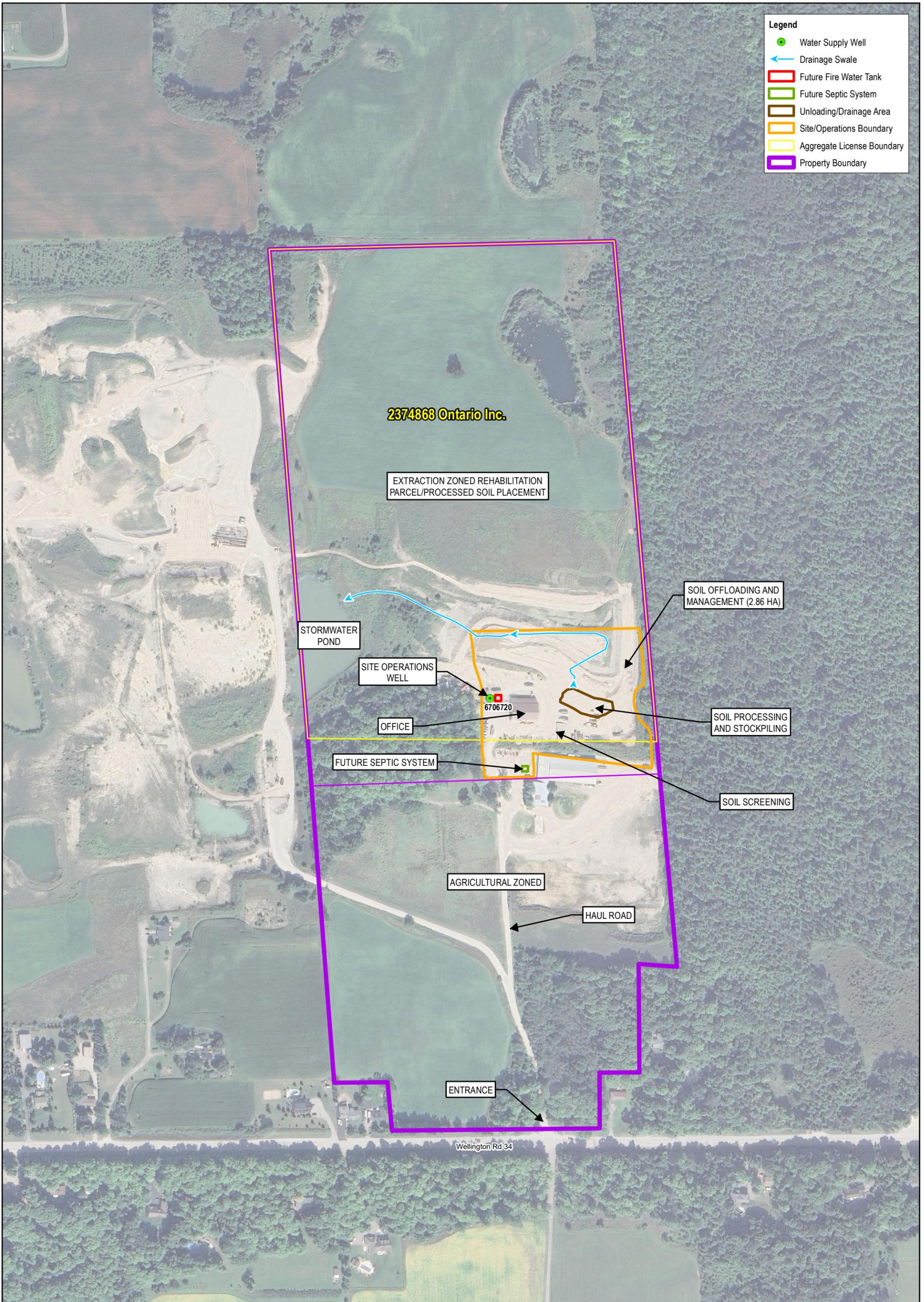
Figure 3

Q:\GIS\PROJECTS\12596000\12596768\GIS\Maps\Deliverables\GeomorphHazardAssessment\11210029_202204_EIA002_GIS004 - Operational Limit, Constraints and Mitigation - OLT.mxd
Print date: 16 Feb 2024 - 10:36

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Attachment B

Concept Plan



- Legend**
- Water Supply Well
 - ← Drainage Swale
 - Future Fire Water Tank
 - Future Septic System
 - Unloading/Drainage Area
 - Site/Operations Boundary
 - Aggregate License Boundary
 - Property Boundary

STORMWATER POND

SITE OPERATIONS WELL

OFFICE

FUTURE SEPTIC SYSTEM

AGRICULTURAL ZONED

HAUL ROAD

ENTRANCE

Wellington Rd 34

SOIL OFFLOADING AND MANAGEMENT (2.86 HA)

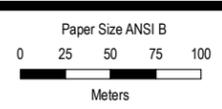
SOIL PROCESSING AND STOCKPILING

SOIL SCREENING

2374868 Ontario Inc.

EXTRACTION ZONED REHABILITATION PARCEL/PROCESSED SOIL PLACEMENT

6706720



2374868 ONTARIO INC.
6678 WELLINGTON RD 34
TOWNSHIP OF PUSLINCH, ON

Project No. 11210029
Revision No. -
Date May 28, 2025

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983 CSRS
Grid: NAD 1983 CSRS UTM Zone 17N

CONCEPT PLAN

FIGURE 1



Stormwater Management Plan Application for an Industrial Sewage Works – Stormwater Environmental Compliance Approval

2374868 Ontario Inc.
6678 Wellington Road 34
Township of Puslinch, Ontario

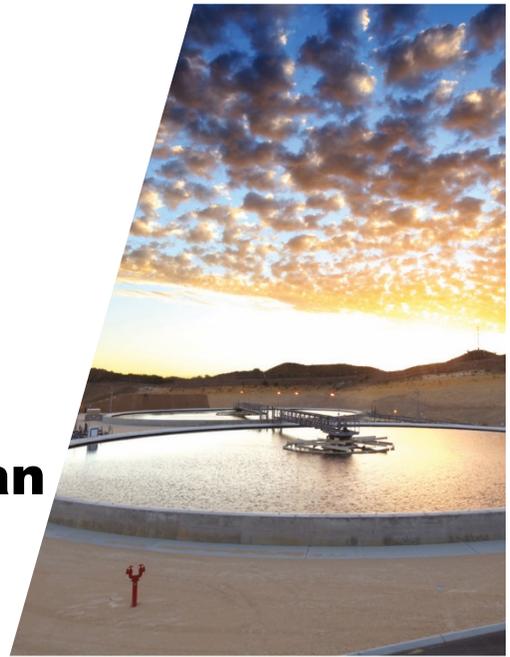




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Table 5	Peak Flow Summary - Existing Conditions
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- Appendix A Zoning Map
- Appendix B Hydrogeological Impact Assessment (HIA) Report
- Appendix C MECP Comments on the HIA Report and Responses
- Appendix D Hydrologic Model Input and Output Files



1. Introduction

GHD has prepared this Stormwater Management (SWM) Plan, on behalf of 2374868 Ontario Inc. (The Applicant), to support an application for a Ministry of the Environment Conservation and Parks (MECP) Environmental Compliance Approval (ECA) (Industrial Sewage Works- Stormwater). This SWM Plan documents the Applicant's stormwater management features at their processing facility located at 6678 Wellington Road 34 in Wellington County, Township of Puslinch, Ontario (Property). The Site is located on a small portion of the Property as shown on Figure 1, Site Location Map. 2374868 Ontario Inc. owns the Property and operates the Site.

This SWM Plan accompanies an ECA application package submitted to the MECP for Industrial Sewage Works, per Section 53 of the Ontario Water Resources Act (OWRA).

This SWM Plan presents GHD review of the existing SWM features in accordance with MECP requirements. GHD notes that this application is for obtaining an ECA for the existing sewage works and that no new works are proposed for the Site. Applications for an ECA (Waste Processing) and an ECA (Air and Noise) for the Site also have been submitted.

The Facility receives soil mixed with approximately 40 to 60 percent potable water (liquid soil) from hydrovacating operations at multiple sites conducted by Site operators and trucks. The soil processing operations are governed under the ECA (Waste Processing). The wet soil is stockpiled and the water drains off the soil by gravity drainage to the stormwater management system. The dry soil is sampled for chemical analysis to confirm that it is acceptable for use at appropriate on or off-Site locations in accordance with Waste ECA requirements.

The report (in addition to figures, drawings, and appendices) is organized into the following sections:

- Section 1 – Introduction
- Section 2 – Background
- Section 3 – Existing Site Conditions
- Section 4 – Hydrologic Assessment
- Section 5 – Monitoring and Maintenance
- Section 6 – Conclusions

The following guidelines and regulations have been reviewed during the process of developing the SWM Plan:

- "Development Engineering Manual" prepared by the City of Guelph Engineering and Capital Infrastructure Services, dated November 2016
- "Stormwater Management Planning and Design Manual", prepared by the MOECC in March 2003



2. Background Information

The Property is legally described as Lot 8, Concession 3 in Wellington County and is 39.3 hectares (ha) in size. The Property is comprised of two (2) equal sized parcels, one zoned as Extractive (EXI) and one zoned as Agricultural (A) as shown on Figure 2.

The Site is located on a 31,000 square meter (m²) portion of the EXI zoned parcel as shown on Figure 2. The zoning in the area of the Property is provided in Appendix A. The current zoning allows the Site operations, and a minor zoning amendment application has been submitted to Wellington County/the Township of Puslinch to update the specific allowed uses. The adjacent land use to the Property to the west is an operating aggregate extraction pit, to the north is agricultural land, to the east is forested conservation land, and to the south across Wellington Road 34 are residential and agricultural lands. The Ontario Ministry of Natural Resources and Forestry (MNRF) approved Pit Rehabilitation Plan provides for soil importation and associated infrastructure for rehabilitation.

2.1 Site Layout

The Site Layout is shown on Figure 2. The Site operations include the following:

- Site access
- Office Building
- Vehicle Parking areas
- Outdoor soil and water management
- Security

The Property has some wooden fencing on the south, east and north sides.

The Office Building is 650 (m²) in size. The building is a barn style open concept, steel-framed, and wood and metal clad structure with a concrete foundation and floor. The building is used for office work and miscellaneous equipment storage. Roof stormwater runoff is directed to the ground surface.

2.2 Hours and Days of Operations

The Site typically operates from 7 am to 6 pm Monday to Friday with trucks leaving in the morning and returning in the afternoon to unload. Some trucks make multiple trips from/to the Site during the day. The Site also occasionally provides hydrovacating services outside typical operating hours (e.g., after hours and weekends). The Site operates for 50 weeks per year.

2.3 Truck Traffic

Traffic to and from the Site uses the access road from the entrance at Wellington Road 34 from near by streets including Highway 401. All vehicles enter the Property from Wellington Road 34 onto the haul road and proceed directly to the Site. The traffic associated with the operations is not expected



to increase from current operations which has 25 hydrovac trucks and personal vehicles of truck drivers and Site personnel.

2.4 Service Area/Waste Accepted

The hydrovac trucks work throughout southern Ontario where liquid soil is collected from utility, municipal and commercial sites to ensure that utility strikes and damage do not occur during intrusive work (e.g., utility and roadwork). No hydrovac is done at environmental or other sites with known soil impacts. Liquid soil loads that may be impacted (e.g., determined by Site information, visual inspection and odours) are not returned to the Site and are sent directly to a MECP permitted treatment or disposal facility.

2.5 Receiving and Storage

The Applicant receives a maximum of 250 tonnes of liquid soil per day which is comprised of approximately 150 tonnes of water and 100 tonnes of dry soil. The Site has no more than ten weeks of dry soil stored at the Site at any one time (5,000 tonnes). The soil is placed in stockpiles for drying and sampling and some aggregate is separated out for recycling.

2.6 Water Sampling

2.6.1 Surface Water Sampling

The Applicant has conducted pond surface water sampling on a weekly basis since 2014. In May 2020, an expanded parameter list was started. From January 2017 to November 2020, 88 surface water samples were collected. The sampling results for 2020 (May to November 2020) are provided in Table 1 and are representative of the entire data set. The analytical data are compared to the Table 2 Potable Standards¹ as pond water infiltrates to groundwater and groundwater is used for potable use in the area of the Site, and all samples met the Standards.

There are two active water wells (livestock well and Site supply well) on the Property. One well is located on the Agriculture zoned portion of the property and the other is within the Site operations area (Extraction zoned). The Applicant has conducted groundwater well sampling since 2014. The sampling results for 2020 are provided in Table 2A (Agricultural Well) and Table 2B (Site Well), respectively and are representative of the entire data set. The analytical data are compared to the Table 2 Standards¹ and the results met the Standards.

In response to a request from MECP a Hydrogeological Impact Assessment (HIA) was completed for the Site. The HIA provides a comprehensive review of hydrogeological conditions in the area of the Site and concludes that there are no impacts to groundwater resources from Site operations. As part of the HIA, three new groundwater monitoring wells were installed and sampled. The HIA report is provided in Appendix B. The HIA demonstrates that there are no impacts to groundwater resources from the Site operations and a monitoring and reporting program also is included to provide ongoing demonstration of these conditions. MECP completed a technical review of the HIA report and concurred with the report conclusions. MECP's review also suggested that additional

¹ Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Coarse Textured Soils, as provided in the Table 1 of the MECP document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011.



monitoring parameters and an increased frequency for the proposed groundwater monitoring program, including reporting be provided. A copy of the MECP's review and the Applicant/GHD's response which concurs with the proposed monitoring program changes are provided in Appendix C.

3. Existing Site Conditions

The majority of the surface cover is woodlots, vegetation and grass. The operational Site surface cover is aggregate covered road and parking areas, bare soil and grass. The gravity water drainage from the soil stockpiles is collected in a vegetated drainage swale which runs east west and drains into an on-Site pond. The pond does not have an outlet and water is lost through evapotranspiration or infiltrates to soil and groundwater.

3.1 Existing Site Drainage

The existing conditions drainage patterns and the SWM features are shown on Figure 3 consist of a vegetated swale and SWM pond.

The eastern portion of the Site (Catchment A101, discharges overland towards the vegetated swale, and runoff is conveyed to the SWM pond. Catchment A102 is also captured by the vegetated swale and conveyed to the SWM pond. The remaining area, Catchment A103, discharges directly via sheet flow into the SWM pond. The on-site SWM pond is considered to be a wet pond with normal water levels at approximately 309 m AMSL as shown on Drawing C-01. There are no direct point source discharges of stormwater or outfalls from the Site to off-site areas.

The Property drainage outside of the Site area is not connected to the Site drainage features. The majority of the Property drains via sheet flow either to a second pond (located in the northern area of the Property), or to lower lying areas of the Property. There are no direct point source discharges of stormwater or outfalls from the Property to off-Site areas. There is some minor sheet flow runoff from the Property at the perimeter Property boundaries.

3.2 Hydrologic Assessment

Existing conditions modelling was conducted using PCSWMM V7.2.2785 to estimate peak flows and runoff volumes and to assess the on-site stormwater features (vegetated swale and SWM pond). The 24-hour SCS Type II storms were simulated using PCSWMM model and the IDF values were obtained from MTO-IDF curve lookup tool. The model was run for the 1:2 year through 1:100 year. Table 3 provides the synthetic design storm input parameters.

Catchment model input parameters were obtained from a review of topographic surveys, aerial photographs, and Site visit notes. A summary of the existing conditions catchment parameters are presented in Table 4 and are based on conditions as shown on Drawing C-01. A summary of the estimated peak flow and runoff volume from each catchment area is presented in Tables 5 and 6, respectively.

The PCSWMM model was used to assess the capacity of the on-Site swale and SWM pond. SWM pond information is presented in Table 7, including the maximum pond stage for each storm.



The PCSWMM hydrologic model input and output files for existing conditions is provided as Appendix D.

The hydrological modelling verifies that the on-site stormwater features have sufficient capacity to capture, convey and mitigate the stormwater runoff from the operational areas including additional areas served by the on-site stormwater features.

4. Inspection and Maintenance

The following proposed measures should be performed to monitor and maintain the on-site stormwater features:

- Inspect the vegetated swale regularly to check for sediment and/or debris accumulation. If there is a large amount of sediment and/or debris buildup, then perform maintenance.
- The SWM pond should be checked regularly to ensure that excessive sediment build-up does not occur. The pond area should be cleaned on an as-required basis. If erosion is present, the affected areas must be maintained, re-graded or otherwise restored as required.
- Conduct yard inspection on a regular basis and perform maintenance as required to keep outside areas clean to minimize potential impacts to stormwater.

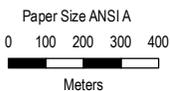
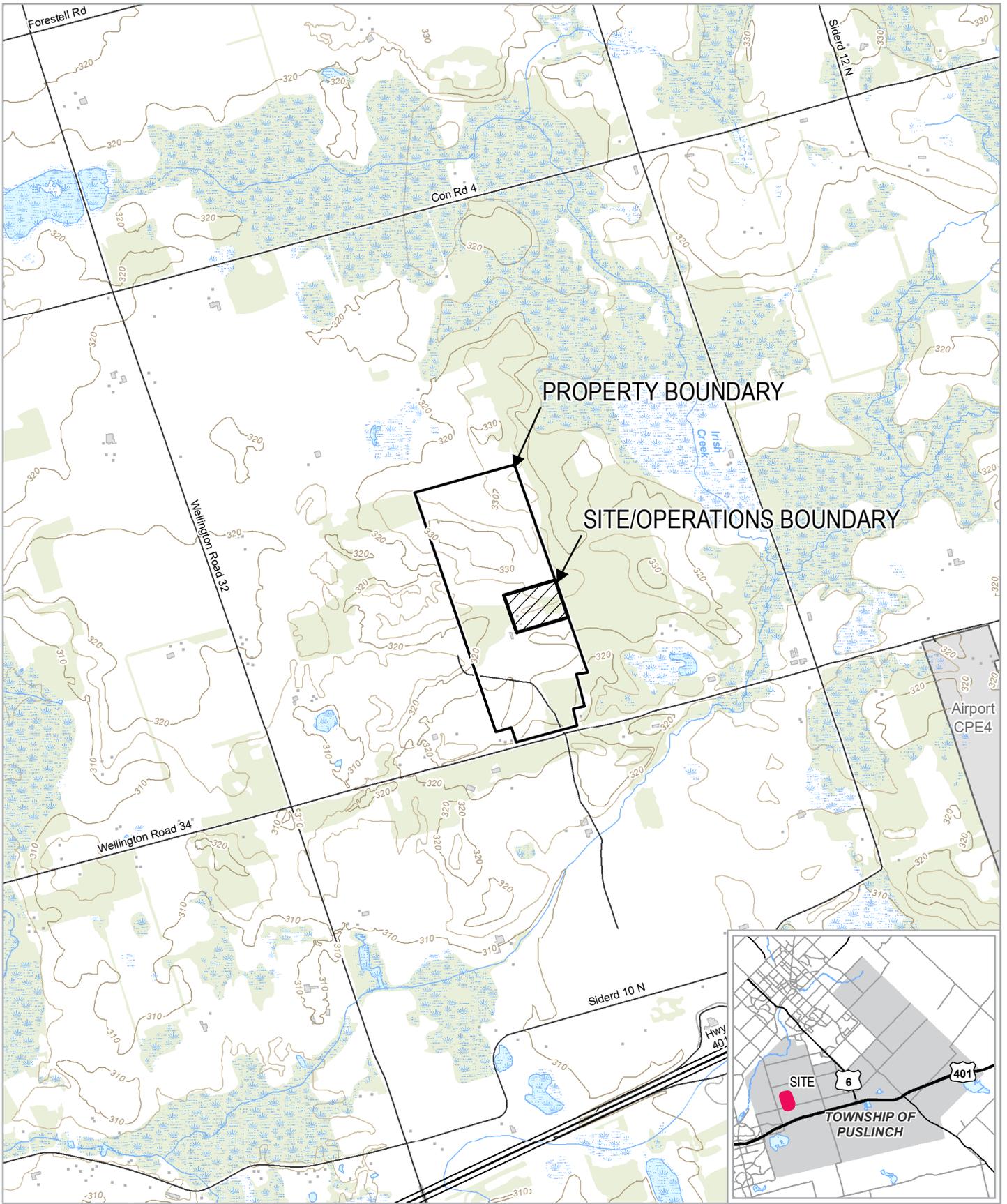
These inspection and maintenance activities are included in the Design and Operations Report for the Site submitted with the application for an ECA (Waste Processing).

5. Conclusions

GHD has prepared this Stormwater Management Plan for 2374868 Ontario Inc. for the exiting Site servicing hydrovacating operations.

This Stormwater Management Plan was submitted with an application for an ECA (Industrial Sewage Works) as per Section 53 of the OWRA. The ECA will govern the operation of the sewage works at the Site consisting of a vegetated swale and SWM pond.

Note that no new works or modifications to the Site are proposed. Hence, Site drainage pattern and stormwater runoff are maintained. GHD's assessment of the operation of the existing sewage works is that no additional quantity or quality works are required. The on-site stormwater features provide water quality treatment accumulatively through a vegetated swale by promoting settling of suspended solids and infiltration of stormwater runoff via the SWM pond. In addition, the SWM pond has sufficient capacity to capture and store stormwater runoff generated by storm events larger than the 100-year from all contributing drainage areas.



Map Projection: Transverse Mercator
 Horizontal Datum: North American 1983 CSRS
 Grid: NAD 1983 CSRS UTM Zone 17N



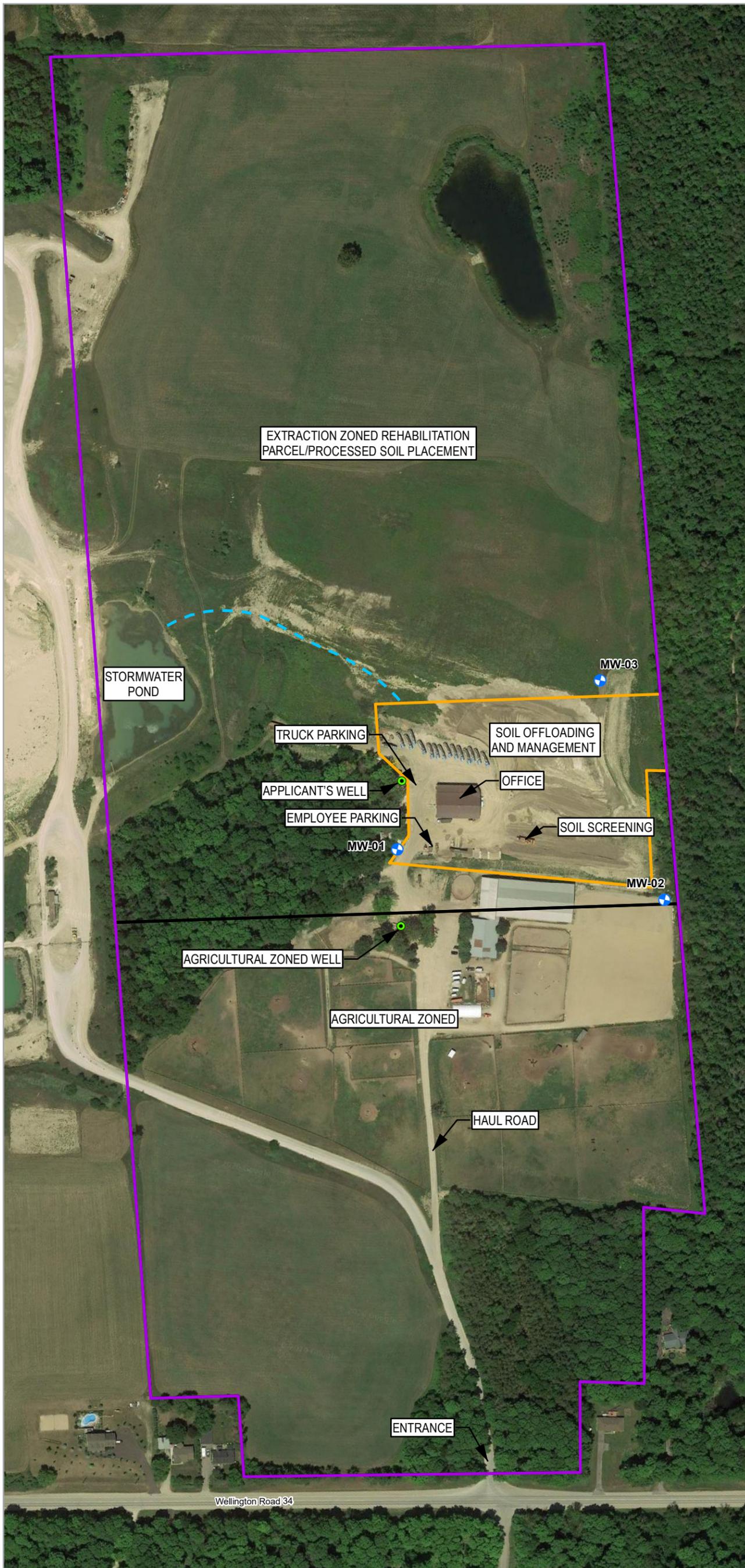
2374868 ONTARIO INC. 6678
 WELLINGTON RD 34
 TOWNSHIP OF PUSLINCH, ON

Project No. 11210029
 Revision No. -
 Date Oct 9, 2020

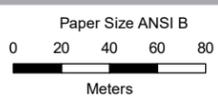
SITE LOCATION MAP

FIGURE 1

Data source: WWIS, 2020. Ontario Ministry of the Environment (Accessed August, 2020); Imagery Google 2020. Capture date: 7/Jul/2018



Legend	
	Well
	Monitoring Well
	Drainage Swale
	Site/Operations Boundary
	Property Boundary



Map Projection: Transverse Mercator
 Horizontal Datum: North American 1983 CSRS
 Grid: NAD 1983 CSRS UTM Zone 17N

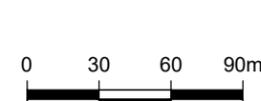
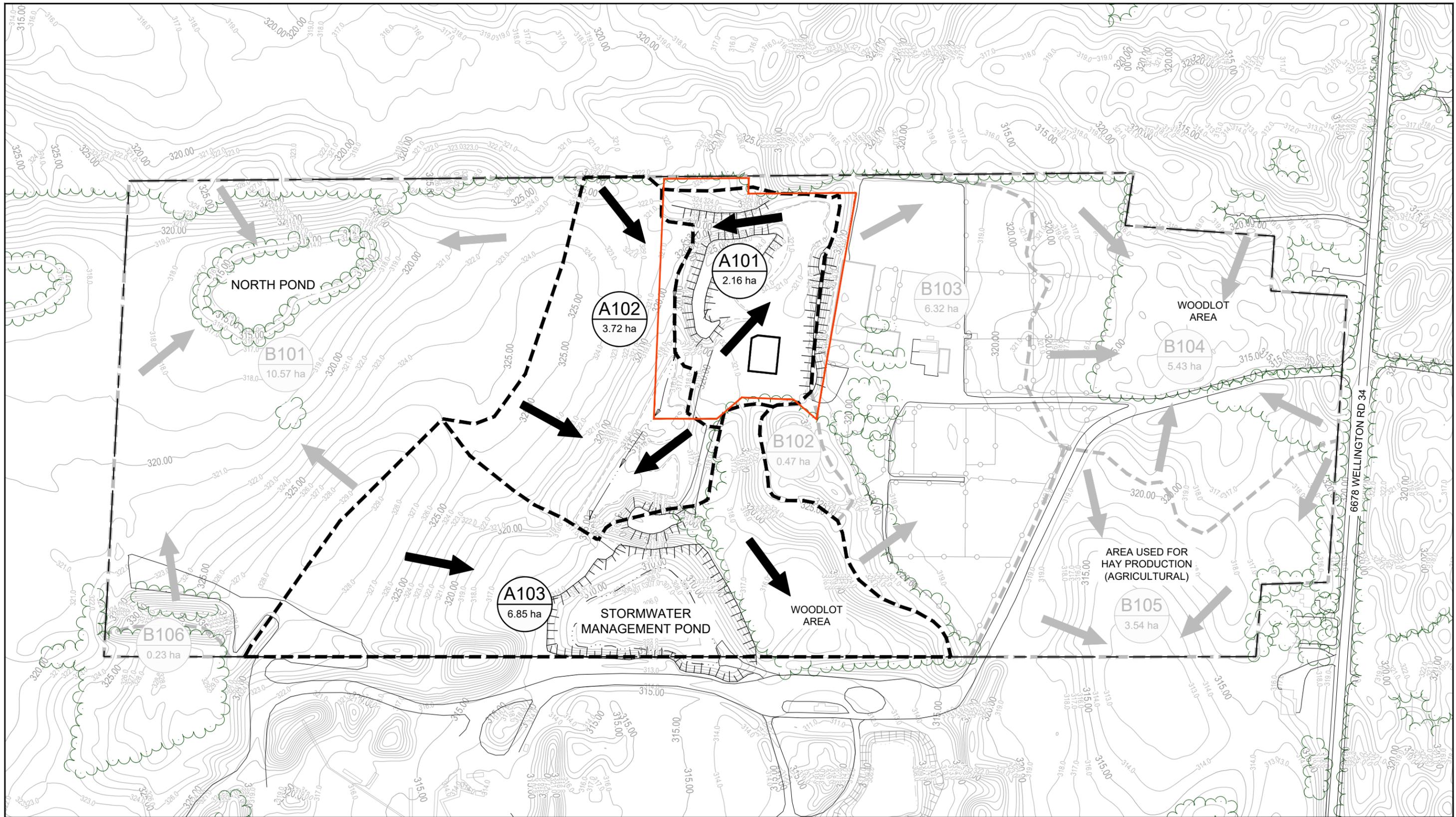


2374868 ONTARIO INC.
 6678 WELLINGTON RD 34
 TOWNSHIP OF PUSLINCH, ON

Project No. 11210029
 Revision No. -
 Date Feb 1, 2021

SITE LAYOUT

FIGURE 2



LEGEND

- SITE OPERATION CATCHMENT BOUNDARY
- CATCHMENT BOUNDARY
- PROPERTY BOUNDARY
- SITE/OPERATIONS BOUNDARY
- DIRECTION OF SURFACE WATER FLOW
- A101 CATCHMENT ID
- 2.16 ha CATCHMENT AREA



2374868 ONTARIO INC.
 STORMWATER MANAGEMENT PLAN
 EXISTING CONDITIONS
 CATCHMENT DELINEATION

11210029-01
 Dec 17, 2020

FIGURE 3

Table 1

**Pond Surface Water Analytical Data (May to November 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Sample ID: Report No. Sample Date:	W-11210029-28052020-CD002 L2453062-1 May 28 2020	W-11210029-040620-AS-004 L2456339-1 June 4 2020	W-11210029-20200611-CD-006 L2459298-1 June 11 2020	W11210029-20200618-8 L2465490 June 18 2020	W-11210029-20200625-10 L2466205-1 June 25 2020	W-11210029-20200716-16 L2475470-1 July 16 2020	W-11210029-20200806-22 L2484852-1 August 6 2020
--	--	---	--	--	--	--	---

	Table 2 Standards ²	PWQO/ IPWQO ³	Units										
	2011	1999		W-11210029-28052020-CD002	W-11210029-040620-AS-004	W-11210029-20200611-CD-006	W11210029-20200618-8	W-11210029-20200625-10	W-11210029-20200716-16	W-11210029-20200806-22			
Metals													
Aluminum	--	75*	µg/L	447	250	876	604	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Antimony	6	20	µg/L	0.18	0.19	0.21	0.25	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	25	5	µg/L	0.92	0.86	1.27	1.19	5.13	5.25	7.84	7.84	7.84	7.84
Barium	1000	--	µg/L	11.8	12.6	18	14.9	64	63.1	49.6	49.6	49.6	49.6
Beryllium (4)	4	1100	µg/L	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bismuth	--	--	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Boron (total)	5000	200	µg/L	17	13	15	16	14	14	<10.0	<10.0	<10.0	<10.0
Cadmium (5)	2.7	0.5	µg/L	0.0168	0.0093	0.0356	0.0333	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Calcium	--	--	µg/L	36500	31000	32100	32100	47400	46900	63300	63300	63300	63300
Cesium	--	--	µg/L	0.033	0.017	0.081	0.051	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	50	8.9	µg/L	0.62	<0.05	1.2	0.92	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium, Hexavalent	25	1	µg/L	<0.50	<0.50	<0.50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	3.8	0.9	µg/L	0.22	0.15	0.52	0.39	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	87	5	µg/L	1.91	1	3	3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron	--	300	µg/L	444	256	1140	823	252	262	714	714	714	714
Lead (6)	10	5	µg/L	1.15	0.694	3.21	2.83	<0.005	<0.005	0.141	0.141	0.141	0.141
Lithium	--	--	µg/L	1.5	<1.0	1.3	1.3	3.1	2.9	2.7	2.7	2.7	2.7
Magnesium	--	--	µg/L	8570	8410	8770	9750	25400	26600	30200	30200	30200	30200
Manganese	--	--	µg/L	35.9	18.6	44.7	43.8	8.29	8.48	8.8	8.8	8.8	8.8
Mercury	0.29	0.2*	µg/L	<0.05	<0.05	<0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum	70	40	µg/L	2.41	2.65	2.38	2.44	0.721	0.722	0.596	0.596	0.596	0.596
Nickel	100	25	µg/L	0.98	0.7	1.6	1.27	<0.5	<0.5	1.22	1.22	1.22	1.22
Phosphorus	--	--	µg/L	60	<50.0	55	66	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Potassium	--	--	µg/L	2530	2460	2570	2570	960	958	898	898	898	898
Rubidium	--	--	µg/L	0.86	0.59	1.36	1.03	0.36	0.3	<0.02	<0.02	<0.02	<0.02
Selenium	10	100	µg/L	0.115	0.108	0.105	0.158	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silicon	--	--	µg/L	860	550	1450	1020	7360	7520	8380	8380	8380	8380
Silver	1.5	0.1	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sodium	490000	--	µg/L	30600	31800	31000	31800	5750	5810	7170	7170	7170	7170
Strontium	--	--	µg/L	105	103	106	108	334	327	145	145	145	145
Sulfur	--	--	µg/L	6620	6630	6520	6830	7030	7380	18300	18300	18300	18300
Tellurium	--	--	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	2.0	0.3	µg/L	<0.01	<0.01	0.013	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thorium	--	--	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	--	--	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Titanium	--	--	µg/L	13.9	6.34	21.3	16.1	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Tungsten	--	30.0	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Uranium	20.0	5.0	µg/L	0.563	0.543	0.59	0.599	0.555	0.564	0.297	0.297	0.297	0.297
Vanadium	6.2	6.0	µg/L	1.14	0.88	2.06	1.73	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Zinc	1100	20	µg/L	4.8	<3.0	14.0	14.3	<3.0	<3.0	44.2	44.2	44.2	44.2
Zirconium	--	4	µg/L	0.4	<0.2	0.54	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total Plate Count	--	--	cfu/mL										
E. coli	--	100 cfu/100 mL	cfu/100 mL										

Table 1

**Pond Surface Water Analytical Data (May to November 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Sample ID:	W-11210029-28052020-CD002	W-11210029-040620-AS-004	W-11210029-20200611-CD-006	W11210029-20200618-8	W-11210029-20200625-10	W-11210029-20200716-16	W-11210029-20200806-22
Report No.	L2453062-1	L2456339-1	L2459298-1	L2465490	L2466205-1	L2475470-1	L2484852-1
Sample Date:	May 28 2020	June 4 2020	June 11 2020	June 18 2020	June 25 2020	July 16 2020	August 6 2020

	Table 2 Standards ²		PWQO/ IPWQO ³	Units							
	2011	1999									
Volatile Organic Compounds (Water)											
Acetone	2700		µg/L	<30	<30	<30	<30	<30	<30	<30	<30
Benzene	5	100	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	16	200	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform	25	60	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	0.89	0.9	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon tetrachloride	0.79		µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	30	15	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	25		µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform	2.4		µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane			µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3	2.5	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	2.5	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	4	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	590		µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloroethane	5	200	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	1.6	100	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	1.6	40	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	1.6	200	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	1.6	200	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	50	100	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	5	0.7	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	0.5		µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	0.5		µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (cis & trans)	0.5		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	2.4	8	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Hexane	51		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Ethyl Ketone	1800	400	µg/L	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone	640		µg/L	<20	<20	<20	<20	<20	<20	<20	<20
MTBE	15	200	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Styrene	5.4	4	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	20	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2,2-Tetrachloroethane	1	70	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethylene	1.6	50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	24	0.8	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	200	10	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	4.7	800	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	1.6	20	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	150		µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	0.5	600	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
o-Xylene		40	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
m+p-Xylenes			µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes (Total)	300		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 1

**Pond Surface Water Analytical Data (May to November 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

	Sample ID: Report No. Sample Date:	W-11210029-28052020-CD002 L2453062-1 May 28 2020	W-11210029-040620-AS-004 L2456339-1 June 4 2020	W-11210029-20200611-CD-006 L2459298-1 June 11 2020	W11210029-20200618-8 L2465490 June 18 2020	W-11210029-20200625-10 L2466205-1 June 25 2020	W-11210029-20200716-16 L2475470-1 July 16 2020	W-11210029-20200806-22 L2484852-1 August 6 2020	
	Table 2 Standards ²								
	PWQO/ IPWQO ³								
	2011								
	1999								
	Units								
Hydrocarbons (Water)									
F1 (C6-C10)	750		<25	<25	<25	<25	<25	<25	<25
F1-BTEX			<25	<25	<25	<25	<25	<25	<25
F2 (C10-C16)	150		<100	<100	<100	<100	<100	<100	<100
F2-Naphth			<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	500		<250	<250	<250	<250	<250	<250	<250
F3-PAH			<250	<250	<250	<250	<250	<250	<250
F4 (C34-C50)	500		<250	<250	<250	<250	<250	<250	<250
Total Hydrocarbons (C6-C50)			<370	<370	<370	<370	<370	<370	<370
Semi-Volatile Organics (Water)									
Biphenyl	0.5	0.2	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
4-Chloroaniline	10		<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Bis(2-chloroethyl)ether	5	200	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Bis(2-chloroisopropyl)ether	120		<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2-Chlorophenol	8.9		<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
3,3'-Dichlorobenzidine	0.5	0.6	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4-Dichlorophenol	20	0.2	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Diethylphthalate	38		<0.40	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dimethylphthalate	38		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4-Dimethylphenol	59	8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2,4-Dinitrophenol	10	10	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0
2,4-Dinitrotoluene	5	4	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,6-Dinitrotoluene	5	6	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4+2,6-Dinitrotoluene	5		<0.57	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57
Bis(2-ethylhexyl)phthalate	10		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Pentachlorophenol	30	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Phenol	890	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	70	0.5	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4,5-Trichlorophenol	8.9	18	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4,6-Trichlorophenol	2	18	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Polychlorinated Biphenyls (Water)									
Aroclor 1242			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Aroclor 1248			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Aroclor 1254			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Aroclor 1260			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Total PCBs	3	0.001	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Aggregate Organics (Water)									
BOD			4100	<3000	<3000				

Table 1

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Sample ID: Report No. Sample Date:	W-11210029-28052020-CD002 L2453062-1 May 28 2020	W-11210029-040620-AS-004 L2456339-1 June 4 2020	W-11210029-20200611-CD-006 L2459298-1 June 11 2020	W11210029-20200618-8 L2465490 June 18 2020	W-11210029-20200625-10 L2466205-1 June 25 2020	W-11210029-20200716-16 L2475470-1 July 16 2020	W-11210029-20200806-22 L2484852-1 August 6 2020
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	Table 2 Standards ²	PWQO/ IPWQO ³	Units							
	2011	1999		W-11210029-28052020-CD002	W-11210029-040620-AS-004	W-11210029-20200611-CD-006	W11210029-20200618-8	W-11210029-20200625-10	W-11210029-20200716-16	W-11210029-20200806-22
Physical Tests (Water)										
pH			pH units	8.23	8.46	8.16				
Total Suspended Solids			µg/L	12800	4600	22600				
Anions and Nutrients (Water)										
Phosphorus, Total			µg/L	36.5	25.7	51.6	35.4	4.5	7.0	7.0
Organic / Inorganic Carbon (Water)										
Total Organic Carbon			µg/L	5730	4830	7240				
Polycyclic Aromatic Hydrocarbons (Water)										
Acenaphthene	4.1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Acenaphthylene	1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Anthracene	2.4		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(a)anthracene	1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(a)pyrene	0.01		µg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(b)fluoranthene	0.1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(g,h,i)perylene	0.2		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(k)fluoranthene	0.1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Chrysene	0.1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dibenzo(ah)anthracene	0.2		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluoranthene	0.41		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorene	120		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Indeno(1,2,3-cd)pyrene	0.2		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1+2-Methylnaphthalenes	3.2		µg/L	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028
1-Methylnaphthalene	3.2		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
2-Methylnaphthalene	3.2		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Naphthalene	11		µg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Phenanthrene	1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Pyrene	4.1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

Notes:

- (1) Data from Guelph Chemical Laboratories Ltd. (GCL) reports for pond water samples collected by Badger on monthly basis from January 2017 to December 2019.
- (2) Full Depth Generic Site Condition Standards in a Potable Ground Water Condition All Types of Property Use, as provided in the Table 2 of the MECP document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011.
- (3) PWQO=Provincial Water Quality Objective, MECP, February 1999
IPWQO= Interim Provincial Water Quality Objective, MECP, February 1999
- (4) The PWQO for beryllium is 1.1 mg/L when the hardness as CaCO3 (mg/L) is >75
- (5) The IPWQO for cadmium is 0.0005 mg/L when the hardness as CaCO3 (mg/L) is >100
- (6) The IPWQO for lead is 0.005 mg/L when the hardness as CaCO3 (mg/L) is >80
- (*) The PWQO is for Dissolved Metals
- No data or Standard available.
- ND Not detected at the associated detection limit (DL).
- µg/L microgram/liter
- cfu /colony forming units/milliliter
- Concentration greater then referenced 2011 Table 2 Criteria.

Table 1

**Pond Surface Water Analytical Data (May to November 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Sample ID:	W-11210029-20200827-28	W-11210029-20200903-30	W-11210029-20200910-32	W-11210029-20200917-34	W-11210029-20200924-36	W-11210029-20201001-38	W-11210029-20201008-40
Report No.	L2495218	L2498566-1	L2501541-1	L2504779-1	L2507865-1	L2511128-1	L2514428-1
Sample Date:	August 27 2020	September 3 2020	September 10 2020	September 17 2020	September 24 2020	October 1 2020	October 8 2020

	Table 2	PWQO/	Units									
	Standards ²	IPWQO ³		2011	1999	W-11210029-20200827-28	W-11210029-20200903-30	W-11210029-20200910-32	W-11210029-20200917-34	W-11210029-20200924-36	W-11210029-20201001-38	W-11210029-20201008-40
Metals												
Aluminum	--	75*	µg/L	251	6.0	626	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Antimony	6	20	µg/L	0.21	<0.1	0.24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	25	5	µg/L	1.27	5.61	1.82	5.42	6	11.1	5.01	5.01	5.01
Barium	1000	--	µg/L	13.5	67.2	21.3	49.4	50	51.4	51.1	51.1	51.1
Beryllium (4)	4	1100	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bismuth	--	--	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Boron (total)	5000	200	µg/L	17	15	17	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Cadmium (5)	2.7	0.5	µg/L	0.0099	<0.005	0.0217	<0.005	<0.005	0.0068	<0.005	<0.005	<0.005
Calcium	--	--	µg/L	24900	49700	29400	70600	69100	69300	71700	71700	71700
Cesium	--	--	µg/L	0.018	<0.01	0.052	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	50	8.9	µg/L	<0.5	<0.5	0.84	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium, Hexavalent	25	1	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	3.8	0.9	µg/L	0.15	<0.1	0.28	<0.1	<0.1	0.32	<0.1	<0.1	<0.1
Copper	87	5	µg/L	1.59	<0.5	3	<0.5	<0.5	3	<0.5	<0.5	<0.5
Iron	--	300	µg/L	275	287	688	434	474	1760	387	387	387
Lead (6)	10	5	µg/L	1.02	<0.05	1.78	0.108	0.131	0.959	0.055	0.055	0.055
Lithium	--	--	µg/L	<1.0	3.5	<1.0	4.2	3.5	3.9	4.0	4.0	4.0
Magnesium	--	--	µg/L	7660	26800	7850	33500	31700	32100	33900	33900	33900
Manganese	--	--	µg/L	15.5	9.08	37.1	10.2	9.55	11.2	11.0	11.0	11.0
Mercury	0.29	0.2*	µg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum	70	40	µg/L	2.74	0.754	2.99	0.59	0.563	0.567	0.544	0.544	0.544
Nickel	100	25	µg/L	0.76	<0.5	1.1	0.97	0.96	12.5	<0.5	<0.5	<0.5
Phosphorus	--	--	µg/L	<50	<50.0	59	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Potassium	--	--	µg/L	2360	1010	2630	950	973	986	980	980	980
Rubidium	--	--	µg/L	0.59	0.31	1.28	0.21	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	10	100	µg/L	0.103	<0.05	0.134	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Silicon	--	--	µg/L	360	7490	1070	8850	8650	9160	8700	8700	8700
Silver	1.5	0.1	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sodium	490000	--	µg/L	31700	6220	31700	7920	7700	7730	8200	8200	8200
Strontium	--	--	µg/L	86.3	3.22	102	153	150	154	147	147	147
Sulfur	--	--	µg/L	5940	7130	6060	20500	19900	19500	19300	19300	19300
Tellurium	--	--	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	2.0	0.3	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thorium	--	--	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	--	--	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	0.18	<0.1	<0.1	<0.1
Titanium	--	--	µg/L	5.22	<0.3	15.5	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Tungsten	--	30.0	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Uranium	20.0	5.0	µg/L	0.493	0.61	0.472	0.251	0.276	0.26	0.254	0.254	0.254
Vanadium	6.2	6.0	µg/L	1.25	<0.5	1.89	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Zinc	1100	20	µg/L	3.6	<3.0	7.6	4.6	8.4	346.0	6.3	6.3	6.3
Zirconium	--	4	µg/L	<0.2	<0.2	0.35	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total Plate Count	--	--	cfu/mL									
E. coli	--	100 cfu/100 mL	cfu/100 mL									

Table 1

Pond Surface Water Analytical Data (May to November 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch

Sample ID:	W-11210029-20200827-28	W-11210029-20200903-30	W-11210029-20200910-32	W-11210029-20200917-34	W-11210029-20200924-36	W-11210029-20201001-38	W-11210029-20201008-40
Report No.:	L2495218	L2498566-1	L2501541-1	L2504779-1	L2507865-1	L2511128-1	L2514428-1
Sample Date:	August 27 2020	September 3 2020	September 10 2020	September 17 2020	September 24 2020	October 1 2020	October 8 2020

	Table 2 Standards ²		PWQO/ IPWQO ³	Units																
	2011	1999																		
Volatile Organic Compounds (Water)																				
Acetone	2700			µg/L	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
Benzene	5	100		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	16	200		µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform	25	60		µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	0.89	0.9		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon tetrachloride	0.79			µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	30	15		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	25			µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform	2.4			µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane				µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3	2.5		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	2.5		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	4		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	590			µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloroethane	5	200		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	1.6	100		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	1.6	40		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	1.6	200		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	1.6	200		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	50	100		µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	5	0.7		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	0.5			µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	0.5			µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (cis & trans)	0.5			µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	2.4	8		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Hexane	51			µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Ethyl Ketone	1800	400		µg/L	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone	640			µg/L	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
MTBE	15	200		µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Styrene	5.4	4		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	20		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2,2-Tetrachloroethane	1	70		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethylene	1.6	50		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	24	0.8		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	200	10		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	4.7	800		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	1.6	20		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	150			µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	0.5	600		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
o-Xylene		40		µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
m+p-Xylenes				µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes (Total)	300			µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 1

**Pond Surface Water Analytical Data (May to November 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

	Sample ID: Report No. Sample Date:	W-11210029-20200827-28 L2495218 August 27 2020	W-11210029-20200903-30 L2498566-1 September 3 2020	W-11210029-20200910-32 L2501541-1 September 10 2020	W-11210029-20200917-34 L2504779-1 September 17 2020	W-11210029-20200924-36 L2507865-1 September 24 2020	W-11210029-20201001-38 L2511128-1 October 1 2020	W-11210029-20201008-40 L2514428-1 October 8 2020	
	Table 2 Standards ²								
	2011								
	PWQO/ IPWQO ³								
	1999								
	Units								
Hydrocarbons (Water)									
F1 (C6-C10)	750	µg/L	<25	<25	<25	<25	<25	<25	<25
F1-BTEX		µg/L	<25	<25	<25	<25	<25	<25	<25
F2 (C10-C16)	150	µg/L	<100	<100	<100	<100	<100	<100	<100
F2-Naphth		µg/L	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	500	µg/L	<250	<250	<250	<250	<250	<250	<250
F3-PAH		µg/L	<250	<250	<250	<250	<250	<250	<250
F4 (C34-C50)	500	µg/L	<250	<250	<250	<250	<250	<250	<250
Total Hydrocarbons (C6-C50)		µg/L	<370	<370	<370	<370	<370	<370	<370
Semi-Volatile Organics (Water)									
Biphenyl	0.5	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
4-Chloroaniline	10	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Bis(2-chloroethyl)ether	5	µg/L	200	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Bis(2-chloroisopropyl)ether	120	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2-Chlorophenol	8.9	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
3,3'-Dichlorobenzidine	0.5	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4-Dichlorophenol	20	µg/L	0.2	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Diethylphthalate	38	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dimethylphthalate	38	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4-Dimethylphenol	59	µg/L	8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2,4-Dinitrophenol	10	µg/L	10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dinitrotoluene	5	µg/L	4	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,6-Dinitrotoluene	5	µg/L	6	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4+2,6-Dinitrotoluene	5	µg/L		<0.57	<0.57	<0.57	<0.57	<0.57	<0.57
Bis(2-ethylhexyl)phthalate	10	µg/L		<2.0	<2.0	<2.0	<2.0	<2.0	2.3
Pentachlorophenol	30	µg/L	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Phenol	890	µg/L	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	70	µg/L	0.5	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4,5-Trichlorophenol	8.9	µg/L	18	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4,6-Trichlorophenol	2	µg/L	18	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Polychlorinated Biphenyls (Water)									
Aroclor 1242		µg/L		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Aroclor 1248		µg/L		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Aroclor 1254		µg/L		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Aroclor 1260		µg/L		<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Total PCBs	3	µg/L	0.001	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Aggregate Organics (Water)									
BOD		µg/L							

Table 1

**Pond Surface Water Analytical Data (May to November 2020)
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2374868 Ontario Inc.
Township of Puslinch**

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	Table 2 Standards ²								
	PWQO/ IPWQO ³								
	2011								
	1999								
	Units								
Physical Tests (Water)									
pH									pH units
Total Suspended Solids									µg/L
Anions and Nutrients (Water)									
Phosphorus, Total		38.1	3.2	48.8	4.6	<3.0	5.8	6.3	µg/L
Organic / Inorganic Carbon (Water)									
Total Organic Carbon									µg/L
Polycyclic Aromatic Hydrocarbons (Water)									
Acenaphthene	4.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Acenaphthylene	1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Anthracene	2.4	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Benzo(a)anthracene	1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Benzo(a)pyrene	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	µg/L
Benzo(b)fluoranthene	0.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Benzo(g,h,i)perylene	0.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Benzo(k)fluoranthene	0.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Chrysene	0.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Dibenzo(ah)anthracene	0.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Fluoranthene	0.41	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Fluorene	120	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Indeno(1,2,3-cd)pyrene	0.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
1+2-Methylnaphthalenes	3.2	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	µg/L
1-Methylnaphthalene	3.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
2-Methylnaphthalene	3.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Naphthalene	11	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	µg/L
Phenanthrene	1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L
Pyrene	4.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	µg/L

Notes:

- (1) Data from Guelph Chemical Laboratories Ltd. (GCL) reports for pond water samples collected by Badger on monthly basis from January 2017 to December 2019.
- (2) Full Depth Generic Site Condition Standards in a Potable Ground Water Condition All Types of Property Use, as provided in the Table 2 of the MECP document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011.
- (3) PWQO=Provincial Water Quality Objective, MECP, February 1999
IPWQO= Interim Provincial Water Quality Objective, MECP, February 1999
- (4) The PWQO for beryllium is 1.1 mg/L when the hardness as CaCO3 (mg/L) is >75
- (5) The IPWQO for cadmium is 0.0005 mg/L when the hardness as CaCO3 (mg/L) is >100
- (6) The IPWQO for lead is 0.005 mg/L when the hardness as CaCO3 (mg/L) is >80
- (*) The PWQO is for Dissolved Metals
- No data or Standard available.
- ND Not detected at the associated detection limit (DL).
- µg/L microgram/liter
- cfu / colony forming units/milliliter
- Concentration greater then referenced 2011 Table 2 Criteria.

Table 1

**Pond Surface Water Analytical Data (May to November 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

	Sample ID: Report No. Sample Date:	W-11210029-20201015-42 L2517112-1 October 15 2020	W-11210029-20201022-44 L2520323-1 October 22 2020	W-11210029-20201029-46 L2523350-1 October 29 2020	W-11210029-20201105- 48 L2526411-1 November 5 2020	W-11210029-20201112-50 L2528910-1 November 12 2020	W-11210029-20201119-52 L2531509-1 November 19 2020	W-11210029-20201126-54 L2534021-1 November 26 2020	
	Table 2 Standards ²	PWQO/ IPWQO ³							
	2011	1999	Units						
Metals									
Aluminum	--	75*	µg/L	<5.0	<5.0	<5.0	<5.0	576	<5.0
Antimony	6	20	µg/L	<0.1	<0.1	<0.1	<0.1	0.23	<0.1
Arsenic	25	5	µg/L	5.35	5.48	5.55	6.56	1.08	5.56
Barium	1000	--	µg/L	53.7	52.3	48.7	48	57.1	25.3
Beryllium (4)	4	1100	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bismuth	--	--	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Boron (total)	5000	200	µg/L	<10.0	<10.0	<10.0	<10.0	19	<10.0
Cadmium (5)	2.7	0.5	µg/L	<0.005	<0.005	<0.005	<0.005	0.0226	<0.005
Calcium	--	--	µg/L	70500	74800	66100	72400	38600	67400
Cesium	--	--	µg/L	<0.01	<0.01	<0.01	<0.01	0.06	<0.01
Chromium	50	8.9	µg/L	0.83	<0.5	<0.5	<0.5	1.15	<0.5
Chromium, Hexavalent	25	1	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	3.8	0.9	µg/L	0.11	0.19	0.11	<0.1	0.11	0.35
Copper	87	5	µg/L	<0.5	1	1	<0.5	<0.5	2.17
Iron	--	300	µg/L	520	432	478	386	620	403
Lead (6)	10	5	µg/L	0.072	0.647	0.135	<0.05	0.103	1.82
Lithium	--	--	µg/L	3.0	4.2	3.3	4.1	3.3	<1.0
Magnesium	--	--	µg/L	33300	34300	31900	31800	34000	8280
Manganese	--	--	µg/L	10.6	10.7	9.95	9.18	11.4	32.4
Mercury	0.29	0.2*	µg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum	70	40	µg/L	0.586	0.58	0.563	0.531	0.599	2.98
Nickel	100	25	µg/L	1.39	3.01	1.98	<0.5	0.89	1.32
Phosphorus	--	--	µg/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Potassium	--	--	µg/L	930	1020	967	921	1040	2960
Rubidium	--	--	µg/L	<0.2	0.21	<0.2	<0.2	0.23	1.18
Selenium	10	100	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.121
Silicon	--	--	µg/L	9130	9290	8470	8250	9290	1260
Silver	1.5	0.1	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sodium	490000	--	µg/L	7640	8040	7710	7510	8030	34800
Strontium	--	--	µg/L	150	153	144	147	160	111
Sulfur	--	--	µg/L	20700	20300	17700	19100	19900	7870
Tellurium	--	--	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	2.0	0.3	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Thorium	--	--	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	--	--	µg/L	<0.1	0.17	<0.1	<0.1	<0.1	0.11
Titanium	--	--	µg/L	<0.3	<0.3	<0.3	<0.3	<0.3	17.5
Tungsten	--	30.0	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Uranium	20.0	5.0	µg/L	0.247	0.264	0.268	0.261	0.264	0.653
Vanadium	6.2	6.0	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	1.56
Zinc	1100	20	µg/L	14.2	8.2	9.1	3	39.3	8.4
Zirconium	--	4	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	0.29
Total Plate Count	--	--	cfu/mL						
E. coli	--	100 cfu/100 mL	cfu/100 mL						

Table 1

**Pond Surface Water Analytical Data (May to November 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

	Sample ID: Report No. Sample Date:	W-11210029-20201015-42 L2517112-1 October 15 2020	W-11210029-20201022-44 L2520323-1 October 22 2020	W-11210029-20201029-46 L2523350-1 October 29 2020	W-11210029-20201105- 48 L2526411-1 November 5 2020	W-11210029-20201112-50 L2528910-1 November 12 2020	W-11210029-20201119-52 L2531509-1 November 19 2020	W-11210029-20201126-54 L2534021-1 November 26 2020
	Table 2 Standards ²							
	2011							
	PWQO/ IPWQO ³							
	1999							
	Units							
Volatile Organic Compounds (Water)								
Acetone	2700		<30	<30	<30	<30	<30	<30
Benzene	5	100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	16	200	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform	25	60	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	0.89	0.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon tetrachloride	0.79		<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	30	15	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	25		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform	2.4		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3	2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	590		<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloroethane	5	200	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	1.6	100	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	1.6	40	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	1.6	200	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	1.6	200	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	50	100	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	5	0.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	0.5		<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	0.5		<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (cis & trans)	0.5		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	2.4	8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Hexane	51		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Ethyl Ketone	1800	400	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone	640		<20	<20	<20	<20	<20	<20
MTBE	15	200	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Styrene	5.4	4	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2,2-Tetrachloroethane	1	70	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethylene	1.6	50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	24	0.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	200	10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	4.7	800	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	1.6	20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	150		<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	0.5	600	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
o-Xylene		40	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
m+p-Xylenes			<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes (Total)	300		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 1

**Pond Surface Water Analytical Data (May to November 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

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	Table 2 Standards ²								
	2011								
	PWQO/ IPWQO ³								
	1999								
	Units								
Hydrocarbons (Water)									
F1 (C6-C10)	750	µg/L	<25	<25	<25	<25	<25	<25	<25
F1-BTEX		µg/L	<25	<25	<25	<25	<25	<25	<25
F2 (C10-C16)	150	µg/L	<100	<100	<100	<100	<100	<100	<100
F2-Naphth		µg/L	<100	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	500	µg/L	<250	<250	<250	<250	<250	<250	<250
F3-PAH		µg/L	<250	<250	<250	<250	<250	<250	<250
F4 (C34-C50)	500	µg/L	<250	<250	<250	<250	<250	<250	<250
Total Hydrocarbons (C6-C50)		µg/L	<370	<370	<370	<370	<370	<370	<370
Semi-Volatile Organics (Water)									
Biphenyl	0.5	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
4-Chloroaniline	10	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Bis(2-chloroethyl)ether	5	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Bis(2-chloroisopropyl)ether	120	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2-Chlorophenol	8.9	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
3,3'-Dichlorobenzidine	0.5	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4-Dichlorophenol	20	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Diethylphthalate	38	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dimethylphthalate	38	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4-Dimethylphenol	59	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2,4-Dinitrophenol	10	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dinitrotoluene	5	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,6-Dinitrotoluene	5	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4+2,6-Dinitrotoluene	5	µg/L	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57
Bis(2-ethylhexyl)phthalate	10	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Pentachlorophenol	30	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Phenol	890	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	70	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4,5-Trichlorophenol	8.9	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4,6-Trichlorophenol	2	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Polychlorinated Biphenyls (Water)									
Aroclor 1242		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Aroclor 1248		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Aroclor 1254		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Aroclor 1260		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Total PCBs	3	µg/L	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Aggregate Organics (Water)									
BOD		µg/L							

Table 1

**Pond Surface Water Analytical Data (May to November 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

	Sample ID: Report No. Sample Date:	W-11210029-20201015-42 L2517112-1 October 15 2020	W-11210029-20201022-44 L2520323-1 October 22 2020	W-11210029-20201029-46 L2523350-1 October 29 2020	W-11210029-20201105- 48 L2526411-1 November 5 2020	W-11210029-20201112-50 L2528910-1 November 12 2020	W-11210029-20201119-52 L2531509-1 November 19 2020	W-11210029-20201126-54 L2534021-1 November 26 2020	
	Table 2 Standards ²								
	PWQO/ IPWQO ³								
	2011								
	1999								
	Units								
Physical Tests (Water)									
pH									
Total Suspended Solids									
Anions and Nutrients (Water)									
Phosphorus, Total		4.2	6.2	6.3	5.6	5.7	29.4	4.9	
Organic / Inorganic Carbon (Water)									
Total Organic Carbon									
Polycyclic Aromatic Hydrocarbons (Water)									
Acenaphthene	4.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Acenaphthylene	1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Anthracene	2.4	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Benzo(a)anthracene	1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Benzo(a)pyrene	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Benzo(b)fluoranthene	0.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Benzo(g,h,i)perylene	0.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Benzo(k)fluoranthene	0.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Chrysene	0.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Dibenzo(ah)anthracene	0.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Fluoranthene	0.41	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Fluorene	120	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Indeno(1,2,3-cd)pyrene	0.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
1+2-Methylnaphthalenes	3.2	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	
1-Methylnaphthalene	3.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
2-Methylnaphthalene	3.2	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Naphthalene	11	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	
Phenanthrene	1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Pyrene	4.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	

Notes:

- (1) Data from Guelph Chemical Laboratories Ltd. (GCL) reports for pond water samples collected by Badger on monthly basis from January 2017 to December 2019.
- (2) Full Depth Generic Site Condition Standards in a Potable Ground Water Condition All Types of Property Use, as provided in the Table 2 of the MECP document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011.
- (3) PWQO=Provincial Water Quality Objective, MECP, February 1999
IPWQO= Interim Provincial Water Quality Objective, MECP, February 1999
- (4) The PWQO for beryllium is 1.1 mg/L when the hardness as CaCO₃ (mg/L) is >75
- (5) The IPWQO for cadmium is 0.0005 mg/L when the hardness as CaCO₃ (mg/L) is >100
- (6) The IPWQO for lead is 0.005 mg/L when the hardness as CaCO₃ (mg/L) is >80
- (*) The PWQO is for Dissolved Metals
- No data or Standard available.
- ND Not detected at the associated detection limit (DL).
- µg/L microgram/liter
- cfu / colony forming units/milliliter
- Concentration greater then referenced 2011 Table 2 Criteria.

**Summary of Water Supply A Zone Groundwater Quality
(July and August 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Location:	Water Supply A Zone	Water Supply A Zone	Water Supply A Zone
Sample ID:	W-11210029-20200702-12	W-11210029-20200723-18	W-11210029-20200813-24
Report No.:	L2468705-1	L2478867-1	L2488954-1
Sample Date:	July 2 2020	July 23 2020	August 13 2020

**Table 2
Standards ²**

	2011	Units			
Metals					
Aluminum	--	µg/L	<5.0	<5.0	19.2
Antimony	6	µg/L	<0.1	<0.1	<0.1
Arsenic	25	µg/L	5.17	2.24	3.64
Barium	1000	µg/L	49.5	50.6	77.9
Beryllium (4)	4	µg/L	<0.1	<0.1	<0.1
Bismuth	--	µg/L	<0.05	<0.05	<0.05
Boron (total)	5000	µg/L	<10.0	<10.0	14
Cadmium (5)	2.7	µg/L	<0.005	<0.005	<0.005
Calcium	--	µg/L	70600	68300	48500
Cesium	--	µg/L	<0.01	<0.01	<0.01
Chromium	50	µg/L	<0.5	<0.5	<0.5
Chromium, Hexavalent	25	µg/L	<0.5	<0.5	<0.5
Cobalt	3.8	µg/L	0.11	<0.1	<0.1
Copper	87	µg/L	<0.5	4	<0.5
Iron	--	µg/L	400	22	244
Lead (6)	10	µg/L	0.227	0.268	0.083
Lithium	--	µg/L	3.4	3.9	3.2
Magnesium	--	µg/L	32600	31800	25600
Manganese	--	µg/L	10.8	7.64	8.13
Mercury	0.29	µg/L	<0.005	<0.005	<0.005
Molybdenum	70	µg/L	0.559	0.632	0.655
Nickel	100	µg/L	1.7	0.86	<0.5
Phosphorus	--	µg/L	<50.0	<50.0	<50.0
Potassium	--	µg/L	978	996	979
Rubidium	--	µg/L	<0.2	0.21	0.35
Selenium	10	µg/L	<0.05	<0.05	<0.05
Silicon	--	µg/L	8890	9290	7300
Silver	1.5	µg/L	<0.05	<0.05	<0.05
Sodium	490000	µg/L	7790	7510	5750
Strontium	--	µg/L	148	146	348
Sulfur	--	µg/L	20200	20100	7710
Tellurium	--	µg/L	<0.2	<0.2	<0.2
Thallium	2.0	µg/L	<0.01	<0.01	<0.01
Thorium	--	µg/L	<0.1	<0.1	<0.1
Tin	--	µg/L	<0.1	<0.1	<0.1
Titanium	--	µg/L	<0.3	<0.3	0.62
Tungsten	--	µg/L	<0.1	<0.1	<0.1
Uranium	20.0	µg/L	0.252	0.296	0.383
Vanadium	6.2	µg/L	<0.5	<0.5	<0.5
Zinc	1100	µg/L	5.4	5.0	<3.0
Zirconium	--	µg/L	<0.2	<0.2	<0.2
Total Plate Count	--	cfu/mL			
E. coli	--	cfu/100 mL			

**Summary of Water Supply A Zone Groundwater Quality
(July and August 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Location:	Water Supply A Zone	Water Supply A Zone	Water Supply A Zone
Sample ID:	W-11210029-20200702-12	W-11210029-20200723-18	W-11210029-20200813-24
Report No.	L2468705-1	L2478867-1	L2488954-1
Sample Date:	July 2 2020	July 23 2020	August 13 2020

**Table 2
Standards ²**

	2011	Units			
<u>Volatile Organic Compounds</u>					
Acetone	2700	µg/L	<30	<30	<30
Benzene	5	µg/L	<0.50	<0.50	<0.50
Bromodichloromethane	16	µg/L	<2.0	<2.0	<2.0
Bromoform	25	µg/L	<5.0	<5.0	<5.0
Bromomethane	0.89	µg/L	<0.50	<0.50	<0.50
Carbon tetrachloride	0.79	µg/L	<0.20	<0.20	<0.20
Chlorobenzene	30	µg/L	<0.50	<0.50	<0.50
Dibromochloromethane	25	µg/L	<2.0	<2.0	<2.0
Chloroform	2.4	µg/L	<1.0	<1.0	<1.0
1,2-Dibromoethane		µg/L	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3	µg/L	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	µg/L	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	µg/L	<0.50	<0.50	<0.50
Dichlorodifluoromethane	590	µg/L	<2.0	<2.0	<2.0
1,1-Dichloroethane	5	µg/L	<0.50	<0.50	<0.50
1,2-Dichloroethane	1.6	µg/L	<0.50	<0.50	<0.50
1,1-Dichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
Methylene Chloride	50	µg/L	<5.0	<5.0	<5.0
1,2-Dichloropropane	5	µg/L	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	0.5	µg/L	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	0.5	µg/L	<0.30	<0.30	<0.30
1,3-Dichloropropene (cis & trans)	0.5	µg/L	<0.50	<0.50	<0.50
Ethylbenzene	2.4	µg/L	<0.50	<0.50	<0.50
n-Hexane	51	µg/L	<0.50	<0.50	<0.50
Methyl Ethyl Ketone	1800	µg/L	<20	<20	<20
Methyl Isobutyl Ketone	640	µg/L	<20	<20	<20
MTBE	15	µg/L	<2.0	<2.0	<2.0
Styrene	5.4	µg/L	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	µg/L	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	1	µg/L	<0.50	<0.50	<0.50
Tetrachloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
Toluene	24	µg/L	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	200	µg/L	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	4.7	µg/L	<0.50	<0.50	<0.50
Trichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
Trichlorofluoromethane	150	µg/L	<5.0	<5.0	<5.0
Vinyl chloride	0.5	µg/L	<0.50	<0.50	<0.50
o-Xylene		µg/L	<0.30	<0.30	<0.30
m+p-Xylenes		µg/L	<0.40	<0.40	<0.40
Xylenes (Total)	300	µg/L	<0.50	<0.50	<0.50

**Summary of Water Supply A Zone Groundwater Quality
(July and August 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Location:	Water Supply A Zone	Water Supply A Zone	Water Supply A Zone
Sample ID:	W-11210029-20200702-12	W-11210029-20200723-18	W-11210029-20200813-24
Report No.:	L2468705-1	L2478867-1	L2488954-1
Sample Date:	July 2 2020	July 23 2020	August 13 2020

**Table 2
Standards ²**

	2011	Units			
<u>Hydrocarbons</u>					
F1 (C6-C10)	750	µg/L	<25	<25	<25
F1-BTEX		µg/L	<25	<25	<25
F2 (C10-C16)	150	µg/L	<100	<100	<100
F2-Naphth		µg/L	<100	<100	<100
F3 (C16-C34)	500	µg/L	<250	<250	<250
F3-PAH		µg/L	<250	<250	<250
F4 (C34-C50)	500	µg/L	<250	<250	<250
Total Hydrocarbons (C6-C50)		µg/L	<370	<370	<370
<u>Semi-Volatile Organics</u>					
Biphenyl	0.5	µg/L	<0.40	<0.40	<0.40
4-Chloroaniline	10	µg/L	<0.40	<0.40	<0.40
Bis(2-chloroethyl)ether	5	µg/L	<0.40	<0.40	<0.40
Bis(2-chloroisopropyl)ether	120	µg/L	<0.40	<0.40	<0.40
2-Chlorophenol	8.9	µg/L	<0.30	<0.30	<0.30
3,3'-Dichlorobenzidine	0.5	µg/L	<0.40	<0.40	<0.40
2,4-Dichlorophenol	20	µg/L	<0.30	<0.30	<0.30
Diethylphthalate	38	µg/L	<0.20	<0.20	<0.20
Dimethylphthalate	38	µg/L	<0.20	<0.20	<0.20
2,4-Dimethylphenol	59	µg/L	<0.50	<0.50	<0.50
2,4-Dinitrophenol	10	µg/L	<2.0	<2.0	<2.0
2,4-Dinitrotoluene	5	µg/L	<0.40	<0.40	<0.40
2,6-Dinitrotoluene	5	µg/L	<0.40	<0.40	<0.40
2,4+2,6-Dinitrotoluene	5	µg/L	<0.57	<0.57	<0.57
Bis(2-ethylhexyl)phthalate	10	µg/L	<2.0	<2.0	<2.0
Pentachlorophenol	30	µg/L	<0.50	<0.50	<0.50
Phenol	890	µg/L	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	70	µg/L	<0.40	<0.40	<0.40
2,4,5-Trichlorophenol	8.9	µg/L	<0.20	<0.20	<0.20
2,4,6-Trichlorophenol	2	µg/L	<0.20	<0.20	<0.20
<u>Polychlorinated Biphenyls</u>					
Aroclor 1242		µg/L	<0.020	<0.020	<0.020
Aroclor 1248		µg/L	<0.020	<0.020	<0.020
Aroclor 1254		µg/L	<0.020	<0.020	<0.020
Aroclor 1260		µg/L	<0.020	<0.020	<0.020
Total PCBs	3	µg/L	<0.040	<0.040	<0.040
<u>Aggregate Organics</u>					
BOD		µg/L			
<u>Physical Tests</u>					
pH		pH units			
Total Suspended Solids		µg/L			
<u>Anions and Nutrients</u>					
Phosphorus, Total		µg/L	5.6	<3.0	8.2
<u>Organic / Inorganic Carbon</u>					
Total Organic Carbon		µg/L			

**Summary of Water Supply A Zone Groundwater Quality
(July and August 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Location:	Water Supply A Zone	Water Supply A Zone	Water Supply A Zone
Sample ID:	W-11210029-20200702-12	W-11210029-20200723-18	W-11210029-20200813-24
Report No.	L2468705-1	L2478867-1	L2488954-1
Sample Date:	July 2 2020	July 23 2020	August 13 2020

**Table 2
Standards ²**

	2011	Units			
<u>Polycyclic Aromatic Hydrocarbons</u>					
Acenaphthene	4.1	µg/L	<0.020	<0.020	<0.020
Acenaphthylene	1	µg/L	<0.020	<0.020	<0.020
Anthracene	2.4	µg/L	<0.020	<0.020	<0.020
Benzo(a)anthracene	1	µg/L	<0.020	<0.020	<0.020
Benzo(a)pyrene	0.01	µg/L	<0.010	<0.010	<0.010
Benzo(b)fluoranthene	0.1	µg/L	<0.020	<0.020	<0.020
Benzo(g,h,i)perylene	0.2	µg/L	<0.020	<0.020	<0.020
Benzo(k)fluoranthene	0.1	µg/L	<0.020	<0.020	<0.020
Chrysene	0.1	µg/L	<0.020	<0.020	<0.020
Dibenzo(ah)anthracene	0.2	µg/L	<0.020	<0.020	<0.020
Fluoranthene	0.41	µg/L	<0.020	<0.020	<0.020
Fluorene	120	µg/L	<0.020	<0.020	<0.020
Indeno(1,2,3-cd)pyrene	0.2	µg/L	<0.020	<0.020	<0.020
1+2-Methylnaphthalenes	3.2	µg/L	<0.028	<0.028	<0.028
1-Methylnaphthalene	3.2	µg/L	<0.020	<0.020	<0.020
2-Methylnaphthalene	3.2	µg/L	<0.020	<0.020	<0.020
Naphthalene	11	µg/L	<0.050	<0.050	<0.050
Phenanthrene	1	µg/L	<0.020	<0.020	<0.020
Pyrene	4.1	µg/L	<0.020	<0.020	<0.020

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

**Summary of Water Supply EXI Zone Groundwater Quality
(July and August 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Location:	Water Supply EXI Zone	Water Supply EXI Zone	Water Supply EXI Zone
Sample ID:	W-11210029-20200709-14	W-11210029-20200730-20	W-11210029-20200813-26
Report No.:	L2472292-1	L2482453-1	L2491984
Sample Date:	July 9 2020	July 30 2020	August 20 2020

**Table 2
Standards²
2011**

	Units			
<u>Metals</u>				
Aluminum	--	µg/L	6.6	8.0
Antimony	6	µg/L	<0.1	<0.1
Arsenic	25	µg/L	5.8	3.62
Barium	1000	µg/L	65.3	70.5
Beryllium (4)	4	µg/L	<0.1	<0.1
Bismuth	--	µg/L	<0.05	<0.05
Boron (total)	5000	µg/L	14	14.0
Cadmium (5)	2.7	µg/L	<0.005	<0.005
Calcium	--	µg/L	46600	47800
Cesium	--	µg/L	<0.01	<0.01
Chromium	50	µg/L	<0.5	<0.5
Chromium, Hexavalent	25	µg/L	<0.5	<0.5
Cobalt	3.8	µg/L	<0.1	<0.1
Copper	87	µg/L	<0.5	<0.5
Iron	--	µg/L	281	265
Lead (6)	10	µg/L	<0.05	<0.05
Lithium	--	µg/L	2.6	3.6
Magnesium	--	µg/L	27300	26600
Manganese	--	µg/L	9.31	7.61
Mercury	0.29	µg/L	<0.005	<0.005
Molybdenum	70	µg/L	0.703	0.668
Nickel	100	µg/L	<0.5	<0.5
Phosphorus	--	µg/L	<50.0	<50.0
Potassium	--	µg/L	995	991
Rubidium	--	µg/L	0.34	0.38
Selenium	10	µg/L	<0.05	<0.05
Silicon	--	µg/L	7600	7430
Silver	1.5	µg/L	<0.05	<0.05
Sodium	490000	µg/L	5880	5970
Strontium	--	µg/L	322	356
Sulfur	--	µg/L	7150	8040
Tellurium	--	µg/L	<0.2	<0.2
Thallium	2.0	µg/L	<0.01	<0.01
Thorium	--	µg/L	<0.1	<0.1
Tin	--	µg/L	<0.1	<0.1
Titanium	--	µg/L	<0.3	<0.3
Tungsten	--	µg/L	<0.1	<0.1
Uranium	20.0	µg/L	0.59	0.397
Vanadium	6.2	µg/L	<0.5	<0.5
Zinc	1100	µg/L	<3.0	<3.0
Zirconium	--	µg/L	<0.2	<0.2
Total Plate Count	--	cfu/mL		
E. coli	--	cfu/100 mL		

**Summary of Water Supply EXI Zone Groundwater Quality
(July and August 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Location:	Water Supply EXI Zone	Water Supply EXI Zone	Water Supply EXI Zone
Sample ID:	W-11210029-20200709-14	W-11210029-20200730-20	W-11210029-20200813-26
Report No.:	L2472292-1	L2482453-1	L2491984
Sample Date:	July 9 2020	July 30 2020	August 20 2020

**Table 2
Standards²
2011 Units**

Volatile Organic Compounds

Acetone	2700	µg/L	<30	<30	<30
Benzene	5	µg/L	<0.50	<0.50	<0.50
Bromodichloromethane	16	µg/L	<2.0	<2.0	<2.0
Bromoform	25	µg/L	<5.0	<5.0	<5.0
Bromomethane	0.89	µg/L	<0.50	<0.50	<0.50
Carbon tetrachloride	0.79	µg/L	<0.20	<0.20	<0.20
Chlorobenzene	30	µg/L	<0.50	<0.50	<0.50
Dibromochloromethane	25	µg/L	<2.0	<2.0	<2.0
Chloroform	2.4	µg/L	<1.0	<1.0	<1.0
1,2-Dibromoethane		µg/L	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3	µg/L	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	µg/L	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	µg/L	<0.50	<0.50	<0.50
Dichlorodifluoromethane	590	µg/L	<2.0	<2.0	<2.0
1,1-Dichloroethane	5	µg/L	<0.50	<0.50	<0.50
1,2-Dichloroethane	1.6	µg/L	<0.50	<0.50	<0.50
1,1-Dichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
Methylene Chloride	50	µg/L	<5.0	<5.0	<5.0
1,2-Dichloropropane	5	µg/L	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	0.5	µg/L	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	0.5	µg/L	<0.30	<0.30	<0.30
1,3-Dichloropropene (cis & trans)	0.5	µg/L	<0.50	<0.50	<0.50
Ethylbenzene	2.4	µg/L	<0.50	<0.50	<0.50
n-Hexane	51	µg/L	<0.50	<0.50	<0.50
Methyl Ethyl Ketone	1800	µg/L	<20	<20	<20
Methyl Isobutyl Ketone	640	µg/L	<20	<20	<20
MTBE	15	µg/L	<2.0	<2.0	<2.0
Styrene	5.4	µg/L	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	µg/L	<0.50	<0.50	<0.50
1,1,1,2,2-Tetrachloroethane	1	µg/L	<0.50	<0.50	<0.50
Tetrachloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
Toluene	24	µg/L	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	200	µg/L	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	4.7	µg/L	<0.50	<0.50	<0.50
Trichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
Trichlorofluoromethane	150	µg/L	<5.0	<5.0	<5.0
Vinyl chloride	0.5	µg/L	<0.50	<0.50	<0.50
o-Xylene		µg/L	<0.30	<0.30	<0.30
m+p-Xylenes		µg/L	<0.40	<0.40	<0.40
Xylenes (Total)	300	µg/L	<0.50	<0.50	<0.50

**Summary of Water Supply EXI Zone Groundwater Quality
(July and August 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Location:	Water Supply EXI Zone	Water Supply EXI Zone	Water Supply EXI Zone
Sample ID:	W-11210029-20200709-14	W-11210029-20200730-20	W-11210029-20200813-26
Report No.:	L2472292-1	L2482453-1	L2491984
Sample Date:	July 9 2020	July 30 2020	August 20 2020

**Table 2
Standards²
2011**

	Units			
<u>Hydrocarbons</u>				
F1 (C6-C10)	750	µg/L	<25	<25
F1-BTEX		µg/L	<25	<25
F2 (C10-C16)	150	µg/L	<100	<100
F2-Naphth		µg/L	<100	<100
F3 (C16-C34)	500	µg/L	<250	<250
F3-PAH		µg/L	<250	<250
F4 (C34-C50)	500	µg/L	<250	<250
Total Hydrocarbons (C6-C50)		µg/L	<370	<370
<u>Semi-Volatile Organics</u>				
Biphenyl	0.5	µg/L	<0.40	<0.40
4-Chloroaniline	10	µg/L	<0.40	<0.40
Bis(2-chloroethyl)ether	5	µg/L	<0.40	<0.40
Bis(2-chloroisopropyl)ether	120	µg/L	<0.40	<0.40
2-Chlorophenol	8.9	µg/L	<0.30	<0.30
3,3'-Dichlorobenzidine	0.5	µg/L	<0.40	<0.40
2,4-Dichlorophenol	20	µg/L	<0.30	<0.30
Diethylphthalate	38	µg/L	<0.20	0.25
Dimethylphthalate	38	µg/L	<0.20	<0.20
2,4-Dimethylphenol	59	µg/L	<0.50	<0.50
2,4-Dinitrophenol	10	µg/L	<2.0	<2.0
2,4-Dinitrotoluene	5	µg/L	<0.40	<0.40
2,6-Dinitrotoluene	5	µg/L	<0.40	<0.40
2,4+2,6-Dinitrotoluene	5	µg/L	<0.57	<0.57
Bis(2-ethylhexyl)phthalate	10	µg/L	<2.0	<2.0
Pentachlorophenol	30	µg/L	<0.50	<0.50
Phenol	890	µg/L	<0.50	<0.50
1,2,4-Trichlorobenzene	70	µg/L	<0.40	<0.40
2,4,5-Trichlorophenol	8.9	µg/L	<0.20	<0.20
2,4,6-Trichlorophenol	2	µg/L	<0.20	<0.20
<u>Polychlorinated Biphenyls</u>				
Aroclor 1242		µg/L	<0.020	<0.020
Aroclor 1248		µg/L	<0.020	<0.020
Aroclor 1254		µg/L	<0.020	<0.020
Aroclor 1260		µg/L	<0.020	<0.020
Total PCBs	3	µg/L	<0.040	<0.040
<u>Aggregate Organics</u>				
BOD		µg/L		
<u>Physical Tests</u>				
pH		pH units		
Total Suspended Solids		µg/L		
<u>Anions and Nutrients</u>				
Phosphorus, Total		µg/L	<3.0	3.4
<u>Organic / Inorganic Carbon</u>				
Total Organic Carbon		µg/L		3.8

**Summary of Water Supply EXI Zone Groundwater Quality
(July and August 2020)
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Location:	Water Supply EXI Zone	Water Supply EXI Zone	Water Supply EXI Zone
Sample ID:	W-11210029-20200709-14	W-11210029-20200730-20	W-11210029-20200813-26
Report No.:	L2472292-1	L2482453-1	L2491984
Sample Date:	July 9 2020	July 30 2020	August 20 2020

**Table 2
Standards²
2011 Units**

Polycyclic Aromatic Hydrocarbons

Acenaphthene	4.1	µg/L	<0.020	<0.020	<0.020
Acenaphthylene	1	µg/L	<0.020	<0.020	<0.020
Anthracene	2.4	µg/L	<0.020	<0.020	<0.020
Benzo(a)anthracene	1	µg/L	<0.020	<0.020	<0.020
Benzo(a)pyrene	0.01	µg/L	<0.010	<0.010	<0.010
Benzo(b)fluoranthene	0.1	µg/L	<0.020	<0.020	<0.020
Benzo(g,h,i)perylene	0.2	µg/L	<0.020	<0.020	<0.020
Benzo(k)fluoranthene	0.1	µg/L	<0.020	<0.020	<0.020
Chrysene	0.1	µg/L	<0.020	<0.020	<0.020
Dibenzo(ah)anthracene	0.2	µg/L	<0.020	<0.020	<0.020
Fluoranthene	0.41	µg/L	<0.020	<0.020	<0.020
Fluorene	120	µg/L	<0.020	<0.020	<0.020
Indeno(1,2,3-cd)pyrene	0.2	µg/L	<0.020	<0.020	<0.020
1+2-Methylnaphthalenes	3.2	µg/L	<0.028	<0.028	<0.028
1-Methylnaphthalene	3.2	µg/L	<0.020	<0.020	<0.020
2-Methylnaphthalene	3.2	µg/L	<0.020	<0.020	<0.020
Naphthalene	11	µg/L	<0.050	<0.050	<0.050
Phenanthrene	1	µg/L	<0.020	<0.020	<0.020
Pyrene	4.1	µg/L	<0.020	<0.020	<0.020

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Table 3

**Design Storms - Intensity Duration Frequency Parameters
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Return Period	Storm Type	Rainfall Depth 1 (mm)	Duration (hr)
2-Year	SCS Type II	60.1	24
5-Year	SCS Type II	79.4	24
10-Year	SCS Type II	92.1	24
25-Year	SCS Type II	108.0	24
50-Year	SCS Type II	120.0	24
100-Year	SCS Type II	131.7	24

1. Rainfall depth obtained from the Ontario Ministry of Transportation, IDF Curve Lookup tool, Retrieved: December 15, 2020

Table 4

Hydrologic Modelling Catchment Parameters - Existing Conditions
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch

Existing Conditions

Subcatchment ID	Area ha	Width m	Flow Length m	Slope %	Imperviousness %	Manning' n		Depression Storage		Infiltration (Horton)	
						Imperv. (-)	Perv. (-)	Imperv. mm	Perv. mm	Max (mm/hr)	Min (mm/hr)
A101	2.16	93	233	0.6	3	0.013	0.24	2.5	5.0	76.2	29.97
A102	3.72	120	311	4.4	0	0.013	0.24	2.5	5.0	76.2	29.97
A103	6.85	118	582	7.7	0	0.013	0.24	2.5	5.0	76.2	29.97
Total	12.73										

Table 5

**Peak Flow Summary - Existing Conditions
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Existing Conditions		Peak Flow				
Subcatchment ID	24 hour SCS Type II Storm					
	2-year	5-year	10-year	25-year	50-year	100-year
	<i>(m³/s)</i>	<i>(m³/s)</i>	<i>(m³/s)</i>	<i>(m³/s)</i>	<i>(m³/s)</i>	<i>(m³/s)</i>
A101	0.02	0.03	0.05	0.07	0.09	0.11
A102	0.01	0.06	0.09	0.15	0.20	0.26
A103	0.02	0.07	0.12	0.19	0.27	0.35
On-Site SWM Pond	0.03	0.12	0.21	0.35	0.50	0.66

Table 6

**Runoff Volume Summary - Existing Conditions
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch**

Existing Conditions	Runoff Volume					
Subcatchment ID	24 hour SCS Type II Storm					
	2-year	5-year	10-year	25-year	50-year	100-year
	<i>(m³)</i>	<i>(m³)</i>	<i>(m³)</i>	<i>(m³)</i>	<i>(m³)</i>	<i>(m³)</i>
A101	40	70	90	140	190	250
A102	10	50	110	200	320	440
A103	10	70	150	300	470	670
On-Site SWM Pond	60	190	350	640	980	1360

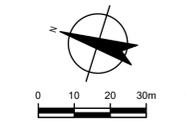
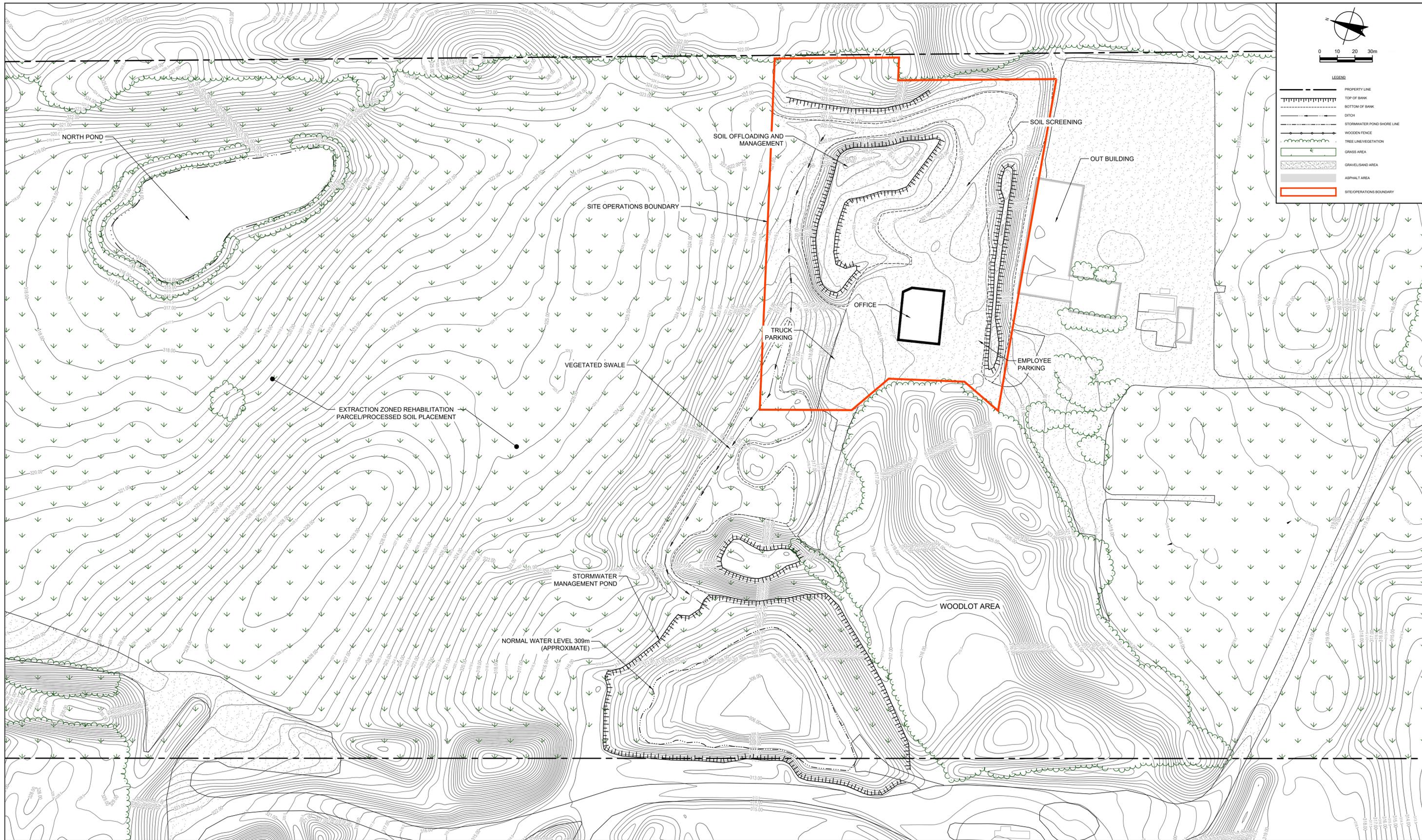
Stormwater Management Pond Stage-Area-Volume - Existing Conditions
Stormwater Management Plan
2374868 Ontario Inc.
Township of Puslinch

Stormwater Management Pond

	<u>Elevation</u> <i>(m asl)</i>	<u>Depth</u> <i>(m)</i>	<u>Area</u> <i>(m²)</i>	<u>Total</u> <u>Volume</u> <i>(m³)</i>	<u>Storm Event Level</u> <i>(m asl)</i>
Bottom of Pond	306.00	0.00	558	-	309.01 2-year SCS Type II 24h storm
	306.25	0.25	1613	271	309.03 5-year SCS Type II 24h storm
	306.50	0.50	2054	730	309.06 10-year SCS Type II 24h storm
	306.75	0.75	2377	1,284	309.11 25-year SCS Type II 24h storm
	307.00	1.00	2680	1,916	309.17 50-year SCS Type II 24h storm
	307.25	1.25	2962	2,621	309.23 100-year SCS Type II 24h storm
	307.50	1.50	3228	3,395	
	307.75	1.75	3505	4,236	
	308.00	2.00	3797	5,149	
	308.25	2.25	4136	6,141	
	308.50	2.50	4540	7,225	
	308.75	2.75	5009	8,419	
	Permanent Pool	309.00	3.00	5543	9,738
309.25		3.25	6257	11,213	
309.50		3.50	7019	12,872	
309.75		3.75	7452	14,681	
310.00		4.00	7910	16,601	
310.25		4.25	8257	18,622	
310.50		4.50	8613	20,731	
310.75		4.75	8938	22,925	
311.00		5.00	9271	25,201	
311.25		5.25	9614	27,562	
311.50		5.50	9964	30,009	
311.75		5.75	10341	32,547	
312.00		6.00	10729	35,181	
312.25	6.25	11144	37,915		
312.50	6.50	11574	40,755		
Top of Pond	312.75	6.75	12369	43,748	

Total Storage (in cubic meters):

43,748



LEGEND

	PROPERTY LINE
	TOP OF BANK
	BOTTOM OF BANK
	DITCH
	STORMWATER POND SHORE LINE
	WOODEN FENCE
	TREE LINE/VEGETATION
	GRASS AREA
	GRAVEL/SAND AREA
	ASPHALT AREA
	SITE OPERATIONS BOUNDARY

No.	Issue	Drawn	Approved	Date

Bar is 20mm on original size drawing
 20mm

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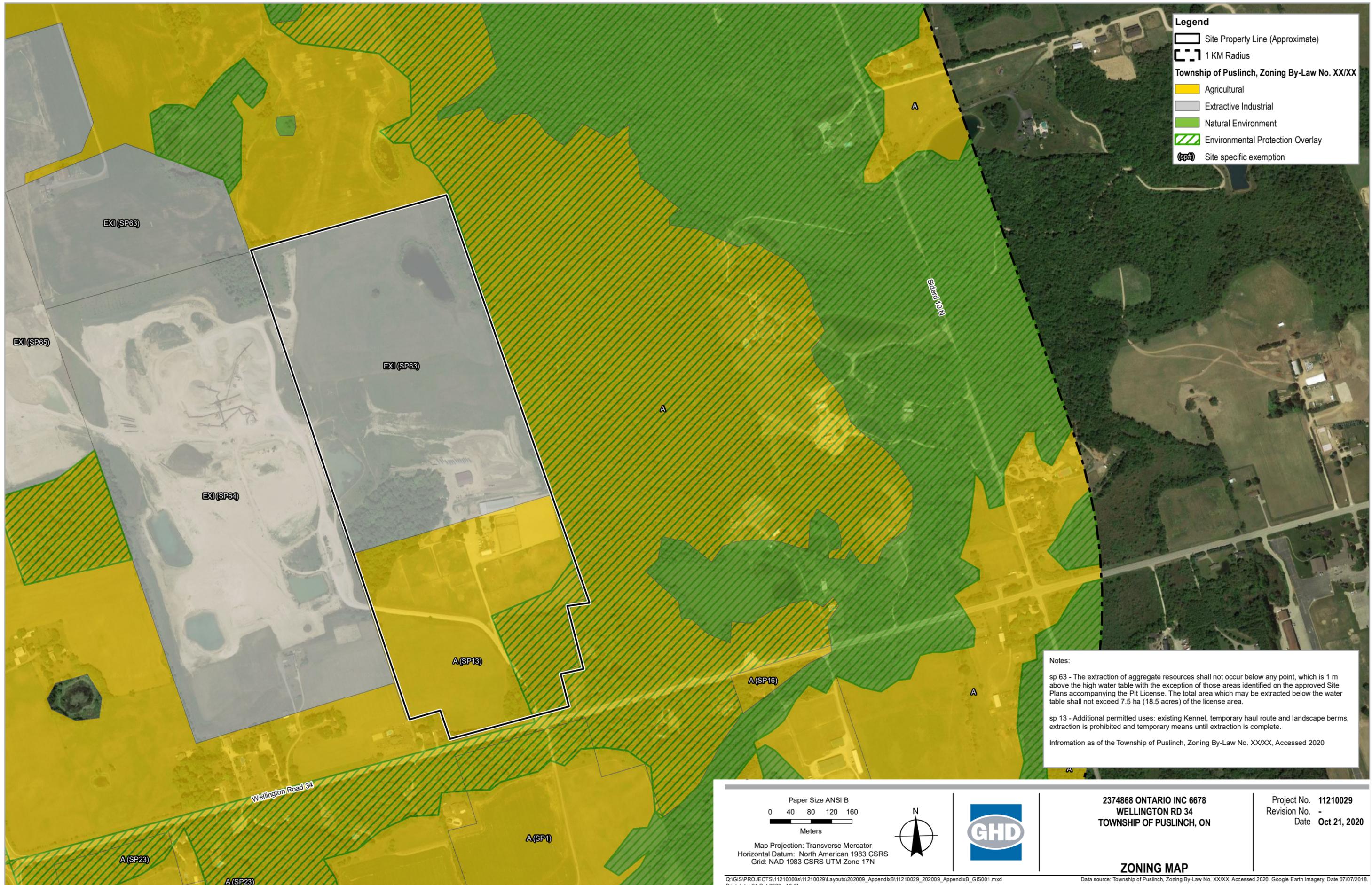
Drawn	B. SUSERSKI	Designer	N. PATEL
Drafting Check	M. WOLFER	Design Check	-
Project Manager	A. SOUTAR	Date	Dec 6, 2021
This document shall not be used for construction unless signed and sealed for construction.		Scale	

Client	2374868 ONTARIO INC.		
Project	STORMWATER MANAGEMENT REPORT		
Title	OPERATIONS EXISTING CONDITIONS SITE PLAN		
Project No.	11210029-01		
Original Size	ANSI D	Sheet No.	C-01
Sheet	1	of	1

Appendices

Appendix A

Zoning Map



Legend

- Site Property Line (Approximate)
- 1 KM Radius
- Township of Puslinch, Zoning By-Law No. XX/XX**
- Agricultural
- Extractive Industrial
- Natural Environment
- Environmental Protection Overlay
- Site specific exemption

Notes:

sp 63 - The extraction of aggregate resources shall not occur below any point, which is 1 m above the high water table with the exception of those areas identified on the approved Site Plans accompanying the Pit License. The total area which may be extracted below the water table shall not exceed 7.5 ha (18.5 acres) of the license area.

sp 13 - Additional permitted uses: existing Kennel, temporary haul route and landscape berms, extraction is prohibited and temporary means until extraction is complete.

Information as of the Township of Puslinch, Zoning By-Law No. XX/XX, Accessed 2020

<p>Paper Size ANSI B</p> <p>0 40 80 120 160</p> <p>Meters</p> <p>Map Projection: Transverse Mercator Horizontal Datum: North American 1983 CSRS Grid: NAD 1983 CSRS UTM Zone 17N</p>		<p>2374868 ONTARIO INC 6678 WELLINGTON RD 34 TOWNSHIP OF PUSLINCH, ON</p>	<p>Project No. 11210029 Revision No. - Date Oct 21, 2020</p>
<p>ZONING MAP</p>		<p>Data source: Township of Puslinch, Zoning By-Law No. XX/XX, Accessed 2020. Google Earth Imagery, Date 07/07/2018.</p>	

Appendix B
Hydrogeological Impact Assessment
(HIA) Report



Hydrogeologic Impact Assessment for the Badger Hydrovac and Daylighting Services Facility (in Support of an ECA)

6678 Wellington Road 34
Cambridge, Ontario

2374868 Ontario Inc.

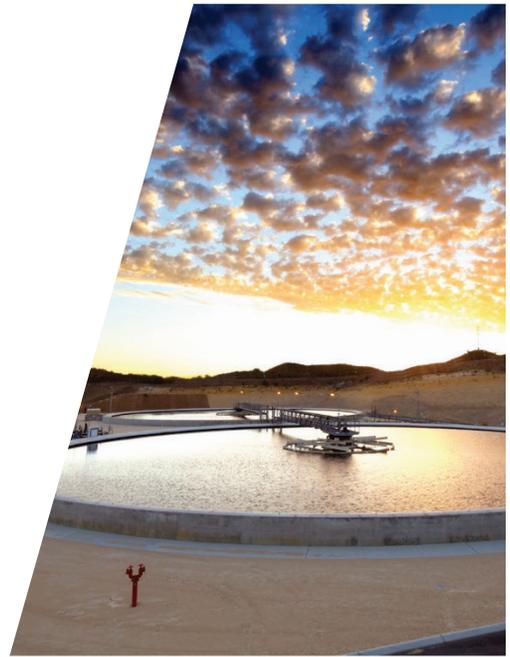




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1. Introduction

1.1 Purpose of the Report

Through pre-consultation with the Ministry of Environment, Conservation and Parks (MECP) for an Environmental Compliance Approval (ECA) (Waste Processing), it was determined that 2374868 Ontario Inc. (Applicant) needed to complete a Hydrogeological Impact Assessment (HIA). The MECP requested that the assessment take into account the waste and industrial sewage works operations at the Site and the potential for impact to groundwater receptors.

The Site is defined as a portion of the Property owned by the Applicant as described in Section 1.2 of this HIA Report.

The MECP specifically requested that the HIA Report include, but not be limited to, a summary of the Site geological/hydrogeological conditions, depth to water table, groundwater flow direction, hydraulic conductivities, vertical and horizontal gradients, identification of downgradient private water wells on-Site and off-Site and an assessment of the potential for impact to groundwater receptors. It was also requested by MECP that the HIA Report determine if groundwater monitoring is necessary.

1.2 Background

The Property is legally described as Lot 8, Concession 3 in Wellington County and consists of a 100 acre property. The northern two thirds of the Property is zoned as Extractive (EXI) and the southern one third is zoned as Agricultural (A). The Site within the Property is located on an approximate 31,000 square meter (m²) portion of the EXI zoned parcel and includes the operations necessary to support the hydrovac and daylighting operations. The current zoning allows some of the Site operations and a minor zoning amendment has been submitted to Wellington County/Township of Puslinch to update the specific allowed uses.

A Property and Site location map is presented on Figure 1.1, and in more detail on Figure 1.2. An aerial photo showing the Property and features around the property is shown on Figure 1.3.

The Site receives soil mixed with water (liquid soil or waste) from hydrovac operations conducted by Site personnel and trucks at multiple sites. The hydrovac trucks work throughout southern Ontario where liquid soil is collected from utility, municipal and commercial sites to ensure that utility strikes and damage do not occur during intrusive work (e.g., utility and roadwork). No hydrovac operations are done at environmental or other sites with known soil impacts. Liquid soil loads that may be impacted (e.g., determined by Site information, visual inspection and odours) are sent directly to a permitted MECP-approved treatment or disposal facility and return to the Site after all liquid soil has been removed. The soil water mixture that returns to Site is placed on the ground surface, water drains off via gravity, and the dry soil is sampled for chemical analysis to confirm that it is acceptable for use at receiving sites.

The Applicant is applying for the following Environmental Compliance Approvals (ECAs):

- ECA (Waste Processing), including a Design and Operations Report



- ECA (Industrial Sewage Works - Stormwater) including a Stormwater Management Plan (SWMP)
- ECA (Noise), including an Acoustic Assessment Report (AAR).

Two potable wells are found on the property. One potable well is located in the EXI zoned portion of the property and the other is located in the Agricultural zoned portion of the property. MECP water well records are provided in Appendix A of this report. The locations of these two water supply wells are shown on Figure 1.2.

The supply well located within the EXI zoned portion of the Property is designated as MECP well number 6706720 and is 33.8 m deep. It obtains water from the deep overburden within gravel deposits at depths between 30.8 m and 33.8 m below ground surface (bgs), where there is presumably a 3 m screen. This is the Site ("EXI") water supply well.

The supply well located within the Agricultural zoned portion of the Property is designated as MECP well number 6705884, was originally 29.6 m deep, and was subsequently deepened. It obtains water from the bedrock from depths of 24.1 m to greater than 29.6 m bgs as an open hole in the bedrock. This is the agricultural (livestock) ("A") water supply well.

1.3 Report Organization

This HIA Report provides a complete hydrogeological impact assessment in support of an ECA, as requested by the MECP. The report is organized into the following sections:

Section 1	Introduction
Section 2	Hydrogeologic Assessment Requirements, Objectives and Scope
Section 3	Hydrogeologic Setting
Section 4	Impact Assessment
Section 5	Proposed Monitoring Program
Section 6	Summary and Recommendations
Section 7	References

2. Hydrogeologic Assessment Requirements, Objectives and Scope

2.1 Requirements and Objectives

MECP requires that Applicants complete a Hydrogeologic Impact Assessment (HIA) in support of ECA applications to evaluate the potential impact to groundwater resources. The MECP also requires that the guide to applying for an environmental compliance approval under Part C: Supporting Documentation and Technical Requirements, Section 9 – Supporting Documentation be followed for the application and required assessments.



For ECAs, there is a requirement to assess the impacts of the current works or proposed works to the environment, including groundwater resources. Subsection 4.10.4 describes the scope of work for an Environmental Impact Analysis including a groundwater (hydrogeologic) impact assessment.

Subsection 5.4 describes the minimum requirements of the Hydrogeological Report (herein referred to as the HIA Report) that is required to be submitted in support of an ECA.

Additionally, since the Township of Puslinch is not serviced by Municipal water supply, the residents rely on groundwater wells for potable drinking water supply. Because of this fact, MECP considered imperative that the Applicant complete a HIA taking into account the waste and industrial sewage works operations at the Site and the potential for impact to groundwater receptors.

MECP also requires that the HIA be prepared by a qualified person, a hydrogeologist with Professional Geoscientist designation or a Professional Engineer with relevant hydrogeological expertise.

The Applicant, despite the fact that the operations at the Site do not include handling of contaminated soil or water (the operations at the Site do not include disposal of waste), agreed to MECP's request to complete the HIA.

This HIA, as defined by MECP, includes the following components:

- a summary of the site geological/hydrogeological conditions
- depth to the water table
- groundwater flow direction
- hydraulic conductivity of the water table deposits
- vertical and horizontal gradients along and across the water table
- identification of downgradient private water wells onsite and offsite
- assessment of the potential for impact to groundwater receptors

The HIA was also completed considering the Wellington County guidelines and Source Water Protection Plans.

As required by MECP, this HIA was completed by a team including "qualified" individuals (Professional Geoscientist/Professional Engineer) who are competent by virtue of training and experience to engage in practices that would also constitute the practice of professional geosciences (i.e., hydrogeology).

2.2 Scope

There are two water supply wells within the Property, the EX1 and the A supply wells, both of which are deep wells. The EX1 supply well obtains groundwater from a deep overburden (gravel) water-bearing zone or aquifer at a depth of 33.8 m bgs. The A supply well obtains water from the bedrock aquifer from a depth of 24.1 m to a depth greater than 29.6 m bgs.



There are other water supply wells around the Site which are used for domestic or agricultural purposes since this area is not serviced by municipal water. The supply wells are either within the deep overburden or bedrock aquifers.

The bedrock in this area is the main aquifer for both the City of Guelph and City of Cambridge municipal water supply well fields.

The Applicant collected groundwater samples from the EX1 and A supply wells on three occasions (two in July and one in August 2020) and provided the groundwater quality to MECP, to show that operations at the Site have not impacted groundwater in the vicinity of the Site. The groundwater samples were analyzed for a comprehensive suite of analytes which included total metals, polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH including the F1 to F4 fraction), semi-volatiles/ polycyclic aromatic hydrocarbons/base neutral extractables (SVOCs/PAHs/BNAS).

The groundwater quality results from both supply wells show that the water is reflective of the natural geochemistry of the deep overburden and bedrock aquifers. No VOCs, TPH, PCBs, SVOCs/PAHs/BNAs were detected above the laboratory reporting limits (RLs). The laboratory RLs were set at levels lower than the Ontario drinking water quality standards.

This clearly shows that the Site operations are not currently impacting the nearby groundwater supplies. If there was impact to nearby groundwater supplies by Site operations, then it would have shown on the groundwater quality results of these two supply wells since they are the wells located downgradient and closest to Site operations.

Additionally, the Applicant collected several surface waters samples between October and November 2020 from the storm management pond located to the northwest of the Site operations. The surface water samples were analyzed for metals, VOCs, TPH (F1 to F4), and SVOCs/PAHs/BNAs. None of the surface water samples had VOCs, TPH (F1 to F4), or SVOCs/PAHs/BNAs detections above the laboratory RLs. The laboratory set the RLs at concentrations lower than the provincial water quality objectives (PWQOs).

As with the groundwater samples collected from the two groundwater supply wells, the surface water quality data showed that Site operations are not impacting surface water.

The Applicant has also been collecting soil samples from soil piles at regular intervals since 2017 to present. The soil samples are analyzed for a comprehensive suite of analytes. The soil samples have been analyzed for saturated paste extractables, sodium adsorption ratio (SAR), metals, cyanide, VOCs, SVOCs and PCBs. Except for the 2011 Table 1 criteria for SAR, toluene and lead sporadically exceeded, the soil quality meets applicable criteria.

The Applicant provided all the data described above in support of the ECA application in November 2020.

MECP indicated that despite the favorable analytical data for groundwater, surface water and soil, the Applicant was required to complete the HIA in support of the ECA application.

With the available historical data in mind and the requirements by MECP, the Applicant designed the HIA to investigate the water table in the area where Site operations are conducted.



The HIA's main purpose was to investigate the shallowest groundwater regime (first water-bearing unit or water table) around and downgradient of the Site operations because these would be the places where groundwater impact would be detected, if operations were impacting groundwater. It is already known that the deep groundwater supplies are not being impacted from Site operations because the two deep water supply wells (A and EX1 water supply wells) are clean. Surface water from the storm management pond is also clean. The historical soil quality data also shows generally clean soils.

In order to satisfy the requirements of the HIA the following tasks were completed as part of the scope:

- Task 1 - Installation of three monitoring wells in November 2020 (MW1-20 - downgradient of Site operations, MW2-20 - downgradient of Site operations, and MW3-20 - upgradient of Site operations) for the sole purpose of this HIA. The wells were installed to depths between 12.2 metres (m) and 14.3 m bgs (elevations of 307.3 m above mean sea level [AMSL] and 308.2 m AMSL) to screen the water table (shallowest groundwater regime). The three monitoring wells defined the stratigraphy, and depth to the groundwater table. Each monitoring well was constructed with a screen 3 m long, 5.08 cm in diameter and made of PVC attached to riser pipe, with an appropriate sand pack length, seal and grout and a lockable above ground protective casing.
- Task 2 - Horizontal and vertical survey of the three monitoring wells in November 2020. The wells were surveyed for vertical control with respect to elevation AMSL.
- Task 3 - Hydraulic monitoring in November and December 2020 to establish the depth to the groundwater table and consequently groundwater elevations and groundwater flow patterns.
- Task 4 - Collection of groundwater samples on 2 occasions (November and December 2020) following purging/development of the three monitoring wells. The groundwater samples were analyzed for general chemistry, total and dissolved metals, VOCs, SVOCs/PAHs/, TPH (F1 to F4) and oil and grease.
- Task 5 - Hydraulic conductivity calculation. Hydraulic conductivity was determined by completing single well response tests (slug tests) in the three monitoring wells in December 2020.
- Task 6 - Private well survey. A limited physical confirmation of the initial private well survey was completed in September 2020. Due to the Covid-19 pandemic, a more widespread physical well confirmation is not prudent at this time.
- Task 7 - Preparation of a HIA Report to define the geologic and hydrogeologic framework, and investigate the groundwater quality with the ultimate purpose of evaluating potential risk to nearby groundwater users.

3. Hydrogeologic Setting

3.1 Regional Setting

The Site is located on Wellington Road 34, east of Wellington Road 32, and north of Highway 401, in Wellington County (see Figure 1.1).



The Site is located on a Property which is legally described as Lot 8, Concession 3 and consists of a 100 acre property. As described in Section 1.2 of this Report, the northern two thirds of the Property is zoned as Extractive (EXI) and the southern one third is zoned as Agricultural (A). The Site is located on an approximate 31,000 square meter (s.m.) portion of the EXI zoned parcel.

Two potable wells are found on the Property. One potable well is located in the EXI zoned portion of the Property and the other is located in the Agricultural zoned portion of the Property.

The Property is currently primarily under agricultural use. The surrounding area is rural with small settlements, agricultural land, and an existing aggregate extraction operation.

The regional physiographic, geologic, and hydrogeologic settings in the vicinity of the Site are presented in the following sections.

3.1.1 Regional Physiography

The regional physiography and distribution of unconsolidated sediments, are mostly the result of glacial activity that took place in the late Wisconsinan substage of the Pleistocene Epoch, which ended approximately 10,000 years ago (OGS, 1998). The glacial activity in this area has created subsurface conditions that can be very variable over short distances.

The most prominent glacial features in the area are till moraines and spillways, as shown on Figure 3.1. The Property is located within a till moraine surrounded on all sides by spillways. The regional till moraines are classified as part of the Horseshoe Moraines physiographic region, and in particular the Paris and Galt moraines (Chapman and Putnam, 1984). The Paris and Galt moraine region stretches a distance of approximately 130 kilometres (km) from Caledon to Lake Erie, are upwards of 11 km in width, and have relief of upwards of 30 m. The moraines are surficial ridges that provide topographic relief for the headwaters of a large number of streams within the Credit River and Grand River watersheds (Russell et al. 2013).

The regional topography in the area of the Site is characterized as rolling to hummocky with localized hills and valleys and ranges from approximately 310 to 330 m above mean sea level (AMSL) (MNRF NRVIS, 2015).

3.1.2 Drainage and Hydrology

The regional area is near the Irish Creek which is in the Grand River watershed (WESA, 2005). The Grand River watershed is ultimately part of the Lake Erie drainage basin. The Grand River is located approximately 5 km west of the Site. The Site is within an area of low runoff potential as shown on Figure 3.2. Shown on Figures 3.2 and 3.3 is the location of Irish Creek which is about 300 m southeast of the southern part of the Property and about 600 southwest of the Site operations.

3.1.3 Surficial Geology

The regional surficial geology is dominated by extensive ice-contact stratified deposits, surrounded by silty to sandy till, organic and gravel deposits as shown on Figure 3.4. The overburden deposits are regionally approximately 40 m in thickness (Miller, 1979).

The ice-contact stratified deposits consist of a mixture of sand, gravel, silt, sandy silt, and some clay/silt layers/seams. Beneath the ice-contact stratified deposits there might be fine-grained



deposits, which are classified regionally as various drifts and tills which in turn are overlain by sand and gravel on top of the bedrock in places (Bajc and Shiota, 2007).

3.1.4 Bedrock Geology

Regionally bedrock is at an elevation of approximately 285 to 295 m AMSL, or approximately 40 m below ground surface (bgs) (Miller et al. 1979) (Karrow, 1987). The bedrock is the Guelph Formation as shown on Figure 3.5.

The Guelph Formation is an Upper Silurian-aged, massive and thick-bedded brown and grey limestone/dolostone and trends to the northwest and has a gentle dip to the southwest (Armstrong and Dodge, 2007).

3.1.5 Physical Hydrogeology

The physical hydrogeology in the area is defined by two or three hydrostratigraphic units in descending stratigraphic order.

An upper water bearing unit/unconfined aquifer/ water table aquifer composed primarily of ice-contact stratified sand, gravel, silt and silty sand deposits. This aquifer is not significant in terms of water supply due to low yields. This water table unit is found at depths between 6 and 11 m bgs.

A deeper permeable sand and gravel aquifer under confined conditions might be present in some areas and it would be separated from the unconfined water table unit by aquitard (s) comprised of silt and clay deposits. This deeper aquifer is a more significant source of water supply and some of the nearby domestic private wells might use this aquifer for water supply.

A bedrock aquifer underlies the overburden. The bedrock aquifer is comprised of the Guelph Formation and has a relatively high permeability and generally good groundwater yielding capacity. The top of the bedrock surface is at an elevation of approximately 285 to 295 m AMSL.

The Guelph Formation is a regional aquifer which is used by municipal wells in the City of Guelph and City of Cambridge for water supply.

3.1.6 Water Supply

Water use within the area is limited to private wells for domestic, agricultural, and industrial use. There is little urban development and no municipal wells within the immediate area to service home or businesses.

Most of the private wells are screened either in the deep overburden and more commonly in the bedrock.

The Property is located within a medium intrinsic vulnerability area and within combined Zone D wellhead protection area (WHPA) from the Hespeler and Pinebush well fields in Cambridge as shown on Figure 3.6. These two well fields obtain water supplies from the Guelph Formation.

3.2 Site Setting

The Site geology and hydrogeology were characterized based on the regional geologic and hydrogeologic framework (See Section 3.1 of this report) and Site-specific information collected



specifically for the purpose of the HIA and other available data (water well records for the two water supply wells within the Property).

The following data were evaluated to define the geologic and hydrogeologic conditions, and groundwater quality:

- Stratigraphic and hydrogeologic data from the three monitoring wells (MW1-20, MW2-20, and MW3-20) installed at the Site in November 2020.
- Stratigraphic and hydrogeologic data from MECP water well records for the two water supply wells within the Property (A and EXI).
- Site-specific hydraulic monitoring data collected in November and December 2020 from MW1-20, MW2-20, and MW3-20.
- Hydraulic monitoring data (static water level data) collected from supply wells A and EXI at the time of their installation.
- Site-specific groundwater quality data collected in November and December 2020 from MW1-20, MW-2-20, and MW3-20.
- Site-specific groundwater quality collected from water supply wells A and EXI in July and August 2020.
- Surface water quality from the storm water management pond collected in October and November 2020.
- Site-specific hydraulic conductivity data collected from MW1-20, MW2-20, and MW3-20 in December 2020.

The monitoring well completion details are summarized in Table 3.1.

3.2.1 Site Hydrologic Setting

Drainage of precipitation from the Site is primarily via infiltration into the groundwater flow system with little surface water runoff. Due to the prevalence of sand and gravel deposits in the shallow overburden and a depth to groundwater of 6 to 11 m or greater, precipitation infiltrates the ground relatively easily.

A storm water management is located within the west-central part of the Property and west of the Site operations.

A natural pond is located to the north of the Site and is not related to operations.

There are no major surface water features or drainage pathways on Site of provincial significance.

3.2.2 Site Geologic Setting

The geologic framework within the Site was characterized through the evaluation of stratigraphic data from borehole logs and monitoring well data generated specifically for the purpose of the HIA (MW1-20, MW2-20, and MW3-20). The stratigraphic and instrumentation logs are provided in Appendix B. Other available data (MECP water well records for the two on Site water supply wells A and EXI) were also used in the geologic characterization and are provided in Appendix A.



The borehole/monitoring well stratigraphic data for these three monitoring wells and the stratigraphic data from the two existing water supply well within the Property were used to prepare three geologic/hydrogeologic cross-sections A-A' (north-south - along the western site of the operations), B-B' (north south - along the east side of the operations) and C-C' (across the middle of the operations) .

The locations of the geologic cross-sections are shown on Figure 3.7. The Site geologic cross-sections are shown on Figures 3.8 to 3.10.

Ice-Contact Stratified Deposits

As shown on Figures 3.8 to 3.10, the Site is underlain by heterogenous ice- contact stratified deposits identified on a regional basis (see Figure 3.4). The Site is underlain by a mixture of sandy silt/silty sand, sand, silt, clay and sand and gravel deposits typical of ice contact settings from ground surface to the top of the bedrock.

The two water supply wells shown on Figure 3.8 (geologic/hydrogeologic cross-section A-A'), show extremely variable lithologies. The northern water supply well shows coarse-grained deposits (sand and gravel) from ground surface elevation of 322 m AMSL to an elevation of 287 m AMSL). The southern supply well on the other hand shows impermeable deposits (clay) from ground surface (elevation of 320 m AMSL) to bedrock (elevation of 295 m AMSL).The other two geologic/hydrogeologic cross-sections shown on Figures 3.9 and 3.10 (geologic cross-sections B-B and C-C') show similar patterns of lithologic heterogeneity.

However, generally the northern portion of the Site is primarily comprised of more impermeable fine-grained deposits than the central portion the Site where coarser grained deposits are found.

Bedrock

Bedrock underlying the various overburden deposits was penetrated by one of the water supply wells at an elevation of 295 m AMSL. Regionally bedrock is comprised of bedded limestone/dolostone of the Guelph Formation. The top of the bedrock at the Site appears to slope to the south.

3.2.3 Site Hydrogeologic Setting

The Site hydrogeologic conditions were characterized based on the regional hydrogeology, local geologic conditions, described above, groundwater monitoring, and hydraulic conductivity testing.

Water Table (Upper Unconfined Aquifer)

The Ice-Contact Stratified Deposits described in Section 3.2.2 correspond to the water table unit (upper unconfined aquifer or first water-bearing zone).

This is the hydrostratigraphic unit relevant to this HIA as it contains the water table.

If groundwater impact was present beneath the Site within the groundwater flow system, it would be found in the water table unit because it is the shallowest groundwater regime.



Hydraulic Properties

The hydraulic conductivity of the ice-contact stratified deposits which comprise the water table unit is variable, as summarized in Table 3.3. The hydraulic conductivity ranges between 2.4×10^{-5} to 9.1×10^{-3} centimetres per second (cm/s) based on slug test data collected on December 1, 2020 from the three monitoring wells. The hydraulic conductivity plots are provided in Appendix C. The geometric mean hydraulic conductivity is 5.8×10^{-4} cm/sec.

Groundwater Flow Patterns

Groundwater elevation contours were prepared for the water table unit using hydraulic monitoring data collected on November 23, 2020 (see Table 3.2). The groundwater contours are shown on Figure 3.11.

As shown on Figure 3.11, groundwater flow generally follows the topography. Groundwater flows to the south-southwest from MW3-20 to MW1-20 and MW2-20. The water table elevation ranges from approximately 317 m AMSL to 311 m AMSL and the average horizontal hydraulic gradient is 0.02.

Based on the groundwater contours shown on Figure 3.11, water supply wells A and EX1 are downgradient of the Site operations.

The vertical hydraulic gradient from the water table unit to the deeper overburden water-bearing zone or bedrock is 0.2 downwards based on the groundwater elevation at MW1-20 of 311.5 m AMSL and a groundwater elevation of 306 m AMSL at water supply well EX1 adjacent to it.

Groundwater Flow Velocity

Based on an average hydraulic conductivity of 5.8×10^{-4} cm/sec, an average horizontal hydraulic gradient of 0.02 and an assumed porosity of 30 percent (0.3) the average horizontal groundwater flow velocity across the Site would be 0.03 m/day (11 m/year).

The vertical groundwater flow velocity would be 0.03 m/day (11 m/year) based on a vertical hydraulic conductivity of 5.8×10^{-5} cm/sec (one order of magnitude lower than the horizontal hydraulic conductivity), a vertical hydraulic gradient of 0.2, and a porosity of 0.3.

The horizontal and vertical groundwater flow velocities are both the same due to the offset in hydraulic conductivity and hydraulic gradients differences, both groundwater flow velocities are slow allowing for attenuation of chemical constituents, if they were present.

Summary

In summary, the Site is underlain by ice-contact stratified deposits which extend from ground surface to the top of the bedrock. The ice contact-stratified deposits are highly heterogeneous but are generally finer-grained in the north than the south.

The shallowest groundwater flow regime, referred in this report as the water table unit is found at depths between 6 and 11 m.

Groundwater flows horizontally to the south-southwest with an average horizontal hydraulic gradient of 0.02 and a groundwater flow velocity of about 0.03 m/day.



Groundwater flows vertically downwards from the water table unit to the deeper water-bearing overburden unit and bedrock with an average vertical hydraulic gradient of 0.2 and a vertical groundwater flow velocity of 0.03 m/day.

4. Impact Assessment

This section provides an impact assessment based on the groundwater and surface water quality collected at the Site.

Private Water Well Use

A review of the private water wells in the area as documented in a letter from GHD to the Applicant, dated September 18, 2020 and contained in Appendix D of this report, identified a few supply wells in the vicinity of the Site. These wells are shown on Figure 4.1. Most of the wells are deeper than 20 m and obtain water from the bedrock and a few from the deep overburden aquifer.

As noted in Section 2.2, the two Site supply water wells (A and EX1 water supply) would be the first wells to be impacted if operations at the Site were to cause a negative impact to nearby groundwater quality.

Municipal Well Fields

As discussed in Section 3.1.6 of this report, the Property is located within a medium intrinsic vulnerability area. The Site is located approximately 4.7 km and 3.8 km northeast of the City of Cambridge Pinebush and Hespeler well fields, respectively, and is located within the combined Zone D wellhead protection area (WHPA) from these two well fields.

Groundwater Quality - Water Table Unit

Groundwater samples from monitoring wells MW1-20, MW2-20, and MW3-20 were collected on two occasions, on November 24/25, 2020 and December 4, 2020 from the three monitoring wells and analyzed for general chemistry, total and dissolved metals, VOCs, SVOCs/PAHs, THP (F1 to F4) and oil and grease. The groundwater samples were collected to assess whether the water table unit had been impacted by Site operations. The water table unit groundwater quality is summarized in Table 4.1 and the laboratory reports are provided in Appendix E.

General Chemistry/Total Metals/Dissolved Metals

Groundwater in monitoring wells MW1-20, MW2-20, and MW3-20 reflects the geochemical make-up of the ice-contact stratified deposits which make up the media of the water table unit. Total and dissolved metals are generally low and below Ontario drinking water quality standards.

VOCs

No VOCs were detected in MW1-20, MW2-20, or MW3-20 above the RLs.

SVOCs/PAHs

SVOCs/PAHs were generally not detected above the RLs. A few SVOCs/PAHs were sporadically detected above the RLs at levels less than 1 ug/L. These were: diethylphthalate, fluoranthene,



fluorene, 1+2-methylnaphthalenes, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, phenanthrene, phenol, pyrene. All these compounds were below the Ontario drinking water quality standards.

TPH/Oil and Grease

TPH and oil and grease were not detected above the RLs in any of the groundwater samples from MW1-20, MW2-20, or MW3-20.

Therefore, none of the Ontario drinking water quality standards were exceeded in the groundwater samples from the water table unit.

Groundwater Quality - Water Supply Wells EX1 and A

There are other water supply wells around the Site which are used for domestic or agricultural purpose since this area is not serviced by municipal water. The supply wells are either within the deep overburden or bedrock.

Groundwater samples from the EX1 and A supply wells have been collected on three occasions (two in July and one in August 2020). The groundwater samples were analyzed for a comprehensive suite of analytes which included total metals, polychlorinated biphenyls (PCBs), VOCs, TPH including the F1 to F4 fraction, semi-volatiles/ polycyclic aromatic hydrocarbons/base neutral extractables (SVOCs/PAHs/BNAS).

The groundwater quality data for supply wells EX1 and A are summarized in Tables 4.2 and 4.3 and the laboratory reports are provided in Appendix E.

The groundwater quality results from both supply wells show that the water is reflective of the natural geochemistry of the deep overburden and bedrock aquifers. No VOCs, TPH, PCBs, SVOCs/PAHs/BNAs were detected above the laboratory reporting limits (RLs). The laboratory RLs were set at levels lower than the Ontario drinking water quality standards.

Therefore, no Ontario drinking water quality standards were exceeded in the Site water supply wells.

Surface Water Quality

Several surface waters samples have been collected between October and November 2020 from the storm management pond located to the northwest of the Site operations. The surface water samples were analyzed for metals, VOCs, TPH (F1 to F4), and SVOCs/PAHs/BNAs.

The surface water quality is summarized in Table 4.4 and the laboratory reports are provided in Appendix E.

None of the surface water samples had VOCs, TPH (F1 to F4), or SVOCs/PAHs/BNAs detections above the laboratory RLs. The laboratory set the RLs at concentrations lower than the provincial water quality objectives (PWQOs).

No PWQOs were exceeded by surface water in the storm water management pond.

The historical data collected at the Site and the data collected as part of the HIA clearly show that the operations at the Site are not impacting either shallow or deep groundwater.



5. Proposed Monitoring Program

Groundwater quality in the water table unit and deeper overburden and bedrock aquifers reflects the natural geochemistry of the aquifer media.

Groundwater or surface water have not been impacted by Site operations. Only low levels (less than 1 ug/L) of a small number of SVOCs/PAHs were detected in the water table unit. These levels are below the Ontario drinking water quality standards.

However, the Site is located within combined Zone D of the Hespeler and Pinebush well fields which operate in the City of Cambridge.

Therefore, it is proposed that potential future impacts to groundwater be monitored by the following:

- Groundwater sampling of MW1-20, MW2-20, and MW3-20, and two on-Site supply wells be monitored once per year for SVOCs/PAHs only.
- Surface water sampling of the operations pond be monitored once per year for SVOCs/PAHs only.
- Groundwater levels be monitored in MW1-20, MW2-20, and MW3-20 four times per year.

The monitoring network is shown on Figure 5.1.

It is also proposed that a monitoring program report be prepared every 5 years and provided to MECP.

6. Summary and Recommendations

1. The geologic and hydrogeologic conditions have been characterized and the potential for impacts from Site operations to groundwater has been assessed.
2. There are no anticipated impacts to groundwater resources from the Site operations to shallow groundwater or deeper groundwater supplies.
3. A monitoring program has been created to identify any future unanticipated impacts, because the Site is located within combined Zone D of the Hespeler and Pinebush well fields.

7. References

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- MNRF NRVIS, 2015. Land Information Ontario. Ontario Ministry of Natural Resources and Forestry: NAD 1983, UTM Zone 17N.
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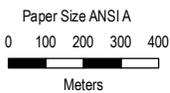
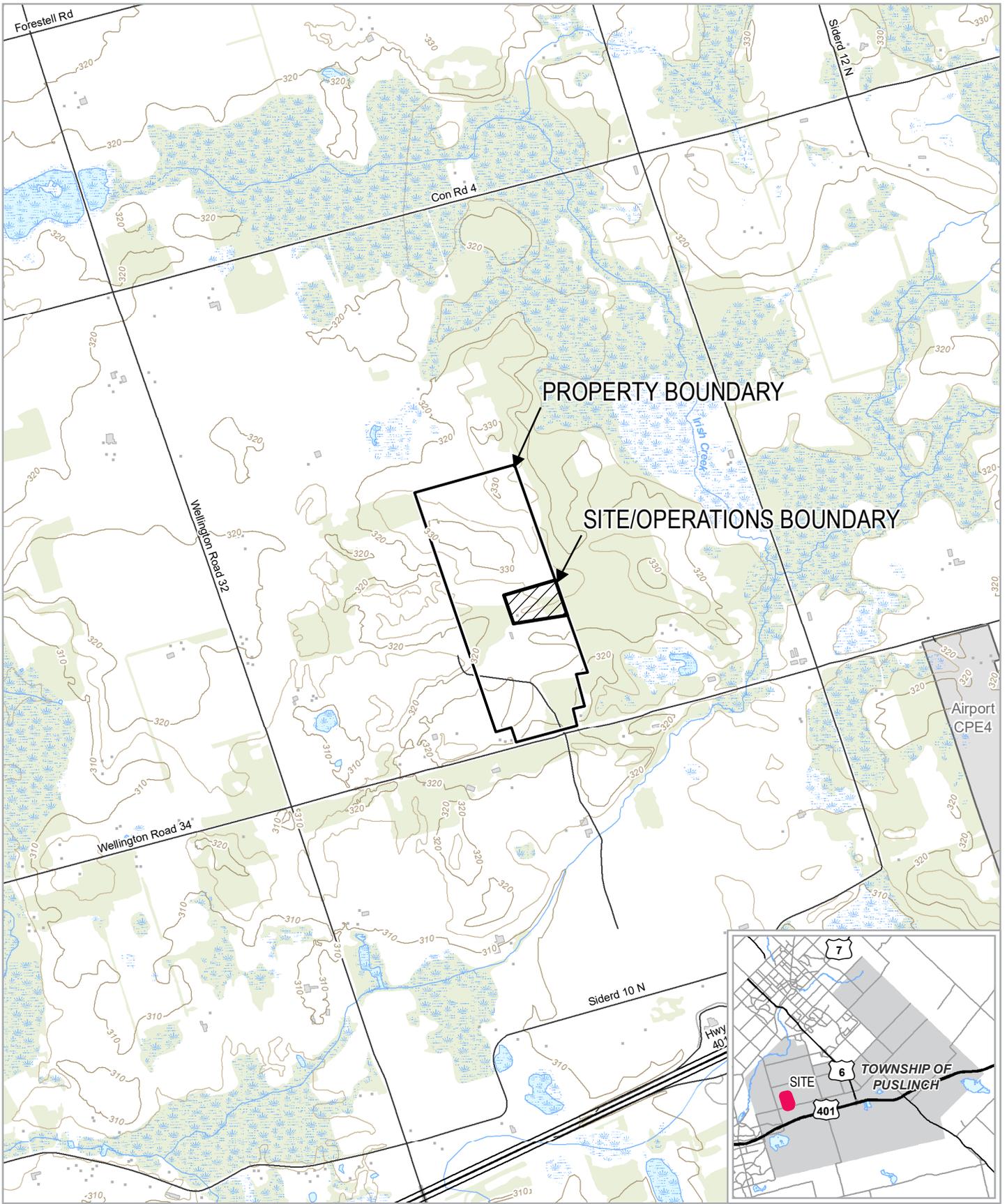
All of Which is Respectfully Submitted,

GHD

Prepared By:



Gary I. Lagos, M.Sc., P. Geo



Map Projection: Transverse Mercator
 Horizontal Datum: North American 1983 CSRS
 Grid: NAD 1983 CSRS UTM Zone 17N



2374868 ONTARIO INC.
 6678 WELLINGTON RD 34
 WELLINGTON COUNTY, ON

Project No. 11210029
 Revision No. -
 Date Dec 11, 2020

SITE LOCATION

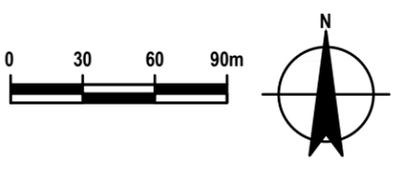
FIGURE 1.1

Data source: WWIS, 2020. Ontario Ministry of the Environment (Accessed August, 2020); Imagery Google 2020. Capture date: 7/Jul/2018



LEGEND

- PROPERTY BOUNDARY
- MW01-20 MONITORING WELL LOCATION
- ⊕ 6705884 PRIVATE WELL LOCATION
- - - - - DRAINAGE SWALE
- SITE/OPERATION BOUNDARY



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 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ONTARIO

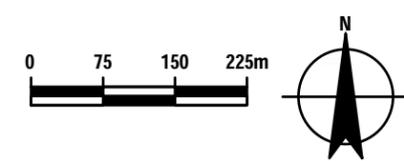
Project No. 11210029
 Date December 2020

SITE FEATURES

FIGURE 1.2



- LEGEND**
- Regulation Limit (GRCA)
 - Regulation Watercourse (GRCA)
 - Regulation Waterbody (GRCA)
 - Wetland (GRCA)
 - Floodplain (GRCA)
 - Engineered
 - Estimated
 - Approximate
 - Special Policy Area
 - Slope Valley (GRCA)
 - Steep
 - Oversteep
 - Steep
 - Slope Erosion (GRCA)
 - Oversteep
 - Toe
 - Lake Erie Flood (GRCA)
 - Lake Erie Shoreline Reach (GRCA)
 - Lake Erie Dynamic Beach (GRCA)
 - Lake Erie Erosion (GRCA)
 - Parcel - Assessment (MPAC/MNRP)

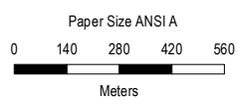
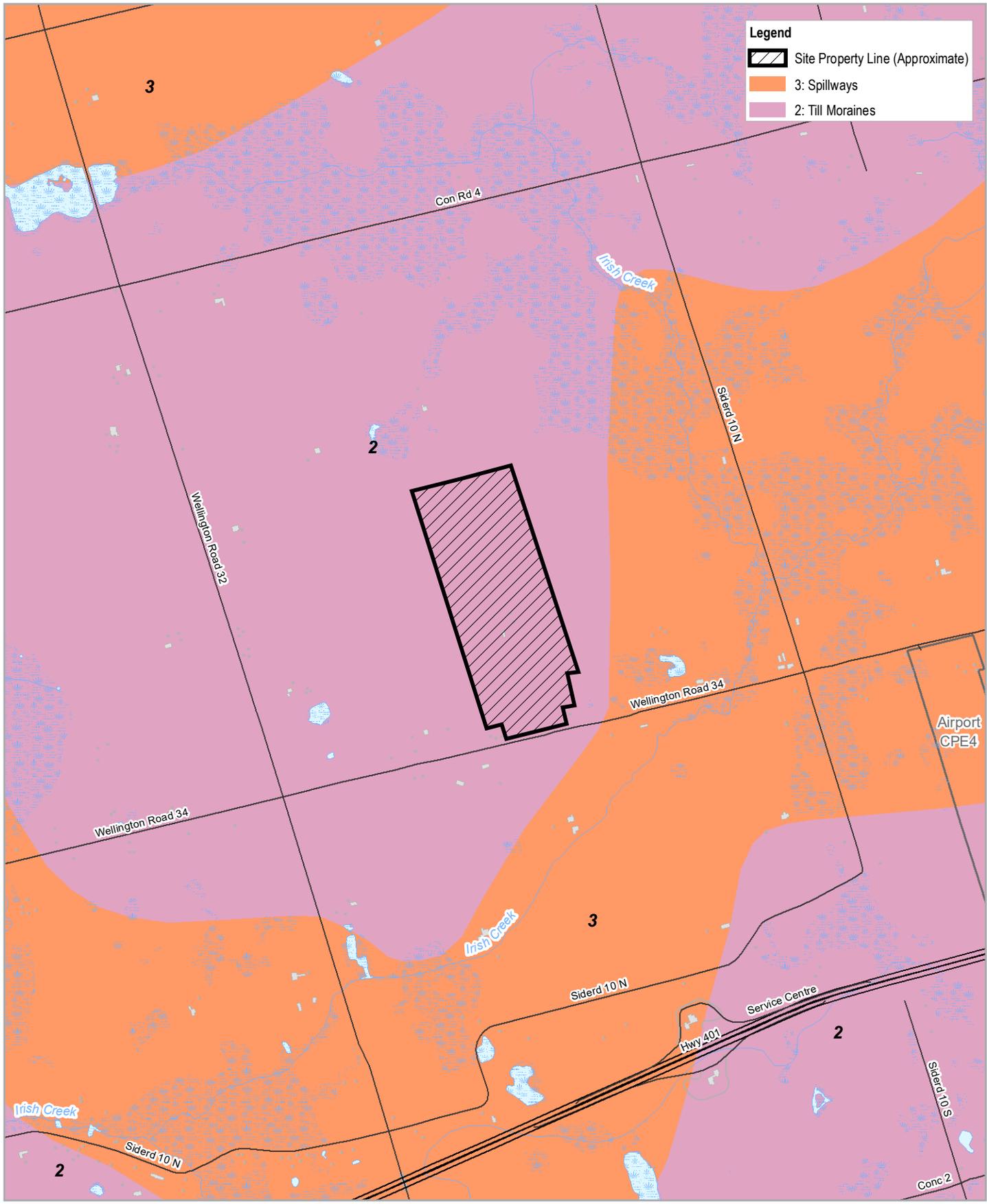


BADGER DAYLIGHTING AND HYDROVAC SERVICES
 6678 WELLINGTON ROAD 34,
 WELLINGTON COUNTY, ONTARIO

Project No. 11210029
 Date April 2020

SITE AERIAL PHOTO

FIGURE 1.3



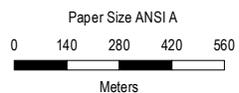
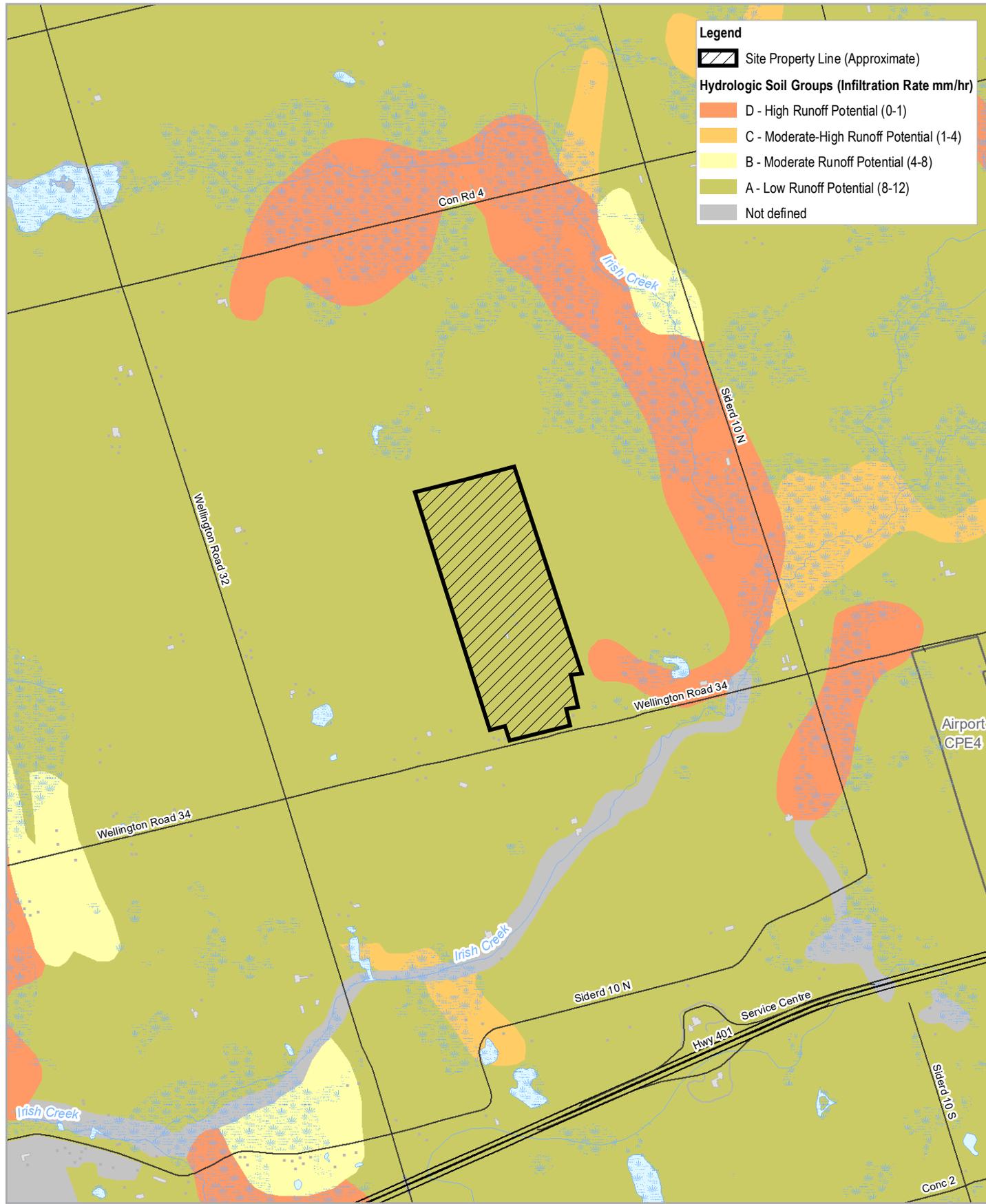
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6678 WELLINGTON RD 34
WELLINGTON COUNTY, ON

Project No. 11210029
Revision No. -
Date Dec 9, 2020

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N

REGIONAL PHYSIOGRAPHY

FIGURE 3.1



Map Projection: Transverse Mercator
 Horizontal Datum: North American 1983
 Grid: NAD 1983 UTM Zone 17N

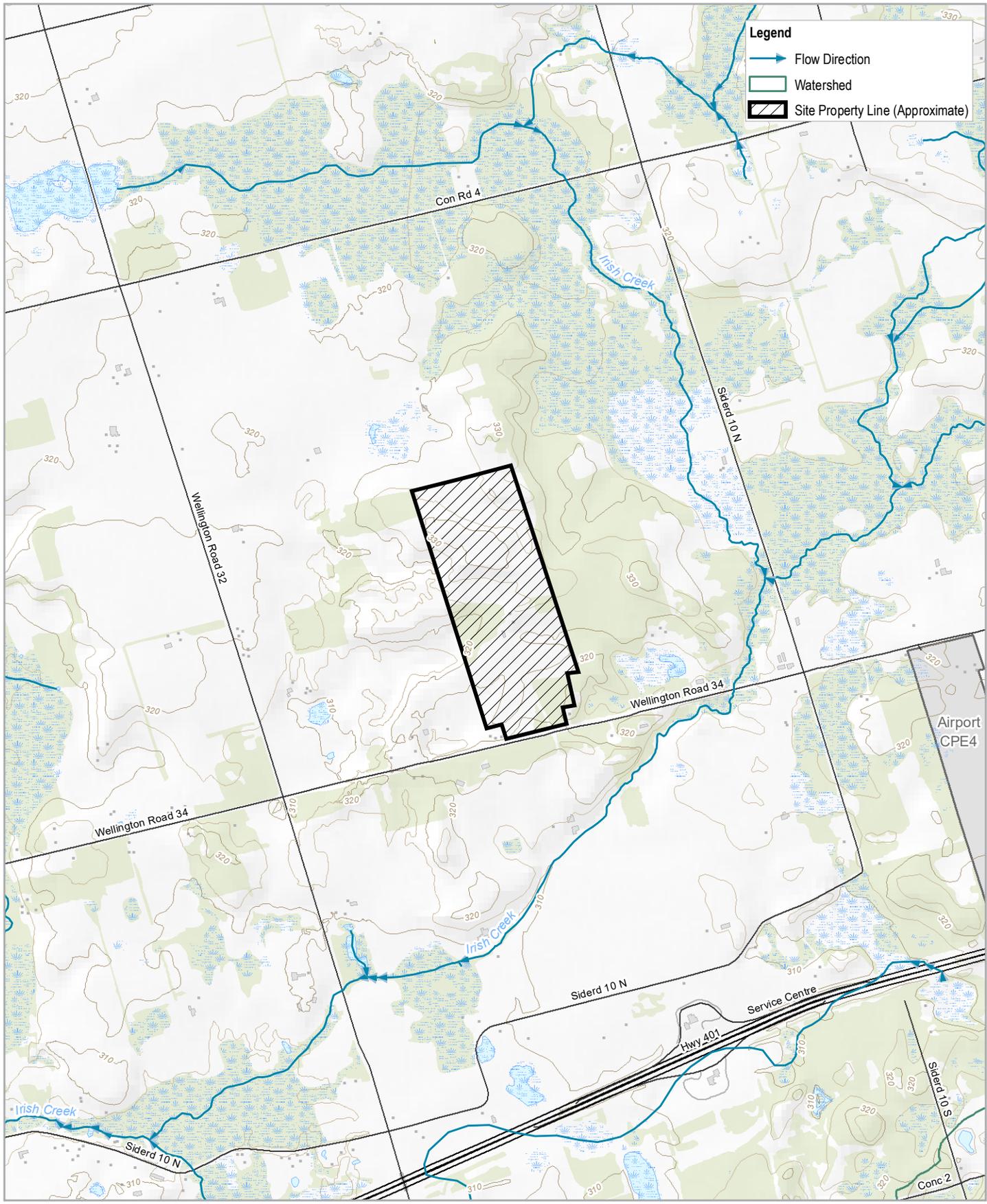


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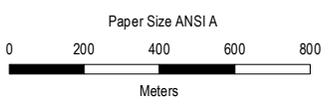
HYDROLOGIC SUBCATCHMENTS

FIGURE 3.2



Legend

- Flow Direction
- Watershed
- Site Property Line (Approximate)



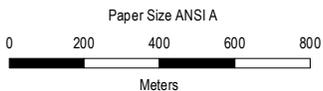
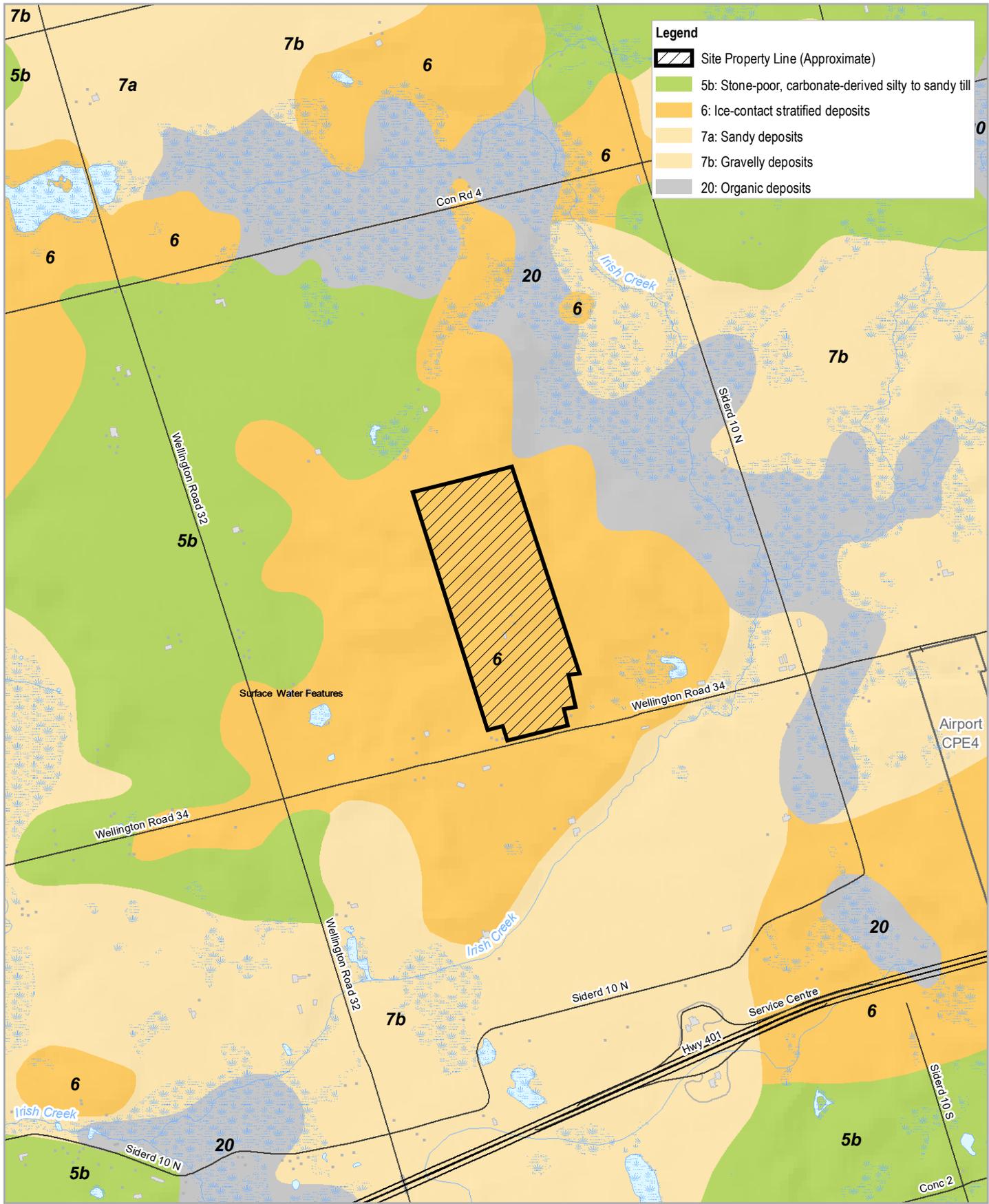
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6678 WELLINGTON RD 34
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Date Dec 9, 2020

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N

SURFACE WATER FEATURES

FIGURE 3.3



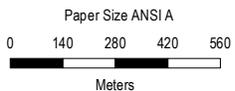
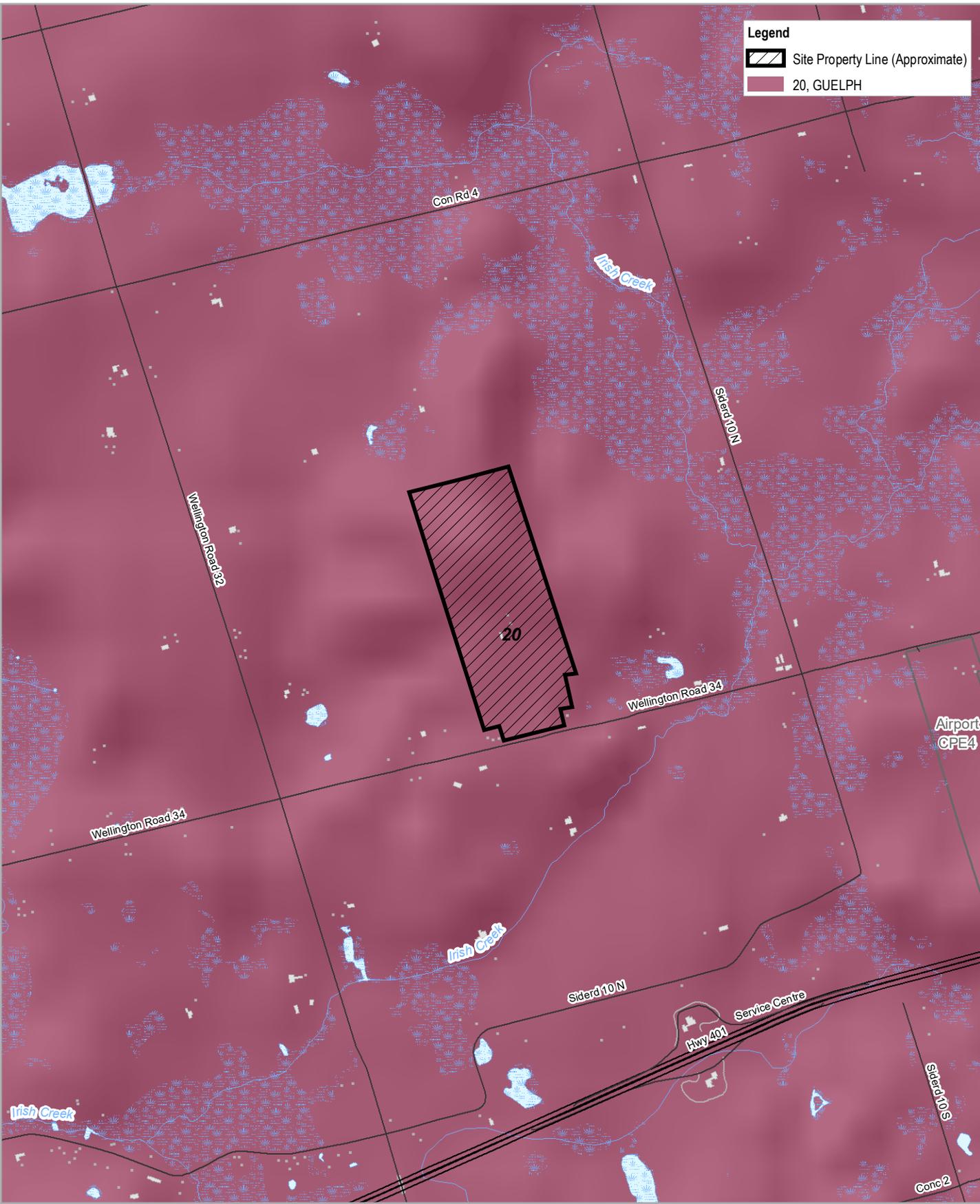
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Date Dec 9, 2020

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Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N

REGIONAL SURFICIAL GEOLOGY

FIGURE 3.4



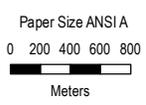
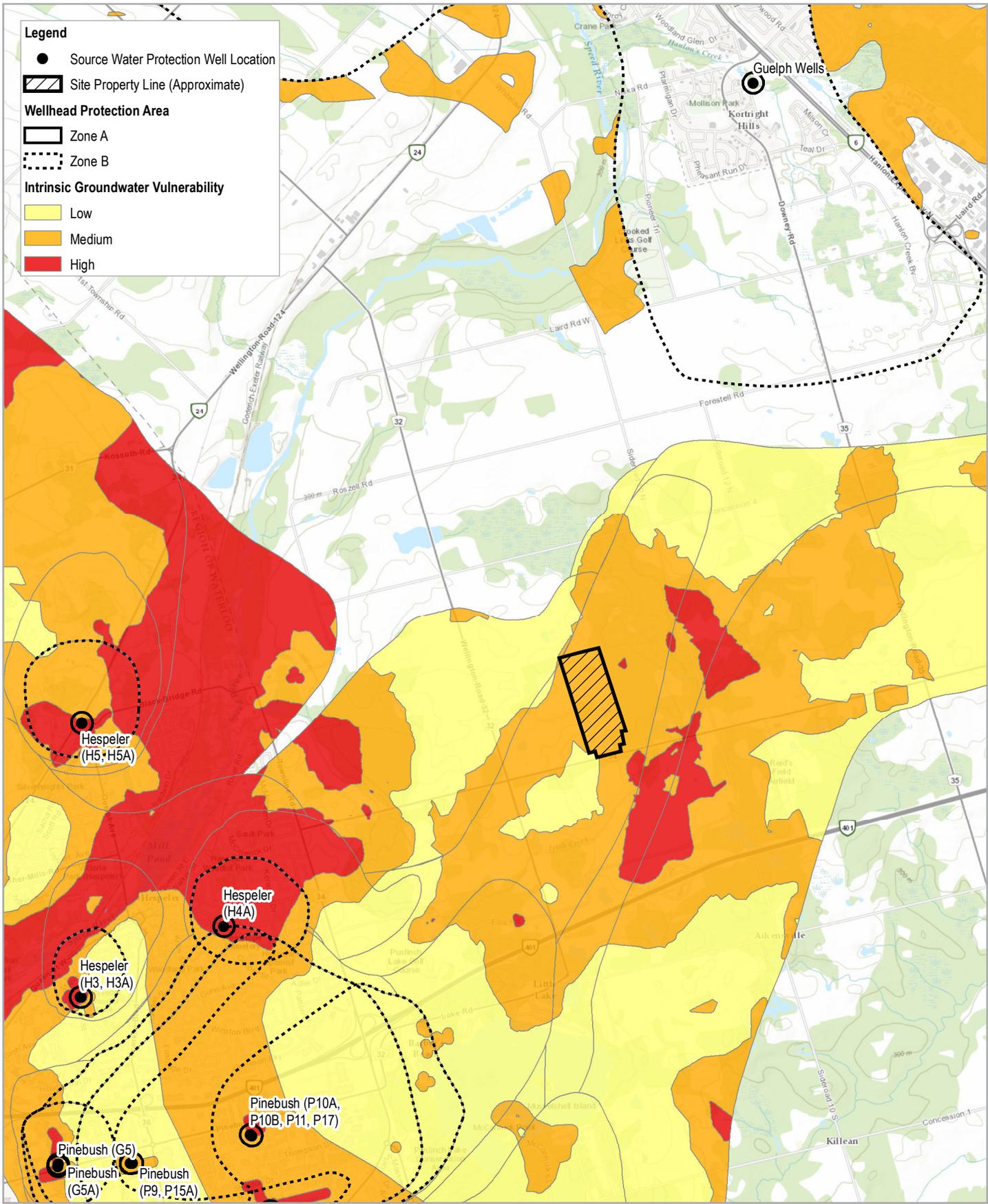
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6678 WELLINGTON RD 34
WELLINGTON COUNTY, ON

Project No. 11210029
Revision No. -
Date Dec 9, 2020

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N

PALEOZOIC GEOLOGY

FIGURE 3.5



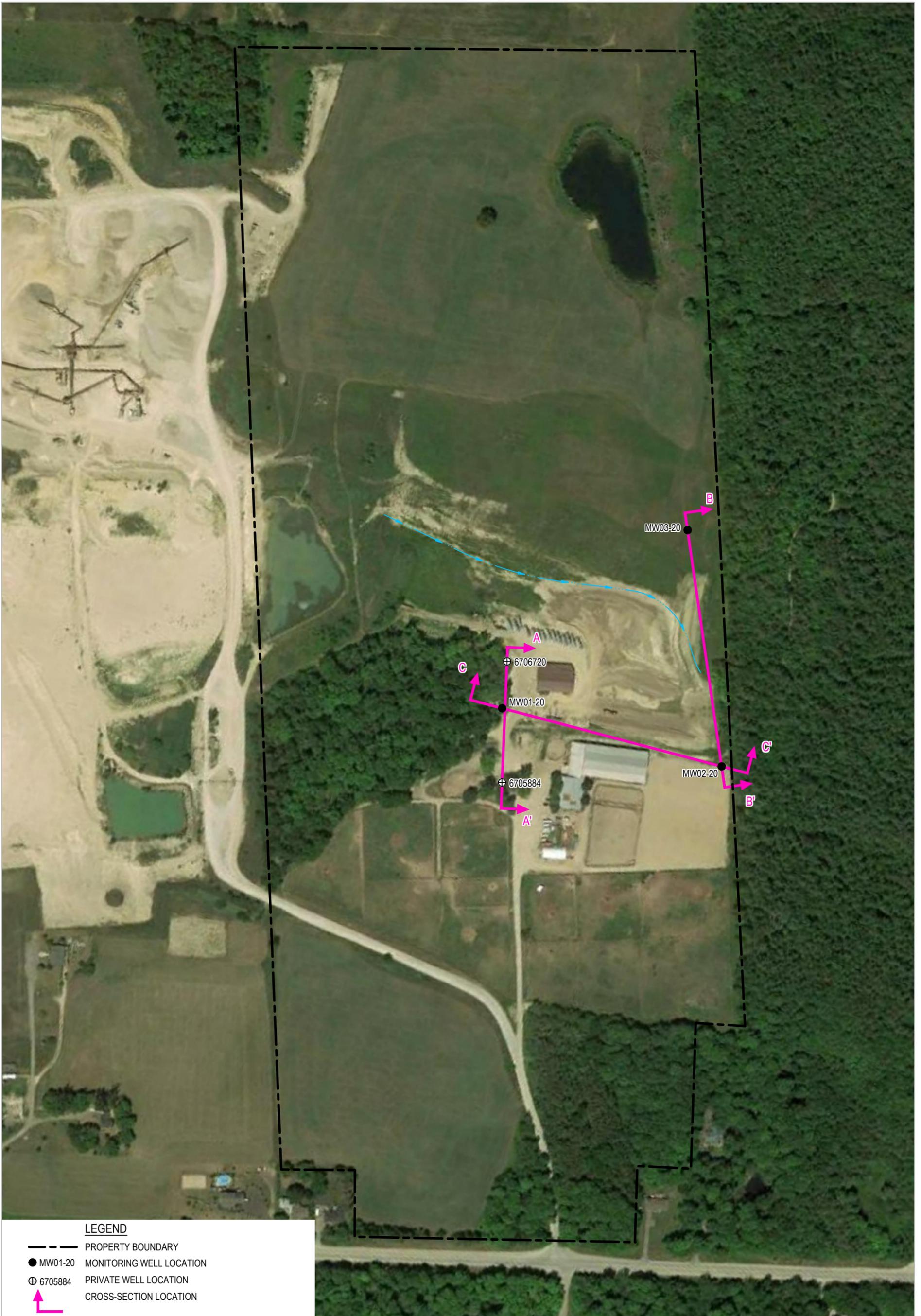
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6678 WELLINGTON RD 34
WELLINGTON COUNTY, ON

Project No. 11210029
Revision No. -
Date Dec 8, 2020

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 17N

**WELLHEAD PROTECTION AREAS
(WHPAS)**

FIGURE 3.6



LEGEND

- PROPERTY BOUNDARY
- MW01-20 MONITORING WELL LOCATION
- ⊕ 6705884 PRIVATE WELL LOCATION
- ↑ CROSS-SECTION LOCATION

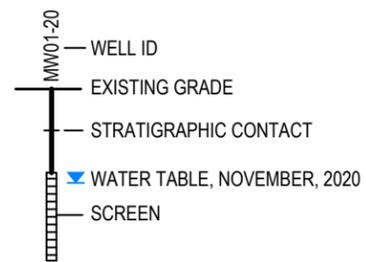
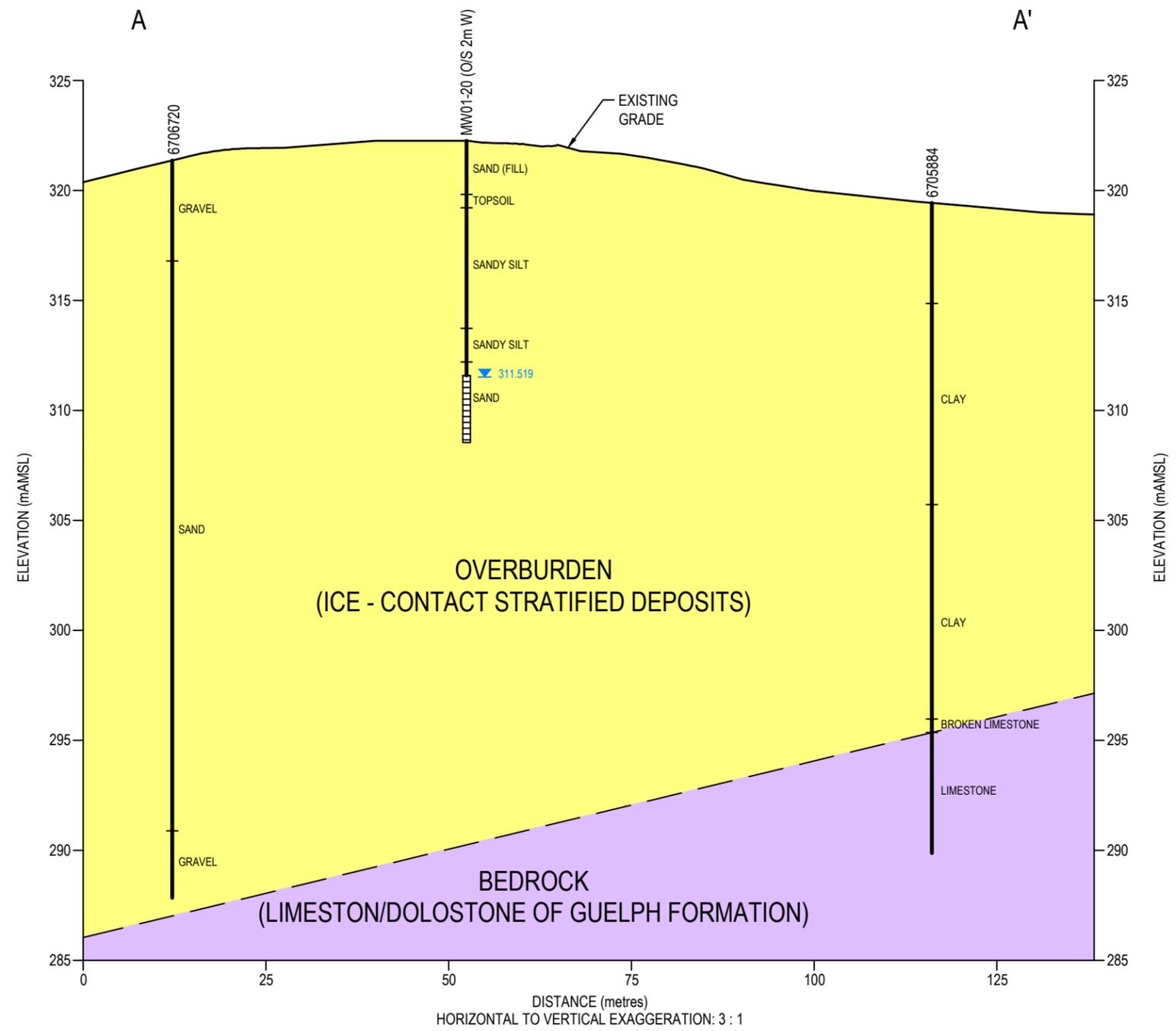


2374868 ONTARIO INC.
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Project No. 11210029
 Date December 2020

GEOLOGIC CROSS-SECTION LOCATIONS

FIGURE 3.7

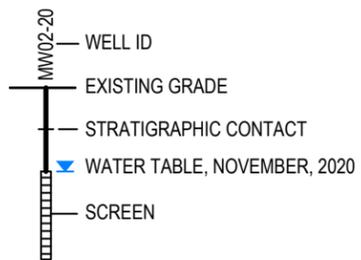
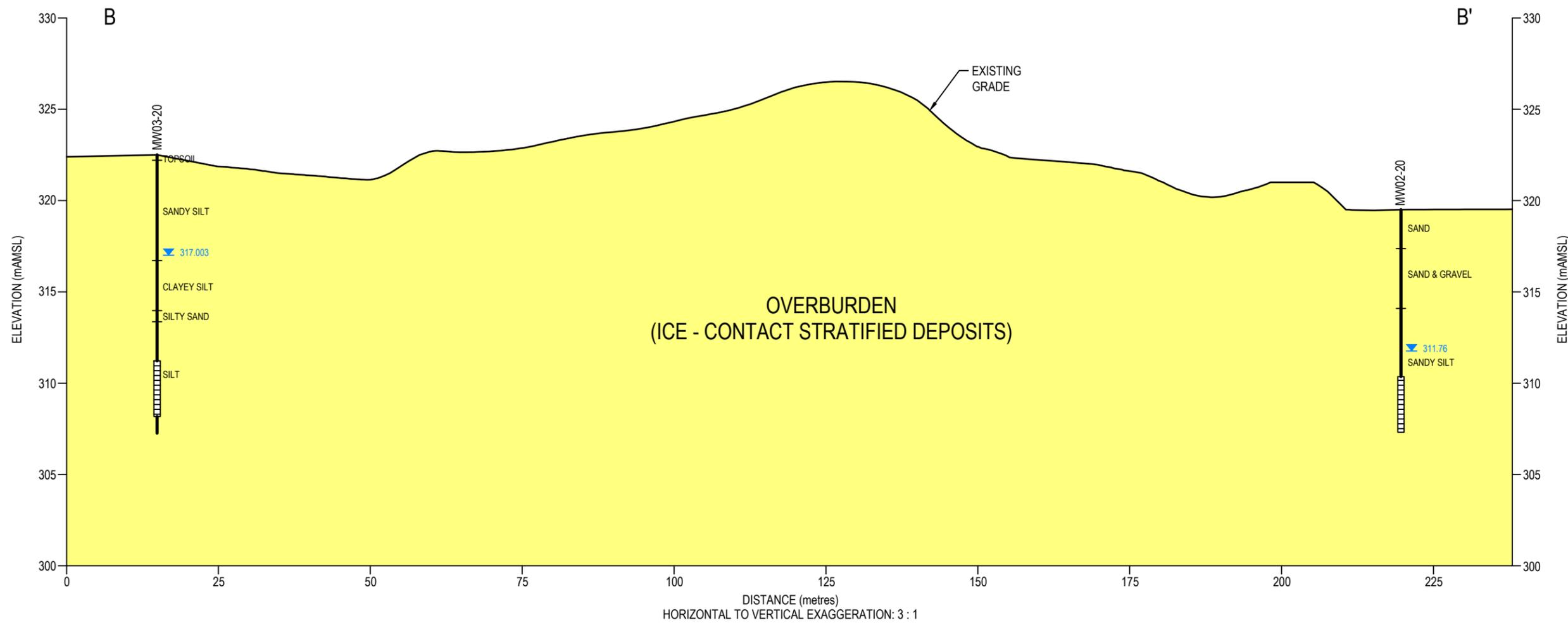


2374868 ONTARIO INC.
6678 WELLINGTON ROAD 34
WELLINGTON COUNTY, ONTARIO

Project No. 11210029
Date December 2020

GEOLOGIC CROSS-SECTION A-A'

FIGURE 3.8

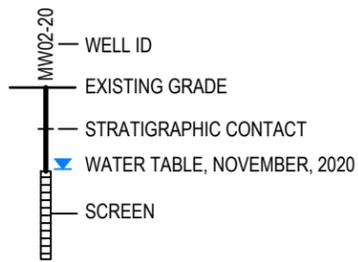
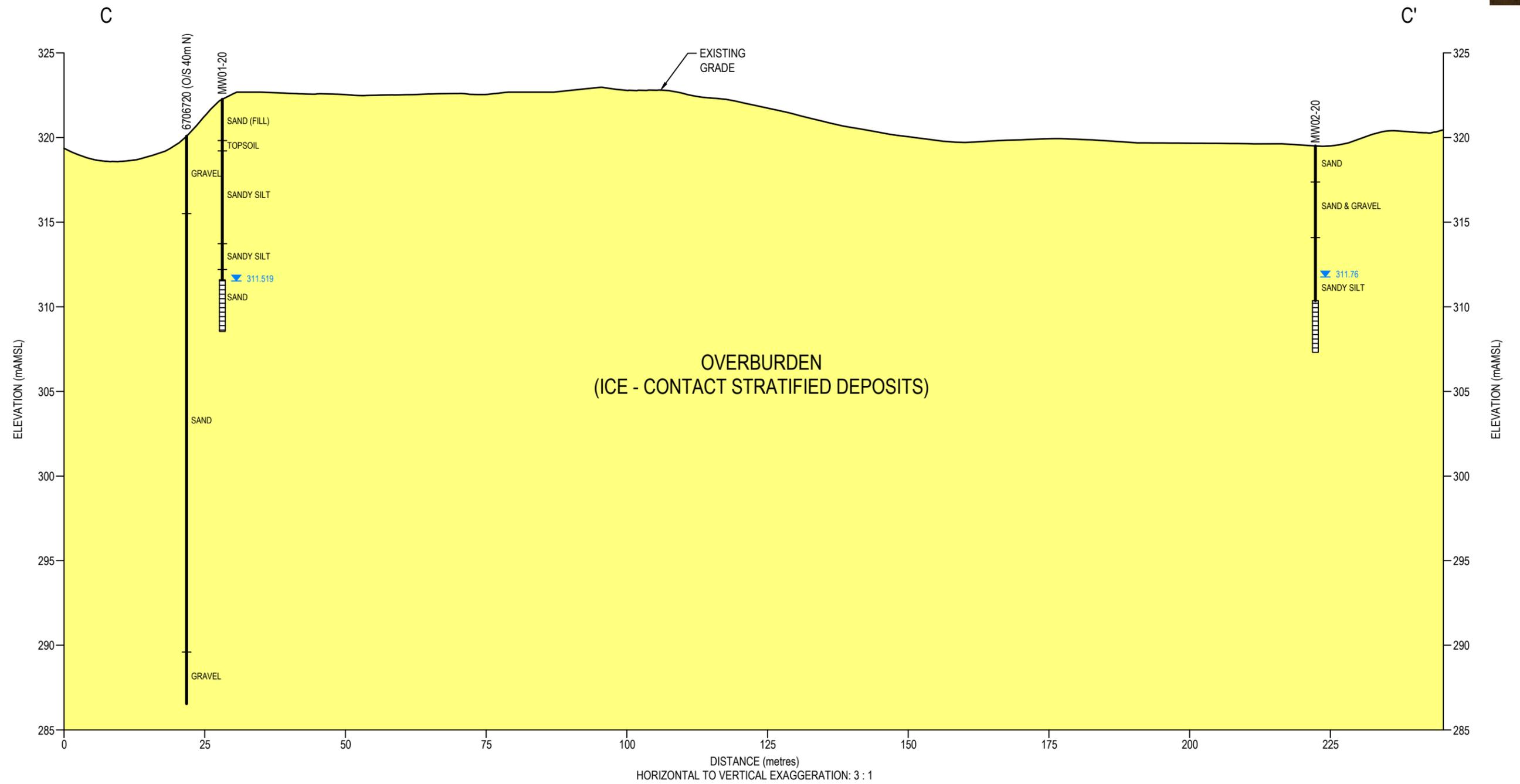


2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ONTARIO

Project No. 11210029
 Date December 2020

GEOLOGIC CROSS-SECTION B-B'

FIGURE 3.9

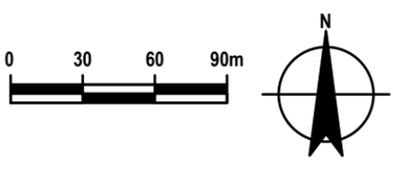
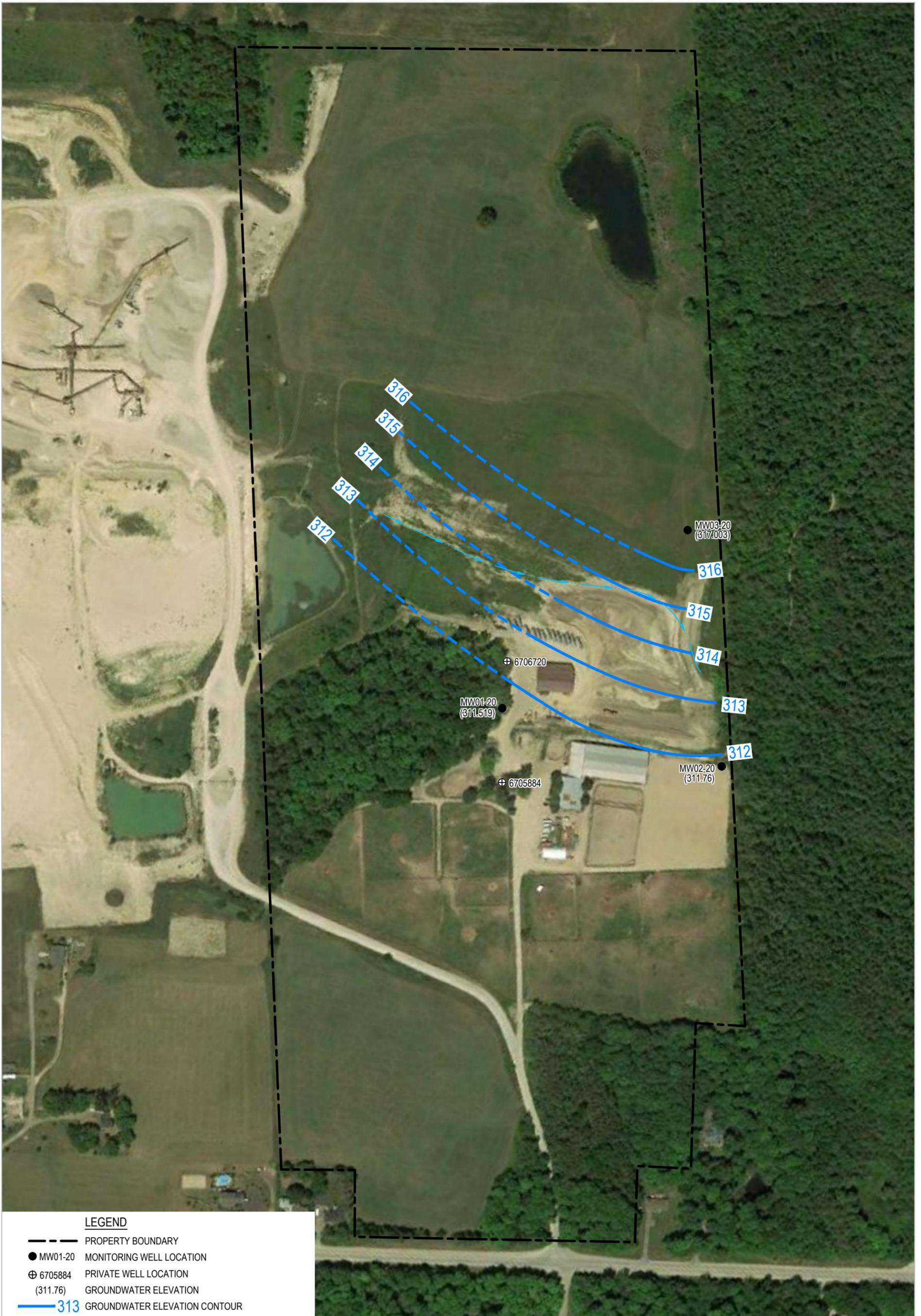


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6678 WELLINGTON ROAD 34
WELLINGTON COUNTY, ONTARIO

Project No. 11210029
Date December 2020

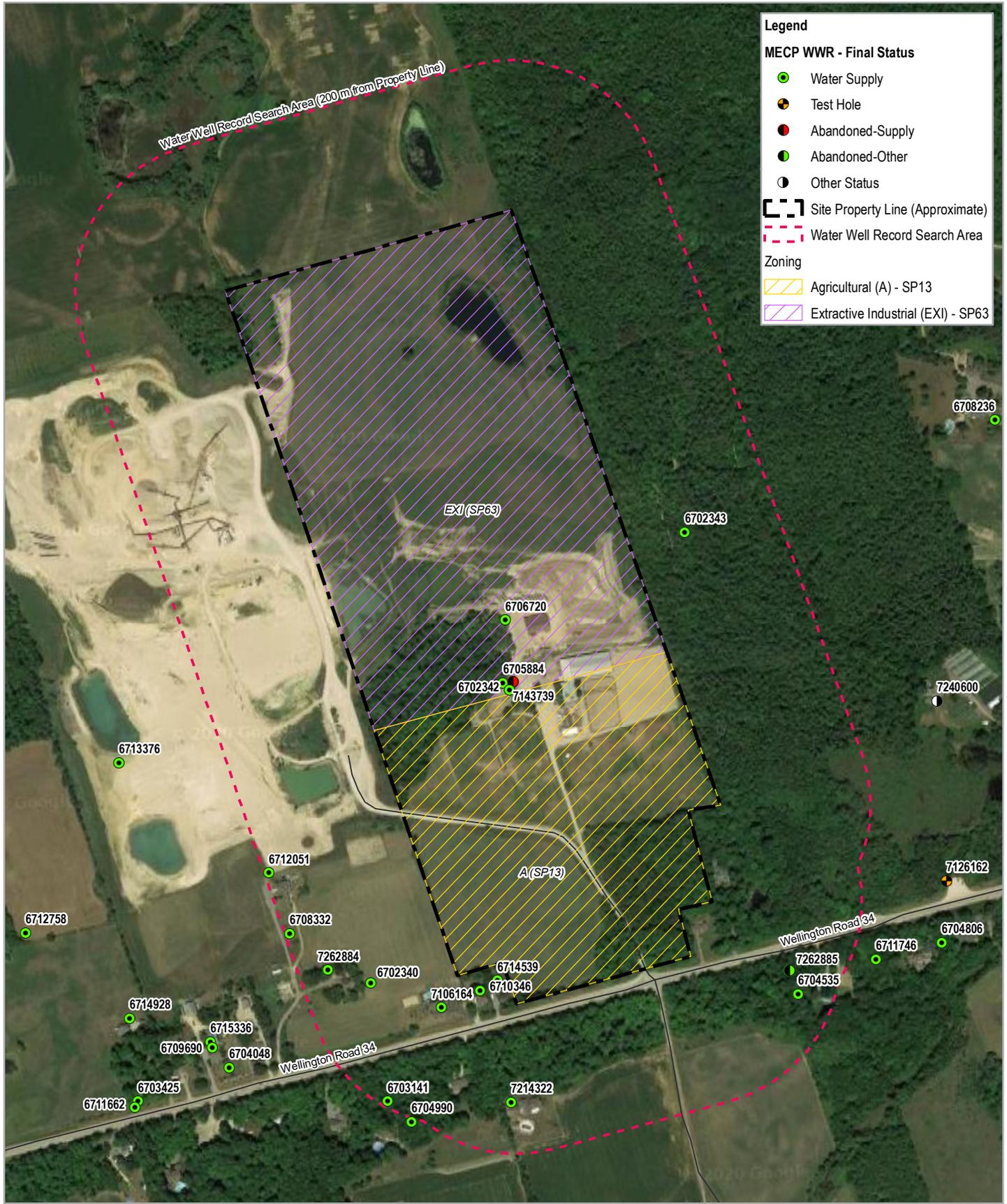
GEOLOGIC CROSS-SECTION C-C'

FIGURE 3.10



2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ONTARIO

Project No. 11210029
 Date December 2020



Legend

MECP WWR - Final Status

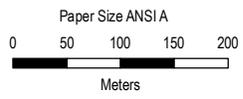
- Water Supply
- Test Hole
- Abandoned-Supply
- Abandoned-Other
- Other Status

Site Property Line (Approximate)

Water Well Record Search Area

Zoning

- Agricultural (A) - SP13
- Extractive Industrial (EXI) - SP63



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 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ON

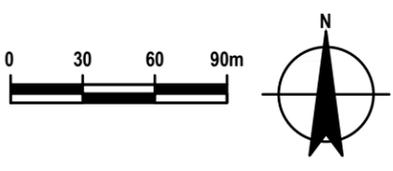
Project No. 11210029
 Revision No. -
 Date Dec 14, 2020

Map Projection: Transverse Mercator
 Horizontal Datum: North American 1983 CSRS
 Grid: NAD 1983 CSRS UTM Zone 17N

WATER WELL RECORD SEARCH

FIGURE 4.1

Data source: WWIS, 2020. Ontario Ministry of the Environment (Accessed August, 2020); Imagery Google 2020. Capture date: 7/Jul/2018



2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34
 WELLINGTON COUNTY, ONTARIO

Project No. 11210029
 Date December 2020

Table 3.1
Monitoring Well Completion Details
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario

Location	Easting	Northing	Installation Date	Diameter (mm)	Ground Surface Elevation (m AMSL)	Reference (Top of Riser) Elevation (m AMSL)	Sand Pack		Screen		Geological Unit
							(m AMSL)	(m bgs)	(m AMSL)	(m bgs)	
MW1-20	560291.98	4810969.38	11/19/2020	51	322.26	322.96	312.2 - 308.5	10.1 - 13.7	311.6 - 308.5	10.7 - 13.7	Fill, Sand, Top Soil, Sandy Silt, Silty Sand, Sand
MW2-20	560486.20	4810970.37	11/20/2020	51	319.50	320.15	311.0 - 307.3	8.5 - 12.2	310.4 - 307.3	9.1 - 12.2	Sand, Sand and Gravel, Sandy Silt
MW3-20	560405.03	4811158.33	11/20/2020	51	322.50	323.19	316.0 - 308.2	6.6 - 14.3	311.2 - 308.2	11.3 - 14.3	Top Soil, Sandy Silt, Clayey Silt, Silty Sand, Silt

Notes:

- m AMSL metres above mean sea level.
- m bgs metres below ground surface.
- mm millimetre.

Table 3.2

**Summary of Groundwater Elevations
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario**

Location	Ground Surface Elevation (m AMSL)	Reference Elevation (m AMSL)	11/23/2020		11/24/2020		11/25/2020		12/1/2020		12/4/2020	
			Depth to Water (m btor)	Groundwater Elevation (m AMSL)	Depth to Water (m btor)	Groundwater Elevation (m AMSL)	Depth to Water (m btor)	Groundwater Elevation (m AMSL)	Depth to Water (m btor)	Groundwater Elevation (m AMSL)	Depth to Water (m btor)	Groundwater Elevation (m AMSL)
MW1-20	322.26	322.96	11.44	311.52	--	--	11.48	311.48	11.50	311.46	11.51	311.45
MW2-20	319.50	320.15	8.39	311.76	8.39	311.76	--	--	8.42	311.73	8.43	311.72
MW3-20	322.50	323.19	6.19	317.00	7.12	316.07	--	--	7.03	316.16	7.06	316.13

Notes:

m btor metres below top of riser.
M AMSL metres above mean sea level.

Table 3.3

**Hydraulic Conductivity Results
Hydrogeologic Impact Assessment
6678 Wellington Road 34
Cambridge, Ontario**

Location	Test	Solution Method⁽²⁾	Aquifer Model	Hydraulic Conductivity⁽¹⁾ (cm/sec)
MW1-20	Falling Head 1	Bouwer-Rice	Unconfined	1.3E-04
	Rising Head 1	Bouwer-Rice	Unconfined	3.4E-04
	Rising Head 2	Bouwer-Rice	Unconfined	3.2E-04
MW2-20	Falling Head 1	Bouwer-Rice	Unconfined	3.0E-03
	Rising Head 1	Bouwer-Rice	Unconfined	8.8E-03
	Falling Head 2	Bouwer-Rice	Unconfined	3.4E-03
	Rising Head 2	Bouwer-Rice	Unconfined	9.1E-03
MW3-20	Falling Head 1	Bouwer-Rice	Unconfined	2.5E-05
	Rising Head 1	Bouwer-Rice	Unconfined	2.4E-05
Geometric Mean:				5.8E-04

Notes:

- (1) Calculated using AQTESOLV®, Version 4.51, HydroSOLVE, Inc.
- (2) Bouwer, H. and R.C. Rice, 1976. A slug test method for determining hydraulic conductivity of unconfined aquifers with completely or partially penetrating wells, Water Resources Research, vol. 12, no. 3, pp. 423-428.

Table 4.1

Summary of Groundwater Quality for
MW1-20, MW2-20, and MW3-20
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario

Location:	MW1-20	MW1-20	MW2-20	MW2-20	MW2-20	MW2-20
Sample ID:	GW-11210029-112520-MW-1	GW-11210029-120420-MW-01	GW-11210029-112420-MW-2	GW-11210029-112420-MW-2D	GW-11210029-120420-MW-02	GW-11210029-120420-MW-02D
Report No.:	L2533335-4	L2537182-1	L2533335-1	L2533335-2	L2537182-2	L2537182-3
Sample Date:	25-Nov-20	4-Dec-2020	24-Nov-20	24-Nov-20 DUPLICATE	4-Dec-2020	4-Dec-2020 DUPLICATE

Table 2 Standards² Table 3 Standards³

	Table 2 Standards ²	Table 3 Standards ³	Units	MW1-20	MW1-20	MW2-20	MW2-20	MW2-20	MW2-20
Physical Tests									
Conductivity			mS/cm	0.557	0.632	0.864	0.867	0.688	0.682
pH			pH Units	8.07	7.68	7.46	7.68	7.69	8.15
Anions and Nutrients									
Chloride	790000	2300000	ug/L	8170	11.7	8110	8000	5.40	5.42
Cyanides									
Cyanide, Weak Acid Diss	66	66	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Metals									
Aluminum			µg/L	352	366	6.6	6.4	9.2	9.6
Antimony			µg/L	0.23	0.21	<0.1	<0.1	<0.1	<0.1
Arsenic			µg/L	0.57	0.55	0.5	0.5	0.51	0.50
Barium			µg/L	72.9	93.9	78.3	77.4	53.1	53.7
Beryllium			µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bismuth			µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Boron (total)			µg/L	24	29	68	70	43	43
Cadmium			µg/L	0.0257	0.0319	0.101	0.102	0.0789	0.0807
Calcium			µg/L	71400	91000	93700	95400	96100	95500
Cesium			µg/L	0.033	0.039	<0.01	<0.01	<0.01	0.013
Chromium			µg/L	0.88	0.97	<0.5	<0.5	<0.5	0.58
Chromium, Hexavalent			µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cobalt			µg/L	0.59	0.66	1.59	1.63	0.66	0.67
Copper			µg/L	1.39	1.43	18	17.5	10.4	10.8
Iron			µg/L	417	439	<10.0	<10.0	<10.0	<10.0
Lead			µg/L	0.628	0.725	0.27	0.171	0.083	0.095
Lithium			µg/L	9.1	12.4	2.6	2.7	1.9	1.9
Magnesium			µg/L	30100	34200	34300	34600	31000	31400
Manganese			µg/L	114	135	354	357	140	143
Mercury			µg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum			µg/L	4.24	3.25	1.14	1.11	0.528	0.542
Nickel			µg/L	1.46	1.73	8.97	9.19	4.90	4.93
Phosphorus			µg/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Potassium			µg/L	4100	5560	63200	63700	31200	32200
Rubidium			µg/L	1	0.99	10.4	10.5	5.87	5.94
Selenium			µg/L	0.074	0.109	0.119	0.125	0.113	0.128
Silicon			µg/L	6110	7050	4980	4960	4650	4750
Silver			µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sodium			µg/L	8500	9850	6570	6780	4900	5050
Strontium			µg/L	257	269	156	155	119	120
Sulfur			µg/L	8360	8870	7180	7080	5210	5360
Tellurium			µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium			µg/L	0.011	0.012	0.112	0.113	0.068	0.068
Thorium			µg/L	<0.1	0.11	<0.1	<0.1	<0.1	<0.1
Tin			µg/L	0.16	0.28	<0.1	<0.1	<0.1	<0.1
Titanium			µg/L	12.8	14.2	<0.3	<0.3	0.53	<0.3
Tungsten			µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Uranium			µg/L	0.879	0.905	0.608	0.609	0.428	0.432
Vanadium			µg/L	0.92	1.040	<0.5	<0.5	<0.5	<0.5
Zinc			µg/L	6.5	10.2	25.1	25.3	18.5	18.9
Zirconium			µg/L	0.37	0.40	<0.2	<0.2	<0.2	<0.2

Table 4.1

Summary of Groundwater Quality for
MW1-20, MW2-20, and MW3-20
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario

Location:	MW1-20	MW1-20	MW2-20	MW2-20	MW2-20	MW2-20
Sample ID:	GW-11210029-112520-MW-1	GW-11210029-120420-MW-01	GW-11210029-112420-MW-2	GW-11210029-112420-MW-2D	GW-11210029-120420-MW-02	GW-11210029-120420-MW-02D
Report No.:	L2533335-4	L2537182-1	L2533335-1	L2533335-2	L2537182-2	L2537182-3
Sample Date:	25-Nov-20	4-Dec-2020	24-Nov-20	24-Nov-20 DUPLICATE	4-Dec-2020	4-Dec-2020 DUPLICATE

Table 2 Standards² Table 3 Standards³

			Units						
Dissolved Metals									
Antimony (Sb)-Dissolved	6	20000	ug/L	0.18	0.16	<1.0	<1.0	<0.10	<0.10
Arsenic (As)-Dissolved	25	1900	ug/L	0.41	0.36	<1.0	<1.0	0.46	0.46
Barium (Ba)-Dissolved	1000	29000	ug/L	67.5	93.5	78.5	78.5	51.5	52.8
Beryllium (Be)-Dissolved	4	67	ug/L	<0.10	<0.10	<1.0	<1.0	<0.10	<0.10
Boron (B)-Dissolved	5000	45000	ug/L	22	23	<100	<100	36	36
Cadmium (Cd)-Dissolved	2.7	2	ug/L	<0.010	0.014	0.118	0.139	0.073	0.072
Chromium (Cr)-Dissolved	50	810	ug/L	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50
Cobalt (Co)-Dissolved	3.8	66	ug/L	0.39	0.43	1.6	1.6	0.62	0.64
Copper (Cu)-Dissolved	87	87	ug/L	0.66	0.70	17.1	17	10.5	10.8
Lead (Pb)-Dissolved	10	25	ug/L	<0.050	<0.050	<0.50	<0.50	<0.050	<0.050
Mercury (Hg)-Dissolved	0.29	0.29	ug/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Molybdenum (Mo)-Dissolved	70	9200	ug/L	3.77	2.89	1.02	1.12	0.524	0.555
Nickel (Ni)-Dissolved	100	490	ug/L	0.88	1.13	9.2	9.5	4.70	4.94
Selenium (Se)-Dissolved	10	63	ug/L	0.069	0.096	<0.50	<0.50	0.146	0.111
Silver (Ag)-Dissolved	1.5	1.5	ug/L	<0.050	<0.050	<0.50	<0.50	<0.050	<0.050
Sodium (Na)-Dissolved	490000	2300000	ug/L	8450	9100	6920	7340	4670	4800
Thallium (Tl)-Dissolved	2	510	ug/L	<0.010	0.015	0.1	0.11	0.063	0.066
Uranium (U)-Dissolved	20	420	ug/L	0.764	0.816	0.61	0.6	0.348	0.351
Vanadium (V)-Dissolved	6.2	250	ug/L	<5.0	<0.50	<5.0	<5.0	<0.50	<0.50
Zinc (Zn)-Dissolved	1100	1100	ug/L	1.3	4.3	26	26	17.7	18.7
Volatile Organic Compounds									
Acetone	2700	130000	µg/L	<30	<30	<30	<30	<30	<30
Benzene	5	44	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	16	85000	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform	25	380	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	0.89	5.6	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon tetrachloride	0.79	0.79	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	30	630	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	25	82000	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform	2.4	2.4	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane			µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3	4600	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	9600	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	8	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	590	4400	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloroethane	5	320	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	1.6	1.6	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	1.6	1.6	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	1.6	1.6	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	1.6	1.6	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	50	610	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	5	16	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	0.5	5.2	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	0.5	5.2	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (cis & trans)	0.5	5.2	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	2.4	2300	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Hexane	51	51	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Ethyl Ketone	1800	470000	µg/L	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone	640	140000	µg/L	<20	<20	<20	<20	<20	<20
MTBE	15	190	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Styrene	5.4	1300	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 4.1

Summary of Groundwater Quality for
MW1-20, MW2-20, and MW3-20
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario

Location:	MW1-20	MW1-20	MW2-20	MW2-20	MW2-20	MW2-20
Sample ID:	GW-11210029-112520-MW-1	GW-11210029-120420-MW-01	GW-11210029-112420-MW-2	GW-11210029-112420-MW-2D	GW-11210029-120420-MW-02	GW-11210029-120420-MW-02D
Report No.:	L2533335-4	L2537182-1	L2533335-1	L2533335-2	L2537182-2	L2537182-3
Sample Date:	25-Nov-20	4-Dec-2020	24-Nov-20	24-Nov-20 DUPLICATE	4-Dec-2020	4-Dec-2020 DUPLICATE

Table 2 Standards² Table 3 Standards³

			Units						
1,1,1,2-Tetrachloroethane	1.1	3.3	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	1	3.2	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethylene	1.6	1.6	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	24	18000	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	200	640	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	4.7	4.7	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	1.6	1.6	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	150	2500	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	0.5	0.5	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
o-Xylene			µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
m+p-Xylenes			µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes (Total)	300	4200	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hydrocarbons									
F1 (C6-C10)	750	750	µg/L	<25	<25	<25	<25	<25	<25
F1-BTEX			µg/L	<25	<25	<25	<25	<25	<25
F2 (C10-C16)	150	150	µg/L	<100	<100	<100	<100	<100	<100
F2-Naphth			µg/L	<100	<100	<100	<100	<100	<100
F3 (C16-C34)	500	500	µg/L	<250	<250	<250	<250	<250	<250
F3-PAH			µg/L	<250	<250	<250	<250	<250	<250
F4 (C34-C50)	500	500	µg/L	<250	<250	<250	<250	<250	<250
Total Hydrocarbons (C6-C50)			µg/L	<370	<370	<370	<370	<370	<370
Semi-Volatile Organics									
Biphenyl	0.5	1000	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
4-Chloroaniline	10	400	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Bis(2-chloroethyl)ether	5	300000	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Bis(2-chloroisopropyl)ether	120	20000	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2-Chlorophenol	8.9	3300	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
3,3'-Dichlorobenzidine	0.5	640	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4-Dichlorophenol	20	4600	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Diethylphthalate	38	38	µg/L	0.29	<0.20	<0.20	<0.20	<0.20	<0.20
Dimethylphthalate	38	38	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4-Dimethylphenol	59	39000	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2,4-Dinitrophenol	10	11000	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2,4-Dinitrotoluene	5	2900	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,6-Dinitrotoluene	5	2900	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4+2,6-Dinitrotoluene	5	2900	µg/L	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57
Bis(2-ethylhexyl)phthalate	10	140	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Pentachlorophenol	30	62	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Phenol	890	12000	µg/L	0.53	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	70	180	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
2,4,5-Trichlorophenol	8.9	1600	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
2,4,6-Trichlorophenol	2	230	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Aggregate Organics									
Oil and Grease, Total			mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Animal/Veg Oil & Grease			mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Mineral Oil and Grease			mg/L	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5

Table 4.1

Summary of Groundwater Quality for
MW1-20, MW2-20, and MW3-20
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario

Location:	MW1-20	MW1-20	MW2-20	MW2-20	MW2-20	MW2-20
Sample ID:	GW-11210029-112520-MW-1	GW-11210029-120420-MW-01	GW-11210029-112420-MW-2	GW-11210029-112420-MW-2D	GW-11210029-120420-MW-02	GW-11210029-120420-MW-02D
Report No.	L2533335-4	L2537182-1	L2533335-1	L2533335-2	L2537182-2	L2537182-3
Sample Date:	25-Nov-20	4-Dec-2020	24-Nov-20	24-Nov-20 DUPLICATE	4-Dec-2020	4-Dec-2020 DUPLICATE

Table 2 Standards² Table 3 Standards³

	Table 2 Standards ²	Table 3 Standards ³	Units	MW1-20	MW1-20	MW2-20	MW2-20	MW2-20	MW2-20
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	4.1	600	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Acenaphthylene	1	1.8	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Anthracene	2.4	2.4	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(a)anthracene	1	4.7	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(a)pyrene	0.01	0.81	µg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(b)fluoranthene	0.1	0.75	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(g,h,i)perylene	0.2	0.2	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(k)fluoranthene	0.1	0.4	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Chrysene	0.1	1	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dibenzo(ah)anthracene	0.2	0.52	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluoranthene	0.41	130	µg/L	0.091	0.075	0.031	0.038	<0.020	<0.020
Fluorene	120	400	µg/L	0.053	<0.020	<0.020	<0.020	<0.020	<0.020
Indeno(1,2,3-cd)pyrene	0.2	0.2	µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1+2-Methylnaphthalenes	3.2	1800	µg/L	0.141	<0.028	<0.028	<0.028	<0.028	<0.028
1-Methylnaphthalene	3.2	1800	µg/L	0.047	<0.020	<0.020	<0.020	<0.020	<0.020
2-Methylnaphthalene	3.2	1800	µg/L	0.094	<0.020	<0.020	<0.020	<0.020	<0.020
Naphthalene	11	1400	µg/L	0.073	<0.050	<0.050	<0.050	<0.050	<0.050
Phenanthrene	1	580	µg/L	0.384	<0.020	0.024	0.027	<0.020	<0.020
Pyrene	4.1	68	µg/L	0.096	0.109	0.037	0.04	<0.020	<0.020

Table 1: Full Depth Background Site Condition Standards

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition.

Table 4.1

Summary of Groundwater Quality for
MW1-20, MW2-20, and MW3-20
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario

Location:	MW3-20	MW3-20	TRIP BLANK	TRIP BLANK
Sample ID:	GW-11210029-112420-MW-3	GW-11210029-120420-MW-03	TRIP BLANK	TRIP BLANK
Report No.:	L2533335-3	L2537182-4	L2533335-5	L2537182-5
Sample Date:	24-Nov-20	4-Dec-2020	25-Nov-20	4-Dec-2020

Table 2 Standards² Table 3 Standards³

	Table 2 Standards ²	Table 3 Standards ³	Units		
<u>Physical Tests</u>					
Conductivity			mS/cm	0.609	0.624
pH			pH Units	7.9	7.74
<u>Anions and Nutrients</u>					
Chloride	790000	2300000	ug/L	4800	3.98
<u>Cyanides</u>					
Cyanide, Weak Acid Diss	66	66	ug/L	<2.0	<2.0
<u>Total Metals</u>					
Aluminum			µg/L	210	61
Antimony			µg/L	0.15	<0.10
Arsenic			µg/L	0.35	0.32000
Barium			µg/L	68.9	70.8
Beryllium			µg/L	<0.1	<0.1
Bismuth			µg/L	<0.05	<0.05
Boron (total)			µg/L	12	11
Cadmium			µg/L	0.01	0.0067000
Calcium			µg/L	80600	95300
Cesium			µg/L	0.022	0.02
Chromium			µg/L	<0.5	<0.5
Chromium, Hexavalent			µg/L	<0.50	<0.50
Cobalt			µg/L	0.64	0.51
Copper			µg/L	0.96	1.42
Iron			µg/L	224	68
Lead			µg/L	0.299	0.123
Lithium			µg/L	9.9	6.0
Magnesium			µg/L	36900	39700
Manganese			µg/L	90.6	50.9
Mercury			µg/L	<0.005	<0.005
Molybdenum			µg/L	16.9	16.9
Nickel			µg/L	1.62	1.09
Phosphorus			µg/L	<50.0	<50.0
Potassium			µg/L	1910	1350
Rubidium			µg/L	1.06	0.67
Selenium			µg/L	0.226	0.107
Silicon			µg/L	7250	7460
Silver			µg/L	<0.05	<0.05
Sodium			µg/L	6780	4390
Strontium			µg/L	158	130
Sulfur			µg/L	8990	7400
Tellurium			µg/L	<0.2	<0.2
Thallium			µg/L	<0.01	<0.01
Thorium			µg/L	<0.1	<0.1
Tin			µg/L	<0.1	0.13
Titanium			µg/L	8.91	2.46
Tungsten			µg/L	<0.1	<0.1
Uranium			µg/L	2	0.957
Vanadium			µg/L	0.87	0.72
Zinc			µg/L	<3.0	<3.0
Zirconium			µg/L	0.22	<0.2

Table 4.1

**Summary of Groundwater Quality for
MW1-20, MW2-20, and MW3-20
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario**

Location:	MW3-20	MW3-20	TRIP BLANK	TRIP BLANK
Sample ID:	GW-11210029-112420-MW-3	GW-11210029-120420-MW-03	TRIP BLANK	TRIP BLANK
Report No.:	L2533335-3	L2537182-4	L2533335-5	L2537182-5
Sample Date:	24-Nov-20	4-Dec-2020	25-Nov-20	4-Dec-2020

Table 2 Standards² Table 3 Standards³

			Units				
<u>Dissolved Metals</u>							
Antimony (Sb)-Dissolved	6	20000	ug/L	0.15	<0.10		
Arsenic (As)-Dissolved	25	1900	ug/L	0.31	0.22		
Barium (Ba)-Dissolved	1000	29000	ug/L	67.9	63.5		
Beryllium (Be)-Dissolved	4	67	ug/L	<0.10	<0.10		
Boron (B)-Dissolved	5000	45000	ug/L	11	<10		
Cadmium (Cd)-Dissolved	2.7	2	ug/L	<0.010	<0.010		
Chromium (Cr)-Dissolved	50	810	ug/L	<0.50	<0.50		
Cobalt (Co)-Dissolved	3.8	66	ug/L	0.57	0.41		
Copper (Cu)-Dissolved	87	87	ug/L	3.02	0.53		
Lead (Pb)-Dissolved	10	25	ug/L	0.109	<0.050		
Mercury (Hg)-Dissolved	0.29	0.29	ug/L	<0.0050	<0.0050		
Molybdenum (Mo)-Dissolved	70	9200	ug/L	15.8	1.85		
Nickel (Ni)-Dissolved	100	490	ug/L	1.35	0.95		
Selenium (Se)-Dissolved	10	63	ug/L	0.278	0.098		
Silver (Ag)-Dissolved	1.5	1.5	ug/L	<0.050	<0.050		
Sodium (Na)-Dissolved	490000	2300000	ug/L	6870	3680		
Thallium (Tl)-Dissolved	2	510	ug/L	<0.010	<0.010		
Uranium (U)-Dissolved	20	420	ug/L	1.86	0.867		
Vanadium (V)-Dissolved	6.2	250	ug/L	<5.0	<0.50		
Zinc (Zn)-Dissolved	1100	1100	ug/L	1.7	<1.0		
<u>Volatile Organic Compounds</u>							
Acetone	2700	130000	µg/L	<30	<30	<30	<30
Benzene	5	44	µg/L	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	16	85000	µg/L	<2.0	<2.0	<2.0	<2.0
Bromoform	25	380	µg/L	<5.0	<5.0	<5.0	<5.0
Bromomethane	0.89	5.6	µg/L	<0.50	<0.50	<0.50	<0.50
Carbon tetrachloride	0.79	0.79	µg/L	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	30	630	µg/L	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	25	82000	µg/L	<2.0	<2.0	<2.0	<2.0
Chloroform	2.4	2.4	µg/L	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane			µg/L	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3	4600	µg/L	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	9600	µg/L	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	8	µg/L	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	590	4400	µg/L	<2.0	<2.0	<2.0	<2.0
1,1-Dichloroethane	5	320	µg/L	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	1.6	1.6	µg/L	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	1.6	1.6	µg/L	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	1.6	1.6	µg/L	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	1.6	1.6	µg/L	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	50	610	µg/L	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	5	16	µg/L	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	0.5	5.2	µg/L	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	0.5	5.2	µg/L	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (cis & trans)	0.5	5.2	µg/L	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	2.4	2300	µg/L	<0.50	<0.50	<0.50	<0.50
n-Hexane	51	51	µg/L	<0.50	<0.50	<0.50	<0.50
Methyl Ethyl Ketone	1800	470000	µg/L	<20	<20	<20	<20
Methyl Isobutyl Ketone	640	140000	µg/L	<20	<20	<20	<20
MTBE	15	190	µg/L	<2.0	<2.0	<2.0	<2.0
Styrene	5.4	1300	µg/L	<0.50	<0.50	<0.50	<0.50

Table 4.1

**Summary of Groundwater Quality for
MW1-20, MW2-20, and MW3-20
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario**

Location:	MW3-20	MW3-20	TRIP BLANK	TRIP BLANK
Sample ID:	GW-11210029-112420-MW-3	GW-11210029-120420-MW-03	TRIP BLANK	TRIP BLANK
Report No.:	L2533335-3	L2537182-4	L2533335-5	L2537182-5
Sample Date:	24-Nov-20	4-Dec-2020	25-Nov-20	4-Dec-2020

Table 2 Standards² Table 3 Standards³

			Units				
1,1,1,2-Tetrachloroethane	1.1	3.3	µg/L	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	1	3.2	µg/L	<0.50	<0.50	<0.50	<0.50
Tetrachloroethylene	1.6	1.6	µg/L	<0.50	<0.50	<0.50	<0.50
Toluene	24	18000	µg/L	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	200	640	µg/L	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	4.7	4.7	µg/L	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	1.6	1.6	µg/L	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	150	2500	µg/L	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	0.5	0.5	µg/L	<0.50	<0.50	<0.50	<0.50
o-Xylene			µg/L	<0.30	<0.30	<0.30	<0.30
m+p-Xylenes			µg/L	<0.40	<0.40	<0.40	<0.40
Xylenes (Total)	300	4200	µg/L	<0.50	<0.50	<0.50	<0.50
<u>Hydrocarbons</u>							
F1 (C6-C10)	750	750	µg/L	<25	<25	<25	<25
F1-BTEX			µg/L	<25	<25	<25	<25
F2 (C10-C16)	150	150	µg/L	<100	<100		
F2-Naphth			µg/L	<100	<100		
F3 (C16-C34)	500	500	µg/L	<250	<250		
F3-PAH			µg/L	<250	<250		
F4 (C34-C50)	500	500	µg/L	<250	<250		
Total Hydrocarbons (C6-C50)			µg/L	<370	<370		
<u>Semi-Volatile Organics</u>							
Biphenyl	0.5	1000	µg/L	<0.40	<0.40		
4-Chloroaniline	10	400	µg/L	<0.40	<0.40		
Bis(2-chloroethyl)ether	5	300000	µg/L	<0.40	<0.40		
Bis(2-chloroisopropyl)ether	120	20000	µg/L	<0.40	<0.40		
2-Chlorophenol	8.9	3300	µg/L	<0.30	<0.30		
3,3'-Dichlorobenzidine	0.5	640	µg/L	<0.40	<0.40		
2,4-Dichlorophenol	20	4600	µg/L	<0.30	<0.30		
Diethylphthalate	38	38	µg/L	0.29	<0.20		
Dimethylphthalate	38	38	µg/L	<0.20	<0.20		
2,4-Dimethylphenol	59	39000	µg/L	<0.50	<0.50		
2,4-Dinitrophenol	10	11000	µg/L	<1.0	<1.0		
2,4-Dinitrotoluene	5	2900	µg/L	<0.40	<0.40		
2,6-Dinitrotoluene	5	2900	µg/L	<0.40	<0.40		
2,4+2,6-Dinitrotoluene	5	2900	µg/L	<0.57	<0.57		
Bis(2-ethylhexyl)phthalate	10	140	µg/L	<2.0	<2.0		
Pentachlorophenol	30	62	µg/L	<0.50	<0.50		
Phenol	890	12000	µg/L	<0.50	<0.50		
1,2,4-Trichlorobenzene	70	180	µg/L	<0.40	<0.40		
2,4,5-Trichlorophenol	8.9	1600	µg/L	<0.20	<0.20		
2,4,6-Trichlorophenol	2	230	µg/L	<0.20	<0.20		
<u>Aggregate Organics</u>							
Oil and Grease, Total			mg/L	<5.0	<5.0		
Animal/Veg Oil & Grease			mg/L	<5.0	<5.0		
Mineral Oil and Grease			mg/L	<2.5	<2.5		

Table 4.1

**Summary of Groundwater Quality for
MW1-20, MW2-20, and MW3-20
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario**

Location:	MW3-20	MW3-20	TRIP BLANK	TRIP BLANK
Sample ID:	GW-11210029-112420-MW-3	GW-11210029-120420-MW-03	TRIP BLANK	TRIP BLANK
Report No.	L2533335-3	L2537182-4	L2533335-5	L2537182-5
Sample Date:	24-Nov-20	4-Dec-2020	25-Nov-20	4-Dec-2020

Table 2 Standards² Table 3 Standards³

			Units		
<u>Polycyclic Aromatic Hydrocarbons</u>					
Acenaphthene	4.1	600	µg/L	<0.020	<0.020
Acenaphthylene	1	1.8	µg/L	<0.020	<0.020
Anthracene	2.4	2.4	µg/L	<0.020	<0.020
Benzo(a)anthracene	1	4.7	µg/L	<0.020	<0.020
Benzo(a)pyrene	0.01	0.81	µg/L	<0.010	<0.010
Benzo(b)fluoranthene	0.1	0.75	µg/L	<0.020	<0.020
Benzo(g,h,i)perylene	0.2	0.2	µg/L	<0.020	<0.020
Benzo(k)fluoranthene	0.1	0.4	µg/L	<0.020	<0.020
Chrysene	0.1	1	µg/L	<0.020	<0.020
Dibenzo(ah)anthracene	0.2	0.52	µg/L	<0.020	<0.020
Fluoranthene	0.41	130	µg/L	0.059	0.053
Fluorene	120	400	µg/L	0.031	<0.020
Indeno(1,2,3-cd)pyrene	0.2	0.2	µg/L	<0.020	<0.020
1+2-Methylnaphthalenes	3.2	1800	µg/L	0.067	<0.028
1-Methylnaphthalene	3.2	1800	µg/L	0.024	<0.020
2-Methylnaphthalene	3.2	1800	µg/L	0.043	<0.020
Naphthalene	11	1400	µg/L	<0.050	<0.050
Phenanthrene	1	580	µg/L	0.21	0.029
Pyrene	4.1	68	µg/L	0.059	0.056

Table 1: Full Depth Background Site Condition Standards

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition.

**Summary of Water Supply A Zone Groundwater Quality
(July and August 2020)
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario**

Location:	Water Supply A Zone	Water Supply A Zone	Water Supply A Zone
Sample ID:	W-11210029-20200702-12	W-11210029-20200723-18	W-11210029-20200813-24
Report No.:	L2468705-1	L2478867-1	L2488954-1
Sample Date:	July 2 2020	July 23 2020	August 13 2020

**Table 2
Standards ²**

	2011	Units			
Metals					
Aluminum	--	µg/L	<5.0	<5.0	19.2
Antimony	6	µg/L	<0.1	<0.1	<0.1
Arsenic	25	µg/L	5.17	2.24	3.64
Barium	1000	µg/L	49.5	50.6	77.9
Beryllium (4)	4	µg/L	<0.1	<0.1	<0.1
Bismuth	--	µg/L	<0.05	<0.05	<0.05
Boron (total)	5000	µg/L	<10.0	<10.0	14
Cadmium (5)	2.7	µg/L	<0.005	<0.005	<0.005
Calcium	--	µg/L	70600	68300	48500
Cesium	--	µg/L	<0.01	<0.01	<0.01
Chromium	50	µg/L	<0.5	<0.5	<0.5
Chromium, Hexavalent	25	µg/L	<0.5	<0.5	<0.5
Cobalt	3.8	µg/L	0.11	<0.1	<0.1
Copper	87	µg/L	<0.5	4	<0.5
Iron	--	µg/L	400	22	244
Lead (6)	10	µg/L	0.227	0.268	0.083
Lithium	--	µg/L	3.4	3.9	3.2
Magnesium	--	µg/L	32600	31800	25600
Manganese	--	µg/L	10.8	7.64	8.13
Mercury	0.29	µg/L	<0.005	<0.005	<0.005
Molybdenum	70	µg/L	0.559	0.632	0.655
Nickel	100	µg/L	1.7	0.86	<0.5
Phosphorus	--	µg/L	<50.0	<50.0	<50.0
Potassium	--	µg/L	978	996	979
Rubidium	--	µg/L	<0.2	0.21	0.35
Selenium	10	µg/L	<0.05	<0.05	<0.05
Silicon	--	µg/L	8890	9290	7300
Silver	1.5	µg/L	<0.05	<0.05	<0.05
Sodium	490000	µg/L	7790	7510	5750
Strontium	--	µg/L	148	146	348
Sulfur	--	µg/L	20200	20100	7710
Tellurium	--	µg/L	<0.2	<0.2	<0.2
Thallium	2.0	µg/L	<0.01	<0.01	<0.01
Thorium	--	µg/L	<0.1	<0.1	<0.1
Tin	--	µg/L	<0.1	<0.1	<0.1
Titanium	--	µg/L	<0.3	<0.3	0.62
Tungsten	--	µg/L	<0.1	<0.1	<0.1
Uranium	20.0	µg/L	0.252	0.296	0.383
Vanadium	6.2	µg/L	<0.5	<0.5	<0.5
Zinc	1100	µg/L	5.4	5.0	<3.0
Zirconium	--	µg/L	<0.2	<0.2	<0.2
Total Plate Count	--	cfu/mL			
E. coli	--	cfu/100 mL			

**Summary of Water Supply A Zone Groundwater Quality
(July and August 2020)
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario**

Location:	Water Supply A Zone	Water Supply A Zone	Water Supply A Zone
Sample ID:	W-11210029-20200702-12	W-11210029-20200723-18	W-11210029-20200813-24
Report No.	L2468705-1	L2478867-1	L2488954-1
Sample Date:	July 2 2020	July 23 2020	August 13 2020

**Table 2
Standards ²**

	2011	Units			
<u>Volatile Organic Compounds</u>					
Acetone	2700	µg/L	<30	<30	<30
Benzene	5	µg/L	<0.50	<0.50	<0.50
Bromodichloromethane	16	µg/L	<2.0	<2.0	<2.0
Bromoform	25	µg/L	<5.0	<5.0	<5.0
Bromomethane	0.89	µg/L	<0.50	<0.50	<0.50
Carbon tetrachloride	0.79	µg/L	<0.20	<0.20	<0.20
Chlorobenzene	30	µg/L	<0.50	<0.50	<0.50
Dibromochloromethane	25	µg/L	<2.0	<2.0	<2.0
Chloroform	2.4	µg/L	<1.0	<1.0	<1.0
1,2-Dibromoethane		µg/L	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3	µg/L	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	µg/L	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	µg/L	<0.50	<0.50	<0.50
Dichlorodifluoromethane	590	µg/L	<2.0	<2.0	<2.0
1,1-Dichloroethane	5	µg/L	<0.50	<0.50	<0.50
1,2-Dichloroethane	1.6	µg/L	<0.50	<0.50	<0.50
1,1-Dichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
Methylene Chloride	50	µg/L	<5.0	<5.0	<5.0
1,2-Dichloropropane	5	µg/L	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	0.5	µg/L	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	0.5	µg/L	<0.30	<0.30	<0.30
1,3-Dichloropropene (cis & trans)	0.5	µg/L	<0.50	<0.50	<0.50
Ethylbenzene	2.4	µg/L	<0.50	<0.50	<0.50
n-Hexane	51	µg/L	<0.50	<0.50	<0.50
Methyl Ethyl Ketone	1800	µg/L	<20	<20	<20
Methyl Isobutyl Ketone	640	µg/L	<20	<20	<20
MTBE	15	µg/L	<2.0	<2.0	<2.0
Styrene	5.4	µg/L	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	µg/L	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	1	µg/L	<0.50	<0.50	<0.50
Tetrachloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
Toluene	24	µg/L	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	200	µg/L	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	4.7	µg/L	<0.50	<0.50	<0.50
Trichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
Trichlorofluoromethane	150	µg/L	<5.0	<5.0	<5.0
Vinyl chloride	0.5	µg/L	<0.50	<0.50	<0.50
o-Xylene		µg/L	<0.30	<0.30	<0.30
m+p-Xylenes		µg/L	<0.40	<0.40	<0.40
Xylenes (Total)	300	µg/L	<0.50	<0.50	<0.50

**Summary of Water Supply A Zone Groundwater Quality
(July and August 2020)
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario**

Location:	Water Supply A Zone	Water Supply A Zone	Water Supply A Zone
Sample ID:	W-11210029-20200702-12	W-11210029-20200723-18	W-11210029-20200813-24
Report No.:	L2468705-1	L2478867-1	L2488954-1
Sample Date:	July 2 2020	July 23 2020	August 13 2020

**Table 2
Standards ²**

	2011	Units			
<u>Hydrocarbons</u>					
F1 (C6-C10)	750	µg/L	<25	<25	<25
F1-BTEX		µg/L	<25	<25	<25
F2 (C10-C16)	150	µg/L	<100	<100	<100
F2-Naphth		µg/L	<100	<100	<100
F3 (C16-C34)	500	µg/L	<250	<250	<250
F3-PAH		µg/L	<250	<250	<250
F4 (C34-C50)	500	µg/L	<250	<250	<250
Total Hydrocarbons (C6-C50)		µg/L	<370	<370	<370
<u>Semi-Volatile Organics</u>					
Biphenyl	0.5	µg/L	<0.40	<0.40	<0.40
4-Chloroaniline	10	µg/L	<0.40	<0.40	<0.40
Bis(2-chloroethyl)ether	5	µg/L	<0.40	<0.40	<0.40
Bis(2-chloroisopropyl)ether	120	µg/L	<0.40	<0.40	<0.40
2-Chlorophenol	8.9	µg/L	<0.30	<0.30	<0.30
3,3'-Dichlorobenzidine	0.5	µg/L	<0.40	<0.40	<0.40
2,4-Dichlorophenol	20	µg/L	<0.30	<0.30	<0.30
Diethylphthalate	38	µg/L	<0.20	<0.20	<0.20
Dimethylphthalate	38	µg/L	<0.20	<0.20	<0.20
2,4-Dimethylphenol	59	µg/L	<0.50	<0.50	<0.50
2,4-Dinitrophenol	10	µg/L	<2.0	<2.0	<2.0
2,4-Dinitrotoluene	5	µg/L	<0.40	<0.40	<0.40
2,6-Dinitrotoluene	5	µg/L	<0.40	<0.40	<0.40
2,4+2,6-Dinitrotoluene	5	µg/L	<0.57	<0.57	<0.57
Bis(2-ethylhexyl)phthalate	10	µg/L	<2.0	<2.0	<2.0
Pentachlorophenol	30	µg/L	<0.50	<0.50	<0.50
Phenol	890	µg/L	<0.50	<0.50	<0.50
1,2,4-Trichlorobenzene	70	µg/L	<0.40	<0.40	<0.40
2,4,5-Trichlorophenol	8.9	µg/L	<0.20	<0.20	<0.20
2,4,6-Trichlorophenol	2	µg/L	<0.20	<0.20	<0.20
<u>Polychlorinated Biphenyls</u>					
Aroclor 1242		µg/L	<0.020	<0.020	<0.020
Aroclor 1248		µg/L	<0.020	<0.020	<0.020
Aroclor 1254		µg/L	<0.020	<0.020	<0.020
Aroclor 1260		µg/L	<0.020	<0.020	<0.020
Total PCBs	3	µg/L	<0.040	<0.040	<0.040
<u>Aggregate Organics</u>					
BOD		µg/L			
<u>Physical Tests</u>					
pH		pH units			
Total Suspended Solids		µg/L			
<u>Anions and Nutrients</u>					
Phosphorus, Total		µg/L	5.6	<3.0	8.2
<u>Organic / Inorganic Carbon</u>					
Total Organic Carbon		µg/L			

**Summary of Water Supply A Zone Groundwater Quality
(July and August 2020)
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario**

Location:	Water Supply A Zone	Water Supply A Zone	Water Supply A Zone
Sample ID:	W-11210029-20200702-12	W-11210029-20200723-18	W-11210029-20200813-24
Report No.	L2468705-1	L2478867-1	L2488954-1
Sample Date:	July 2 2020	July 23 2020	August 13 2020

**Table 2
Standards ²**

	2011	Units			
<u>Polycyclic Aromatic Hydrocarbons</u>					
Acenaphthene	4.1	µg/L	<0.020	<0.020	<0.020
Acenaphthylene	1	µg/L	<0.020	<0.020	<0.020
Anthracene	2.4	µg/L	<0.020	<0.020	<0.020
Benzo(a)anthracene	1	µg/L	<0.020	<0.020	<0.020
Benzo(a)pyrene	0.01	µg/L	<0.010	<0.010	<0.010
Benzo(b)fluoranthene	0.1	µg/L	<0.020	<0.020	<0.020
Benzo(g,h,i)perylene	0.2	µg/L	<0.020	<0.020	<0.020
Benzo(k)fluoranthene	0.1	µg/L	<0.020	<0.020	<0.020
Chrysene	0.1	µg/L	<0.020	<0.020	<0.020
Dibenzo(ah)anthracene	0.2	µg/L	<0.020	<0.020	<0.020
Fluoranthene	0.41	µg/L	<0.020	<0.020	<0.020
Fluorene	120	µg/L	<0.020	<0.020	<0.020
Indeno(1,2,3-cd)pyrene	0.2	µg/L	<0.020	<0.020	<0.020
1+2-Methylnaphthalenes	3.2	µg/L	<0.028	<0.028	<0.028
1-Methylnaphthalene	3.2	µg/L	<0.020	<0.020	<0.020
2-Methylnaphthalene	3.2	µg/L	<0.020	<0.020	<0.020
Naphthalene	11	µg/L	<0.050	<0.050	<0.050
Phenanthrene	1	µg/L	<0.020	<0.020	<0.020
Pyrene	4.1	µg/L	<0.020	<0.020	<0.020

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

**Summary of Water Supply EXI Zone Groundwater Quality
(July and August 2020)
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario**

Location:	Water Supply EXI Zone	Water Supply EXI Zone	Water Supply EXI Zone
Sample ID:	W-11210029-20200709-14	W-11210029-20200730-20	W-11210029-20200813-26
Report No.:	L2472292-1	L2482453-1	L2491984
Sample Date:	July 9 2020	July 30 2020	August 20 2020

Table 2
Standards²
2011

		Units			
Metals					
Aluminum	--	µg/L	6.6	8.0	<5.0
Antimony	6	µg/L	<0.1	<0.1	<0.1
Arsenic	25	µg/L	5.8	3.62	2.80
Barium	1000	µg/L	65.3	70.5	49.2
Beryllium (4)	4	µg/L	<0.1	<0.1	<0.1
Bismuth	--	µg/L	<0.05	<0.05	<0.05
Boron (total)	5000	µg/L	14	14.0	<10
Cadmium (5)	2.7	µg/L	<0.005	<0.005	<0.005
Calcium	--	µg/L	46600	47800	68200
Cesium	--	µg/L	<0.01	<0.01	<0.01
Chromium	50	µg/L	<0.5	<0.5	<0.5
Chromium, Hexavalent	25	µg/L	<0.5	<0.5	<0.5
Cobalt	3.8	µg/L	<0.1	<0.1	<0.1
Copper	87	µg/L	<0.5	<0.5	2.22
Iron	--	µg/L	281	265	79
Lead (6)	10	µg/L	<0.05	<0.05	0.166
Lithium	--	µg/L	2.6	3.6	4.5
Magnesium	--	µg/L	27300	26600	34100
Manganese	--	µg/L	9.31	7.61	9.68
Mercury	0.29	µg/L	<0.005	<0.005	<0.005
Molybdenum	70	µg/L	0.703	0.668	0.589
Nickel	100	µg/L	<0.5	<0.5	<0.5
Phosphorus	--	µg/L	<50.0	<50.0	<50
Potassium	--	µg/L	995	991	937
Rubidium	--	µg/L	0.34	0.38	<0.2
Selenium	10	µg/L	<0.05	<0.05	<0.05
Silicon	--	µg/L	7600	7430	8950
Silver	1.5	µg/L	<0.05	<0.05	<0.05
Sodium	490000	µg/L	5880	5970	7880
Strontium	--	µg/L	322	356	147
Sulfur	--	µg/L	7150	8040	20400
Tellurium	--	µg/L	<0.2	<0.2	<0.2
Thallium	2.0	µg/L	<0.01	<0.01	<0.01
Thorium	--	µg/L	<0.1	<0.1	<0.1
Tin	--	µg/L	<0.1	<0.1	<0.1
Titanium	--	µg/L	<0.3	<0.3	<0.3
Tungsten	--	µg/L	<0.1	<0.1	<0.1
Uranium	20.0	µg/L	0.59	0.397	0.228
Vanadium	6.2	µg/L	<0.5	<0.5	<0.5
Zinc	1100	µg/L	<3.0	<3.0	4.1
Zirconium	--	µg/L	<0.2	<0.2	<0.2
Total Plate Count	--	cfu/mL			
E. coli	--	cfu/100 mL			

**Summary of Water Supply EXI Zone Groundwater Quality
(July and August 2020)
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario**

Location:	Water Supply EXI Zone	Water Supply EXI Zone	Water Supply EXI Zone
Sample ID:	W-11210029-20200709-14	W-11210029-20200730-20	W-11210029-20200813-26
Report No.:	L2472292-1	L2482453-1	L2491984
Sample Date:	July 9 2020	July 30 2020	August 20 2020

**Table 2
Standards²
2011**

		Units			
<u>Volatile Organic Compounds</u>					
Acetone	2700	µg/L	<30	<30	<30
Benzene	5	µg/L	<0.50	<0.50	<0.50
Bromodichloromethane	16	µg/L	<2.0	<2.0	<2.0
Bromoform	25	µg/L	<5.0	<5.0	<5.0
Bromomethane	0.89	µg/L	<0.50	<0.50	<0.50
Carbon tetrachloride	0.79	µg/L	<0.20	<0.20	<0.20
Chlorobenzene	30	µg/L	<0.50	<0.50	<0.50
Dibromochloromethane	25	µg/L	<2.0	<2.0	<2.0
Chloroform	2.4	µg/L	<1.0	<1.0	<1.0
1,2-Dibromoethane		µg/L	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3	µg/L	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	µg/L	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	µg/L	<0.50	<0.50	<0.50
Dichlorodifluoromethane	590	µg/L	<2.0	<2.0	<2.0
1,1-Dichloroethane	5	µg/L	<0.50	<0.50	<0.50
1,2-Dichloroethane	1.6	µg/L	<0.50	<0.50	<0.50
1,1-Dichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
Methylene Chloride	50	µg/L	<5.0	<5.0	<5.0
1,2-Dichloropropane	5	µg/L	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	0.5	µg/L	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	0.5	µg/L	<0.30	<0.30	<0.30
1,3-Dichloropropene (cis & trans)	0.5	µg/L	<0.50	<0.50	<0.50
Ethylbenzene	2.4	µg/L	<0.50	<0.50	<0.50
n-Hexane	51	µg/L	<0.50	<0.50	<0.50
Methyl Ethyl Ketone	1800	µg/L	<20	<20	<20
Methyl Isobutyl Ketone	640	µg/L	<20	<20	<20
MTBE	15	µg/L	<2.0	<2.0	<2.0
Styrene	5.4	µg/L	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	µg/L	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	1	µg/L	<0.50	<0.50	<0.50
Tetrachloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
Toluene	24	µg/L	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	200	µg/L	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	4.7	µg/L	<0.50	<0.50	<0.50
Trichloroethylene	1.6	µg/L	<0.50	<0.50	<0.50
Trichlorofluoromethane	150	µg/L	<5.0	<5.0	<5.0
Vinyl chloride	0.5	µg/L	<0.50	<0.50	<0.50
o-Xylene		µg/L	<0.30	<0.30	<0.30
m+p-Xylenes		µg/L	<0.40	<0.40	<0.40
Xylenes (Total)	300	µg/L	<0.50	<0.50	<0.50

**Summary of Water Supply EXI Zone Groundwater Quality
(July and August 2020)
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario**

Location:	Water Supply EXI Zone	Water Supply EXI Zone	Water Supply EXI Zone
Sample ID:	W-11210029-20200709-14	W-11210029-20200730-20	W-11210029-20200813-26
Report No.:	L2472292-1	L2482453-1	L2491984
Sample Date:	July 9 2020	July 30 2020	August 20 2020

**Table 2
Standards²
2011**

	Units			
<u>Hydrocarbons</u>				
F1 (C6-C10)	µg/L	750	<25	<25
F1-BTEX	µg/L		<25	<25
F2 (C10-C16)	µg/L	150	<100	<100
F2-Naphth	µg/L		<100	<100
F3 (C16-C34)	µg/L	500	<250	<250
F3-PAH	µg/L		<250	<250
F4 (C34-C50)	µg/L	500	<250	<250
Total Hydrocarbons (C6-C50)	µg/L		<370	<370
<u>Semi-Volatile Organics</u>				
Biphenyl	µg/L	0.5	<0.40	<0.40
4-Chloroaniline	µg/L	10	<0.40	<0.40
Bis(2-chloroethyl)ether	µg/L	5	<0.40	<0.40
Bis(2-chloroisopropyl)ether	µg/L	120	<0.40	<0.40
2-Chlorophenol	µg/L	8.9	<0.30	<0.30
3,3'-Dichlorobenzidine	µg/L	0.5	<0.40	<0.40
2,4-Dichlorophenol	µg/L	20	<0.30	<0.30
Diethylphthalate	µg/L	38	<0.20	0.25
Dimethylphthalate	µg/L	38	<0.20	<0.20
2,4-Dimethylphenol	µg/L	59	<0.50	<0.50
2,4-Dinitrophenol	µg/L	10	<2.0	<1.0
2,4-Dinitrotoluene	µg/L	5	<0.40	<0.40
2,6-Dinitrotoluene	µg/L	5	<0.40	<0.40
2,4+2,6-Dinitrotoluene	µg/L	5	<0.57	<0.57
Bis(2-ethylhexyl)phthalate	µg/L	10	<2.0	<2.0
Pentachlorophenol	µg/L	30	<0.50	<0.50
Phenol	µg/L	890	<0.50	<0.50
1,2,4-Trichlorobenzene	µg/L	70	<0.40	<0.40
2,4,5-Trichlorophenol	µg/L	8.9	<0.20	<0.20
2,4,6-Trichlorophenol	µg/L	2	<0.20	<0.20
<u>Polychlorinated Biphenyls</u>				
Aroclor 1242	µg/L		<0.020	<0.020
Aroclor 1248	µg/L		<0.020	<0.020
Aroclor 1254	µg/L		<0.020	<0.020
Aroclor 1260	µg/L		<0.020	<0.020
Total PCBs	µg/L	3	<0.040	<0.040
<u>Aggregate Organics</u>				
BOD	µg/L			
<u>Physical Tests</u>				
pH	pH units			
Total Suspended Solids	µg/L			
<u>Anions and Nutrients</u>				
Phosphorus, Total	µg/L		<3.0	3.4
<u>Organic / Inorganic Carbon</u>				
Total Organic Carbon	µg/L			3.8

**Summary of Water Supply EXI Zone Groundwater Quality
(July and August 2020)
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario**

Location:	Water Supply EXI Zone	Water Supply EXI Zone	Water Supply EXI Zone
Sample ID:	W-11210029-20200709-14	W-11210029-20200730-20	W-11210029-20200813-26
Report No.:	L2472292-1	L2482453-1	L2491984
Sample Date:	July 9 2020	July 30 2020	August 20 2020

**Table 2
Standards²
2011**

		Units			
<u>Polycyclic Aromatic Hydrocarbons</u>					
Acenaphthene	4.1	µg/L	<0.020	<0.020	<0.020
Acenaphthylene	1	µg/L	<0.020	<0.020	<0.020
Anthracene	2.4	µg/L	<0.020	<0.020	<0.020
Benzo(a)anthracene	1	µg/L	<0.020	<0.020	<0.020
Benzo(a)pyrene	0.01	µg/L	<0.010	<0.010	<0.010
Benzo(b)fluoranthene	0.1	µg/L	<0.020	<0.020	<0.020
Benzo(g,h,i)perylene	0.2	µg/L	<0.020	<0.020	<0.020
Benzo(k)fluoranthene	0.1	µg/L	<0.020	<0.020	<0.020
Chrysene	0.1	µg/L	<0.020	<0.020	<0.020
Dibenzo(ah)anthracene	0.2	µg/L	<0.020	<0.020	<0.020
Fluoranthene	0.41	µg/L	<0.020	<0.020	<0.020
Fluorene	120	µg/L	<0.020	<0.020	<0.020
Indeno(1,2,3-cd)pyrene	0.2	µg/L	<0.020	<0.020	<0.020
1+2-Methylnaphthalenes	3.2	µg/L	<0.028	<0.028	<0.028
1-Methylnaphthalene	3.2	µg/L	<0.020	<0.020	<0.020
2-Methylnaphthalene	3.2	µg/L	<0.020	<0.020	<0.020
Naphthalene	11	µg/L	<0.050	<0.050	<0.050
Phenanthrene	1	µg/L	<0.020	<0.020	<0.020
Pyrene	4.1	µg/L	<0.020	<0.020	<0.020

Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Table 4.4

Summary of Pond Surface Water Quality
(October to December 2020)
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario

Sample ID:	W-11210029-20201001-38	W-11210029-20201008-40	W-11210029-20201015-42	W-11210029-20201022-44	W-11210029-20201029-46	W-11210029-20201105- 48	W-11210029-20201112-50	W-11210029-20201119-52	W-11210029-20201126-54
Report No.:	L2511128-1	L2514428-1	L2517112-1	L2520323-1	L2523350-1	L2526411-1	L2528910-1	L2531509-1	L2534021-1
Sample Date:	October 1 2020	October 8 2020	October 15 2020	October 22 2020	October 29 2020	November 5 2020	November 12 2020	November 19 2020	November 26 2020

	Table 2 Standards ² 2011	PWQO/ IPWQO ³ 1999	Units	W-11210029-20201001-38	W-11210029-20201008-40	W-11210029-20201015-42	W-11210029-20201022-44	W-11210029-20201029-46	W-11210029-20201105- 48	W-11210029-20201112-50	W-11210029-20201119-52	W-11210029-20201126-54
Metals												
Aluminum	--	75*	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	576	<5.0
Antimony	6	20	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.23	<0.1
Arsenic	25	5	µg/L	11.1	5.01	5.35	5.48	5.55	5.61	6.56	1.08	5.56
Barium	1000	--	µg/L	51.4	51.1	53.7	52.3	48.7	48	57.1	25.3	53.6
Beryllium (4)	4	1100	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bismuth	--	--	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Boron (total)	5000	200	µg/L	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	19	<10.0
Cadmium (5)	2.7	0.5	µg/L	0.0068	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0226	<0.005
Calcium	--	--	µg/L	69300	71700	70500	74800	66100	72400	73000	38600	67400
Cesium	--	--	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01
Chromium	50	8.9	µg/L	<0.5	<0.5	0.83	<0.5	<0.5	<0.5	<0.5	1.15	<0.5
Chromium, Hexavalent	25	1	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	3.8	0.9	µg/L	0.32	<0.1	0.11	0.19	0.11	<0.1	0.11	0.35	<0.1
Copper	87	5	µg/L	3	<0.5	<0.5	1	1	<0.5	<0.5	2.17	<0.5
Iron	--	300	µg/L	1760	387	520	432	478	386	620	690	403
Lead (6)	10	5	µg/L	0.959	0.055	0.072	0.647	0.135	<0.05	0.103	1.82	<0.05
Lithium	--	--	µg/L	3.9	4.0	3.0	4.2	3.3	4.1	3.3	<1.0	3.9
Magnesium	--	--	µg/L	32100	33900	33300	34300	31900	31800	34000	8280	32300
Manganese	--	--	µg/L	11.2	11.0	10.6	10.7	9.95	9.18	11.4	32.4	9.94
Mercury	0.29	0.2*	µg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Molybdenum	70	40	µg/L	0.567	0.544	0.586	0.58	0.563	0.531	0.599	2.98	0.601
Nickel	100	25	µg/L	12.5	<0.5	1.39	3.01	1.98	<0.5	0.89	1.32	<0.5
Phosphorus	--	--	µg/L	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0	<50.0
Potassium	--	--	µg/L	986	980	930	1020	967	921	1040	2960	984
Rubidium	--	--	µg/L	<0.2	<0.2	<0.2	0.21	<0.2	<0.2	0.23	1.18	<0.2
Selenium	10	100	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.121	<0.05
Silicon	--	--	µg/L	9160	8700	9130	9290	8470	8250	9290	1260	9010
Silver	1.5	0.1	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sodium	490000	--	µg/L	7730	8200	7640	8040	7710	7510	8030	34800	7420
Strontium	--	--	µg/L	154	147	150	153	144	147	160	111	155
Sulfur	--	--	µg/L	19500	19300	20700	20300	17700	19100	19900	7870	20600
Tellurium	--	--	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	2.0	0.3	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Thorium	--	--	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	--	--	µg/L	0.18	<0.1	<0.1	0.17	<0.1	<0.1	<0.1	0.11	<0.1
Titanium	--	--	µg/L	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	17.5	<0.3
Tungsten	--	30.0	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Uranium	20.0	5.0	µg/L	0.26	0.254	0.247	0.264	0.268	0.261	0.264	0.653	0.241
Vanadium	6.2	6.0	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.56	<0.5
Zinc	1100	20	µg/L	346.0	6.3	14.2	8.2	9.1	3	39.3	8.4	3.7
Zirconium	--	4	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.29	<0.2
Total Plate Count	--	--	cfu/mL									
E. coli	--	100 cfu/100 mL	cfu/100 mL									

Table 4.4

Summary of Pond Surface Water Quality
(October to December 2020)
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario

Sample ID:	W-11210029-20201001-38	W-11210029-20201008-40	W-11210029-20201015-42	W-11210029-20201022-44	W-11210029-20201029-46	W-11210029-20201105- 48	W-11210029-20201112-50	W-11210029-20201119-52	W-11210029-20201126-54
Report No.	L2511128-1	L2514428-1	L2517112-1	L2520323-1	L2523350-1	L2526411-1	L2528910-1	L2531509-1	L2534021-1
Sample Date:	October 1 2020	October 8 2020	October 15 2020	October 22 2020	October 29 2020	November 5 2020	November 12 2020	November 19 2020	November 26 2020

	Table 2 Standards ² 2011	PWQO/ IPWQO ³ 1999	Units	October 1 2020	October 8 2020	October 15 2020	October 22 2020	October 29 2020	November 5 2020	November 12 2020	November 19 2020	November 26 2020
Volatile Organic Compounds												
Acetone	2700		µg/L	<30	<30	<30	<30	<30	<30	<30	<30	<30
Benzene	5	100	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	16	200	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform	25	60	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	0.89	0.9	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon tetrachloride	0.79		µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	30	15	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dibromochloromethane	25		µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Chloroform	2.4		µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-Dibromoethane			µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	3	2.5	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	2.5	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	4	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	590		µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1-Dichloroethane	5	200	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	1.6	100	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	1.6	40	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	1.6	200	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-Dichloroethylene	1.6	200	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methylene Chloride	50	100	µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-Dichloropropane	5	0.7	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	0.5		µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-Dichloropropene	0.5		µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropene (cis & trans)	0.5		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	2.4	8	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
n-Hexane	51		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Ethyl Ketone	1800	400	µg/L	<20	<20	<20	<20	<20	<20	<20	<20	<20
Methyl Isobutyl Ketone	640		µg/L	<20	<20	<20	<20	<20	<20	<20	<20	<20
MTBE	15	200	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Styrene	5.4	4	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	20	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	1	70	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethylene	1.6	50	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	24	0.8	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	200	10	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	4.7	800	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	1.6	20	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	150		µg/L	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Vinyl chloride	0.5	600	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
o-Xylene		40	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
m+p-Xylenes			µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Xylenes (Total)	300		µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Table 4.4

Summary of Pond Surface Water Quality
(October to December 2020)
Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario

Sample ID: Report No. Sample Date:	W-11210029-20201001-38 L2511128-1 October 1 2020	W-11210029-20201008-40 L2514428-1 October 8 2020	W-11210029-20201015-42 L2517112-1 October 15 2020	W-11210029-20201022-44 L2520323-1 October 22 2020	W-11210029-20201029-46 L2523350-1 October 29 2020	W-11210029-20201105-48 L2526411-1 November 5 2020	W-11210029-20201112-50 L2528910-1 November 12 2020	W-11210029-20201119-52 L2531509-1 November 19 2020	W-11210029-20201126-54 L2534021-1 November 26 2020
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	Table 2 Standards ² 2011	PWQO/ IPWQO ³ 1999	Units									
Hydrocarbons												
F1 (C6-C10)	750		µg/L	<25	<25	<25	<25	<25	<25	<25	<25	
F1-BTEX			µg/L	<25	<25	<25	<25	<25	<25	<25	<25	
F2 (C10-C16)	150		µg/L	<100	<100	<100	<100	<100	<100	<100	<100	
F2-Naphth			µg/L	<100	<100	<100	<100	<100	<100	<100	<100	
F3 (C16-C34)	500		µg/L	<250	<250	<250	<250	<250	<250	<250	<250	
F3-PAH			µg/L	<250	<250	<250	<250	<250	<250	<250	<250	
F4 (C34-C50)	500		µg/L	<250	<250	<250	<250	<250	<250	<250	<250	
Total Hydrocarbons (C6-C50)			µg/L	<370	<370	<370	<370	<370	<370	<370	<370	
Semi-Volatile Organics												
Biphenyl	0.5	0.2	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	
4-Chloroaniline	10		µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	
Bis(2-chloroethyl)ether	5	200	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	
Bis(2-chloroisopropyl)ether	120		µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	
2-Chlorophenol	8.9		µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	
3,3'-Dichlorobenzidine	0.5	0.6	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	
2,4-Dichlorophenol	20	0.2	µg/L	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	
Diethylphthalate	38		µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Dimethylphthalate	38		µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
2,4-Dimethylphenol	59	8	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2,4-Dinitrophenol	10	10	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dinitrotoluene	5	4	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	
2,6-Dinitrotoluene	5	6	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	
2,4+2,6-Dinitrotoluene	5		µg/L	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57	<0.57	
Bis(2-ethylhexyl)phthalate	10		µg/L	<2.0	2.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Pentachlorophenol	30	0.5	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
Phenol	890	5	µg/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
1,2,4-Trichlorobenzene	70	0.5	µg/L	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	
2,4,5-Trichlorophenol	8.9	18	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
2,4,6-Trichlorophenol	2	18	µg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	
Polychlorinated Biphenyls												
Aroclor 1242			µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Aroclor 1248			µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Aroclor 1254			µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Aroclor 1260			µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	
Total PCBs	3	0.001	µg/L	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	
Aggregate Organics												
BOD			µg/L									

Table 4.4

Summary of Pond Surface Water Quality
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Hydrogeologic Impact Assessment
6678 Wellington Road 34,
Cambridge, Ontario

Sample ID: Report No. Sample Date:	W-11210029-20201001-38 L2511128-1 October 1 2020	W-11210029-20201008-40 L2514428-1 October 8 2020	W-11210029-20201015-42 L2517112-1 October 15 2020	W-11210029-20201022-44 L2520323-1 October 22 2020	W-11210029-20201029-46 L2523350-1 October 29 2020	W-11210029-20201105- 48 L2526411-1 November 5 2020	W-11210029-20201112-50 L2528910-1 November 12 2020	W-11210029-20201119-52 L2531509-1 November 19 2020	W-11210029-20201126-54 L2534021-1 November 26 2020
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	Table 2 Standards ² 2011	PWQO/ IPWQO ³ 1999	Units									
Physical Tests												
pH			pH units									
Total Suspended Solids			µg/L									
Anions and Nutrients												
Phosphorus, Total			µg/L	5.8	6.3	4.2	6.2	6.3	5.6	5.7	29.4	4.9
Organic / Inorganic Carbon												
Total Organic Carbon			µg/L									
Polycyclic Aromatic Hydrocarbons												
Acenaphthene	4.1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Acenaphthylene	1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Anthracene	2.4		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(a)anthracene	1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(a)pyrene	0.01		µg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(b)fluoranthene	0.1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(g,h,i)perylene	0.2		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Benzo(k)fluoranthene	0.1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Chrysene	0.1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dibenzo(ah)anthracene	0.2		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluoranthene	0.41		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Fluorene	120		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Indeno(1,2,3-cd)pyrene	0.2		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
1+2-Methylnaphthalenes	3.2		µg/L	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028	<0.028
1-Methylnaphthalene	3.2		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
2-Methylnaphthalene	3.2		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Naphthalene	11		µg/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Phenanthrene	1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Pyrene	4.1		µg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

Notes:

- (2) Full Depth Generic Site Condition Standards in a Potable Ground Water Condition All Types of Property Use, as provided in the Table 2 of the MECP document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011.
- (3) PWQO=Provincial Water Quality Objective, MECP, February 1999
IPWQO= Interim Provincial Water Quality Objective, MECP, February 1999
- (4) The PWQO for beryllium is 1.1 mg/L when the hardness as CaCO3 (mg/L) is >75
- (5) The IPWQO for cadmium is 0.0005 mg/L when the hardness as CaCO3 (mg/L) is >100
- (6) The IPWQO for lead is 0.005 mg/L when the hardness as CaCO3 (mg/L) is >80
- (*) The PWQO is for Dissolved Metals
- ' -- No data or Standard available.
- ND Not detected at the associated detection limit (DL).
- µg/L microgram/liter
- cfu /mL colony forming units/milliliter

Appendices

Appendix A

MECP Water Well Record Logs



UTM 11 U E

67 No 2342

The Ontario Water Resources Commission Act

Elev. 0 R 1050

WATER WELL RECORD

Basin 23 Wellington

Township, Village, Town or City Puslinch

Con. 3 III Lot 8

Date completed 14 May 67
(day month year)

Owner [Redacted]
(print in block letters)

Address 474 Hwy Crescent
R.R # 2, Nepean, Guelph

Casing and Screen Record

Pumping Test

Inside diameter of casing 6 1/4
Total length of casing 92
Type of screen —
Length of screen —
Depth to top of screen —
Diameter of finished hole 5 in

Static level 33
Test-pumping rate 20 G.P.M.
Pumping level 37
Duration of test pumping 1 hr
Water clear or cloudy at end of test clear
Recommended pumping rate 10 G.P.M.
with pump setting of 50 to 70 feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record

	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
<u>stones and gravel</u>	<u>0</u>	<u>35</u>	<u>94</u>	<u>fresh</u>
<u>Sandy clay and small stones</u>	<u>35</u>	<u>85</u>		
<u>Sand and gravel</u>	<u>85</u>	<u>90</u>		
<u>Silty sand</u>	<u>90</u>	<u>92</u>		
<u>Rock</u>	<u>92</u>	<u>96</u>		

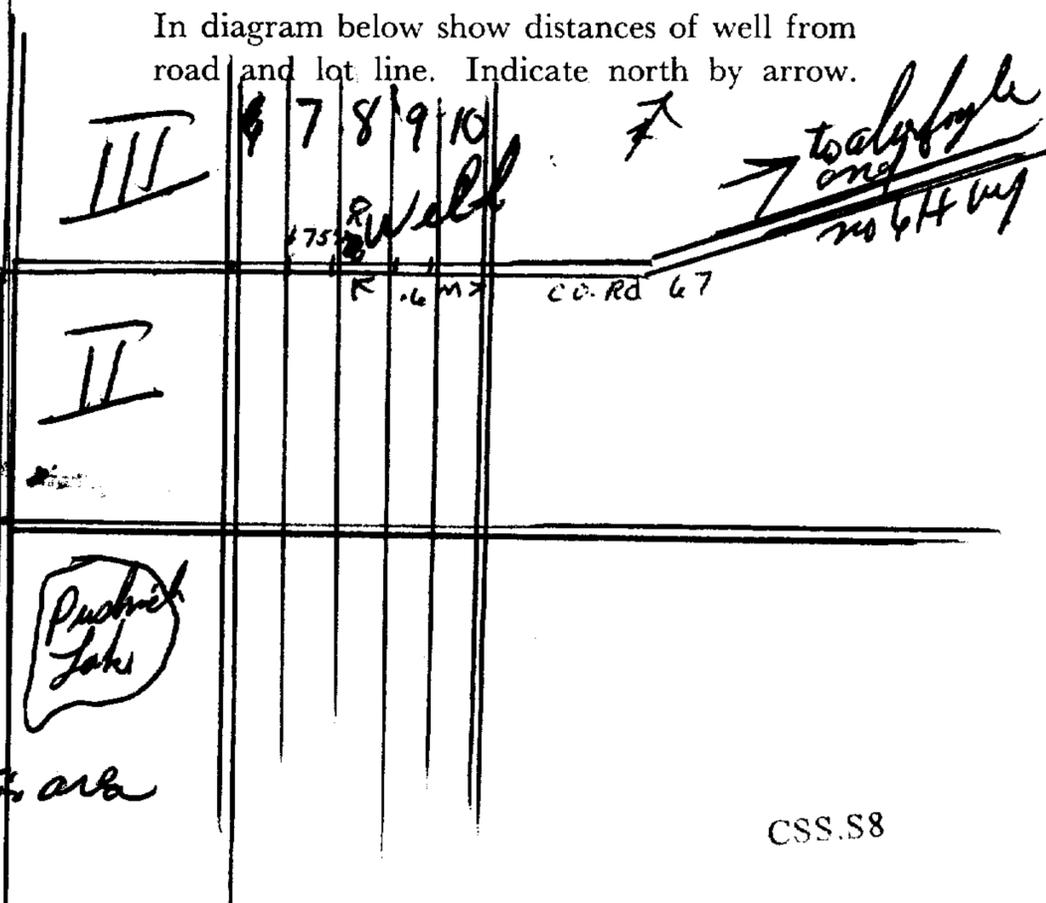
For what purpose(s) is the water to be used? D. house

Location of Well

Is well on upland, in valley, or on hillside? upland

In diagram below show distances of well from road and lot line. Indicate north by arrow.

Drilling or Boring Firm W Pockhom



Address RR 2 Oneaster

Licence Number 2498

Name of Driller or Borer W Pockhom

Address RR 2 Oneaster

Date May 14/67

[Redacted Signature]

(Signature of Licensed Drilling or Boring Contractor)

Form 7 15M-60-4138 125th N & SRd
W side of county reformation area

409/6W

17 5601010
5 9810150
5 1045



6703141-
3 9

DIVISION OF
WATER RESOURCES
JAN 9 1969
ONTARIO WATER
RESOURCES COMMISSION

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District **Wellington** Township, Village, Town or City
Con. **2** Lot **7** Date completed **4th December 1968**
(day month year)
Address **Guelph Ont. RR# 2 Hepler**

Casing and Screen Record
Inside diameter of casing **5 inch**
Total length of casing **111 ft**
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole **5 inch**

Pumping Test
Static level **42 ft**
Test-pumping rate **10** G.P.M.
Pumping level **60 ft**
Duration of test pumping **1/2 hr** **bailer test**
Water clear or cloudy at end of test **clear**
Recommended pumping rate **10** G.P.M.
with pump setting of **60** feet below ground surface

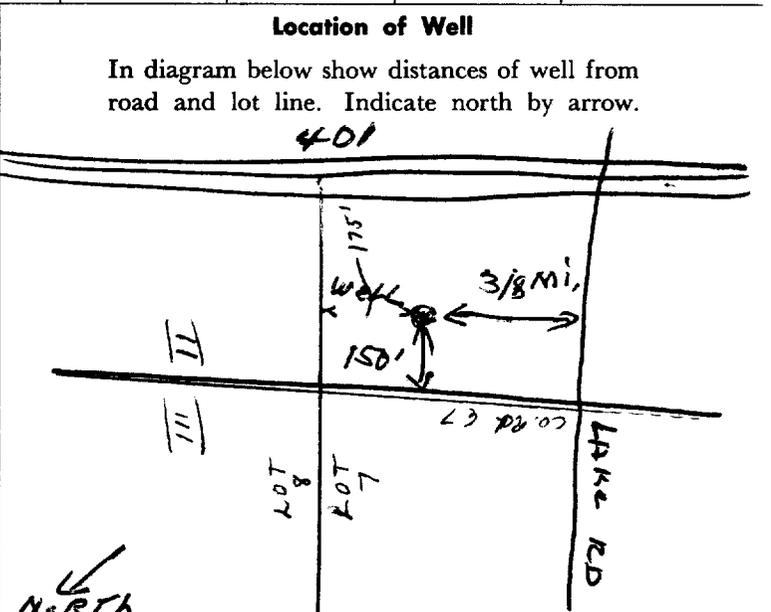
Well Log

Overburden and Bedrock Record	From ft.	To ft.
stones and gravel	0	48
clay and gravel	48	90
hard packed sand	90	111
brown rock	111	155
light grey rock	180	194

Water Record

Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
180 to 194	fresh

For what purpose(s) is the water to be used? **household**
Is well on upland, in valley, or on hillside? **hillside**
Drilling or Boring Firm **Graham Well Drilling**
mailing R 2 Guelph Ont.
Address
Licence Number **2855**
Name of Driller or Borer **Arthur Titus**
Address **25 Eramosa Rd. Guelph**
Date **December 4th 1968**
(Signature of Licensed Drilling or Boring Contractor)





WATER WELL RECORD

40 P/SW1

Water management in Ontario

1. PRINT ONLY IN SPACES PROVIDED

2. CHECK CORRECT BOX WHERE APPLICABLE

11
1 2

670 4535

MUNICIP 670.12

CON Cdn

02

COUNTY OR DISTRICT WILLINGTON	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE DUSLINCH	CON., BLOCK, TRACT, SURVEY, ETC. 2	LOT 25-27 009
DATE COMPLETED DAY 27 MO 01 YR 73			
22 Fairview or Preston			
1 10280	RC 4	ELEVATION 10.35	RC 5
24	25	26	30
BASIN CODE		23	

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
		well pit		0	5
Brown	Clay & Boulders			5	24
	sandy clay & boulders			24	87
	Cemented gravel				
	Rock			92	167

31	0005 23	0027 05 13	0067 06 26
32			

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
0160	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	14	
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	19	
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	24	
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	29	
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	34	
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL	80	

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
05	1 <input checked="" type="checkbox"/> STEEL		0	93
	2 <input type="checkbox"/> GALVANIZED	244		0093
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			
17-18	1 <input type="checkbox"/> STEEL		93	0167
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			
24-25	1 <input type="checkbox"/> STEEL			27-30
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			

SCREEN

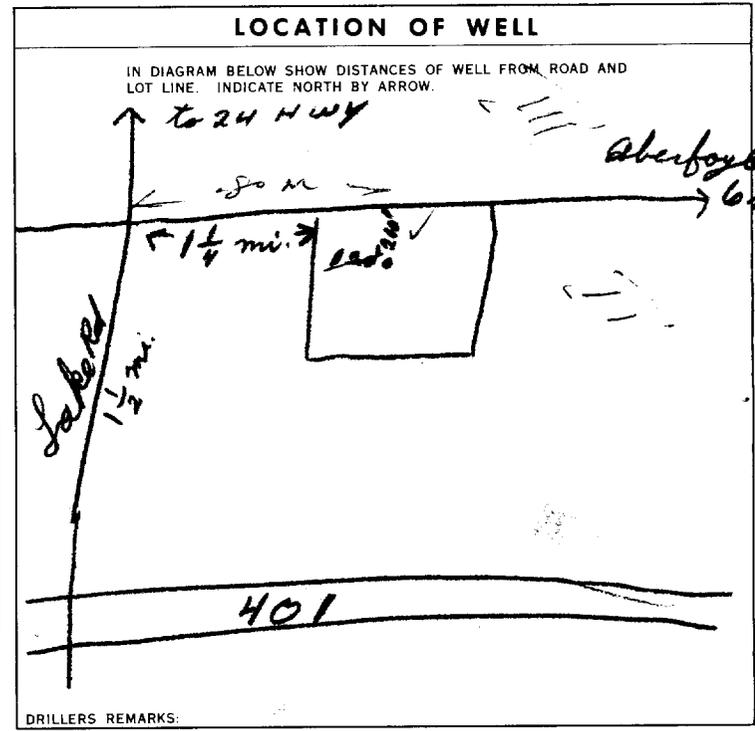
SIZE(S) OF OPENING (SLOT NO.)	31-33 DIAMETER	34-38 LENGTH	39-40
MATERIAL AND TYPE		INCHES	FEET
		DEPTH TO TOP OF SCREEN	41-44 80

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
FROM	TO	
10-13	14-17	
18-21	22-25	
26-29	30-33	80

71 PUMPING TEST

PUMPING TEST METHOD	10 PUMPING RATE	11-14 DURATION OF PUMPING
1 <input type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	0012	01 15-16 HOURS 30 MINS.
STATIC LEVEL	WATER LEVEL END OF PUMPING	25 WATER LEVELS DURING
032	038	15 MINUTES 003
		30 MINUTES
		45 MINUTES 032
		60 MINUTES
IF FLOWING, GIVE RATE	38-41 PUMP INTAKE SET AT	42 WATER AT END OF TEST
		1 <input type="checkbox"/> CLEAR 2 <input checked="" type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	43-45 RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	080	0012
50-53 002.0 GPM./FT. SPECIFIC CAPACITY		



FINAL STATUS OF WELL

1 <input checked="" type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
2 <input type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED, POOR QUALITY
3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
4 <input type="checkbox"/> RECHARGE WELL	

WATER USE

1 <input checked="" type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
<input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED

METHOD OF DRILLING

1 <input checked="" type="checkbox"/> CABLE TOOL	6 <input type="checkbox"/> BORING
2 <input type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND
3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING
4 <input type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING
5 <input type="checkbox"/> AIR PERCUSSION	

CONTRACTOR NAME OF WELL CONTRACTOR Paul Weber	LICENCE NUMBER 5469
ADDRESS RR 2 Breslau	
NAME OF DRILLER OR BORE Clayton Shantz	LICENCE NUMBER
SIGNATURE OF CONTRACTOR	SUBMISSION DATE DAY 30 MO 1 YR 73

OFFICE USE ONLY	DATA SOURCE	58 CONTRACTOR 5469	59-62 DATE RECEIVED 020273	63-68 80
	DATE OF INSPECTION	INSPECTOR		
REMARKS:				P WI



Ontario

WATER WELL RECORD

40p/87

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

6704990

MUNICIPALITY 1670124

CON. CDN

LOT 007

COUNTY OR DISTRICT: Wellington
 TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Puslinch
 CON., BLOCK, TRACT, SURVEY, ETC.: conc. 2
 DATE COMPLETED: 14 02 74
 DAY MO YR

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
 6704990 11 380151 4810122 4 1045 4 23 MAR 20, 1975 50

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	clay	stones		0	40
"	"	gravel		40	60
Dark brown-hardpan,	sand			60	90
"	"	coarse gravel		90	100
"	sand	gravel		100	106
		gravel		106	107
Total depth 107 ft.					

31 0040605/12 0060605/11 0090614/28 0100614/28/11 0100629/11 01017/11
 32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
0107	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
15-18	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
20-23	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
25-28	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
30-33	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
05	STEEL	.188	0	106
05	STEEL		106	107

SCREEN

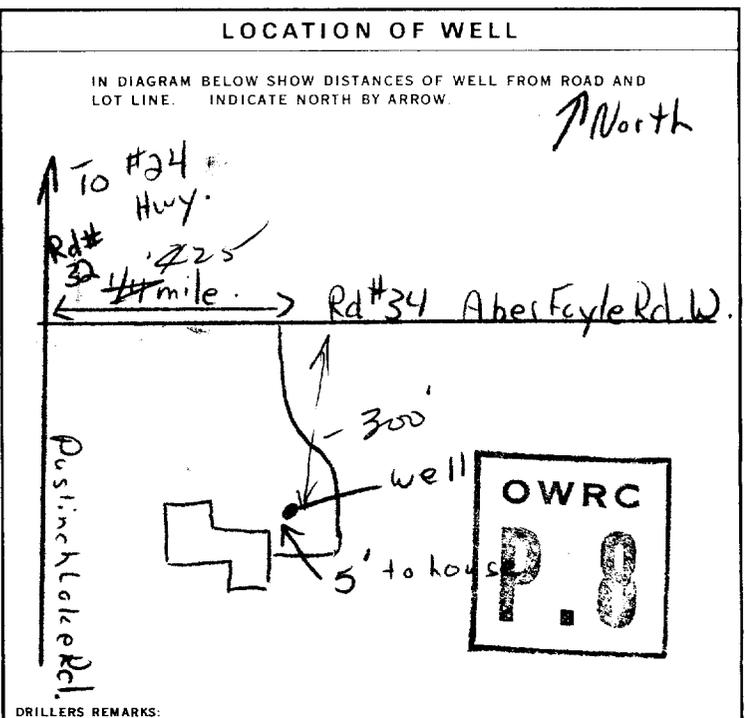
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN FEET
		41-44
		80

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
FROM	TO
10-13	14-17
18-21	22-25
26-29	30-33
	80

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE GPM	DURATION OF PUMPING HOURS
1 <input type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	0010	00
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
040	048	040
IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	055	
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
1 <input type="checkbox"/> SHALLOW 2 <input type="checkbox"/> DEEP	055	0020



FINAL STATUS OF WELL

1 WATER SUPPLY
 2 OBSERVATION WELL
 3 TEST HOLE
 4 RECHARGE WELL
 5 ABANDONED, INSUFFICIENT SUPPLY
 6 ABANDONED, POOR QUALITY
 7 UNFINISHED

WATER USE

1 DOMESTIC
 2 STOCK
 3 IRRIGATION
 4 INDUSTRIAL
 5 OTHER
 6 COMMERCIAL
 7 MUNICIPAL
 8 PUBLIC SUPPLY
 9 COOLING OR AIR CONDITIONING
 10 NOT USED

METHOD OF DRILLING

1 CABLE TOOL
 2 ROTARY (CONVENTIONAL)
 3 ROTARY (REVERSE)
 4 ROTARY (AIR)
 5 AIR PERCUSSION
 6 BORING
 7 DIAMOND
 8 JETTING
 9 DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: R.H. Graham Well Drilling
 LICENCE NUMBER: 2336
 ADDRESS: 212 Waverley Drive, GUELPH, Ont.
 NAME OF DRILLER OR BORER: J. Hawkins
 LICENCE NUMBER: 22W71
 SUBMISSION DATE: DAY 21 MO 2 YR 74

OFFICE USE ONLY

DATA SOURCE: 1
 CONTRACTOR: 2336
 DATE RECEIVED: 2 20 74
 DATE OF INSPECTION: _____
 INSPECTOR: _____
 REMARKS: _____



Ontario

WATER WELL RECORD

40 P/82

1. PRINT ONLY IN SPACES PROVIDED
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11 6706720

MUNICIP. 67012

CON. CON

02

COUNTY OR DISTRICT WELL: [REDACTED]	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE PUSHINCH TWP	CON., BLOCK, TRACT, SURVEY, ETC. CON. 2	DATE COMPLETED 05 06 78
7 GUELPH		RC 10980	RC 4 ELEVATION 1030
BASIN CODE 23		II III IV	

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	GRAVEL	SAND	STONEY	0	15
	SAND			15	100
	GRAVEL		FINE	100	111

37 0015 11287 0190 28 0111 29

32

47 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-15	1 FRESH 3 <input type="checkbox"/> SULPHUR 2 SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 FRESH 3 <input type="checkbox"/> SULPHUR 2 SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 FRESH 3 <input type="checkbox"/> SULPHUR 2 SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 FRESH 3 <input type="checkbox"/> SULPHUR 2 SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 FRESH 3 <input type="checkbox"/> SULPHUR 2 SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
04	STEEL	.188	0 911
17-18	STEEL		20-23
24-25	STEEL		27-30

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	CEMENT GROUT LEAD PACKER, ETC.
10-13		
18-21		
26-29		

77 PUMPING TEST

PUMPING TEST METHOD: 1 PUMP 2 BAILER

PUMPING RATE: 0010 GPM

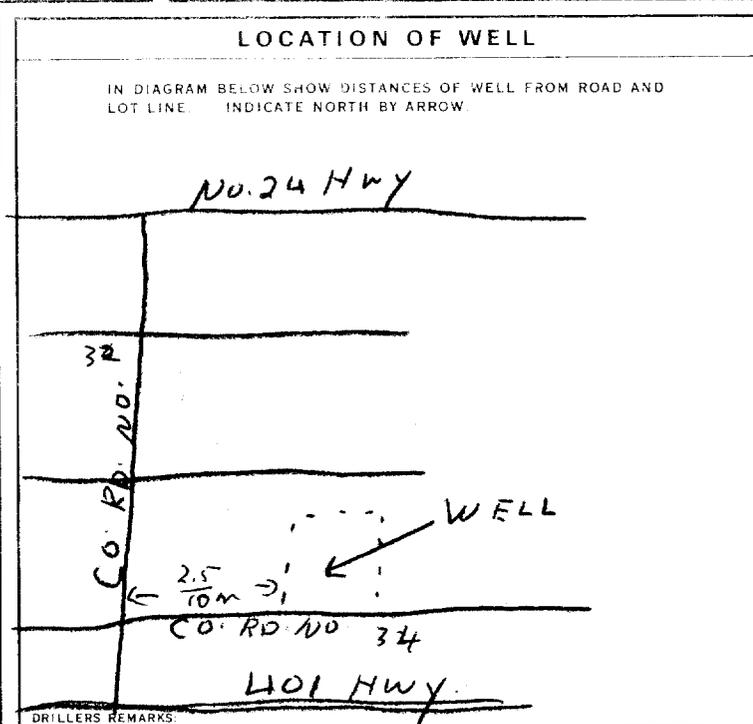
DURATION OF PUMPING: 03 HOURS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING				
048	050	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES	
		26-28	29-31	32-34	35-37	

RECOMMENDED PUMP TYPE: SHALLOW DEEP

RECOMMENDED PUMP SETTING: 060 FEET

RECOMMENDED PUMPING RATE: 0008 GPM



54 FINAL STATUS OF WELL: 1 WATER SUPPLY

55-56 WATER USE: 1 DOMESTIC

57 METHOD OF DRILLING: 1 CABLE TOOL

CONTRACTOR: HARVEY HILL WELL DRILLING

ADDRESS: RRI ELORA ONT

LICENCE NUMBER: 2564

SIGNATURE OF CONTRACTOR: [REDACTED]

SUBMISSION DATE: [REDACTED]

OFFICE USE ONLY

DATA SOURCE: 1

CONTRACTOR: 2564

DATE RECEIVED: 070778

DATE OF INSPECTION: April 1979

INSPECTOR: [REDACTED]

REMARKS: [REDACTED]

CSS.S8

P

WI



Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

6708332

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

COUNTY OR DISTRICT: 21111 TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Paslinch CON. BLOCK, TRACT, SURVEY, ETC: III LOT: 7

DATE COMPLETED: DAY 30 MO Nov. YR 85

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	gravel	stone clay		0	30
Brown	sand	gravel clay		30	50
Gray	clay	sand gravel		50	80
Gray	limestone			80	92

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13 90	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11 6 1/4	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	188	0	80
17-18 6 1/2	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		80	92

SCREEN

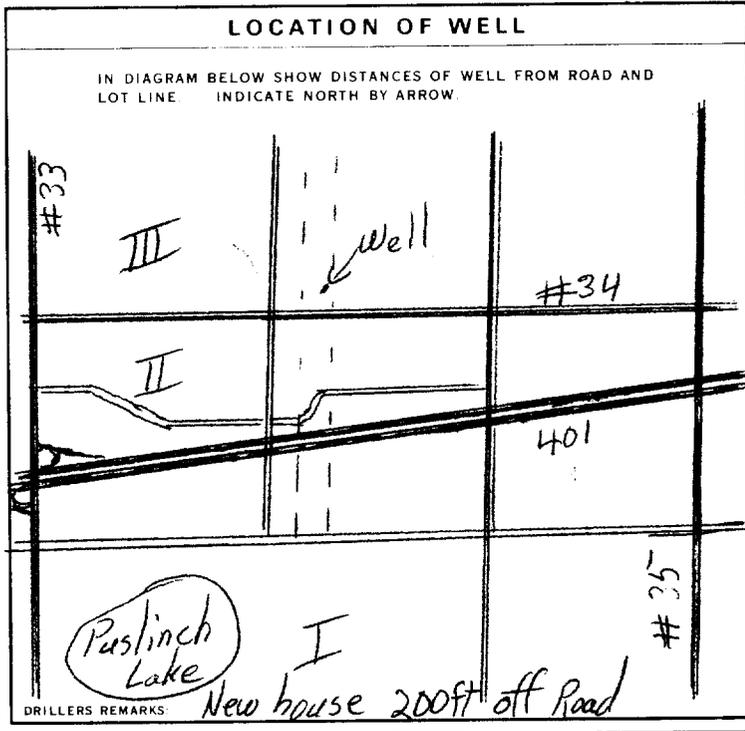
SIZES (S) OF OPENING (SLOT NO 1)	DIAMETER INCHES	LENGTH FEET
	34-38	39-40
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN 41-44

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
FROM	TO	
10-13	14-17	
18-21	22-25	
26-29	30-33	80

71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input checked="" type="checkbox"/> Air 2 <input type="checkbox"/> BAILER	9 GPM	1 15-16 HOURS 0 17-18 MINS
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
19-21 34 FEET	22-24 92 FEET	15 MINUTES 26-28 40 FEET 30 MINUTES 29-31 35 FEET 45 MINUTES 32-34 35 FEET 60 MINUTES 35-37 34 FEET
IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	92 GPM	1 <input checked="" type="checkbox"/> CLEAR 2 <input type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	85 FEET	9 GPM



FINAL STATUS OF WELL

1 WATER SUPPLY
2 OBSERVATION WELL
3 TEST HOLE
4 RECHARGE WELL

5 ABANDONED, INSUFFICIENT SUPPLY
6 ABANDONED, POOR QUALITY
7 UNFINISHED

WATER USE

1 DOMESTIC
2 STOCK
3 IRRIGATION
4 INDUSTRIAL
5 OTHER

6 COMMERCIAL
7 MUNICIPAL
8 PUBLIC SUPPLY
9 COOLING OR AIR CONDITIONING
10 NOT USED

METHOD OF DRILLING

1 CABLE TOOL
2 ROTARY (CONVENTIONAL)
3 ROTARY (REVERSE)
4 ROTARY (AIR)
5 AIR PERCUSSION

6 BORING
7 DIAMOND
8 JETTING
9 DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Packham Well Drilling Inc. LICENCE NUMBER: 4207

ADDRESS: 1235 Trinity Rd. Ancaster Ont.

NAME OF DRILLER OR BORER: Mervyn Packham LICENCE NUMBER: 4207

SIGNATURE OF CONTRACTOR: [Signature] SUBMISSION DATE: DAY 30 MO Nov. YR 85

OFFICE USE ONLY

DATA SOURCE: 58 CONTRACTOR: 59-62 DATE RECEIVED: 13.01.86 80

DATE OF INSPECTION: INSPECTOR:

REMARKS:

CSS.ES

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED

2. CHECK CORRECT BOX WHERE APPLICABLE

11

6710346

MUNICIP 67012

CON. CON.

03

COUNTY OR DISTRICT: Wellington TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Pushinch CON. BLOCK, TRACT, SURVEY ETC: III LOT: 8 25-27

OWNER (SURNAME/FIRST): Van-Del Contracting LTD ADDRESS: RR#1 Breslau Ont NO B 1 MO DATE COMPLETED: DAY 8 MO May YR 90

21 ZONE EASTING NORTHING RC. ELEVATION RC. BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	clay	gravel stones		0	5
Grey	clay	silt	soft	5	80
Grey	sand	silt clay		80	94
White	Limestone			94	140

31 32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13 125	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
15-18 138	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11 6 1/4	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	188	0	97
17-18 6 1/8	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC		97	140
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			

SCREEN

SIZE (S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
31-33	34-38	39-40

MATERIAL AND TYPE: _____ DEPTH TO TOP OF SCREEN: 41-44 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
FROM	TO
10-13	14-17
18-21	22-25
26-28	30-33

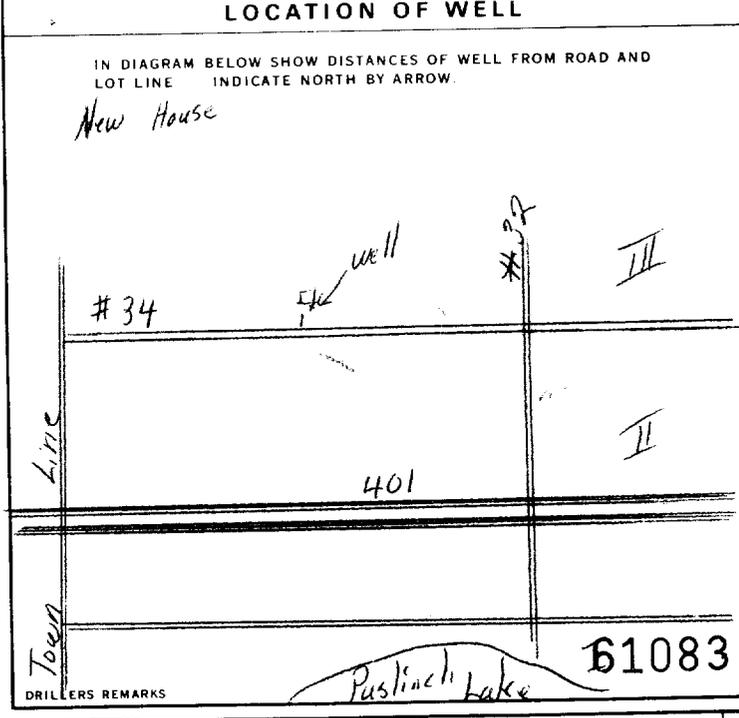
71 PUMPING TEST

PUMPING TEST METHOD	PUMPING RATE	DURATION OF PUMPING
1 <input checked="" type="checkbox"/> AIR PUMP 2 <input type="checkbox"/> BAILER	100 GPM	15-16 HOURS 0

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING				
19-21	22-24	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES	
37 FEET	140 FEET	37 FEET	37 FEET	37 FEET	37 FEET	

IF FLOWING, GIVE RATE: _____ PUMP INTAKE SET AT: _____ FEET WATER AT END OF TEST: _____ FEET

RECOMMENDED PUMP TYPE: SHALLOW DEEP RECOMMENDED PUMP SETTING: 100 FEET RECOMMENDED PUMPING RATE: 20 GPM



FINAL STATUS OF WELL

1 <input checked="" type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
2 <input type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED, POOR QUALITY
3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
4 <input type="checkbox"/> RECHARGE WELL	<input type="checkbox"/> DEWATERING

WATER USE

1 <input checked="" type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
<input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED

METHOD OF CONSTRUCTION

1 <input type="checkbox"/> CABLE TOOL	6 <input type="checkbox"/> BORING
2 <input type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND
3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING
4 <input checked="" type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING
5 <input type="checkbox"/> AIR PERCUSSION	<input type="checkbox"/> DIGGING <input type="checkbox"/> OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Packham Well Drilling Inc. WELL CONTRACTOR'S LICENCE NUMBER: 4207

ADDRESS: RR #2 Cheaster Ont.

NAME OF WELL TECHNICIAN: Mervyn Packham WELL TECHNICIAN'S LICENCE NUMBER: 10058

SIGNATURE OF TECHNICIAN/CONTRACTOR: _____ SUBMISSION DATE: DAY 8 MO May YR 90

OFFICE USE ONLY

DATA SOURCE: _____ CONTRACTOR: 4207 DATE RECEIVED: JUN 26 1990

DATE OF INSPECTION: _____ INSPECTOR: _____

REMARKS: _____

CSS.ES

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

6712051

Municipality 67012 Con. 07
10 14 15 22 23 24

11
1 2

County or District [Redacted] Township/Borough/City/Town/Village PUSHMICH Con block tract survey, etc. 7 Lot 3
Address R.R. #22 Cambridge Date completed 06 08 96
day month year
Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
	GRAVEL	SAND		0	20
	SAND		FINE	20	44
	GRAVEL	SAND		44	60
Brown	CLAY	SAND GRAVEL		60	106
	GRAVEL	SAND	FINE	106	111
	GRAVEL		CONCRETE	111	
TOTAL = 111					
6" CASING DRIVE SIDE					

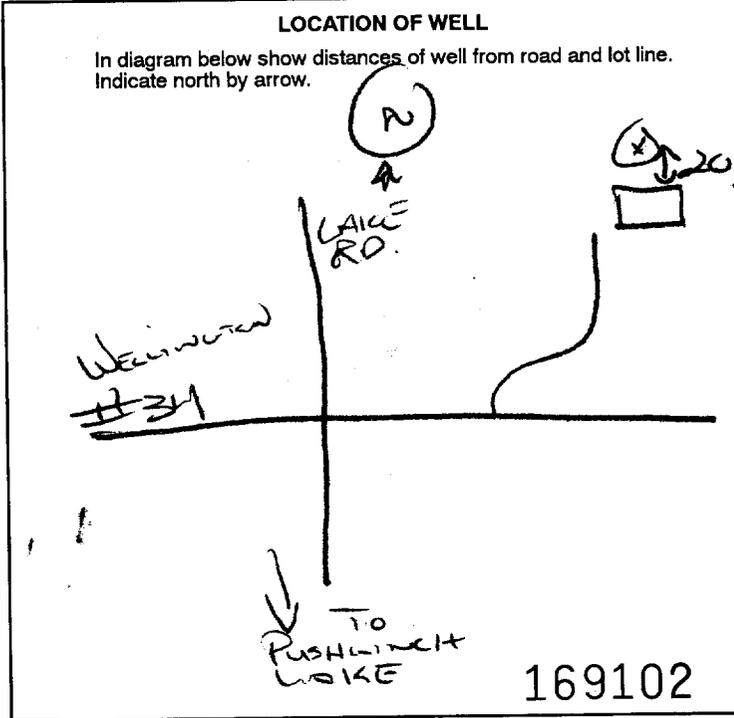
WATER RECORD			
Water found at - feet	Kind of water		
111	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals
	<input type="checkbox"/> Salty	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals
	<input type="checkbox"/> Salty	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals
	<input type="checkbox"/> Salty	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals
	<input type="checkbox"/> Salty	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas

CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
6"	Steel	100 + 2		111
	Galvanized			
	Concrete			
	Open hole			
	Plastic			
	Steel			
	Galvanized			
	Concrete			
	Open hole			
	Plastic			
	Steel			
	Galvanized			
	Concrete			
	Open hole			
	Plastic			

SCREEN	Sizes of opening (Slot No.)	Diameter inches	Length feet
	Material and type		Depth at top of screen feet

PLUGGING & SEALING RECORD			
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
0	20	BENSAC	
18	21		
27	25		
30	33		
33	33		

PUMPING TEST		PUMPING RATE		DURATION OF PUMPING	
<input checked="" type="checkbox"/> Pump	<input type="checkbox"/> Bail	20	GPM	1	Hours
Static level	Water level end of pumping	Water levels during Pumping			
59 feet	99 feet	15 minutes	30 minutes	45 minutes	60 minutes
		69 feet	79 feet	89 feet	99 feet
If flowing give rate	Pump intake set at	Water at end of test			
		<input checked="" type="checkbox"/> Clear <input type="checkbox"/> Cloudy			
Recommended pump type	Recommended pump setting	Recommended pump rate			
<input checked="" type="checkbox"/> Shallow <input checked="" type="checkbox"/> Deep	100 feet	20 GPM			



FINAL STATUS OF WELL

Water supply Abandoned, insufficient supply Unfinished

Observation well Abandoned, poor quality Replacement well

Test hole Abandoned (Other)

Recharge well Dewatering

WATER USE

Domestic Commercial Not used

Stock Municipal Other

Irrigation Public supply

Industrial Cooling & air conditioning

METHOD OF CONSTRUCTION

Cable tool Air percussion Driving

Rotary (conventional) Boring Digging

Rotary (reverse) Diamond Other

Rotary (air) Jetting

Name of Well Contractor Steven New Drilling Ltd Well Contractor's Licence No. 2663

Address R.R. #5 GUYTON CANT.

Name of Well Technician Devin Robinson Well Technician's Licence No. 7-0590

Signature of Technician/Contractor [Signature] Submission date 01 08 96

MINISTRY USE ONLY

Data source 2663 Contractor 2663 Date received AUG 27 1996

Date of inspection _____ Inspector _____

Remarks _____

CSS/ES

Measurements recorded in: Metric Imperial

Page _____ of _____

A072033

Well Owner's Information

6666 WELL RD #34 RR#22
County/District/Municipality: WELLINGTON
City/Town/Village: ~~WATERLOO~~ CAMBRIDGE
Province: Ontario
Postal Code: _____
UTM Coordinates: Zone 17, Easting 560189, Northing 4810496
Municipal Plan and Sublot Number: _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
BROWN	CLAY	STONES - SAND		0	18
BROWN	CLAY	SAND		18	45
BROWN	SAND			45	90
BROWN	SAND	GRAVEL		90	94
GREY	CLAY	GRAVEL		94	97
BROWN	LIMESTONE			97	102
TOTAL				102 FT	

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From	To	
0	20 BENTONITE SLURRY	

Results of Well Yield Testing

After test of well yield, water was: <input checked="" type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason: _____	Static Level	35 FT		
	1	38	1	40
	2	40	2	38
	3	41	3	37
	4	41.6	4	36
	5	42.2	5	35
Pump intake set at (m/ft): 80 FT				
Pumping rate (l/min / GPM): 12 GPM				
Duration of pumping: 1 hrs + 0 min				
Final water level end of pumping (m/ft): 43 FT				
If flowing give rate (l/min / GPM): _____				
Recommended pump depth (m/ft): 80 FT				
Recommended pump rate (l/min / GPM): 12 GPM				
Well production (l/min / GPM): 12 GPM				
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				

Method of Construction

Cable Tool Diamond
 Rotary (Conventional) Jetting
 Rotary (Reverse) Driving
 Boring Digging
 Air percussion
 Other, specify **AIR ROTARY**

Well Use

Public Commercial Not used
 Domestic Municipal Dewatering
 Livestock Test Hole Monitoring
 Irrigation Cooling & Air Conditioning
 Industrial
 Other, specify _____

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
6 1/8	STEEL	.188	+2	98	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____
6 1/8	OPEN HOLE		98	102	

Construction Record - Screen

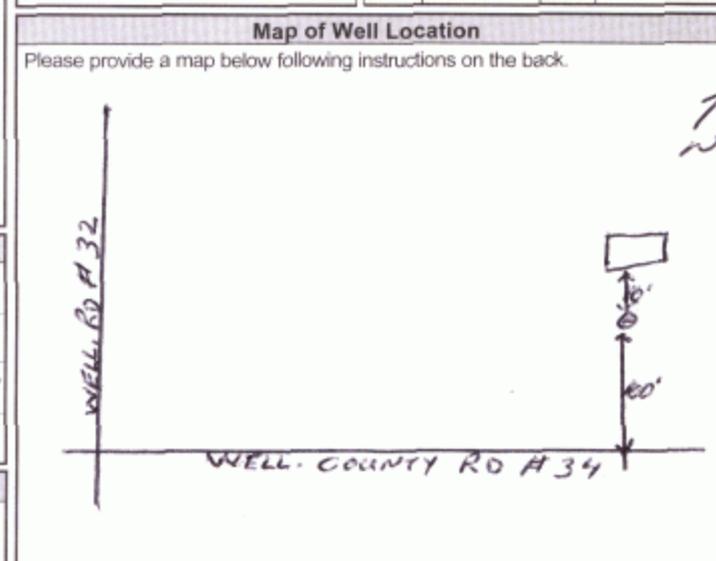
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To

Water Details

Water found at Depth (m/ft)	Kind of Water:	Hole Diameter
	<input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Untested	Depth (m/ft) From To Diameter (cm/in)
102 (m/ft)	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	0 20 8 3/4
(m/ft)	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	20 102 6 1/8

Well Contractor and Well Technician Information

Business Name: ~~NAME OF WELL CONTRACTOR~~ ADDRESS: 2086 SHANTZ STN. RD
 Well Contractor's Licence No.: 7385
 Business Address (Street Number Name): JIM WILSON WELL DRILLING
 Municipality: BRESLAU
 Province: ON Postal Code: N0B1M0 Business E-mail Address: _____
 Bus. Telephone No. (inc. area code): 5196482412 Name of Well Technician (Last Name, First Name): WILSON JIM
 Well Technician's Licence No.: T1924 Signature of Technician and/or Contractor: _____ Date Submitted: 20080529



Comments: _____

Well owner's information package delivered: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered: 20080505	Ministry Use Only Audit No. Z 80621 JUN 09 2008 Received _____
Date Work Completed: 20080505		

Address of Well Location (Street Number/Name) **#6678 WILSON RD. #34 R2#22** Township **PURNELL** Lot **A 8** Concession **3**

County/District/Municipality **WILSON** City/Town/Village **PURNELL** Province **Ontario** Postal Code _____

UTM Coordinates Zone **83** Easting **12560290** Northing **4810922** Municipal Plan and Sublot Number _____ Other _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
				From To
	ABANDONMENT			
		GRAVEL		
		GRAVEL 6 YARDS		
		BENTONITE = 1850 LBS.		
			EXTENDED 6" WELL	
			8 FT	
			36"	
			6 FT.	
			100 FT	
			18 FT	
			8"	
			5' WELL	
			ABANDONED DUG WELL	
			ABANDONED	

Annular Space		
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From To		
0 18	BENTONITE + GRAVEL (DUG WELL)	
6 80	BENTONITE (5' WELL)	

Results of Well Yield Testing				
After test of well yield, water was:	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
<input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____				
If pumping discontinued, give reason:	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
Duration of pumping _____ hrs + _____ min	4		4	
Final water level end of pumping (m/ft)	5		5	
	10		10	
If flowing give rate (l/min / GPM)	15		15	
	20		20	
Recommended pump depth (m/ft)	25		25	
Recommended pump rate (l/min / GPM)	30		30	
Well production (l/min / GPM)	40		40	
	50		50	
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	60		60	

Method of Construction		Well Use	
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input type="checkbox"/> Domestic	<input type="checkbox"/> Municipal
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning
<input type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial	
<input type="checkbox"/> Other, specify _____		<input type="checkbox"/> Other, specify _____	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input checked="" type="checkbox"/> Alteration (Construction) <input checked="" type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____
			From	To	

Construction Record - Screen		Water Details		Hole Diameter		
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	Depth (m/ft)	
					From	To

Well Contractor and Well Technician Information

Business Name of Well Contractor **Hannon Well Drilling** Well Contractor's Licence No. **2663**

Business Address (Street Number/Name) **2663 WILSON RD. #34 R2#22 WILSON** Municipality _____

Province **ONT.** Postal Code **N1H6S2** Business E-mail Address **hannonwelldrilling@bellnet.ca**

Bus. Telephone No. (inc. area code) **5197630239** Name of Well Technician (Last Name, First Name) **Hannon Harry**

Well Technician's Licence No. **2663** Signature of Technician and/or Contractor _____ Date Submitted **2009/12/15**

Map of Well Location

Please provide a map below following instructions on the back.

Comments: _____

Well owner's information package delivered	Date Package Delivered	Ministry Use Only	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2009/11/17	Audit No.	Z 107698
		Date Work Completed	2009/11/17
		Registered	23 2010

Measurements recorded in: Metric Imperial

Well Location

Address of Well Location (Street Number/Name): 6669 COUNTY RD #34
 Township: RUSLINCH TWP Lot: 8 Concession: 2
 County/District/Municipality: WELLINGTON City/Town/Village: _____ Province: Ontario Postal Code: _____
 UTM Coordinates: Zone: NAD Easting: 8317560279 Northing: 4810368
 Municipal Plan and Sublot Number: _____ Other: _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
BROWN	SAND	STONES		0	51ft
BROWN	SAND			51	90
BROWN	SAND	GRAVEL	WET	90	97
BROWN	LIMESTONE		BROKEN / CLAY LAYERS	97	112
Grey	LIMESTONE		HARD	112	137ft

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0 To 20	GROUT	

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
<input checked="" type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____				
If pumping discontinued, give reason:	Static Level	41ft		
Pump intake set at (m/ft): 75ft	1		1	
Pumping rate (l/min / GPM): 40	2		2	
Duration of pumping: 1 hrs + min	3		3	
Final water level end of pumping (m/ft):	4		4	
	5		5	
	10		10	42
	15		15	
	20		20	41
	25		25	
	30		30	
	40		40	
	50		50	
	60		60	41

Method of Construction: Other, specify Air-Dr

Well Use: Domestic

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
6"	STEEL	188	+2	102	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____
6"	OPEN HOLE		102	137	

Construction Record - Screen

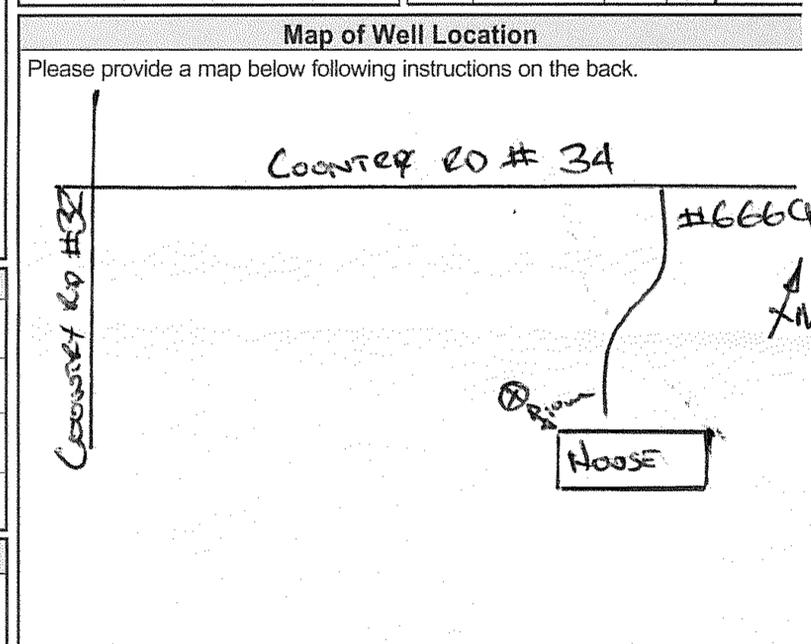
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To
	N/A			

Water Details

Water found at Depth (m/ft)	Kind of Water:	Hole Diameter
105 (m/ft)	<input checked="" type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	Depth (m/ft): 0 To 137 Diameter (cm/in): 6"
131 (m/ft)	<input checked="" type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested	
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	

Well Contractor and Well Technician Information

Business Name of Well Contractor: HIGHLAND WATER WELLS Well Contractor's Licence No.: 2576
 Business Address (Street Number/Name): Box 141, DURHAM Municipality: _____
 Province: ONT Postal Code: N0G1R0 Business E-mail Address: _____



Bus. Telephone No. (inc. area code): 5193696363 Name of Well Technician (Last Name, First Name): POPPLETON, NIKEL
 Well Technician's Licence No.: 2130 Signature of Technician and/or Contractor: _____ Date Submitted: 20130319

Well owner's information package delivered: Yes No Date Package Delivered: YYY Y MM DD Date Work Completed: 20130318

Ministry Use Only
 Audit No.: 2162250
 Received: JAN 06 2014

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the [Open Data catalogue](#).

[Go Back to Map](#)

Well ID

Well ID Number: 7262884
 Well Audit Number: Z226390
 Well Tag Number: A191498

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	6656 WELLINGTON RD 34
Township	PUSLINCH TOWNSHIP
Lot	007
Concession	CON 03
County/District/Municipality	WELLINGTON
City/Town/Village	Cambridge
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 560039.00 Northing: 4810550.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
	SAND			0 ft	17 ft
	SAND	GRVL		17 ft	30 ft
	SAND	GRVL	CLAY	30 ft	50 ft
BRWN	SAND			50 ft	60 ft

BRWN SAND
GREY LMSN

60 ft 101 ft
101 ft 125 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	20 ft	BENTONITE SLURRY	

Method of Construction & Well Use

Method of Construction	Well Use
Other Method DUAL ROTARY	Domestic

Status of Well

Water Supply

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
6.125 inch	STEEL	-2 ft	103 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
------------------	----------	------------	----------

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7556

Results of Well Yield Testing

After test of well yield, water was	CLEAR
If pumping discontinued, give reason	
Pump intake set at	110 ft
Pumping Rate	12 GPM
Duration of Pumping	1 h:0 m

Final water level	38.333 ft
If flowing give rate	
Recommended pump depth	110 ft
Recommended pump rate	12 GPM
Well Production	
Disinfected?	Y

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL	38 ft		
1	38.333 ft	1	38.083 ft
2	38.333 ft	2	38 ft
3	38.333 ft	3	38 ft
4	38.333 ft	4	38 ft
5	38.333 ft	5	38 ft
10	38.333 ft	10	38 ft
15	38.333 ft	15	38 ft
20	38.333 ft	20	38 ft
25	38.333 ft	25	38 ft
30	38.333 ft	30	38 ft
40	38.333 ft	40	38 ft
45		45	
50	38.333 ft	50	38 ft
60	38.333 ft	60	38 ft

Water Details

Water Found at Depth	Kind
125 ft	Untested

Hole Diameter

Depth From	Depth To	Diameter
0 ft	20 ft	10 inch
20 ft	103 ft	6.625 inch
103 ft	125 ft	6 inch

Audit Number: Z226390

Date Well Completed: March 03, 2016

Date Well Record Received by MOE: May 11, 2016

Updated: January 24, 2020

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the [Open Data catalogue](#).

[Go Back to Map](#)

Well ID

Well ID Number: 7262885
 Well Audit Number: Z226388
 Well Tag Number:

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	6656 WELL RD 34
Township	PUSLINCH TOWNSHIP
Lot	007
Concession	CON 03
County/District/Municipality	WELLINGTON
City/Town/Village	Cambridge
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 560654.00 Northing: 4810535.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
----------------	----------------------	-----------------	---------------------	------------	----------

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	108 ft	HOLEPLUG	

Method of Construction & Well Use

Method of Construction	Well Use
	Domestic

Status of Well

Abandoned-Other

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
4 inch	STEEL		

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7556

Results of Well Yield Testing

After test of well yield, water was

If pumping discontinued, give reason

Pump intake set at

Pumping Rate

Duration of Pumping

Final water level

If flowing give rate

Recommended pump depth

Recommended pump rate

Well Production

Disinfected? Y

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind
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Hole Diameter

Depth From	Depth To	Diameter
------------	----------	----------

Audit Number: Z226388

Date Well Completed: March 03, 2016

Date Well Record Received by MOE: May 12, 2016

Updated: January 24, 2020

Appendix B

Stratigraphic and Instrumentation Logs



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: HIA
 PROJECT NUMBER: 11210029
 CLIENT: 2374868 Ontario Inc.
 LOCATION: Cambridge, Ontario

HOLE DESIGNATION: MW1-20
 DATE COMPLETED: 19 November 2020
 DRILLING METHOD: Sonic
 FIELD PERSONNEL: M. Waldick

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' Value	PID (ppm)
	NORTHING: 4810969.38 EASTING: 560291.98 TOP OF RISER GROUND SURFACE	322.96 322.26						
0.5	FILL							
1.0								
1.5								
2.0								
2.5	SAND (FILL), with gravel, trace silt and cobbles, fine to coarse grained, brown, moist	319.82						
3.0	TOPSOIL, sand, silt, with gravel, trace cobbles, cohesive, dark brown, moist	319.36						
3.5	SANDY SILT, with gravel, trace cobbles, cohesive, light brown, moist	319.21						
4.0								
4.5								
5.0								
5.5								
6.0								
6.5								
			 Bentonite					
				145mm Ø Borehole				
					1	75		1.1
					2	100		3.6
					3	100		9.1
					4	100		6.4
					5			3.9
					6	20		4.2

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 STATIC WATER LEVEL ▼ November 23, 2020

File: C:\USERS\CACHILDS\DESKTOP\11210029-MI.GPJ Library File: GHD_ENV\IRO_V02.GLB Report: OVERBURDEN LOG Date: 9/12/20



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: HIA
 PROJECT NUMBER: 11210029
 CLIENT: 2374868 Ontario Inc.
 LOCATION: Cambridge, Ontario

HOLE DESIGNATION: MW1-20
 DATE COMPLETED: 19 November 2020
 DRILLING METHOD: Sonic
 FIELD PERSONNEL: M. Waldick

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE					
				NUMBER	INTERVAL	REC (%)	'N' Value	PID (ppm)	
7.5									
8.0				7	X	100		4.2	
8.5	SILTY SAND, and gravel, trace cobbles, fine to coarse grained, light brown, moist to wet	313.72		8	X	100		4.0	
9.0				9	X	100		2.4	
9.5				10	X	100		4.5	
10.0	SAND, with silt and gravel, trace cobbles, fine to medium grained, brown, wet	312.20	Bentonite Chips	11	X	100		3.5	
10.5				12	X	100		2.2	
11.0				13	X	100		1.0	
11.5				14	X	100		1.5	
12.0	- increase in fine sand and silt, decrease in gravel at 12.19m BGS		Sand Pack						
12.5			Well Screen						
13.0									
13.5									
	END OF BOREHOLE @ 13.72m BGS	308.54							

File: C:\USERS\CACHILDS\DESKTOP\11210029-MI.GPJ Library File: GHD_ENV\IRO_V02.GLB Report: OVERBURDEN LOG Date: 9/12/20

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 STATIC WATER LEVEL ▼ November 23, 2020

WELL DETAILS
 Screened interval:



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: HIA
 PROJECT NUMBER: 11210029
 CLIENT: 2374868 Ontario Inc.
 LOCATION: Cambridge, Ontario

HOLE DESIGNATION: MW1-20
 DATE COMPLETED: 19 November 2020
 DRILLING METHOD: Sonic
 FIELD PERSONNEL: M. Waldick

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' Value	PID (ppm)
14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5 20.0 20.5	Note: PID readings are reflective of background conditions		311.59 to 308.54mAMS 10.67 to 13.72m BGS Length: 3.05m Diameter: 51mm Slot Size: #10 Material: PVC Sand Pack: 312.20 to 308.54mAMS 10.06 to 13.72m BGS Material: Silica					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 STATIC WATER LEVEL ▼ November 23, 2020

File: C:\USERS\CACHILDS\DESKTOP\11210029-MI.GPJ Library File: GHD_ENV\IRO_V02.GLB Report: OVERBURDEN LOG Date: 9/12/20



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: HIA
 PROJECT NUMBER: 11210029
 CLIENT: 2374868 Ontario Inc.
 LOCATION: Cambridge, Ontario

HOLE DESIGNATION: MW2-20
 DATE COMPLETED: 20 November 2020
 DRILLING METHOD: Sonic
 FIELD PERSONNEL: M. Waldick

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' Value	PID (ppm)
	NORTHING: 4810970.37 EASTING: 560486.2	TOP OF RISER GROUND SURFACE 320.15 319.50						
0.5	SAND, with gravel, trace silt and cobbles, fine to coarse grained, brown, moist			1		75		2.8
1.0				2		75		2.4
1.5				3		100		2.5
2.0	SAND AND GRAVEL, trace silt and cobbles, fine to coarse grained, brown, moist	317.36		4		100		3.2
2.5				5		100		3.1
3.0				6		100		4.9
3.5				7		100		4.3
4.0				8		100		4.3
4.5	SANDY SILT, with gravel, trace cobbles, fine to coarse grained, light brown, moist to dry	314.09						
5.0								
5.5								
6.0								
6.5								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 STATIC WATER LEVEL ▼ November 23, 2020

File: C:\USERS\CACHILDS\DESKTOP\11210029-MI.GPJ Library File: GHD_ENV\IRO_V02.GLB Report: OVERBURDEN LOG Date: 9/12/20



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: HIA
 PROJECT NUMBER: 11210029
 CLIENT: 2374868 Ontario Inc.
 LOCATION: Cambridge, Ontario

HOLE DESIGNATION: MW3-20
 DATE COMPLETED: 20 November 2020
 DRILLING METHOD: Sonic
 FIELD PERSONNEL: M. Waldick

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' Value	PID (ppm)
	NORTHING: 4811158.33 EASTING: 560405.03	TOP OF RISER GROUND SURFACE 323.19 322.50						
0.5	TOPSOIL, sand, silt, with gravel, fine to medium grained, brown, moist, rootlets	322.20		1	X	90		1.3
1.0	SANDY SILT, with gravel, trace cobbles, fine to medium grained, brown, moist			2	X	90		1.4
1.5				3	X	60		2.1
2.0				4	X	60		2.6
2.5				5	X	60		3.6
3.0				6	X	60		3.2
3.5				7	X	60		4.7
4.0				8	X	60		8.6
4.5	- increase in sand and gravel from 4.27 to 4.88m BGS							
5.0								
5.5								
6.0	CLAYEY SILT, with sand, trace gravel, hard, semi-plastic, grey-brown, moist	316.71						
6.5								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 STATIC WATER LEVEL ▼ November 23, 2020

File: C:\USERS\CACHILDS\DESKTOP\11210029-MI.GPJ Library File: GHD_ENV\IRO_V02.GLB Report: OVERBURDEN LOG Date: 9/12/20



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: HIA
 PROJECT NUMBER: 11210029
 CLIENT: 2374868 Ontario Inc.
 LOCATION: Cambridge, Ontario

HOLE DESIGNATION: MW3-20
 DATE COMPLETED: 20 November 2020
 DRILLING METHOD: Sonic
 FIELD PERSONNEL: M. Waldick

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' Value	PID (ppm)
7.5				9	X	100		11.3
8.0				10	X	100		12.9
8.5	SILTY SAND, with gravel, fine to coarse grained, brown, moist	313.97		11	X	100		11.1
9.0		313.36		12	X	100		5.8
9.5	SILT, and clay, with sand and gravel, hard, low plasticity, grey-brown, moist			13	X	100		5.5
10.0				14	X	100		5.9
10.5				15	X	100		7.2
11.0				16	X	100		6.0
11.5				17	X	100		4.6
12.0								
12.5								
13.0								
13.5								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 STATIC WATER LEVEL ▼ November 23, 2020

File: C:\USERS\CACHILDS\DESKTOP\11210029-MI.GPJ Library File: GHD_ENV\IRO_V02.GLB Report: OVERBURDEN LOG Date: 9/12/20



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: HIA
 PROJECT NUMBER: 11210029
 CLIENT: 2374868 Ontario Inc.
 LOCATION: Cambridge, Ontario

HOLE DESIGNATION: MW3-20
 DATE COMPLETED: 20 November 2020
 DRILLING METHOD: Sonic
 FIELD PERSONNEL: M. Waldick

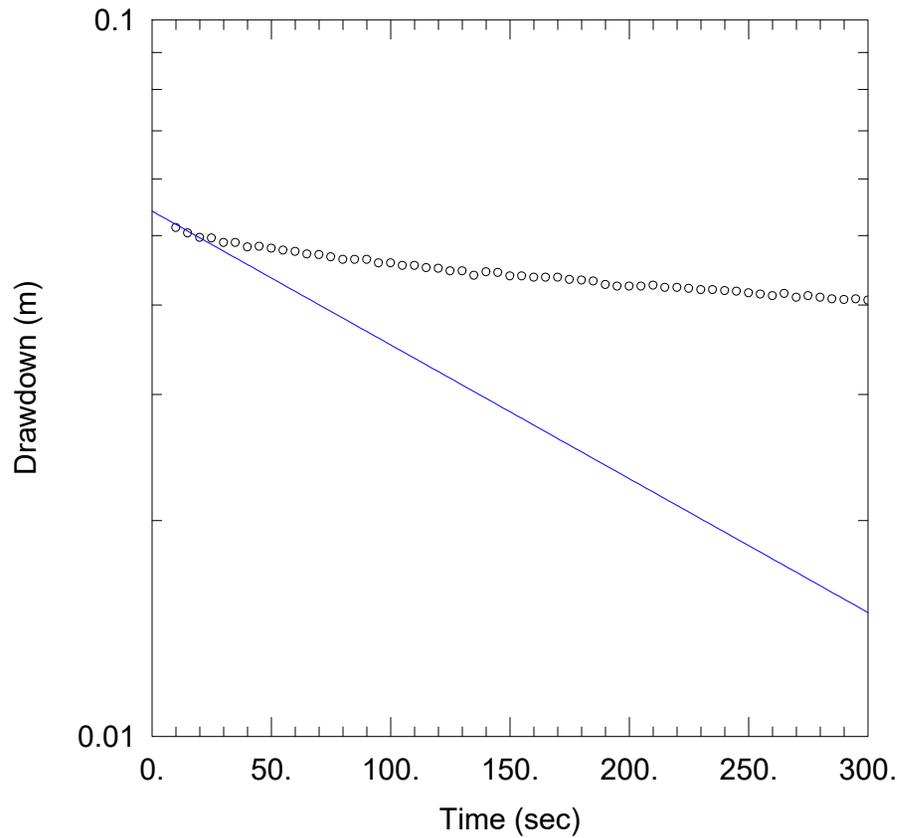
DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. BGS	MONITOR INSTALLATION	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' Value	PID (ppm)
14.5 15.0 15.5 16.0 16.5 17.0 17.5 18.0 18.5 19.0 19.5 20.0 20.5	 <p style="text-align: center;">END OF BOREHOLE @ 15.24m BGS</p> <p>Note: PID readings are reflective of background conditions</p>	307.26	 <p><u>WELL DETAILS</u> Screened interval: 311.23 to 308.18m AMSL 11.28 to 14.33m BGS Length: 3.05m Diameter: 51mm Slot Size: #10 Material: PVC Sand Pack: 315.95 to 308.18m AMSL 6.55 to 14.33m BGS Material: Silica</p>	18	X	100		7.7
				19	X	100		1.2

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 STATIC WATER LEVEL ▼ November 23, 2020

File: C:\USERS\CACHILDS\DESKTOP\11210029-MI.GPJ Library File: GHD_ENV\IRO_V02.GLB Report: OVERBURDEN LOG Date: 9/12/20

Appendix C

Hydraulic Conductivity Plots



FALLING HEAD 1

Data Set: C:\...\MW1-20-Falling1.aqt
 Date: 12/15/20 Time: 10:54:21

PROJECT INFORMATION

Company: GHD
 Client: 2374868 Ontario Inc.
 Project: 11210029
 Location: Cambridge, Ontario
 Test Well: MW1-20
 Test Date: December 1, 2020

SOLUTION

Aquifer Model: Unconfined
 Solution Method: Bouwer-Rice
 K = 0.0001332 cm/sec
 y0 = 0.05409 m

AQUIFER DATA

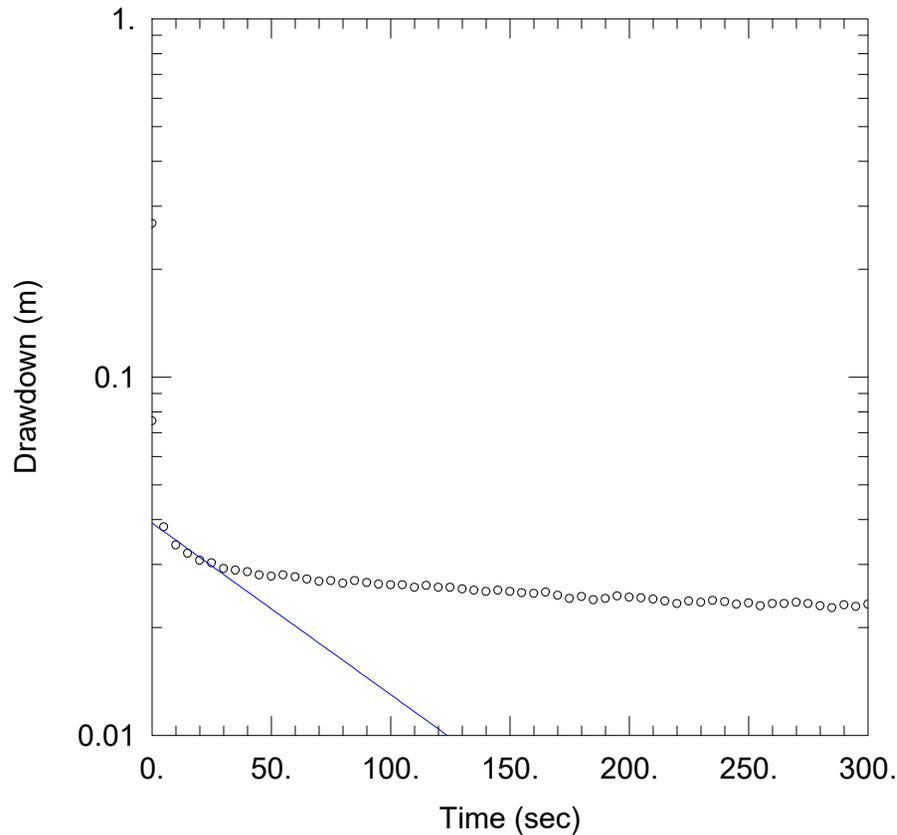
Saturated Thickness: 2.92 m

Anisotropy Ratio (Kz/Kr): 0.5

WELL DATA (MW1-20)

Initial Displacement: 0.3432 m
 Total Well Penetration Depth: 3.05 m
 Casing Radius: 0.0254 m

Static Water Column Height: 2.92 m
 Screen Length: 3.05 m
 Well Radius: 0.0762 m



RISING HEAD 1

Data Set: C:\...\MW1-20-Rising1.aqt
 Date: 12/15/20 Time: 10:50:02

PROJECT INFORMATION

Company: GHD
 Client: 2374868 Ontario Inc.
 Project: 11210029
 Location: Cambridge, Ontario
 Test Well: MW1-20
 Test Date: December 1, 2020

SOLUTION

Aquifer Model: Unconfined
 Solution Method: Bouwer-Rice
 $K = 0.0003417$ cm/sec
 $y_0 = 0.03914$ m

AQUIFER DATA

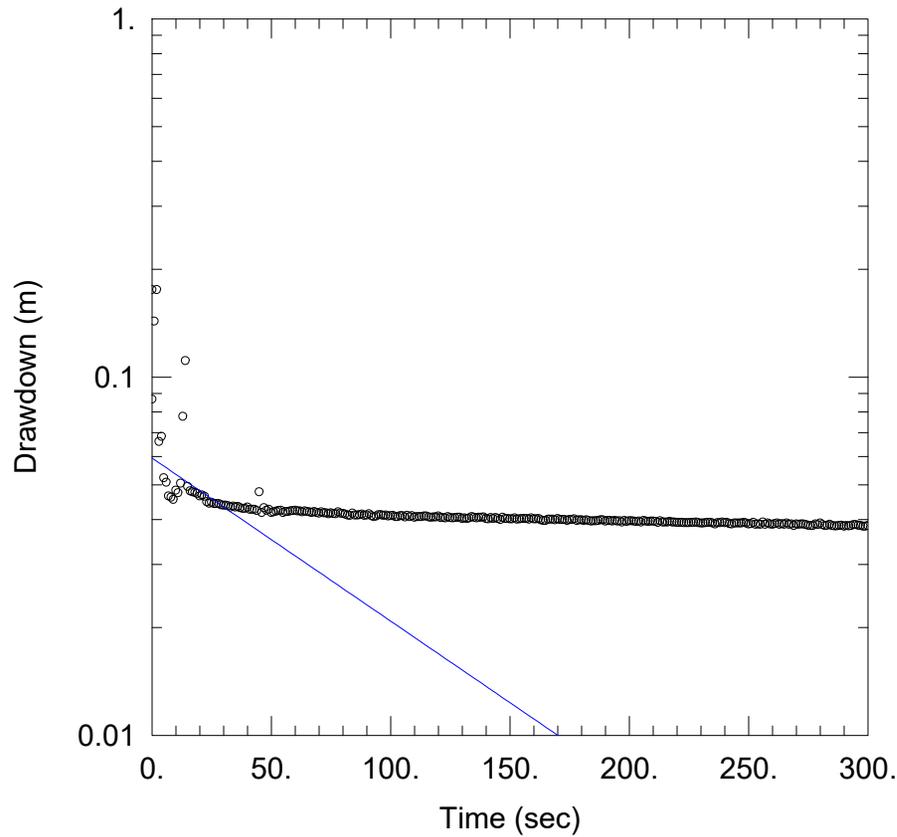
Saturated Thickness: 2.92 m

Anisotropy Ratio (K_z/K_r): 0.5

WELL DATA (MW1-20)

Initial Displacement: 0.2683 m
 Total Well Penetration Depth: 3.05 m
 Casing Radius: 0.0254 m

Static Water Column Height: 2.92 m
 Screen Length: 3.05 m
 Well Radius: 0.0762 m



RISING HEAD 2

Data Set: C:\...\MW1-20-Rising2.aqt
 Date: 12/15/20 Time: 10:51:25

PROJECT INFORMATION

Company: GHD
 Client: 2374868 Ontario Inc.
 Project: 11210029
 Location: Cambridge, Ontario
 Test Well: MW1-20
 Test Date: December 1, 2020

SOLUTION

Aquifer Model: Unconfined
 Solution Method: Bouwer-Rice
 $K = 0.0003247$ cm/sec
 $y_0 = 0.05943$ m

AQUIFER DATA

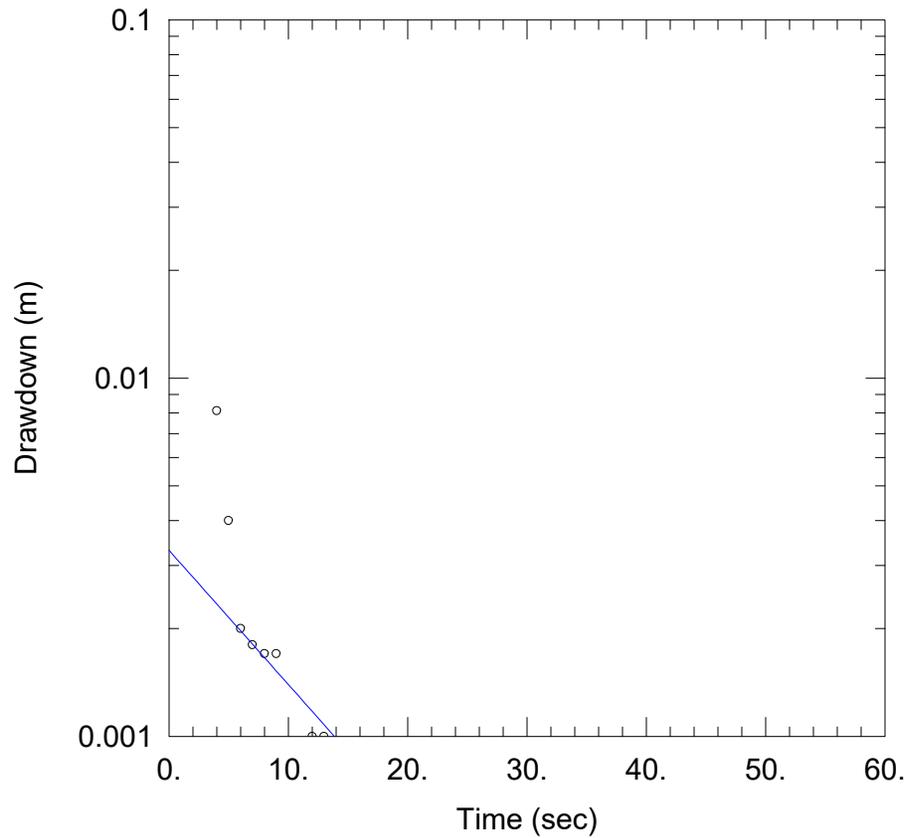
Saturated Thickness: 2.92 m

Anisotropy Ratio (K_z/K_r): 0.5

WELL DATA (MW1-20)

Initial Displacement: 0.1754 m
 Total Well Penetration Depth: 3.05 m
 Casing Radius: 0.0254 m

Static Water Column Height: 2.92 m
 Screen Length: 3.05 m
 Well Radius: 0.0762 m



FALLING HEAD 1

Data Set: C:\...\MW2-20-Falling1.aqt
 Date: 12/15/20 Time: 10:40:33

PROJECT INFORMATION

Company: GHD
 Client: 2374868 Ontario Inc.
 Project: 11210029
 Location: Cambridge, Ontario
 Test Well: MW2-20
 Test Date: December 1, 2020

SOLUTION

Aquifer Model: Unconfined
 Solution Method: Bouwer-Rice
 K = 0.003037 cm/sec
 y0 = 0.003305 m

AQUIFER DATA

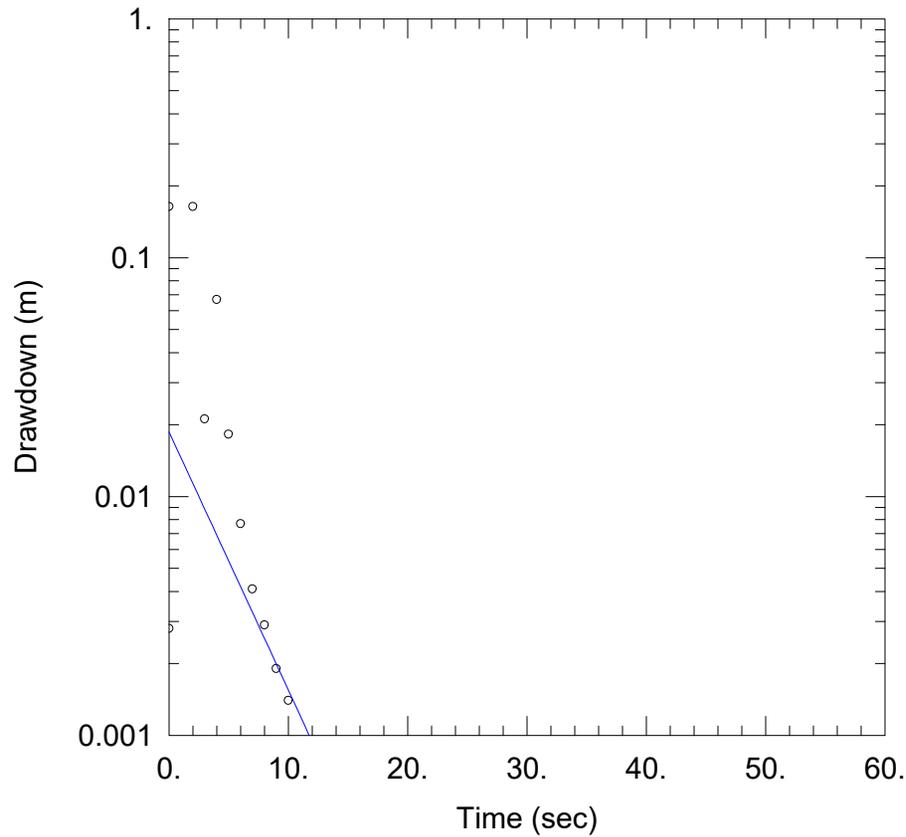
Saturated Thickness: 4.42 m

Anisotropy Ratio (Kz/Kr): 0.5

WELL DATA (MW2-20)

Initial Displacement: 0.2903 m
 Total Well Penetration Depth: 4.42 m
 Casing Radius: 0.0254 m

Static Water Column Height: 4.42 m
 Screen Length: 3.05 m
 Well Radius: 0.0762 m



RISING HEAD 1

Data Set: C:\...\MW2-20-Rising1.aqt
 Date: 12/15/20 Time: 10:46:21

PROJECT INFORMATION

Company: GHD
 Client: 2374868 Ontario Inc.
 Project: 11210029
 Location: Cambridge, Ontario
 Test Well: MW2-20
 Test Date: December 1, 2020

SOLUTION

Aquifer Model: Unconfined
 Solution Method: Bouwer-Rice
 $K = 0.008762$ cm/sec
 $y_0 = 0.01864$ m

AQUIFER DATA

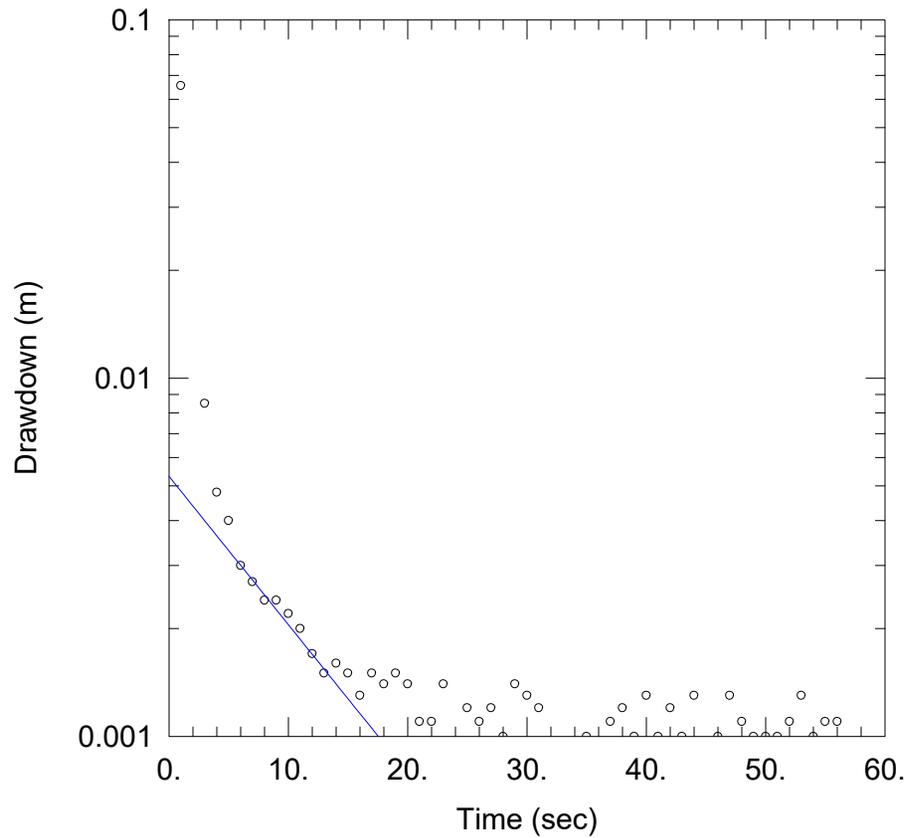
Saturated Thickness: 4.42 m

Anisotropy Ratio (K_z/K_r): 0.5

WELL DATA (MW2-20)

Initial Displacement: 0.1637 m
 Total Well Penetration Depth: 4.42 m
 Casing Radius: 0.0254 m

Static Water Column Height: 4.42 m
 Screen Length: 3.05 m
 Well Radius: 0.0762 m



FALLING HEAD 2

Data Set: C:\...\MW2-20-Falling2.aqt

Date: 12/15/20

Time: 10:44:11

PROJECT INFORMATION

Company: GHD

Client: 2374868 Ontario Inc.

Project: 11210029

Location: Cambridge, Ontario

Test Well: MW2-20

Test Date: December 1, 2020

SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 0.003352 cm/sec

y0 = 0.005314 m

AQUIFER DATA

Saturated Thickness: 4.42 m

Anisotropy Ratio (Kz/Kr): 0.5

WELL DATA (MW2-20)

Initial Displacement: 0.5797 m

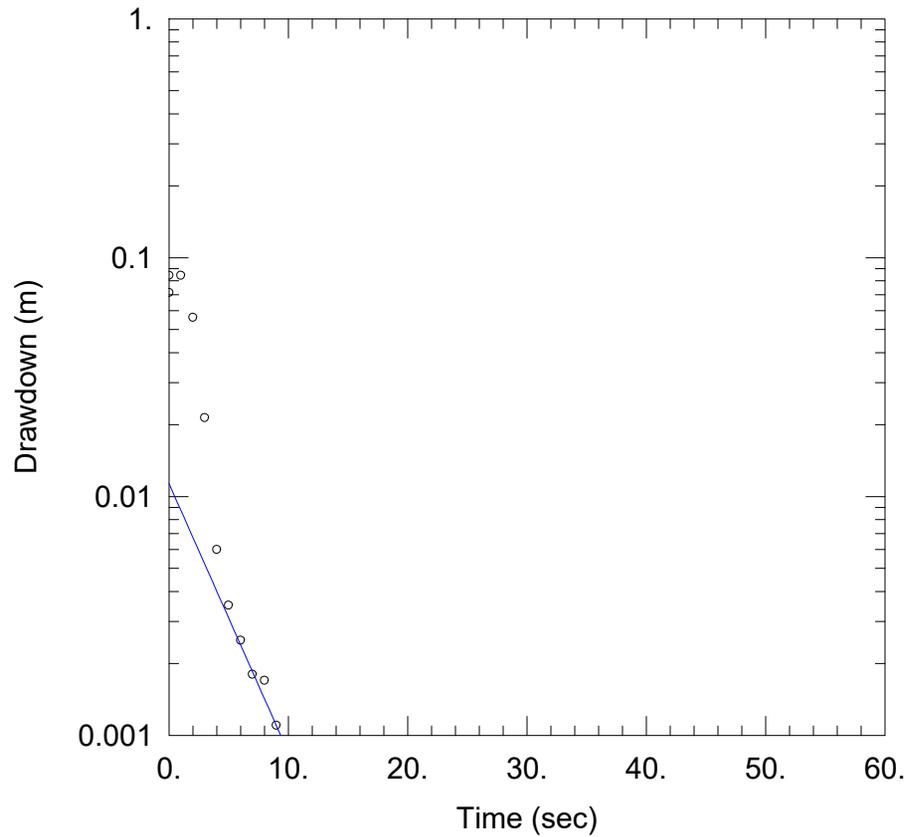
Total Well Penetration Depth: 4.42 m

Casing Radius: 0.0254 m

Static Water Column Height: 4.42 m

Screen Length: 3.05 m

Well Radius: 0.0762 m



RISING HEAD 2

Data Set: C:\...\MW2-20-Rising2.aqt
 Date: 12/15/20 Time: 10:47:38

PROJECT INFORMATION

Company: GHD
 Client: 2374868 Ontario Inc.
 Project: 11210029
 Location: Cambridge, Ontario
 Test Well: MW2-20
 Test Date: December 1, 2020

SOLUTION

Aquifer Model: Unconfined
 Solution Method: Bouwer-Rice
 K = 0.00913 cm/sec
 y0 = 0.01132 m

AQUIFER DATA

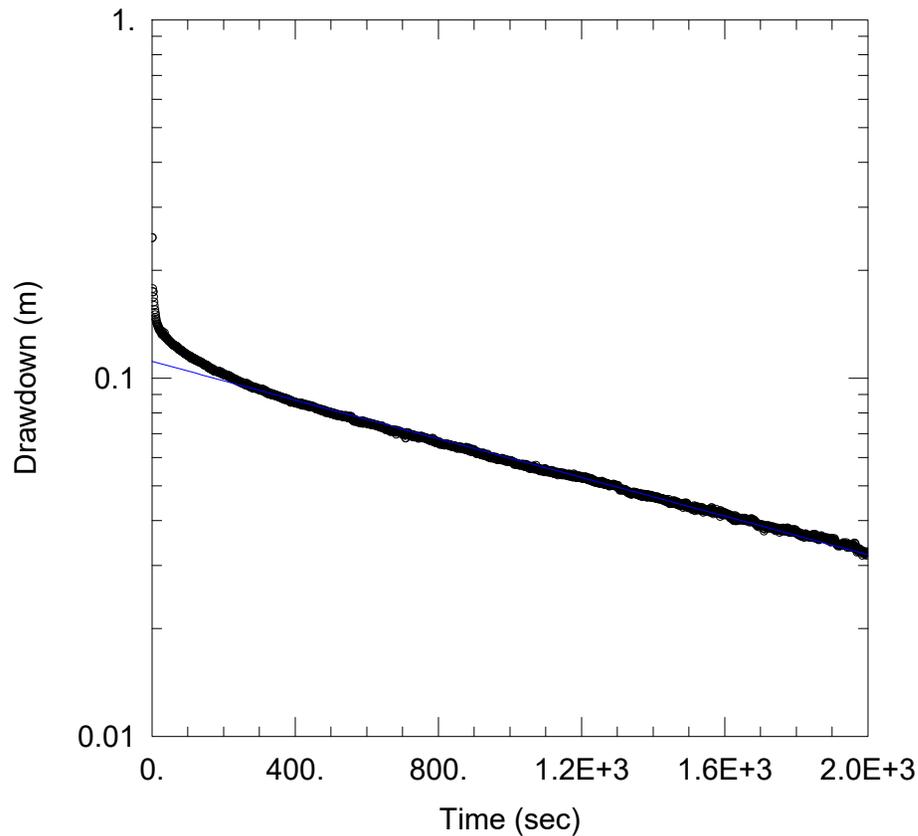
Saturated Thickness: 4.42 m

Anisotropy Ratio (Kz/Kr): 0.5

WELL DATA (MW2-20)

Initial Displacement: 0.0843 m
 Total Well Penetration Depth: 4.42 m
 Casing Radius: 0.0254 m

Static Water Column Height: 4.42 m
 Screen Length: 3.05 m
 Well Radius: 0.0762 m



FALLING HEAD 1

Data Set: C:\...\MW3-20-Falling1.aqt

Date: 12/15/20

Time: 10:29:03

PROJECT INFORMATION

Company: GHD

Client: 2374868 Ontario Inc.

Project: 11210029

Location: Cambridge, Ontario

Test Well: MW3-20

Test Date: December 1, 2020

SOLUTION

Aquifer Model: Unconfined

Solution Method: Bouwer-Rice

K = 2.484E-5 cm/sec

y0 = 0.1113 m

AQUIFER DATA

Saturated Thickness: 9.2 m

Anisotropy Ratio (Kz/Kr): 0.5

WELL DATA (MW3-20)

Initial Displacement: 0.2464 m

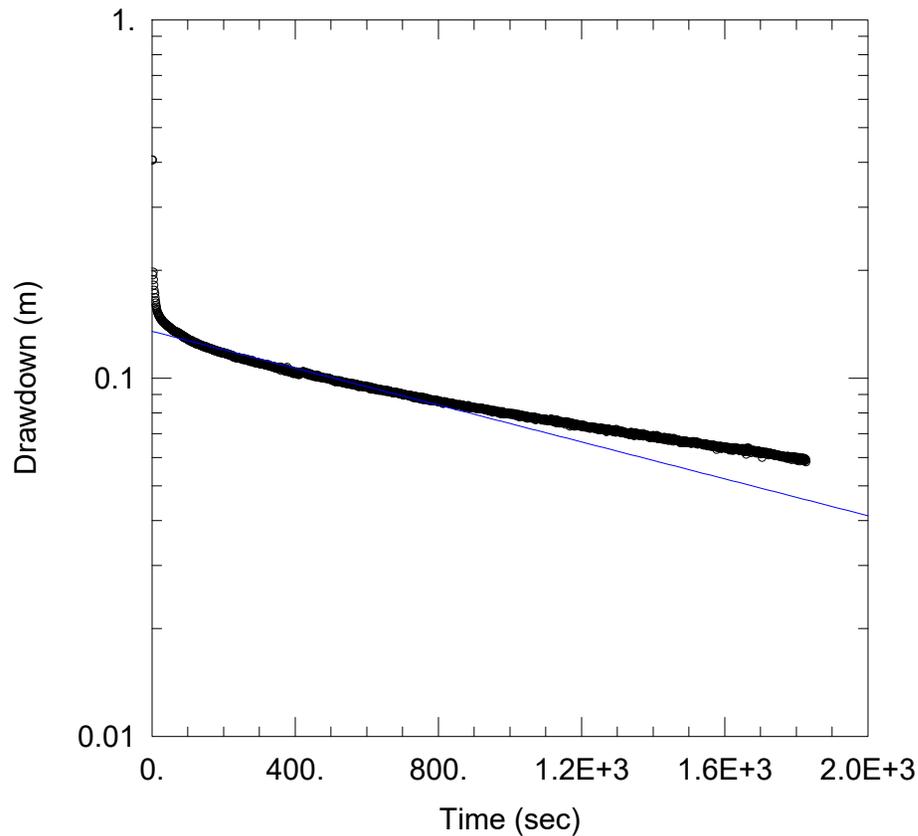
Total Well Penetration Depth: 9.2 m

Casing Radius: 0.0254 m

Static Water Column Height: 9.2 m

Screen Length: 3.05 m

Well Radius: 0.0762 m



RISING HEAD 1

Data Set: C:\...\MW3-20-Rising1.aqt
 Date: 12/15/20 Time: 10:29:52

PROJECT INFORMATION

Company: GHD
 Client: 2374868 Ontario Inc.
 Project: 11210029
 Location: Cambridge, Ontario
 Test Well: MW3-20
 Test Date: December 1, 2020

SOLUTION

Aquifer Model: Unconfined
 Solution Method: Bouwer-Rice
 $K = 2.368E-5$ cm/sec
 $y_0 = 0.1351$ m

AQUIFER DATA

Saturated Thickness: 9.2 m

Anisotropy Ratio (K_z/K_r): 0.5

WELL DATA (MW3-20)

Initial Displacement: 0.4056 m
 Total Well Penetration Depth: 9.2 m
 Casing Radius: 0.0254 m

Static Water Column Height: 9.2 m
 Screen Length: 3.05 m
 Well Radius: 0.0762 m

Appendix D

Water Well Inventory Report



September 18, 2020

Reference No. 11210029

Mr. Frank Ertl
Badger Daylighting and Hydrovac Services
6678 Wellington Road 34
Cambridge, Ontario
N3C 2V4

Dear Mr. Ertl:

**Re: Water Well Record Search Update
Badger Daylighting & Hydrovac Services
6678 Wellington Road 34, Cambridge, Ontario (Site or Facility)**

1. Introduction

GHD Limited (GHD) has prepared this letter to provide an update to our August 20, 2020 water well survey completed for the above-referenced Site. The original survey involved the identification of on-site wells and off-site wells within 200 metres (m) of the Site property boundary based on the Ontario Ministry of the Environment, Conservation, and Parks (MECP's) on-line Water Well Record Database (Water Well Database)¹. The well locations provided in the Water Well Database are commonly only estimated by MECP in their mapping and need to be verified by a site inspection. GHD conducted a Site inspection with Badger on August 27, 2020. This letter provides the updated well survey and updated recommendations based on the Site inspection and further review of the records.

2. Water Well Search

GHD completed a search of the Water Well Database in order to identify water well records in the database for the on-Site wells and wells located within a 200 m radius of the Site. The search identified 7 on-site well records and 10 off-site (within 200 m of the Property boundary) as documented in the August 20, 2020 letter.

On-Site Wells

During the Site inspection only 4 of the 7 on-site wells identified in the Water Well Database were determined to actually be located on the Property. The locations of the 4 on-site wells are shown on the updated Water Well Search provided as Figure 1. Tabulations of the available well information, including record number, type of well recorded or estimated northing and easting, installation/refurbishment dates, current status, type of well, total depth, and geology are provided in Table 1 (4 on-site wells) and Table 2 (13 off-site wells).

¹ <https://www.ontario.ca/environment-and-energy/map-well-records>



GHD also inspected 3 adjacent residential properties for wells without entering the properties. Based on the well log details and inspections it appears that 3 of 7 wells previously reported as on-site wells are most likely located on 3 residential properties adjacent to the Site. GHD also did not access other off-site properties to attempt to verify the information provide in the Water Well Database for the other 10 off-site wells identified in the August 20, 2020 letter. The updated information and description for each of the 4 on-site and 13 off-site wells located within 200 m of the Site are provided below.

2.1 On-Site Water Supply (Domestic/House) Well 6702342

This domestic well is located on the southwest corner of the Property and was installed in 1967 has a 5 inch diameter well. The well log indicates that the well was installed to a total depth of 28 m and was an open well (no slotted screen) in bedrock.

GHD believes that this well is the original well located in the well house next to Buck Off Stables. Further information provided in a newer well record from 2009 (7143739) indicates that a 5 inch well was abandoned. Well 6702342 is the only on-site well with a 5-inch diameter.

GHD believes that the original 1967 domestic well was abandoned in 2009 and is no longer present.

2.2 Water Supply (Livestock) Well 6705884

This livestock well was installed in 1975 as a 6-inch diameter well. The well log indicates that the well was installed to a total depth of 29.5m and was an open well (no slotted screen) in limestone.

The well is described as located in the center of the Property with "long lane, backs into farm building, and name on mailbox". Further information provided in newer well records from 2009 (7143739 and A0871817) indicates that a 6 inch well was extended up 2.4 m. Well 6705884 is the only on-site well with a 6-inch diameter.

GHD believes that this livestock well is located in the well house next to Buck Off Stables and is currently in use.

2.3 Water Supply (Domestic Well) 6706720

This domestic well was installed in 1978 and appears to be located on-site in the field north of the Badger operations. The well log indicates that the well was installed in 1978 to a total depth of 33.8 m and was an open well (no slotted screen) in gravel.

The sketch on the well log suggests that the MECP map is not accurate as the northing reference point provided on the well log is 4810980 which locates the well at the well house to west of the Badger operations.

GHD believes that this domestic well is located in the well house to the west of Badger operations and is currently used for Badger's operations.



2.4 Water Supply (Domestic) Well 6708332

This domestic well was installed in 1985 and appears to be located in the southeast corner of the Property. The well log indicates that the well was constructed to a total depth of 28 m and was an open well (no slotted screen) in limestone.

The well log says that the well was constructed for a new house, 200m off the road. Although most of the address is redacted, the information suggests that this well is located on concession 3, lot 7, whereas the Badger property is located on parcel 8.

GHD believes that this well is not located on the Property but is located on a separate property west of the Site and adjacent to Country Road 34.

2.5 Water Supply (Domestic Well) 6710346

This well domestic well was installed in 1990 and appears to be located at the north end of Property. The well log indicate that the well was constructed to a depth of 42.6m and was an open well (no slotted screen) in limestone.

Well log information also indicates that this well was constructed for a new house. Although most of the address is redacted, the information suggests that this well is located south of the Site adjacent to Wellington Road 34.

GHD believes that this domestic well is located on a separate residential property southwest of the Site at 6668 County Road 34.

2.6 Water Supply (Domestic Well) 6714539

This domestic well was installed in 2003 and appears to be located at the north end of Property. The well log indicates that this well was constructed to a depth of 28m and was an open well (no slotted screen) in packed gravel.

However, the well log includes an exact address and provides the distance between Wellington Road 34, to the well and to the dwelling.

GHD believes that this domestic well is located on a separate residential property southwest of the Site at 6670 County Road 34.

2.7 On-Site Well Summary

Based on the above information there are currently two active water supply wells on the property. Livestock well 6705884 which is located in the well house next to Buck Off Stables and domestic well 6706720 is located in the Badger well house.



2.8 Additional (Monitoring) Well

During the Site investigation, it also was determined that there also is a hydrogeological monitoring well located east of the main Badger building that is not included in the Water Well Database. The well has a stick up steel casing and a lock but it was not locked at the time of the inspection. It also has a label of BH—214 inside the well lid but no other identification. Well sampling tubing was present in the well at time of inspection. GHD's well depth measurement indicated that the total depth from top of casing was 10.64 m.

2.9 Off-Site Wells Located Within 200 m of Property Line

The 10 off-site wells located within 200 m of the Property boundary were reported in GHD's August 20, 2020 letter and are also located (according to the Water Well Database) as shown on Figure 1 and the well installation details are provided in Table 2.

2.10 Conclusions and Recommendations

Based on the water well record search, onsite investigation and conversations with Badger, the locations and other information for the on and off-site wells was corrected, as shown on Figure 1 and provided in Tables 1 and 2. GHD verified that there are 2 water supply wells on site that are in good working order. Badger has collected groundwater samples from the 2 wells three times each during July and August 2020. Chemical analyses have been completed at an accredited environmental analytical laboratory. The chemical analyses have been reviewed by GHD and reported to Badger (under separate cover). The analyses indicated that all sample results met MECP O. Reg. 153/04 Table 2 Standards ².

GHD recommends that the monitoring well be developed and sampled for chemical analysis at least once to complete the evaluation of Site groundwater quality based on existing wells.

Please contact the undersigned if you have any questions (Telephone: 519-340-4222 or at Email: fred.taylor@ghd.com).

Yours truly,

GHD

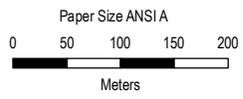
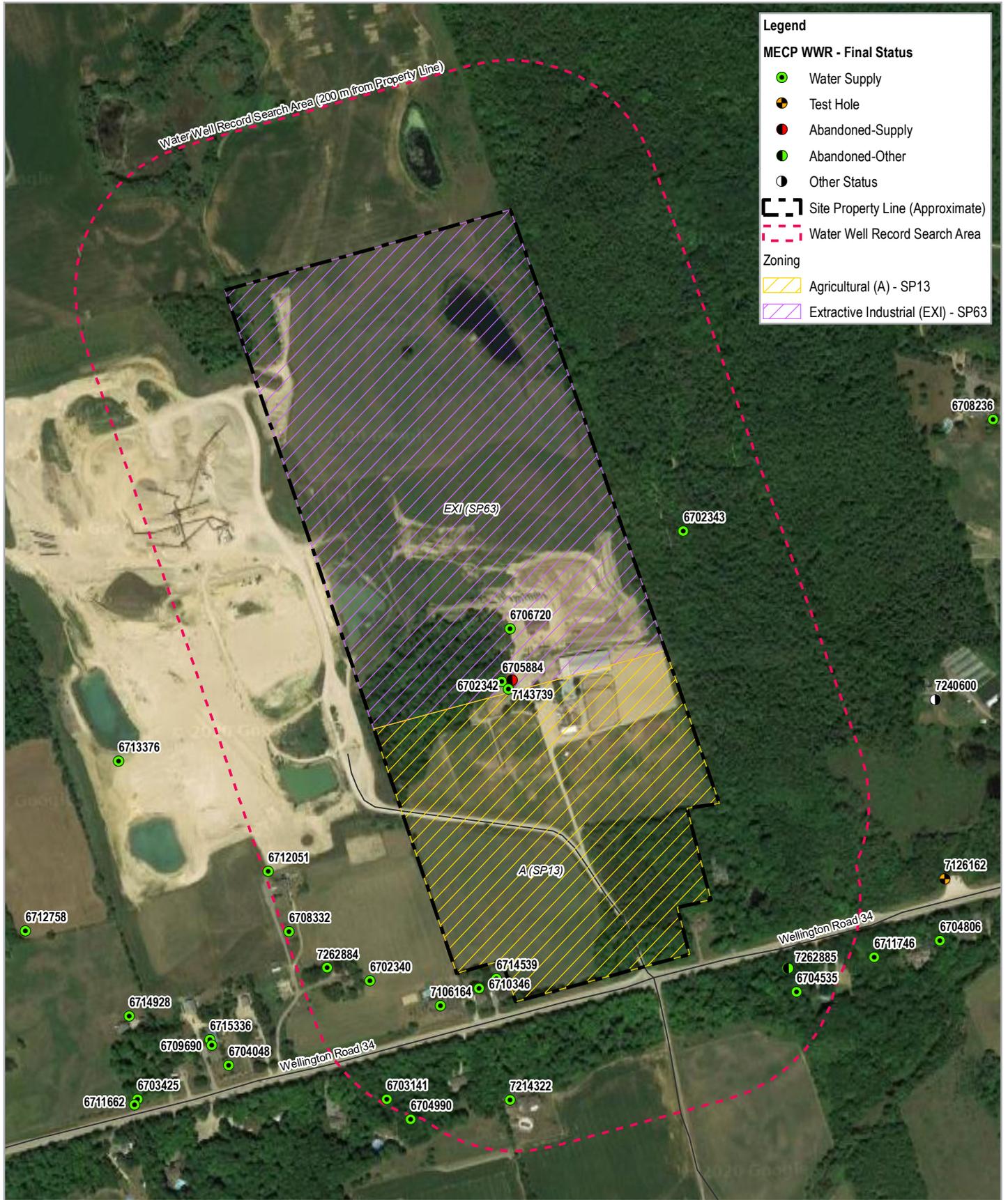


Fred K. Taylor, P. Eng.

FT/cb/

cc: Amelia Soutar, GHD

Encl.



BADGER CONESTOGA INC.
 6678 WELLINGTON ROAD 34
 CAMBRIDGE, ONTARIO

Project No. 11210029
 Revision No. -
 Date Sep 17, 2020

Map Projection: Transverse Mercator
 Horizontal Datum: North American 1983 CSRS
 Grid: NAD 1983 CSRS UTM Zone 17N

WATER WELL RECORD SEARCH

FIGURE 1

Data source: WWIS, 2020. Ontario Ministry of the Environment (Accessed August, 2020); Imagery Google 2020. Capture date: 7/Jul/2018

Well ID	Well Tag # (since 2003)	Depth (m)	Geology	Type of Well	Location	Installed	Refurbishment	Potable	Abandoned	Current Status
<u>On Site Wells</u>										
6702342	NA	29.3	Stones, sand, clay, bedrock	water supply domestic (house)	N/A	1967	N/A	Yes	No	Abandoned
6705884	NA	29.5	Clay, broken limestone, limestone	water supply (livestock)	Stable well house	1975	Yes	Yes	No	In use, well extended based on well record (7143739)
6706720	NA	33.8	Sand, gravel	water supply (domestic)	Badger well house	1978	N/A	Yes	No	In use
7143739	A087181	NA	N/A	Well record for abandonment and extension	N/A	2009	Yes	Yes	Yes	Well record of abandonment of 2 wells (dug well and 5 inch) and a well extension.
No Record	BH-214		Unknown	Monitoring		Unknown	Unknown	No	No	

Notes:

(1) Comments found on: <https://www.ontario.ca/environment-and-energy/map-well-records>
 NA - not available

Table 2

Well ID	Well Tag # (since 2003)	Depth (m)	Geology	Type of Well	Northing and Easting	Installed	Abandoned	Current Status
<u>Off Site Wells</u>								
6708332	NA	28.0	Gravel, sand, sly, limestone	water supply domestic	N/A	1985	no	Unknown
6710346	NA	42.6	Clay, sand, limestone	water supply domestic	N/A	1990	no	Unknown
6714539	NA	28.0	Top soil, clay, gravel	water supply domestic	N/A	2003	no	Unknown
6702340	NA	26.8	Gravel, clay, sand	water supply domestic	N/A	1950	N/A	Unknown
6702343	NA	38.4	Sand, gravel, rock	water supply domestic	N/A	1962	N/A	Unknown
6703141	NA	59.1	Sand, gravel, rock	water supply domestic	N/A	1968	N/A	Unknown
6704535	NA	50.9	Clay, gravel, rock	water supply domestic	N/A	1973	N/A	Unknown
6704990	NA	32.6	Clay, sand, gravel	water supply domestic	N/A	1974	N/A	Unknown
6712051	NA	33.8	Sand, clay, gravel	water supply domestic	N/A	1996	N/A	Unknown
7106164	A072033	31.1	Clay, sand, gravel, limestone	water supply domestic	N/A	2008	N/A	Unknown
7214322	A137700	41.8	Sand, gravel, limestone	water supply domestic	Easting: 560279 Northing: 4810368	2013	N/A	Unknown
7262884	A191498	38.1	Sand, Limestone	water supply domestic	Easting: 560039 Northing: 4810550	2016	no	Unknown
7262885	A087181	32.9	N/A	water supply domestic	Easting: 560654 Northing: 4810535	2016	yes	Well abandonment

Notes:

(1) Comments found on: <https://www.ontario.ca/environment-and-energy/map-well-records>
NA - not available

Attachment A



67 No 2342

UTM 11 U E

5 R N

The Ontario Water Resources Commission Act

Elev. 0 R 1050

WATER WELL RECORD

Basin 23 Wellington
County or District

Township, Village, Town or City *Puskech*

Con. 3 III Lot 8

Date completed 14 May 67
(day month year)

Owner [Redacted]
(print in block letters)

Address *474 Hwy Crescent
R.R # 2, Nepean, Goulph*

Casing and Screen Record

Pumping Test

Inside diameter of casing *6 1/4*
Total length of casing *92*
Type of screen *—*
Length of screen *—*
Depth to top of screen *—*
Diameter of finished hole *5 in*

Static level *33*
Test-pumping rate *20* G.P.M.
Pumping level *37*
Duration of test pumping *1 hr*
Water clear or cloudy at end of test *clear*
Recommended pumping rate *10* G.P.M.
with pump setting of *50 to 70* feet below ground surface

Well Log

Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
<i>stones and gravel</i>	<i>0</i>	<i>35</i>	<i>94</i>	<i>fresh</i>
<i>Sandy clay and small stones</i>	<i>35</i>	<i>85</i>		
<i>Sand and gravel</i>	<i>85</i>	<i>90</i>		
<i>Silty sand</i>	<i>90</i>	<i>92</i>		
<i>Rock</i>	<i>92</i>	<i>96</i>		

For what purpose(s) is the water to be used? *D. house*

Is well on upland, in valley, or on hillside? *upland*

Drilling or Boring Firm *W Pockhom*

Address *RR 2 Oneaster*

Licence Number *2498*

Name of Driller or Borer *W Pockhom*

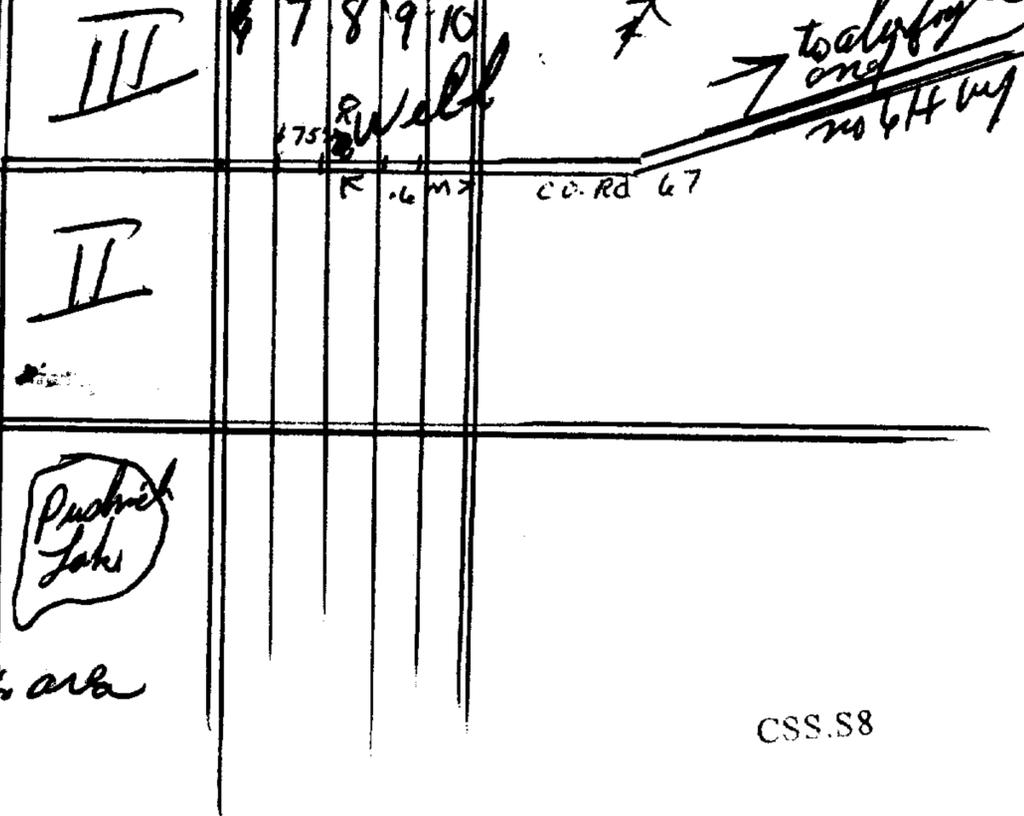
Address *RR 2 Oneaster*

Date *May 14/67*

[Redacted Signature]
(Signature of Licensed Drilling or Boring Contractor)

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Form 7 15M-60-4138 *125th N & SRd
NW side of county reformation area*

OWRC COPY

CSS.S8

40916W

17 5601010
5 9810150
5 71045



6703141-
3 9

DIVISION OF
WATER RESOURCES
JAN 9 1969
ONTARIO WATER
RESOURCES COMMISSION

The Ontario Water Resources Commission Act

WATER WELL RECORD

County or District **Wellington** Township, Village, Town or City
Con. **2** Lot **7** Date completed **4th December 1968**
(day month year)
Address **Guelph Ont. RR# 2 Hepler**

Casing and Screen Record
Inside diameter of casing **5 inch**
Total length of casing **111 ft**
Type of screen
Length of screen
Depth to top of screen
Diameter of finished hole **5 inch**

Pumping Test
Static level **42 ft**
Test-pumping rate **10** G.P.M.
Pumping level **60 ft**
Duration of test pumping **1/2 hr bailer test**
Water clear or cloudy at end of test **clear**
Recommended pumping rate **10** G.P.M.
with pump setting of **60** feet below ground surface

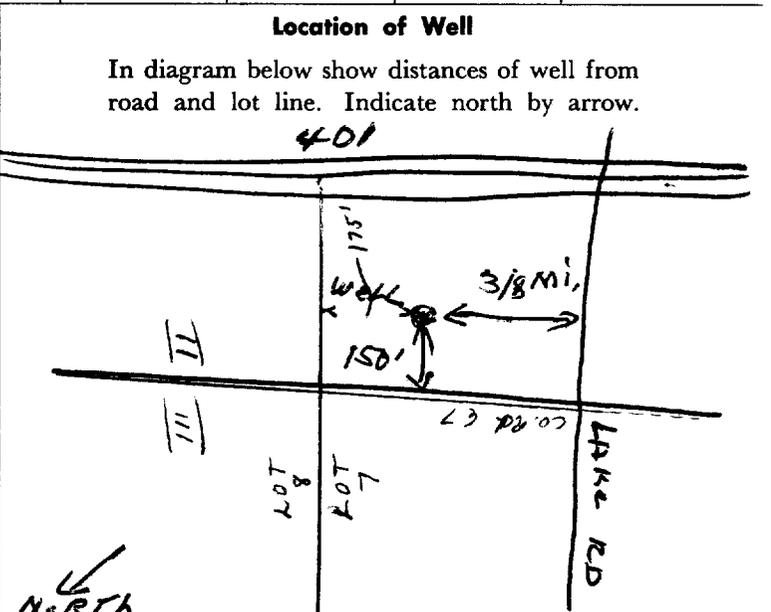
Well Log

Overburden and Bedrock Record	From ft.	To ft.
stones and gravel	0	48
clay and gravel	48	90
hard packed sand	90	111
brown rock	111	155
light grey rock	180	194

Water Record

Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
180 to 194	fresh

For what purpose(s) is the water to be used? **household**
Is well on upland, in valley, or on hillside? **hillside**
Drilling or Boring Firm **Graham Well Drilling**
mailing R 2 Guelph Ont.
Address
Licence Number **2855**
Name of Driller or Borer **Arthur Titus**
Address **25 Eramosa Rd. Guelph**
Date **December 4th 1968**
(Signature of Licensed Drilling or Boring Contractor)





WATER WELL RECORD

40 P/SW1

Water management in Ontario

1. PRINT ONLY IN SPACES PROVIDED

2. CHECK CORRECT BOX WHERE APPLICABLE

11
1 2

670 4535

MUNICIP 670.12

CON Cdn

02

COUNTY OR DISTRICT WELLINGTON	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE DUSLINC H	CON., BLOCK, TRACT, SURVEY, ETC. 2	LOT 25-27 009
DATE COMPLETED DAY 27 MO 01 YR 73			
22 Fairview or Preston			
1 10280	RC 4	ELEVATION 10.35	RC 5
24	25	26	30
BASIN CODE		23	

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
		well pit		0	5
Brown	Clay & Boulders			5	24
	sandy clay & boulders			24	87
	Cemented gravel				
	Rock			92	167

31	0005 23	0027 05 13	0067 06 26
32			

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
0160	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	14	
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	19	
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	24	
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	29	
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL		
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	34	
	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL	80	

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
05	1 <input checked="" type="checkbox"/> STEEL		0	93
	2 <input type="checkbox"/> GALVANIZED	244		0093
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			
17-18	1 <input type="checkbox"/> STEEL		93	0167
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			
24-25	1 <input type="checkbox"/> STEEL			27-30
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			

SCREEN

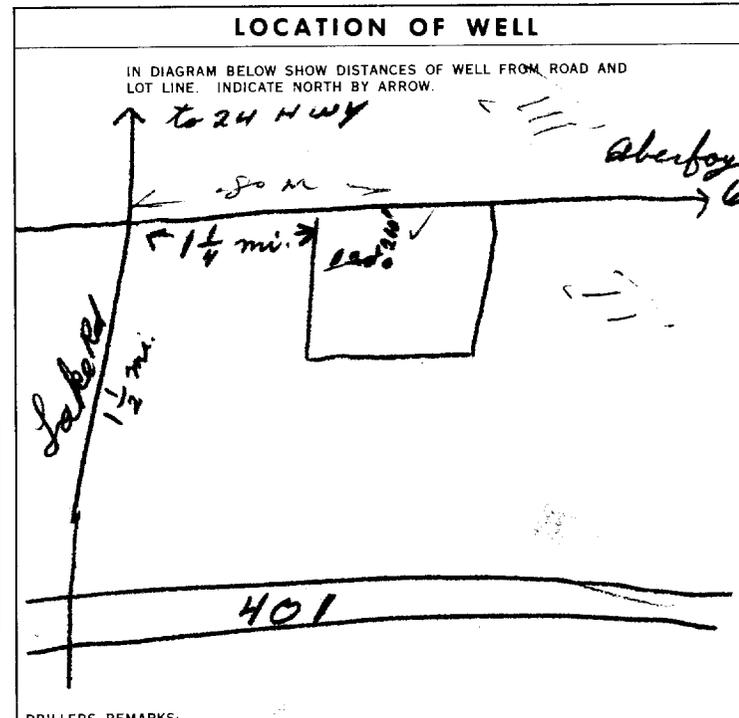
SIZE(S) OF OPENING (SLOT NO.)	31-33 DIAMETER	34-38 LENGTH	39-40
MATERIAL AND TYPE	INCHES		FEET
	DEPTH TO TOP OF SCREEN		41-44 80

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
FROM	TO	
10-13	14-17	
18-21	22-25	
26-29	30-33	80

71 PUMPING TEST

PUMPING TEST METHOD	10 PUMPING RATE	11-14 DURATION OF PUMPING
1 <input type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	0012	01 15-16 HOURS 30 MINS.
STATIC LEVEL	WATER LEVEL END OF PUMPING	25 WATER LEVELS DURING
032	038	15 MINUTES 26-28 003
		30 MINUTES 29-31 032
		45 MINUTES 32-34
		60 MINUTES 35-37
IF FLOWING, GIVE RATE	38-41 PUMP INTAKE SET AT	42 WATER AT END OF TEST
		1 <input type="checkbox"/> CLEAR 2 <input checked="" type="checkbox"/> CLOUDY
RECOMMENDED PUMP TYPE	RECOMMENDED PUMP SETTING	43-45 RECOMMENDED PUMPING RATE
<input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	080	0012
50-53 002.0 GPM./FT. SPECIFIC CAPACITY		



FINAL STATUS OF WELL

54	1 <input checked="" type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
	2 <input type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED, POOR QUALITY
	3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
	4 <input type="checkbox"/> RECHARGE WELL	

WATER USE

55-56	1 <input checked="" type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
	2 <input type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
	3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
	4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
	<input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED

METHOD OF DRILLING

57	1 <input checked="" type="checkbox"/> CABLE TOOL	6 <input type="checkbox"/> BORING
	2 <input type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND
	3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING
	4 <input type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING
	5 <input type="checkbox"/> AIR PERCUSSION	

CONTRACTOR NAME OF WELL CONTRACTOR Paul Weber	LICENCE NUMBER 5469
ADDRESS RR 2 Breslau	
NAME OF DRILLER OR BORE Clayton Shantz	LICENCE NUMBER
SIGNATURE OF CONTRACTOR	SUBMISSION DATE DAY 30 MO 1 YR 73

OFFICE USE ONLY	DATA SOURCE	58 CONTRACTOR 5469	59-62 DATE RECEIVED 020273	63-68 80
	DATE OF INSPECTION	INSPECTOR		
REMARKS:				P WI



Ontario

WATER WELL RECORD

409/87

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

6704990

MUNICIPALITY 1670124

CON. CDN

LOT 007

COUNTY OR DISTRICT Wellington	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE Puslinch	CON., BLOCK, TRACT, SURVEY, ETC. conc. 2	LOT 007
DATE COMPLETED DAY 14 MO 02 YR 74			

10 6704990	11 11	12 380151	13 4810122	14 4	15 1045	16 4	17 23	18 MAR 20,	19 1975	20 50
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LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	clay	stones		0	40
"	"	gravel		40	60
Dark brown-hardpan,	sand			60	90
"	"	coarse gravel		90	100
"	sand	gravel		100	106
		gravel		106	107
Total depth 107 ft.					

31 0040605/12	32 0060605/11	33 0090614/28	34 0100614/28/11	35 0100629/11	36 01017/11
-------------------------	-------------------------	-------------------------	----------------------------	-------------------------	-----------------------

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13 0107	<input checked="" type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
15-18	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
20-23	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
25-28	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL
30-33	<input type="checkbox"/> FRESH <input type="checkbox"/> SALTY <input type="checkbox"/> SULPHUR <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11 05	<input checked="" type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE	.188	0	106
17-18 05	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input checked="" type="checkbox"/> OPEN HOLE		106	0107
24-25	<input type="checkbox"/> STEEL <input type="checkbox"/> GALVANIZED <input type="checkbox"/> CONCRETE <input type="checkbox"/> OPEN HOLE			

SCREEN

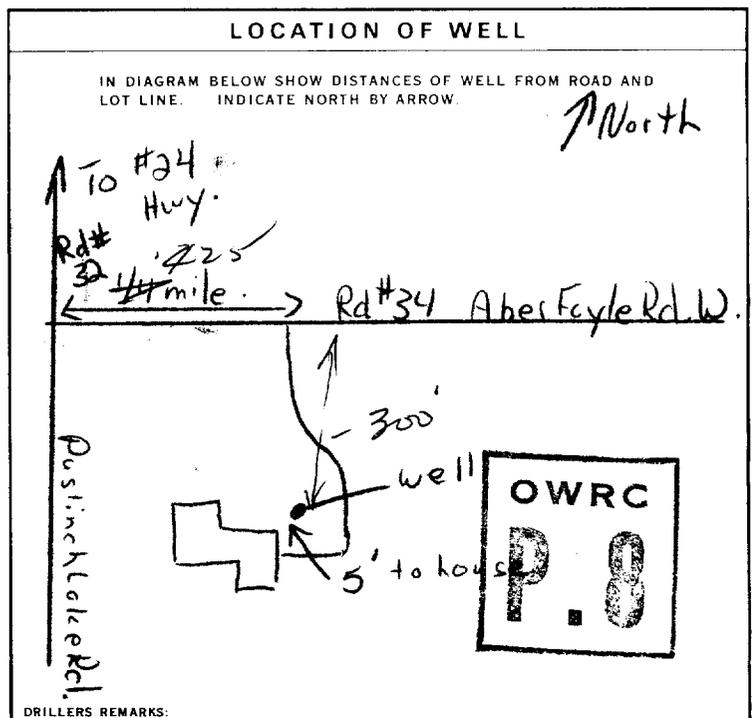
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN FEET	

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
FROM	TO
10-13	14-17
18-21	22-25
26-29	30-33

71 PUMPING TEST

PUMPING TEST METHOD <input type="checkbox"/> PUMP <input checked="" type="checkbox"/> BAILER	PUMPING RATE 0010 GPM	DURATION OF PUMPING 15-16 HOURS 00 MINS
STATIC LEVEL 040 FEET	WATER LEVEL END OF PUMPING 048 FEET	WATER LEVELS DURING
19-21	22-24	15 MINUTES 26-28
040 FEET	040 FEET	30 MINUTES 29-31
		45 MINUTES 32-34
		60 MINUTES 35-37
IF FLOWING GIVE RATE	PUMP INTAKE SET AT	WATER AT END OF TEST
	055 FEET	020 FEET
RECOMMENDED PUMP TYPE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING	RECOMMENDED PUMPING RATE
020/3	055 FEET	020 GPM



FINAL STATUS OF WELL

<input checked="" type="checkbox"/> WATER SUPPLY	<input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
<input type="checkbox"/> OBSERVATION WELL	<input type="checkbox"/> ABANDONED, POOR QUALITY
<input type="checkbox"/> TEST HOLE	<input type="checkbox"/> UNFINISHED
<input type="checkbox"/> RECHARGE WELL	

WATER USE

<input checked="" type="checkbox"/> DOMESTIC	<input type="checkbox"/> COMMERCIAL
<input type="checkbox"/> STOCK	<input type="checkbox"/> MUNICIPAL
<input type="checkbox"/> IRRIGATION	<input type="checkbox"/> PUBLIC SUPPLY
<input type="checkbox"/> INDUSTRIAL	<input type="checkbox"/> COOLING OR AIR CONDITIONING
<input type="checkbox"/> OTHER	<input type="checkbox"/> NOT USED

METHOD OF DRILLING

<input checked="" type="checkbox"/> CABLE TOOL	<input type="checkbox"/> BORING
<input type="checkbox"/> ROTARY (CONVENTIONAL)	<input type="checkbox"/> DIAMOND
<input type="checkbox"/> ROTARY (REVERSE)	<input type="checkbox"/> JETTING
<input type="checkbox"/> ROTARY (AIR)	<input type="checkbox"/> DRIVING
<input type="checkbox"/> AIR PERCUSSION	

CONTRACTOR

NAME OF WELL CONTRACTOR R.H. Graham Well Drilling	LICENCE NUMBER 2336
ADDRESS 212 Waverley Drive, GUELPH, Ont.	
NAME OF DRILLER OR BORER J. Hawkins	LICENCE NUMBER 22W71
SUBMISSION DATE DAY 21 MO 2 YR 74	

OFFICE USE ONLY

DATA SOURCE 1	CONTRACTOR 2336	DATE RECEIVED 2 30 74
DATE OF INSPECTION	INSPECTOR	
REMARKS:		



MINISTRY OF THE ENVIRONMENT
The Ontario Water Resources Act
WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

6705884-11 67012 CON 03

COUNTY OR DISTRICT: Killarney TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Kustinch 3 3 3
 DATE COMPLETED: 04-18-73 DAY: 01 MONTH: 04 YEAR: 73
 ELEVATION: 410720 BASIN CODE: 4 23 LOT: 008
 AUG 09, 1977 320

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	Dray Well			0	15
Grey	clay			15	45
Grey	clay Hardpan			45	77
Grey	Broken Limestone			77	79
Grey	Limestone			79	97

31 0015 23 0045205 007720514 007921571 0097215

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	14
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	19
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	24
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	29
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	4 <input type="checkbox"/> MINERAL	34-80

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
6 1/4	1 <input checked="" type="checkbox"/> STEEL	188	0	2079
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			
	1 <input type="checkbox"/> STEEL			20-23
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			
	1 <input type="checkbox"/> STEEL			27-30
	2 <input type="checkbox"/> GALVANIZED			
	3 <input type="checkbox"/> CONCRETE			
	4 <input type="checkbox"/> OPEN HOLE			

SCREEN

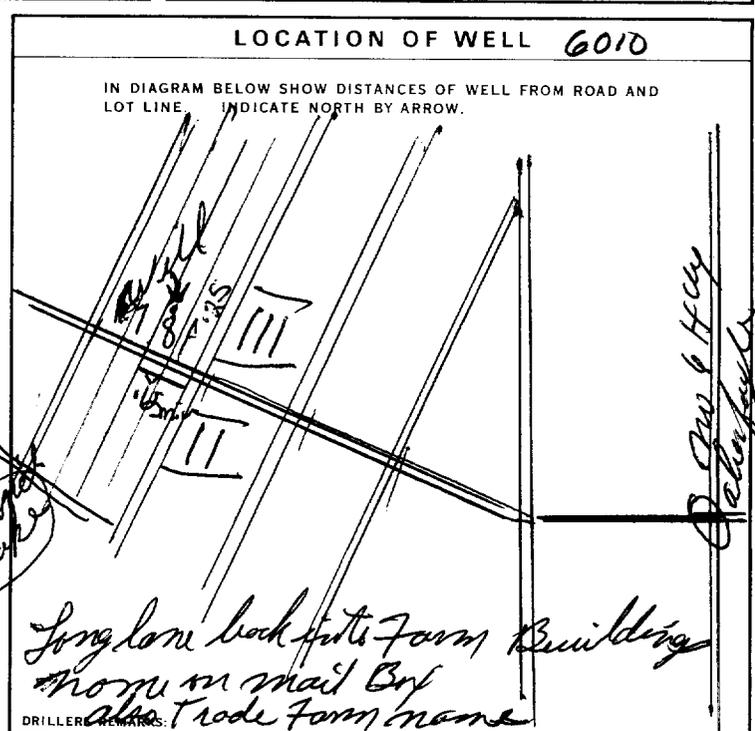
SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
	INCHES	FEET
MATERIAL AND TYPE		DEPTH TO TOP OF SCREEN
		41-44 80
		FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
FROM TO	
10-13 14-17	
18-21 22-25	
26-29 30-33 80	

71 PUMPING TEST

PUMPING TEST METHOD: 1 <input type="checkbox"/> PUMP 2 <input checked="" type="checkbox"/> BAILER	PUMPING RATE: 0007 GPM	DURATION OF PUMPING: 01 15-16 HOURS 00 17-18 MINS
STATIC LEVEL: 037 FEET	WATER LEVEL END OF PUMPING: 090 FEET	WATER LEVELS DURING:
19-21 037 FEET	22-24 047 FEET	15 MINUTES 30 MINUTES 45 MINUTES 60 MINUTES
IF FLOWING, GIVE RATE:	PUMP INTAKE SET AT: 080 FEET	WATER AT END OF TEST: 037 FEET
RECOMMENDED PUMP TYPE: <input checked="" type="checkbox"/> SHALLOW <input checked="" type="checkbox"/> DEEP	RECOMMENDED PUMP SETTING: 080 FEET	RECOMMENDED PUMPING RATE: 0007 GPM



FINAL STATUS OF WELL

1 <input checked="" type="checkbox"/> WATER SUPPLY	5 <input type="checkbox"/> ABANDONED, INSUFFICIENT SUPPLY
2 <input checked="" type="checkbox"/> OBSERVATION WELL	6 <input type="checkbox"/> ABANDONED, POOR QUALITY
3 <input type="checkbox"/> TEST HOLE	7 <input type="checkbox"/> UNFINISHED
4 <input type="checkbox"/> RECHARGE WELL	

WATER USE

1 <input type="checkbox"/> DOMESTIC	5 <input type="checkbox"/> COMMERCIAL
2 <input checked="" type="checkbox"/> STOCK	6 <input type="checkbox"/> MUNICIPAL
3 <input type="checkbox"/> IRRIGATION	7 <input type="checkbox"/> PUBLIC SUPPLY
4 <input type="checkbox"/> INDUSTRIAL	8 <input type="checkbox"/> COOLING OR AIR CONDITIONING
9 <input type="checkbox"/> OTHER	9 <input type="checkbox"/> NOT USED

METHOD OF DRILLING

1 <input checked="" type="checkbox"/> CABLE TOOL	6 <input type="checkbox"/> BORING
2 <input type="checkbox"/> ROTARY (CONVENTIONAL)	7 <input type="checkbox"/> DIAMOND
3 <input type="checkbox"/> ROTARY (REVERSE)	8 <input type="checkbox"/> JETTING
4 <input type="checkbox"/> ROTARY (AIR)	9 <input type="checkbox"/> DRIVING
5 <input type="checkbox"/> AIR PERCUSSION	

CONTRACTOR

NAME OF WELL CONTRACTOR: <u>Wesley Packham</u>	LICENCE NUMBER: <u>4208</u>
NAME OF DRILLER: <u>Wesley Packham</u>	LICENCE NUMBER: <u>4208</u>
SIGNATURE OF CONTRACTOR: <u>[Signature]</u>	SUBMISSION DATE: DAY <u>1</u> MO. <u>04</u> YR. <u>73</u>

OFFICE USE ONLY

DATA SOURCE: <u>1</u>	CONTRACTOR: <u>4208</u>	DATE RECEIVED: <u>300176</u>
DATE OF INSPECTION:	INSPECTOR:	
REMARKS:		
	CSS S8	WI



Ontario

WATER WELL RECORD

40 P/82

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11 6706720

MUNICIP. 67012

CON. CON

02

COUNTY OR DISTRICT: WELL Co. TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: PUSLINC H TWP CON., BLOCK, TRACT, SURVEY, ETC: CON. 2

DATE COMPLETED: 05 06 78

RC: 10980 ELEVATION: 4 1030 BASIN CODE: 4 23

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	GRAVEL	SAND	STONEY	0	15
	SAND			15	100
	GRAVEL		FINE	100	111

37 0015 11287 0190 28 0111 29

32

47 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-15	1 FRESH 3 <input type="checkbox"/> SULPHUR 2 SALTY 4 <input type="checkbox"/> MINERAL
15-18	1 FRESH 3 <input type="checkbox"/> SULPHUR 2 SALTY 4 <input type="checkbox"/> MINERAL
20-23	1 FRESH 3 <input type="checkbox"/> SULPHUR 2 SALTY 4 <input type="checkbox"/> MINERAL
25-28	1 FRESH 3 <input type="checkbox"/> SULPHUR 2 SALTY 4 <input type="checkbox"/> MINERAL
30-33	1 FRESH 3 <input type="checkbox"/> SULPHUR 2 SALTY 4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
04	STEEL	.188	0 911

SCREEN

SIZE(S) OF OPENING (SLOT NO.)	DIAMETER	LENGTH
	INCHES	FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE	(CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17	
18-21	22-25	
26-29	30-33	

77 PUMPING TEST

PUMPING TEST METHOD: 1 PUMP 2 BAILER

PUMPING RATE: 0010 GPM

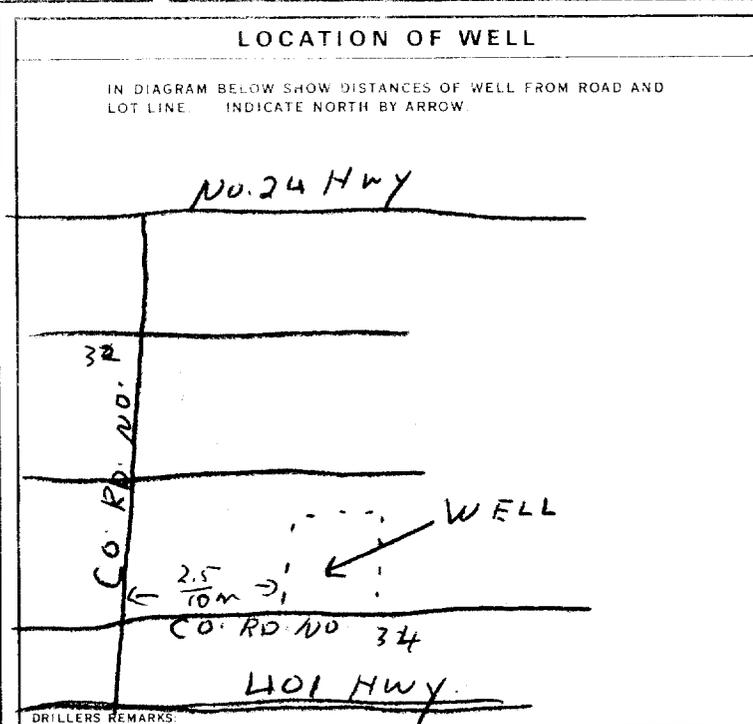
DURATION OF PUMPING: 03 HOUR

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING
048	050	15 MINUTES: 26-28 30 MINUTES: 29-31 45 MINUTES: 32-34 60 MINUTES: 35-37

RECOMMENDED PUMP TYPE: SHALLOW DEEP

RECOMMENDED PUMP SETTING: 060 FEET

RECOMMENDED PUMPING RATE: 0008 GPM



54 FINAL STATUS OF WELL: 1 WATER SUPPLY

55-56 WATER USE: 1 DOMESTIC

57 METHOD OF DRILLING: 1 CABLE TOOL

CONTRACTOR: HARVEY HILL WELL DRILLING

ADDRESS: RRI ELORA ONT.

LICENCE NUMBER: 2564

SIGNATURE OF CONTRACTOR: [Redacted]

SUBMISSION DATE: DAY MO. YR.

OFFICE USE ONLY

DATA SOURCE: 1

CONTRACTOR: 2564

DATE RECEIVED: 070778

DATE OF INSPECTION: April 1979

INSPECTOR: [Signature]

REMARKS:

CSS.S8

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Ministry of the Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

6708332

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

COUNTY OR DISTRICT: 21111 TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Paslinch CON. BLOCK, TRACT, SURVEY, ETC: III LOT: 7

DATE COMPLETED: DAY 30 MO Nov. YR 85

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	gravel	stone clay		0	30
Brown	sand	gravel clay		30	50
Gray	clay	sand gravel		50	80
Gray	limestone			80	92

31

32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER			
10-13 90	1 <input checked="" type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
15-18	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
20-23	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
25-28	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL
30-33	1 <input type="checkbox"/> FRESH	3 <input type="checkbox"/> SULPHUR	2 <input type="checkbox"/> SALTY	4 <input type="checkbox"/> MINERAL

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11 6 1/4	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE	188	0	80
17-18 6 1/2	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input checked="" type="checkbox"/> OPEN HOLE		80	92

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET		MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
FROM	TO	
10-13	14-17	
18-21	22-25	
26-29	30-33	80

71 PUMPING TEST

PUMPING TEST METHOD: 1 Air PUMP 2 BAILER

PUMPING RATE: 9 GPM

DURATION OF PUMPING: 1 HOURS 0 MINS

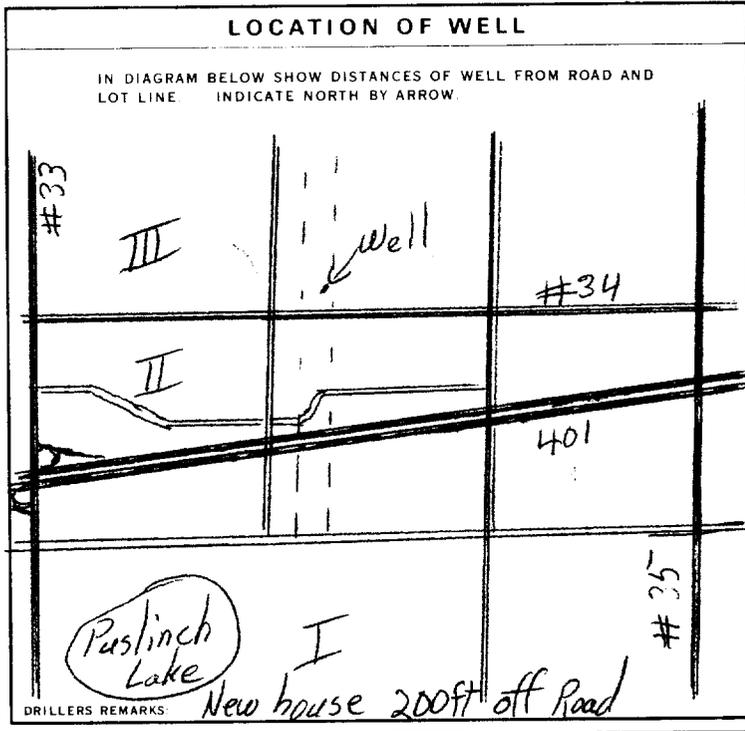
STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING			
19-21 34 FEET	22-24 92 FEET	15 MINUTES 26-28 40 FEET	30 MINUTES 29-31 35 FEET	45 MINUTES 32-34 35 FEET	60 MINUTES 35-37 34 FEET

IF FLOWING GIVE RATE: 38-41
PUMP INTAKE SET AT: 92 FEET

RECOMMENDED PUMP TYPE: SHALLOW DEEP

RECOMMENDED PUMP SETTING: 85 FEET

RECOMMENDED PUMPING RATE: 9 GPM



FINAL STATUS OF WELL

1 WATER SUPPLY
2 OBSERVATION WELL
3 TEST HOLE
4 RECHARGE WELL

5 ABANDONED, INSUFFICIENT SUPPLY
6 ABANDONED, POOR QUALITY
7 UNFINISHED

WATER USE

1 DOMESTIC
2 STOCK
3 IRRIGATION
4 INDUSTRIAL
5 OTHER

6 COMMERCIAL
7 MUNICIPAL
8 PUBLIC SUPPLY
9 COOLING OR AIR CONDITIONING
10 NOT USED

METHOD OF DRILLING

1 CABLE TOOL
2 ROTARY (CONVENTIONAL)
3 ROTARY (REVERSE)
4 ROTARY (AIR)
5 AIR PERCUSSION

6 BORING
7 DIAMOND
8 JETTING
9 DRIVING

CONTRACTOR

NAME OF WELL CONTRACTOR: Packham Well Drilling Inc. LICENCE NUMBER: 4207

ADDRESS: 1235 Trinity Rd. Ancaster Ont.

NAME OF DRILLER OR BORER: Mervyn Packham LICENCE NUMBER: 4207

SIGNATURE OF CONTRACTOR: _____

SUBMISSION DATE: DAY 30 MO Nov. YR 85

OFFICE USE ONLY

DATA SOURCE: _____ CONTRACTOR: _____ DATE RECEIVED: 13.01.86

DATE OF INSPECTION: _____ INSPECTOR: _____

REMARKS: _____

CSS.ES

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK CORRECT BOX WHERE APPLICABLE

11

6710346

MUNICIP 67012

CON. CON.

03

COUNTY OR DISTRICT: Wellington TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE: Pushinch CON. BLOCK, TRACT, SURVEY ETC: III LOT: 8 25-27

OWNER (SURNAME/FIRST): Van-Del Contracting LTD ADDRESS: RR#1 Breslau Ont NO B 1 MO DATE COMPLETED: DAY 8 MO May YR 90

21 ZONE EASTING NORTHING RC. ELEVATION RC. BASIN CODE

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
Brown	clay	gravel stones		0	5
Grey	clay	silt	soft	5	80
Grey	sand	silt clay		80	94
White	Limestone			94	140

31 32

41 WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
10-13 125	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
15-18 138	1 <input checked="" type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
20-23	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
25-28	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS
30-33	1 <input type="checkbox"/> FRESH 3 <input type="checkbox"/> SULPHUR 2 <input type="checkbox"/> SALTY 4 <input type="checkbox"/> MINERALS 6 <input type="checkbox"/> GAS

51 CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET	
			FROM	TO
10-11 6 1/4	1 <input checked="" type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC	188	0	97
17-18 6 1/8	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC		97	140
24-25	1 <input type="checkbox"/> STEEL 2 <input type="checkbox"/> GALVANIZED 3 <input type="checkbox"/> CONCRETE 4 <input type="checkbox"/> OPEN HOLE 5 <input type="checkbox"/> PLASTIC			

SCREEN

SIZE (S) OF OPENING (SLOT NO.)	DIAMETER INCHES	LENGTH FEET
31-33	34-38	39-40

MATERIAL AND TYPE: _____ DEPTH TO TOP OF SCREEN: 41-44 FEET

61 PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT LEAD PACKER, ETC.)
FROM	TO
10-13	14-17
18-21	22-25
26-28	30-33

71 PUMPING TEST

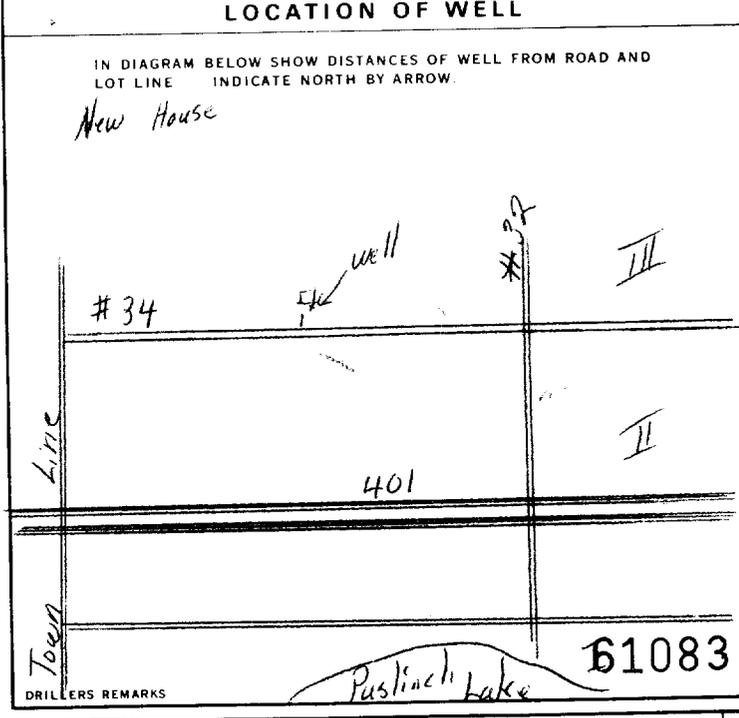
PUMPING TEST METHOD: 1 AIR PUMP 2 BAILER

PUMPING RATE: 100 GPM DURATION OF PUMPING: 15-16 HOURS 0 17-18 MINS

STATIC LEVEL	WATER LEVEL END OF PUMPING	WATER LEVELS DURING				
19-21	22-24	15 MINUTES	30 MINUTES	45 MINUTES	60 MINUTES	
37 FEET	140 FEET	37 FEET	37 FEET	37 FEET	37 FEET	

RECOMMENDED PUMP TYPE: SHALLOW DEEP

RECOMMENDED PUMP SETTING: 100 FEET RECOMMENDED PUMPING RATE: 20 GPM



FINAL STATUS OF WELL

1 WATER SUPPLY 5 ABANDONED, INSUFFICIENT SUPPLY
2 OBSERVATION WELL 6 ABANDONED, POOR QUALITY
3 TEST HOLE 7 UNFINISHED
4 RECHARGE WELL 8 DEWATERING

WATER USE

1 DOMESTIC 5 COMMERCIAL
2 STOCK 6 MUNICIPAL
3 IRRIGATION 7 PUBLIC SUPPLY
4 INDUSTRIAL 8 COOLING OR AIR CONDITIONING
9 NOT USED

METHOD OF CONSTRUCTION

1 CABLE TOOL 6 BORING
2 ROTARY (CONVENTIONAL) 7 DIAMOND
3 ROTARY (REVERSE) 8 JETTING
4 ROTARY (AIR) 9 DRIVING
5 AIR PERCUSSION DIGGING OTHER

CONTRACTOR

NAME OF WELL CONTRACTOR: Packham Well Drilling Inc. WELL CONTRACTOR'S LICENCE NUMBER: 4207

ADDRESS: RR#2 Cheaster Ont.

NAME OF WELL TECHNICIAN: Mervyn Packham WELL TECHNICIAN'S LICENCE NUMBER: 10058

SIGNATURE OF TECHNICIAN/CONTRACTOR: _____ SUBMISSION DATE: DAY 8 MO May YR 90

OFFICE USE ONLY

DATA SOURCE: _____ CONTRACTOR: 4207 DATE RECEIVED: JUN 26 1990

DATE OF INSPECTION: _____ INSPECTOR: _____

REMARKS: _____

CSS.ES

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

6712051

Municipality 67012 Con. 07
10 14 15 22 23 24

11
1 2

County or District [Redacted] Township/Borough/City/Town/Village PUSHWICH Con block tract survey, etc. 7 Lot 3
Address R.R. #22 Cambridge Date completed 06 08/96
day month year
Northing RC Elevation RC Basin Code

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)					
General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
	GRAVEL	SAND		0	20
	SAND		FINE	20	44
	GRAVEL	SAND		44	60
Brown	CLAY	SAND GRAVEL		60	106
	GRAVEL	SAND	FINE	106	111
	GRAVEL		CONCRETE	111	
TOTAL = 111					
6" CASING DRIVE SIDE					

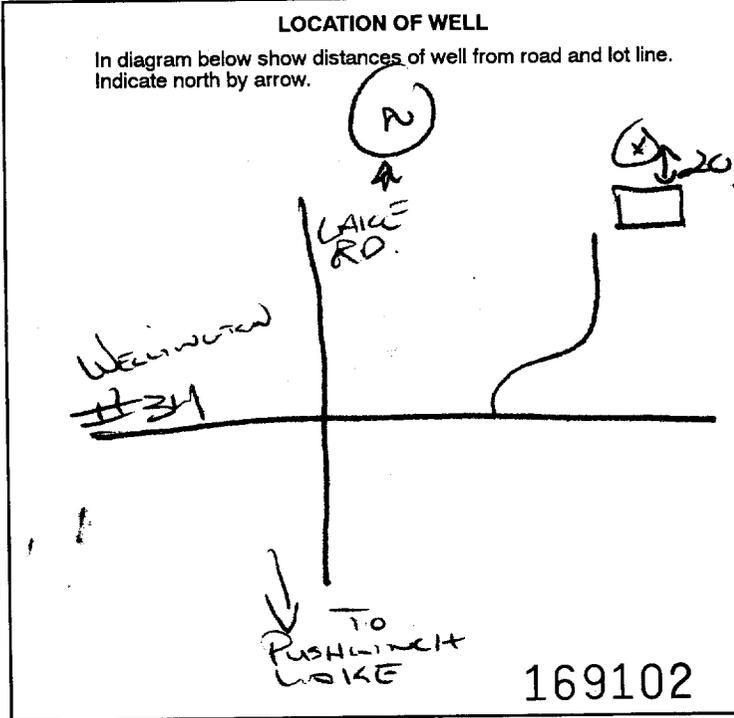
WATER RECORD			
Water found at - feet	Kind of water		
111	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals
	<input type="checkbox"/> Salty	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals
	<input type="checkbox"/> Salty	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals
	<input type="checkbox"/> Salty	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur	<input type="checkbox"/> Minerals
	<input type="checkbox"/> Salty	<input type="checkbox"/> Minerals	<input type="checkbox"/> Gas

CASING & OPEN HOLE RECORD				
Inside diam inches	Material	Wall thickness inches	Depth - feet	
			From	To
6"	Steel	1.00 + 2	111	
	Galvanized			
	Concrete			
	Open hole			
	Plastic			
	Steel			
	Galvanized			
	Concrete			
	Open hole			
	Plastic			
	Steel			
	Galvanized			
	Concrete			
	Open hole			
	Plastic			

SCREEN	Sizes of opening (Slot No.)	Diameter inches	Length feet
	Material and type		Depth at top of screen feet

PLUGGING & SEALING RECORD			
<input checked="" type="checkbox"/> Annular space		<input type="checkbox"/> Abandonment	
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
From	To		
0	20	BENSAC	
18	21		
27	25		
30	33		
33	33		

PUMPING TEST		PUMPING RATE		DURATION OF PUMPING	
<input type="checkbox"/> Pump	<input checked="" type="checkbox"/> Bail	20	GPM	1	Hours
Static level	Water level end of pumping	Water levels during Pumping		<input type="checkbox"/> Recovery	
59 feet	99 feet	15 minutes	30 minutes	45 minutes	60 minutes
		69 feet	79 feet	89 feet	99 feet
If flowing give rate	Pump intake set at	Water at end of test			
		<input checked="" type="checkbox"/> Clear <input type="checkbox"/> Cloudy			
Recommended pump type	Recommended pump setting	Recommended pump rate			
<input type="checkbox"/> Shallow <input checked="" type="checkbox"/> Deep	100 feet	20 GPM			



FINAL STATUS OF WELL			
<input checked="" type="checkbox"/> Water supply	<input type="checkbox"/> Abandoned, insufficient supply	<input type="checkbox"/> Unfinished	<input type="checkbox"/> Replacement well
<input type="checkbox"/> Observation well	<input type="checkbox"/> Abandoned, poor quality		
<input type="checkbox"/> Test hole	<input type="checkbox"/> Abandoned (Other)		
<input type="checkbox"/> Recharge well	<input type="checkbox"/> Dewatering		
WATER USE			
<input checked="" type="checkbox"/> Domestic	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used	
<input type="checkbox"/> Stock	<input type="checkbox"/> Municipal	<input type="checkbox"/> Other	
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Public supply		
<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling & air conditioning		
METHOD OF CONSTRUCTION			
<input type="checkbox"/> Cable tool	<input type="checkbox"/> Air percussion	<input type="checkbox"/> Driving	<input type="checkbox"/> Digging
<input type="checkbox"/> Rotary (conventional)	<input type="checkbox"/> Boring		
<input type="checkbox"/> Rotary (reverse)	<input type="checkbox"/> Diamond		
<input checked="" type="checkbox"/> Rotary (air)	<input type="checkbox"/> Jetting		

Name of Well Contractor <u>Steven New Drilling Ltd</u>	Well Contractor's Licence No. <u>2663</u>
Address <u>R.R. #5 GUYTON CANT.</u>	
Name of Well Technician <u>Devin Robinson</u>	Well Technician's Licence No. <u>7-0590</u>
Submission date <u>01 08/96</u>	

MINISTRY USE ONLY	Data source	Contractor 2663	Date received AUG 27 1996
	Date of inspection	Inspector	
	Remarks		

CSS/ES



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6714539

Municipality 67012

Con. CON 03

County of District, Township/Borough/City/Town/Village (RUSHING), Con. block tract survey, etc. (3), Lot (8), Address of Well Location (6670 Wellington Rd. #34), Date completed (25 07 03)

Zone, Easting, Northing, RC, Elevation, RC, Basin Code, ii, iii, iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions). Table with columns: General colour, Most common material, Other materials, General description, Depth - feet (From, To). Includes handwritten entries: Top Soil, SAND, SOFT, TOTAL = 92 FT, 6 1/4" CASING DRIVE SHAFT.

31, 32

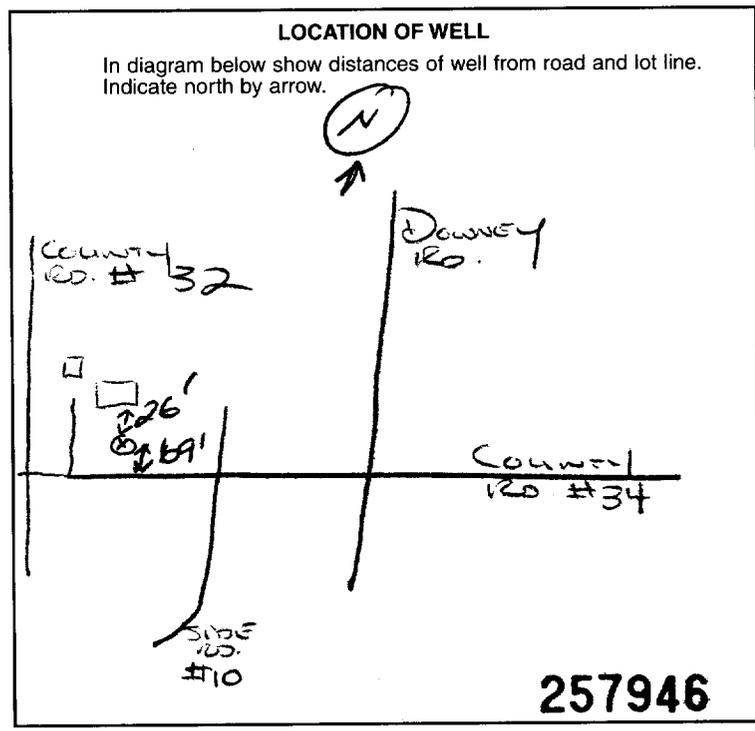
41 WATER RECORD. Table with columns: Water found at - feet, Kind of water (Fresh, Salty, Sulphur, Minerals, Gas).

51 CASING & OPEN HOLE RECORD. Table with columns: Inside diam inches, Material, Wall thickness inches, Depth - feet (From, To).

54 SIZES OF OPENING (Slot No.), Diameter, Length, Material and type, Depth at top of screen.

61 PLUGGING & SEALING RECORD. Table with columns: Depth set at - feet (From, To), Material and type (Cement grout, bentonite, etc.).

71 PUMPING TEST. Table with columns: Pumping test method, Pumping rate, Duration of pumping, Static level, Water level end of pumping, Water levels during, If flowing give rate, Recommended pump type, Recommended pump setting, Recommended pump rate.



FINAL STATUS OF WELL, WATER USE, METHOD OF CONSTRUCTION. Multiple choice sections for well status, use, and construction method.

Name of Well Contractor, Well Contractor's Licence No., Address, Name of Well Technician, Well Technician's Licence No., Signature of Technician/Contractor, Submission date.

MINISTRY USE ONLY. Data source, Contractor, Date received, Date of inspection, Inspector, Remarks.

Measurements recorded in: Metric Imperial

Page _____ of _____

A072033

Well Owner's Information

6666 WELL RD #34 RR#22
County/District/Municipality: WELLINGTON
City/Town/Village: ~~WATERLOO~~ CAMBRIDGE
Province: Ontario
Postal Code: _____
UTM Coordinates: Zone 17, Easting 560189, Northing 4810496
Municipal Plan and Sublot Number: _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)				
General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From To
BROWN	CLAY	STONES - SAND		0 18
BROWN	CLAY	SAND		18 45
BROWN	SAND			45 90
BROWN	SAND	GRAVEL		90 94
GREY	CLAY	GRAVEL		94 97
BROWN	LIMESTONE			97 102
TOTAL				102 FT

Annular Space		
Depth Set at (m/ft) From To	Type of Sealant Used (Material and Type)	Volume Placed (m ³ /ft ³)
0 20	BENTONITE SLURRY	

Results of Well Yield Testing				
After test of well yield, water was: <input checked="" type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
If pumping discontinued, give reason: Pump intake set at (m/ft): 80 FT Pumping rate (l/min / GPM): 12 GPM Duration of pumping: 1 hrs + 0 min Final water level end of pumping (m/ft): 43 FT If flowing give rate (l/min / GPM): _____ Recommended pump depth (m/ft): 80 FT Recommended pump rate (l/min / GPM): 12 GPM Well production (l/min / GPM): 12 GPM Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Static Level	35 FT		
	1	38	1	40
	2	40	2	38
	3	41	3	37
	4	41.6	4	36
	5	42.2	5	35
10	42.6	10	35	
15	43	15	35	
20	43	20	35	
25	43	25	35	
30	43	30	35	
40	43	40	35	
50	43	50	35	
60	43	60	35	

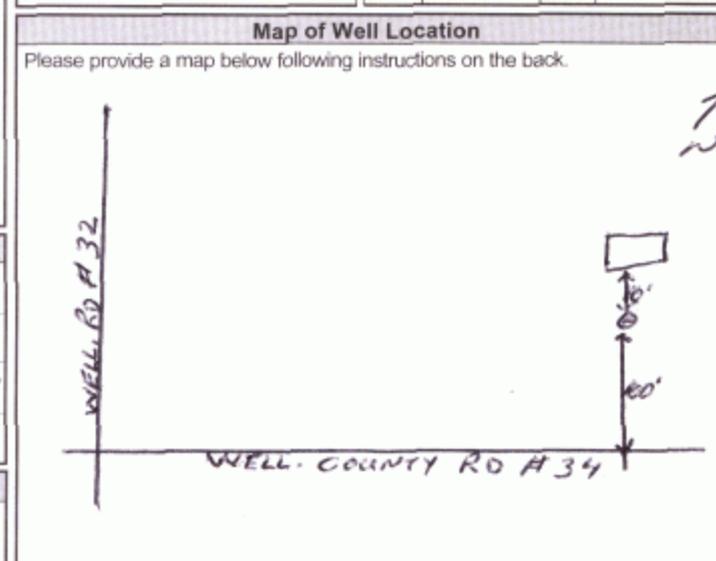
Method of Construction		Well Use	
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input checked="" type="checkbox"/> Domestic	<input type="checkbox"/> Municipal
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning
<input type="checkbox"/> Air percussion	<input type="checkbox"/> Industrial	<input type="checkbox"/> Other, specify _____	<input type="checkbox"/> Not used
<input checked="" type="checkbox"/> Other, specify AIR ROTARY			<input type="checkbox"/> Dewatering
			<input type="checkbox"/> Monitoring

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____
			From	To	
6 1/8	STEEL	.188	+2	98	
6 1/8	OPEN HOLE		98	102	

Construction Record - Screen				
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To

Water Details		Hole Diameter	
Water found at Depth: 102 (m/ft)	Kind of Water: <input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Untested	Depth (m/ft) From To	Diameter (cm/in)
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	0 20	8 3/4
Water found at Depth: _____ (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	20 102	6 1/8
	<input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____		

Well Contractor and Well Technician Information			
Business Name: JIM WILSON WELL DRILLING	Address: 2086 SHANTZ STN. RD	Well Contractor's Licence No.: 7385	Municipality: BRESLAU
Province: ON	Postal Code: N0B1M0	Business E-mail Address: _____	
Bus. Telephone No. (inc. area code): 5196482412	Name of Well Technician (Last Name, First Name): WILSON JIM		
Well Technician's Licence No.: T1924	Signature of Technician and/or Contractor: _____	Date Submitted: 20080529	



Ministry Use Only	
Audit No. Z 80621	Received JUN 09 2008
Well owner's information package delivered: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered: 20080505
	Date Work Completed: 20080505

Address of Well Location (Street Number/Name) **#6678 WILSON RD. #34 R2#22** Township **PURNELL** Lot **A 8** Concession **3**

County/District/Municipality **WILSON** City/Town/Village **PURNELL** Province **Ontario** Postal Code _____

UTM Coordinates Zone **83** Easting **12560290** Northing **4810922** Municipal Plan and Sublot Number _____ Other _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
				From To
	ABANDONMENT			
		GRAVEL		
		GRAVEL 6 YARDS		
		BENTONITE = 1850 LBS.		
			EXTENDED 6" WELL	
			8 FT	
			6 FT	
			36"	
			18 FT	
			8 FT	
			100 FT	
			#1 ABANDONED 6" WELL	
			#2 ABANDONED 5" WELL	

Annular Space		
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
From To		
#1 0 18	BENTONITE + GRAVEL (6" WELL)	
#2 -6 80	BENTONITE (5" WELL)	

Results of Well Yield Testing				
After test of well yield, water was:	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
<input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____				
If pumping discontinued, give reason:	Static Level			
	1		1	
Pump intake set at (m/ft)	2		2	
Pumping rate (l/min / GPM)	3		3	
Duration of pumping _____ hrs + _____ min	4		4	
Final water level end of pumping (m/ft)	5		5	
	10		10	
If flowing give rate (l/min / GPM)	15		15	
	20		20	
Recommended pump depth (m/ft)	25		25	
Recommended pump rate (l/min / GPM)	30		30	
Well production (l/min / GPM)	40		40	
	50		50	
Disinfected? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	60		60	

Method of Construction		Well Use	
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input type="checkbox"/> Domestic	<input type="checkbox"/> Municipal
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input type="checkbox"/> Test Hole
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Cooling & Air Conditioning
<input type="checkbox"/> Air percussion		<input type="checkbox"/> Industrial	
<input type="checkbox"/> Other, specify _____		<input type="checkbox"/> Other, specify _____	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input checked="" type="checkbox"/> Alteration (Construction) <input checked="" type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____
			From	To	

Construction Record - Screen		Water Details		Hole Diameter		
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested	Depth (m/ft)	
					From	To

Well Contractor and Well Technician Information

Business Name of Well Contractor **Hannon Well Drilling** Well Contractor's Licence No. **2663**

Business Address (Street Number/Name) **2663 GUY RD. #14652 WILSON** Municipality _____

Province **ONT.** Postal Code **N1H6S2** Business E-mail Address **hannonwelldrilling@bellnet.ca**

Bus. Telephone No. (inc. area code) **5197630239** Name of Well Technician (Last Name, First Name) **Hannon Harry**

Well Technician's Licence No. **2663** Signature of Technician and/or Contractor **[Signature]** Date Submitted **2009/12/15**

Map of Well Location

Please provide a map below following instructions on the back.

Comments: _____

Well owner's information package delivered	Date Package Delivered	Ministry Use Only	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	2009/1/17	Audit No.	Z 107698
		Date Work Completed	2009/1/17
		Registered	23 2010

Measurements recorded in: Metric Imperial

Well Location

Address of Well Location (Street Number/Name) **6669 COUNTY RD #34** Township **RUSLINCH TWP** Lot **8** Concession **2**
 County/District/Municipality **WELLINGTON** City/Town/Village _____ Province **Ontario** Postal Code _____
 UTM Coordinates Zone **18** Easting **317560279** Northing **4810368** Municipal Plan and Sublot Number _____ Other _____

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)	
				From	To
BROWN	SAND	STONES		0	51ft
BROWN	SAND			51	90
BROWN	SAND	GRAVEL	WET	90	97
BROWN	LIMESTONE		BROKEN / CLAY LAYERS	97	112
Grey	LIMESTONE		HARD	112	137ft

Annular Space

Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	20 GROUT	

Results of Well Yield Testing

After test of well yield, water was:	Draw Down		Recovery	
	Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
<input checked="" type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____				
If pumping discontinued, give reason:	Static Level	41ft		
Pump intake set at (m/ft)	1		1	
Pumping rate (l/min / GPM)	2		2	
40	3		3	
Duration of pumping	4		4	
1 hrs + min	5		5	
Final water level end of pumping (m/ft)	10		10	42
If flowing give rate (l/min / GPM)	15		15	
Recommended pump depth (m/ft)	20		20	41
75-80ft	25		25	
Recommended pump rate (l/min / GPM)	30		30	
15-20	40		40	
Well production (l/min / GPM)	50		50	
60+ AIR	60		60	41
Disinfected?				
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				

Method of Construction

Cable Tool Diamond Public Commercial Not used
 Rotary (Conventional) Jetting Domestic Municipal Dewatering
 Rotary (Reverse) Driving Livestock Test Hole Monitoring
 Boring Digging Irrigation Cooling & Air Conditioning
 Air percussion Industrial Other, specify _____
 Other, specify **Air-Dr**

Construction Record - Casing

Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		Status of Well
			From	To	
6"	STEEL	188	+2	102	<input checked="" type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____
6"	OPEN HOLE		102	137	

Construction Record - Screen

Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)	
			From	To
	N/A			

Water Details

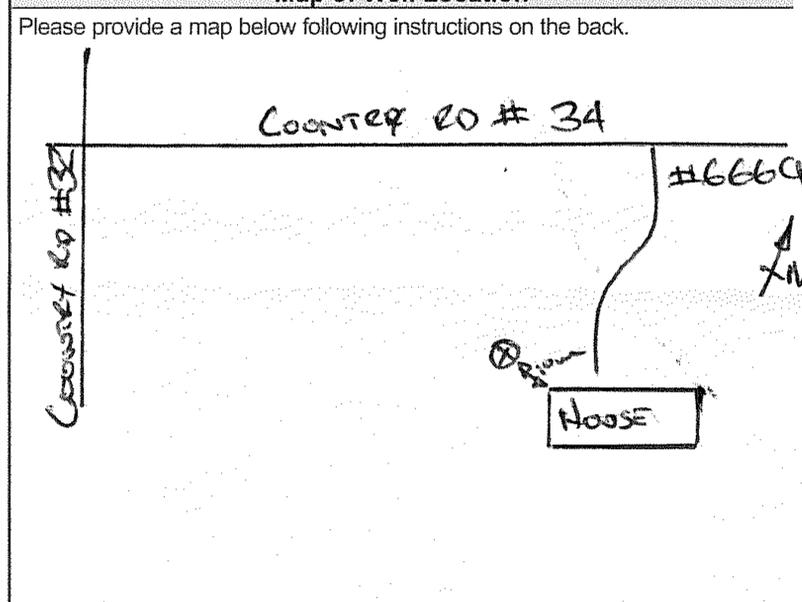
Water found at Depth (m/ft)	Kind of Water:	Hole Diameter	
		Depth (m/ft)	Diameter (cm/in)
105 (m/ft)	<input checked="" type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	From	To
131 (m/ft)	<input checked="" type="checkbox"/> Fresh <input checked="" type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	0	137
	<input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____		6"

Well Contractor and Well Technician Information

Business Name of Well Contractor **HIGHLAND WATER WELLS** Well Contractor's Licence No. **2576**
 Business Address (Street Number/Name) **Box 141, DURHAM** Municipality _____
 Province **ONT** Postal Code **N0G1R0** Business E-mail Address _____

Bus. Telephone No. (inc. area code) **5193696363** Name of Well Technician (Last Name, First Name) **ROBERTSON, NIKEL**
 Well Technician's Licence No. **2130** Signature of Technician and/or Contractor _____ Date Submitted **20130319**

Map of Well Location



Comments:

Well owner's information package delivered Yes No
 Date Package Delivered **Y Y Y Y M M D D**
 Date Work Completed **20130318**

Ministry Use Only
 Audit No. **2162250**
 Received **JAN 06 2014**

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the [Open Data catalogue](#).

[Go Back to Map](#)

Well ID

Well ID Number: 7262884
 Well Audit Number: Z226390
 Well Tag Number: A191498

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	6656 WELLINGTON RD 34
Township	PUSLINCH TOWNSHIP
Lot	007
Concession	CON 03
County/District/Municipality	WELLINGTON
City/Town/Village	Cambridge
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 560039.00 Northing: 4810550.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
	SAND			0 ft	17 ft
	SAND	GRVL		17 ft	30 ft
	SAND	GRVL	CLAY	30 ft	50 ft
BRWN	SAND			50 ft	60 ft

BRWN SAND
GREY LMSN

60 ft 101 ft
101 ft 125 ft

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	20 ft	BENTONITE SLURRY	

Method of Construction & Well Use

Method of Construction	Well Use
Other Method DUAL ROTARY	Domestic

Status of Well

Water Supply

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
6.125 inch	STEEL	-2 ft	103 ft

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To
------------------	----------	------------	----------

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7556

Results of Well Yield Testing

After test of well yield, water was	CLEAR
If pumping discontinued, give reason	
Pump intake set at	110 ft
Pumping Rate	12 GPM
Duration of Pumping	1 h:0 m

Final water level	38.333 ft
If flowing give rate	
Recommended pump depth	110 ft
Recommended pump rate	12 GPM
Well Production	
Disinfected?	Y

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL	38 ft		
1	38.333 ft	1	38.083 ft
2	38.333 ft	2	38 ft
3	38.333 ft	3	38 ft
4	38.333 ft	4	38 ft
5	38.333 ft	5	38 ft
10	38.333 ft	10	38 ft
15	38.333 ft	15	38 ft
20	38.333 ft	20	38 ft
25	38.333 ft	25	38 ft
30	38.333 ft	30	38 ft
40	38.333 ft	40	38 ft
45		45	
50	38.333 ft	50	38 ft
60	38.333 ft	60	38 ft

Water Details

Water Found at Depth	Kind
125 ft	Untested

Hole Diameter

Depth From	Depth To	Diameter
0 ft	20 ft	10 inch
20 ft	103 ft	6.625 inch
103 ft	125 ft	6 inch

Audit Number: Z226390

Date Well Completed: March 03, 2016

Date Well Record Received by MOE: May 11, 2016

Updated: January 24, 2020

Map: Well records

This map allows you to search and view well record information from reported wells in Ontario.

Full dataset is available in the [Open Data catalogue](#).

[Go Back to Map](#)

Well ID

Well ID Number: 7262885
 Well Audit Number: Z226388
 Well Tag Number:

This table contains information from the original well record and any subsequent updates.

Well Location

Address of Well Location	6656 WELL RD 34
Township	PUSLINCH TOWNSHIP
Lot	007
Concession	CON 03
County/District/Municipality	WELLINGTON
City/Town/Village	Cambridge
Province	ON
Postal Code	n/a
UTM Coordinates	NAD83 — Zone 17 Easting: 560654.00 Northing: 4810535.00
Municipal Plan and Sublot Number	
Other	

Overburden and Bedrock Materials Interval

General Colour	Most Common Material	Other Materials	General Description	Depth From	Depth To
----------------	----------------------	-----------------	---------------------	------------	----------

Annular Space/Abandonment Sealing Record

Depth From	Depth To	Type of Sealant Used (Material and Type)	Volume Placed
0 ft	108 ft	HOLEPLUG	

Method of Construction & Well Use

Method of Construction	Well Use
	Domestic

Status of Well

Abandoned-Other

Construction Record - Casing

Inside Diameter	Open Hole or material	Depth From	Depth To
4 inch	STEEL		

Construction Record - Screen

Outside Diameter	Material	Depth From	Depth To

Well Contractor and Well Technician Information

Well Contractor's Licence Number: 7556

Results of Well Yield Testing

After test of well yield, water was

If pumping discontinued, give reason

Pump intake set at

Pumping Rate

Duration of Pumping

Final water level

If flowing give rate

Recommended pump depth

Recommended pump rate

Well Production

Disinfected? Y

Draw Down & Recovery

Draw Down Time(min)	Draw Down Water level	Recovery Time(min)	Recovery Water level
SWL			
1		1	
2		2	
3		3	
4		4	
5		5	
10		10	
15		15	
20		20	
25		25	
30		30	
40		40	
45		45	
50		50	
60		60	

Water Details

Water Found at Depth	Kind
----------------------	------

Hole Diameter

Depth From	Depth To	Diameter
------------	----------	----------

Audit Number: Z226388

Date Well Completed: March 03, 2016

Date Well Record Received by MOE: May 12, 2016

Updated: January 24, 2020

Appendix E

Groundwater and Surface Water Quality Data



GHD Limited (Waterloo)
ATTN: Laura Ermeta
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 25-NOV-20
Report Date: 30-NOV-20 08:54 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2533335

Project P.O. #: 73522069
Job Reference: 11210029-02
C of C Numbers: 17-871527
Legal Site Desc:



Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-1 GW-11210029-112420-MW-2 Sampled By: CLIENT on 24-NOV-20 @ 11:25 Matrix: WATER							
Physical Tests							
Conductivity	0.864		0.0030	mS/cm		26-NOV-20	R5298244
pH	7.46		0.10	pH units		26-NOV-20	R5298244
Anions and Nutrients							
Chloride (Cl)	8.11		0.50	mg/L		27-NOV-20	R5299616
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		26-NOV-20	R5298560
Total Metals							
Aluminum (Al)-Total	0.0066		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Arsenic (As)-Total	0.00050		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Barium (Ba)-Total	0.0783		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Boron (B)-Total	0.068		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Cadmium (Cd)-Total	0.000101		0.0000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Calcium (Ca)-Total	93.7		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cobalt (Co)-Total	0.00159		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Copper (Cu)-Total	0.0180		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Iron (Fe)-Total	<0.010		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Lead (Pb)-Total	0.000270		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Lithium (Li)-Total	0.0026		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Magnesium (Mg)-Total	34.3		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Manganese (Mn)-Total	0.354		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-NOV-20	R5298809
Molybdenum (Mo)-Total	0.00114		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Nickel (Ni)-Total	0.00897		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Phosphorus (P)-Total	<0.050		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Potassium (K)-Total	63.2	DLHC	0.50	mg/L	26-NOV-20	26-NOV-20	R5298095
Rubidium (Rb)-Total	0.0104		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Selenium (Se)-Total	0.000119		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Silicon (Si)-Total	4.98		0.10	mg/L	26-NOV-20	27-NOV-20	R5298095
Silver (Ag)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Sodium (Na)-Total	6.57		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Strontium (Sr)-Total	0.156		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Sulfur (S)-Total	7.18		0.50	mg/L	26-NOV-20	27-NOV-20	R5298095
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Thallium (Tl)-Total	0.000112		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Thorium (Th)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Tin (Sn)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	26-NOV-20	27-NOV-20	R5298095

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-1 GW-11210029-112420-MW-2							
Sampled By: CLIENT on 24-NOV-20 @ 11:25							
Matrix: WATER							
Total Metals							
Tungsten (W)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Uranium (U)-Total	0.000608		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Vanadium (V)-Total	<0.00050		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Zinc (Zn)-Total	0.0251		0.0030	mg/L	26-NOV-20	27-NOV-20	R5298095
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					26-NOV-20	R5298103
Dissolved Metals Filtration Location	FIELD					26-NOV-20	R5297816
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Arsenic (As)-Dissolved	<1.0	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Barium (Ba)-Dissolved	78.5	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Boron (B)-Dissolved	<100	DLHC	100	ug/L	26-NOV-20	26-NOV-20	R5298475
Cadmium (Cd)-Dissolved	0.118	DLHC	0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Cobalt (Co)-Dissolved	1.6	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Copper (Cu)-Dissolved	17.1	DLHC	2.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	26-NOV-20	27-NOV-20	R5298836
Molybdenum (Mo)-Dissolved	1.02	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Nickel (Ni)-Dissolved	9.2	DLHC	5.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Selenium (Se)-Dissolved	<0.50	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Sodium (Na)-Dissolved	6920	DLHC	500	ug/L	26-NOV-20	26-NOV-20	R5298475
Thallium (Tl)-Dissolved	0.10	DLHC	0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Uranium (U)-Dissolved	0.61	DLHC	0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Zinc (Zn)-Dissolved	26	DLHC	10	ug/L	26-NOV-20	26-NOV-20	R5298475
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		25-NOV-20	R5297893
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	26-NOV-20	26-NOV-20	R5298859
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		27-NOV-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	26-NOV-20	26-NOV-20	R5298859
Volatile Organic Compounds							
Acetone	<30		30	ug/L		30-NOV-20	R5299578
Benzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Bromodichloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Bromoform	<5.0		5.0	ug/L		30-NOV-20	R5299578
Bromomethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Carbon tetrachloride	<0.20		0.20	ug/L		30-NOV-20	R5299578
Chlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-1 GW-11210029-112420-MW-2							
Sampled By: CLIENT on 24-NOV-20 @ 11:25							
Matrix: WATER							
Volatile Organic Compounds							
Dibromochloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Chloroform	<1.0		1.0	ug/L		30-NOV-20	R5299578
1,2-Dibromoethane	<0.20		0.20	ug/L		30-NOV-20	R5299578
1,2-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,3-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,4-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dichlorodifluoromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
1,1-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,2-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methylene Chloride	<5.0		5.0	ug/L		30-NOV-20	R5299578
1,2-Dichloropropane	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		30-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
n-Hexane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methyl Ethyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
Methyl Isobutyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
MTBE	<2.0		2.0	ug/L		30-NOV-20	R5299578
Styrene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Tetrachloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Toluene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichlorofluoromethane	<5.0		5.0	ug/L		30-NOV-20	R5299578
Vinyl chloride	<0.50		0.50	ug/L		30-NOV-20	R5299578
o-Xylene	<0.30		0.30	ug/L		30-NOV-20	R5299578
m+p-Xylenes	<0.40		0.40	ug/L		30-NOV-20	R5299578
Xylenes (Total)	<0.50		0.50	ug/L		30-NOV-20	
Surrogate: 4-Bromofluorobenzene	98.6		70-130	%		30-NOV-20	R5299578
Surrogate: 1,4-Difluorobenzene	100.7		70-130	%		30-NOV-20	R5299578
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		30-NOV-20	R5299578
F1-BTEX	<25		25	ug/L		30-NOV-20	
F2 (C10-C16)	<100		100	ug/L	25-NOV-20	26-NOV-20	R5298486

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-1 GW-11210029-112420-MW-2							
Sampled By: CLIENT on 24-NOV-20 @ 11:25							
Matrix: WATER							
Hydrocarbons							
F2-Naphth	<100		100	ug/L		30-NOV-20	
F3 (C16-C34)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
F3-PAH	<250		250	ug/L		30-NOV-20	
F4 (C34-C50)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
Total Hydrocarbons (C6-C50)	<370		370	ug/L		30-NOV-20	
Chrom. to baseline at nC50	YES				25-NOV-20	26-NOV-20	R5298486
Surrogate: 2-Bromobenzotrifluoride	91.8		60-140	%	25-NOV-20	26-NOV-20	R5298486
Surrogate: 3,4-Dichlorotoluene	81.5		60-140	%		30-NOV-20	R5299578
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Acenaphthylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)pyrene	<0.010		0.010	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(b)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(k)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Chrysene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluoranthene	0.031		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluorene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		27-NOV-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
2-Methylnaphthalene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Naphthalene	<0.050		0.050	ug/L	25-NOV-20	27-NOV-20	R5298949
Phenanthrene	0.024		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Pyrene	0.037		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Acenaphthene	84.3		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d12-Chrysene	90.5		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d8-Naphthalene	86.2		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Phenanthrene	93.9		60-140	%	25-NOV-20	27-NOV-20	R5298949
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
4-Chloroaniline	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2-Chlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dichlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
Diethylphthalate	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-1 GW-11210029-112420-MW-2 Sampled By: CLIENT on 24-NOV-20 @ 11:25 Matrix: WATER							
Semi-Volatile Organics							
Dimethylphthalate	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dimethylphenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrophenol	<1.0		1.0	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,6-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		27-NOV-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	25-NOV-20	27-NOV-20	R5298692
Pentachlorophenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
Phenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2-Fluorobiphenyl	85.1		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: Nitrobenzene d5	94.5		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: p-Terphenyl d14	105.6		60-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2,4,6-Tribromophenol	115.1		50-140	%	25-NOV-20	27-NOV-20	R5298692
L2533335-2 GW-11210029-112420-MW-2D Sampled By: CLIENT on 24-NOV-20 @ 11:30 Matrix: WATER							
Physical Tests							
Conductivity	0.867		0.0030	mS/cm		26-NOV-20	R5299316
pH	7.68		0.10	pH units		26-NOV-20	R5299316
Anions and Nutrients							
Chloride (Cl)	8.00		0.50	mg/L		27-NOV-20	R5299616
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		26-NOV-20	R5298560
Total Metals							
Aluminum (Al)-Total	0.0064		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Arsenic (As)-Total	0.00050		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Barium (Ba)-Total	0.0774		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Boron (B)-Total	0.070		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Cadmium (Cd)-Total	0.000102		0.0000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Calcium (Ca)-Total	95.4		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cobalt (Co)-Total	0.00163		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Copper (Cu)-Total	0.0175		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Iron (Fe)-Total	<0.010		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Lead (Pb)-Total	0.000171		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-2 GW-11210029-112420-MW-2D Sampled By: CLIENT on 24-NOV-20 @ 11:30 Matrix: WATER							
Total Metals							
Lithium (Li)-Total	0.0027		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Magnesium (Mg)-Total	34.6		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Manganese (Mn)-Total	0.357		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-NOV-20	R5298809
Molybdenum (Mo)-Total	0.00111		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Nickel (Ni)-Total	0.00919		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Phosphorus (P)-Total	<0.050		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Potassium (K)-Total	63.7	DLHC	0.50	mg/L	26-NOV-20	26-NOV-20	R5298095
Rubidium (Rb)-Total	0.0105		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Selenium (Se)-Total	0.000125		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Silicon (Si)-Total	4.96		0.10	mg/L	26-NOV-20	27-NOV-20	R5298095
Silver (Ag)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Sodium (Na)-Total	6.78		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Strontium (Sr)-Total	0.155		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Sulfur (S)-Total	7.08		0.50	mg/L	26-NOV-20	27-NOV-20	R5298095
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Thallium (Tl)-Total	0.000113		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Thorium (Th)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Tin (Sn)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	26-NOV-20	27-NOV-20	R5298095
Tungsten (W)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Uranium (U)-Total	0.000609		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Vanadium (V)-Total	<0.00050		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Zinc (Zn)-Total	0.0253		0.0030	mg/L	26-NOV-20	27-NOV-20	R5298095
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					26-NOV-20	R5298103
Dissolved Metals Filtration Location	FIELD					26-NOV-20	R5297816
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Arsenic (As)-Dissolved	<1.0	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Barium (Ba)-Dissolved	78.5	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Boron (B)-Dissolved	<100	DLHC	100	ug/L	26-NOV-20	26-NOV-20	R5298475
Cadmium (Cd)-Dissolved	0.139	DLHC	0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Cobalt (Co)-Dissolved	1.6	DLHC	1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Copper (Cu)-Dissolved	17.0	DLHC	2.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	26-NOV-20	27-NOV-20	R5298836
Molybdenum (Mo)-Dissolved	1.12	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Nickel (Ni)-Dissolved	9.5	DLHC	5.0	ug/L	26-NOV-20	26-NOV-20	R5298475

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-2 GW-11210029-112420-MW-2D Sampled By: CLIENT on 24-NOV-20 @ 11:30 Matrix: WATER							
Dissolved Metals							
Selenium (Se)-Dissolved	<0.50	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Sodium (Na)-Dissolved	7340	DLHC	500	ug/L	26-NOV-20	26-NOV-20	R5298475
Thallium (Tl)-Dissolved	0.11	DLHC	0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Uranium (U)-Dissolved	0.60	DLHC	0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Zinc (Zn)-Dissolved	26	DLHC	10	ug/L	26-NOV-20	26-NOV-20	R5298475
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		25-NOV-20	R5297893
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	26-NOV-20	26-NOV-20	R5298859
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		27-NOV-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	26-NOV-20	26-NOV-20	R5298859
Volatile Organic Compounds							
Acetone	<30		30	ug/L		30-NOV-20	R5299578
Benzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Bromodichloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Bromoform	<5.0		5.0	ug/L		30-NOV-20	R5299578
Bromomethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Carbon tetrachloride	<0.20		0.20	ug/L		30-NOV-20	R5299578
Chlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dibromochloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Chloroform	<1.0		1.0	ug/L		30-NOV-20	R5299578
1,2-Dibromoethane	<0.20		0.20	ug/L		30-NOV-20	R5299578
1,2-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,3-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,4-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dichlorodifluoromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
1,1-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,2-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methylene Chloride	<5.0		5.0	ug/L		30-NOV-20	R5299578
1,2-Dichloropropane	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		30-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
n-Hexane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methyl Ethyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
Methyl Isobutyl Ketone	<20		20	ug/L		30-NOV-20	R5299578

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-2 GW-11210029-112420-MW-2D Sampled By: CLIENT on 24-NOV-20 @ 11:30 Matrix: WATER							
Volatile Organic Compounds							
MTBE	<2.0		2.0	ug/L		30-NOV-20	R5299578
Styrene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Tetrachloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Toluene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichlorofluoromethane	<5.0		5.0	ug/L		30-NOV-20	R5299578
Vinyl chloride	<0.50		0.50	ug/L		30-NOV-20	R5299578
o-Xylene	<0.30		0.30	ug/L		30-NOV-20	R5299578
m+p-Xylenes	<0.40		0.40	ug/L		30-NOV-20	R5299578
Xylenes (Total)	<0.50		0.50	ug/L		30-NOV-20	
Surrogate: 4-Bromofluorobenzene	97.7		70-130	%		30-NOV-20	R5299578
Surrogate: 1,4-Difluorobenzene	100.8		70-130	%		30-NOV-20	R5299578
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		30-NOV-20	R5299578
F1-BTEX	<25		25	ug/L		30-NOV-20	
F2 (C10-C16)	<100		100	ug/L	25-NOV-20	26-NOV-20	R5298486
F2-Naphth	<100		100	ug/L		30-NOV-20	
F3 (C16-C34)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
F3-PAH	<250		250	ug/L		30-NOV-20	
F4 (C34-C50)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
Total Hydrocarbons (C6-C50)	<370		370	ug/L		30-NOV-20	
Chrom. to baseline at nC50	YES				25-NOV-20	26-NOV-20	R5298486
Surrogate: 2-Bromobenzotrifluoride	91.1		60-140	%	25-NOV-20	26-NOV-20	R5298486
Surrogate: 3,4-Dichlorotoluene	76.2		60-140	%		30-NOV-20	R5299578
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Acenaphthylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)pyrene	<0.010		0.010	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(b)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(k)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Chrysene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluoranthene	0.038		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluorene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-2 GW-11210029-112420-MW-2D Sampled By: CLIENT on 24-NOV-20 @ 11:30 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		27-NOV-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
2-Methylnaphthalene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Naphthalene	<0.050		0.050	ug/L	25-NOV-20	27-NOV-20	R5298949
Phenanthrene	0.027		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Pyrene	0.040		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Acenaphthene	89.3		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d12-Chrysene	93.9		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d8-Naphthalene	91.7		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Phenanthrene	98.1		60-140	%	25-NOV-20	27-NOV-20	R5298949
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
4-Chloroaniline	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2-Chlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dichlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
Diethylphthalate	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Dimethylphthalate	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dimethylphenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrophenol	<1.0		1.0	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,6-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		27-NOV-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	25-NOV-20	27-NOV-20	R5298692
Pentachlorophenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
Phenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2-Fluorobiphenyl	85.8		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: Nitrobenzene d5	93.7		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: p-Terphenyl d14	99.0		60-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2,4,6-Tribromophenol	114.6		50-140	%	25-NOV-20	27-NOV-20	R5298692
L2533335-3 GW-11210029-112420-MW-3 Sampled By: CLIENT on 24-NOV-20 @ 13:45 Matrix: WATER							
Physical Tests							
Conductivity	0.609		0.0030	mS/cm		26-NOV-20	R5299316
pH	7.90		0.10	pH units		26-NOV-20	R5299316

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-3 GW-11210029-112420-MW-3 Sampled By: CLIENT on 24-NOV-20 @ 13:45 Matrix: WATER							
Physical Tests							
Anions and Nutrients							
Chloride (Cl)	4.80		0.50	mg/L		27-NOV-20	R5299616
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		26-NOV-20	R5298560
Total Metals							
Aluminum (Al)-Total	0.210		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Antimony (Sb)-Total	0.00015		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Arsenic (As)-Total	0.00035		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Barium (Ba)-Total	0.0689		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Boron (B)-Total	0.012		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Cadmium (Cd)-Total	0.0000100		0.0000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Calcium (Ca)-Total	80.6		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cesium (Cs)-Total	0.000022		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cobalt (Co)-Total	0.00064		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Copper (Cu)-Total	0.00096		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Iron (Fe)-Total	0.224		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Lead (Pb)-Total	0.000299		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Lithium (Li)-Total	0.0099		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Magnesium (Mg)-Total	36.9		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Manganese (Mn)-Total	0.0906		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-NOV-20	R5298809
Molybdenum (Mo)-Total	0.0169		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Nickel (Ni)-Total	0.00162		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Phosphorus (P)-Total	<0.050		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Potassium (K)-Total	1.91		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Rubidium (Rb)-Total	0.00106		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Selenium (Se)-Total	0.000226		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Silicon (Si)-Total	7.25		0.10	mg/L	26-NOV-20	27-NOV-20	R5298095
Silver (Ag)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Sodium (Na)-Total	6.78		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Strontium (Sr)-Total	0.158		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Sulfur (S)-Total	8.99		0.50	mg/L	26-NOV-20	27-NOV-20	R5298095
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Thorium (Th)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Tin (Sn)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Titanium (Ti)-Total	0.00891		0.00030	mg/L	26-NOV-20	27-NOV-20	R5298095
Tungsten (W)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Uranium (U)-Total	0.00200		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-3 GW-11210029-112420-MW-3							
Sampled By: CLIENT on 24-NOV-20 @ 13:45							
Matrix: WATER							
Total Metals							
Vanadium (V)-Total	0.00087		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	26-NOV-20	27-NOV-20	R5298095
Zirconium (Zr)-Total	0.00022		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					26-NOV-20	R5298103
Dissolved Metals Filtration Location	FIELD					26-NOV-20	R5297816
Antimony (Sb)-Dissolved	0.15		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Arsenic (As)-Dissolved	0.31		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Barium (Ba)-Dissolved	67.9		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Boron (B)-Dissolved	11		10	ug/L	26-NOV-20	26-NOV-20	R5298475
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	26-NOV-20	26-NOV-20	R5298475
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Cobalt (Co)-Dissolved	0.57		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Copper (Cu)-Dissolved	3.02		0.20	ug/L	26-NOV-20	26-NOV-20	R5298475
Lead (Pb)-Dissolved	0.109		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	26-NOV-20	27-NOV-20	R5298836
Molybdenum (Mo)-Dissolved	15.8		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Nickel (Ni)-Dissolved	1.35		0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Selenium (Se)-Dissolved	0.278		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Sodium (Na)-Dissolved	6870		500	ug/L	26-NOV-20	26-NOV-20	R5298475
Thallium (Tl)-Dissolved	<0.010		0.010	ug/L	26-NOV-20	26-NOV-20	R5298475
Uranium (U)-Dissolved	1.86		0.010	ug/L	26-NOV-20	26-NOV-20	R5298475
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Zinc (Zn)-Dissolved	1.7		1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		25-NOV-20	R5297893
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	26-NOV-20	26-NOV-20	R5298859
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		27-NOV-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	26-NOV-20	26-NOV-20	R5298859
Volatile Organic Compounds							
Acetone	<30		30	ug/L		30-NOV-20	R5299578
Benzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Bromodichloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Bromoform	<5.0		5.0	ug/L		30-NOV-20	R5299578
Bromomethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Carbon tetrachloride	<0.20		0.20	ug/L		30-NOV-20	R5299578
Chlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dibromochloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Chloroform	<1.0		1.0	ug/L		30-NOV-20	R5299578

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-3 GW-11210029-112420-MW-3 Sampled By: CLIENT on 24-NOV-20 @ 13:45 Matrix: WATER							
Volatile Organic Compounds							
1,2-Dibromoethane	<0.20		0.20	ug/L		30-NOV-20	R5299578
1,2-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,3-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,4-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dichlorodifluoromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
1,1-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,2-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methylene Chloride	<5.0		5.0	ug/L		30-NOV-20	R5299578
1,2-Dichloropropane	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		30-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
n-Hexane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methyl Ethyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
Methyl Isobutyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
MTBE	<2.0		2.0	ug/L		30-NOV-20	R5299578
Styrene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Tetrachloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Toluene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichlorofluoromethane	<5.0		5.0	ug/L		30-NOV-20	R5299578
Vinyl chloride	<0.50		0.50	ug/L		30-NOV-20	R5299578
o-Xylene	<0.30		0.30	ug/L		30-NOV-20	R5299578
m+p-Xylenes	<0.40		0.40	ug/L		30-NOV-20	R5299578
Xylenes (Total)	<0.50		0.50	ug/L		30-NOV-20	
Surrogate: 4-Bromofluorobenzene	98.0		70-130	%		30-NOV-20	R5299578
Surrogate: 1,4-Difluorobenzene	100.4		70-130	%		30-NOV-20	R5299578
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		30-NOV-20	R5299578
F1-BTEX	<25		25	ug/L		30-NOV-20	
F2 (C10-C16)	<100		100	ug/L	25-NOV-20	26-NOV-20	R5298486
F2-Naphth	<100		100	ug/L		30-NOV-20	
F3 (C16-C34)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-3 GW-11210029-112420-MW-3 Sampled By: CLIENT on 24-NOV-20 @ 13:45 Matrix: WATER							
Hydrocarbons							
F3-PAH	<250		250	ug/L		30-NOV-20	
F4 (C34-C50)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
Total Hydrocarbons (C6-C50)	<370		370	ug/L		30-NOV-20	
Chrom. to baseline at nC50	YES				25-NOV-20	26-NOV-20	R5298486
Surrogate: 2-Bromobenzotrifluoride	90.2		60-140	%	25-NOV-20	26-NOV-20	R5298486
Surrogate: 3,4-Dichlorotoluene	79.0		60-140	%		30-NOV-20	R5299578
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Acenaphthylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)pyrene	<0.010		0.010	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(b)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(k)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Chrysene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluoranthene	0.059		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluorene	0.031	AI	0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
1+2-Methylnaphthalenes	0.067		0.028	ug/L		27-NOV-20	
1-Methylnaphthalene	0.024		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
2-Methylnaphthalene	0.043		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Naphthalene	<0.050		0.050	ug/L	25-NOV-20	27-NOV-20	R5298949
Phenanthrene	0.210		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Pyrene	0.059		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Acenaphthene	82.3		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d12-Chrysene	90.5		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d8-Naphthalene	85.6		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Phenanthrene	93.0		60-140	%	25-NOV-20	27-NOV-20	R5298949
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
4-Chloroaniline	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2-Chlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dichlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
Diethylphthalate	0.29	RRR	0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Dimethylphthalate	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dimethylphenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-3 GW-11210029-112420-MW-3 Sampled By: CLIENT on 24-NOV-20 @ 13:45 Matrix: WATER							
Semi-Volatile Organics							
2,4-Dinitrophenol	<1.0		1.0	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,6-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		27-NOV-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	25-NOV-20	27-NOV-20	R5298692
Pentachlorophenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
Phenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2-Fluorobiphenyl	91.1		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: Nitrobenzene d5	120.5		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: p-Terphenyl d14	110.3		60-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2,4,6-Tribromophenol	127.7		50-140	%	25-NOV-20	27-NOV-20	R5298692
Report Remarks : RRR: Although the method blank is non-detect there is a strong peak for Diethylphthalate causing uncertainty near the detection limit, interpret as a maximum value.							
L2533335-4 GW-11210029-112520-MW-1 Sampled By: CLIENT on 25-NOV-20 @ 11:20 Matrix: WATER							
Physical Tests							
Conductivity	0.557		0.0030	mS/cm		26-NOV-20	R5299316
pH	8.07		0.10	pH units		26-NOV-20	R5299316
Anions and Nutrients							
Chloride (Cl)	8.17		0.50	mg/L		27-NOV-20	R5299616
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		26-NOV-20	R5298560
Total Metals							
Aluminum (Al)-Total	0.352		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Antimony (Sb)-Total	0.00023		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Arsenic (As)-Total	0.00057		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Barium (Ba)-Total	0.0729		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Boron (B)-Total	0.024		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Cadmium (Cd)-Total	0.0000257		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Calcium (Ca)-Total	71.4		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cesium (Cs)-Total	0.000033		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Chromium (Cr)-Total	0.00088		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Cobalt (Co)-Total	0.00059		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Copper (Cu)-Total	0.00139		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Iron (Fe)-Total	0.417		0.010	mg/L	26-NOV-20	27-NOV-20	R5298095
Lead (Pb)-Total	0.000628		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Lithium (Li)-Total	0.0091		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-4 GW-11210029-112520-MW-1 Sampled By: CLIENT on 25-NOV-20 @ 11:20 Matrix: WATER							
Total Metals							
Magnesium (Mg)-Total	30.1		0.0050	mg/L	26-NOV-20	27-NOV-20	R5298095
Manganese (Mn)-Total	0.114		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-NOV-20	R5298809
Molybdenum (Mo)-Total	0.00424		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Nickel (Ni)-Total	0.00146		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Phosphorus (P)-Total	<0.050		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Potassium (K)-Total	4.10		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Rubidium (Rb)-Total	0.00100		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Selenium (Se)-Total	0.000074		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Silicon (Si)-Total	6.11		0.10	mg/L	26-NOV-20	27-NOV-20	R5298095
Silver (Ag)-Total	<0.000050		0.000050	mg/L	26-NOV-20	27-NOV-20	R5298095
Sodium (Na)-Total	8.50		0.050	mg/L	26-NOV-20	27-NOV-20	R5298095
Strontium (Sr)-Total	0.257		0.0010	mg/L	26-NOV-20	27-NOV-20	R5298095
Sulfur (S)-Total	8.36		0.50	mg/L	26-NOV-20	27-NOV-20	R5298095
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Thallium (Tl)-Total	0.000011		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Thorium (Th)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Tin (Sn)-Total	0.00016		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Titanium (Ti)-Total	0.0128		0.00030	mg/L	26-NOV-20	27-NOV-20	R5298095
Tungsten (W)-Total	<0.00010		0.00010	mg/L	26-NOV-20	27-NOV-20	R5298095
Uranium (U)-Total	0.000879		0.000010	mg/L	26-NOV-20	27-NOV-20	R5298095
Vanadium (V)-Total	0.00092		0.00050	mg/L	26-NOV-20	27-NOV-20	R5298095
Zinc (Zn)-Total	0.0065		0.0030	mg/L	26-NOV-20	27-NOV-20	R5298095
Zirconium (Zr)-Total	0.00037		0.00020	mg/L	26-NOV-20	27-NOV-20	R5298095
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					26-NOV-20	R5298103
Dissolved Metals Filtration Location	FIELD					26-NOV-20	R5297816
Antimony (Sb)-Dissolved	0.18		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Arsenic (As)-Dissolved	0.41		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Barium (Ba)-Dissolved	67.5		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Boron (B)-Dissolved	22		10	ug/L	26-NOV-20	26-NOV-20	R5298475
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	26-NOV-20	26-NOV-20	R5298475
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Cobalt (Co)-Dissolved	0.39		0.10	ug/L	26-NOV-20	26-NOV-20	R5298475
Copper (Cu)-Dissolved	0.66		0.20	ug/L	26-NOV-20	26-NOV-20	R5298475
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	26-NOV-20	27-NOV-20	R5298836
Molybdenum (Mo)-Dissolved	3.77		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Nickel (Ni)-Dissolved	0.88		0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Selenium (Se)-Dissolved	0.069		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-4 GW-11210029-112520-MW-1 Sampled By: CLIENT on 25-NOV-20 @ 11:20 Matrix: WATER							
Dissolved Metals							
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	26-NOV-20	26-NOV-20	R5298475
Sodium (Na)-Dissolved	8450		500	ug/L	26-NOV-20	26-NOV-20	R5298475
Thallium (Tl)-Dissolved	<0.010		0.010	ug/L	26-NOV-20	26-NOV-20	R5298475
Uranium (U)-Dissolved	0.764		0.010	ug/L	26-NOV-20	26-NOV-20	R5298475
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	26-NOV-20	26-NOV-20	R5298475
Zinc (Zn)-Dissolved	1.3		1.0	ug/L	26-NOV-20	26-NOV-20	R5298475
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		25-NOV-20	R5297893
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	26-NOV-20	26-NOV-20	R5298859
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		27-NOV-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	26-NOV-20	26-NOV-20	R5298859
Volatile Organic Compounds							
Acetone	<30		30	ug/L		30-NOV-20	R5299578
Benzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Bromodichloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Bromoform	<5.0		5.0	ug/L		30-NOV-20	R5299578
Bromomethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Carbon tetrachloride	<0.20		0.20	ug/L		30-NOV-20	R5299578
Chlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dibromochloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Chloroform	<1.0		1.0	ug/L		30-NOV-20	R5299578
1,2-Dibromoethane	<0.20		0.20	ug/L		30-NOV-20	R5299578
1,2-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,3-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,4-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dichlorodifluoromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
1,1-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,2-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methylene Chloride	<5.0		5.0	ug/L		30-NOV-20	R5299578
1,2-Dichloropropane	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		30-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
n-Hexane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methyl Ethyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
Methyl Isobutyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
MTBE	<2.0		2.0	ug/L		30-NOV-20	R5299578

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-4 GW-11210029-112520-MW-1 Sampled By: CLIENT on 25-NOV-20 @ 11:20 Matrix: WATER							
Volatile Organic Compounds							
Styrene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Tetrachloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Toluene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichlorofluoromethane	<5.0		5.0	ug/L		30-NOV-20	R5299578
Vinyl chloride	<0.50		0.50	ug/L		30-NOV-20	R5299578
o-Xylene	<0.30		0.30	ug/L		30-NOV-20	R5299578
m+p-Xylenes	<0.40		0.40	ug/L		30-NOV-20	R5299578
Xylenes (Total)	<0.50		0.50	ug/L		30-NOV-20	
Surrogate: 4-Bromofluorobenzene	98.1		70-130	%		30-NOV-20	R5299578
Surrogate: 1,4-Difluorobenzene	100.3		70-130	%		30-NOV-20	R5299578
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		30-NOV-20	R5299578
F1-BTEX	<25		25	ug/L		30-NOV-20	
F2 (C10-C16)	<100		100	ug/L	25-NOV-20	26-NOV-20	R5298486
F2-Naphth	<100		100	ug/L		30-NOV-20	
F3 (C16-C34)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
F3-PAH	<250		250	ug/L		30-NOV-20	
F4 (C34-C50)	<250		250	ug/L	25-NOV-20	26-NOV-20	R5298486
Total Hydrocarbons (C6-C50)	<370		370	ug/L		30-NOV-20	
Chrom. to baseline at nC50	YES				25-NOV-20	26-NOV-20	R5298486
Surrogate: 2-Bromobenzotrifluoride	95.5		60-140	%	25-NOV-20	26-NOV-20	R5298486
Surrogate: 3,4-Dichlorotoluene	83.6		60-140	%		30-NOV-20	R5299578
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Acenaphthylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(a)pyrene	<0.010		0.010	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(b)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Benzo(k)fluoranthene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Chrysene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluoranthene	0.091		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Fluorene	0.053		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-4 GW-11210029-112520-MW-1 Sampled By: CLIENT on 25-NOV-20 @ 11:20 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
1+2-Methylnaphthalenes	0.141		0.028	ug/L		27-NOV-20	
1-Methylnaphthalene	0.047		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
2-Methylnaphthalene	0.094		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Naphthalene	0.073		0.050	ug/L	25-NOV-20	27-NOV-20	R5298949
Phenanthrene	0.384		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Pyrene	0.096		0.020	ug/L	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Acenaphthene	87.0		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d12-Chrysene	95.0		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d8-Naphthalene	89.7		60-140	%	25-NOV-20	27-NOV-20	R5298949
Surrogate: d10-Phenanthrene	93.0		60-140	%	25-NOV-20	27-NOV-20	R5298949
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
4-Chloroaniline	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2-Chlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dichlorophenol	<0.30		0.30	ug/L	25-NOV-20	27-NOV-20	R5298692
Diethylphthalate	0.29	RRR	0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Dimethylphthalate	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dimethylphenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrophenol	<1.0		1.0	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,6-Dinitrotoluene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		27-NOV-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	25-NOV-20	27-NOV-20	R5298692
Pentachlorophenol	<0.50		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
Phenol	0.53		0.50	ug/L	25-NOV-20	27-NOV-20	R5298692
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2-Fluorobiphenyl	86.5		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: Nitrobenzene d5	92.9		50-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: p-Terphenyl d14	81.5		60-140	%	25-NOV-20	27-NOV-20	R5298692
Surrogate: 2,4,6-Tribromophenol	122.9		50-140	%	25-NOV-20	27-NOV-20	R5298692
Report Remarks : RRR: Although the method blank is non-detect there is a strong peak for Diethylphthalate causing uncertainty near the detection limit, interpret as a maximum value.							
L2533335-5 TRIP BLANK Sampled By: CLIENT on 25-NOV-20 @ 12:00 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<30		30	ug/L		30-NOV-20	R5299578

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-5 TRIP BLANK Sampled By: CLIENT on 25-NOV-20 @ 12:00 Matrix: WATER							
Volatile Organic Compounds							
Benzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Bromodichloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Bromoform	<5.0		5.0	ug/L		30-NOV-20	R5299578
Bromomethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Carbon tetrachloride	<0.20		0.20	ug/L		30-NOV-20	R5299578
Chlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dibromochloromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
Chloroform	<1.0		1.0	ug/L		30-NOV-20	R5299578
1,2-Dibromoethane	<0.20		0.20	ug/L		30-NOV-20	R5299578
1,2-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,3-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,4-Dichlorobenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Dichlorodifluoromethane	<2.0		2.0	ug/L		30-NOV-20	R5299578
1,1-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,2-Dichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methylene Chloride	<5.0		5.0	ug/L		30-NOV-20	R5299578
1,2-Dichloropropane	<0.50		0.50	ug/L		30-NOV-20	R5299578
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		30-NOV-20	R5299578
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		30-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		30-NOV-20	R5299578
n-Hexane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Methyl Ethyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
Methyl Isobutyl Ketone	<20		20	ug/L		30-NOV-20	R5299578
MTBE	<2.0		2.0	ug/L		30-NOV-20	R5299578
Styrene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Tetrachloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Toluene	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,1-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
1,1,2-Trichloroethane	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichloroethylene	<0.50		0.50	ug/L		30-NOV-20	R5299578
Trichlorofluoromethane	<5.0		5.0	ug/L		30-NOV-20	R5299578
Vinyl chloride	<0.50		0.50	ug/L		30-NOV-20	R5299578
o-Xylene	<0.30		0.30	ug/L		30-NOV-20	R5299578
m+p-Xylenes	<0.40		0.40	ug/L		30-NOV-20	R5299578
Xylenes (Total)	<0.50		0.50	ug/L		30-NOV-20	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2533335-5 TRIP BLANK Sampled By: CLIENT on 25-NOV-20 @ 12:00 Matrix: WATER							
Volatile Organic Compounds							
Surrogate: 4-Bromofluorobenzene	98.4		70-130	%		30-NOV-20	R5299578
Surrogate: 1,4-Difluorobenzene	100.4		70-130	%		30-NOV-20	R5299578
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		30-NOV-20	R5299578
F1-BTEX	<25		25	ug/L		30-NOV-20	R5299578
Surrogate: 3,4-Dichlorotoluene	86.6		60-140	%		30-NOV-20	R5299578

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Cyanide, Weak Acid Diss	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Aluminum (Al)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Barium (Ba)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Boron (B)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Calcium (Ca)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Iron (Fe)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Lithium (Li)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Molybdenum (Mo)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Potassium (K)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Silicon (Si)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Sodium (Na)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Strontium (Sr)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Sulfur (S)-Total	MS-B	L2533335-1, -2, -3, -4
Matrix Spike	Uranium (U)-Total	MS-B	L2533335-1, -2, -3, -4

Sample Parameter Qualifier key listed:

Qualifier	Description
AI	Analytical interferences may be present. Result may be biased high.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
CN-WAD-R511-WT	Water	Cyanide (WAD)-O.Reg 153/04	APHA 4500CN I-Weak acid Dist Colorimet
Weak acid dissociable cyanide (WAD) is determined by undergoing a distillation procedure. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
CR-CR6-IC-R511-WT	Water	Hex Chrom-O.Reg 153/04 (July 2011)	EPA 7199
This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
EC-R511-WT	Water	Conductivity-O.Reg 153/04 (July 2011)	APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.			

Reference Information

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
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Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L
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Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-D-UG/L-CVAA-WT	Water	Diss. Mercury in Water by CVAAS (ug/L)	EPA 1631E (mod)
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Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-D-UG/L-MS-WT	Water	Diss. Metals in Water by ICPMS (ug/L)	EPA 200.8
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The metal constituents of a non-acidified sample that pass through a membrane filter prior to ICP/MS analysis.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Reference Information

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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OGG-SPEC-CALC-WT	Water	Speciated Oil and Grease A/V Calc	CALCULATION
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Sample is extracted with hexane, sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.

OGG-SPEC-WT	Water	Speciated Oil and Grease- Gravimetric	APHA 5520 B
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The procedure involves an extraction of the entire water sample with hexane. Sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PH-WT	Water	pH	APHA 4500 H-Electrode
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Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

17-871527

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5298692							
WG3451657-2 LCS								
1,2,4-Trichlorobenzene			89.1		%		50-140	27-NOV-20
2-Chlorophenol			84.1		%		50-140	27-NOV-20
2,4-Dichlorophenol			96.6		%		50-140	27-NOV-20
2,4-Dimethylphenol			76.6		%		30-130	27-NOV-20
2,4-Dinitrophenol			117.8		%		50-140	27-NOV-20
2,4-Dinitrotoluene			119.4		%		50-140	27-NOV-20
2,4,5-Trichlorophenol			101.0		%		50-140	27-NOV-20
2,4,6-Trichlorophenol			99.2		%		50-140	27-NOV-20
2,6-Dinitrotoluene			99.4		%		50-140	27-NOV-20
3,3'-Dichlorobenzidine			84.7		%		30-130	27-NOV-20
4-Chloroaniline			85.2		%		30-130	27-NOV-20
Biphenyl			97.8		%		50-140	27-NOV-20
Bis(2-chloroethyl)ether			88.4		%		50-140	27-NOV-20
Bis(2-chloroisopropyl)ether			87.1		%		50-140	27-NOV-20
Bis(2-ethylhexyl)phthalate			107.8		%		50-140	27-NOV-20
Diethylphthalate			94.7		%		50-140	27-NOV-20
Dimethylphthalate			93.5		%		50-140	27-NOV-20
Pentachlorophenol			112.4		%		50-140	27-NOV-20
Phenol			115.9		%		30-130	27-NOV-20
WG3451657-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	27-NOV-20
2-Chlorophenol			<0.30		ug/L		0.3	27-NOV-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	27-NOV-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	27-NOV-20
2,4-Dinitrophenol			<1.0		ug/L		1	27-NOV-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	27-NOV-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	27-NOV-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	27-NOV-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	27-NOV-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	27-NOV-20
4-Chloroaniline			<0.40		ug/L		0.4	27-NOV-20
Biphenyl			<0.40		ug/L		0.4	27-NOV-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	27-NOV-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	27-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5298692								
WG3451657-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	27-NOV-20
Diethylphthalate			<0.20		ug/L		0.2	27-NOV-20
Dimethylphthalate			<0.20		ug/L		0.2	27-NOV-20
Pentachlorophenol			<0.50		ug/L		0.5	27-NOV-20
Phenol			<0.50		ug/L		0.5	27-NOV-20
Surrogate: 2-Fluorobiphenyl			84.6		%		50-140	27-NOV-20
Surrogate: 2,4,6-Tribromophenol			72.1		%		50-140	27-NOV-20
Surrogate: Nitrobenzene d5			83.5		%		50-140	27-NOV-20
Surrogate: p-Terphenyl d14			103.5		%		60-140	27-NOV-20
CL-IC-N-WT Water								
Batch R5299616								
WG3453128-4 DUP								
Chloride (Cl)		WG3453128-3 2.94	2.94		mg/L	0.2	20	27-NOV-20
WG3453128-2 LCS								
Chloride (Cl)			101.6		%		90-110	27-NOV-20
WG3453128-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	27-NOV-20
WG3453128-5 MS								
Chloride (Cl)		WG3453128-3	99.9		%		75-125	27-NOV-20
CN-WAD-R511-WT Water								
Batch R5298560								
WG3451693-3 DUP								
Cyanide, Weak Acid Diss		WG3451693-5 655	652		ug/L	0.4	20	26-NOV-20
WG3451693-2 LCS								
Cyanide, Weak Acid Diss			101.9		%		80-120	26-NOV-20
WG3451693-1 MB								
Cyanide, Weak Acid Diss			<2.0		ug/L		2	26-NOV-20
WG3451693-4 MS								
Cyanide, Weak Acid Diss		WG3451693-5	N/A	MS-B	%		-	26-NOV-20
CR-CR6-IC-R511-WT Water								
Batch R5297893								
WG3451701-4 DUP								
Chromium, Hexavalent		WG3451701-3 <0.50	<0.50	RPD-NA	ug/L	N/A	20	25-NOV-20
WG3451701-2 LCS								
Chromium, Hexavalent			99.4		%		80-120	25-NOV-20
WG3451701-1 MB								



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed	
CR-CR6-IC-R511-WT Water									
Batch R5297893									
WG3451701-1	MB								
Chromium, Hexavalent			<0.50		ug/L		0.5	25-NOV-20	
WG3451701-5	MS	WG3451701-3							
Chromium, Hexavalent			96.8		%		70-130	25-NOV-20	
EC-R511-WT Water									
Batch R5298244									
WG3452155-4	DUP	WG3452155-3							
Conductivity			0.241	0.245	mS/cm	1.6	10	26-NOV-20	
WG3452155-2	LCS								
Conductivity			99.7		%		90-110	26-NOV-20	
WG3452155-1	MB								
Conductivity			<0.0030		mS/cm		0.003	26-NOV-20	
Batch R5299316									
WG3452156-4	DUP	WG3452156-3							
Conductivity			0.539	0.543	mS/cm	0.7	10	26-NOV-20	
WG3452156-2	LCS								
Conductivity			99.2		%		90-110	26-NOV-20	
WG3452156-1	MB								
Conductivity			<0.0030		mS/cm		0.003	26-NOV-20	
F1-HS-511-WT Water									
Batch R5299578									
WG3453379-4	DUP	WG3453379-3							
F1 (C6-C10)			<25	<25	RPD-NA	ug/L	N/A	30	30-NOV-20
WG3453379-1	LCS								
F1 (C6-C10)			105.9		%		80-120	30-NOV-20	
WG3453379-2	MB								
F1 (C6-C10)			<25		ug/L		25	30-NOV-20	
Surrogate: 3,4-Dichlorotoluene			101.5		%		60-140	30-NOV-20	
WG3453379-5	MS	WG3453379-3							
F1 (C6-C10)			83.4		%		60-140	30-NOV-20	
F2-F4-511-WT Water									
Batch R5298486									
WG3451674-2	LCS								
F2 (C10-C16)			99.9		%		70-130	26-NOV-20	
F3 (C16-C34)			105.1		%		70-130	26-NOV-20	
F4 (C34-C50)			103.1		%		70-130	26-NOV-20	
WG3451674-1	MB								



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT Water								
Batch R5298486								
WG3451674-1 MB								
F2 (C10-C16)			<100		ug/L		100	26-NOV-20
F3 (C16-C34)			<250		ug/L		250	26-NOV-20
F4 (C34-C50)			<250		ug/L		250	26-NOV-20
Surrogate: 2-Bromobenzotrifluoride			89.9		%		60-140	26-NOV-20
HG-D-UG/L-CVAA-WT Water								
Batch R5298836								
WG3452289-3 DUP								
Mercury (Hg)-Dissolved		L2532511-4	<0.0050	RPD-NA	ug/L	N/A	20	27-NOV-20
WG3452289-2 LCS								
Mercury (Hg)-Dissolved			109.0		%		80-120	27-NOV-20
WG3452289-1 MB								
Mercury (Hg)-Dissolved			<0.0050		ug/L		0.005	27-NOV-20
WG3452289-4 MS								
Mercury (Hg)-Dissolved		L2532511-5	99.7		%		70-130	27-NOV-20
HG-T-CVAA-WT Water								
Batch R5298809								
WG3452162-4 DUP								
Mercury (Hg)-Total		WG3452162-3	0.0000063	J	mg/L	0.0000014	0.00001	27-NOV-20
WG3452162-2 LCS								
Mercury (Hg)-Total			108.0		%		80-120	27-NOV-20
WG3452162-1 MB								
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	27-NOV-20
WG3452162-6 MS								
Mercury (Hg)-Total		WG3452162-5	110.7		%		70-130	27-NOV-20
MET-D-UG/L-MS-WT Water								
Batch R5298475								
WG3451975-4 DUP								
Antimony (Sb)-Dissolved		WG3451975-3	<0.10	RPD-NA	ug/L	N/A	20	26-NOV-20
Arsenic (As)-Dissolved			<0.10	RPD-NA	ug/L	N/A	20	26-NOV-20
Barium (Ba)-Dissolved			<0.10	RPD-NA	ug/L	N/A	20	26-NOV-20
Beryllium (Be)-Dissolved			<0.10	RPD-NA	ug/L	N/A	20	26-NOV-20
Boron (B)-Dissolved			<10	RPD-NA	ug/L	N/A	20	26-NOV-20
Cadmium (Cd)-Dissolved			<0.0050	RPD-NA	ug/L	N/A	20	26-NOV-20
Chromium (Cr)-Dissolved			<0.50	RPD-NA	ug/L	N/A	20	26-NOV-20
Cobalt (Co)-Dissolved			<0.10	RPD-NA	ug/L	N/A	20	26-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT		Water						
Batch	R5298475							
WG3451975-4	DUP	WG3451975-3						
Copper (Cu)-Dissolved		<0.20	<0.20	RPD-NA	ug/L	N/A	20	26-NOV-20
Lead (Pb)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	26-NOV-20
Molybdenum (Mo)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	26-NOV-20
Nickel (Ni)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	26-NOV-20
Selenium (Se)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	26-NOV-20
Silver (Ag)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	26-NOV-20
Sodium (Na)-Dissolved		<50	<50	RPD-NA	ug/L	N/A	20	26-NOV-20
Thallium (Tl)-Dissolved		<0.010	<0.010	RPD-NA	ug/L	N/A	20	26-NOV-20
Uranium (U)-Dissolved		<0.010	<0.010	RPD-NA	ug/L	N/A	20	26-NOV-20
Vanadium (V)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	26-NOV-20
Zinc (Zn)-Dissolved		<1.0	<1.0	RPD-NA	ug/L	N/A	20	26-NOV-20
WG3451975-2	LCS							
Antimony (Sb)-Dissolved			103.4		%		80-120	26-NOV-20
Arsenic (As)-Dissolved			100.6		%		80-120	26-NOV-20
Barium (Ba)-Dissolved			98.3		%		80-120	26-NOV-20
Beryllium (Be)-Dissolved			103.7		%		80-120	26-NOV-20
Boron (B)-Dissolved			102.4		%		80-120	26-NOV-20
Cadmium (Cd)-Dissolved			99.6		%		80-120	26-NOV-20
Chromium (Cr)-Dissolved			99.1		%		80-120	26-NOV-20
Cobalt (Co)-Dissolved			97.8		%		80-120	26-NOV-20
Copper (Cu)-Dissolved			97.8		%		80-120	26-NOV-20
Lead (Pb)-Dissolved			100.8		%		80-120	26-NOV-20
Molybdenum (Mo)-Dissolved			103.1		%		80-120	26-NOV-20
Nickel (Ni)-Dissolved			99.3		%		80-120	26-NOV-20
Selenium (Se)-Dissolved			101.1		%		80-120	26-NOV-20
Silver (Ag)-Dissolved			99.6		%		80-120	26-NOV-20
Sodium (Na)-Dissolved			101.6		%		80-120	26-NOV-20
Thallium (Tl)-Dissolved			100.3		%		80-120	26-NOV-20
Uranium (U)-Dissolved			101.4		%		80-120	26-NOV-20
Vanadium (V)-Dissolved			101.3		%		80-120	26-NOV-20
Zinc (Zn)-Dissolved			98.1		%		80-120	26-NOV-20
WG3451975-1	MB							
Antimony (Sb)-Dissolved			<0.10		ug/L		0.1	26-NOV-20
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT								
	Water							
Batch	R5298475							
WG3451975-1 MB								
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	26-NOV-20
Barium (Ba)-Dissolved			<0.10		ug/L		0.1	26-NOV-20
Beryllium (Be)-Dissolved			<0.10		ug/L		0.1	26-NOV-20
Boron (B)-Dissolved			<10		ug/L		10	26-NOV-20
Cadmium (Cd)-Dissolved			<0.0050		ug/L		0.005	26-NOV-20
Chromium (Cr)-Dissolved			<0.50		ug/L		0.5	26-NOV-20
Cobalt (Co)-Dissolved			<0.10		ug/L		0.1	26-NOV-20
Copper (Cu)-Dissolved			<0.20		ug/L		0.2	26-NOV-20
Lead (Pb)-Dissolved			<0.050		ug/L		0.05	26-NOV-20
Molybdenum (Mo)-Dissolved			<0.050		ug/L		0.05	26-NOV-20
Nickel (Ni)-Dissolved			<0.50		ug/L		0.5	26-NOV-20
Selenium (Se)-Dissolved			<0.050		ug/L		0.05	26-NOV-20
Silver (Ag)-Dissolved			<0.050		ug/L		0.05	26-NOV-20
Sodium (Na)-Dissolved			<50		ug/L		50	26-NOV-20
Thallium (Tl)-Dissolved			<0.010		ug/L		0.01	26-NOV-20
Uranium (U)-Dissolved			<0.010		ug/L		0.01	26-NOV-20
Vanadium (V)-Dissolved			<0.50		ug/L		0.5	26-NOV-20
Zinc (Zn)-Dissolved			<1.0		ug/L		1	26-NOV-20
WG3451975-5 MS		WG3451975-3						
Antimony (Sb)-Dissolved			101.4		%		70-130	26-NOV-20
Arsenic (As)-Dissolved			101.2		%		70-130	26-NOV-20
Barium (Ba)-Dissolved			100.4		%		70-130	26-NOV-20
Beryllium (Be)-Dissolved			100.9		%		70-130	26-NOV-20
Boron (B)-Dissolved			97.2		%		70-130	26-NOV-20
Cadmium (Cd)-Dissolved			101.7		%		70-130	26-NOV-20
Chromium (Cr)-Dissolved			100.4		%		70-130	26-NOV-20
Cobalt (Co)-Dissolved			98.8		%		70-130	26-NOV-20
Copper (Cu)-Dissolved			99.1		%		70-130	26-NOV-20
Lead (Pb)-Dissolved			100.5		%		70-130	26-NOV-20
Molybdenum (Mo)-Dissolved			99.7		%		70-130	26-NOV-20
Nickel (Ni)-Dissolved			99.3		%		70-130	26-NOV-20
Selenium (Se)-Dissolved			104.5		%		70-130	26-NOV-20
Silver (Ag)-Dissolved			98.8		%		70-130	26-NOV-20
Sodium (Na)-Dissolved			101.7		%		70-130	26-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT		Water						
Batch	R5298475							
WG3451975-5 MS		WG3451975-3						
Thallium (Tl)-Dissolved			101.6		%		70-130	26-NOV-20
Uranium (U)-Dissolved			99.2		%		70-130	26-NOV-20
Vanadium (V)-Dissolved			101.5		%		70-130	26-NOV-20
Zinc (Zn)-Dissolved			101.1		%		70-130	26-NOV-20
MET-T-CCMS-WT		Water						
Batch	R5298095							
WG3451966-4 DUP		WG3451966-3						
Aluminum (Al)-Total		0.164	0.172		mg/L	4.4	20	26-NOV-20
Antimony (Sb)-Total		0.0013	0.0013		mg/L	2.5	20	26-NOV-20
Arsenic (As)-Total		0.0016	0.0018		mg/L	11	20	26-NOV-20
Barium (Ba)-Total		0.118	0.119		mg/L	0.5	20	26-NOV-20
Beryllium (Be)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	26-NOV-20
Bismuth (Bi)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	26-NOV-20
Boron (B)-Total		0.13	0.13		mg/L	1.0	20	26-NOV-20
Cadmium (Cd)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	26-NOV-20
Calcium (Ca)-Total		118	118		mg/L	0.4	20	26-NOV-20
Chromium (Cr)-Total		0.0051	<0.0050	RPD-NA	mg/L	N/A	20	26-NOV-20
Cesium (Cs)-Total		0.00016	0.00016		mg/L	1.4	20	26-NOV-20
Cobalt (Co)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	26-NOV-20
Copper (Cu)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	26-NOV-20
Iron (Fe)-Total		0.19	0.17		mg/L	7.4	20	26-NOV-20
Lead (Pb)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	26-NOV-20
Lithium (Li)-Total		0.067	0.066		mg/L	1.5	20	26-NOV-20
Magnesium (Mg)-Total		17.6	17.6		mg/L	0.1	20	26-NOV-20
Manganese (Mn)-Total		0.0082	0.0081		mg/L	1.1	20	26-NOV-20
Molybdenum (Mo)-Total		0.0127	0.0123		mg/L	2.7	20	26-NOV-20
Nickel (Ni)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	26-NOV-20
Phosphorus (P)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	26-NOV-20
Potassium (K)-Total		102	104		mg/L	1.5	20	26-NOV-20
Rubidium (Rb)-Total		0.184	0.185		mg/L	0.7	20	26-NOV-20
Selenium (Se)-Total		0.00062	0.00078	J	mg/L	0.00016	0.001	26-NOV-20
Silicon (Si)-Total		8.4	8.2		mg/L	2.1	20	26-NOV-20
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	26-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5298095							
WG3451966-4	DUP	WG3451966-3						
Sodium (Na)-Total		109	110		mg/L	0.4	20	26-NOV-20
Strontium (Sr)-Total		1.91	1.93		mg/L	1.1	20	26-NOV-20
Sulfur (S)-Total		61.5	61.0		mg/L	0.8	25	26-NOV-20
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	26-NOV-20
Tellurium (Te)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	26-NOV-20
Thorium (Th)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	25	26-NOV-20
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	26-NOV-20
Titanium (Ti)-Total		0.0069	0.0061		mg/L	12	20	26-NOV-20
Tungsten (W)-Total		0.0012	0.0012		mg/L	4.5	20	26-NOV-20
Uranium (U)-Total		0.00055	0.00055		mg/L	1.2	20	26-NOV-20
Vanadium (V)-Total		0.0095	0.0093		mg/L	1.6	20	26-NOV-20
Zinc (Zn)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	26-NOV-20
Zirconium (Zr)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	26-NOV-20
WG3451966-2	LCS							
Aluminum (Al)-Total			111.0		%		80-120	26-NOV-20
Antimony (Sb)-Total			104.6		%		80-120	26-NOV-20
Arsenic (As)-Total			108.7		%		80-120	26-NOV-20
Barium (Ba)-Total			105.7		%		80-120	26-NOV-20
Beryllium (Be)-Total			103.9		%		80-120	26-NOV-20
Bismuth (Bi)-Total			102.3		%		80-120	26-NOV-20
Boron (B)-Total			99.4		%		80-120	26-NOV-20
Cadmium (Cd)-Total			105.9		%		80-120	26-NOV-20
Calcium (Ca)-Total			103.7		%		80-120	26-NOV-20
Chromium (Cr)-Total			107.7		%		80-120	26-NOV-20
Cesium (Cs)-Total			101.2		%		80-120	26-NOV-20
Cobalt (Co)-Total			106.6		%		80-120	26-NOV-20
Copper (Cu)-Total			105.6		%		80-120	26-NOV-20
Iron (Fe)-Total			102.7		%		80-120	26-NOV-20
Lead (Pb)-Total			102.8		%		80-120	26-NOV-20
Lithium (Li)-Total			99.5		%		80-120	26-NOV-20
Magnesium (Mg)-Total			113.6		%		80-120	26-NOV-20
Manganese (Mn)-Total			108.4		%		80-120	26-NOV-20
Molybdenum (Mo)-Total			106.2		%		80-120	26-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5298095							
WG3451966-2	LCS							
Nickel (Ni)-Total			106.9		%		80-120	26-NOV-20
Phosphorus (P)-Total			101.2		%		70-130	26-NOV-20
Potassium (K)-Total			103.5		%		80-120	26-NOV-20
Rubidium (Rb)-Total			106.8		%		80-120	26-NOV-20
Selenium (Se)-Total			101.8		%		80-120	26-NOV-20
Silicon (Si)-Total			105.0		%		60-140	26-NOV-20
Silver (Ag)-Total			103.2		%		80-120	26-NOV-20
Sodium (Na)-Total			110.4		%		80-120	26-NOV-20
Strontium (Sr)-Total			103.1		%		80-120	26-NOV-20
Sulfur (S)-Total			105.3		%		80-120	26-NOV-20
Thallium (Tl)-Total			103.5		%		80-120	26-NOV-20
Tellurium (Te)-Total			100.2		%		80-120	26-NOV-20
Thorium (Th)-Total			100.5		%		70-130	26-NOV-20
Tin (Sn)-Total			98.5		%		80-120	26-NOV-20
Titanium (Ti)-Total			107.8		%		80-120	26-NOV-20
Tungsten (W)-Total			102.0		%		80-120	26-NOV-20
Uranium (U)-Total			103.2		%		80-120	26-NOV-20
Vanadium (V)-Total			108.2		%		80-120	26-NOV-20
Zinc (Zn)-Total			104.8		%		80-120	26-NOV-20
Zirconium (Zr)-Total			99.4		%		80-120	26-NOV-20
WG3451966-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	26-NOV-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	26-NOV-20
Boron (B)-Total			<0.010		mg/L		0.01	26-NOV-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	26-NOV-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	26-NOV-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	26-NOV-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	26-NOV-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	26-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5298095							
WG3451966-1	MB							
Iron (Fe)-Total			<0.010		mg/L		0.01	26-NOV-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	26-NOV-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	26-NOV-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	26-NOV-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	26-NOV-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	26-NOV-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	26-NOV-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	26-NOV-20
Potassium (K)-Total			<0.050		mg/L		0.05	26-NOV-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	26-NOV-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	26-NOV-20
Silicon (Si)-Total			<0.10		mg/L		0.1	26-NOV-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	26-NOV-20
Sodium (Na)-Total			<0.050		mg/L		0.05	26-NOV-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	26-NOV-20
Sulfur (S)-Total			<0.50		mg/L		0.5	26-NOV-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	26-NOV-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	26-NOV-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	26-NOV-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	26-NOV-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	26-NOV-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	26-NOV-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	26-NOV-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	26-NOV-20
WG3451966-5	MS	WG3451966-3						
Aluminum (Al)-Total			N/A	MS-B	%		-	26-NOV-20
Antimony (Sb)-Total			101.2		%		70-130	26-NOV-20
Arsenic (As)-Total			109.5		%		70-130	26-NOV-20
Barium (Ba)-Total			N/A	MS-B	%		-	26-NOV-20
Beryllium (Be)-Total			107.7		%		70-130	26-NOV-20
Bismuth (Bi)-Total			101.6		%		70-130	26-NOV-20
Boron (B)-Total			N/A	MS-B	%		-	26-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5298095							
WG3451966-5 MS		WG3451966-3						
Cadmium (Cd)-Total			101.6		%		70-130	26-NOV-20
Calcium (Ca)-Total			N/A	MS-B	%		-	26-NOV-20
Chromium (Cr)-Total			103.1		%		70-130	26-NOV-20
Cesium (Cs)-Total			99.2		%		70-130	26-NOV-20
Cobalt (Co)-Total			105.1		%		70-130	26-NOV-20
Copper (Cu)-Total			106.0		%		70-130	26-NOV-20
Iron (Fe)-Total			N/A	MS-B	%		-	26-NOV-20
Lead (Pb)-Total			100.6		%		70-130	26-NOV-20
Lithium (Li)-Total			N/A	MS-B	%		-	26-NOV-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	26-NOV-20
Manganese (Mn)-Total			104.6		%		70-130	26-NOV-20
Molybdenum (Mo)-Total			N/A	MS-B	%		-	26-NOV-20
Nickel (Ni)-Total			105.3		%		70-130	26-NOV-20
Phosphorus (P)-Total			125.5		%		70-130	26-NOV-20
Potassium (K)-Total			N/A	MS-B	%		-	26-NOV-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	26-NOV-20
Selenium (Se)-Total			99.8		%		70-130	26-NOV-20
Silicon (Si)-Total			N/A	MS-B	%		-	26-NOV-20
Silver (Ag)-Total			98.9		%		70-130	26-NOV-20
Sodium (Na)-Total			N/A	MS-B	%		-	26-NOV-20
Strontium (Sr)-Total			N/A	MS-B	%		-	26-NOV-20
Sulfur (S)-Total			N/A	MS-B	%		-	26-NOV-20
Thallium (Tl)-Total			102.5		%		70-130	26-NOV-20
Tellurium (Te)-Total			102.6		%		70-130	26-NOV-20
Thorium (Th)-Total			94.6		%		70-130	26-NOV-20
Tin (Sn)-Total			97.4		%		70-130	26-NOV-20
Titanium (Ti)-Total			107.9		%		70-130	26-NOV-20
Tungsten (W)-Total			102.2		%		70-130	26-NOV-20
Uranium (U)-Total			N/A	MS-B	%		-	26-NOV-20
Vanadium (V)-Total			105.5		%		70-130	26-NOV-20
Zinc (Zn)-Total			104.4		%		70-130	26-NOV-20
Zirconium (Zr)-Total			92.0		%		70-130	26-NOV-20

OGG-SPEC-WT Water



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OGG-SPEC-WT		Water						
Batch	R5298859							
WG3451948-2	LCS							
Oil and Grease, Total			94.9		%		70-130	26-NOV-20
Mineral Oil and Grease			90.2		%		70-130	26-NOV-20
WG3451948-1	MB							
Oil and Grease, Total			<5.0		mg/L		5	26-NOV-20
Mineral Oil and Grease			<2.5		mg/L		2.5	26-NOV-20
PAH-511-WT		Water						
Batch	R5298949							
WG3451674-2	LCS							
1-Methylnaphthalene			89.0		%		50-140	27-NOV-20
2-Methylnaphthalene			82.6		%		50-140	27-NOV-20
Acenaphthene			89.4		%		50-140	27-NOV-20
Acenaphthylene			88.7		%		50-140	27-NOV-20
Anthracene			94.7		%		50-140	27-NOV-20
Benzo(a)anthracene			101.1		%		50-140	27-NOV-20
Benzo(a)pyrene			89.0		%		50-140	27-NOV-20
Benzo(b)fluoranthene			88.2		%		50-140	27-NOV-20
Benzo(g,h,i)perylene			88.8		%		50-140	27-NOV-20
Benzo(k)fluoranthene			87.8		%		50-140	27-NOV-20
Chrysene			107.1		%		50-140	27-NOV-20
Dibenzo(ah)anthracene			90.1		%		50-140	27-NOV-20
Fluoranthene			95.0		%		50-140	27-NOV-20
Fluorene			93.4		%		50-140	27-NOV-20
Indeno(1,2,3-cd)pyrene			103.8		%		50-140	27-NOV-20
Naphthalene			80.2		%		50-140	27-NOV-20
Phenanthrene			99.8		%		50-140	27-NOV-20
Pyrene			97.0		%		50-140	27-NOV-20
WG3451674-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	27-NOV-20
2-Methylnaphthalene			<0.020		ug/L		0.02	27-NOV-20
Acenaphthene			<0.020		ug/L		0.02	27-NOV-20
Acenaphthylene			<0.020		ug/L		0.02	27-NOV-20
Anthracene			<0.020		ug/L		0.02	27-NOV-20
Benzo(a)anthracene			<0.020		ug/L		0.02	27-NOV-20
Benzo(a)pyrene			<0.010		ug/L		0.01	27-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT		Water						
Batch R5298949								
WG3451674-1 MB								
Benzo(b)fluoranthene			<0.020		ug/L		0.02	27-NOV-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	27-NOV-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	27-NOV-20
Chrysene			<0.020		ug/L		0.02	27-NOV-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	27-NOV-20
Fluoranthene			<0.020		ug/L		0.02	27-NOV-20
Fluorene			<0.020		ug/L		0.02	27-NOV-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	27-NOV-20
Naphthalene			<0.050		ug/L		0.05	27-NOV-20
Phenanthrene			<0.020		ug/L		0.02	27-NOV-20
Pyrene			<0.020		ug/L		0.02	27-NOV-20
Surrogate: d8-Naphthalene			86.5		%		60-140	27-NOV-20
Surrogate: d10-Phenanthrene			96.0		%		60-140	27-NOV-20
Surrogate: d12-Chrysene			93.2		%		60-140	27-NOV-20
Surrogate: d10-Acenaphthene			88.5		%		60-140	27-NOV-20
PH-WT		Water						
Batch R5298244								
WG3452155-4 DUP		WG3452155-3						
pH		7.80	7.76	J	pH units	0.04	0.2	26-NOV-20
WG3452155-2 LCS								
pH			7.05		pH units		6.9-7.1	26-NOV-20
Batch R5299316								
WG3452156-4 DUP		WG3452156-3						
pH		8.28	8.26	J	pH units	0.02	0.2	26-NOV-20
WG3452156-2 LCS								
pH			7.01		pH units		6.9-7.1	26-NOV-20
VOC-511-HS-WT		Water						
Batch R5299578								
WG3453379-4 DUP		WG3453379-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20



Quality Control Report

Workorder: L2533335

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5299578							
WG3453379-4	DUP	WG3453379-3						
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	30-NOV-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	30-NOV-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-NOV-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	30-NOV-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	30-NOV-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	30-NOV-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	30-NOV-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-NOV-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-NOV-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	30-NOV-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	30-NOV-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	30-NOV-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	30-NOV-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-NOV-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	30-NOV-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	30-NOV-20
Trichloroethylene		<0.50	<0.50		ug/L			30-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5299578							
WG3453379-4	DUP	WG3453379-3						
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	30-NOV-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-NOV-20
WG3453379-1	LCS							
1,1,1,2-Tetrachloroethane			89.1		%		70-130	30-NOV-20
1,1,2,2-Tetrachloroethane			74.2		%		70-130	30-NOV-20
1,1,1-Trichloroethane			100.5		%		70-130	30-NOV-20
1,1,2-Trichloroethane			83.8		%		70-130	30-NOV-20
1,1-Dichloroethane			90.6		%		70-130	30-NOV-20
1,1-Dichloroethylene			100.8		%		70-130	30-NOV-20
1,2-Dibromoethane			82.0		%		70-130	30-NOV-20
1,2-Dichlorobenzene			97.6		%		70-130	30-NOV-20
1,2-Dichloroethane			88.0		%		70-130	30-NOV-20
1,2-Dichloropropane			86.1		%		70-130	30-NOV-20
1,3-Dichlorobenzene			106.1		%		70-130	30-NOV-20
1,4-Dichlorobenzene			104.9		%		70-130	30-NOV-20
Acetone			86.0		%		60-140	30-NOV-20
Benzene			89.9		%		70-130	30-NOV-20
Bromodichloromethane			96.9		%		70-130	30-NOV-20
Bromoform			90.3		%		70-130	30-NOV-20
Bromomethane			83.2		%		60-140	30-NOV-20
Carbon tetrachloride			106.5		%		70-130	30-NOV-20
Chlorobenzene			93.9		%		70-130	30-NOV-20
Chloroform			94.9		%		70-130	30-NOV-20
cis-1,2-Dichloroethylene			90.5		%		70-130	30-NOV-20
cis-1,3-Dichloropropene			91.5		%		70-130	30-NOV-20
Dibromochloromethane			86.5		%		70-130	30-NOV-20
Dichlorodifluoromethane			71.6		%		50-140	30-NOV-20
Ethylbenzene			100.0		%		70-130	30-NOV-20
n-Hexane			97.9		%		70-130	30-NOV-20
m+p-Xylenes			100.9		%		70-130	30-NOV-20
Methyl Ethyl Ketone			63.0		%		60-140	30-NOV-20
Methyl Isobutyl Ketone			75.9		%		60-140	30-NOV-20
Methylene Chloride			90.0				70-130	



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5299578							
WG3453379-1	LCS							
Methylene Chloride			90.0		%		70-130	30-NOV-20
MTBE			97.4		%		70-130	30-NOV-20
o-Xylene			104.5		%		70-130	30-NOV-20
Styrene			91.0		%		70-130	30-NOV-20
Tetrachloroethylene			105.4		%		70-130	30-NOV-20
Toluene			97.4		%		70-130	30-NOV-20
trans-1,2-Dichloroethylene			101.9		%		70-130	30-NOV-20
trans-1,3-Dichloropropene			92.4		%		70-130	30-NOV-20
Trichloroethylene			100.7		%		70-130	30-NOV-20
Trichlorofluoromethane			99.5		%		60-140	30-NOV-20
Vinyl chloride			89.3		%		60-140	30-NOV-20
WG3453379-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	30-NOV-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	30-NOV-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	30-NOV-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	30-NOV-20
1,1-Dichloroethane			<0.50		ug/L		0.5	30-NOV-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	30-NOV-20
1,2-Dibromoethane			<0.20		ug/L		0.2	30-NOV-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	30-NOV-20
1,2-Dichloroethane			<0.50		ug/L		0.5	30-NOV-20
1,2-Dichloropropane			<0.50		ug/L		0.5	30-NOV-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	30-NOV-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	30-NOV-20
Acetone			<30		ug/L		30	30-NOV-20
Benzene			<0.50		ug/L		0.5	30-NOV-20
Bromodichloromethane			<2.0		ug/L		2	30-NOV-20
Bromoform			<5.0		ug/L		5	30-NOV-20
Bromomethane			<0.50		ug/L		0.5	30-NOV-20
Carbon tetrachloride			<0.20		ug/L		0.2	30-NOV-20
Chlorobenzene			<0.50		ug/L		0.5	30-NOV-20
Chloroform			<1.0		ug/L		1	30-NOV-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	30-NOV-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	30-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5299578							
WG3453379-2 MB								
Dibromochloromethane			<2.0		ug/L		2	30-NOV-20
Dichlorodifluoromethane			<2.0		ug/L		2	30-NOV-20
Ethylbenzene			<0.50		ug/L		0.5	30-NOV-20
n-Hexane			<0.50		ug/L		0.5	30-NOV-20
m+p-Xylenes			<0.40		ug/L		0.4	30-NOV-20
Methyl Ethyl Ketone			<20		ug/L		20	30-NOV-20
Methyl Isobutyl Ketone			<20		ug/L		20	30-NOV-20
Methylene Chloride			<5.0		ug/L		5	30-NOV-20
MTBE			<2.0		ug/L		2	30-NOV-20
o-Xylene			<0.30		ug/L		0.3	30-NOV-20
Styrene			<0.50		ug/L		0.5	30-NOV-20
Tetrachloroethylene			<0.50		ug/L		0.5	30-NOV-20
Toluene			<0.50		ug/L		0.5	30-NOV-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	30-NOV-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	30-NOV-20
Trichloroethylene			<0.50		ug/L		0.5	30-NOV-20
Trichlorofluoromethane			<5.0		ug/L		5	30-NOV-20
Vinyl chloride			<0.50		ug/L		0.5	30-NOV-20
Surrogate: 1,4-Difluorobenzene			101.1		%		70-130	30-NOV-20
Surrogate: 4-Bromofluorobenzene			100.4		%		70-130	30-NOV-20
WG3453379-5 MS		WG3453379-3						
1,1,1,2-Tetrachloroethane			90.2		%		50-140	30-NOV-20
1,1,1,2,2-Tetrachloroethane			83.2		%		50-140	30-NOV-20
1,1,1-Trichloroethane			96.2		%		50-140	30-NOV-20
1,1,2-Trichloroethane			89.5		%		50-140	30-NOV-20
1,1-Dichloroethane			91.7		%		50-140	30-NOV-20
1,1-Dichloroethylene			95.8		%		50-140	30-NOV-20
1,2-Dibromoethane			88.0		%		50-140	30-NOV-20
1,2-Dichlorobenzene			97.5		%		50-140	30-NOV-20
1,2-Dichloroethane			96.3		%		50-140	30-NOV-20
1,2-Dichloropropane			91.1		%		50-140	30-NOV-20
1,3-Dichlorobenzene			102.1		%		50-140	30-NOV-20
1,4-Dichlorobenzene			101.8		%		50-140	30-NOV-20
Acetone			101.0		%		50-140	30-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5299578							
WG3453379-5 MS		WG3453379-3						
Benzene			91.0		%		50-140	30-NOV-20
Bromodichloromethane			102.1		%		50-140	30-NOV-20
Bromoform			96.9		%		50-140	30-NOV-20
Bromomethane			78.5		%		50-140	30-NOV-20
Carbon tetrachloride			101.9		%		50-140	30-NOV-20
Chlorobenzene			93.3		%		50-140	30-NOV-20
Chloroform			96.9		%		50-140	30-NOV-20
cis-1,2-Dichloroethylene			91.7		%		50-140	30-NOV-20
cis-1,3-Dichloropropene			92.8		%		50-140	30-NOV-20
Dibromochloromethane			89.8		%		50-140	30-NOV-20
Dichlorodifluoromethane			59.9		%		50-140	30-NOV-20
Ethylbenzene			95.7		%		50-140	30-NOV-20
n-Hexane			90.2		%		50-140	30-NOV-20
m+p-Xylenes			96.5		%		50-140	30-NOV-20
Methyl Ethyl Ketone			78.1		%		50-140	30-NOV-20
Methyl Isobutyl Ketone			90.8		%		50-140	30-NOV-20
Methylene Chloride			92.3		%		50-140	30-NOV-20
MTBE			97.6		%		50-140	30-NOV-20
o-Xylene			102.6		%		50-140	30-NOV-20
Styrene			90.6		%		50-140	30-NOV-20
Tetrachloroethylene			96.3		%		50-140	30-NOV-20
Toluene			94.6		%		50-140	30-NOV-20
trans-1,2-Dichloroethylene			97.8		%		50-140	30-NOV-20
trans-1,3-Dichloropropene			91.3		%		50-140	30-NOV-20
Trichloroethylene			97.2		%		50-140	30-NOV-20
Trichlorofluoromethane			91.6		%		50-140	30-NOV-20
Vinyl chloride			81.3		%		50-140	30-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
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Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

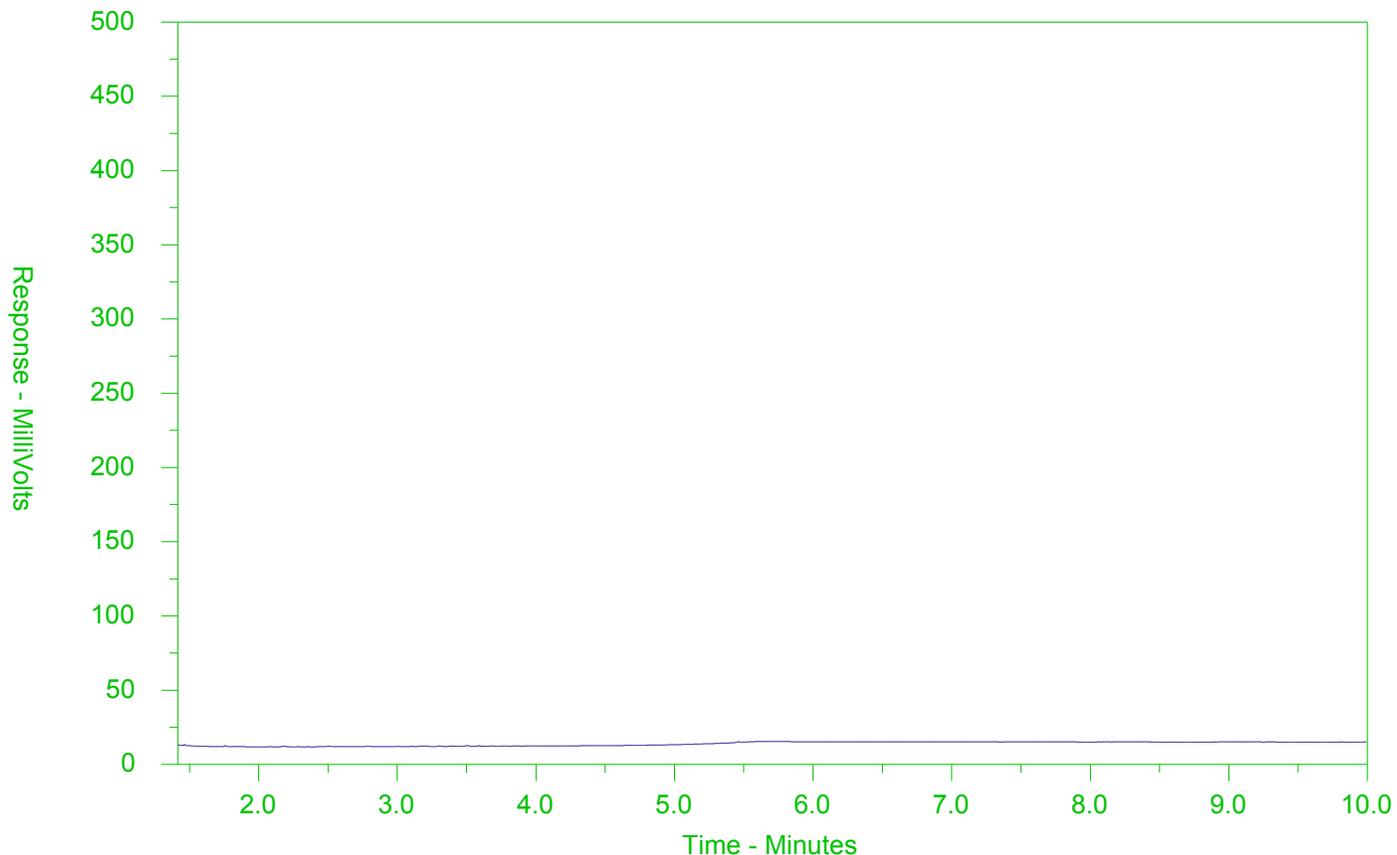
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2533335-1
 Client Sample ID: GW-11210029-112420-MW-2



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

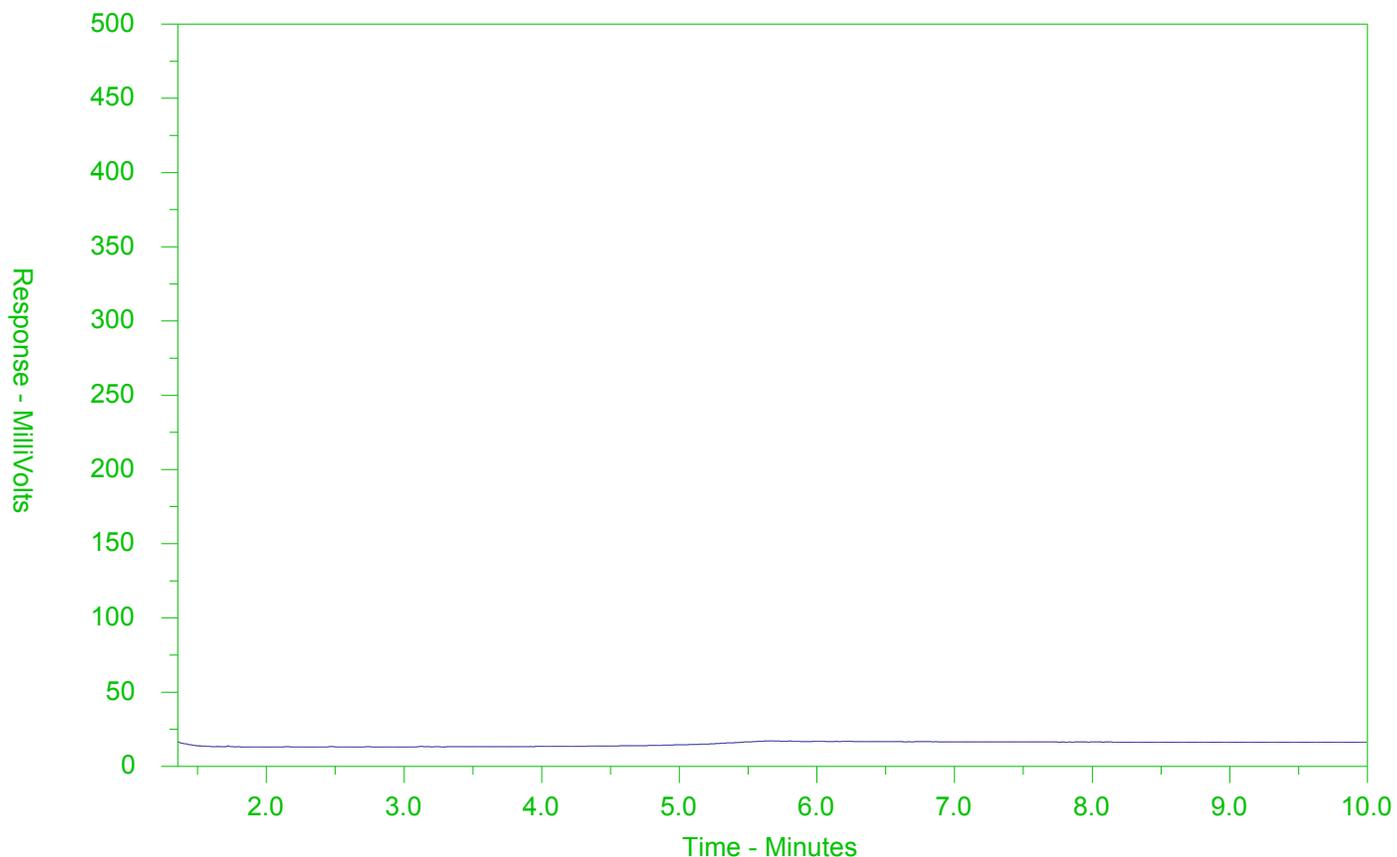
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2533335-2
 Client Sample ID: GW-11210029-112420-MW-2D



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

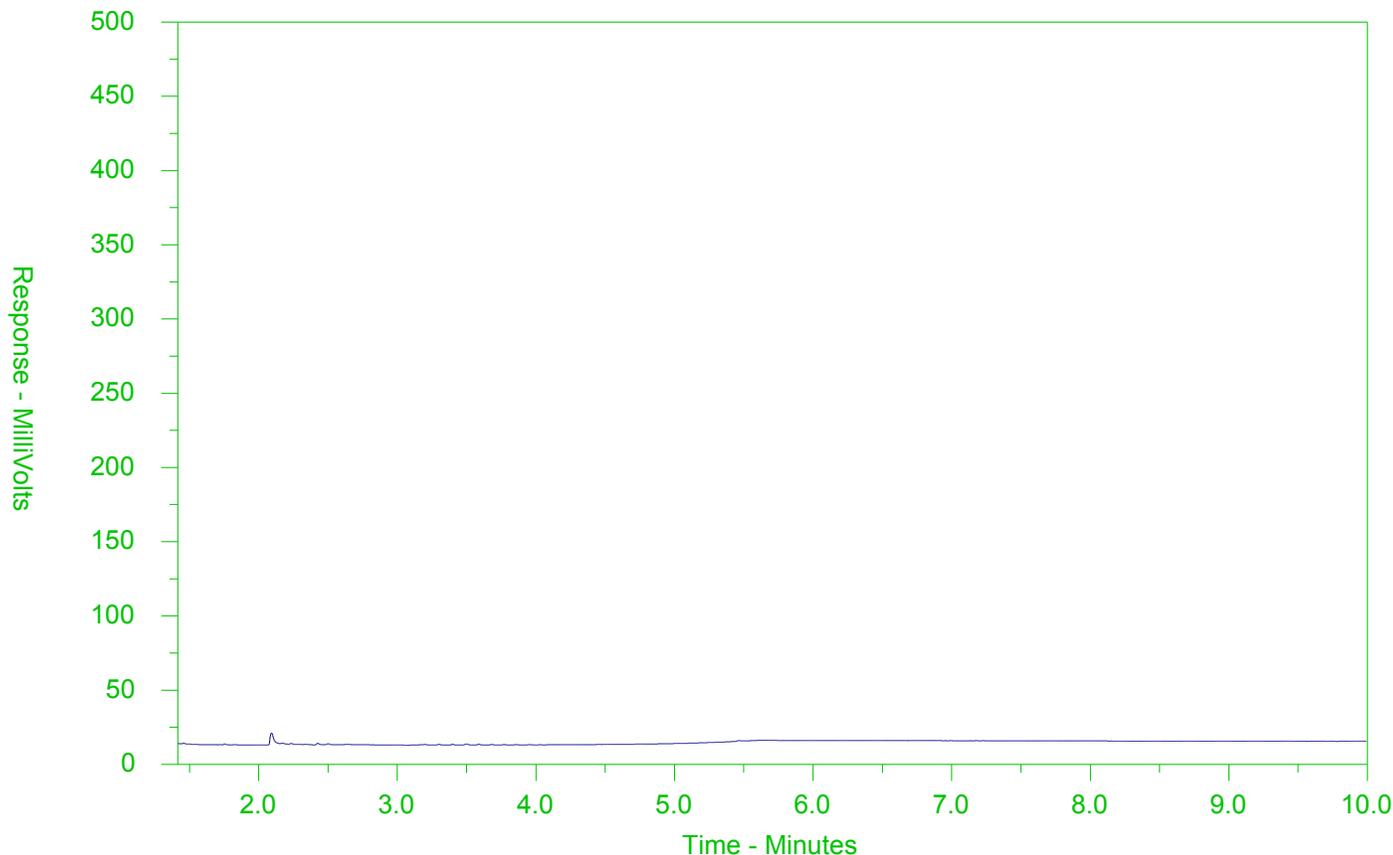
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2533335-3
 Client Sample ID: GW-11210029-112420-MW-3



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

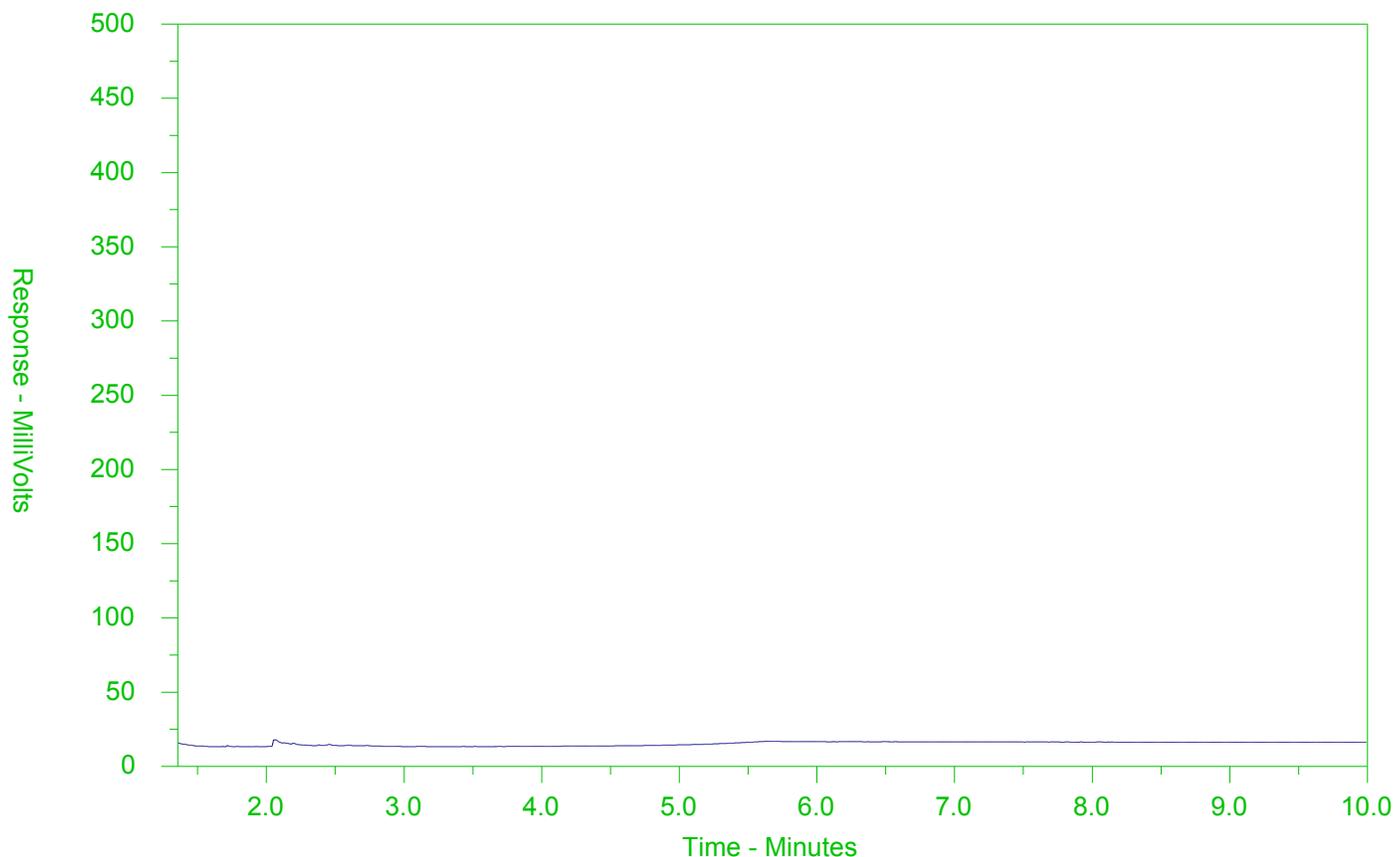
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2533335-4
 Client Sample ID: GW-11210029-112520-MW-1



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytical Request Form



L2533335-COFC

COC Number: 17 - 871527

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Canada Toll Free: 1 800 668 9878

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Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																																																																																																																	
Company: GHD		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																																																																																																																	
Contact: Jon Balk with		Quality Control (QC) Report with Report <input type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)	4 day [P4-20%] <input type="checkbox"/>		EMERGENCY	1 Business day [E - 100%] <input type="checkbox"/>																																																																																																													
Phone:		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked				3 day [P3-25%] <input type="checkbox"/>			Same Day, Weekend or Statutory holiday [E2 - 200% (Laboratory opening fees may apply)] <input type="checkbox"/>																																																																																																													
Company address below will appear on the final report		Select Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			2 day [P2-50%] <input type="checkbox"/>		Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm																																																																																																															
Street: 455 Philip St		Email 1 or Fax: Jennifer.Balkwith@ghd.com			For tests that can not be performed according to the service level selected, you will be contacted.																																																																																																																	
City/Province: Waterloo ON		Email 2: Gary.Larios@ghd.com			Analysis Request																																																																																																																	
Postal Code:		Email 3: Amelia.Selsta@ghd.com																																																																																																																				
Invoice To: Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Invoice Distribution			<table border="1"> <tr> <th rowspan="2">NUMBER OF CONTAINERS</th> <th colspan="10">Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below</th> <th rowspan="2">SAMPLES ON HOLD</th> <th rowspan="2">SUSPECTED HAZARD (see Special Instructions)</th> </tr> <tr> <th>P</th><th>P</th><th>FP</th><th>P</th><th>FP</th><th>FP</th><th>P</th><th>P</th><th>P</th><th></th><th></th> </tr> <tr> <td></td> <td>VOC, FI</td> <td>Total Metals</td> <td>Dissolved Metals</td> <td>Total Hg</td> <td>Dissolved As</td> <td>Dissolved Cr6</td> <td>CN</td> <td>SVOC</td> <td>PAH F2-F4</td> <td>EC, PA, CL</td> <td>Oil & Grease</td> <td></td> <td></td> </tr> <tr> <td>15</td> <td>x</td> <td>*</td> <td></td> </tr> <tr> <td>15</td> <td>x</td> <td></td> </tr> <tr> <td>15</td> <td>x</td> <td></td> </tr> <tr> <td>15</td> <td>x</td> <td></td> </tr> <tr> <td>2</td> <td>x</td> <td></td> </tr> </table>						NUMBER OF CONTAINERS	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below										SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)	P	P	FP	P	FP	FP	P	P	P				VOC, FI	Total Metals	Dissolved Metals	Total Hg	Dissolved As	Dissolved Cr6	CN	SVOC	PAH F2-F4	EC, PA, CL	Oil & Grease			15	x	*												15	x													15	x													15	x													2	x												
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Company:		Email 1 or Fax:																																																																																																																				
Contact:		Email 2:																																																																																																																				
Project Information		Oil and Gas Required Fields (client use)																																																																																																																				
ALS Account # / Quote #: 13791		AFE/Cost Center:		PO#:																																																																																																																		
Job #: 11210029-02-WATER		Major/Minor Code:		Routing Code:																																																																																																																		
PO / AFE:		Requisitioner:																																																																																																																				
LSD:		Location:																																																																																																																				
ALS Lab Work Order # (lab use only): L2533335 MM		ALS Contact:		Sampler:																																																																																																																		
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type																																																																																																																		
	GW-11210029-112420-MW-2	24-Nov-20	11:25	GW																																																																																																																		
	- 2D	11	11:30	↓																																																																																																																		
	- 3	11	13:45	↓																																																																																																																		
	- 1	25-Nov-20	11:20	↓																																																																																																																		
	Trip Blank	11	12:00	↓																																																																																																																		
Drinking Water (DW) Samples' (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)																																																																																																																	
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Frozen <input type="checkbox"/> SIP Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																																																																																																																	
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input checked="" type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																																																																																																																	
					Cooling Initiated <input type="checkbox"/>																																																																																																																	
					INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C																																																																																																														
								2.9 3.3																																																																																																														
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)																																																																																																																	
Released by:	Date: 11-25-2020	Time: 12:53	Received by:	Date:	Time:	Received by:	Date: Nov 25/20	Time: 1300																																																																																																														

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2018 FRONT

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



GHD Limited (Waterloo)
ATTN: Laura Ermeta
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 04-DEC-20
Report Date: 14-DEC-20 10:02 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2537182

Project P.O. #: 73522069
Job Reference: 11210029-02
C of C Numbers: 17-871523
Legal Site Desc:


Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-1 GW-11210029-120420-MW-01							
Sampled By: CLIENT on 04-DEC-20 @ 11:30							
Matrix: WATER							
Physical Tests							
Conductivity	0.632		0.0030	mS/cm		08-DEC-20	R5309386
pH	7.68		0.10	pH units		08-DEC-20	R5309386
Anions and Nutrients							
Chloride (Cl)	11.7		0.50	mg/L		08-DEC-20	R5309768
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		07-DEC-20	R5309148
Total Metals							
Aluminum (Al)-Total	0.366		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Antimony (Sb)-Total	0.00021		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Arsenic (As)-Total	0.00055		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Barium (Ba)-Total	0.0939		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Boron (B)-Total	0.029		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Cadmium (Cd)-Total	0.0000319		0.0000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Calcium (Ca)-Total	91.0		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cesium (Cs)-Total	0.000039		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Chromium (Cr)-Total	0.00097		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cobalt (Co)-Total	0.00066		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Copper (Cu)-Total	0.00143		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Iron (Fe)-Total	0.439		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Lead (Pb)-Total	0.000725		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Lithium (Li)-Total	0.0124		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Magnesium (Mg)-Total	34.2		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Manganese (Mn)-Total	0.135		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		08-DEC-20	R5309314
Molybdenum (Mo)-Total	0.00325		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Nickel (Ni)-Total	0.00173		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Phosphorus (P)-Total	<0.050		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Potassium (K)-Total	5.56		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Rubidium (Rb)-Total	0.00099		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Selenium (Se)-Total	0.000109		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Silicon (Si)-Total	7.05		0.10	mg/L	07-DEC-20	07-DEC-20	R5308869
Silver (Ag)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Sodium (Na)-Total	9.85		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Strontium (Sr)-Total	0.269		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Sulfur (S)-Total	8.87		0.50	mg/L	07-DEC-20	07-DEC-20	R5308869
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Thallium (Tl)-Total	0.000012		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Thorium (Th)-Total	0.00011		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Tin (Sn)-Total	0.00028		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Titanium (Ti)-Total	0.0142		0.00030	mg/L	07-DEC-20	07-DEC-20	R5308869

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-1 GW-11210029-120420-MW-01							
Sampled By: CLIENT on 04-DEC-20 @ 11:30							
Matrix: WATER							
Total Metals							
Tungsten (W)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Uranium (U)-Total	0.000905		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Vanadium (V)-Total	0.00104		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Zinc (Zn)-Total	0.0102		0.0030	mg/L	07-DEC-20	07-DEC-20	R5308869
Zirconium (Zr)-Total	0.00040		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					07-DEC-20	R5308717
Dissolved Metals Filtration Location	FIELD					08-DEC-20	R5309129
Antimony (Sb)-Dissolved	0.16		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Arsenic (As)-Dissolved	0.36		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Barium (Ba)-Dissolved	93.5		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Boron (B)-Dissolved	23		10	ug/L	08-DEC-20	08-DEC-20	R5309628
Cadmium (Cd)-Dissolved	0.014		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Cobalt (Co)-Dissolved	0.43		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Copper (Cu)-Dissolved	0.70		0.20	ug/L	08-DEC-20	08-DEC-20	R5309628
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	07-DEC-20	07-DEC-20	R5308859
Molybdenum (Mo)-Dissolved	2.89		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Nickel (Ni)-Dissolved	1.13		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Selenium (Se)-Dissolved	0.096		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Sodium (Na)-Dissolved	9100		500	ug/L	08-DEC-20	08-DEC-20	R5309628
Thallium (Tl)-Dissolved	0.015		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Uranium (U)-Dissolved	0.816		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Zinc (Zn)-Dissolved	4.3		1.0	ug/L	08-DEC-20	08-DEC-20	R5309628
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		07-DEC-20	R5309177
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	07-DEC-20	07-DEC-20	R5309404
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		08-DEC-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	07-DEC-20	07-DEC-20	R5309404
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-DEC-20	R5310357
Benzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Bromodichloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Bromoform	<5.0		5.0	ug/L		10-DEC-20	R5310357
Bromomethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Carbon tetrachloride	<0.20		0.20	ug/L		10-DEC-20	R5310357
Chlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-1 GW-11210029-120420-MW-01 Sampled By: CLIENT on 04-DEC-20 @ 11:30 Matrix: WATER							
Volatile Organic Compounds							
Dibromochloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Chloroform	<1.0		1.0	ug/L		10-DEC-20	R5310357
1,2-Dibromoethane	<0.20		0.20	ug/L		10-DEC-20	R5310357
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
1,1-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,2-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methylene Chloride	<5.0		5.0	ug/L		10-DEC-20	R5310357
1,2-Dichloropropane	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-DEC-20	
Ethylbenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
n-Hexane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methyl Ethyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
Methyl Isobutyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
MTBE	<2.0		2.0	ug/L		10-DEC-20	R5310357
Styrene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Tetrachloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Toluene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichlorofluoromethane	<5.0		5.0	ug/L		10-DEC-20	R5310357
Vinyl chloride	<0.50		0.50	ug/L		10-DEC-20	R5310357
o-Xylene	<0.30		0.30	ug/L		10-DEC-20	R5310357
m+p-Xylenes	<0.40		0.40	ug/L		10-DEC-20	R5310357
Xylenes (Total)	<0.50		0.50	ug/L		10-DEC-20	
Surrogate: 4-Bromofluorobenzene	99.7		70-130	%		10-DEC-20	R5310357
Surrogate: 1,4-Difluorobenzene	98.8		70-130	%		10-DEC-20	R5310357
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-DEC-20	R5310357
F1-BTEX	<25		25	ug/L		11-DEC-20	
F2 (C10-C16)	<100		100	ug/L	07-DEC-20	08-DEC-20	R5309249

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-1 GW-11210029-120420-MW-01							
Sampled By: CLIENT on 04-DEC-20 @ 11:30							
Matrix: WATER							
Hydrocarbons							
F2-Naphth	<100		100	ug/L		11-DEC-20	
F3 (C16-C34)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
F3-PAH	<250		250	ug/L		11-DEC-20	
F4 (C34-C50)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
Total Hydrocarbons (C6-C50)	<370		370	ug/L		11-DEC-20	
Chrom. to baseline at nC50	YES				07-DEC-20	08-DEC-20	R5309249
Surrogate: 2-Bromobenzotrifluoride	92.2		60-140	%	07-DEC-20	08-DEC-20	R5309249
Surrogate: 3,4-Dichlorotoluene	104.3		60-140	%		10-DEC-20	R5310357
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Acenaphthylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)pyrene	<0.010		0.010	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(b)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(k)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Chrysene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluoranthene	0.075		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluorene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		11-DEC-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
2-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Naphthalene	<0.050		0.050	ug/L	07-DEC-20	09-DEC-20	R5310144
Phenanthrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Pyrene	0.109		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Acenaphthene	93.9		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d12-Chrysene	102.7		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d8-Naphthalene	89.9		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Phenanthrene	99.0		60-140	%	07-DEC-20	09-DEC-20	R5310144
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
4-Chloroaniline	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2-Chlorophenol	<0.30		0.30	ug/L	07-DEC-20	11-DEC-20	R5309926
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dichlorophenol	<0.30		0.30	ug/L	07-DEC-20	11-DEC-20	R5309926
Diethylphthalate	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-1 GW-11210029-120420-MW-01 Sampled By: CLIENT on 04-DEC-20 @ 11:30 Matrix: WATER							
Semi-Volatile Organics							
Dimethylphthalate	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dimethylphenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dinitrophenol	<1.0		1.0	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,6-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		11-DEC-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	07-DEC-20	11-DEC-20	R5309926
Pentachlorophenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
Phenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
Surrogate: 2-Fluorobiphenyl	86.9		50-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: Nitrobenzene d5	95.2		50-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: p-Terphenyl d14	91.5		60-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: 2,4,6-Tribromophenol	114.2		50-140	%	07-DEC-20	11-DEC-20	R5309926
L2537182-2 GW-11210029-120420-MW-02 Sampled By: CLIENT on 04-DEC-20 @ 13:05 Matrix: WATER							
Physical Tests							
Conductivity	0.688		0.0030	mS/cm		08-DEC-20	R5309386
pH	7.69		0.10	pH units		08-DEC-20	R5309386
Anions and Nutrients							
Chloride (Cl)	5.40		0.50	mg/L		08-DEC-20	R5309768
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		07-DEC-20	R5309148
Total Metals							
Aluminum (Al)-Total	0.0092		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Arsenic (As)-Total	0.00051		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Barium (Ba)-Total	0.0531		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Boron (B)-Total	0.043		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Cadmium (Cd)-Total	0.0000789		0.0000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Calcium (Ca)-Total	96.1		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Chromium (Cr)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cobalt (Co)-Total	0.00066		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Copper (Cu)-Total	0.0104		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Iron (Fe)-Total	<0.010		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Lead (Pb)-Total	0.000083		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-2 GW-11210029-120420-MW-02							
Sampled By: CLIENT on 04-DEC-20 @ 13:05							
Matrix: WATER							
Total Metals							
Lithium (Li)-Total	0.0019		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Magnesium (Mg)-Total	31.0		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Manganese (Mn)-Total	0.140		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		08-DEC-20	R5309314
Molybdenum (Mo)-Total	0.000528		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Nickel (Ni)-Total	0.00490		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Phosphorus (P)-Total	<0.050		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Potassium (K)-Total	31.2		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Rubidium (Rb)-Total	0.00587		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Selenium (Se)-Total	0.000113		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Silicon (Si)-Total	4.65		0.10	mg/L	07-DEC-20	07-DEC-20	R5308869
Silver (Ag)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Sodium (Na)-Total	4.90		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Strontium (Sr)-Total	0.119		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Sulfur (S)-Total	5.21		0.50	mg/L	07-DEC-20	07-DEC-20	R5308869
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Thallium (Tl)-Total	0.000068		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Thorium (Th)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Tin (Sn)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Titanium (Ti)-Total	0.00053		0.00030	mg/L	07-DEC-20	07-DEC-20	R5308869
Tungsten (W)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Uranium (U)-Total	0.000428		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Vanadium (V)-Total	<0.00050		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Zinc (Zn)-Total	0.0185		0.0030	mg/L	07-DEC-20	07-DEC-20	R5308869
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					07-DEC-20	R5308717
Dissolved Metals Filtration Location	FIELD					08-DEC-20	R5309129
Antimony (Sb)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Arsenic (As)-Dissolved	0.46		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Barium (Ba)-Dissolved	51.5		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Boron (B)-Dissolved	36		10	ug/L	08-DEC-20	08-DEC-20	R5309628
Cadmium (Cd)-Dissolved	0.073		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Cobalt (Co)-Dissolved	0.62		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Copper (Cu)-Dissolved	10.5		0.20	ug/L	08-DEC-20	08-DEC-20	R5309628
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	07-DEC-20	07-DEC-20	R5308859
Molybdenum (Mo)-Dissolved	0.524		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Nickel (Ni)-Dissolved	4.70		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-2 GW-11210029-120420-MW-02							
Sampled By: CLIENT on 04-DEC-20 @ 13:05							
Matrix: WATER							
Dissolved Metals							
Selenium (Se)-Dissolved	0.146		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Sodium (Na)-Dissolved	4670		500	ug/L	08-DEC-20	08-DEC-20	R5309628
Thallium (Tl)-Dissolved	0.063		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Uranium (U)-Dissolved	0.348		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Zinc (Zn)-Dissolved	17.7		1.0	ug/L	08-DEC-20	08-DEC-20	R5309628
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		07-DEC-20	R5309177
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	07-DEC-20	07-DEC-20	R5309404
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		08-DEC-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	07-DEC-20	07-DEC-20	R5309404
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-DEC-20	R5310357
Benzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Bromodichloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Bromoform	<5.0		5.0	ug/L		10-DEC-20	R5310357
Bromomethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Carbon tetrachloride	<0.20		0.20	ug/L		10-DEC-20	R5310357
Chlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dibromochloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Chloroform	<1.0		1.0	ug/L		10-DEC-20	R5310357
1,2-Dibromoethane	<0.20		0.20	ug/L		10-DEC-20	R5310357
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
1,1-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,2-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methylene Chloride	<5.0		5.0	ug/L		10-DEC-20	R5310357
1,2-Dichloropropane	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-DEC-20	
Ethylbenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
n-Hexane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methyl Ethyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
Methyl Isobutyl Ketone	<20		20	ug/L		10-DEC-20	R5310357

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-2 GW-11210029-120420-MW-02							
Sampled By: CLIENT on 04-DEC-20 @ 13:05							
Matrix: WATER							
Volatile Organic Compounds							
MTBE	<2.0		2.0	ug/L		10-DEC-20	R5310357
Styrene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Tetrachloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Toluene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichlorofluoromethane	<5.0		5.0	ug/L		10-DEC-20	R5310357
Vinyl chloride	<0.50		0.50	ug/L		10-DEC-20	R5310357
o-Xylene	<0.30		0.30	ug/L		10-DEC-20	R5310357
m+p-Xylenes	<0.40		0.40	ug/L		10-DEC-20	R5310357
Xylenes (Total)	<0.50		0.50	ug/L		10-DEC-20	
Surrogate: 4-Bromofluorobenzene	95.4		70-130	%		10-DEC-20	R5310357
Surrogate: 1,4-Difluorobenzene	100.0		70-130	%		10-DEC-20	R5310357
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-DEC-20	R5310357
F1-BTEX	<25		25	ug/L		11-DEC-20	
F2 (C10-C16)	<100		100	ug/L	07-DEC-20	08-DEC-20	R5309249
F2-Naphth	<100		100	ug/L		11-DEC-20	
F3 (C16-C34)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
F3-PAH	<250		250	ug/L		11-DEC-20	
F4 (C34-C50)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
Total Hydrocarbons (C6-C50)	<370		370	ug/L		11-DEC-20	
Chrom. to baseline at nC50	YES				07-DEC-20	08-DEC-20	R5309249
Surrogate: 2-Bromobenzotrifluoride	90.6		60-140	%	07-DEC-20	08-DEC-20	R5309249
Surrogate: 3,4-Dichlorotoluene	91.6		60-140	%		10-DEC-20	R5310357
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Acenaphthylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)pyrene	<0.010		0.010	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(b)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(k)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Chrysene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluorene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-2 GW-11210029-120420-MW-02 Sampled By: CLIENT on 04-DEC-20 @ 13:05 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		11-DEC-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
2-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Naphthalene	<0.050		0.050	ug/L	07-DEC-20	09-DEC-20	R5310144
Phenanthrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Pyrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Acenaphthene	93.8		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d12-Chrysene	93.7		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d8-Naphthalene	92.7		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Phenanthrene	94.8		60-140	%	07-DEC-20	09-DEC-20	R5310144
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
4-Chloroaniline	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2-Chlorophenol	<0.30		0.30	ug/L	07-DEC-20	11-DEC-20	R5309926
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dichlorophenol	<0.30		0.30	ug/L	07-DEC-20	11-DEC-20	R5309926
Diethylphthalate	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
Dimethylphthalate	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dimethylphenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dinitrophenol	<1.0		1.0	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,6-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		11-DEC-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	07-DEC-20	11-DEC-20	R5309926
Pentachlorophenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
Phenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
Surrogate: 2-Fluorobiphenyl	81.4		50-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: Nitrobenzene d5	93.0		50-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: p-Terphenyl d14	85.5		60-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: 2,4,6-Tribromophenol	96.4		50-140	%	07-DEC-20	11-DEC-20	R5309926
L2537182-3 GW-11210029-120420-MW-02D Sampled By: CLIENT on 04-DEC-20 @ 13:10 Matrix: WATER							
Physical Tests							
Conductivity	0.682		0.0030	mS/cm		08-DEC-20	R5309913
pH	8.15		0.10	pH units		08-DEC-20	R5309913

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-3 GW-11210029-120420-MW-02D Sampled By: CLIENT on 04-DEC-20 @ 13:10 Matrix: WATER							
Physical Tests							
Anions and Nutrients							
Chloride (Cl)	5.42		0.50	mg/L		08-DEC-20	R5309768
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		07-DEC-20	R5309148
Total Metals							
Aluminum (Al)-Total	0.0096		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Arsenic (As)-Total	0.00050		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Barium (Ba)-Total	0.0537		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Boron (B)-Total	0.043		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Cadmium (Cd)-Total	0.0000807		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Calcium (Ca)-Total	95.5		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cesium (Cs)-Total	0.000013		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Chromium (Cr)-Total	0.00058		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cobalt (Co)-Total	0.00067		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Copper (Cu)-Total	0.0108		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Iron (Fe)-Total	<0.010		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Lead (Pb)-Total	0.000095		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Lithium (Li)-Total	0.0019		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Magnesium (Mg)-Total	31.4		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Manganese (Mn)-Total	0.143		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		08-DEC-20	R5309314
Molybdenum (Mo)-Total	0.000542		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Nickel (Ni)-Total	0.00493		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Phosphorus (P)-Total	<0.050		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Potassium (K)-Total	32.2		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Rubidium (Rb)-Total	0.00594		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Selenium (Se)-Total	0.000128		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Silicon (Si)-Total	4.75		0.10	mg/L	07-DEC-20	07-DEC-20	R5308869
Silver (Ag)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Sodium (Na)-Total	5.05		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Strontium (Sr)-Total	0.120		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Sulfur (S)-Total	5.36		0.50	mg/L	07-DEC-20	07-DEC-20	R5308869
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Thallium (Tl)-Total	0.000068		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Thorium (Th)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Tin (Sn)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	07-DEC-20	07-DEC-20	R5308869
Tungsten (W)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Uranium (U)-Total	0.000432		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-3 GW-11210029-120420-MW-02D							
Sampled By: CLIENT on 04-DEC-20 @ 13:10							
Matrix: WATER							
Total Metals							
Vanadium (V)-Total	<0.00050		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Zinc (Zn)-Total	0.0189		0.0030	mg/L	07-DEC-20	07-DEC-20	R5308869
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					07-DEC-20	R5308717
Dissolved Metals Filtration Location	FIELD					08-DEC-20	R5309129
Antimony (Sb)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Arsenic (As)-Dissolved	0.46		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Barium (Ba)-Dissolved	52.8		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Boron (B)-Dissolved	36		10	ug/L	08-DEC-20	08-DEC-20	R5309628
Cadmium (Cd)-Dissolved	0.072		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Cobalt (Co)-Dissolved	0.64		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Copper (Cu)-Dissolved	10.8		0.20	ug/L	08-DEC-20	08-DEC-20	R5309628
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	07-DEC-20	07-DEC-20	R5308859
Molybdenum (Mo)-Dissolved	0.555		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Nickel (Ni)-Dissolved	4.94		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Selenium (Se)-Dissolved	0.111		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Sodium (Na)-Dissolved	4800		500	ug/L	08-DEC-20	08-DEC-20	R5309628
Thallium (Tl)-Dissolved	0.066		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Uranium (U)-Dissolved	0.351		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Zinc (Zn)-Dissolved	18.7		1.0	ug/L	08-DEC-20	08-DEC-20	R5309628
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		07-DEC-20	R5309177
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	07-DEC-20	07-DEC-20	R5309404
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		08-DEC-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	07-DEC-20	07-DEC-20	R5309404
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-DEC-20	R5310357
Benzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Bromodichloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Bromoform	<5.0		5.0	ug/L		10-DEC-20	R5310357
Bromomethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Carbon tetrachloride	<0.20		0.20	ug/L		10-DEC-20	R5310357
Chlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dibromochloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Chloroform	<1.0		1.0	ug/L		10-DEC-20	R5310357

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-3 GW-11210029-120420-MW-02D							
Sampled By: CLIENT on 04-DEC-20 @ 13:10							
Matrix: WATER							
Volatile Organic Compounds							
1,2-Dibromoethane	<0.20		0.20	ug/L		10-DEC-20	R5310357
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
1,1-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,2-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methylene Chloride	<5.0		5.0	ug/L		10-DEC-20	R5310357
1,2-Dichloropropane	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-DEC-20	
Ethylbenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
n-Hexane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methyl Ethyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
Methyl Isobutyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
MTBE	<2.0		2.0	ug/L		10-DEC-20	R5310357
Styrene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Tetrachloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Toluene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichlorofluoromethane	<5.0		5.0	ug/L		10-DEC-20	R5310357
Vinyl chloride	<0.50		0.50	ug/L		10-DEC-20	R5310357
o-Xylene	<0.30		0.30	ug/L		10-DEC-20	R5310357
m+p-Xylenes	<0.40		0.40	ug/L		10-DEC-20	R5310357
Xylenes (Total)	<0.50		0.50	ug/L		10-DEC-20	
Surrogate: 4-Bromofluorobenzene	95.5		70-130	%		10-DEC-20	R5310357
Surrogate: 1,4-Difluorobenzene	99.3		70-130	%		10-DEC-20	R5310357
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-DEC-20	R5310357
F1-BTEX	<25		25	ug/L		11-DEC-20	
F2 (C10-C16)	<100		100	ug/L	07-DEC-20	08-DEC-20	R5309249
F2-Naphth	<100		100	ug/L		11-DEC-20	
F3 (C16-C34)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-3 GW-11210029-120420-MW-02D							
Sampled By: CLIENT on 04-DEC-20 @ 13:10							
Matrix: WATER							
Hydrocarbons							
F3-PAH	<250		250	ug/L		11-DEC-20	
F4 (C34-C50)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
Total Hydrocarbons (C6-C50)	<370		370	ug/L		11-DEC-20	
Chrom. to baseline at nC50	YES				07-DEC-20	08-DEC-20	R5309249
Surrogate: 2-Bromobenzotrifluoride	91.3		60-140	%	07-DEC-20	08-DEC-20	R5309249
Surrogate: 3,4-Dichlorotoluene	89.1		60-140	%		10-DEC-20	R5310357
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Acenaphthylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)pyrene	<0.010		0.010	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(b)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(k)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Chrysene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluorene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		11-DEC-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
2-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Naphthalene	<0.050		0.050	ug/L	07-DEC-20	09-DEC-20	R5310144
Phenanthrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Pyrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Acenaphthene	95.8		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d12-Chrysene	90.0		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d8-Naphthalene	94.4		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Phenanthrene	94.3		60-140	%	07-DEC-20	09-DEC-20	R5310144
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
4-Chloroaniline	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2-Chlorophenol	<0.30		0.30	ug/L	07-DEC-20	11-DEC-20	R5309926
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dichlorophenol	<0.30		0.30	ug/L	07-DEC-20	11-DEC-20	R5309926
Diethylphthalate	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
Dimethylphthalate	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dimethylphenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-3 GW-11210029-120420-MW-02D Sampled By: CLIENT on 04-DEC-20 @ 13:10 Matrix: WATER							
Semi-Volatile Organics							
2,4-Dinitrophenol	<1.0		1.0	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,6-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		11-DEC-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	07-DEC-20	11-DEC-20	R5309926
Pentachlorophenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
Phenol	<0.50		0.50	ug/L	07-DEC-20	11-DEC-20	R5309926
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	11-DEC-20	R5309926
Surrogate: 2-Fluorobiphenyl	86.4		50-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: Nitrobenzene d5	94.8		50-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: p-Terphenyl d14	90.4		60-140	%	07-DEC-20	11-DEC-20	R5309926
Surrogate: 2,4,6-Tribromophenol	102.9		50-140	%	07-DEC-20	11-DEC-20	R5309926
L2537182-4 GW-11210029-120420-MW-03 Sampled By: CLIENT on 04-DEC-20 @ 15:10 Matrix: WATER							
Physical Tests							
Conductivity	0.624		0.0030	mS/cm		08-DEC-20	R5309913
pH	7.74		0.10	pH units		08-DEC-20	R5309913
Anions and Nutrients							
Chloride (Cl)	3.98		0.50	mg/L		08-DEC-20	R5309768
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L		07-DEC-20	R5309148
Total Metals							
Aluminum (Al)-Total	0.0610		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Arsenic (As)-Total	0.00032		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Barium (Ba)-Total	0.0708		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Boron (B)-Total	0.011		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Cadmium (Cd)-Total	0.0000067		0.0000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Calcium (Ca)-Total	95.3		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cesium (Cs)-Total	0.000020		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Cobalt (Co)-Total	0.00051		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Copper (Cu)-Total	0.00142		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Iron (Fe)-Total	0.068		0.010	mg/L	07-DEC-20	07-DEC-20	R5308869
Lead (Pb)-Total	0.000123		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Lithium (Li)-Total	0.0060		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Magnesium (Mg)-Total	39.7		0.0050	mg/L	07-DEC-20	07-DEC-20	R5308869

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-4 GW-11210029-120420-MW-03							
Sampled By: CLIENT on 04-DEC-20 @ 15:10							
Matrix: WATER							
Total Metals							
Manganese (Mn)-Total	0.0509		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		08-DEC-20	R5309314
Molybdenum (Mo)-Total	0.00169		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Nickel (Ni)-Total	0.00109		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Phosphorus (P)-Total	<0.050		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Potassium (K)-Total	1.35		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Rubidium (Rb)-Total	0.00067		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Selenium (Se)-Total	0.000107		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Silicon (Si)-Total	7.46		0.10	mg/L	07-DEC-20	07-DEC-20	R5308869
Silver (Ag)-Total	<0.000050		0.000050	mg/L	07-DEC-20	07-DEC-20	R5308869
Sodium (Na)-Total	4.39		0.050	mg/L	07-DEC-20	07-DEC-20	R5308869
Strontium (Sr)-Total	0.130		0.0010	mg/L	07-DEC-20	07-DEC-20	R5308869
Sulfur (S)-Total	7.40		0.50	mg/L	07-DEC-20	07-DEC-20	R5308869
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Thorium (Th)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Tin (Sn)-Total	0.00013		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Titanium (Ti)-Total	0.00246		0.00030	mg/L	07-DEC-20	07-DEC-20	R5308869
Tungsten (W)-Total	<0.00010		0.00010	mg/L	07-DEC-20	07-DEC-20	R5308869
Uranium (U)-Total	0.000957		0.000010	mg/L	07-DEC-20	07-DEC-20	R5308869
Vanadium (V)-Total	0.00072		0.00050	mg/L	07-DEC-20	07-DEC-20	R5308869
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	07-DEC-20	07-DEC-20	R5308869
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	07-DEC-20	07-DEC-20	R5308869
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD					07-DEC-20	R5308717
Dissolved Metals Filtration Location	FIELD					08-DEC-20	R5309129
Antimony (Sb)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Arsenic (As)-Dissolved	0.22		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Barium (Ba)-Dissolved	63.5		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Boron (B)-Dissolved	<10		10	ug/L	08-DEC-20	08-DEC-20	R5309628
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Cobalt (Co)-Dissolved	0.41		0.10	ug/L	08-DEC-20	08-DEC-20	R5309628
Copper (Cu)-Dissolved	0.53		0.20	ug/L	08-DEC-20	08-DEC-20	R5309628
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	07-DEC-20	07-DEC-20	R5308859
Molybdenum (Mo)-Dissolved	1.85		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Nickel (Ni)-Dissolved	0.95		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Selenium (Se)-Dissolved	0.098		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	08-DEC-20	08-DEC-20	R5309628

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-4 GW-11210029-120420-MW-03							
Sampled By: CLIENT on 04-DEC-20 @ 15:10							
Matrix: WATER							
Dissolved Metals							
Sodium (Na)-Dissolved	3680		500	ug/L	08-DEC-20	08-DEC-20	R5309628
Thallium (Tl)-Dissolved	<0.010		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Uranium (U)-Dissolved	0.867		0.010	ug/L	08-DEC-20	08-DEC-20	R5309628
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	08-DEC-20	08-DEC-20	R5309628
Zinc (Zn)-Dissolved	<1.0		1.0	ug/L	08-DEC-20	08-DEC-20	R5309628
Speciated Metals							
Chromium, Hexavalent	<0.50		0.50	ug/L		07-DEC-20	R5309177
Aggregate Organics							
Oil and Grease, Total	<5.0		5.0	mg/L	07-DEC-20	07-DEC-20	R5309404
Animal/Veg Oil & Grease	<5.0		5.0	mg/L		08-DEC-20	
Mineral Oil and Grease	<2.5		2.5	mg/L	07-DEC-20	07-DEC-20	R5309404
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-DEC-20	R5310357
Benzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Bromodichloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Bromoform	<5.0		5.0	ug/L		10-DEC-20	R5310357
Bromomethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Carbon tetrachloride	<0.20		0.20	ug/L		10-DEC-20	R5310357
Chlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dibromochloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Chloroform	<1.0		1.0	ug/L		10-DEC-20	R5310357
1,2-Dibromoethane	<0.20		0.20	ug/L		10-DEC-20	R5310357
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
1,1-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,2-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methylene Chloride	<5.0		5.0	ug/L		10-DEC-20	R5310357
1,2-Dichloropropane	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-DEC-20	
Ethylbenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
n-Hexane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methyl Ethyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
Methyl Isobutyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
MTBE	<2.0		2.0	ug/L		10-DEC-20	R5310357
Styrene	<0.50		0.50	ug/L		10-DEC-20	R5310357

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-4 GW-11210029-120420-MW-03 Sampled By: CLIENT on 04-DEC-20 @ 15:10 Matrix: WATER							
Volatile Organic Compounds							
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Tetrachloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Toluene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichlorofluoromethane	<5.0		5.0	ug/L		10-DEC-20	R5310357
Vinyl chloride	<0.50		0.50	ug/L		10-DEC-20	R5310357
o-Xylene	<0.30		0.30	ug/L		10-DEC-20	R5310357
m+p-Xylenes	<0.40		0.40	ug/L		10-DEC-20	R5310357
Xylenes (Total)	<0.50		0.50	ug/L		10-DEC-20	
Surrogate: 4-Bromofluorobenzene	94.5		70-130	%		10-DEC-20	R5310357
Surrogate: 1,4-Difluorobenzene	99.4		70-130	%		10-DEC-20	R5310357
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-DEC-20	R5310357
F1-BTEX	<25		25	ug/L		14-DEC-20	
F2 (C10-C16)	<100		100	ug/L	07-DEC-20	08-DEC-20	R5309249
F2-Naphth	<100		100	ug/L		14-DEC-20	
F3 (C16-C34)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
F3-PAH	<250		250	ug/L		14-DEC-20	
F4 (C34-C50)	<250		250	ug/L	07-DEC-20	08-DEC-20	R5309249
Total Hydrocarbons (C6-C50)	<370		370	ug/L		14-DEC-20	
Chrom. to baseline at nC50	YES				07-DEC-20	08-DEC-20	R5309249
Surrogate: 2-Bromobenzotrifluoride	89.3		60-140	%	07-DEC-20	08-DEC-20	R5309249
Surrogate: 3,4-Dichlorotoluene	80.1		60-140	%		10-DEC-20	R5310357
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Acenaphthylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(a)pyrene	<0.010		0.010	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(b)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Benzo(k)fluoranthene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Chrysene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluoranthene	0.053		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Fluorene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		14-DEC-20	

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-4 GW-11210029-120420-MW-03 Sampled By: CLIENT on 04-DEC-20 @ 15:10 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
1-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
2-Methylnaphthalene	<0.020		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Naphthalene	<0.050		0.050	ug/L	07-DEC-20	09-DEC-20	R5310144
Phenanthrene	0.029		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Pyrene	0.056		0.020	ug/L	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Acenaphthene	94.0		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d12-Chrysene	94.9		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d8-Naphthalene	94.8		60-140	%	07-DEC-20	09-DEC-20	R5310144
Surrogate: d10-Phenanthrene	95.6		60-140	%	07-DEC-20	09-DEC-20	R5310144
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
4-Chloroaniline	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
2-Chlorophenol	<0.30		0.30	ug/L	07-DEC-20	14-DEC-20	R5314036
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4-Dichlorophenol	<0.30		0.30	ug/L	07-DEC-20	14-DEC-20	R5314036
Diethylphthalate	<0.20		0.20	ug/L	07-DEC-20	14-DEC-20	R5314036
Dimethylphthalate	<0.20		0.20	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4-Dimethylphenol	<0.50		0.50	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4-Dinitrophenol	<1.0		1.0	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
2,6-Dinitrotoluene	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		14-DEC-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	07-DEC-20	14-DEC-20	R5314036
Pentachlorophenol	<0.50		0.50	ug/L	07-DEC-20	14-DEC-20	R5314036
Phenol	<0.50		0.50	ug/L	07-DEC-20	14-DEC-20	R5314036
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	14-DEC-20	R5314036
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	07-DEC-20	14-DEC-20	R5314036
Surrogate: 2-Fluorobiphenyl	83.9		50-140	%	07-DEC-20	14-DEC-20	R5314036
Surrogate: Nitrobenzene d5	87.0		50-140	%	07-DEC-20	14-DEC-20	R5314036
Surrogate: p-Terphenyl d14	106.0		60-140	%	07-DEC-20	14-DEC-20	R5314036
Surrogate: 2,4,6-Tribromophenol	81.6		50-140	%	07-DEC-20	14-DEC-20	R5314036
L2537182-5 TRIP BLANK Sampled By: CLIENT on 04-DEC-20 @ 16:15 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-DEC-20	R5310357
Benzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Bromodichloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Bromoform	<5.0		5.0	ug/L		10-DEC-20	R5310357

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-5 TRIP BLANK							
Sampled By: CLIENT on 04-DEC-20 @ 16:15							
Matrix: WATER							
Volatile Organic Compounds							
Bromomethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Carbon tetrachloride	<0.20		0.20	ug/L		10-DEC-20	R5310357
Chlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dibromochloromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
Chloroform	<1.0		1.0	ug/L		10-DEC-20	R5310357
1,2-Dibromoethane	<0.20		0.20	ug/L		10-DEC-20	R5310357
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-DEC-20	R5310357
1,1-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,2-Dichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methylene Chloride	<5.0		5.0	ug/L		10-DEC-20	R5310357
1,2-Dichloropropane	<0.50		0.50	ug/L		10-DEC-20	R5310357
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-DEC-20	R5310357
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-DEC-20	
Ethylbenzene	<0.50		0.50	ug/L		10-DEC-20	R5310357
n-Hexane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Methyl Ethyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
Methyl Isobutyl Ketone	<20		20	ug/L		10-DEC-20	R5310357
MTBE	<2.0		2.0	ug/L		10-DEC-20	R5310357
Styrene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Tetrachloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Toluene	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichloroethylene	<0.50		0.50	ug/L		10-DEC-20	R5310357
Trichlorofluoromethane	<5.0		5.0	ug/L		10-DEC-20	R5310357
Vinyl chloride	<0.50		0.50	ug/L		10-DEC-20	R5310357
o-Xylene	<0.30		0.30	ug/L		10-DEC-20	R5310357
m+p-Xylenes	<0.40		0.40	ug/L		10-DEC-20	R5310357
Xylenes (Total)	<0.50		0.50	ug/L		10-DEC-20	
Surrogate: 4-Bromofluorobenzene	95.2		70-130	%		10-DEC-20	R5310357
Surrogate: 1,4-Difluorobenzene	99.4		70-130	%		10-DEC-20	R5310357
Hydrocarbons							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2537182-5 TRIP BLANK Sampled By: CLIENT on 04-DEC-20 @ 16:15 Matrix: WATER Hydrocarbons F1 (C6-C10) F1-BTEX Surrogate: 3,4-Dichlorotoluene	 <25 <25 94.2	 	 25 25 60-140	 ug/L ug/L %	 	 10-DEC-20 10-DEC-20 10-DEC-20	 R5310357 R5310357

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	2,4-Dinitrophenol	LCS-H	L2537182-1, -2, -3
Matrix Spike	Cyanide, Weak Acid Diss	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Barium (Ba)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Calcium (Ca)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Manganese (Mn)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Potassium (K)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Silicon (Si)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Sodium (Na)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Strontium (Sr)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Sulfur (S)-Total	MS-B	L2537182-1, -2, -3, -4
Matrix Spike	Uranium (U)-Total	MS-B	L2537182-1, -2, -3, -4

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
<p>Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
CN-WAD-R511-WT	Water	Cyanide (WAD)-O.Reg 153/04	APHA 4500CN I-Weak acid Dist Colorimet
<p>Weak acid dissociable cyanide (WAD) is determined by undergoing a distillation procedure. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
CR-CR6-IC-R511-WT	Water	Hex Chrom-O.Reg 153/04 (July 2011)	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
EC-R511-WT	Water	Conductivity-O.Reg 153/04 (July 2011)	APHA 2510 B
<p>Water samples can be measured directly by immersing the conductivity cell into the sample.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			

Reference Information

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
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Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L
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Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-D-UG/L-CVAA-WT	Water	Diss. Mercury in Water by CVAAS (ug/L)	EPA 1631E (mod)
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Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-D-UG/L-MS-WT	Water	Diss. Metals in Water by ICPMS (ug/L)	EPA 200.8
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The metal constituents of a non-acidified sample that pass through a membrane filter prior to ICP/MS analysis.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Reference Information

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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OGG-SPEC-CALC-WT	Water	Speciated Oil and Grease A/V Calc	CALCULATION
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Sample is extracted with hexane, sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.

OGG-SPEC-WT	Water	Speciated Oil and Grease- Gravimetric	APHA 5520 B
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The procedure involves an extraction of the entire water sample with hexane. Sample speciation into mineral and animal/vegetable fractions is achieved via silica gel separation and is then determined gravimetrically.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PH-WT	Water	pH	APHA 4500 H-Electrode
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Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

17-871523

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2537182

Report Date: 14-DEC-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5309926							
WG3457478-2	LCS							
1,2,4-Trichlorobenzene			54.3		%		50-140	09-DEC-20
2-Chlorophenol			80.6		%		50-140	09-DEC-20
2,4-Dichlorophenol			92.0		%		50-140	09-DEC-20
2,4-Dimethylphenol			63.9		%		30-130	09-DEC-20
2,4-Dinitrophenol			143.4	LCS-H	%		50-140	09-DEC-20
2,4-Dinitrotoluene			138.7		%		50-140	09-DEC-20
2,4,5-Trichlorophenol			101.4		%		50-140	09-DEC-20
2,4,6-Trichlorophenol			98.9		%		50-140	09-DEC-20
2,6-Dinitrotoluene			108.9		%		50-140	09-DEC-20
3,3'-Dichlorobenzidine			87.3		%		30-130	09-DEC-20
4-Chloroaniline			37.0		%		30-130	09-DEC-20
Biphenyl			72.7		%		50-140	09-DEC-20
Bis(2-chloroethyl)ether			86.7		%		50-140	09-DEC-20
Bis(2-chloroisopropyl)ether			83.3		%		50-140	09-DEC-20
Bis(2-ethylhexyl)phthalate			110.2		%		50-140	09-DEC-20
Diethylphthalate			94.9		%		50-140	09-DEC-20
Dimethylphthalate			90.9		%		50-140	09-DEC-20
Pentachlorophenol			137.0		%		50-140	09-DEC-20
Phenol			104.4		%		30-130	09-DEC-20
WG3457478-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	09-DEC-20
2-Chlorophenol			<0.30		ug/L		0.3	09-DEC-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	09-DEC-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	09-DEC-20
2,4-Dinitrophenol			<1.0		ug/L		1	09-DEC-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	09-DEC-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	09-DEC-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	09-DEC-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	09-DEC-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	09-DEC-20
4-Chloroaniline			<0.40		ug/L		0.4	09-DEC-20
Biphenyl			<0.40		ug/L		0.4	09-DEC-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	09-DEC-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	09-DEC-20



Quality Control Report

Workorder: L2537182

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT		Water						
Batch R5309926								
WG3457478-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	09-DEC-20
Diethylphthalate			<0.20		ug/L		0.2	09-DEC-20
Dimethylphthalate			<0.20		ug/L		0.2	09-DEC-20
Pentachlorophenol			<0.50		ug/L		0.5	09-DEC-20
Phenol			<0.50		ug/L		0.5	09-DEC-20
Surrogate: 2-Fluorobiphenyl			90.3		%		50-140	09-DEC-20
Surrogate: 2,4,6-Tribromophenol			92.3		%		50-140	09-DEC-20
Surrogate: Nitrobenzene d5			91.1		%		50-140	09-DEC-20
Surrogate: p-Terphenyl d14			116.2		%		60-140	09-DEC-20
Batch R5314036								
WG3457854-2 LCS								
1,2,4-Trichlorobenzene			82.1		%		50-140	14-DEC-20
2-Chlorophenol			73.7		%		50-140	14-DEC-20
2,4-Dichlorophenol			84.4		%		50-140	14-DEC-20
2,4-Dimethylphenol			65.7		%		30-130	14-DEC-20
2,4-Dinitrophenol			111.6		%		50-140	14-DEC-20
2,4-Dinitrotoluene			101.9		%		50-140	14-DEC-20
2,4,5-Trichlorophenol			93.7		%		50-140	14-DEC-20
2,4,6-Trichlorophenol			89.8		%		50-140	14-DEC-20
2,6-Dinitrotoluene			91.2		%		50-140	14-DEC-20
3,3'-Dichlorobenzidine			61.6		%		30-130	14-DEC-20
4-Chloroaniline			43.8		%		30-130	14-DEC-20
Biphenyl			87.3		%		50-140	14-DEC-20
Bis(2-chloroethyl)ether			85.4		%		50-140	14-DEC-20
Bis(2-chloroisopropyl)ether			82.2		%		50-140	14-DEC-20
Bis(2-ethylhexyl)phthalate			95.7		%		50-140	14-DEC-20
Diethylphthalate			90.7		%		50-140	14-DEC-20
Dimethylphthalate			88.4		%		50-140	14-DEC-20
Pentachlorophenol			110.3		%		50-140	14-DEC-20
Phenol			103.0		%		30-130	14-DEC-20
WG3457854-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	14-DEC-20
2-Chlorophenol			<0.30		ug/L		0.3	14-DEC-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	14-DEC-20



Quality Control Report

Workorder: L2537182

Report Date: 14-DEC-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT		Water						
Batch	R5314036							
WG3457854-1 MB								
2,4-Dimethylphenol			<0.50		ug/L		0.5	14-DEC-20
2,4-Dinitrophenol			<1.0		ug/L		1	14-DEC-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	14-DEC-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	14-DEC-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	14-DEC-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	14-DEC-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	14-DEC-20
4-Chloroaniline			<0.40		ug/L		0.4	14-DEC-20
Biphenyl			<0.40		ug/L		0.4	14-DEC-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	14-DEC-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	14-DEC-20
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	14-DEC-20
Diethylphthalate			<0.20		ug/L		0.2	14-DEC-20
Dimethylphthalate			<0.20		ug/L		0.2	14-DEC-20
Pentachlorophenol			<0.50		ug/L		0.5	14-DEC-20
Phenol			<0.50		ug/L		0.5	14-DEC-20
Surrogate: 2-Fluorobiphenyl			76.6		%		50-140	14-DEC-20
Surrogate: 2,4,6-Tribromophenol			66.1		%		50-140	14-DEC-20
Surrogate: Nitrobenzene d5			75.6		%		50-140	14-DEC-20
Surrogate: p-Terphenyl d14			102.3		%		60-140	14-DEC-20
CL-IC-N-WT		Water						
Batch	R5309768							
WG3458397-9 DUP	L2537179-4							
Chloride (Cl)		0.80	0.80		mg/L	0.2	20	08-DEC-20
WG3458397-7 LCS								
Chloride (Cl)			101.2		%		90-110	08-DEC-20
WG3458397-6 MB								
Chloride (Cl)			<0.50		mg/L		0.5	08-DEC-20
WG3458397-10 MS	L2537179-4							
Chloride (Cl)			101.6		%		75-125	08-DEC-20
CN-WAD-R511-WT		Water						
Batch	R5309148							
WG3457795-8 DUP	WG3457795-10							
Cyanide, Weak Acid Diss		22300	19300		ug/L	14	20	07-DEC-20
WG3457795-7 LCS								



Quality Control Report

Workorder: L2537182

Report Date: 14-DEC-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-WAD-R511-WT		Water						
Batch	R5309148							
WG3457795-7	LCS							
Cyanide, Weak Acid Diss			104.7		%		80-120	07-DEC-20
WG3457795-6	MB							
Cyanide, Weak Acid Diss			<2.0		ug/L		2	07-DEC-20
WG3457795-9	MS	WG3457795-10						
Cyanide, Weak Acid Diss			N/A	MS-B	%		-	07-DEC-20
CR-CR6-IC-R511-WT		Water						
Batch	R5309177							
WG3457940-4	DUP	WG3457940-3						
Chromium, Hexavalent		<0.50	<0.50	RPD-NA	ug/L	N/A	20	07-DEC-20
WG3457940-2	LCS							
Chromium, Hexavalent			95.3		%		80-120	07-DEC-20
WG3457940-1	MB							
Chromium, Hexavalent			<0.50		ug/L		0.5	07-DEC-20
WG3457940-5	MS	WG3457940-3						
Chromium, Hexavalent			98.1		%		70-130	07-DEC-20
EC-R511-WT		Water						
Batch	R5309386							
WG3458364-4	DUP	WG3458364-3						
Conductivity		0.562	0.561		mS/cm	0.2	10	08-DEC-20
WG3458364-2	LCS							
Conductivity			96.6		%		90-110	08-DEC-20
WG3458364-1	MB							
Conductivity			<0.0030		mS/cm		0.003	08-DEC-20
Batch	R5309913							
WG3458418-4	DUP	WG3458418-3						
Conductivity		6.56	6.59		mS/cm	0.5	10	08-DEC-20
WG3458418-2	LCS							
Conductivity			95.8		%		90-110	08-DEC-20
WG3458418-1	MB							
Conductivity			<0.0030		mS/cm		0.003	08-DEC-20
F1-HS-511-WT		Water						
Batch	R5310357							
WG3458463-4	DUP	WG3458463-3						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	10-DEC-20
WG3458463-1	LCS							
F1 (C6-C10)			107.0		%		80-120	10-DEC-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F1-HS-511-WT								
	Water							
Batch	R5310357							
WG3458463-2	MB							
F1 (C6-C10)			<25		ug/L		25	10-DEC-20
Surrogate: 3,4-Dichlorotoluene			110.0		%		60-140	10-DEC-20
WG3458463-5	MS	WG3458463-3						
F1 (C6-C10)			103.1		%		60-140	10-DEC-20
F2-F4-511-WT								
	Water							
Batch	R5309249							
WG3457542-2	LCS							
F2 (C10-C16)			101.9		%		70-130	08-DEC-20
F3 (C16-C34)			104.2		%		70-130	08-DEC-20
F4 (C34-C50)			102.3		%		70-130	08-DEC-20
WG3457542-1	MB							
F2 (C10-C16)			<100		ug/L		100	08-DEC-20
F3 (C16-C34)			<250		ug/L		250	08-DEC-20
F4 (C34-C50)			<250		ug/L		250	08-DEC-20
Surrogate: 2-Bromobenzotrifluoride			91.0		%		60-140	08-DEC-20
HG-D-UG/L-CVAA-WT								
	Water							
Batch	R5308859							
WG3457683-5	DUP	L2537179-6						
Mercury (Hg)-Dissolved		<0.0050	<0.0050	RPD-NA	ug/L	N/A	20	07-DEC-20
WG3457683-2	LCS							
Mercury (Hg)-Dissolved			94.1		%		80-120	07-DEC-20
WG3457683-1	MB							
Mercury (Hg)-Dissolved			<0.0050		ug/L		0.005	07-DEC-20
WG3457683-4	MS	L2537182-1						
Mercury (Hg)-Dissolved			92.7		%		70-130	07-DEC-20
HG-T-CVAA-WT								
	Water							
Batch	R5309314							
WG3458201-3	DUP	L2537586-1						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	08-DEC-20
WG3458201-2	LCS							
Mercury (Hg)-Total			109.0		%		80-120	08-DEC-20
WG3458201-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	08-DEC-20
WG3458201-4	MS	L2537182-1						
Mercury (Hg)-Total			99.4		%		70-130	08-DEC-20
MET-D-UG/L-MS-WT								
	Water							



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT								
	Water							
Batch	R5309628							
WG3458096-4	DUP	WG3458096-3						
Antimony (Sb)-Dissolved		0.16	0.16		ug/L	1.4	20	08-DEC-20
Arsenic (As)-Dissolved		0.36	0.35		ug/L	4.7	20	08-DEC-20
Barium (Ba)-Dissolved		93.5	97.3		ug/L	4.1	20	08-DEC-20
Beryllium (Be)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	08-DEC-20
Boron (B)-Dissolved		23	23		ug/L	0.2	20	08-DEC-20
Cadmium (Cd)-Dissolved		0.0142	0.0138		ug/L	2.9	20	08-DEC-20
Chromium (Cr)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	08-DEC-20
Cobalt (Co)-Dissolved		0.43	0.45		ug/L	4.3	20	08-DEC-20
Copper (Cu)-Dissolved		0.70	0.72		ug/L	2.7	20	08-DEC-20
Lead (Pb)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	08-DEC-20
Molybdenum (Mo)-Dissolved		2.89	2.96		ug/L	2.1	20	08-DEC-20
Nickel (Ni)-Dissolved		1.13	1.17		ug/L	3.7	20	08-DEC-20
Selenium (Se)-Dissolved		0.096	0.126	J	ug/L	0.030	0.1	08-DEC-20
Silver (Ag)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	08-DEC-20
Sodium (Na)-Dissolved		9100	9220		ug/L	1.3	20	08-DEC-20
Thallium (Tl)-Dissolved		0.015	<0.010	RPD-NA	ug/L	N/A	20	08-DEC-20
Uranium (U)-Dissolved		0.816	0.791		ug/L	3.0	20	08-DEC-20
Vanadium (V)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	08-DEC-20
Zinc (Zn)-Dissolved		4.3	4.5		ug/L	4.0	20	08-DEC-20
WG3458096-2	LCS							
Antimony (Sb)-Dissolved			94.0		%		80-120	08-DEC-20
Arsenic (As)-Dissolved			103.1		%		80-120	08-DEC-20
Barium (Ba)-Dissolved			104.8		%		80-120	08-DEC-20
Beryllium (Be)-Dissolved			86.8		%		80-120	08-DEC-20
Boron (B)-Dissolved			88.6		%		80-120	08-DEC-20
Cadmium (Cd)-Dissolved			96.1		%		80-120	08-DEC-20
Chromium (Cr)-Dissolved			102.1		%		80-120	08-DEC-20
Cobalt (Co)-Dissolved			95.2		%		80-120	08-DEC-20
Copper (Cu)-Dissolved			90.9		%		80-120	08-DEC-20
Lead (Pb)-Dissolved			93.1		%		80-120	08-DEC-20
Molybdenum (Mo)-Dissolved			102.3		%		80-120	08-DEC-20
Nickel (Ni)-Dissolved			95.5		%		80-120	08-DEC-20
Selenium (Se)-Dissolved			88.5		%		80-120	08-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT								
	Water							
Batch	R5309628							
WG3458096-2	LCS							
Silver (Ag)-Dissolved			92.6		%		80-120	08-DEC-20
Sodium (Na)-Dissolved			97.4		%		80-120	08-DEC-20
Thallium (Tl)-Dissolved			93.4		%		80-120	08-DEC-20
Uranium (U)-Dissolved			93.5		%		80-120	08-DEC-20
Vanadium (V)-Dissolved			105.0		%		80-120	08-DEC-20
Zinc (Zn)-Dissolved			90.1		%		80-120	08-DEC-20
WG3458096-1	MB							
Antimony (Sb)-Dissolved			<0.10		ug/L		0.1	08-DEC-20
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	08-DEC-20
Barium (Ba)-Dissolved			<0.10		ug/L		0.1	08-DEC-20
Beryllium (Be)-Dissolved			<0.10		ug/L		0.1	08-DEC-20
Boron (B)-Dissolved			<10		ug/L		10	08-DEC-20
Cadmium (Cd)-Dissolved			<0.0050		ug/L		0.005	08-DEC-20
Chromium (Cr)-Dissolved			<0.50		ug/L		0.5	08-DEC-20
Cobalt (Co)-Dissolved			<0.10		ug/L		0.1	08-DEC-20
Copper (Cu)-Dissolved			<0.20		ug/L		0.2	08-DEC-20
Lead (Pb)-Dissolved			<0.050		ug/L		0.05	08-DEC-20
Molybdenum (Mo)-Dissolved			<0.050		ug/L		0.05	08-DEC-20
Nickel (Ni)-Dissolved			<0.50		ug/L		0.5	08-DEC-20
Selenium (Se)-Dissolved			<0.050		ug/L		0.05	08-DEC-20
Silver (Ag)-Dissolved			<0.050		ug/L		0.05	08-DEC-20
Sodium (Na)-Dissolved			<50		ug/L		50	08-DEC-20
Thallium (Tl)-Dissolved			<0.010		ug/L		0.01	08-DEC-20
Uranium (U)-Dissolved			<0.010		ug/L		0.01	08-DEC-20
Vanadium (V)-Dissolved			<0.50		ug/L		0.5	08-DEC-20
Zinc (Zn)-Dissolved			<1.0		ug/L		1	08-DEC-20
WG3458096-5	MS	WG3458096-6						
Antimony (Sb)-Dissolved			96.4		%		70-130	08-DEC-20
Arsenic (As)-Dissolved			104.0		%		70-130	08-DEC-20
Barium (Ba)-Dissolved			N/A	MS-B	%		-	08-DEC-20
Beryllium (Be)-Dissolved			91.8		%		70-130	08-DEC-20
Boron (B)-Dissolved			84.1		%		70-130	08-DEC-20
Cadmium (Cd)-Dissolved			97.6		%		70-130	08-DEC-20
Chromium (Cr)-Dissolved			99.2		%		70-130	08-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT								
	Water							
Batch	R5309628							
WG3458096-5 MS		WG3458096-6						
Cobalt (Co)-Dissolved			92.3		%		70-130	08-DEC-20
Copper (Cu)-Dissolved			86.6		%		70-130	08-DEC-20
Lead (Pb)-Dissolved			92.4		%		70-130	08-DEC-20
Molybdenum (Mo)-Dissolved			101.5		%		70-130	08-DEC-20
Nickel (Ni)-Dissolved			94.0		%		70-130	08-DEC-20
Selenium (Se)-Dissolved			105.7		%		70-130	08-DEC-20
Silver (Ag)-Dissolved			77.2		%		70-130	08-DEC-20
Sodium (Na)-Dissolved			N/A	MS-B	%		-	08-DEC-20
Thallium (Tl)-Dissolved			95.6		%		70-130	08-DEC-20
Uranium (U)-Dissolved			N/A	MS-B	%		-	08-DEC-20
Vanadium (V)-Dissolved			101.3		%		70-130	08-DEC-20
Zinc (Zn)-Dissolved			94.1		%		70-130	08-DEC-20
MET-T-CCMS-WT								
	Water							
Batch	R5308869							
WG3457451-4 DUP		WG3457451-3						
Aluminum (Al)-Total		0.366	0.375		mg/L	2.5	20	07-DEC-20
Antimony (Sb)-Total		0.00021	0.00021		mg/L	2.2	20	07-DEC-20
Arsenic (As)-Total		0.00055	0.00055		mg/L	0.4	20	07-DEC-20
Barium (Ba)-Total		0.0939	0.0960		mg/L	2.2	20	07-DEC-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	07-DEC-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	07-DEC-20
Boron (B)-Total		0.029	0.029		mg/L	0.1	20	07-DEC-20
Cadmium (Cd)-Total		0.0000319	0.0000330		mg/L	3.4	20	07-DEC-20
Calcium (Ca)-Total		91.0	89.7		mg/L	1.5	20	07-DEC-20
Chromium (Cr)-Total		0.00097	0.00099		mg/L	1.3	20	07-DEC-20
Cesium (Cs)-Total		0.000039	0.000043		mg/L	9.2	20	07-DEC-20
Cobalt (Co)-Total		0.00066	0.00069		mg/L	5.0	20	07-DEC-20
Copper (Cu)-Total		0.00143	0.00241	J	mg/L	0.00098	0.001	07-DEC-20
Iron (Fe)-Total		0.439	0.432		mg/L	1.6	20	07-DEC-20
Lead (Pb)-Total		0.000725	0.000800		mg/L	9.9	20	07-DEC-20
Lithium (Li)-Total		0.0124	0.0122		mg/L	1.5	20	07-DEC-20
Magnesium (Mg)-Total		34.2	35.2		mg/L	2.8	20	07-DEC-20
Manganese (Mn)-Total		0.135	0.138		mg/L	2.8	20	07-DEC-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5308869							
WG3457451-4 DUP		WG3457451-3						
Molybdenum (Mo)-Total		0.00325	0.00320		mg/L	1.4	20	07-DEC-20
Nickel (Ni)-Total		0.00173	0.00180		mg/L	3.5	20	07-DEC-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	07-DEC-20
Potassium (K)-Total		5.56	5.73		mg/L	3.1	20	07-DEC-20
Rubidium (Rb)-Total		0.00099	0.00106		mg/L	6.7	20	07-DEC-20
Selenium (Se)-Total		0.000109	0.000100		mg/L	9.1	20	07-DEC-20
Silicon (Si)-Total		7.05	7.25		mg/L	2.8	20	07-DEC-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	07-DEC-20
Sodium (Na)-Total		9.85	10.1		mg/L	2.6	20	07-DEC-20
Strontium (Sr)-Total		0.269	0.262		mg/L	2.7	20	07-DEC-20
Sulfur (S)-Total		8.87	8.93		mg/L	0.6	25	07-DEC-20
Thallium (Tl)-Total		0.000012	0.000014		mg/L	8.5	20	07-DEC-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	07-DEC-20
Thorium (Th)-Total		0.00011	<0.00010	RPD-NA	mg/L	N/A	25	07-DEC-20
Tin (Sn)-Total		0.00028	0.00029		mg/L	4.6	20	07-DEC-20
Titanium (Ti)-Total		0.0142	0.0144		mg/L	1.6	20	07-DEC-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	07-DEC-20
Uranium (U)-Total		0.000905	0.000892		mg/L	1.5	20	07-DEC-20
Vanadium (V)-Total		0.00104	0.00108		mg/L	4.5	20	07-DEC-20
Zinc (Zn)-Total		0.0102	0.0110		mg/L	8.2	20	07-DEC-20
Zirconium (Zr)-Total		0.00040	0.00039		mg/L	2.8	20	07-DEC-20
WG3457451-2 LCS								
Aluminum (Al)-Total			107.0		%		80-120	07-DEC-20
Antimony (Sb)-Total			107.5		%		80-120	07-DEC-20
Arsenic (As)-Total			103.0		%		80-120	07-DEC-20
Barium (Ba)-Total			105.1		%		80-120	07-DEC-20
Beryllium (Be)-Total			107.6		%		80-120	07-DEC-20
Bismuth (Bi)-Total			102.2		%		80-120	07-DEC-20
Boron (B)-Total			107.1		%		80-120	07-DEC-20
Cadmium (Cd)-Total			100.9		%		80-120	07-DEC-20
Calcium (Ca)-Total			100.8		%		80-120	07-DEC-20
Chromium (Cr)-Total			101.6		%		80-120	07-DEC-20
Cesium (Cs)-Total			103.7		%		80-120	07-DEC-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5308869							
WG3457451-2	LCS							
Cobalt (Co)-Total			101.9		%		80-120	07-DEC-20
Copper (Cu)-Total			101.2		%		80-120	07-DEC-20
Iron (Fe)-Total			102.0		%		80-120	07-DEC-20
Lead (Pb)-Total			104.0		%		80-120	07-DEC-20
Lithium (Li)-Total			107.2		%		80-120	07-DEC-20
Magnesium (Mg)-Total			111.2		%		80-120	07-DEC-20
Manganese (Mn)-Total			103.4		%		80-120	07-DEC-20
Molybdenum (Mo)-Total			105.1		%		80-120	07-DEC-20
Nickel (Ni)-Total			102.0		%		80-120	07-DEC-20
Phosphorus (P)-Total			110.6		%		70-130	07-DEC-20
Potassium (K)-Total			102.4		%		80-120	07-DEC-20
Rubidium (Rb)-Total			106.0		%		80-120	07-DEC-20
Selenium (Se)-Total			102.0		%		80-120	07-DEC-20
Silicon (Si)-Total			102.4		%		60-140	07-DEC-20
Silver (Ag)-Total			103.6		%		80-120	07-DEC-20
Sodium (Na)-Total			109.6		%		80-120	07-DEC-20
Strontium (Sr)-Total			107.1		%		80-120	07-DEC-20
Sulfur (S)-Total			105.5		%		80-120	07-DEC-20
Thallium (Tl)-Total			102.5		%		80-120	07-DEC-20
Tellurium (Te)-Total			100.1		%		80-120	07-DEC-20
Thorium (Th)-Total			101.4		%		70-130	07-DEC-20
Tin (Sn)-Total			100.8		%		80-120	07-DEC-20
Titanium (Ti)-Total			102.0		%		80-120	07-DEC-20
Tungsten (W)-Total			100.7		%		80-120	07-DEC-20
Uranium (U)-Total			103.4		%		80-120	07-DEC-20
Vanadium (V)-Total			104.4		%		80-120	07-DEC-20
Zinc (Zn)-Total			104.4		%		80-120	07-DEC-20
Zirconium (Zr)-Total			98.7		%		80-120	07-DEC-20
WG3457451-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	07-DEC-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	07-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5308869							
WG3457451-1 MB								
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	07-DEC-20
Boron (B)-Total			<0.010		mg/L		0.01	07-DEC-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	07-DEC-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	07-DEC-20
Chromium (Cr)-Total			<0.000050		mg/L		0.0005	07-DEC-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	07-DEC-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Copper (Cu)-Total			<0.000050		mg/L		0.0005	07-DEC-20
Iron (Fe)-Total			<0.010		mg/L		0.01	07-DEC-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	07-DEC-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	07-DEC-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	07-DEC-20
Manganese (Mn)-Total			<0.000050		mg/L		0.0005	07-DEC-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	07-DEC-20
Nickel (Ni)-Total			<0.000050		mg/L		0.0005	07-DEC-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	07-DEC-20
Potassium (K)-Total			<0.050		mg/L		0.05	07-DEC-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	07-DEC-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	07-DEC-20
Silicon (Si)-Total			<0.10		mg/L		0.1	07-DEC-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	07-DEC-20
Sodium (Na)-Total			<0.050		mg/L		0.05	07-DEC-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	07-DEC-20
Sulfur (S)-Total			<0.50		mg/L		0.5	07-DEC-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	07-DEC-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	07-DEC-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	07-DEC-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	07-DEC-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	07-DEC-20
Vanadium (V)-Total			<0.000050		mg/L		0.0005	07-DEC-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	07-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5308869							
WG3457451-1 MB								
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	07-DEC-20
WG3457451-5 MS		WG3457451-6						
Aluminum (Al)-Total			105.8		%		70-130	07-DEC-20
Antimony (Sb)-Total			101.1		%		70-130	07-DEC-20
Arsenic (As)-Total			100.6		%		70-130	07-DEC-20
Barium (Ba)-Total			N/A	MS-B	%		-	07-DEC-20
Beryllium (Be)-Total			109.2		%		70-130	07-DEC-20
Bismuth (Bi)-Total			93.7		%		70-130	07-DEC-20
Boron (B)-Total			110.1		%		70-130	07-DEC-20
Cadmium (Cd)-Total			94.8		%		70-130	07-DEC-20
Calcium (Ca)-Total			N/A	MS-B	%		-	07-DEC-20
Chromium (Cr)-Total			100.7		%		70-130	07-DEC-20
Cesium (Cs)-Total			101.9		%		70-130	07-DEC-20
Cobalt (Co)-Total			97.2		%		70-130	07-DEC-20
Copper (Cu)-Total			91.7		%		70-130	07-DEC-20
Iron (Fe)-Total			100.5		%		70-130	07-DEC-20
Lead (Pb)-Total			94.4		%		70-130	07-DEC-20
Lithium (Li)-Total			109.4		%		70-130	07-DEC-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	07-DEC-20
Manganese (Mn)-Total			N/A	MS-B	%		-	07-DEC-20
Molybdenum (Mo)-Total			105.6		%		70-130	07-DEC-20
Nickel (Ni)-Total			94.6		%		70-130	07-DEC-20
Phosphorus (P)-Total			103.5		%		70-130	07-DEC-20
Potassium (K)-Total			N/A	MS-B	%		-	07-DEC-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	07-DEC-20
Selenium (Se)-Total			101.5		%		70-130	07-DEC-20
Silicon (Si)-Total			N/A	MS-B	%		-	07-DEC-20
Silver (Ag)-Total			95.4		%		70-130	07-DEC-20
Sodium (Na)-Total			N/A	MS-B	%		-	07-DEC-20
Strontium (Sr)-Total			N/A	MS-B	%		-	07-DEC-20
Sulfur (S)-Total			N/A	MS-B	%		-	07-DEC-20
Thallium (Tl)-Total			97.4		%		70-130	07-DEC-20
Tellurium (Te)-Total			93.4		%		70-130	07-DEC-20
Thorium (Th)-Total			98.6		%		70-130	07-DEC-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5308869							
WG3457451-5 MS		WG3457451-6						
Tin (Sn)-Total			97.1		%		70-130	07-DEC-20
Titanium (Ti)-Total			99.4		%		70-130	07-DEC-20
Tungsten (W)-Total			98.7		%		70-130	07-DEC-20
Uranium (U)-Total			N/A	MS-B	%		-	07-DEC-20
Vanadium (V)-Total			104.4		%		70-130	07-DEC-20
Zinc (Zn)-Total			89.0		%		70-130	07-DEC-20
Zirconium (Zr)-Total			92.5		%		70-130	07-DEC-20
OGG-SPEC-WT								
	Water							
Batch	R5309404							
WG3457440-2 LCS								
Oil and Grease, Total			85.6		%		70-130	07-DEC-20
Mineral Oil and Grease			80.4		%		70-130	07-DEC-20
WG3457440-1 MB								
Oil and Grease, Total			<5.0		mg/L		5	07-DEC-20
Mineral Oil and Grease			<2.5		mg/L		2.5	07-DEC-20
PAH-511-WT								
	Water							
Batch	R5310144							
WG3457542-2 LCS								
1-Methylnaphthalene			87.0		%		50-140	09-DEC-20
2-Methylnaphthalene			99.2		%		50-140	09-DEC-20
Acenaphthene			113.0		%		50-140	09-DEC-20
Acenaphthylene			103.4		%		50-140	09-DEC-20
Anthracene			83.0		%		50-140	09-DEC-20
Benzo(a)anthracene			95.7		%		50-140	09-DEC-20
Benzo(a)pyrene			93.8		%		50-140	09-DEC-20
Benzo(b)fluoranthene			73.4		%		50-140	09-DEC-20
Benzo(g,h,i)perylene			125.0		%		50-140	09-DEC-20
Benzo(k)fluoranthene			93.6		%		50-140	09-DEC-20
Chrysene			121.9		%		50-140	09-DEC-20
Dibenzo(ah)anthracene			123.5		%		50-140	09-DEC-20
Fluoranthene			106.9		%		50-140	09-DEC-20
Fluorene			102.6		%		50-140	09-DEC-20
Indeno(1,2,3-cd)pyrene			126.3		%		50-140	09-DEC-20
Naphthalene			101.6		%		50-140	09-DEC-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT								
	Water							
Batch	R5310144							
WG3457542-2	LCS							
Phenanthrene			103.8		%		50-140	09-DEC-20
Pyrene			111.0		%		50-140	09-DEC-20
WG3457542-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	09-DEC-20
2-Methylnaphthalene			<0.020		ug/L		0.02	09-DEC-20
Acenaphthene			<0.020		ug/L		0.02	09-DEC-20
Acenaphthylene			<0.020		ug/L		0.02	09-DEC-20
Anthracene			<0.020		ug/L		0.02	09-DEC-20
Benzo(a)anthracene			<0.020		ug/L		0.02	09-DEC-20
Benzo(a)pyrene			<0.010		ug/L		0.01	09-DEC-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	09-DEC-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	09-DEC-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	09-DEC-20
Chrysene			<0.020		ug/L		0.02	09-DEC-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	09-DEC-20
Fluoranthene			<0.020		ug/L		0.02	09-DEC-20
Fluorene			<0.020		ug/L		0.02	09-DEC-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	09-DEC-20
Naphthalene			<0.050		ug/L		0.05	09-DEC-20
Phenanthrene			<0.020		ug/L		0.02	09-DEC-20
Pyrene			<0.020		ug/L		0.02	09-DEC-20
Surrogate: d8-Naphthalene			99.4		%		60-140	09-DEC-20
Surrogate: d10-Phenanthrene			99.2		%		60-140	09-DEC-20
Surrogate: d12-Chrysene			97.8		%		60-140	09-DEC-20
Surrogate: d10-Acenaphthene			101.0		%		60-140	09-DEC-20
PH-WT								
	Water							
Batch	R5309386							
WG3458364-4	DUP	WG3458364-3						
pH		7.10	7.12	J	pH units	0.02	0.2	08-DEC-20
WG3458364-2	LCS							
pH			7.00		pH units		6.9-7.1	08-DEC-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-WT		Water						
Batch	R5309913							
WG3458418-4	DUP	WG3458418-3						
pH		8.11	8.12	J	pH units	0.01	0.2	08-DEC-20
WG3458418-2	LCS							
pH			7.02		pH units		6.9-7.1	08-DEC-20
VOC-511-HS-WT		Water						
Batch	R5310357							
WG3458463-4	DUP	WG3458463-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	10-DEC-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	10-DEC-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-DEC-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-DEC-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	10-DEC-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	10-DEC-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-DEC-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-DEC-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-DEC-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	10-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5310357							
WG3458463-4 DUP		WG3458463-3						
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	10-DEC-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	10-DEC-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-DEC-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-DEC-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-DEC-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Toluene		0.62	0.58		ug/L	6.7	30	10-DEC-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-DEC-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-DEC-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-DEC-20
WG3458463-1 LCS								
1,1,1,2-Tetrachloroethane			100.4		%		70-130	10-DEC-20
1,1,2,2-Tetrachloroethane			113.2		%		70-130	10-DEC-20
1,1,1-Trichloroethane			100.2		%		70-130	10-DEC-20
1,1,2-Trichloroethane			104.0		%		70-130	10-DEC-20
1,1-Dichloroethane			102.3		%		70-130	10-DEC-20
1,1-Dichloroethylene			101.2		%		70-130	10-DEC-20
1,2-Dibromoethane			101.2		%		70-130	10-DEC-20
1,2-Dichlorobenzene			105.0		%		70-130	10-DEC-20
1,2-Dichloroethane			103.3		%		70-130	10-DEC-20
1,2-Dichloropropane			103.0		%		70-130	10-DEC-20
1,3-Dichlorobenzene			104.6		%		70-130	10-DEC-20
1,4-Dichlorobenzene			102.6		%		70-130	10-DEC-20
Acetone			122.0		%		60-140	10-DEC-20
Benzene			100.2		%		70-130	10-DEC-20
Bromodichloromethane			109.4		%		70-130	10-DEC-20
Bromoform			116.2		%		70-130	10-DEC-20
Bromomethane			98.1		%		60-140	10-DEC-20
Carbon tetrachloride			103.7		%		70-130	10-DEC-20
Chlorobenzene			103.1		%		70-130	10-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5310357							
WG3458463-1	LCS							
Chloroform			105.6		%		70-130	10-DEC-20
cis-1,2-Dichloroethylene			104.0		%		70-130	10-DEC-20
cis-1,3-Dichloropropene			102.4		%		70-130	10-DEC-20
Dibromochloromethane			99.3		%		70-130	10-DEC-20
Dichlorodifluoromethane			103.7		%		50-140	10-DEC-20
Ethylbenzene			99.1		%		70-130	10-DEC-20
n-Hexane			97.1		%		70-130	10-DEC-20
m+p-Xylenes			101.6		%		70-130	10-DEC-20
Methyl Ethyl Ketone			115.3		%		60-140	10-DEC-20
Methyl Isobutyl Ketone			109.2		%		60-140	10-DEC-20
Methylene Chloride			107.1		%		70-130	10-DEC-20
MTBE			104.7		%		70-130	10-DEC-20
o-Xylene			107.9		%		70-130	10-DEC-20
Styrene			101.5		%		70-130	10-DEC-20
Tetrachloroethylene			103.7		%		70-130	10-DEC-20
Toluene			101.6		%		70-130	10-DEC-20
trans-1,2-Dichloroethylene			104.7		%		70-130	10-DEC-20
trans-1,3-Dichloropropene			109.6		%		70-130	10-DEC-20
Trichloroethylene			101.2		%		70-130	10-DEC-20
Trichlorofluoromethane			100.1		%		60-140	10-DEC-20
Vinyl chloride			107.1		%		60-140	10-DEC-20
WG3458463-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	10-DEC-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	10-DEC-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	10-DEC-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	10-DEC-20
1,1-Dichloroethane			<0.50		ug/L		0.5	10-DEC-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	10-DEC-20
1,2-Dibromoethane			<0.20		ug/L		0.2	10-DEC-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	10-DEC-20
1,2-Dichloroethane			<0.50		ug/L		0.5	10-DEC-20
1,2-Dichloropropane			<0.50		ug/L		0.5	10-DEC-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	10-DEC-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	10-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5310357							
WG3458463-2 MB								
Acetone			<30		ug/L		30	10-DEC-20
Benzene			<0.50		ug/L		0.5	10-DEC-20
Bromodichloromethane			<2.0		ug/L		2	10-DEC-20
Bromoform			<5.0		ug/L		5	10-DEC-20
Bromomethane			<0.50		ug/L		0.5	10-DEC-20
Carbon tetrachloride			<0.20		ug/L		0.2	10-DEC-20
Chlorobenzene			<0.50		ug/L		0.5	10-DEC-20
Chloroform			<1.0		ug/L		1	10-DEC-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	10-DEC-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	10-DEC-20
Dibromochloromethane			<2.0		ug/L		2	10-DEC-20
Dichlorodifluoromethane			<2.0		ug/L		2	10-DEC-20
Ethylbenzene			<0.50		ug/L		0.5	10-DEC-20
n-Hexane			<0.50		ug/L		0.5	10-DEC-20
m+p-Xylenes			<0.40		ug/L		0.4	10-DEC-20
Methyl Ethyl Ketone			<20		ug/L		20	10-DEC-20
Methyl Isobutyl Ketone			<20		ug/L		20	10-DEC-20
Methylene Chloride			<5.0		ug/L		5	10-DEC-20
MTBE			<2.0		ug/L		2	10-DEC-20
o-Xylene			<0.30		ug/L		0.3	10-DEC-20
Styrene			<0.50		ug/L		0.5	10-DEC-20
Tetrachloroethylene			<0.50		ug/L		0.5	10-DEC-20
Toluene			<0.50		ug/L		0.5	10-DEC-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	10-DEC-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	10-DEC-20
Trichloroethylene			<0.50		ug/L		0.5	10-DEC-20
Trichlorofluoromethane			<5.0		ug/L		5	10-DEC-20
Vinyl chloride			<0.50		ug/L		0.5	10-DEC-20
Surrogate: 1,4-Difluorobenzene			99.8		%		70-130	10-DEC-20
Surrogate: 4-Bromofluorobenzene			97.9		%		70-130	10-DEC-20
WG3458463-5 MS		WG3458463-3						
1,1,1,2-Tetrachloroethane			99.5		%		50-140	10-DEC-20
1,1,2,2-Tetrachloroethane			131.8		%		50-140	10-DEC-20
1,1,1-Trichloroethane			99.1		%		50-140	10-DEC-20

Quality Control Report

Workorder: L2537182

Report Date: 14-DEC-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5310357							
WG3458463-5 MS		WG3458463-3						
1,1,2-Trichloroethane			106.0		%		50-140	10-DEC-20
1,1-Dichloroethane			102.3		%		50-140	10-DEC-20
1,1-Dichloroethylene			99.0		%		50-140	10-DEC-20
1,2-Dibromoethane			103.2		%		50-140	10-DEC-20
1,2-Dichlorobenzene			104.8		%		50-140	10-DEC-20
1,2-Dichloroethane			105.4		%		50-140	10-DEC-20
1,2-Dichloropropane			105.8		%		50-140	10-DEC-20
1,3-Dichlorobenzene			103.9		%		50-140	10-DEC-20
1,4-Dichlorobenzene			102.6		%		50-140	10-DEC-20
Acetone			127.6		%		50-140	10-DEC-20
Benzene			102.2		%		50-140	10-DEC-20
Bromodichloromethane			111.4		%		50-140	10-DEC-20
Bromoform			117.4		%		50-140	10-DEC-20
Bromomethane			99.1		%		50-140	10-DEC-20
Carbon tetrachloride			102.6		%		50-140	10-DEC-20
Chlorobenzene			102.6		%		50-140	10-DEC-20
Chloroform			107.3		%		50-140	10-DEC-20
cis-1,2-Dichloroethylene			106.0		%		50-140	10-DEC-20
cis-1,3-Dichloropropene			103.6		%		50-140	10-DEC-20
Dibromochloromethane			99.7		%		50-140	10-DEC-20
Dichlorodifluoromethane			94.7		%		50-140	10-DEC-20
Ethylbenzene			94.8		%		50-140	10-DEC-20
n-Hexane			94.0		%		50-140	10-DEC-20
m+p-Xylenes			98.0		%		50-140	10-DEC-20
Methyl Ethyl Ketone			120.8		%		50-140	10-DEC-20
Methyl Isobutyl Ketone			112.0		%		50-140	10-DEC-20
Methylene Chloride			110.1		%		50-140	10-DEC-20
MTBE			105.1		%		50-140	10-DEC-20
o-Xylene			103.6		%		50-140	10-DEC-20
Styrene			98.7		%		50-140	10-DEC-20
Tetrachloroethylene			99.7		%		50-140	10-DEC-20
Toluene			98.7		%		50-140	10-DEC-20
trans-1,2-Dichloroethylene			102.4		%		50-140	10-DEC-20



Quality Control Report

Workorder: L2537182

Report Date: 14-DEC-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: Laura Ermeta

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5310357							
WG3458463-5 MS		WG3458463-3						
trans-1,3-Dichloropropene			107.4		%		50-140	10-DEC-20
Trichloroethylene			100.7		%		50-140	10-DEC-20
Trichlorofluoromethane			98.1		%		50-140	10-DEC-20
Vinyl chloride			105.3		%		50-140	10-DEC-20

Quality Control Report

Workorder: L2537182

Report Date: 14-DEC-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: Laura Ermeta

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

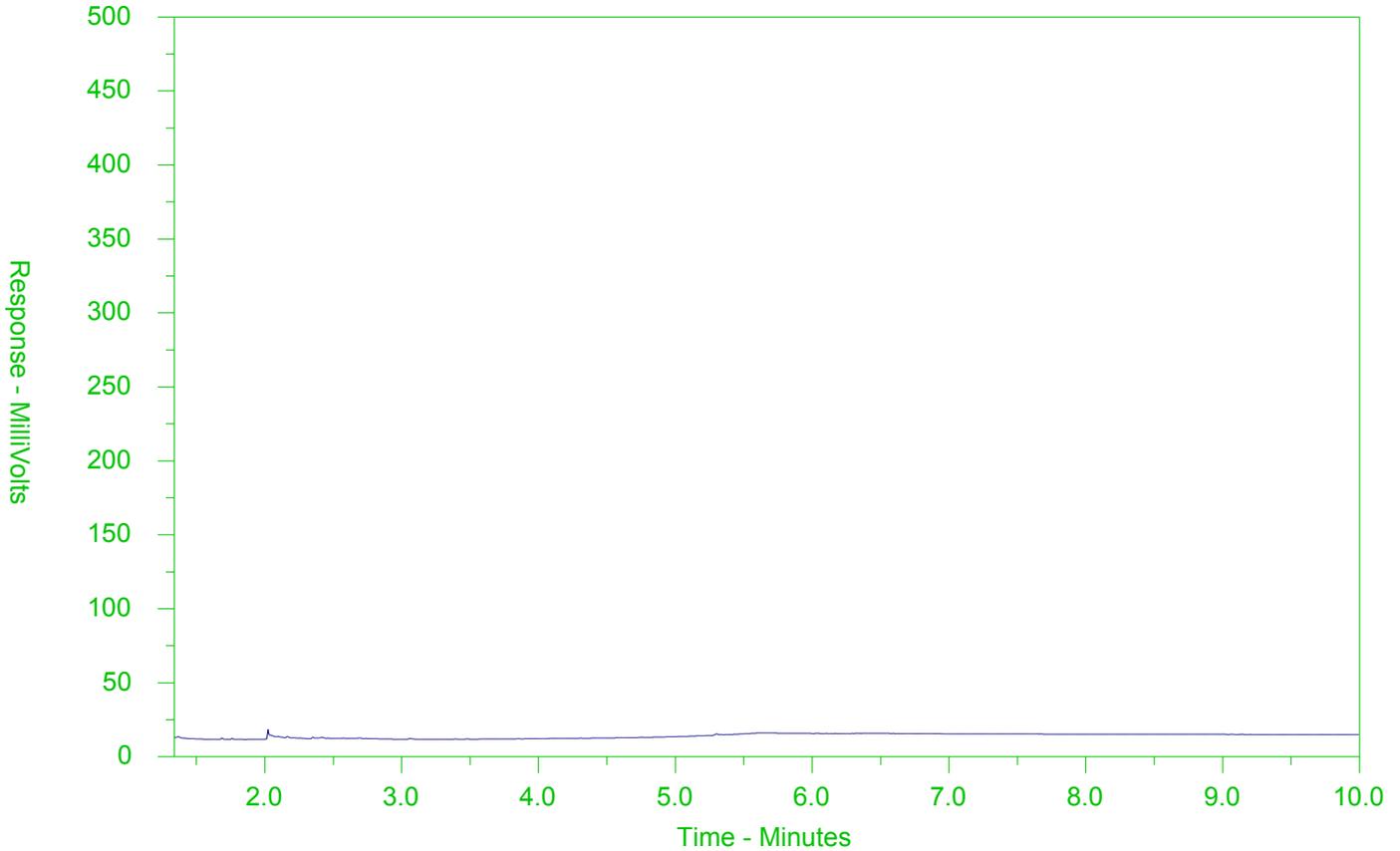
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2537182-1
 Client Sample ID: GW-11210029-120420-MW-01



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

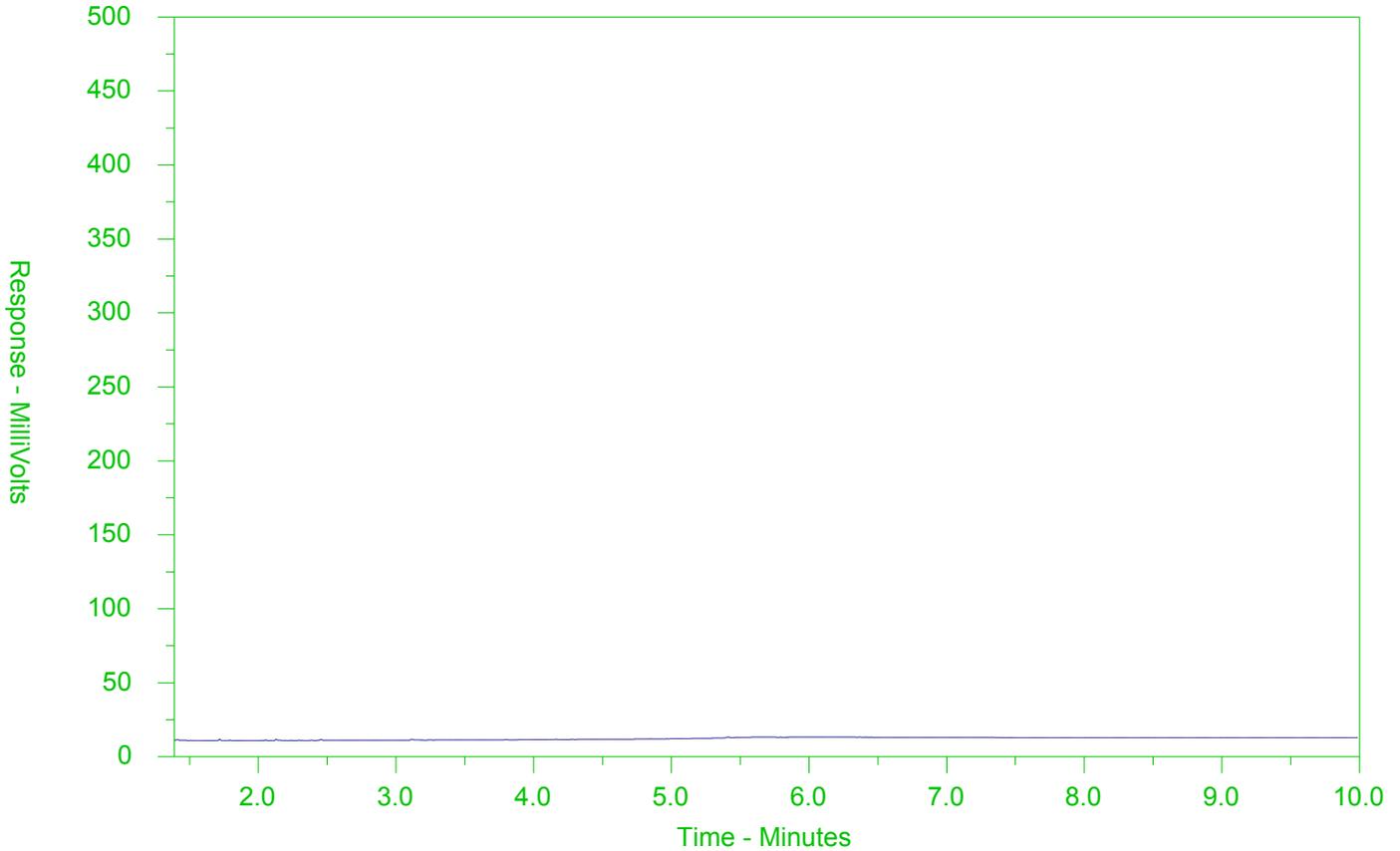
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2537182-2
 Client Sample ID: GW-11210029-120420-MW-02



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

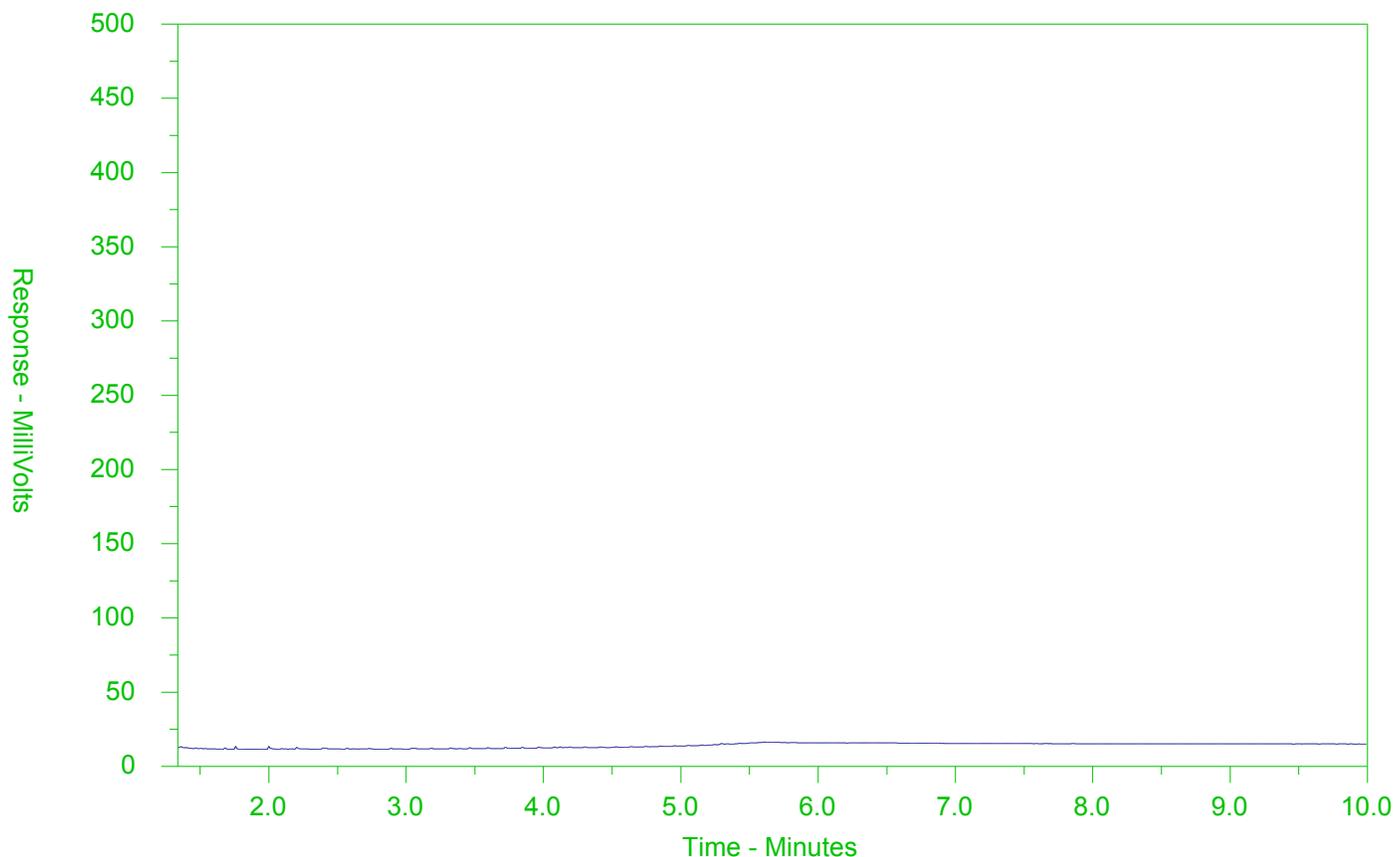
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2537182-3
 Client Sample ID: GW-11210029-120420-MW-02D



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

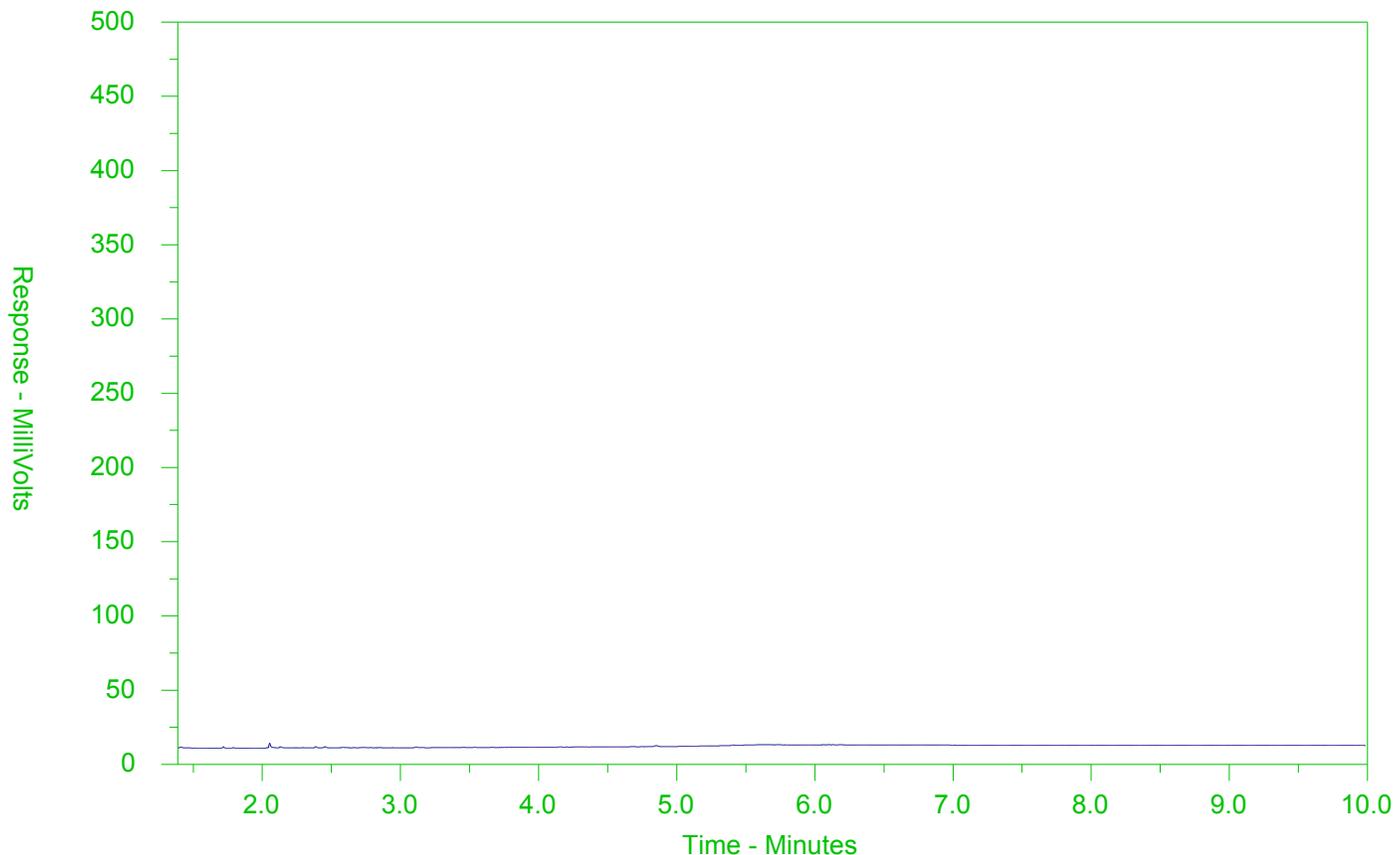
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2537182-4
 Client Sample ID: GW-11210029-120420-MW-03



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 02-JUL-20
Report Date: 14-JUL-20 14:27 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2468705

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2468705-1 W-11210029-20200702-12 Sampled By: CLIENT on 02-JUL-20 @ 10:30 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0056		0.0030	mg/L	03-JUL-20	06-JUL-20	R5142828
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	03-JUL-20	06-JUL-20	R5142637
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Arsenic (As)-Total	0.00517		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Barium (Ba)-Total	0.0495		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	03-JUL-20	06-JUL-20	R5142637
Boron (B)-Total	<0.010		0.010	mg/L	03-JUL-20	06-JUL-20	R5142637
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	03-JUL-20	06-JUL-20	R5142637
Calcium (Ca)-Total	70.6		0.050	mg/L	03-JUL-20	06-JUL-20	R5142637
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	03-JUL-20	06-JUL-20	R5142637
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	03-JUL-20	06-JUL-20	R5142637
Cobalt (Co)-Total	0.00011		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Copper (Cu)-Total	<0.00050		0.00050	mg/L	03-JUL-20	06-JUL-20	R5142637
Iron (Fe)-Total	0.400		0.010	mg/L	03-JUL-20	06-JUL-20	R5142637
Lead (Pb)-Total	0.000227		0.000050	mg/L	03-JUL-20	06-JUL-20	R5142637
Lithium (Li)-Total	0.0034		0.0010	mg/L	03-JUL-20	06-JUL-20	R5142637
Magnesium (Mg)-Total	32.6		0.0050	mg/L	03-JUL-20	06-JUL-20	R5142637
Manganese (Mn)-Total	0.0108		0.00050	mg/L	03-JUL-20	06-JUL-20	R5142637
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		07-JUL-20	R5143798
Molybdenum (Mo)-Total	0.000559		0.000050	mg/L	03-JUL-20	06-JUL-20	R5142637
Nickel (Ni)-Total	0.00170		0.00050	mg/L	03-JUL-20	06-JUL-20	R5142637
Phosphorus (P)-Total	<0.050		0.050	mg/L	03-JUL-20	06-JUL-20	R5142637
Potassium (K)-Total	0.978		0.050	mg/L	03-JUL-20	06-JUL-20	R5142637
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	03-JUL-20	06-JUL-20	R5142637
Selenium (Se)-Total	<0.000050		0.000050	mg/L	03-JUL-20	06-JUL-20	R5142637
Silicon (Si)-Total	8.89		0.10	mg/L	03-JUL-20	06-JUL-20	R5142637
Silver (Ag)-Total	<0.000050		0.000050	mg/L	03-JUL-20	06-JUL-20	R5142637
Sodium (Na)-Total	7.79		0.050	mg/L	03-JUL-20	06-JUL-20	R5142637
Strontium (Sr)-Total	0.148		0.0010	mg/L	03-JUL-20	06-JUL-20	R5142637
Sulfur (S)-Total	20.2		0.50	mg/L	03-JUL-20	06-JUL-20	R5142637
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	03-JUL-20	06-JUL-20	R5142637
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	03-JUL-20	06-JUL-20	R5142637
Thorium (Th)-Total	<0.00010		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Tin (Sn)-Total	<0.00010		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	03-JUL-20	06-JUL-20	R5142637
Tungsten (W)-Total	<0.00010		0.00010	mg/L	03-JUL-20	06-JUL-20	R5142637
Uranium (U)-Total	0.000252		0.000010	mg/L	03-JUL-20	06-JUL-20	R5142637
Vanadium (V)-Total	<0.00050		0.00050	mg/L	03-JUL-20	06-JUL-20	R5142637
Zinc (Zn)-Total	0.0054		0.0030	mg/L	03-JUL-20	06-JUL-20	R5142637

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2468705-1 W-11210029-20200702-12 Sampled By: CLIENT on 02-JUL-20 @ 10:30 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	03-JUL-20	06-JUL-20	R5142637
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		03-JUL-20	R5142654
Volatile Organic Compounds							
Acetone	<30		30	ug/L		08-JUL-20	R5145927
Benzene	<0.50		0.50	ug/L		08-JUL-20	R5145927
Bromodichloromethane	<2.0		2.0	ug/L		08-JUL-20	R5145927
Bromoform	<5.0		5.0	ug/L		08-JUL-20	R5145927
Bromomethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
Carbon tetrachloride	<0.20		0.20	ug/L		08-JUL-20	R5145927
Chlorobenzene	<0.50		0.50	ug/L		08-JUL-20	R5145927
Dibromochloromethane	<2.0		2.0	ug/L		08-JUL-20	R5145927
Chloroform	<1.0		1.0	ug/L		08-JUL-20	R5145927
1,2-Dibromoethane	<0.20		0.20	ug/L		08-JUL-20	R5145927
1,2-Dichlorobenzene	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,3-Dichlorobenzene	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,4-Dichlorobenzene	<0.50		0.50	ug/L		08-JUL-20	R5145927
Dichlorodifluoromethane	<2.0		2.0	ug/L		08-JUL-20	R5145927
1,1-Dichloroethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,2-Dichloroethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,1-Dichloroethylene	<0.50		0.50	ug/L		08-JUL-20	R5145927
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		08-JUL-20	R5145927
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		08-JUL-20	R5145927
Methylene Chloride	<5.0		5.0	ug/L		08-JUL-20	R5145927
1,2-Dichloropropane	<0.50		0.50	ug/L		08-JUL-20	R5145927
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		08-JUL-20	R5145927
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		08-JUL-20	R5145927
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		08-JUL-20	R5145927
Ethylbenzene	<0.50		0.50	ug/L		08-JUL-20	R5145927
n-Hexane	<0.50		0.50	ug/L		08-JUL-20	R5145927
Methyl Ethyl Ketone	<20		20	ug/L		08-JUL-20	R5145927
Methyl Isobutyl Ketone	<20		20	ug/L		08-JUL-20	R5145927
MTBE	<2.0		2.0	ug/L		08-JUL-20	R5145927
Styrene	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
Tetrachloroethylene	<0.50		0.50	ug/L		08-JUL-20	R5145927
Toluene	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,1,1-Trichloroethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
1,1,2-Trichloroethane	<0.50		0.50	ug/L		08-JUL-20	R5145927
Trichloroethylene	<0.50		0.50	ug/L		08-JUL-20	R5145927

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2468705-1 W-11210029-20200702-12							
Sampled By: CLIENT on 02-JUL-20 @ 10:30							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		08-JUL-20	R5145927
Vinyl chloride	<0.50		0.50	ug/L		08-JUL-20	R5145927
o-Xylene	<0.30		0.30	ug/L		08-JUL-20	R5145927
m+p-Xylenes	<0.40		0.40	ug/L		08-JUL-20	R5145927
Xylenes (Total)	<0.50		0.50	ug/L		08-JUL-20	
Surrogate: 4-Bromofluorobenzene	91.7		70-130	%		08-JUL-20	R5145927
Surrogate: 1,4-Difluorobenzene	96.9		70-130	%		08-JUL-20	R5145927
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		08-JUL-20	R5145927
F1-BTEX	<25		25	ug/L		14-JUL-20	
F2 (C10-C16)	<100		100	ug/L	03-JUL-20	06-JUL-20	R5142623
F2-Naphth	<100		100	ug/L		14-JUL-20	
F3 (C16-C34)	<250		250	ug/L	03-JUL-20	06-JUL-20	R5142623
F3-PAH	<250		250	ug/L		14-JUL-20	
F4 (C34-C50)	<250		250	ug/L	03-JUL-20	06-JUL-20	R5142623
Total Hydrocarbons (C6-C50)	<370		370	ug/L		14-JUL-20	
Chrom. to baseline at nC50	YES				03-JUL-20	06-JUL-20	R5142623
Surrogate: 2-Bromobenzotrifluoride	84.6		60-140	%	03-JUL-20	06-JUL-20	R5142623
Surrogate: 3,4-Dichlorotoluene	69.3		60-140	%		08-JUL-20	R5145927
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Acenaphthylene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Anthracene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Benzo(a)anthracene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Benzo(a)pyrene	<0.010		0.010	ug/L	03-JUL-20	07-JUL-20	R5142701
Benzo(b)fluoranthene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Benzo(k)fluoranthene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Chrysene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Fluoranthene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Fluorene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		14-JUL-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
2-Methylnaphthalene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Naphthalene	<0.050		0.050	ug/L	03-JUL-20	07-JUL-20	R5142701
Phenanthrene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Pyrene	<0.020		0.020	ug/L	03-JUL-20	07-JUL-20	R5142701
Surrogate: d10-Acenaphthene	95.8		60-140	%	03-JUL-20	07-JUL-20	R5142701
Surrogate: d12-Chrysene	81.8		60-140	%	03-JUL-20	07-JUL-20	R5142701

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2468705-1 W-11210029-20200702-12							
Sampled By: CLIENT on 02-JUL-20 @ 10:30							
Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	89.6		60-140	%	03-JUL-20	07-JUL-20	R5142701
Surrogate: d10-Phenanthrene	102.8		60-140	%	03-JUL-20	07-JUL-20	R5142701
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
4-Chloroaniline	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
2-Chlorophenol	<0.30		0.30	ug/L	13-JUL-20	14-JUL-20	R5152021
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4-Dichlorophenol	<0.30		0.30	ug/L	13-JUL-20	14-JUL-20	R5152021
Diethylphthalate	<0.20		0.20	ug/L	13-JUL-20	14-JUL-20	R5152021
Dimethylphthalate	<0.20		0.20	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4-Dimethylphenol	<0.50		0.50	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4-Dinitrophenol	<1.0		1.0	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4-Dinitrotoluene	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
2,6-Dinitrotoluene	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	13-JUL-20	14-JUL-20	R5152021
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	13-JUL-20	14-JUL-20	R5152021
Pentachlorophenol	<0.50		0.50	ug/L	13-JUL-20	14-JUL-20	R5152021
Phenol	<0.50		0.50	ug/L	13-JUL-20	14-JUL-20	R5152021
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	13-JUL-20	14-JUL-20	R5152021
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	13-JUL-20	14-JUL-20	R5152021
Surrogate: 2-Fluorobiphenyl	86.8		50-140	%	13-JUL-20	14-JUL-20	R5152021
Surrogate: Nitrobenzene d5	91.7		50-140	%	13-JUL-20	14-JUL-20	R5152021
Surrogate: p-Terphenyl d14	116.1		60-140	%	13-JUL-20	14-JUL-20	R5152021
Surrogate: 2,4,6-Tribromophenol	76.2		50-140	%	13-JUL-20	14-JUL-20	R5152021
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	06-JUL-20	06-JUL-20	R5142612
Aroclor 1248	<0.020		0.020	ug/L	06-JUL-20	06-JUL-20	R5142612
Aroclor 1254	<0.020		0.020	ug/L	06-JUL-20	06-JUL-20	R5142612
Aroclor 1260	<0.020		0.020	ug/L	06-JUL-20	06-JUL-20	R5142612
Surrogate: Decachlorobiphenyl	142.0		50-150	%	06-JUL-20	06-JUL-20	R5142612
Total PCBs	<0.040		0.040	ug/L	06-JUL-20	06-JUL-20	R5142612
Surrogate: Tetrachloro-m-xylene	83.4		50-150	%	06-JUL-20	06-JUL-20	R5142612

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	1,2,4-Trichlorobenzene	LCS-ND	L2468705-1
Matrix Spike	Aluminum (Al)-Total	MS-B	L2468705-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2468705-1
Matrix Spike	Boron (B)-Total	MS-B	L2468705-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2468705-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2468705-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2468705-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2468705-1
Matrix Spike	Potassium (K)-Total	MS-B	L2468705-1
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2468705-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2468705-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2468705-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2468705-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2468705-1
Matrix Spike	Uranium (U)-Total	MS-B	L2468705-1

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

Reference Information

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2468705

Report Date: 14-JUL-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5152021							
WG3360817-2	LCS							
1,2,4-Trichlorobenzene			33.2	LCS-ND	%		50-140	14-JUL-20
2-Chlorophenol			82.3		%		50-140	14-JUL-20
2,4-Dichlorophenol			96.7		%		50-140	14-JUL-20
2,4-Dimethylphenol			107.0		%		30-130	14-JUL-20
2,4-Dinitrophenol			139.9		%		50-140	14-JUL-20
2,4-Dinitrotoluene			137.0		%		50-140	14-JUL-20
2,4,5-Trichlorophenol			97.2		%		50-140	14-JUL-20
2,4,6-Trichlorophenol			95.8		%		50-140	14-JUL-20
2,6-Dinitrotoluene			113.7		%		50-140	14-JUL-20
3,3'-Dichlorobenzidine			84.5		%		30-130	14-JUL-20
4-Chloroaniline			50.8		%		30-130	14-JUL-20
Biphenyl			50.2		%		50-140	14-JUL-20
Bis(2-chloroethyl)ether			94.3		%		50-140	14-JUL-20
Bis(2-chloroisopropyl)ether			75.9		%		50-140	14-JUL-20
Bis(2-ethylhexyl)phthalate			119.3		%		50-140	14-JUL-20
Diethylphthalate			95.9		%		50-140	14-JUL-20
Dimethylphthalate			93.2		%		50-140	14-JUL-20
Pentachlorophenol			113.1		%		50-140	14-JUL-20
Phenol			108.7		%		30-130	14-JUL-20
WG3360817-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	14-JUL-20
2-Chlorophenol			<0.30		ug/L		0.3	14-JUL-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	14-JUL-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	14-JUL-20
2,4-Dinitrophenol			<1.0		ug/L		1	14-JUL-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	14-JUL-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	14-JUL-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	14-JUL-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	14-JUL-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	14-JUL-20
4-Chloroaniline			<0.40		ug/L		0.4	14-JUL-20
Biphenyl			<0.40		ug/L		0.4	14-JUL-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	14-JUL-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	14-JUL-20



Quality Control Report

Workorder: L2468705

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5152021								
WG3360817-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	14-JUL-20
Diethylphthalate			<0.20		ug/L		0.2	14-JUL-20
Dimethylphthalate			<0.20		ug/L		0.2	14-JUL-20
Pentachlorophenol			<0.50		ug/L		0.5	14-JUL-20
Phenol			<0.50		ug/L		0.5	14-JUL-20
Surrogate: 2-Fluorobiphenyl			87.4		%		50-140	14-JUL-20
Surrogate: 2,4,6-Tribromophenol			80.8		%		50-140	14-JUL-20
Surrogate: Nitrobenzene d5			90.5		%		50-140	14-JUL-20
Surrogate: p-Terphenyl d14			130.1		%		60-140	14-JUL-20
CR-CR6-IC-WT Water								
Batch R5142654								
WG3355133-4 DUP								
Chromium, Hexavalent		WG3355133-3 0.00592	0.00579		mg/L	2.3	20	03-JUL-20
WG3355133-2 LCS								
Chromium, Hexavalent			103.6		%		80-120	03-JUL-20
WG3355133-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	03-JUL-20
WG3355133-5 MS								
Chromium, Hexavalent		WG3355133-3	104.5		%		70-130	03-JUL-20
F1-HS-511-WT Water								
Batch R5145927								
WG3357552-4 DUP								
F1 (C6-C10)		WG3357552-3 <25	<25	RPD-NA	ug/L	N/A	30	08-JUL-20
WG3357552-1 LCS								
F1 (C6-C10)			110.6		%		80-120	08-JUL-20
WG3357552-2 MB								
F1 (C6-C10)			<25		ug/L		25	08-JUL-20
Surrogate: 3,4-Dichlorotoluene			84.0		%		60-140	08-JUL-20
WG3357552-5 MS								
F1 (C6-C10)		WG3357552-3	94.6		%		60-140	08-JUL-20
F2-F4-511-WT Water								
Batch R5142623								
WG3355185-2 LCS								
F2 (C10-C16)			100.8		%		70-130	06-JUL-20
F3 (C16-C34)			104.0		%		70-130	06-JUL-20



Quality Control Report

Workorder: L2468705

Report Date: 14-JUL-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch	R5142623							
WG3355185-2	LCS							
F4 (C34-C50)			105.7		%		70-130	06-JUL-20
WG3355185-1	MB							
F2 (C10-C16)			<100		ug/L		100	06-JUL-20
F3 (C16-C34)			<250		ug/L		250	06-JUL-20
F4 (C34-C50)			<250		ug/L		250	06-JUL-20
Surrogate: 2-Bromobenzotrifluoride			87.6		%		60-140	06-JUL-20
HG-T-CVAA-WT		Water						
Batch	R5143798							
WG3356339-3	DUP	L2467371-1						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	07-JUL-20
WG3356339-2	LCS							
Mercury (Hg)-Total			101.0		%		80-120	07-JUL-20
WG3356339-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	07-JUL-20
WG3356339-4	MS	L2467371-2						
Mercury (Hg)-Total			95.5		%		70-130	07-JUL-20
MET-T-CCMS-WT		Water						
Batch	R5142637							
WG3354650-4	DUP	WG3354650-3						
Aluminum (Al)-Total		0.906	0.894		mg/L	1.3	20	03-JUL-20
Antimony (Sb)-Total		0.00035	0.00035		mg/L	0.4	20	03-JUL-20
Arsenic (As)-Total		0.00113	0.00110		mg/L	2.8	20	03-JUL-20
Barium (Ba)-Total		0.0642	0.0655		mg/L	1.9	20	03-JUL-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-JUL-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	03-JUL-20
Boron (B)-Total		0.030	0.031		mg/L	1.6	20	03-JUL-20
Cadmium (Cd)-Total		0.0000154	0.0000181		mg/L	16	20	03-JUL-20
Calcium (Ca)-Total		36.7	34.3		mg/L	6.8	20	03-JUL-20
Chromium (Cr)-Total		0.00138	0.00137		mg/L	0.9	20	03-JUL-20
Cesium (Cs)-Total		0.000068	0.000067		mg/L	2.7	20	03-JUL-20
Cobalt (Co)-Total		0.00038	0.00039		mg/L	4.0	20	03-JUL-20
Copper (Cu)-Total		0.00232	0.00229		mg/L	1.1	20	03-JUL-20
Iron (Fe)-Total		0.789	0.774		mg/L	1.9	20	03-JUL-20
Lead (Pb)-Total		0.000465	0.000475		mg/L	2.1	20	03-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5142637							
WG3354650-4	DUP	WG3354650-3						
Lithium (Li)-Total		0.0026	0.0026		mg/L	1.3	20	03-JUL-20
Magnesium (Mg)-Total		9.79	9.92		mg/L	1.3	20	03-JUL-20
Manganese (Mn)-Total		0.0148	0.0146		mg/L	1.4	20	03-JUL-20
Molybdenum (Mo)-Total		0.00154	0.00153		mg/L	0.7	20	03-JUL-20
Nickel (Ni)-Total		0.00132	0.00129		mg/L	2.3	20	03-JUL-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	03-JUL-20
Potassium (K)-Total		2.26	2.26		mg/L	0.0	20	03-JUL-20
Rubidium (Rb)-Total		0.00235	0.00214		mg/L	9.1	20	03-JUL-20
Selenium (Se)-Total		0.000142	0.000188	J	mg/L	0.000046	0.0001	03-JUL-20
Silicon (Si)-Total		2.84	2.80		mg/L	1.4	20	03-JUL-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	03-JUL-20
Sodium (Na)-Total		14.1	14.0		mg/L	0.1	20	03-JUL-20
Strontium (Sr)-Total		0.184	0.183		mg/L	0.5	20	03-JUL-20
Sulfur (S)-Total		8.56	8.55		mg/L	0.2	25	03-JUL-20
Thallium (Tl)-Total		0.000010	<0.000010	RPD-NA	mg/L	N/A	20	03-JUL-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	03-JUL-20
Thorium (Th)-Total		0.00012	0.00014		mg/L	13	25	03-JUL-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-JUL-20
Titanium (Ti)-Total		0.0300	0.0300		mg/L	0.0	20	03-JUL-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	03-JUL-20
Uranium (U)-Total		0.000429	0.000435		mg/L	1.5	20	03-JUL-20
Vanadium (V)-Total		0.00197	0.00197		mg/L	0.3	20	03-JUL-20
Zinc (Zn)-Total		0.0323	0.0317		mg/L	2.0	20	03-JUL-20
Zirconium (Zr)-Total		0.00035	0.00036		mg/L	1.2	20	03-JUL-20
WG3354650-2	LCS							
Aluminum (Al)-Total			97.2		%		80-120	03-JUL-20
Antimony (Sb)-Total			102.9		%		80-120	03-JUL-20
Arsenic (As)-Total			98.0		%		80-120	03-JUL-20
Barium (Ba)-Total			98.4		%		80-120	03-JUL-20
Beryllium (Be)-Total			97.9		%		80-120	03-JUL-20
Bismuth (Bi)-Total			99.4		%		80-120	03-JUL-20
Boron (B)-Total			97.9		%		80-120	03-JUL-20
Cadmium (Cd)-Total			98.0		%		80-120	03-JUL-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5142637							
WG3354650-2	LCS							
Calcium (Ca)-Total			98.3		%		80-120	03-JUL-20
Chromium (Cr)-Total			98.8		%		80-120	03-JUL-20
Cesium (Cs)-Total			98.1		%		80-120	03-JUL-20
Cobalt (Co)-Total			96.8		%		80-120	03-JUL-20
Copper (Cu)-Total			96.0		%		80-120	03-JUL-20
Iron (Fe)-Total			99.6		%		80-120	03-JUL-20
Lead (Pb)-Total			99.2		%		80-120	03-JUL-20
Lithium (Li)-Total			96.9		%		80-120	03-JUL-20
Magnesium (Mg)-Total			99.0		%		80-120	03-JUL-20
Manganese (Mn)-Total			96.7		%		80-120	03-JUL-20
Molybdenum (Mo)-Total			99.3		%		80-120	03-JUL-20
Nickel (Ni)-Total			97.2		%		80-120	03-JUL-20
Phosphorus (P)-Total			101.4		%		70-130	03-JUL-20
Potassium (K)-Total			97.7		%		80-120	03-JUL-20
Rubidium (Rb)-Total			96.3		%		80-120	03-JUL-20
Selenium (Se)-Total			97.7		%		80-120	03-JUL-20
Silicon (Si)-Total			99.7		%		60-140	03-JUL-20
Silver (Ag)-Total			97.9		%		80-120	03-JUL-20
Sodium (Na)-Total			100.6		%		80-120	03-JUL-20
Strontium (Sr)-Total			101.3		%		80-120	03-JUL-20
Sulfur (S)-Total			100.3		%		80-120	03-JUL-20
Thallium (Tl)-Total			100.0		%		80-120	03-JUL-20
Tellurium (Te)-Total			96.6		%		80-120	03-JUL-20
Thorium (Th)-Total			97.1		%		70-130	03-JUL-20
Tin (Sn)-Total			97.6		%		80-120	03-JUL-20
Titanium (Ti)-Total			95.5		%		80-120	03-JUL-20
Tungsten (W)-Total			96.4		%		80-120	03-JUL-20
Uranium (U)-Total			102.0		%		80-120	03-JUL-20
Vanadium (V)-Total			98.0		%		80-120	03-JUL-20
Zinc (Zn)-Total			98.0		%		80-120	03-JUL-20
Zirconium (Zr)-Total			94.2		%		80-120	03-JUL-20
WG3354650-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	03-JUL-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	03-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5142637							
WG3354650-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	03-JUL-20
Boron (B)-Total			<0.010		mg/L		0.01	03-JUL-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	03-JUL-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	03-JUL-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	03-JUL-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	03-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	03-JUL-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	03-JUL-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	03-JUL-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	03-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	03-JUL-20
Potassium (K)-Total			<0.050		mg/L		0.05	03-JUL-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	03-JUL-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	03-JUL-20
Silicon (Si)-Total			<0.10		mg/L		0.1	03-JUL-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	03-JUL-20
Sodium (Na)-Total			<0.050		mg/L		0.05	03-JUL-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	03-JUL-20
Sulfur (S)-Total			<0.50		mg/L		0.5	03-JUL-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	03-JUL-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	03-JUL-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	03-JUL-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	03-JUL-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	03-JUL-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5142637							
WG3354650-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	03-JUL-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	03-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	03-JUL-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	03-JUL-20
WG3354650-5 MS		WG3354650-6						
Aluminum (Al)-Total			N/A	MS-B	%		-	03-JUL-20
Antimony (Sb)-Total			100.4		%		70-130	03-JUL-20
Arsenic (As)-Total			98.3		%		70-130	03-JUL-20
Barium (Ba)-Total			N/A	MS-B	%		-	03-JUL-20
Beryllium (Be)-Total			96.4		%		70-130	03-JUL-20
Bismuth (Bi)-Total			91.4		%		70-130	03-JUL-20
Boron (B)-Total			N/A	MS-B	%		-	03-JUL-20
Cadmium (Cd)-Total			97.2		%		70-130	03-JUL-20
Calcium (Ca)-Total			N/A	MS-B	%		-	03-JUL-20
Chromium (Cr)-Total			99.5		%		70-130	03-JUL-20
Cesium (Cs)-Total			96.5		%		70-130	03-JUL-20
Cobalt (Co)-Total			93.5		%		70-130	03-JUL-20
Copper (Cu)-Total			92.3		%		70-130	03-JUL-20
Iron (Fe)-Total			N/A	MS-B	%		-	03-JUL-20
Lead (Pb)-Total			94.5		%		70-130	03-JUL-20
Lithium (Li)-Total			92.8		%		70-130	03-JUL-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	03-JUL-20
Manganese (Mn)-Total			N/A	MS-B	%		-	03-JUL-20
Molybdenum (Mo)-Total			99.5		%		70-130	03-JUL-20
Nickel (Ni)-Total			91.4		%		70-130	03-JUL-20
Phosphorus (P)-Total			97.8		%		70-130	03-JUL-20
Potassium (K)-Total			N/A	MS-B	%		-	03-JUL-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	03-JUL-20
Selenium (Se)-Total			96.5		%		70-130	03-JUL-20
Silicon (Si)-Total			N/A	MS-B	%		-	03-JUL-20
Silver (Ag)-Total			93.5		%		70-130	03-JUL-20
Sodium (Na)-Total			N/A	MS-B	%		-	03-JUL-20
Strontium (Sr)-Total			N/A	MS-B	%		-	03-JUL-20
Sulfur (S)-Total			N/A	MS-B	%		-	03-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5142637							
WG3354650-5 MS		WG3354650-6						
Thallium (Tl)-Total			93.6		%		70-130	03-JUL-20
Tellurium (Te)-Total			91.2		%		70-130	03-JUL-20
Thorium (Th)-Total			93.5		%		70-130	03-JUL-20
Tin (Sn)-Total			96.1		%		70-130	03-JUL-20
Titanium (Ti)-Total			98.6		%		70-130	03-JUL-20
Tungsten (W)-Total			94.1		%		70-130	03-JUL-20
Uranium (U)-Total			N/A	MS-B	%		-	03-JUL-20
Vanadium (V)-Total			99.9		%		70-130	03-JUL-20
Zinc (Zn)-Total			92.6		%		70-130	03-JUL-20
Zirconium (Zr)-Total			85.2		%		70-130	03-JUL-20
P-T-COL-WT								
	Water							
Batch	R5142828							
WG3354570-3 DUP		L2468705-1						
Phosphorus, Total		0.0056	0.0059		mg/L	6.8	20	06-JUL-20
WG3354570-2 LCS								
Phosphorus, Total			97.6		%		80-120	06-JUL-20
WG3354570-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	06-JUL-20
WG3354570-4 MS		L2468705-1						
Phosphorus, Total			93.6		%		70-130	06-JUL-20
PAH-511-WT								
	Water							
Batch	R5142701							
WG3355185-2 LCS								
1-Methylnaphthalene			89.8		%		50-140	06-JUL-20
2-Methylnaphthalene			86.7		%		50-140	06-JUL-20
Acenaphthene			97.8		%		50-140	06-JUL-20
Acenaphthylene			101.6		%		50-140	06-JUL-20
Anthracene			103.8		%		50-140	06-JUL-20
Benzo(a)anthracene			94.2		%		50-140	06-JUL-20
Benzo(a)pyrene			99.9		%		50-140	06-JUL-20
Benzo(b)fluoranthene			103.5		%		50-140	06-JUL-20
Benzo(g,h,i)perylene			107.0		%		50-140	06-JUL-20
Benzo(k)fluoranthene			102.2		%		50-140	06-JUL-20
Chrysene			93.8		%		50-140	06-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5142701							
WG3355185-2	LCS							
Dibenzo(ah)anthracene			97.8		%		50-140	06-JUL-20
Fluoranthene			107.1		%		50-140	06-JUL-20
Fluorene			103.0		%		50-140	06-JUL-20
Indeno(1,2,3-cd)pyrene			108.6		%		50-140	06-JUL-20
Naphthalene			92.0		%		50-140	06-JUL-20
Phenanthrene			108.1		%		50-140	06-JUL-20
Pyrene			107.4		%		50-140	06-JUL-20
WG3355185-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	06-JUL-20
2-Methylnaphthalene			<0.020		ug/L		0.02	06-JUL-20
Acenaphthene			<0.020		ug/L		0.02	06-JUL-20
Acenaphthylene			<0.020		ug/L		0.02	06-JUL-20
Anthracene			<0.020		ug/L		0.02	06-JUL-20
Benzo(a)anthracene			<0.020		ug/L		0.02	06-JUL-20
Benzo(a)pyrene			<0.010		ug/L		0.01	06-JUL-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	06-JUL-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	06-JUL-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	06-JUL-20
Chrysene			<0.020		ug/L		0.02	06-JUL-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	06-JUL-20
Fluoranthene			<0.020		ug/L		0.02	06-JUL-20
Fluorene			<0.020		ug/L		0.02	06-JUL-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	06-JUL-20
Naphthalene			<0.050		ug/L		0.05	06-JUL-20
Phenanthrene			<0.020		ug/L		0.02	06-JUL-20
Pyrene			<0.020		ug/L		0.02	06-JUL-20
Surrogate: d8-Naphthalene			95.9		%		60-140	06-JUL-20
Surrogate: d10-Phenanthrene			103.0		%		60-140	06-JUL-20
Surrogate: d12-Chrysene			77.2		%		60-140	06-JUL-20
Surrogate: d10-Acenaphthene			96.5		%		60-140	06-JUL-20

PCB-511-WT **Water**



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5142612							
WG3354767-2	LCS							
Aroclor 1242			118.8		%		60-140	06-JUL-20
Aroclor 1248			121.4		%		60-140	06-JUL-20
Aroclor 1254			116.3		%		60-140	06-JUL-20
Aroclor 1260			91.1		%		60-140	06-JUL-20
WG3354767-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	06-JUL-20
Aroclor 1248			<0.020		ug/L		0.02	06-JUL-20
Aroclor 1254			<0.020		ug/L		0.02	06-JUL-20
Aroclor 1260			<0.020		ug/L		0.02	06-JUL-20
Surrogate: Decachlorobiphenyl			111.0		%		50-150	06-JUL-20
Surrogate: Tetrachloro-m-xylene			84.4		%		50-150	06-JUL-20
VOC-511-HS-WT		Water						
Batch	R5145927							
WG3357552-4	DUP		WG3357552-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	08-JUL-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	08-JUL-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	08-JUL-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	08-JUL-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	08-JUL-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5145927							
WG3357552-4	DUP	WG3357552-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	08-JUL-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	08-JUL-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	08-JUL-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	08-JUL-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	08-JUL-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	08-JUL-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	08-JUL-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	08-JUL-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	08-JUL-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	08-JUL-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	08-JUL-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	08-JUL-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	08-JUL-20
WG3357552-1	LCS							
1,1,1,2-Tetrachloroethane			101.5		%		70-130	08-JUL-20
1,1,2,2-Tetrachloroethane			106.0		%		70-130	08-JUL-20
1,1,1-Trichloroethane			109.4		%		70-130	08-JUL-20
1,1,2-Trichloroethane			101.3		%		70-130	08-JUL-20
1,1-Dichloroethane			103.9		%		70-130	08-JUL-20
1,1-Dichloroethylene			105.0		%		70-130	08-JUL-20
1,2-Dibromoethane			98.4		%		70-130	08-JUL-20
1,2-Dichlorobenzene			103.6		%		70-130	08-JUL-20
1,2-Dichloroethane			103.5		%		70-130	08-JUL-20
1,2-Dichloropropane			108.9		%		70-130	08-JUL-20
1,3-Dichlorobenzene			99.0		%		70-130	08-JUL-20



Quality Control Report

Workorder: L2468705

Report Date: 14-JUL-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5145927							
WG3357552-1	LCS							
1,4-Dichlorobenzene			100.7		%		70-130	08-JUL-20
Acetone			116.8		%		60-140	08-JUL-20
Benzene			102.8		%		70-130	08-JUL-20
Bromodichloromethane			115.3		%		70-130	08-JUL-20
Bromoform			99.3		%		70-130	08-JUL-20
Bromomethane			117.9		%		60-140	08-JUL-20
Carbon tetrachloride			110.4		%		70-130	08-JUL-20
Chlorobenzene			101.4		%		70-130	08-JUL-20
Chloroform			109.2		%		70-130	08-JUL-20
cis-1,2-Dichloroethylene			101.0		%		70-130	08-JUL-20
cis-1,3-Dichloropropene			97.1		%		70-130	08-JUL-20
Dibromochloromethane			99.0		%		70-130	08-JUL-20
Dichlorodifluoromethane			105.8		%		50-140	08-JUL-20
Ethylbenzene			99.1		%		70-130	08-JUL-20
n-Hexane			108.7		%		70-130	08-JUL-20
m+p-Xylenes			102.5		%		70-130	08-JUL-20
Methyl Ethyl Ketone			112.2		%		60-140	08-JUL-20
Methyl Isobutyl Ketone			94.4		%		60-140	08-JUL-20
Methylene Chloride			102.5		%		70-130	08-JUL-20
MTBE			97.8		%		70-130	08-JUL-20
o-Xylene			106.6		%		70-130	08-JUL-20
Styrene			94.8		%		70-130	08-JUL-20
Tetrachloroethylene			103.4		%		70-130	08-JUL-20
Toluene			101.1		%		70-130	08-JUL-20
trans-1,2-Dichloroethylene			103.4		%		70-130	08-JUL-20
trans-1,3-Dichloropropene			100.1		%		70-130	08-JUL-20
Trichloroethylene			96.4		%		70-130	08-JUL-20
Trichlorofluoromethane			104.5		%		60-140	08-JUL-20
Vinyl chloride			119.7		%		60-140	08-JUL-20
WG3357552-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	08-JUL-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	08-JUL-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	08-JUL-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	08-JUL-20



Quality Control Report

Workorder: L2468705

Report Date: 14-JUL-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5145927							
WG3357552-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	08-JUL-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	08-JUL-20
1,2-Dibromoethane			<0.20		ug/L		0.2	08-JUL-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	08-JUL-20
1,2-Dichloroethane			<0.50		ug/L		0.5	08-JUL-20
1,2-Dichloropropane			<0.50		ug/L		0.5	08-JUL-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	08-JUL-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	08-JUL-20
Acetone			<30		ug/L		30	08-JUL-20
Benzene			<0.50		ug/L		0.5	08-JUL-20
Bromodichloromethane			<2.0		ug/L		2	08-JUL-20
Bromoform			<5.0		ug/L		5	08-JUL-20
Bromomethane			<0.50		ug/L		0.5	08-JUL-20
Carbon tetrachloride			<0.20		ug/L		0.2	08-JUL-20
Chlorobenzene			<0.50		ug/L		0.5	08-JUL-20
Chloroform			<1.0		ug/L		1	08-JUL-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	08-JUL-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	08-JUL-20
Dibromochloromethane			<2.0		ug/L		2	08-JUL-20
Dichlorodifluoromethane			<2.0		ug/L		2	08-JUL-20
Ethylbenzene			<0.50		ug/L		0.5	08-JUL-20
n-Hexane			<0.50		ug/L		0.5	08-JUL-20
m+p-Xylenes			<0.40		ug/L		0.4	08-JUL-20
Methyl Ethyl Ketone			<20		ug/L		20	08-JUL-20
Methyl Isobutyl Ketone			<20		ug/L		20	08-JUL-20
Methylene Chloride			<5.0		ug/L		5	08-JUL-20
MTBE			<2.0		ug/L		2	08-JUL-20
o-Xylene			<0.30		ug/L		0.3	08-JUL-20
Styrene			<0.50		ug/L		0.5	08-JUL-20
Tetrachloroethylene			<0.50		ug/L		0.5	08-JUL-20
Toluene			<0.50		ug/L		0.5	08-JUL-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	08-JUL-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	08-JUL-20



Quality Control Report

Workorder: L2468705

Report Date: 14-JUL-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5145927							
WG3357552-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	08-JUL-20
Trichlorofluoromethane			<5.0		ug/L		5	08-JUL-20
Vinyl chloride			<0.50		ug/L		0.5	08-JUL-20
Surrogate: 1,4-Difluorobenzene			97.2		%		70-130	08-JUL-20
Surrogate: 4-Bromofluorobenzene			92.3		%		70-130	08-JUL-20
WG3357552-5 MS		WG3357552-3						
1,1,1,2-Tetrachloroethane			102.3		%		50-140	08-JUL-20
1,1,1,2-Tetrachloroethane			112.6		%		50-140	08-JUL-20
1,1,1-Trichloroethane			108.4		%		50-140	08-JUL-20
1,1,2-Trichloroethane			105.1		%		50-140	08-JUL-20
1,1-Dichloroethane			104.5		%		50-140	08-JUL-20
1,1-Dichloroethylene			103.0		%		50-140	08-JUL-20
1,2-Dibromoethane			102.4		%		50-140	08-JUL-20
1,2-Dichlorobenzene			102.9		%		50-140	08-JUL-20
1,2-Dichloroethane			107.1		%		50-140	08-JUL-20
1,2-Dichloropropane			111.4		%		50-140	08-JUL-20
1,3-Dichlorobenzene			97.0		%		50-140	08-JUL-20
1,4-Dichlorobenzene			98.8		%		50-140	08-JUL-20
Acetone			125.5		%		50-140	08-JUL-20
Benzene			103.1		%		50-140	08-JUL-20
Bromodichloromethane			118.6		%		50-140	08-JUL-20
Bromoform			102.8		%		50-140	08-JUL-20
Bromomethane			115.7		%		50-140	08-JUL-20
Carbon tetrachloride			108.7		%		50-140	08-JUL-20
Chlorobenzene			101.2		%		50-140	08-JUL-20
Chloroform			110.6		%		50-140	08-JUL-20
cis-1,2-Dichloroethylene			101.2		%		50-140	08-JUL-20
cis-1,3-Dichloropropene			95.7		%		50-140	08-JUL-20
Dibromochloromethane			102.1		%		50-140	08-JUL-20
Dichlorodifluoromethane			100.5		%		50-140	08-JUL-20
Ethylbenzene			96.5		%		50-140	08-JUL-20
n-Hexane			105.1		%		50-140	08-JUL-20
m+p-Xylenes			99.9		%		50-140	08-JUL-20
Methyl Ethyl Ketone			108.0		%		50-140	08-JUL-20



Quality Control Report

Workorder: L2468705

Report Date: 14-JUL-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5145927							
WG3357552-5 MS		WG3357552-3						
Methyl Isobutyl Ketone			101.1		%		50-140	08-JUL-20
Methylene Chloride			104.2		%		50-140	08-JUL-20
MTBE			98.0		%		50-140	08-JUL-20
o-Xylene			105.0		%		50-140	08-JUL-20
Styrene			93.6		%		50-140	08-JUL-20
Tetrachloroethylene			100.2		%		50-140	08-JUL-20
Toluene			99.3		%		50-140	08-JUL-20
trans-1,2-Dichloroethylene			102.1		%		50-140	08-JUL-20
trans-1,3-Dichloropropene			98.2		%		50-140	08-JUL-20
Trichloroethylene			94.6		%		50-140	08-JUL-20
Trichlorofluoromethane			101.7		%		50-140	08-JUL-20
Vinyl chloride			116.5		%		50-140	08-JUL-20

Quality Control Report

Workorder: L2468705

Report Date: 14-JUL-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

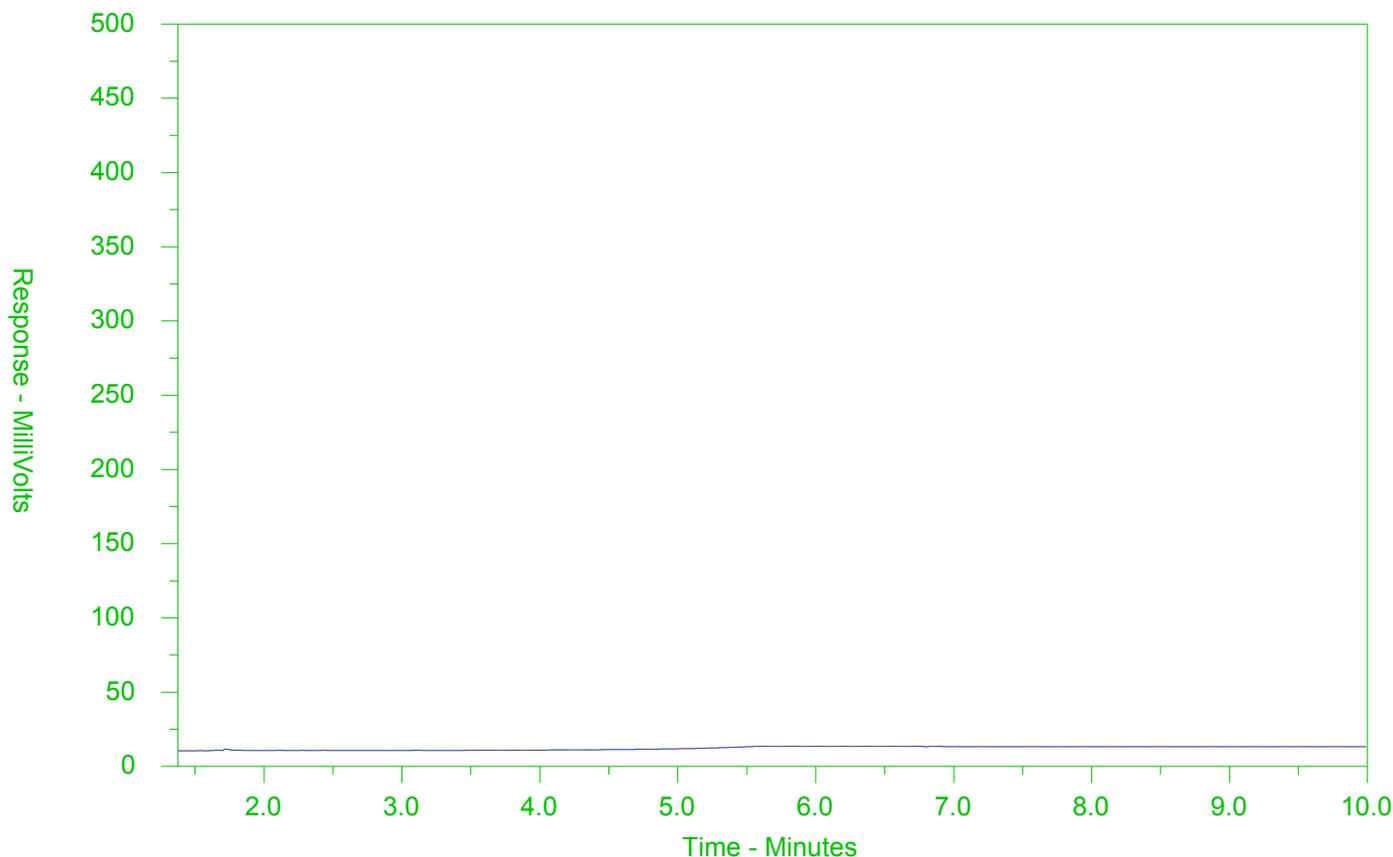
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2468705-1
 Client Sample ID: W-11210029-20200702-12



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 23-JUL-20
Report Date: 05-AUG-20 10:32 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2478867

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2478867-1 W-11210029-20200723-18 Sampled By: CLIENT on 23-JUL-20 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	<0.0030		0.0030	mg/L	24-JUL-20	27-JUL-20	R5167529
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	24-JUL-20	24-JUL-20	R5166457
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Arsenic (As)-Total	0.00224		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Barium (Ba)-Total	0.0506		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	24-JUL-20	24-JUL-20	R5166457
Boron (B)-Total	<0.010		0.010	mg/L	24-JUL-20	24-JUL-20	R5166457
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	24-JUL-20	24-JUL-20	R5166457
Calcium (Ca)-Total	68.3		0.050	mg/L	24-JUL-20	24-JUL-20	R5166457
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	24-JUL-20	24-JUL-20	R5166457
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	24-JUL-20	24-JUL-20	R5166457
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Copper (Cu)-Total	0.00389		0.00050	mg/L	24-JUL-20	24-JUL-20	R5166457
Iron (Fe)-Total	0.022		0.010	mg/L	24-JUL-20	24-JUL-20	R5166457
Lead (Pb)-Total	0.000268		0.000050	mg/L	24-JUL-20	24-JUL-20	R5166457
Lithium (Li)-Total	0.0039		0.0010	mg/L	24-JUL-20	24-JUL-20	R5166457
Magnesium (Mg)-Total	31.8		0.0050	mg/L	24-JUL-20	24-JUL-20	R5166457
Manganese (Mn)-Total	0.00764		0.00050	mg/L	24-JUL-20	24-JUL-20	R5166457
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		24-JUL-20	R5166423
Molybdenum (Mo)-Total	0.000632		0.000050	mg/L	24-JUL-20	24-JUL-20	R5166457
Nickel (Ni)-Total	0.00086		0.00050	mg/L	24-JUL-20	24-JUL-20	R5166457
Phosphorus (P)-Total	<0.050		0.050	mg/L	24-JUL-20	24-JUL-20	R5166457
Potassium (K)-Total	0.996		0.050	mg/L	24-JUL-20	24-JUL-20	R5166457
Rubidium (Rb)-Total	0.00021		0.00020	mg/L	24-JUL-20	24-JUL-20	R5166457
Selenium (Se)-Total	<0.000050		0.000050	mg/L	24-JUL-20	24-JUL-20	R5166457
Silicon (Si)-Total	9.29		0.10	mg/L	24-JUL-20	24-JUL-20	R5166457
Silver (Ag)-Total	<0.000050		0.000050	mg/L	24-JUL-20	24-JUL-20	R5166457
Sodium (Na)-Total	7.51		0.050	mg/L	24-JUL-20	24-JUL-20	R5166457
Strontium (Sr)-Total	0.146		0.0010	mg/L	24-JUL-20	24-JUL-20	R5166457
Sulfur (S)-Total	20.1		0.50	mg/L	24-JUL-20	24-JUL-20	R5166457
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	24-JUL-20	24-JUL-20	R5166457
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	24-JUL-20	24-JUL-20	R5166457
Thorium (Th)-Total	<0.00010		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Tin (Sn)-Total	<0.00010		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	24-JUL-20	24-JUL-20	R5166457
Tungsten (W)-Total	<0.00010		0.00010	mg/L	24-JUL-20	24-JUL-20	R5166457
Uranium (U)-Total	0.000296		0.000010	mg/L	24-JUL-20	24-JUL-20	R5166457
Vanadium (V)-Total	<0.00050		0.00050	mg/L	24-JUL-20	24-JUL-20	R5166457
Zinc (Zn)-Total	0.0050		0.0030	mg/L	24-JUL-20	24-JUL-20	R5166457

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2478867-1 W-11210029-20200723-18 Sampled By: CLIENT on 23-JUL-20 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	24-JUL-20	24-JUL-20	R5166457
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		24-JUL-20	R5167456
Volatile Organic Compounds							
Acetone	<30		30	ug/L		28-JUL-20	R5168118
Benzene	<0.50		0.50	ug/L		28-JUL-20	R5168118
Bromodichloromethane	<2.0		2.0	ug/L		28-JUL-20	R5168118
Bromoform	<5.0		5.0	ug/L		28-JUL-20	R5168118
Bromomethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
Carbon tetrachloride	<0.20		0.20	ug/L		28-JUL-20	R5168118
Chlorobenzene	<0.50		0.50	ug/L		28-JUL-20	R5168118
Dibromochloromethane	<2.0		2.0	ug/L		28-JUL-20	R5168118
Chloroform	<1.0		1.0	ug/L		28-JUL-20	R5168118
1,2-Dibromoethane	<0.20		0.20	ug/L		28-JUL-20	R5168118
1,2-Dichlorobenzene	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,3-Dichlorobenzene	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,4-Dichlorobenzene	<0.50		0.50	ug/L		28-JUL-20	R5168118
Dichlorodifluoromethane	<2.0		2.0	ug/L		28-JUL-20	R5168118
1,1-Dichloroethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,2-Dichloroethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,1-Dichloroethylene	<0.50		0.50	ug/L		28-JUL-20	R5168118
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		28-JUL-20	R5168118
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		28-JUL-20	R5168118
Methylene Chloride	<5.0		5.0	ug/L		28-JUL-20	R5168118
1,2-Dichloropropane	<0.50		0.50	ug/L		28-JUL-20	R5168118
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		28-JUL-20	R5168118
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		28-JUL-20	R5168118
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		28-JUL-20	R5168118
Ethylbenzene	<0.50		0.50	ug/L		28-JUL-20	R5168118
n-Hexane	<0.50		0.50	ug/L		28-JUL-20	R5168118
Methyl Ethyl Ketone	<20		20	ug/L		28-JUL-20	R5168118
Methyl Isobutyl Ketone	<20		20	ug/L		28-JUL-20	R5168118
MTBE	<2.0		2.0	ug/L		28-JUL-20	R5168118
Styrene	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
Tetrachloroethylene	<0.50		0.50	ug/L		28-JUL-20	R5168118
Toluene	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,1,1-Trichloroethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
1,1,2-Trichloroethane	<0.50		0.50	ug/L		28-JUL-20	R5168118
Trichloroethylene	<0.50		0.50	ug/L		28-JUL-20	R5168118

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2478867-1 W-11210029-20200723-18							
Sampled By: CLIENT on 23-JUL-20							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		28-JUL-20	R5168118
Vinyl chloride	<0.50		0.50	ug/L		28-JUL-20	R5168118
o-Xylene	<0.30		0.30	ug/L		28-JUL-20	R5168118
m+p-Xylenes	<0.40		0.40	ug/L		28-JUL-20	R5168118
Xylenes (Total)	<0.50		0.50	ug/L		28-JUL-20	
Surrogate: 4-Bromofluorobenzene	102.2		70-130	%		28-JUL-20	R5168118
Surrogate: 1,4-Difluorobenzene	101.0		70-130	%		28-JUL-20	R5168118
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		28-JUL-20	R5168118
F1-BTEX	<25		25	ug/L		30-JUL-20	
F2 (C10-C16)	<100		100	ug/L	24-JUL-20	26-JUL-20	R5167279
F2-Naphth	<100		100	ug/L		30-JUL-20	
F3 (C16-C34)	<250		250	ug/L	24-JUL-20	26-JUL-20	R5167279
F3-PAH	<250		250	ug/L		30-JUL-20	
F4 (C34-C50)	<250		250	ug/L	24-JUL-20	26-JUL-20	R5167279
Total Hydrocarbons (C6-C50)	<370		370	ug/L		30-JUL-20	
Chrom. to baseline at nC50	YES				24-JUL-20	26-JUL-20	R5167279
Surrogate: 2-Bromobenzotrifluoride	87.2		60-140	%	24-JUL-20	26-JUL-20	R5167279
Surrogate: 3,4-Dichlorotoluene	83.5		60-140	%		28-JUL-20	R5168118
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Acenaphthylene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Anthracene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Benzo(a)anthracene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Benzo(a)pyrene	<0.010		0.010	ug/L	24-JUL-20	28-JUL-20	R5168250
Benzo(b)fluoranthene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Benzo(k)fluoranthene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Chrysene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Fluoranthene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Fluorene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		30-JUL-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
2-Methylnaphthalene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Naphthalene	<0.050		0.050	ug/L	24-JUL-20	28-JUL-20	R5168250
Phenanthrene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Pyrene	<0.020		0.020	ug/L	24-JUL-20	28-JUL-20	R5168250
Surrogate: d10-Acenaphthene	95.4		60-140	%	24-JUL-20	28-JUL-20	R5168250
Surrogate: d12-Chrysene	90.9		60-140	%	24-JUL-20	28-JUL-20	R5168250

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2478867-1 W-11210029-20200723-18 Sampled By: CLIENT on 23-JUL-20 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	95.1		60-140	%	24-JUL-20	28-JUL-20	R5168250
Surrogate: d10-Phenanthrene	97.0		60-140	%	24-JUL-20	28-JUL-20	R5168250
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
4-Chloroaniline	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
2-Chlorophenol	<0.30		0.30	ug/L	28-JUL-20	30-JUL-20	R5171958
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4-Dichlorophenol	<0.30		0.30	ug/L	28-JUL-20	30-JUL-20	R5171958
Diethylphthalate	<0.20		0.20	ug/L	28-JUL-20	30-JUL-20	R5171958
Dimethylphthalate	<0.20		0.20	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4-Dimethylphenol	<0.50		0.50	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4-Dinitrophenol	<2.0	RRR	2.0	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4-Dinitrotoluene	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
2,6-Dinitrotoluene	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		30-JUL-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	28-JUL-20	30-JUL-20	R5171958
Pentachlorophenol	<0.50		0.50	ug/L	28-JUL-20	30-JUL-20	R5171958
Phenol	<0.50		0.50	ug/L	28-JUL-20	30-JUL-20	R5171958
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	28-JUL-20	30-JUL-20	R5171958
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	28-JUL-20	30-JUL-20	R5171958
Surrogate: 2-Fluorobiphenyl	77.3		50-140	%	28-JUL-20	30-JUL-20	R5171958
Surrogate: Nitrobenzene d5	93.3		50-140	%	28-JUL-20	30-JUL-20	R5171958
Surrogate: p-Terphenyl d14	93.2		60-140	%	28-JUL-20	30-JUL-20	R5171958
Surrogate: 2,4,6-Tribromophenol	95.3		50-140	%	28-JUL-20	30-JUL-20	R5171958
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	29-JUL-20	29-JUL-20	R5170783
Aroclor 1248	<0.020		0.020	ug/L	29-JUL-20	29-JUL-20	R5170783
Aroclor 1254	<0.020		0.020	ug/L	29-JUL-20	29-JUL-20	R5170783
Aroclor 1260	<0.020		0.020	ug/L	29-JUL-20	29-JUL-20	R5170783
Surrogate: Decachlorobiphenyl	101.1		50-150	%	29-JUL-20	29-JUL-20	R5170783
Total PCBs	<0.040		0.040	ug/L	29-JUL-20	29-JUL-20	R5170783
Surrogate: Tetrachloro-m-xylene	76.9		50-150	%	29-JUL-20	29-JUL-20	R5170783
Report Remarks : RRR: Detection limits raised due to suspected bias low results at or near the detection limit.							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Chromium, Hexavalent	MS-B	L2478867-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2478867-1
Matrix Spike	Boron (B)-Total	MS-B	L2478867-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2478867-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2478867-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2478867-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2478867-1
Matrix Spike	Potassium (K)-Total	MS-B	L2478867-1
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2478867-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2478867-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2478867-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2478867-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2478867-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)

Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

ALS Test Code	Matrix	Test Description	Method Reference**
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

ALS Test Code	Matrix	Test Description	Method Reference**
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

ALS Test Code	Matrix	Test Description	Method Reference**
F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS

Reference Information

Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Reference Information

Laboratory Definition Code	Laboratory Location
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WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
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Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2478867

Report Date: 05-AUG-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5171958							
WG3371588-2 LCS								
1,2,4-Trichlorobenzene			60.5		%		50-140	30-JUL-20
2-Chlorophenol			77.0		%		50-140	30-JUL-20
2,4-Dichlorophenol			88.2		%		50-140	30-JUL-20
2,4-Dimethylphenol			76.2		%		30-130	30-JUL-20
2,4-Dinitrophenol			77.4		%		50-140	30-JUL-20
2,4-Dinitrotoluene			129.2		%		50-140	30-JUL-20
2,4,5-Trichlorophenol			94.1		%		50-140	30-JUL-20
2,4,6-Trichlorophenol			93.4		%		50-140	30-JUL-20
2,6-Dinitrotoluene			104.1		%		50-140	30-JUL-20
3,3'-Dichlorobenzidine			42.8		%		30-130	30-JUL-20
4-Chloroaniline			66.1		%		30-130	30-JUL-20
Biphenyl			78.3		%		50-140	30-JUL-20
Bis(2-chloroethyl)ether			91.1		%		50-140	30-JUL-20
Bis(2-chloroisopropyl)ether			84.9		%		50-140	30-JUL-20
Bis(2-ethylhexyl)phthalate			102.5		%		50-140	30-JUL-20
Diethylphthalate			93.0		%		50-140	30-JUL-20
Dimethylphthalate			90.5		%		50-140	30-JUL-20
Pentachlorophenol			101.9		%		50-140	30-JUL-20
Phenol			109.9		%		30-130	30-JUL-20
WG3371588-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	30-JUL-20
2-Chlorophenol			<0.30		ug/L		0.3	30-JUL-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	30-JUL-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	30-JUL-20
2,4-Dinitrophenol			<1.0		ug/L		1	30-JUL-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	30-JUL-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	30-JUL-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	30-JUL-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	30-JUL-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	30-JUL-20
4-Chloroaniline			<0.40		ug/L		0.4	30-JUL-20
Biphenyl			<0.40		ug/L		0.4	30-JUL-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	30-JUL-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	30-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT		Water						
Batch R5171958								
WG3371588-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	30-JUL-20
Diethylphthalate			<0.20		ug/L		0.2	30-JUL-20
Dimethylphthalate			<0.20		ug/L		0.2	30-JUL-20
Pentachlorophenol			<0.50		ug/L		0.5	30-JUL-20
Phenol			<0.50		ug/L		0.5	30-JUL-20
Surrogate: 2-Fluorobiphenyl			69.8		%		50-140	30-JUL-20
Surrogate: 2,4,6-Tribromophenol			44.5	MBS	%		50-140	30-JUL-20
Surrogate: Nitrobenzene d5			68.9		%		50-140	30-JUL-20
Surrogate: p-Terphenyl d14			110.0		%		60-140	30-JUL-20
CR-CR6-IC-WT		Water						
Batch R5167456								
WG3369681-4 DUP		WG3369681-3						
Chromium, Hexavalent		0.0593	0.0589		mg/L	0.7	20	24-JUL-20
WG3369681-2 LCS								
Chromium, Hexavalent			101.4		%		80-120	24-JUL-20
WG3369681-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	24-JUL-20
WG3369681-5 MS		WG3369681-3						
Chromium, Hexavalent			N/A	MS-B	%		-	24-JUL-20
F1-HS-511-WT		Water						
Batch R5168118								
WG3365814-4 DUP		WG3365814-3						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	28-JUL-20
WG3365814-1 LCS								
F1 (C6-C10)			115.0		%		80-120	28-JUL-20
WG3365814-2 MB								
F1 (C6-C10)			<25		ug/L		25	28-JUL-20
Surrogate: 3,4-Dichlorotoluene			97.3		%		60-140	28-JUL-20
WG3365814-5 MS		WG3365814-3						
F1 (C6-C10)			95.6		%		60-140	28-JUL-20
F2-F4-511-WT		Water						
Batch R5167279								
WG3369454-2 LCS								
F2 (C10-C16)			98.8		%		70-130	26-JUL-20
F3 (C16-C34)			102.7		%		70-130	26-JUL-20



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Client: GHD Limited (Waterloo)
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 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch	R5167279							
WG3369454-2	LCS							
F4 (C34-C50)			99.7		%		70-130	26-JUL-20
WG3369454-1	MB							
F2 (C10-C16)			<100		ug/L		100	26-JUL-20
F3 (C16-C34)			<250		ug/L		250	26-JUL-20
F4 (C34-C50)			<250		ug/L		250	26-JUL-20
Surrogate: 2-Bromobenzotrifluoride			86.0		%		60-140	26-JUL-20
HG-T-CVAA-WT		Water						
Batch	R5166423							
WG3369545-4	DUP	WG3369545-3						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	24-JUL-20
WG3369545-2	LCS							
Mercury (Hg)-Total			112.0		%		80-120	24-JUL-20
WG3369545-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	24-JUL-20
WG3369545-6	MS	WG3369545-5						
Mercury (Hg)-Total			96.1		%		70-130	24-JUL-20
MET-T-CCMS-WT		Water						
Batch	R5166457							
WG3369388-4	DUP	WG3369388-3						
Aluminum (Al)-Total		0.0064	0.0058		mg/L	10	20	24-JUL-20
Antimony (Sb)-Total		0.00048	0.00048		mg/L	0.3	20	24-JUL-20
Arsenic (As)-Total		0.00078	0.00077		mg/L	0.7	20	24-JUL-20
Barium (Ba)-Total		0.130	0.126		mg/L	3.3	20	24-JUL-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-JUL-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-JUL-20
Boron (B)-Total		0.076	0.076		mg/L	0.0	20	24-JUL-20
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	24-JUL-20
Calcium (Ca)-Total		51.7	50.8		mg/L	1.7	20	24-JUL-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	24-JUL-20
Cesium (Cs)-Total		0.000195	0.000186		mg/L	4.5	20	24-JUL-20
Cobalt (Co)-Total		0.00044	0.00044		mg/L	1.4	20	24-JUL-20
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	24-JUL-20
Iron (Fe)-Total		0.108	0.106		mg/L	2.0	20	24-JUL-20
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5166457							
WG3369388-4	DUP	WG3369388-3						
Lithium (Li)-Total		0.0078	0.0075		mg/L	3.7	20	24-JUL-20
Magnesium (Mg)-Total		15.5	15.2		mg/L	2.3	20	24-JUL-20
Manganese (Mn)-Total		0.0317	0.0307		mg/L	3.3	20	24-JUL-20
Molybdenum (Mo)-Total		0.00589	0.00575		mg/L	2.3	20	24-JUL-20
Nickel (Ni)-Total		0.00249	0.00247		mg/L	0.8	20	24-JUL-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	24-JUL-20
Potassium (K)-Total		4.87	4.84		mg/L	0.7	20	24-JUL-20
Rubidium (Rb)-Total		0.00827	0.00810		mg/L	2.0	20	24-JUL-20
Selenium (Se)-Total		0.000139	0.000150		mg/L	7.7	20	24-JUL-20
Silicon (Si)-Total		1.88	1.86		mg/L	1.1	20	24-JUL-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-JUL-20
Sodium (Na)-Total		63.1	63.2		mg/L	0.2	20	24-JUL-20
Strontium (Sr)-Total		0.429	0.424		mg/L	1.1	20	24-JUL-20
Sulfur (S)-Total		29.8	29.5		mg/L	0.7	25	24-JUL-20
Thallium (Tl)-Total		0.000025	0.000026		mg/L	5.6	20	24-JUL-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	24-JUL-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	24-JUL-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-JUL-20
Titanium (Ti)-Total		0.00031	<0.00030	RPD-NA	mg/L	N/A	20	24-JUL-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-JUL-20
Uranium (U)-Total		0.000025	0.000025		mg/L	0.8	20	24-JUL-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	24-JUL-20
Zinc (Zn)-Total		0.0031	<0.0030	RPD-NA	mg/L	N/A	20	24-JUL-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	24-JUL-20
WG3369388-2	LCS							
Aluminum (Al)-Total			105.5		%		80-120	24-JUL-20
Antimony (Sb)-Total			104.5		%		80-120	24-JUL-20
Arsenic (As)-Total			101.2		%		80-120	24-JUL-20
Barium (Ba)-Total			100.4		%		80-120	24-JUL-20
Beryllium (Be)-Total			103.6		%		80-120	24-JUL-20
Bismuth (Bi)-Total			99.6		%		80-120	24-JUL-20
Boron (B)-Total			100.9		%		80-120	24-JUL-20
Cadmium (Cd)-Total			101.6		%		80-120	24-JUL-20



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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5166457							
WG3369388-2	LCS							
Calcium (Ca)-Total			99.2		%		80-120	24-JUL-20
Chromium (Cr)-Total			100.2		%		80-120	24-JUL-20
Cesium (Cs)-Total			100.7		%		80-120	24-JUL-20
Cobalt (Co)-Total			99.5		%		80-120	24-JUL-20
Copper (Cu)-Total			99.5		%		80-120	24-JUL-20
Iron (Fe)-Total			100.3		%		80-120	24-JUL-20
Lead (Pb)-Total			100.4		%		80-120	24-JUL-20
Lithium (Li)-Total			103.5		%		80-120	24-JUL-20
Magnesium (Mg)-Total			105.3		%		80-120	24-JUL-20
Manganese (Mn)-Total			99.4		%		80-120	24-JUL-20
Molybdenum (Mo)-Total			101.2		%		80-120	24-JUL-20
Nickel (Ni)-Total			99.0		%		80-120	24-JUL-20
Phosphorus (P)-Total			105.4		%		70-130	24-JUL-20
Potassium (K)-Total			98.7		%		80-120	24-JUL-20
Rubidium (Rb)-Total			101.6		%		80-120	24-JUL-20
Selenium (Se)-Total			102.4		%		80-120	24-JUL-20
Silicon (Si)-Total			100.4		%		60-140	24-JUL-20
Silver (Ag)-Total			99.0		%		80-120	24-JUL-20
Sodium (Na)-Total			102.9		%		80-120	24-JUL-20
Strontium (Sr)-Total			101.2		%		80-120	24-JUL-20
Sulfur (S)-Total			104.4		%		80-120	24-JUL-20
Thallium (Tl)-Total			100.1		%		80-120	24-JUL-20
Tellurium (Te)-Total			102.2		%		80-120	24-JUL-20
Thorium (Th)-Total			102.4		%		70-130	24-JUL-20
Tin (Sn)-Total			100.4		%		80-120	24-JUL-20
Titanium (Ti)-Total			98.1		%		80-120	24-JUL-20
Tungsten (W)-Total			96.0		%		80-120	24-JUL-20
Uranium (U)-Total			102.4		%		80-120	24-JUL-20
Vanadium (V)-Total			100.5		%		80-120	24-JUL-20
Zinc (Zn)-Total			97.6		%		80-120	24-JUL-20
Zirconium (Zr)-Total			102.1		%		80-120	24-JUL-20
WG3369388-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	24-JUL-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	24-JUL-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5166457							
WG3369388-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	24-JUL-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	24-JUL-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	24-JUL-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	24-JUL-20
Boron (B)-Total			<0.010		mg/L		0.01	24-JUL-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	24-JUL-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	24-JUL-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	24-JUL-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	24-JUL-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	24-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	24-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	24-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	24-JUL-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	24-JUL-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	24-JUL-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	24-JUL-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	24-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	24-JUL-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	24-JUL-20
Potassium (K)-Total			<0.050		mg/L		0.05	24-JUL-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	24-JUL-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	24-JUL-20
Silicon (Si)-Total			<0.10		mg/L		0.1	24-JUL-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	24-JUL-20
Sodium (Na)-Total			<0.050		mg/L		0.05	24-JUL-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	24-JUL-20
Sulfur (S)-Total			<0.50		mg/L		0.5	24-JUL-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	24-JUL-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	24-JUL-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	24-JUL-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	24-JUL-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	24-JUL-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	24-JUL-20



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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5166457							
WG3369388-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	24-JUL-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	24-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	24-JUL-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	24-JUL-20
WG3369388-5 MS		WG3369388-6						
Aluminum (Al)-Total			103.9		%		70-130	24-JUL-20
Antimony (Sb)-Total			104.3		%		70-130	24-JUL-20
Arsenic (As)-Total			103.0		%		70-130	24-JUL-20
Barium (Ba)-Total			N/A	MS-B	%		-	24-JUL-20
Beryllium (Be)-Total			102.1		%		70-130	24-JUL-20
Bismuth (Bi)-Total			90.1		%		70-130	24-JUL-20
Boron (B)-Total			N/A	MS-B	%		-	24-JUL-20
Cadmium (Cd)-Total			97.0		%		70-130	24-JUL-20
Calcium (Ca)-Total			N/A	MS-B	%		-	24-JUL-20
Chromium (Cr)-Total			101.5		%		70-130	24-JUL-20
Cesium (Cs)-Total			101.8		%		70-130	24-JUL-20
Cobalt (Co)-Total			98.7		%		70-130	24-JUL-20
Copper (Cu)-Total			95.0		%		70-130	24-JUL-20
Iron (Fe)-Total			N/A	MS-B	%		-	24-JUL-20
Lead (Pb)-Total			92.7		%		70-130	24-JUL-20
Lithium (Li)-Total			98.9		%		70-130	24-JUL-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	24-JUL-20
Manganese (Mn)-Total			N/A	MS-B	%		-	24-JUL-20
Molybdenum (Mo)-Total			103.1		%		70-130	24-JUL-20
Nickel (Ni)-Total			95.9		%		70-130	24-JUL-20
Phosphorus (P)-Total			116.9		%		70-130	24-JUL-20
Potassium (K)-Total			N/A	MS-B	%		-	24-JUL-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	24-JUL-20
Selenium (Se)-Total			101.7		%		70-130	24-JUL-20
Silicon (Si)-Total			N/A	MS-B	%		-	24-JUL-20
Silver (Ag)-Total			92.7		%		70-130	24-JUL-20
Sodium (Na)-Total			N/A	MS-B	%		-	24-JUL-20
Strontium (Sr)-Total			N/A	MS-B	%		-	24-JUL-20
Sulfur (S)-Total			N/A	MS-B	%		-	24-JUL-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5166457							
WG3369388-5 MS		WG3369388-6						
Thallium (Tl)-Total			93.1		%		70-130	24-JUL-20
Tellurium (Te)-Total			95.3		%		70-130	24-JUL-20
Thorium (Th)-Total			98.4		%		70-130	24-JUL-20
Tin (Sn)-Total			100.4		%		70-130	24-JUL-20
Titanium (Ti)-Total			103.0		%		70-130	24-JUL-20
Tungsten (W)-Total			95.8		%		70-130	24-JUL-20
Uranium (U)-Total			98.8		%		70-130	24-JUL-20
Vanadium (V)-Total			105.2		%		70-130	24-JUL-20
Zinc (Zn)-Total			91.7		%		70-130	24-JUL-20
Zirconium (Zr)-Total			98.1		%		70-130	24-JUL-20
P-T-COL-WT								
	Water							
Batch	R5167529							
WG3369319-3 DUP		L2478438-1						
Phosphorus, Total		0.0963	0.0909		mg/L	5.8	20	27-JUL-20
WG3369319-2 LCS								
Phosphorus, Total			95.7		%		80-120	27-JUL-20
WG3369319-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	27-JUL-20
WG3369319-4 MS		L2478438-1						
Phosphorus, Total			71.2		%		70-130	27-JUL-20
PAH-511-WT								
	Water							
Batch	R5168250							
WG3369454-2 LCS								
1-Methylnaphthalene			91.7		%		50-140	28-JUL-20
2-Methylnaphthalene			89.1		%		50-140	28-JUL-20
Acenaphthene			103.7		%		50-140	28-JUL-20
Acenaphthylene			101.0		%		50-140	28-JUL-20
Anthracene			108.4		%		50-140	28-JUL-20
Benzo(a)anthracene			125.5		%		50-140	28-JUL-20
Benzo(a)pyrene			107.7		%		50-140	28-JUL-20
Benzo(b)fluoranthene			101.5		%		50-140	28-JUL-20
Benzo(g,h,i)perylene			109.1		%		50-140	28-JUL-20
Benzo(k)fluoranthene			103.4		%		50-140	28-JUL-20
Chrysene			120.2		%		50-140	28-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5168250							
WG3369454-2	LCS							
Dibenzo(ah)anthracene			111.3		%		50-140	28-JUL-20
Fluoranthene			109.4		%		50-140	28-JUL-20
Fluorene			104.9		%		50-140	28-JUL-20
Indeno(1,2,3-cd)pyrene			121.6		%		50-140	28-JUL-20
Naphthalene			93.1		%		50-140	28-JUL-20
Phenanthrene			113.4		%		50-140	28-JUL-20
Pyrene			113.1		%		50-140	28-JUL-20
WG3369454-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	28-JUL-20
2-Methylnaphthalene			<0.020		ug/L		0.02	28-JUL-20
Acenaphthene			<0.020		ug/L		0.02	28-JUL-20
Acenaphthylene			<0.020		ug/L		0.02	28-JUL-20
Anthracene			<0.020		ug/L		0.02	28-JUL-20
Benzo(a)anthracene			<0.020		ug/L		0.02	28-JUL-20
Benzo(a)pyrene			<0.010		ug/L		0.01	28-JUL-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	28-JUL-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	28-JUL-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	28-JUL-20
Chrysene			<0.020		ug/L		0.02	28-JUL-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	28-JUL-20
Fluoranthene			<0.020		ug/L		0.02	28-JUL-20
Fluorene			<0.020		ug/L		0.02	28-JUL-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	28-JUL-20
Naphthalene			<0.050		ug/L		0.05	28-JUL-20
Phenanthrene			<0.020		ug/L		0.02	28-JUL-20
Pyrene			<0.020		ug/L		0.02	28-JUL-20
Surrogate: d8-Naphthalene			92.7		%		60-140	28-JUL-20
Surrogate: d10-Phenanthrene			99.2		%		60-140	28-JUL-20
Surrogate: d12-Chrysene			98.3		%		60-140	28-JUL-20
Surrogate: d10-Acenaphthene			97.3		%		60-140	28-JUL-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5170783							
WG3369703-2	LCS							
Aroclor 1242			122.1		%		60-140	29-JUL-20
Aroclor 1248			132.6		%		60-140	29-JUL-20
Aroclor 1254			120.0		%		60-140	29-JUL-20
Aroclor 1260			117.2		%		60-140	29-JUL-20
WG3369703-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	29-JUL-20
Aroclor 1248			<0.020		ug/L		0.02	29-JUL-20
Aroclor 1254			<0.020		ug/L		0.02	29-JUL-20
Aroclor 1260			<0.020		ug/L		0.02	29-JUL-20
Surrogate: Decachlorobiphenyl			141.7		%		50-150	29-JUL-20
Surrogate: Tetrachloro-m-xylene			76.0		%		50-150	29-JUL-20
VOC-511-HS-WT		Water						
Batch	R5168118							
WG3365814-4	DUP	WG3365814-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	28-JUL-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	28-JUL-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-JUL-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	28-JUL-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	28-JUL-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5168118							
WG3365814-4	DUP	WG3365814-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	28-JUL-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-JUL-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-JUL-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-JUL-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	28-JUL-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	28-JUL-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	28-JUL-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	28-JUL-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-JUL-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-JUL-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-JUL-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	28-JUL-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-JUL-20
WG3365814-1	LCS							
1,1,1,2-Tetrachloroethane			98.6		%		70-130	28-JUL-20
1,1,2,2-Tetrachloroethane			102.9		%		70-130	28-JUL-20
1,1,1-Trichloroethane			103.1		%		70-130	28-JUL-20
1,1,2-Trichloroethane			100.5		%		70-130	28-JUL-20
1,1-Dichloroethane			102.2		%		70-130	28-JUL-20
1,1-Dichloroethylene			94.0		%		70-130	28-JUL-20
1,2-Dibromoethane			100.2		%		70-130	28-JUL-20
1,2-Dichlorobenzene			99.3		%		70-130	28-JUL-20
1,2-Dichloroethane			101.0		%		70-130	28-JUL-20
1,2-Dichloropropane			100.2		%		70-130	28-JUL-20
1,3-Dichlorobenzene			99.9		%		70-130	28-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5168118							
WG3365814-1	LCS							
1,4-Dichlorobenzene			100.1		%		70-130	28-JUL-20
Acetone			108.9		%		60-140	28-JUL-20
Benzene			100.7		%		70-130	28-JUL-20
Bromodichloromethane			109.6		%		70-130	28-JUL-20
Bromoform			102.4		%		70-130	28-JUL-20
Bromomethane			119.0		%		60-140	28-JUL-20
Carbon tetrachloride			103.8		%		70-130	28-JUL-20
Chlorobenzene			101.5		%		70-130	28-JUL-20
Chloroform			104.8		%		70-130	28-JUL-20
cis-1,2-Dichloroethylene			98.0		%		70-130	28-JUL-20
cis-1,3-Dichloropropene			95.5		%		70-130	28-JUL-20
Dibromochloromethane			100.5		%		70-130	28-JUL-20
Dichlorodifluoromethane			76.3		%		50-140	28-JUL-20
Ethylbenzene			100.4		%		70-130	28-JUL-20
n-Hexane			96.1		%		70-130	28-JUL-20
m+p-Xylenes			99.8		%		70-130	28-JUL-20
Methyl Ethyl Ketone			94.6		%		60-140	28-JUL-20
Methyl Isobutyl Ketone			100.5		%		60-140	28-JUL-20
Methylene Chloride			96.2		%		70-130	28-JUL-20
MTBE			98.6		%		70-130	28-JUL-20
o-Xylene			106.8		%		70-130	28-JUL-20
Styrene			98.8		%		70-130	28-JUL-20
Tetrachloroethylene			104.6		%		70-130	28-JUL-20
Toluene			100.3		%		70-130	28-JUL-20
trans-1,2-Dichloroethylene			98.1		%		70-130	28-JUL-20
trans-1,3-Dichloropropene			102.0		%		70-130	28-JUL-20
Trichloroethylene			103.8		%		70-130	28-JUL-20
Trichlorofluoromethane			93.8		%		60-140	28-JUL-20
Vinyl chloride			97.1		%		60-140	28-JUL-20
WG3365814-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	28-JUL-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	28-JUL-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	28-JUL-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	28-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5168118							
WG3365814-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	28-JUL-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	28-JUL-20
1,2-Dibromoethane			<0.20		ug/L		0.2	28-JUL-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	28-JUL-20
1,2-Dichloroethane			<0.50		ug/L		0.5	28-JUL-20
1,2-Dichloropropane			<0.50		ug/L		0.5	28-JUL-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	28-JUL-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	28-JUL-20
Acetone			<30		ug/L		30	28-JUL-20
Benzene			<0.50		ug/L		0.5	28-JUL-20
Bromodichloromethane			<2.0		ug/L		2	28-JUL-20
Bromoform			<5.0		ug/L		5	28-JUL-20
Bromomethane			<0.50		ug/L		0.5	28-JUL-20
Carbon tetrachloride			<0.20		ug/L		0.2	28-JUL-20
Chlorobenzene			<0.50		ug/L		0.5	28-JUL-20
Chloroform			<1.0		ug/L		1	28-JUL-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	28-JUL-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	28-JUL-20
Dibromochloromethane			<2.0		ug/L		2	28-JUL-20
Dichlorodifluoromethane			<2.0		ug/L		2	28-JUL-20
Ethylbenzene			<0.50		ug/L		0.5	28-JUL-20
n-Hexane			<0.50		ug/L		0.5	28-JUL-20
m+p-Xylenes			<0.40		ug/L		0.4	28-JUL-20
Methyl Ethyl Ketone			<20		ug/L		20	28-JUL-20
Methyl Isobutyl Ketone			<20		ug/L		20	28-JUL-20
Methylene Chloride			<5.0		ug/L		5	28-JUL-20
MTBE			<2.0		ug/L		2	28-JUL-20
o-Xylene			<0.30		ug/L		0.3	28-JUL-20
Styrene			<0.50		ug/L		0.5	28-JUL-20
Tetrachloroethylene			<0.50		ug/L		0.5	28-JUL-20
Toluene			<0.50		ug/L		0.5	28-JUL-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	28-JUL-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	28-JUL-20



Environmental

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5168118							
WG3365814-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	28-JUL-20
Trichlorofluoromethane			<5.0		ug/L		5	28-JUL-20
Vinyl chloride			<0.50		ug/L		0.5	28-JUL-20
Surrogate: 1,4-Difluorobenzene			100.7		%		70-130	28-JUL-20
Surrogate: 4-Bromofluorobenzene			100.0		%		70-130	28-JUL-20
WG3365814-5 MS		WG3365814-3						
1,1,1,2-Tetrachloroethane			98.2		%		50-140	28-JUL-20
1,1,2,2-Tetrachloroethane			115.3		%		50-140	28-JUL-20
1,1,1-Trichloroethane			102.3		%		50-140	28-JUL-20
1,1,2-Trichloroethane			99.7		%		50-140	28-JUL-20
1,1-Dichloroethane			100.6		%		50-140	28-JUL-20
1,1-Dichloroethylene			91.5		%		50-140	28-JUL-20
1,2-Dibromoethane			100.3		%		50-140	28-JUL-20
1,2-Dichlorobenzene			99.6		%		50-140	28-JUL-20
1,2-Dichloroethane			102.5		%		50-140	28-JUL-20
1,2-Dichloropropane			99.6		%		50-140	28-JUL-20
1,3-Dichlorobenzene			100.3		%		50-140	28-JUL-20
1,4-Dichlorobenzene			100.9		%		50-140	28-JUL-20
Acetone			106.8		%		50-140	28-JUL-20
Benzene			99.7		%		50-140	28-JUL-20
Bromodichloromethane			109.9		%		50-140	28-JUL-20
Bromoform			103.3		%		50-140	28-JUL-20
Bromomethane			116.0		%		50-140	28-JUL-20
Carbon tetrachloride			103.4		%		50-140	28-JUL-20
Chlorobenzene			101.4		%		50-140	28-JUL-20
Chloroform			104.7		%		50-140	28-JUL-20
cis-1,2-Dichloroethylene			98.5		%		50-140	28-JUL-20
cis-1,3-Dichloropropene			99.97		%		50-140	28-JUL-20
Dibromochloromethane			100.4		%		50-140	28-JUL-20
Dichlorodifluoromethane			70.3		%		50-140	28-JUL-20
Ethylbenzene			99.3		%		50-140	28-JUL-20
n-Hexane			91.4		%		50-140	28-JUL-20
m+p-Xylenes			99.5		%		50-140	28-JUL-20
Methyl Ethyl Ketone			97.8		%		50-140	28-JUL-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5168118							
WG3365814-5 MS		WG3365814-3						
Methyl Isobutyl Ketone			99.8		%		50-140	28-JUL-20
Methylene Chloride			95.9		%		50-140	28-JUL-20
MTBE			98.4		%		50-140	28-JUL-20
o-Xylene			106.1		%		50-140	28-JUL-20
Styrene			98.4		%		50-140	28-JUL-20
Tetrachloroethylene			104.8		%		50-140	28-JUL-20
Toluene			98.4		%		50-140	28-JUL-20
trans-1,2-Dichloroethylene			97.1		%		50-140	28-JUL-20
trans-1,3-Dichloropropene			107.4		%		50-140	28-JUL-20
Trichloroethylene			104.2		%		50-140	28-JUL-20
Trichlorofluoromethane			92.3		%		50-140	28-JUL-20
Vinyl chloride			93.4		%		50-140	28-JUL-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MBS	Surrogate recovery in Method Blank was outside ALS DQO. Moderately low-biased results in the MB do not significantly affect its purpose.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

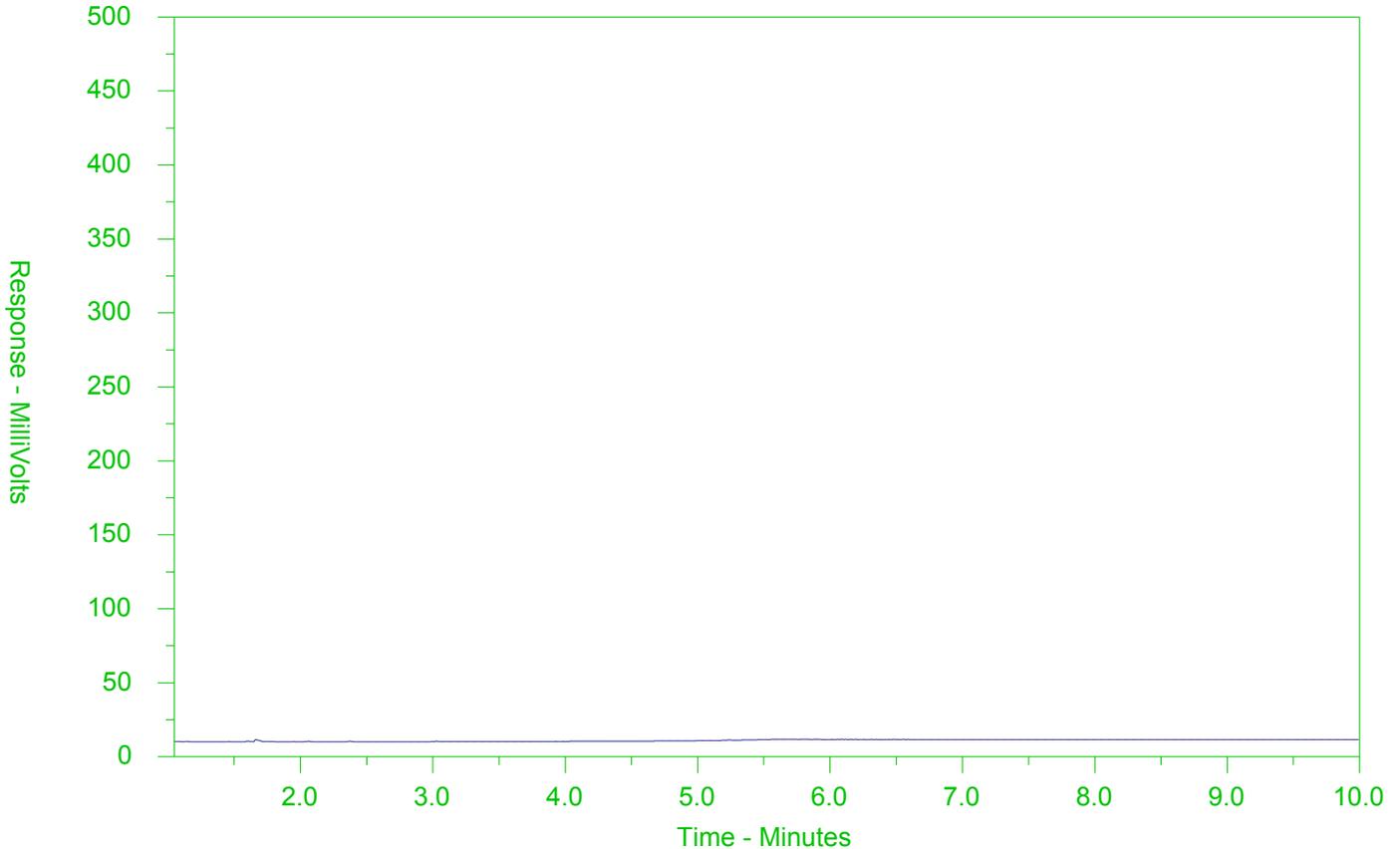
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2478867-1
 Client Sample ID: W-11210029-20200723-18



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 14-AUG-20
Report Date: 25-AUG-20 07:18 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2488954

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2488954-1 W-11210029-20200813-24 Sampled By: CLIENT on 13-AUG-20 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0082		0.0030	mg/L	17-AUG-20	18-AUG-20	R5190740
Total Metals							
Aluminum (Al)-Total	0.0192		0.0050	mg/L	17-AUG-20	18-AUG-20	R5190768
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Arsenic (As)-Total	0.00364		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Barium (Ba)-Total	0.0779		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	17-AUG-20	18-AUG-20	R5190768
Boron (B)-Total	0.014		0.010	mg/L	17-AUG-20	18-AUG-20	R5190768
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	17-AUG-20	18-AUG-20	R5190768
Calcium (Ca)-Total	48.5		0.050	mg/L	17-AUG-20	18-AUG-20	R5190768
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	17-AUG-20	18-AUG-20	R5190768
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	17-AUG-20	18-AUG-20	R5190768
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Copper (Cu)-Total	<0.00050		0.00050	mg/L	17-AUG-20	18-AUG-20	R5190768
Iron (Fe)-Total	0.244		0.010	mg/L	17-AUG-20	18-AUG-20	R5190768
Lead (Pb)-Total	0.000083		0.000050	mg/L	17-AUG-20	18-AUG-20	R5190768
Lithium (Li)-Total	0.0032		0.0010	mg/L	17-AUG-20	18-AUG-20	R5190768
Magnesium (Mg)-Total	25.6		0.0050	mg/L	17-AUG-20	18-AUG-20	R5190768
Manganese (Mn)-Total	0.00813		0.00050	mg/L	17-AUG-20	18-AUG-20	R5190768
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		17-AUG-20	R5190209
Molybdenum (Mo)-Total	0.000655		0.000050	mg/L	17-AUG-20	18-AUG-20	R5190768
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	17-AUG-20	18-AUG-20	R5190768
Phosphorus (P)-Total	<0.050		0.050	mg/L	17-AUG-20	18-AUG-20	R5190768
Potassium (K)-Total	0.979		0.050	mg/L	17-AUG-20	18-AUG-20	R5190768
Rubidium (Rb)-Total	0.00035		0.00020	mg/L	17-AUG-20	18-AUG-20	R5190768
Selenium (Se)-Total	<0.000050		0.000050	mg/L	17-AUG-20	18-AUG-20	R5190768
Silicon (Si)-Total	7.30		0.10	mg/L	17-AUG-20	18-AUG-20	R5190768
Silver (Ag)-Total	<0.000050		0.000050	mg/L	17-AUG-20	18-AUG-20	R5190768
Sodium (Na)-Total	5.75		0.050	mg/L	17-AUG-20	18-AUG-20	R5190768
Strontium (Sr)-Total	0.348		0.0010	mg/L	17-AUG-20	18-AUG-20	R5190768
Sulfur (S)-Total	7.71		0.50	mg/L	17-AUG-20	18-AUG-20	R5190768
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	17-AUG-20	18-AUG-20	R5190768
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	17-AUG-20	18-AUG-20	R5190768
Thorium (Th)-Total	<0.00010		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Tin (Sn)-Total	<0.00010		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Titanium (Ti)-Total	0.00062		0.00030	mg/L	17-AUG-20	18-AUG-20	R5190768
Tungsten (W)-Total	<0.00010		0.00010	mg/L	17-AUG-20	18-AUG-20	R5190768
Uranium (U)-Total	0.000383		0.000010	mg/L	17-AUG-20	18-AUG-20	R5190768
Vanadium (V)-Total	<0.00050		0.00050	mg/L	17-AUG-20	18-AUG-20	R5190768
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	17-AUG-20	18-AUG-20	R5190768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2488954-1 W-11210029-20200813-24 Sampled By: CLIENT on 13-AUG-20 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	17-AUG-20	18-AUG-20	R5190768
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		17-AUG-20	R5190555
Volatile Organic Compounds							
Acetone	<30		30	ug/L		20-AUG-20	R5192095
Benzene	<0.50		0.50	ug/L		20-AUG-20	R5192095
Bromodichloromethane	<2.0		2.0	ug/L		20-AUG-20	R5192095
Bromoform	<5.0		5.0	ug/L		20-AUG-20	R5192095
Bromomethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
Carbon tetrachloride	<0.20		0.20	ug/L		20-AUG-20	R5192095
Chlorobenzene	<0.50		0.50	ug/L		20-AUG-20	R5192095
Dibromochloromethane	<2.0		2.0	ug/L		20-AUG-20	R5192095
Chloroform	<1.0		1.0	ug/L		20-AUG-20	R5192095
1,2-Dibromoethane	<0.20		0.20	ug/L		20-AUG-20	R5192095
1,2-Dichlorobenzene	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,3-Dichlorobenzene	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,4-Dichlorobenzene	<0.50		0.50	ug/L		20-AUG-20	R5192095
Dichlorodifluoromethane	<2.0		2.0	ug/L		20-AUG-20	R5192095
1,1-Dichloroethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,2-Dichloroethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,1-Dichloroethylene	<0.50		0.50	ug/L		20-AUG-20	R5192095
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		20-AUG-20	R5192095
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		20-AUG-20	R5192095
Methylene Chloride	<5.0		5.0	ug/L		20-AUG-20	R5192095
1,2-Dichloropropane	<0.50		0.50	ug/L		20-AUG-20	R5192095
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		20-AUG-20	R5192095
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		20-AUG-20	R5192095
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		20-AUG-20	R5192095
Ethylbenzene	<0.50		0.50	ug/L		20-AUG-20	R5192095
n-Hexane	<0.50		0.50	ug/L		20-AUG-20	R5192095
Methyl Ethyl Ketone	<20		20	ug/L		20-AUG-20	R5192095
Methyl Isobutyl Ketone	<20		20	ug/L		20-AUG-20	R5192095
MTBE	<2.0		2.0	ug/L		20-AUG-20	R5192095
Styrene	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
Tetrachloroethylene	<0.50		0.50	ug/L		20-AUG-20	R5192095
Toluene	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,1,1-Trichloroethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
1,1,2-Trichloroethane	<0.50		0.50	ug/L		20-AUG-20	R5192095
Trichloroethylene	<0.50		0.50	ug/L		20-AUG-20	R5192095

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2488954-1 W-11210029-20200813-24							
Sampled By: CLIENT on 13-AUG-20							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		20-AUG-20	R5192095
Vinyl chloride	<0.50		0.50	ug/L		20-AUG-20	R5192095
o-Xylene	<0.30		0.30	ug/L		20-AUG-20	R5192095
m+p-Xylenes	<0.40		0.40	ug/L		20-AUG-20	R5192095
Xylenes (Total)	<0.50		0.50	ug/L		20-AUG-20	
Surrogate: 4-Bromofluorobenzene	97.6		70-130	%		20-AUG-20	R5192095
Surrogate: 1,4-Difluorobenzene	101.3		70-130	%		20-AUG-20	R5192095
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		20-AUG-20	R5192095
F1-BTEX	<25		25	ug/L		25-AUG-20	
F2 (C10-C16)	<100		100	ug/L	17-AUG-20	18-AUG-20	R5191073
F2-Naphth	<100		100	ug/L		25-AUG-20	
F3 (C16-C34)	<250		250	ug/L	17-AUG-20	18-AUG-20	R5191073
F3-PAH	<250		250	ug/L		25-AUG-20	
F4 (C34-C50)	<250		250	ug/L	17-AUG-20	18-AUG-20	R5191073
Total Hydrocarbons (C6-C50)	<370		370	ug/L		25-AUG-20	
Chrom. to baseline at nC50	YES				17-AUG-20	18-AUG-20	R5191073
Surrogate: 2-Bromobenzotrifluoride	91.6		60-140	%	17-AUG-20	18-AUG-20	R5191073
Surrogate: 3,4-Dichlorotoluene	84.3		60-140	%		20-AUG-20	R5192095
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Acenaphthylene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Anthracene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Benzo(a)anthracene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Benzo(a)pyrene	<0.010		0.010	ug/L	17-AUG-20	19-AUG-20	R5191755
Benzo(b)fluoranthene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Benzo(k)fluoranthene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Chrysene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Fluoranthene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Fluorene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		25-AUG-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
2-Methylnaphthalene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Naphthalene	<0.050		0.050	ug/L	17-AUG-20	19-AUG-20	R5191755
Phenanthrene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Pyrene	<0.020		0.020	ug/L	17-AUG-20	19-AUG-20	R5191755
Surrogate: d10-Acenaphthene	113.5		60-140	%	17-AUG-20	19-AUG-20	R5191755
Surrogate: d12-Chrysene	124.8		60-140	%	17-AUG-20	19-AUG-20	R5191755

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2488954-1 W-11210029-20200813-24							
Sampled By: CLIENT on 13-AUG-20							
Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	107.9		60-140	%	17-AUG-20	19-AUG-20	R5191755
Surrogate: d10-Phenanthrene	126.5		60-140	%	17-AUG-20	19-AUG-20	R5191755
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
4-Chloroaniline	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
2-Chlorophenol	<0.30		0.30	ug/L	20-AUG-20	25-AUG-20	R5199526
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4-Dichlorophenol	<0.30		0.30	ug/L	20-AUG-20	25-AUG-20	R5199526
Diethylphthalate	<0.20		0.20	ug/L	20-AUG-20	25-AUG-20	R5199526
Dimethylphthalate	<0.20		0.20	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4-Dimethylphenol	<0.50		0.50	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4-Dinitrophenol	<1.0		1.0	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4-Dinitrotoluene	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
2,6-Dinitrotoluene	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	20-AUG-20	25-AUG-20	R5199526
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	20-AUG-20	25-AUG-20	R5199526
Pentachlorophenol	<0.50		0.50	ug/L	20-AUG-20	25-AUG-20	R5199526
Phenol	<0.50		0.50	ug/L	20-AUG-20	25-AUG-20	R5199526
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	20-AUG-20	25-AUG-20	R5199526
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	20-AUG-20	25-AUG-20	R5199526
Surrogate: 2-Fluorobiphenyl	86.0		50-140	%	20-AUG-20	25-AUG-20	R5199526
Surrogate: Nitrobenzene d5	90.5		50-140	%	20-AUG-20	25-AUG-20	R5199526
Surrogate: p-Terphenyl d14	111.3		60-140	%	20-AUG-20	25-AUG-20	R5199526
Surrogate: 2,4,6-Tribromophenol	79.9		50-140	%	20-AUG-20	25-AUG-20	R5199526
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	18-AUG-20	18-AUG-20	R5190577
Aroclor 1248	<0.020		0.020	ug/L	18-AUG-20	18-AUG-20	R5190577
Aroclor 1254	<0.020		0.020	ug/L	18-AUG-20	18-AUG-20	R5190577
Aroclor 1260	<0.020		0.020	ug/L	18-AUG-20	18-AUG-20	R5190577
Surrogate: Decachlorobiphenyl	79.1		50-150	%	18-AUG-20	18-AUG-20	R5190577
Total PCBs	<0.040		0.040	ug/L	18-AUG-20	18-AUG-20	R5190577
Surrogate: Tetrachloro-m-xylene	76.7		50-150	%	18-AUG-20	18-AUG-20	R5190577

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Copper (Cu)-Total	MS-B	L2488954-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2488954-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2488954-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2488954-1
Matrix Spike	Zinc (Zn)-Total	MS-B	L2488954-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)

Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
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This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

HG-T-CVAA-WT Water Total Mercury in Water by CVAAS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT Water Total Metals in Water by CRC EPA 200.2/6020A (mod)
ICPMS

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT Water PAH-Calculated Parameters SW846 8270

P-T-COL-WT Water Total P in Water by Colour APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT Water PAH-O. Reg 153/04 (July 2011) SW846 3510/8270

Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT Water PCB-O. Reg 153/04 (July 2011) SW846 3510/8082

Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT Water Regulation 153 VOCs SW8260B/SW8270C

VOC-511-HS-WT Water VOC by GCMS HS O.Reg 153/04 SW846 8260
(July 2011)

Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC- Water Sum of Xylene Isomer CALCULATION
WT Concentrations

Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5199526							
WG3387742-2	LCS							
1,2,4-Trichlorobenzene			88.9		%		50-140	25-AUG-20
2-Chlorophenol			85.9		%		50-140	25-AUG-20
2,4-Dichlorophenol			101.3		%		50-140	25-AUG-20
2,4-Dimethylphenol			72.4		%		30-130	25-AUG-20
2,4-Dinitrophenol			129.8		%		50-140	25-AUG-20
2,4-Dinitrotoluene			120.1		%		50-140	25-AUG-20
2,4,5-Trichlorophenol			112.7		%		50-140	25-AUG-20
2,4,6-Trichlorophenol			109.3		%		50-140	25-AUG-20
2,6-Dinitrotoluene			105.0		%		50-140	25-AUG-20
3,3'-Dichlorobenzidine			108.8		%		30-130	25-AUG-20
4-Chloroaniline			43.2		%		30-130	25-AUG-20
Biphenyl			98.5		%		50-140	25-AUG-20
Bis(2-chloroethyl)ether			90.4		%		50-140	25-AUG-20
Bis(2-chloroisopropyl)ether			92.4		%		50-140	25-AUG-20
Bis(2-ethylhexyl)phthalate			119.4		%		50-140	25-AUG-20
Diethylphthalate			91.8		%		50-140	25-AUG-20
Dimethylphthalate			98.7		%		50-140	25-AUG-20
Pentachlorophenol			138.0		%		50-140	25-AUG-20
Phenol			108.7		%		30-130	25-AUG-20
WG3387742-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	25-AUG-20
2-Chlorophenol			<0.30		ug/L		0.3	25-AUG-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	25-AUG-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	25-AUG-20
2,4-Dinitrophenol			<1.0		ug/L		1	25-AUG-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	25-AUG-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	25-AUG-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	25-AUG-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	25-AUG-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	25-AUG-20
4-Chloroaniline			<0.40		ug/L		0.4	25-AUG-20
Biphenyl			<0.40		ug/L		0.4	25-AUG-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	25-AUG-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	25-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5199526								
WG3387742-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	25-AUG-20
Diethylphthalate			<0.20		ug/L		0.2	25-AUG-20
Dimethylphthalate			<0.20		ug/L		0.2	25-AUG-20
Pentachlorophenol			<0.50		ug/L		0.5	25-AUG-20
Phenol			<0.50		ug/L		0.5	25-AUG-20
Surrogate: 2-Fluorobiphenyl			82.7		%		50-140	25-AUG-20
Surrogate: 2,4,6-Tribromophenol			65.0		%		50-140	25-AUG-20
Surrogate: Nitrobenzene d5			82.0		%		50-140	25-AUG-20
Surrogate: p-Terphenyl d14			127.5		%		60-140	25-AUG-20
CR-CR6-IC-WT Water								
Batch R5190555								
WG3384896-4 DUP WG3384896-3								
Chromium, Hexavalent		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	17-AUG-20
WG3384896-2 LCS								
Chromium, Hexavalent			102.4		%		80-120	17-AUG-20
WG3384896-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	17-AUG-20
WG3384896-5 MS WG3384896-3								
Chromium, Hexavalent			99.6		%		70-130	17-AUG-20
F1-HS-511-WT Water								
Batch R5192095								
WG3386480-4 DUP WG3386480-3								
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	20-AUG-20
WG3386480-1 LCS								
F1 (C6-C10)			113.6		%		80-120	19-AUG-20
WG3386480-2 MB								
F1 (C6-C10)			<25		ug/L		25	20-AUG-20
Surrogate: 3,4-Dichlorotoluene			115.5		%		60-140	20-AUG-20
WG3386480-5 MS WG3386480-3								
F1 (C6-C10)			85.9		%		60-140	20-AUG-20
F2-F4-511-WT Water								
Batch R5191073								
WG3384676-2 LCS								
F2 (C10-C16)			103.8		%		70-130	18-AUG-20
F3 (C16-C34)			109.7		%		70-130	18-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT								
Water								
Batch R5191073								
WG3384676-2	LCS							
F4 (C34-C50)			112.0		%		70-130	18-AUG-20
WG3384676-1	MB							
F2 (C10-C16)			<100		ug/L		100	18-AUG-20
F3 (C16-C34)			<250		ug/L		250	18-AUG-20
F4 (C34-C50)			<250		ug/L		250	18-AUG-20
Surrogate: 2-Bromobenzotrifluoride			90.9		%		60-140	18-AUG-20
HG-T-CVAA-WT								
Water								
Batch R5190209								
WG3384726-3	DUP	L2488947-1						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	17-AUG-20
WG3384726-2	LCS							
Mercury (Hg)-Total			107.0		%		80-120	17-AUG-20
WG3384726-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	17-AUG-20
WG3384726-4	MS	L2487969-1						
Mercury (Hg)-Total			103.7		%		70-130	17-AUG-20
MET-T-CCMS-WT								
Water								
Batch R5190768								
WG3384582-4	DUP	WG3384582-3						
Aluminum (Al)-Total		0.0193	0.0198		mg/L	2.8	20	17-AUG-20
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-AUG-20
Arsenic (As)-Total		0.00037	0.00037		mg/L	0.4	20	17-AUG-20
Barium (Ba)-Total		0.00235	0.00240		mg/L	2.1	20	17-AUG-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-AUG-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	17-AUG-20
Boron (B)-Total		0.011	0.012		mg/L	6.6	20	17-AUG-20
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	17-AUG-20
Calcium (Ca)-Total		1.75	1.85		mg/L	5.8	20	17-AUG-20
Chromium (Cr)-Total		0.00051	<0.00050	RPD-NA	mg/L	N/A	20	17-AUG-20
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	17-AUG-20
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-AUG-20
Copper (Cu)-Total		0.0568	0.0575		mg/L	1.1	20	17-AUG-20
Iron (Fe)-Total		0.022	0.028	J	mg/L	0.005	0.02	17-AUG-20
Lead (Pb)-Total		0.000265	0.000281		mg/L	5.9	20	17-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5190768							
WG3384582-4	DUP	WG3384582-3						
Lithium (Li)-Total		0.0051	0.0054		mg/L	4.9	20	17-AUG-20
Magnesium (Mg)-Total		0.354	0.354		mg/L	0.1	20	17-AUG-20
Manganese (Mn)-Total		0.00074	0.00077		mg/L	3.2	20	17-AUG-20
Molybdenum (Mo)-Total		0.000467	0.000467		mg/L	0.1	20	17-AUG-20
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	17-AUG-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	17-AUG-20
Potassium (K)-Total		0.384	0.390		mg/L	1.6	20	17-AUG-20
Rubidium (Rb)-Total		0.00020	0.00022		mg/L	11	20	17-AUG-20
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	17-AUG-20
Silicon (Si)-Total		9.60	9.17		mg/L	4.6	20	17-AUG-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	17-AUG-20
Sodium (Na)-Total		179	175		mg/L	1.8	20	17-AUG-20
Strontium (Sr)-Total		0.0054	0.0058		mg/L	7.3	20	17-AUG-20
Sulfur (S)-Total		13.8	13.1		mg/L	5.3	25	17-AUG-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	17-AUG-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	17-AUG-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	17-AUG-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-AUG-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	17-AUG-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	17-AUG-20
Uranium (U)-Total		0.000095	0.000105		mg/L	9.7	20	17-AUG-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	17-AUG-20
Zinc (Zn)-Total		0.0433	0.0440		mg/L	1.6	20	17-AUG-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	17-AUG-20
WG3384582-2	LCS							
Aluminum (Al)-Total			98.8		%		80-120	17-AUG-20
Antimony (Sb)-Total			97.8		%		80-120	17-AUG-20
Arsenic (As)-Total			98.6		%		80-120	17-AUG-20
Barium (Ba)-Total			98.8		%		80-120	17-AUG-20
Beryllium (Be)-Total			100.2		%		80-120	17-AUG-20
Bismuth (Bi)-Total			93.7		%		80-120	17-AUG-20
Boron (B)-Total			96.0		%		80-120	17-AUG-20
Cadmium (Cd)-Total			96.0		%		80-120	17-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5190768							
WG3384582-2	LCS							
Calcium (Ca)-Total			97.9		%		80-120	17-AUG-20
Chromium (Cr)-Total			97.8		%		80-120	17-AUG-20
Cesium (Cs)-Total			97.1		%		80-120	17-AUG-20
Cobalt (Co)-Total			97.2		%		80-120	17-AUG-20
Copper (Cu)-Total			95.6		%		80-120	17-AUG-20
Iron (Fe)-Total			99.1		%		80-120	17-AUG-20
Lead (Pb)-Total			98.1		%		80-120	17-AUG-20
Lithium (Li)-Total			99.2		%		80-120	17-AUG-20
Magnesium (Mg)-Total			104.4		%		80-120	17-AUG-20
Manganese (Mn)-Total			96.2		%		80-120	17-AUG-20
Molybdenum (Mo)-Total			94.7		%		80-120	17-AUG-20
Nickel (Ni)-Total			96.1		%		80-120	17-AUG-20
Phosphorus (P)-Total			104.4		%		70-130	17-AUG-20
Potassium (K)-Total			95.5		%		80-120	17-AUG-20
Rubidium (Rb)-Total			99.7		%		80-120	17-AUG-20
Selenium (Se)-Total			99.7		%		80-120	17-AUG-20
Silicon (Si)-Total			102.2		%		60-140	17-AUG-20
Silver (Ag)-Total			98.3		%		80-120	17-AUG-20
Sodium (Na)-Total			99.6		%		80-120	17-AUG-20
Strontium (Sr)-Total			100.3		%		80-120	17-AUG-20
Sulfur (S)-Total			101.9		%		80-120	17-AUG-20
Thallium (Tl)-Total			97.0		%		80-120	17-AUG-20
Tellurium (Te)-Total			93.4		%		80-120	17-AUG-20
Thorium (Th)-Total			97.3		%		70-130	17-AUG-20
Tin (Sn)-Total			94.0		%		80-120	17-AUG-20
Titanium (Ti)-Total			95.5		%		80-120	17-AUG-20
Tungsten (W)-Total			94.3		%		80-120	17-AUG-20
Uranium (U)-Total			99.96		%		80-120	17-AUG-20
Vanadium (V)-Total			97.7		%		80-120	17-AUG-20
Zinc (Zn)-Total			97.6		%		80-120	17-AUG-20
Zirconium (Zr)-Total			94.5		%		80-120	17-AUG-20
WG3384582-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	17-AUG-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	17-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5190768							
WG3384582-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	17-AUG-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	17-AUG-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	17-AUG-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	17-AUG-20
Boron (B)-Total			<0.010		mg/L		0.01	17-AUG-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	17-AUG-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	17-AUG-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	17-AUG-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	17-AUG-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	17-AUG-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	17-AUG-20
Iron (Fe)-Total			<0.010		mg/L		0.01	17-AUG-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	17-AUG-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	17-AUG-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	17-AUG-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	17-AUG-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	17-AUG-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	17-AUG-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	17-AUG-20
Potassium (K)-Total			<0.050		mg/L		0.05	17-AUG-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	17-AUG-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	17-AUG-20
Silicon (Si)-Total			<0.10		mg/L		0.1	17-AUG-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	17-AUG-20
Sodium (Na)-Total			<0.050		mg/L		0.05	17-AUG-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	17-AUG-20
Sulfur (S)-Total			<0.50		mg/L		0.5	17-AUG-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	17-AUG-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	17-AUG-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	17-AUG-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	17-AUG-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	17-AUG-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	17-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5190768							
WG3384582-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	17-AUG-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	17-AUG-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	17-AUG-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	17-AUG-20
WG3384582-5 MS		WG3384582-3						
Aluminum (Al)-Total			97.9		%		70-130	17-AUG-20
Antimony (Sb)-Total			97.4		%		70-130	17-AUG-20
Arsenic (As)-Total			93.7		%		70-130	17-AUG-20
Barium (Ba)-Total			92.7		%		70-130	17-AUG-20
Beryllium (Be)-Total			101.4		%		70-130	17-AUG-20
Bismuth (Bi)-Total			84.6		%		70-130	17-AUG-20
Boron (B)-Total			98.7		%		70-130	17-AUG-20
Cadmium (Cd)-Total			89.9		%		70-130	17-AUG-20
Calcium (Ca)-Total			98.9		%		70-130	17-AUG-20
Chromium (Cr)-Total			91.8		%		70-130	17-AUG-20
Cesium (Cs)-Total			97.5		%		70-130	17-AUG-20
Cobalt (Co)-Total			92.3		%		70-130	17-AUG-20
Copper (Cu)-Total			N/A	MS-B	%		-	17-AUG-20
Iron (Fe)-Total			90.5		%		70-130	17-AUG-20
Lead (Pb)-Total			90.0		%		70-130	17-AUG-20
Lithium (Li)-Total			102.2		%		70-130	17-AUG-20
Magnesium (Mg)-Total			98.7		%		70-130	17-AUG-20
Manganese (Mn)-Total			92.1		%		70-130	17-AUG-20
Molybdenum (Mo)-Total			97.2		%		70-130	17-AUG-20
Nickel (Ni)-Total			89.1		%		70-130	17-AUG-20
Phosphorus (P)-Total			101.9		%		70-130	17-AUG-20
Potassium (K)-Total			95.0		%		70-130	17-AUG-20
Rubidium (Rb)-Total			94.9		%		70-130	17-AUG-20
Selenium (Se)-Total			98.7		%		70-130	17-AUG-20
Silicon (Si)-Total			N/A	MS-B	%		-	17-AUG-20
Silver (Ag)-Total			90.4		%		70-130	17-AUG-20
Sodium (Na)-Total			N/A	MS-B	%		-	17-AUG-20
Strontium (Sr)-Total			99.2		%		70-130	17-AUG-20
Sulfur (S)-Total			N/A	MS-B	%		-	17-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5190768							
WG3384582-5 MS		WG3384582-3						
Thallium (Tl)-Total			88.7		%		70-130	17-AUG-20
Tellurium (Te)-Total			86.1		%		70-130	17-AUG-20
Thorium (Th)-Total			95.4		%		70-130	17-AUG-20
Tin (Sn)-Total			95.0		%		70-130	17-AUG-20
Titanium (Ti)-Total			96.6		%		70-130	17-AUG-20
Tungsten (W)-Total			92.6		%		70-130	17-AUG-20
Uranium (U)-Total			99.5		%		70-130	17-AUG-20
Vanadium (V)-Total			97.9		%		70-130	17-AUG-20
Zinc (Zn)-Total			N/A	MS-B	%		-	17-AUG-20
Zirconium (Zr)-Total			96.7		%		70-130	17-AUG-20
P-T-COL-WT								
	Water							
Batch	R5190740							
WG3384091-3 DUP		WG3384091-5						
Phosphorus, Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	18-AUG-20
WG3384091-2 LCS								
Phosphorus, Total			99.7		%		80-120	18-AUG-20
WG3384091-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	18-AUG-20
WG3384091-4 MS		WG3384091-5						
Phosphorus, Total			100.1		%		70-130	18-AUG-20
PAH-511-WT								
	Water							
Batch	R5191755							
WG3384676-2 LCS								
1-Methylnaphthalene			98.5		%		50-140	19-AUG-20
2-Methylnaphthalene			96.3		%		50-140	19-AUG-20
Acenaphthene			106.5		%		50-140	19-AUG-20
Acenaphthylene			99.1		%		50-140	19-AUG-20
Anthracene			95.6		%		50-140	19-AUG-20
Benzo(a)anthracene			103.0		%		50-140	19-AUG-20
Benzo(a)pyrene			96.7		%		50-140	19-AUG-20
Benzo(b)fluoranthene			92.8		%		50-140	19-AUG-20
Benzo(g,h,i)perylene			105.1		%		50-140	19-AUG-20
Benzo(k)fluoranthene			95.3		%		50-140	19-AUG-20
Chrysene			108.2		%		50-140	19-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5191755							
WG3384676-2	LCS							
Dibenzo(ah)anthracene			105.8		%		50-140	19-AUG-20
Fluoranthene			102.6		%		50-140	19-AUG-20
Fluorene			101.4		%		50-140	19-AUG-20
Indeno(1,2,3-cd)pyrene			109.9		%		50-140	19-AUG-20
Naphthalene			94.5		%		50-140	19-AUG-20
Phenanthrene			105.7		%		50-140	19-AUG-20
Pyrene			103.1		%		50-140	19-AUG-20
WG3384676-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	19-AUG-20
2-Methylnaphthalene			<0.020		ug/L		0.02	19-AUG-20
Acenaphthene			<0.020		ug/L		0.02	19-AUG-20
Acenaphthylene			<0.020		ug/L		0.02	19-AUG-20
Anthracene			<0.020		ug/L		0.02	19-AUG-20
Benzo(a)anthracene			<0.020		ug/L		0.02	19-AUG-20
Benzo(a)pyrene			<0.010		ug/L		0.01	19-AUG-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	19-AUG-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	19-AUG-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	19-AUG-20
Chrysene			<0.020		ug/L		0.02	19-AUG-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	19-AUG-20
Fluoranthene			<0.020		ug/L		0.02	19-AUG-20
Fluorene			<0.020		ug/L		0.02	19-AUG-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	19-AUG-20
Naphthalene			<0.050		ug/L		0.05	19-AUG-20
Phenanthrene			<0.020		ug/L		0.02	19-AUG-20
Pyrene			<0.020		ug/L		0.02	19-AUG-20
Surrogate: d8-Naphthalene			98.3		%		60-140	19-AUG-20
Surrogate: d10-Phenanthrene			106.9		%		60-140	19-AUG-20
Surrogate: d12-Chrysene			103.9		%		60-140	19-AUG-20
Surrogate: d10-Acenaphthene			104.9		%		60-140	19-AUG-20

PCB-511-WT **Water**



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 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5190577							
WG3384645-2	LCS							
Aroclor 1242			111.5		%		60-140	18-AUG-20
Aroclor 1248			99.4		%		60-140	18-AUG-20
Aroclor 1254			105.1		%		60-140	18-AUG-20
Aroclor 1260			82.1		%		60-140	18-AUG-20
WG3384645-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	18-AUG-20
Aroclor 1248			<0.020		ug/L		0.02	18-AUG-20
Aroclor 1254			<0.020		ug/L		0.02	18-AUG-20
Aroclor 1260			<0.020		ug/L		0.02	18-AUG-20
Surrogate: Decachlorobiphenyl			79.5		%		50-150	18-AUG-20
Surrogate: Tetrachloro-m-xylene			78.2		%		50-150	18-AUG-20
VOC-511-HS-WT		Water						
Batch	R5192095							
WG3386480-4	DUP	WG3386480-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	20-AUG-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	20-AUG-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	20-AUG-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	20-AUG-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	20-AUG-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5192095							
WG3386480-4	DUP	WG3386480-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	20-AUG-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	20-AUG-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	20-AUG-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	20-AUG-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	20-AUG-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	20-AUG-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	20-AUG-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	20-AUG-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	20-AUG-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	20-AUG-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	20-AUG-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	20-AUG-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	20-AUG-20
WG3386480-1	LCS							
1,1,1,2-Tetrachloroethane			93.5		%		70-130	19-AUG-20
1,1,2,2-Tetrachloroethane			94.3		%		70-130	19-AUG-20
1,1,1-Trichloroethane			96.9		%		70-130	19-AUG-20
1,1,2-Trichloroethane			96.9		%		70-130	19-AUG-20
1,1-Dichloroethane			98.6		%		70-130	19-AUG-20
1,1-Dichloroethylene			92.3		%		70-130	19-AUG-20
1,2-Dibromoethane			94.4		%		70-130	19-AUG-20
1,2-Dichlorobenzene			96.3		%		70-130	19-AUG-20
1,2-Dichloroethane			96.6		%		70-130	19-AUG-20
1,2-Dichloropropane			100.1		%		70-130	19-AUG-20
1,3-Dichlorobenzene			95.9		%		70-130	19-AUG-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5192095							
WG3386480-1	LCS							
1,4-Dichlorobenzene			96.5		%		70-130	19-AUG-20
Acetone			94.8		%		60-140	19-AUG-20
Benzene			101.2		%		70-130	19-AUG-20
Bromodichloromethane			102.9		%		70-130	19-AUG-20
Bromoform			92.9		%		70-130	19-AUG-20
Bromomethane			118.3		%		60-140	19-AUG-20
Carbon tetrachloride			96.9		%		70-130	19-AUG-20
Chlorobenzene			99.95		%		70-130	19-AUG-20
Chloroform			101.1		%		70-130	19-AUG-20
cis-1,2-Dichloroethylene			97.2		%		70-130	19-AUG-20
cis-1,3-Dichloropropene			93.0		%		70-130	19-AUG-20
Dibromochloromethane			88.7		%		70-130	19-AUG-20
Dichlorodifluoromethane			86.3		%		50-140	19-AUG-20
Ethylbenzene			93.0		%		70-130	19-AUG-20
n-Hexane			95.7		%		70-130	19-AUG-20
m+p-Xylenes			92.9		%		70-130	19-AUG-20
Methyl Ethyl Ketone			98.0		%		60-140	19-AUG-20
Methyl Isobutyl Ketone			94.4		%		60-140	19-AUG-20
Methylene Chloride			99.4		%		70-130	19-AUG-20
MTBE			100.8		%		70-130	19-AUG-20
o-Xylene			101.4		%		70-130	19-AUG-20
Styrene			92.9		%		70-130	19-AUG-20
Tetrachloroethylene			97.8		%		70-130	19-AUG-20
Toluene			97.9		%		70-130	19-AUG-20
trans-1,2-Dichloroethylene			94.6		%		70-130	19-AUG-20
trans-1,3-Dichloropropene			90.8		%		70-130	19-AUG-20
Trichloroethylene			100.1		%		70-130	19-AUG-20
Trichlorofluoromethane			90.4		%		60-140	19-AUG-20
Vinyl chloride			104.8		%		60-140	19-AUG-20
WG3386480-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	20-AUG-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	20-AUG-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	20-AUG-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	20-AUG-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5192095							
WG3386480-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	20-AUG-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	20-AUG-20
1,2-Dibromoethane			<0.20		ug/L		0.2	20-AUG-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	20-AUG-20
1,2-Dichloroethane			<0.50		ug/L		0.5	20-AUG-20
1,2-Dichloropropane			<0.50		ug/L		0.5	20-AUG-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	20-AUG-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	20-AUG-20
Acetone			<30		ug/L		30	20-AUG-20
Benzene			<0.50		ug/L		0.5	20-AUG-20
Bromodichloromethane			<2.0		ug/L		2	20-AUG-20
Bromoform			<5.0		ug/L		5	20-AUG-20
Bromomethane			<0.50		ug/L		0.5	20-AUG-20
Carbon tetrachloride			<0.20		ug/L		0.2	20-AUG-20
Chlorobenzene			<0.50		ug/L		0.5	20-AUG-20
Chloroform			<1.0		ug/L		1	20-AUG-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	20-AUG-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	20-AUG-20
Dibromochloromethane			<2.0		ug/L		2	20-AUG-20
Dichlorodifluoromethane			<2.0		ug/L		2	20-AUG-20
Ethylbenzene			<0.50		ug/L		0.5	20-AUG-20
n-Hexane			<0.50		ug/L		0.5	20-AUG-20
m+p-Xylenes			<0.40		ug/L		0.4	20-AUG-20
Methyl Ethyl Ketone			<20		ug/L		20	20-AUG-20
Methyl Isobutyl Ketone			<20		ug/L		20	20-AUG-20
Methylene Chloride			<5.0		ug/L		5	20-AUG-20
MTBE			<2.0		ug/L		2	20-AUG-20
o-Xylene			<0.30		ug/L		0.3	20-AUG-20
Styrene			<0.50		ug/L		0.5	20-AUG-20
Tetrachloroethylene			<0.50		ug/L		0.5	20-AUG-20
Toluene			<0.50		ug/L		0.5	20-AUG-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	20-AUG-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	20-AUG-20



Quality Control Report

Workorder: L2488954

Report Date: 25-AUG-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5192095							
WG3386480-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	20-AUG-20
Trichlorofluoromethane			<5.0		ug/L		5	20-AUG-20
Vinyl chloride			<0.50		ug/L		0.5	20-AUG-20
Surrogate: 1,4-Difluorobenzene			101.5		%		70-130	20-AUG-20
Surrogate: 4-Bromofluorobenzene			99.3		%		70-130	20-AUG-20
WG3386480-5 MS		WG3386480-3						
1,1,1,2-Tetrachloroethane			93.3		%		50-140	20-AUG-20
1,1,1,2-Tetrachloroethane			94.4		%		50-140	20-AUG-20
1,1,1-Trichloroethane			96.3		%		50-140	20-AUG-20
1,1,2-Trichloroethane			97.2		%		50-140	20-AUG-20
1,1-Dichloroethane			98.4		%		50-140	20-AUG-20
1,1-Dichloroethylene			88.5		%		50-140	20-AUG-20
1,2-Dibromoethane			95.2		%		50-140	20-AUG-20
1,2-Dichlorobenzene			97.1		%		50-140	20-AUG-20
1,2-Dichloroethane			96.2		%		50-140	20-AUG-20
1,2-Dichloropropane			101.0		%		50-140	20-AUG-20
1,3-Dichlorobenzene			95.6		%		50-140	20-AUG-20
1,4-Dichlorobenzene			95.8		%		50-140	20-AUG-20
Acetone			106.5		%		50-140	20-AUG-20
Benzene			101.6		%		50-140	20-AUG-20
Bromodichloromethane			104.3		%		50-140	20-AUG-20
Bromoform			92.6		%		50-140	20-AUG-20
Bromomethane			110.2		%		50-140	20-AUG-20
Carbon tetrachloride			96.2		%		50-140	20-AUG-20
Chlorobenzene			98.8		%		50-140	20-AUG-20
Chloroform			102.1		%		50-140	20-AUG-20
cis-1,2-Dichloroethylene			97.8		%		50-140	20-AUG-20
cis-1,3-Dichloropropene			86.9		%		50-140	20-AUG-20
Dibromochloromethane			89.1		%		50-140	20-AUG-20
Dichlorodifluoromethane			72.5		%		50-140	20-AUG-20
Ethylbenzene			90.8		%		50-140	20-AUG-20
n-Hexane			90.9		%		50-140	20-AUG-20
m+p-Xylenes			90.1		%		50-140	20-AUG-20
Methyl Ethyl Ketone			102.9		%		50-140	20-AUG-20



Quality Control Report

Workorder: L2488954

Report Date: 25-AUG-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5192095							
WG3386480-5 MS		WG3386480-3						
Methyl Isobutyl Ketone			94.2		%		50-140	20-AUG-20
Methylene Chloride			100.1		%		50-140	20-AUG-20
MTBE			99.99		%		50-140	20-AUG-20
o-Xylene			99.6		%		50-140	20-AUG-20
Styrene			90.0		%		50-140	20-AUG-20
Tetrachloroethylene			93.2		%		50-140	20-AUG-20
Toluene			96.0		%		50-140	20-AUG-20
trans-1,2-Dichloroethylene			90.7		%		50-140	20-AUG-20
trans-1,3-Dichloropropene			82.7		%		50-140	20-AUG-20
Trichloroethylene			99.2		%		50-140	20-AUG-20
Trichlorofluoromethane			85.9		%		50-140	20-AUG-20
Vinyl chloride			95.8		%		50-140	20-AUG-20

Quality Control Report

Workorder: L2488954

Report Date: 25-AUG-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

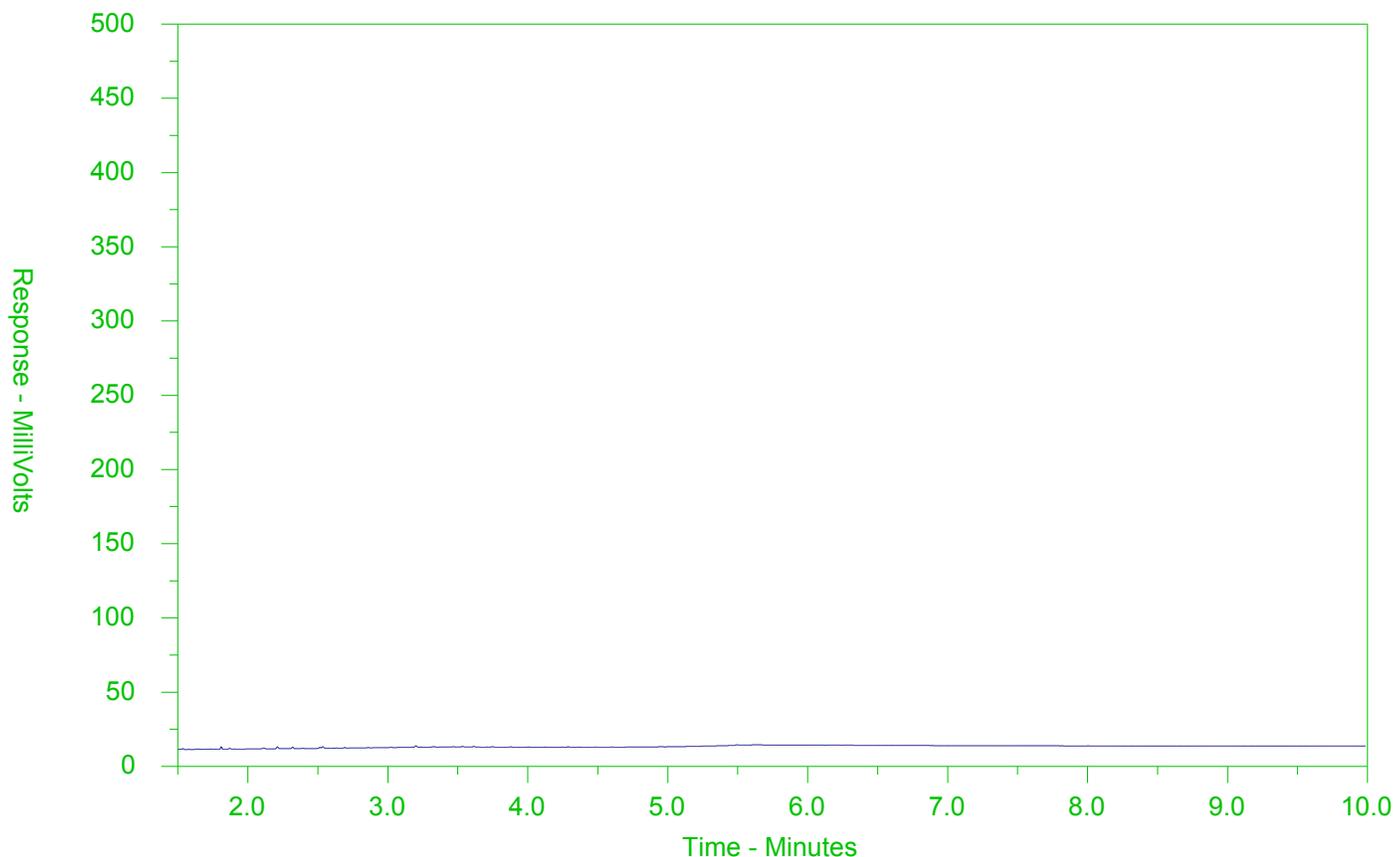
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2488954-1
 Client Sample ID: W-11210029-20200813-24



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 09-JUL-20
Report Date: 22-JUL-20 14:40 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2472292

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2472292-1 W-11210029-20200709-14 Sampled By: CLIENT on 09-JUL-20 @ 10:30 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	<0.0030		0.0030	mg/L	10-JUL-20	14-JUL-20	R5152717
Total Metals							
Aluminum (Al)-Total	0.0066		0.0050	mg/L	09-JUL-20	10-JUL-20	R5147581
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Arsenic (As)-Total	0.00580		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Barium (Ba)-Total	0.0653		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	09-JUL-20	10-JUL-20	R5147581
Boron (B)-Total	0.014		0.010	mg/L	09-JUL-20	10-JUL-20	R5147581
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	09-JUL-20	10-JUL-20	R5147581
Calcium (Ca)-Total	46.6		0.050	mg/L	09-JUL-20	10-JUL-20	R5147581
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	09-JUL-20	10-JUL-20	R5147581
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	09-JUL-20	10-JUL-20	R5147581
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Copper (Cu)-Total	<0.00050		0.00050	mg/L	09-JUL-20	10-JUL-20	R5147581
Iron (Fe)-Total	0.281		0.010	mg/L	09-JUL-20	10-JUL-20	R5147581
Lead (Pb)-Total	<0.000050		0.000050	mg/L	09-JUL-20	10-JUL-20	R5147581
Lithium (Li)-Total	0.0026		0.0010	mg/L	09-JUL-20	10-JUL-20	R5147581
Magnesium (Mg)-Total	27.3		0.0050	mg/L	09-JUL-20	10-JUL-20	R5147581
Manganese (Mn)-Total	0.00931		0.00050	mg/L	09-JUL-20	10-JUL-20	R5147581
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-JUL-20	R5149605
Molybdenum (Mo)-Total	0.000703		0.000050	mg/L	09-JUL-20	10-JUL-20	R5147581
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	09-JUL-20	10-JUL-20	R5147581
Phosphorus (P)-Total	<0.050		0.050	mg/L	09-JUL-20	10-JUL-20	R5147581
Potassium (K)-Total	0.995		0.050	mg/L	09-JUL-20	10-JUL-20	R5147581
Rubidium (Rb)-Total	0.00034		0.00020	mg/L	09-JUL-20	10-JUL-20	R5147581
Selenium (Se)-Total	<0.000050		0.000050	mg/L	09-JUL-20	10-JUL-20	R5147581
Silicon (Si)-Total	7.60		0.10	mg/L	09-JUL-20	10-JUL-20	R5147581
Silver (Ag)-Total	<0.000050		0.000050	mg/L	09-JUL-20	10-JUL-20	R5147581
Sodium (Na)-Total	5.88		0.050	mg/L	09-JUL-20	10-JUL-20	R5147581
Strontium (Sr)-Total	0.322		0.0010	mg/L	09-JUL-20	10-JUL-20	R5147581
Sulfur (S)-Total	7.15		0.50	mg/L	09-JUL-20	10-JUL-20	R5147581
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	09-JUL-20	10-JUL-20	R5147581
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	09-JUL-20	10-JUL-20	R5147581
Thorium (Th)-Total	<0.00010		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Tin (Sn)-Total	<0.00010		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	09-JUL-20	10-JUL-20	R5147581
Tungsten (W)-Total	<0.00010		0.00010	mg/L	09-JUL-20	10-JUL-20	R5147581
Uranium (U)-Total	0.000590		0.000010	mg/L	09-JUL-20	10-JUL-20	R5147581
Vanadium (V)-Total	<0.00050		0.00050	mg/L	09-JUL-20	10-JUL-20	R5147581
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	09-JUL-20	10-JUL-20	R5147581

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2472292-1 W-11210029-20200709-14 Sampled By: CLIENT on 09-JUL-20 @ 10:30 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	09-JUL-20	10-JUL-20	R5147581
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		14-JUL-20	R5153562
Volatile Organic Compounds							
Acetone	<30		30	ug/L		14-JUL-20	R5151425
Benzene	<0.50		0.50	ug/L		14-JUL-20	R5151425
Bromodichloromethane	<2.0		2.0	ug/L		14-JUL-20	R5151425
Bromoform	<5.0		5.0	ug/L		14-JUL-20	R5151425
Bromomethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
Carbon tetrachloride	<0.20		0.20	ug/L		14-JUL-20	R5151425
Chlorobenzene	<0.50		0.50	ug/L		14-JUL-20	R5151425
Dibromochloromethane	<2.0		2.0	ug/L		14-JUL-20	R5151425
Chloroform	<1.0		1.0	ug/L		14-JUL-20	R5151425
1,2-Dibromoethane	<0.20		0.20	ug/L		14-JUL-20	R5151425
1,2-Dichlorobenzene	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,3-Dichlorobenzene	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,4-Dichlorobenzene	<0.50		0.50	ug/L		14-JUL-20	R5151425
Dichlorodifluoromethane	<2.0		2.0	ug/L		14-JUL-20	R5151425
1,1-Dichloroethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,2-Dichloroethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,1-Dichloroethylene	<0.50		0.50	ug/L		14-JUL-20	R5151425
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		14-JUL-20	R5151425
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		14-JUL-20	R5151425
Methylene Chloride	<5.0		5.0	ug/L		14-JUL-20	R5151425
1,2-Dichloropropane	<0.50		0.50	ug/L		14-JUL-20	R5151425
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		14-JUL-20	R5151425
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		14-JUL-20	R5151425
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		14-JUL-20	
Ethylbenzene	<0.50		0.50	ug/L		14-JUL-20	R5151425
n-Hexane	<0.50		0.50	ug/L		14-JUL-20	R5151425
Methyl Ethyl Ketone	<20		20	ug/L		14-JUL-20	R5151425
Methyl Isobutyl Ketone	<20		20	ug/L		14-JUL-20	R5151425
MTBE	<2.0		2.0	ug/L		14-JUL-20	R5151425
Styrene	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
Tetrachloroethylene	<0.50		0.50	ug/L		14-JUL-20	R5151425
Toluene	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,1,1-Trichloroethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
1,1,2-Trichloroethane	<0.50		0.50	ug/L		14-JUL-20	R5151425
Trichloroethylene	<0.50		0.50	ug/L		14-JUL-20	R5151425

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2472292-1 W-11210029-20200709-14 Sampled By: CLIENT on 09-JUL-20 @ 10:30 Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		14-JUL-20	R5151425
Vinyl chloride	<0.50		0.50	ug/L		14-JUL-20	R5151425
o-Xylene	<0.30		0.30	ug/L		14-JUL-20	R5151425
m+p-Xylenes	<0.40		0.40	ug/L		14-JUL-20	R5151425
Xylenes (Total)	<0.50		0.50	ug/L		14-JUL-20	
Surrogate: 4-Bromofluorobenzene	97.6		70-130	%		14-JUL-20	R5151425
Surrogate: 1,4-Difluorobenzene	99.4		70-130	%		14-JUL-20	R5151425
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		14-JUL-20	R5151425
F1-BTEX	<25		25	ug/L		22-JUL-20	
F2 (C10-C16)	<100		100	ug/L	09-JUL-20	10-JUL-20	R5147989
F2-Naphth	<100		100	ug/L		22-JUL-20	
F3 (C16-C34)	<250		250	ug/L	09-JUL-20	10-JUL-20	R5147989
F3-PAH	<250		250	ug/L		22-JUL-20	
F4 (C34-C50)	<250		250	ug/L	09-JUL-20	10-JUL-20	R5147989
Total Hydrocarbons (C6-C50)	<370		370	ug/L		22-JUL-20	
Chrom. to baseline at nC50	YES				09-JUL-20	10-JUL-20	R5147989
Surrogate: 2-Bromobenzotrifluoride	90.9		60-140	%	09-JUL-20	10-JUL-20	R5147989
Surrogate: 3,4-Dichlorotoluene	74.8		60-140	%		14-JUL-20	R5151425
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Acenaphthylene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Anthracene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Benzo(a)anthracene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Benzo(a)pyrene	<0.010		0.010	ug/L	09-JUL-20	14-JUL-20	R5152458
Benzo(b)fluoranthene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Benzo(k)fluoranthene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Chrysene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Fluoranthene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Fluorene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		22-JUL-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
2-Methylnaphthalene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Naphthalene	<0.050		0.050	ug/L	09-JUL-20	14-JUL-20	R5152458
Phenanthrene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Pyrene	<0.020		0.020	ug/L	09-JUL-20	14-JUL-20	R5152458
Surrogate: d10-Acenaphthene	88.7		60-140	%	09-JUL-20	14-JUL-20	R5152458
Surrogate: d12-Chrysene	89.1		60-140	%	09-JUL-20	14-JUL-20	R5152458

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2472292-1 W-11210029-20200709-14 Sampled By: CLIENT on 09-JUL-20 @ 10:30 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	87.4		60-140	%	09-JUL-20	14-JUL-20	R5152458
Surrogate: d10-Phenanthrene	94.5		60-140	%	09-JUL-20	14-JUL-20	R5152458
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
4-Chloroaniline	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
2-Chlorophenol	<0.30		0.30	ug/L	17-JUL-20	22-JUL-20	R5158683
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4-Dichlorophenol	<0.30		0.30	ug/L	17-JUL-20	22-JUL-20	R5158683
Diethylphthalate	<0.20		0.20	ug/L	17-JUL-20	22-JUL-20	R5158683
Dimethylphthalate	<0.20		0.20	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4-Dimethylphenol	<0.50		0.50	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4-Dinitrophenol	<2.0	RRR	2.0	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4-Dinitrotoluene	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
2,6-Dinitrotoluene	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	17-JUL-20	22-JUL-20	R5158683
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	17-JUL-20	22-JUL-20	R5158683
Pentachlorophenol	<0.50		0.50	ug/L	17-JUL-20	22-JUL-20	R5158683
Phenol	<0.50		0.50	ug/L	17-JUL-20	22-JUL-20	R5158683
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	17-JUL-20	22-JUL-20	R5158683
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	17-JUL-20	22-JUL-20	R5158683
Surrogate: 2-Fluorobiphenyl	84.1		50-140	%	17-JUL-20	22-JUL-20	R5158683
Surrogate: Nitrobenzene d5	87.1		50-140	%	17-JUL-20	22-JUL-20	R5158683
Surrogate: p-Terphenyl d14	108.1		60-140	%	17-JUL-20	22-JUL-20	R5158683
Surrogate: 2,4,6-Tribromophenol	89.3		50-140	%	17-JUL-20	22-JUL-20	R5158683
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	13-JUL-20	13-JUL-20	R5149337
Aroclor 1248	<0.020		0.020	ug/L	13-JUL-20	13-JUL-20	R5149337
Aroclor 1254	<0.020		0.020	ug/L	13-JUL-20	13-JUL-20	R5149337
Aroclor 1260	<0.020		0.020	ug/L	13-JUL-20	13-JUL-20	R5149337
Surrogate: Decachlorobiphenyl	109.1		50-150	%	13-JUL-20	13-JUL-20	R5149337
Total PCBs	<0.040		0.040	ug/L	13-JUL-20	13-JUL-20	R5149337
Surrogate: Tetrachloro-m-xylene	77.0		50-150	%	13-JUL-20	13-JUL-20	R5149337
Report Remarks : RRR: Detection limits raised due to suspected bias low results at or near the detection limit.							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	2,4-Dinitrophenol	LCS-H	L2472292-1
Matrix Spike	Aluminum (Al)-Total	MS-B	L2472292-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2472292-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2472292-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2472292-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2472292-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2472292-1
Matrix Spike	Potassium (K)-Total	MS-B	L2472292-1
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2472292-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2472292-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2472292-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2472292-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2472292-1
Matrix Spike	Titanium (Ti)-Total	MS-B	L2472292-1
Matrix Spike	Uranium (U)-Total	MS-B	L2472292-1

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.

Reference Information

3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.

4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

Reference Information

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2472292

Report Date: 22-JUL-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5158683							
WG3364962-2	LCS							
1,2,4-Trichlorobenzene			79.4		%		50-140	20-JUL-20
2-Chlorophenol			78.1		%		50-140	20-JUL-20
2,4-Dichlorophenol			94.6		%		50-140	20-JUL-20
2,4-Dimethylphenol			103.8		%		30-130	20-JUL-20
2,4-Dinitrophenol			150.6	LCS-H	%		50-140	20-JUL-20
2,4-Dinitrotoluene			134.7		%		50-140	20-JUL-20
2,4,5-Trichlorophenol			107.3		%		50-140	20-JUL-20
2,4,6-Trichlorophenol			105.2		%		50-140	20-JUL-20
2,6-Dinitrotoluene			122.7		%		50-140	20-JUL-20
3,3'-Dichlorobenzidine			92.2		%		30-130	20-JUL-20
4-Chloroaniline			62.7		%		30-130	20-JUL-20
Biphenyl			86.3		%		50-140	20-JUL-20
Bis(2-chloroethyl)ether			88.9		%		50-140	20-JUL-20
Bis(2-chloroisopropyl)ether			87.6		%		50-140	20-JUL-20
Bis(2-ethylhexyl)phthalate			124.5		%		50-140	20-JUL-20
Diethylphthalate			90.8		%		50-140	20-JUL-20
Dimethylphthalate			92.6		%		50-140	20-JUL-20
Pentachlorophenol			136.4		%		50-140	20-JUL-20
Phenol			101.8		%		30-130	20-JUL-20
WG3364962-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	20-JUL-20
2-Chlorophenol			<0.30		ug/L		0.3	20-JUL-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	20-JUL-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	20-JUL-20
2,4-Dinitrophenol			<1.0		ug/L		1	20-JUL-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	20-JUL-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	20-JUL-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	20-JUL-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	20-JUL-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	20-JUL-20
4-Chloroaniline			<0.40		ug/L		0.4	20-JUL-20
Biphenyl			<0.40		ug/L		0.4	20-JUL-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	20-JUL-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	20-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5158683								
WG3364962-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	20-JUL-20
Diethylphthalate			<0.20		ug/L		0.2	20-JUL-20
Dimethylphthalate			<0.20		ug/L		0.2	20-JUL-20
Pentachlorophenol			<0.50		ug/L		0.5	20-JUL-20
Phenol			<0.50		ug/L		0.5	20-JUL-20
Surrogate: 2-Fluorobiphenyl			83.8		%		50-140	20-JUL-20
Surrogate: 2,4,6-Tribromophenol			89.7		%		50-140	20-JUL-20
Surrogate: Nitrobenzene d5			92.7		%		50-140	20-JUL-20
Surrogate: p-Terphenyl d14			111.6		%		60-140	20-JUL-20
CR-CR6-IC-WT Water								
Batch R5153562								
WG3361024-4 DUP								
Chromium, Hexavalent		WG3361024-3	<0.00050	RPD-NA	mg/L	N/A	20	14-JUL-20
WG3361024-2 LCS								
Chromium, Hexavalent			102.4		%		80-120	14-JUL-20
WG3361024-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	14-JUL-20
WG3361024-5 MS								
Chromium, Hexavalent		WG3361024-3	101.8		%		70-130	14-JUL-20
F1-HS-511-WT Water								
Batch R5151425								
WG3361086-4 DUP								
F1 (C6-C10)		WG3361086-3	<25	RPD-NA	ug/L	N/A	30	14-JUL-20
WG3361086-1 LCS								
F1 (C6-C10)			108.5		%		80-120	14-JUL-20
WG3361086-2 MB								
F1 (C6-C10)			<25		ug/L		25	14-JUL-20
Surrogate: 3,4-Dichlorotoluene			94.5		%		60-140	14-JUL-20
WG3361086-5 MS								
F1 (C6-C10)		WG3361086-3	100.0		%		60-140	14-JUL-20
F2-F4-511-WT Water								
Batch R5147989								
WG3359493-2 LCS								
F2 (C10-C16)			113.3		%		70-130	10-JUL-20
F3 (C16-C34)			118.4		%		70-130	10-JUL-20



Quality Control Report

Workorder: L2472292

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch	R5147989							
WG3359493-2	LCS							
F4 (C34-C50)			121.0		%		70-130	10-JUL-20
WG3359493-1	MB							
F2 (C10-C16)			<100		ug/L		100	10-JUL-20
F3 (C16-C34)			<250		ug/L		250	10-JUL-20
F4 (C34-C50)			<250		ug/L		250	10-JUL-20
Surrogate: 2-Bromobenzotrifluoride			94.3		%		60-140	10-JUL-20
HG-T-CVAA-WT		Water						
Batch	R5149605							
WG3359974-3	DUP	L2472289-4						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	13-JUL-20
WG3359974-2	LCS							
Mercury (Hg)-Total			108.0		%		80-120	13-JUL-20
WG3359974-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	13-JUL-20
WG3359974-4	MS	L2472300-1						
Mercury (Hg)-Total			102.0		%		70-130	13-JUL-20
MET-T-CCMS-WT		Water						
Batch	R5147581							
WG3359509-4	DUP	WG3359509-3						
Aluminum (Al)-Total		1.05	1.07		mg/L	1.4	20	10-JUL-20
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-20
Arsenic (As)-Total		0.00018	0.00020		mg/L	11	20	10-JUL-20
Barium (Ba)-Total		0.0178	0.0187		mg/L	4.9	20	10-JUL-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	10-JUL-20
Boron (B)-Total		0.029	0.029		mg/L	1.9	20	10-JUL-20
Cadmium (Cd)-Total		0.0000602	0.0000613		mg/L	1.8	20	10-JUL-20
Calcium (Ca)-Total		36.8	37.0		mg/L	0.6	20	10-JUL-20
Chromium (Cr)-Total		0.00123	0.00126		mg/L	2.4	20	10-JUL-20
Cesium (Cs)-Total		0.000094	0.000094		mg/L	0.3	20	10-JUL-20
Cobalt (Co)-Total		0.0102	0.0107		mg/L	4.9	20	10-JUL-20
Copper (Cu)-Total		0.00338	0.00346		mg/L	2.4	20	10-JUL-20
Iron (Fe)-Total		1.73	1.77		mg/L	2.2	20	10-JUL-20
Lead (Pb)-Total		0.000890	0.000896		mg/L	0.7	20	10-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5147581							
WG3359509-4	DUP	WG3359509-3						
Lithium (Li)-Total		0.0097	0.0094		mg/L	2.3	20	10-JUL-20
Magnesium (Mg)-Total		80.7	83.5		mg/L	3.5	20	10-JUL-20
Manganese (Mn)-Total		1.33	1.36		mg/L	2.2	20	10-JUL-20
Molybdenum (Mo)-Total		0.00155	0.00158		mg/L	2.3	20	10-JUL-20
Nickel (Ni)-Total		0.0190	0.0196		mg/L	3.1	20	10-JUL-20
Phosphorus (P)-Total		<0.050	0.051	RPD-NA	mg/L	N/A	20	10-JUL-20
Potassium (K)-Total		6.51	6.79		mg/L	4.2	20	10-JUL-20
Rubidium (Rb)-Total		0.00693	0.00696		mg/L	0.4	20	10-JUL-20
Selenium (Se)-Total		0.00182	0.00193		mg/L	5.9	20	10-JUL-20
Silicon (Si)-Total		2.58	2.58		mg/L	0.1	20	10-JUL-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	10-JUL-20
Sodium (Na)-Total		2.60	2.65		mg/L	1.9	20	10-JUL-20
Strontium (Sr)-Total		0.0468	0.0482		mg/L	2.9	20	10-JUL-20
Sulfur (S)-Total		133	137		mg/L	2.6	25	10-JUL-20
Thallium (Tl)-Total		0.000033	0.000030		mg/L	7.9	20	10-JUL-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	10-JUL-20
Thorium (Th)-Total		0.00053	0.00055		mg/L	3.9	25	10-JUL-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-20
Titanium (Ti)-Total		0.0484	0.0484		mg/L	0.1	20	10-JUL-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	10-JUL-20
Uranium (U)-Total		0.00126	0.00127		mg/L	1.1	20	10-JUL-20
Vanadium (V)-Total		0.00151	0.00155		mg/L	2.7	20	10-JUL-20
Zinc (Zn)-Total		0.0031	0.0030		mg/L	3.8	20	10-JUL-20
Zirconium (Zr)-Total		0.00057	0.00063		mg/L	9.3	20	10-JUL-20
WG3359509-2	LCS							
Aluminum (Al)-Total			97.6		%		80-120	10-JUL-20
Antimony (Sb)-Total			100.6		%		80-120	10-JUL-20
Arsenic (As)-Total			100.2		%		80-120	10-JUL-20
Barium (Ba)-Total			96.8		%		80-120	10-JUL-20
Beryllium (Be)-Total			95.3		%		80-120	10-JUL-20
Bismuth (Bi)-Total			97.5		%		80-120	10-JUL-20
Boron (B)-Total			94.6		%		80-120	10-JUL-20
Cadmium (Cd)-Total			99.7		%		80-120	10-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5147581							
WG3359509-2	LCS							
Calcium (Ca)-Total			96.6		%		80-120	10-JUL-20
Chromium (Cr)-Total			97.3		%		80-120	10-JUL-20
Cesium (Cs)-Total			97.6		%		80-120	10-JUL-20
Cobalt (Co)-Total			96.3		%		80-120	10-JUL-20
Copper (Cu)-Total			96.8		%		80-120	10-JUL-20
Iron (Fe)-Total			95.4		%		80-120	10-JUL-20
Lead (Pb)-Total			101.0		%		80-120	10-JUL-20
Lithium (Li)-Total			90.8		%		80-120	10-JUL-20
Magnesium (Mg)-Total			102.6		%		80-120	10-JUL-20
Manganese (Mn)-Total			97.8		%		80-120	10-JUL-20
Molybdenum (Mo)-Total			90.9		%		80-120	10-JUL-20
Nickel (Ni)-Total			96.6		%		80-120	10-JUL-20
Phosphorus (P)-Total			97.0		%		70-130	10-JUL-20
Potassium (K)-Total			93.0		%		80-120	10-JUL-20
Rubidium (Rb)-Total			99.9		%		80-120	10-JUL-20
Selenium (Se)-Total			102.9		%		80-120	10-JUL-20
Silicon (Si)-Total			95.6		%		60-140	10-JUL-20
Silver (Ag)-Total			93.1		%		80-120	10-JUL-20
Sodium (Na)-Total			97.1		%		80-120	10-JUL-20
Strontium (Sr)-Total			94.4		%		80-120	10-JUL-20
Sulfur (S)-Total			92.4		%		80-120	10-JUL-20
Thallium (Tl)-Total			99.5		%		80-120	10-JUL-20
Tellurium (Te)-Total			99.4		%		80-120	10-JUL-20
Thorium (Th)-Total			93.9		%		70-130	10-JUL-20
Tin (Sn)-Total			97.1		%		80-120	10-JUL-20
Titanium (Ti)-Total			93.5		%		80-120	10-JUL-20
Tungsten (W)-Total			101.1		%		80-120	10-JUL-20
Uranium (U)-Total			100.3		%		80-120	10-JUL-20
Vanadium (V)-Total			98.0		%		80-120	10-JUL-20
Zinc (Zn)-Total			97.8		%		80-120	10-JUL-20
Zirconium (Zr)-Total			87.2		%		80-120	10-JUL-20
WG3359509-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	10-JUL-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	10-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5147581							
WG3359509-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	10-JUL-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	10-JUL-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	10-JUL-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	10-JUL-20
Boron (B)-Total			<0.010		mg/L		0.01	10-JUL-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	10-JUL-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	10-JUL-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	10-JUL-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	10-JUL-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	10-JUL-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	10-JUL-20
Iron (Fe)-Total			<0.010		mg/L		0.01	10-JUL-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	10-JUL-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	10-JUL-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	10-JUL-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	10-JUL-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	10-JUL-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	10-JUL-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	10-JUL-20
Potassium (K)-Total			<0.050		mg/L		0.05	10-JUL-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	10-JUL-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	10-JUL-20
Silicon (Si)-Total			<0.10		mg/L		0.1	10-JUL-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	10-JUL-20
Sodium (Na)-Total			<0.050		mg/L		0.05	10-JUL-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	10-JUL-20
Sulfur (S)-Total			<0.50		mg/L		0.5	10-JUL-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	10-JUL-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	10-JUL-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	10-JUL-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	10-JUL-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	10-JUL-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	10-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5147581							
WG3359509-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	10-JUL-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	10-JUL-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	10-JUL-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	10-JUL-20
WG3359509-5 MS		WG3359509-3						
Aluminum (Al)-Total			N/A	MS-B	%		-	10-JUL-20
Antimony (Sb)-Total			101.7		%		70-130	10-JUL-20
Arsenic (As)-Total			104.8		%		70-130	10-JUL-20
Barium (Ba)-Total			N/A	MS-B	%		-	10-JUL-20
Beryllium (Be)-Total			90.5		%		70-130	10-JUL-20
Bismuth (Bi)-Total			94.7		%		70-130	10-JUL-20
Boron (B)-Total			88.4		%		70-130	10-JUL-20
Cadmium (Cd)-Total			108.1		%		70-130	10-JUL-20
Calcium (Ca)-Total			N/A	MS-B	%		-	10-JUL-20
Chromium (Cr)-Total			102.2		%		70-130	10-JUL-20
Cesium (Cs)-Total			100.9		%		70-130	10-JUL-20
Cobalt (Co)-Total			98.7		%		70-130	10-JUL-20
Copper (Cu)-Total			97.0		%		70-130	10-JUL-20
Iron (Fe)-Total			N/A	MS-B	%		-	10-JUL-20
Lead (Pb)-Total			96.4		%		70-130	10-JUL-20
Lithium (Li)-Total			90.8		%		70-130	10-JUL-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	10-JUL-20
Manganese (Mn)-Total			N/A	MS-B	%		-	10-JUL-20
Molybdenum (Mo)-Total			97.5		%		70-130	10-JUL-20
Nickel (Ni)-Total			93.3		%		70-130	10-JUL-20
Phosphorus (P)-Total			110.2		%		70-130	10-JUL-20
Potassium (K)-Total			N/A	MS-B	%		-	10-JUL-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	10-JUL-20
Selenium (Se)-Total			107.7		%		70-130	10-JUL-20
Silicon (Si)-Total			N/A	MS-B	%		-	10-JUL-20
Silver (Ag)-Total			93.2		%		70-130	10-JUL-20
Sodium (Na)-Total			N/A	MS-B	%		-	10-JUL-20
Strontium (Sr)-Total			N/A	MS-B	%		-	10-JUL-20
Sulfur (S)-Total			N/A	MS-B	%		-	10-JUL-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5147581							
WG3359509-5 MS		WG3359509-3						
Thallium (Tl)-Total			95.5		%		70-130	10-JUL-20
Tellurium (Te)-Total			95.4		%		70-130	10-JUL-20
Thorium (Th)-Total			97.5		%		70-130	10-JUL-20
Tin (Sn)-Total			100.5		%		70-130	10-JUL-20
Titanium (Ti)-Total			N/A	MS-B	%		-	10-JUL-20
Tungsten (W)-Total			97.0		%		70-130	10-JUL-20
Uranium (U)-Total			N/A	MS-B	%		-	10-JUL-20
Vanadium (V)-Total			105.2		%		70-130	10-JUL-20
Zinc (Zn)-Total			93.8		%		70-130	10-JUL-20
Zirconium (Zr)-Total			103.0		%		70-130	10-JUL-20
P-T-COL-WT								
	Water							
Batch	R5152717							
WG3359756-3 DUP		L2472266-2						
Phosphorus, Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	14-JUL-20
WG3359756-2 LCS								
Phosphorus, Total			96.8		%		80-120	14-JUL-20
WG3359756-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	14-JUL-20
WG3359756-4 MS		L2472266-2						
Phosphorus, Total			97.8		%		70-130	14-JUL-20
PAH-511-WT								
	Water							
Batch	R5152458							
WG3359493-2 LCS								
1-Methylnaphthalene			88.1		%		50-140	14-JUL-20
2-Methylnaphthalene			88.7		%		50-140	14-JUL-20
Acenaphthene			99.1		%		50-140	14-JUL-20
Acenaphthylene			96.3		%		50-140	14-JUL-20
Anthracene			91.3		%		50-140	14-JUL-20
Benzo(a)anthracene			98.0		%		50-140	14-JUL-20
Benzo(a)pyrene			95.1		%		50-140	14-JUL-20
Benzo(b)fluoranthene			88.7		%		50-140	14-JUL-20
Benzo(g,h,i)perylene			102.0		%		50-140	14-JUL-20
Benzo(k)fluoranthene			95.8		%		50-140	14-JUL-20
Chrysene			100.3		%		50-140	14-JUL-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5152458							
WG3359493-2	LCS							
Dibenzo(ah)anthracene			110.5		%		50-140	14-JUL-20
Fluoranthene			99.5		%		50-140	14-JUL-20
Fluorene			97.8		%		50-140	14-JUL-20
Indeno(1,2,3-cd)pyrene			102.2		%		50-140	14-JUL-20
Naphthalene			90.1		%		50-140	14-JUL-20
Phenanthrene			100.3		%		50-140	14-JUL-20
Pyrene			101.8		%		50-140	14-JUL-20
WG3359493-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	14-JUL-20
2-Methylnaphthalene			<0.020		ug/L		0.02	14-JUL-20
Acenaphthene			<0.020		ug/L		0.02	14-JUL-20
Acenaphthylene			<0.020		ug/L		0.02	14-JUL-20
Anthracene			<0.020		ug/L		0.02	14-JUL-20
Benzo(a)anthracene			<0.020		ug/L		0.02	14-JUL-20
Benzo(a)pyrene			<0.010		ug/L		0.01	14-JUL-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	14-JUL-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	14-JUL-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	14-JUL-20
Chrysene			<0.020		ug/L		0.02	14-JUL-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	14-JUL-20
Fluoranthene			<0.020		ug/L		0.02	14-JUL-20
Fluorene			<0.020		ug/L		0.02	14-JUL-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	14-JUL-20
Naphthalene			<0.050		ug/L		0.05	14-JUL-20
Phenanthrene			<0.020		ug/L		0.02	14-JUL-20
Pyrene			<0.020		ug/L		0.02	14-JUL-20
Surrogate: d8-Naphthalene			93.0		%		60-140	14-JUL-20
Surrogate: d10-Phenanthrene			97.5		%		60-140	14-JUL-20
Surrogate: d12-Chrysene			92.4		%		60-140	14-JUL-20
Surrogate: d10-Acenaphthene			93.5		%		60-140	14-JUL-20

PCB-511-WT **Water**



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5149337							
WG3359635-2	LCS							
Aroclor 1242			120.2		%		60-140	13-JUL-20
Aroclor 1248			116.5		%		60-140	13-JUL-20
Aroclor 1254			112.0		%		60-140	13-JUL-20
Aroclor 1260			89.9		%		60-140	13-JUL-20
WG3359635-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	13-JUL-20
Aroclor 1248			<0.020		ug/L		0.02	13-JUL-20
Aroclor 1254			<0.020		ug/L		0.02	13-JUL-20
Aroclor 1260			<0.020		ug/L		0.02	13-JUL-20
Surrogate: Decachlorobiphenyl			91.0		%		50-150	13-JUL-20
Surrogate: Tetrachloro-m-xylene			75.3		%		50-150	13-JUL-20
VOC-511-HS-WT		Water						
Batch	R5151425							
WG3361086-4	DUP		WG3361086-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	14-JUL-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	14-JUL-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	14-JUL-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	14-JUL-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	14-JUL-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5151425							
WG3361086-4	DUP	WG3361086-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	14-JUL-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	14-JUL-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	14-JUL-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	14-JUL-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	14-JUL-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	14-JUL-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	14-JUL-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	14-JUL-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	14-JUL-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	14-JUL-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	14-JUL-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	14-JUL-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	14-JUL-20
WG3361086-1	LCS							
1,1,1,2-Tetrachloroethane			101.1		%		70-130	14-JUL-20
1,1,2,2-Tetrachloroethane			101.1		%		70-130	14-JUL-20
1,1,1-Trichloroethane			105.1		%		70-130	14-JUL-20
1,1,2-Trichloroethane			105.3		%		70-130	14-JUL-20
1,1-Dichloroethane			104.2		%		70-130	14-JUL-20
1,1-Dichloroethylene			100.0		%		70-130	14-JUL-20
1,2-Dibromoethane			100.3		%		70-130	14-JUL-20
1,2-Dichlorobenzene			112.5		%		70-130	14-JUL-20
1,2-Dichloroethane			101.9		%		70-130	14-JUL-20
1,2-Dichloropropane			104.8		%		70-130	14-JUL-20
1,3-Dichlorobenzene			115.1		%		70-130	14-JUL-20



Quality Control Report

Workorder: L2472292

Report Date: 22-JUL-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5151425							
WG3361086-1	LCS							
1,4-Dichlorobenzene			116.0		%		70-130	14-JUL-20
Acetone			97.4		%		60-140	14-JUL-20
Benzene			106.0		%		70-130	14-JUL-20
Bromodichloromethane			111.5		%		70-130	14-JUL-20
Bromoform			101.0		%		70-130	14-JUL-20
Bromomethane			130.6		%		60-140	14-JUL-20
Carbon tetrachloride			99.2		%		70-130	14-JUL-20
Chlorobenzene			106.7		%		70-130	14-JUL-20
Chloroform			106.5		%		70-130	14-JUL-20
cis-1,2-Dichloroethylene			96.4		%		70-130	14-JUL-20
cis-1,3-Dichloropropene			105.5		%		70-130	14-JUL-20
Dibromochloromethane			94.2		%		70-130	14-JUL-20
Dichlorodifluoromethane			105.6		%		50-140	14-JUL-20
Ethylbenzene			106.9		%		70-130	14-JUL-20
n-Hexane			103.3		%		70-130	14-JUL-20
m+p-Xylenes			107.7		%		70-130	14-JUL-20
Methyl Ethyl Ketone			110.1		%		60-140	14-JUL-20
Methyl Isobutyl Ketone			106.6		%		60-140	14-JUL-20
Methylene Chloride			103.4		%		70-130	14-JUL-20
MTBE			106.0		%		70-130	14-JUL-20
o-Xylene			115.4		%		70-130	14-JUL-20
Styrene			107.8		%		70-130	14-JUL-20
Tetrachloroethylene			105.4		%		70-130	14-JUL-20
Toluene			106.3		%		70-130	14-JUL-20
trans-1,2-Dichloroethylene			101.7		%		70-130	14-JUL-20
trans-1,3-Dichloropropene			113.4		%		70-130	14-JUL-20
Trichloroethylene			105.7		%		70-130	14-JUL-20
Trichlorofluoromethane			99.3		%		60-140	14-JUL-20
Vinyl chloride			108.8		%		60-140	14-JUL-20
WG3361086-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	14-JUL-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	14-JUL-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	14-JUL-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	14-JUL-20



Quality Control Report

Workorder: L2472292

Report Date: 22-JUL-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5151425							
WG3361086-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	14-JUL-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	14-JUL-20
1,2-Dibromoethane			<0.20		ug/L		0.2	14-JUL-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	14-JUL-20
1,2-Dichloroethane			<0.50		ug/L		0.5	14-JUL-20
1,2-Dichloropropane			<0.50		ug/L		0.5	14-JUL-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	14-JUL-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	14-JUL-20
Acetone			<30		ug/L		30	14-JUL-20
Benzene			<0.50		ug/L		0.5	14-JUL-20
Bromodichloromethane			<2.0		ug/L		2	14-JUL-20
Bromoform			<5.0		ug/L		5	14-JUL-20
Bromomethane			<0.50		ug/L		0.5	14-JUL-20
Carbon tetrachloride			<0.20		ug/L		0.2	14-JUL-20
Chlorobenzene			<0.50		ug/L		0.5	14-JUL-20
Chloroform			<1.0		ug/L		1	14-JUL-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	14-JUL-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	14-JUL-20
Dibromochloromethane			<2.0		ug/L		2	14-JUL-20
Dichlorodifluoromethane			<2.0		ug/L		2	14-JUL-20
Ethylbenzene			<0.50		ug/L		0.5	14-JUL-20
n-Hexane			<0.50		ug/L		0.5	14-JUL-20
m+p-Xylenes			<0.40		ug/L		0.4	14-JUL-20
Methyl Ethyl Ketone			<20		ug/L		20	14-JUL-20
Methyl Isobutyl Ketone			<20		ug/L		20	14-JUL-20
Methylene Chloride			<5.0		ug/L		5	14-JUL-20
MTBE			<2.0		ug/L		2	14-JUL-20
o-Xylene			<0.30		ug/L		0.3	14-JUL-20
Styrene			<0.50		ug/L		0.5	14-JUL-20
Tetrachloroethylene			<0.50		ug/L		0.5	14-JUL-20
Toluene			<0.50		ug/L		0.5	14-JUL-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	14-JUL-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	14-JUL-20



Quality Control Report

Workorder: L2472292

Report Date: 22-JUL-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5151425							
WG3361086-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	14-JUL-20
Trichlorofluoromethane			<5.0		ug/L		5	14-JUL-20
Vinyl chloride			<0.50		ug/L		0.5	14-JUL-20
Surrogate: 1,4-Difluorobenzene			100.1		%		70-130	14-JUL-20
Surrogate: 4-Bromofluorobenzene			99.3		%		70-130	14-JUL-20
WG3361086-5 MS		WG3361086-3						
1,1,1,2-Tetrachloroethane			102.1		%		50-140	14-JUL-20
1,1,2,2-Tetrachloroethane			96.9		%		50-140	14-JUL-20
1,1,1-Trichloroethane			106.9		%		50-140	14-JUL-20
1,1,2-Trichloroethane			103.8		%		50-140	14-JUL-20
1,1-Dichloroethane			104.9		%		50-140	14-JUL-20
1,1-Dichloroethylene			101.7		%		50-140	14-JUL-20
1,2-Dibromoethane			97.8		%		50-140	14-JUL-20
1,2-Dichlorobenzene			109.9		%		50-140	14-JUL-20
1,2-Dichloroethane			99.8		%		50-140	14-JUL-20
1,2-Dichloropropane			103.9		%		50-140	14-JUL-20
1,3-Dichlorobenzene			112.6		%		50-140	14-JUL-20
1,4-Dichlorobenzene			112.9		%		50-140	14-JUL-20
Acetone			103.0		%		50-140	14-JUL-20
Benzene			105.6		%		50-140	14-JUL-20
Bromodichloromethane			110.6		%		50-140	14-JUL-20
Bromoform			98.3		%		50-140	14-JUL-20
Bromomethane			124.3		%		50-140	14-JUL-20
Carbon tetrachloride			101.5		%		50-140	14-JUL-20
Chlorobenzene			106.5		%		50-140	14-JUL-20
Chloroform			107.1		%		50-140	14-JUL-20
cis-1,2-Dichloroethylene			95.2		%		50-140	14-JUL-20
cis-1,3-Dichloropropene			93.0		%		50-140	14-JUL-20
Dibromochloromethane			93.7		%		50-140	14-JUL-20
Dichlorodifluoromethane			105.0		%		50-140	14-JUL-20
Ethylbenzene			108.2		%		50-140	14-JUL-20
n-Hexane			106.0		%		50-140	14-JUL-20
m+p-Xylenes			108.6		%		50-140	14-JUL-20
Methyl Ethyl Ketone			103.3		%		50-140	14-JUL-20



Quality Control Report

Workorder: L2472292

Report Date: 22-JUL-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5151425							
WG3361086-5 MS		WG3361086-3						
Methyl Isobutyl Ketone			98.1		%		50-140	14-JUL-20
Methylene Chloride			102.2		%		50-140	14-JUL-20
MTBE			104.7		%		50-140	14-JUL-20
o-Xylene			116.1		%		50-140	14-JUL-20
Styrene			106.2		%		50-140	14-JUL-20
Tetrachloroethylene			106.5		%		50-140	14-JUL-20
Toluene			107.9		%		50-140	14-JUL-20
trans-1,2-Dichloroethylene			100.6		%		50-140	14-JUL-20
trans-1,3-Dichloropropene			97.9		%		50-140	14-JUL-20
Trichloroethylene			105.8		%		50-140	14-JUL-20
Trichlorofluoromethane			101.7		%		50-140	14-JUL-20
Vinyl chloride			108.8		%		50-140	14-JUL-20

Quality Control Report

Workorder: L2472292

Report Date: 22-JUL-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

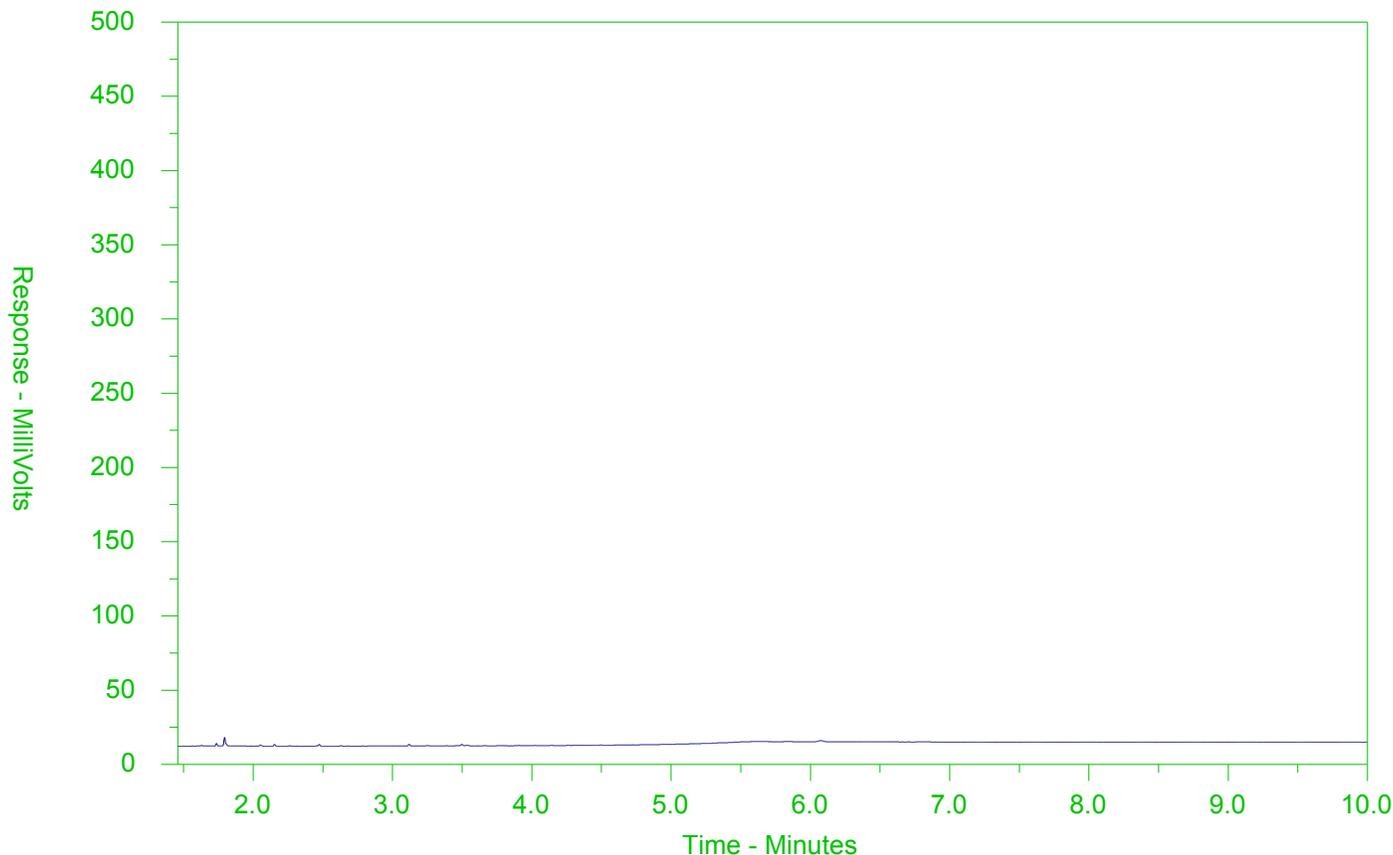
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2472292-1
 Client Sample ID: W-11210029-20200709-14



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytical Request Form



L2472292-COFC

COC Number: 17 -

Page of

Handwritten initials

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Report To: GHD LIMITED - ACCT #13791, Contact: Laura Ermeta, Phone: 519-884-0510, Invoice To: Same as Report To, Company: GHD Limited

Report Format / Distribution: Select Report Format: PDF, EXCEL, EDD (DIGITAL), Quality Control (QC) Report with Report: YES, NO, Select Distribution: EMAIL, MAIL, FAX

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply), Regular [R], Standard TAT if received by 3 pm - business days - no surcharges apply, 4 day [P4-20%], 3 day [P3-25%], 2 day [P2-50%], 1 Business day [E - 100%], Same Day, Weekend or Statutory holiday [E2 -200%]

Project Information: ALS Account # / Quote #: 13791, Job #: 11210029, PO / AFE: 73520086, LSD:

Invoice Distribution: Select Invoice Distribution: EMAIL, MAIL, FAX, Email 1 or Fax: apinvoices-735@ghd.com, Oil and Gas Required Fields (client use): AFE/Cost Center, PO#, Major/Minor Code, Routing Code, Requisitioner, Location

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm, For tests that can not be performed according to the service level selected, you will be contacted.

ALS Lab Work Order # (lab use only): L2472292AP

ALS Contact: Rick H, Sampler:

Table with columns: NUMBER OF CONTAINERS, Total Metals (MET-T-CCMS-WT), Total Mercury (HG-T-CVAA-WT), Total Cr6 (CR-CR6-IC-WT), Total Phosphorous (P-T-COL-WT), PCBs (PCB-511-WT), VOCs and PHCs (VOC-F1-F4-511-P-WT), SVOCs (SVOC-511-GP-WT), SAMPLES ON HOLD, SUSPECTED HAZARD (see Special Instructions)

Table with columns: ALS Sample # (lab use only), Sample Identification and/or coordinates (This description will appear on the report), Date (dd-mmm-yy), Time (hh:mm), Sample Type

Drinking Water (DW) Samples (client use), Are samples taken from a Regulated DW System?, Are samples for human consumption/ use?

Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only), Frozen, Ice Packs, Ice Cubes, Custody seal intact, Cooling Initiated, INITIAL COOLER TEMPERATURES °C, FINAL COOLER TEMPERATURES °C

SHIPMENT RELEASE (client use), Released by: [Signature], Date:

INITIAL SHIPMENT RECEPTION (lab use only), Time, Received by: [Signature], Date:

FINAL SHIPMENT RECEPTION (lab use only), Time, Received by: [Signature], Date: July 9/20



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 31-JUL-20
Report Date: 10-AUG-20 14:31 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2482453

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2482453-1 W-11210029-20200730-20 Sampled By: CLIENT on 30-JUL-20 @ 14:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0034		0.0030	mg/L	04-AUG-20	05-AUG-20	R5174545
Total Metals							
Aluminum (Al)-Total	0.0080		0.0050	mg/L	03-AUG-20	04-AUG-20	R5174048
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Arsenic (As)-Total	0.00362		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Barium (Ba)-Total	0.0705		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	03-AUG-20	04-AUG-20	R5174048
Boron (B)-Total	0.014		0.010	mg/L	03-AUG-20	04-AUG-20	R5174048
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	03-AUG-20	04-AUG-20	R5174048
Calcium (Ca)-Total	47.8		0.050	mg/L	03-AUG-20	04-AUG-20	R5174048
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	03-AUG-20	04-AUG-20	R5174048
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	03-AUG-20	04-AUG-20	R5174048
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Copper (Cu)-Total	<0.00050		0.00050	mg/L	03-AUG-20	04-AUG-20	R5174048
Iron (Fe)-Total	0.265		0.010	mg/L	03-AUG-20	04-AUG-20	R5174048
Lead (Pb)-Total	<0.000050		0.000050	mg/L	03-AUG-20	04-AUG-20	R5174048
Lithium (Li)-Total	0.0036		0.0010	mg/L	03-AUG-20	04-AUG-20	R5174048
Magnesium (Mg)-Total	26.6		0.0050	mg/L	03-AUG-20	04-AUG-20	R5174048
Manganese (Mn)-Total	0.00761		0.00050	mg/L	03-AUG-20	04-AUG-20	R5174048
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		04-AUG-20	R5173955
Molybdenum (Mo)-Total	0.000668		0.000050	mg/L	03-AUG-20	04-AUG-20	R5174048
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	03-AUG-20	04-AUG-20	R5174048
Phosphorus (P)-Total	<0.050		0.050	mg/L	03-AUG-20	04-AUG-20	R5174048
Potassium (K)-Total	0.991		0.050	mg/L	03-AUG-20	04-AUG-20	R5174048
Rubidium (Rb)-Total	0.00038		0.00020	mg/L	03-AUG-20	04-AUG-20	R5174048
Selenium (Se)-Total	<0.000050		0.000050	mg/L	03-AUG-20	04-AUG-20	R5174048
Silicon (Si)-Total	7.43		0.10	mg/L	03-AUG-20	04-AUG-20	R5174048
Silver (Ag)-Total	<0.000050		0.000050	mg/L	03-AUG-20	04-AUG-20	R5174048
Sodium (Na)-Total	5.97		0.050	mg/L	03-AUG-20	04-AUG-20	R5174048
Strontium (Sr)-Total	0.356		0.0010	mg/L	03-AUG-20	04-AUG-20	R5174048
Sulfur (S)-Total	8.04		0.50	mg/L	03-AUG-20	04-AUG-20	R5174048
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	03-AUG-20	04-AUG-20	R5174048
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	03-AUG-20	04-AUG-20	R5174048
Thorium (Th)-Total	<0.00010		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Tin (Sn)-Total	<0.00010		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	03-AUG-20	04-AUG-20	R5174048
Tungsten (W)-Total	<0.00010		0.00010	mg/L	03-AUG-20	04-AUG-20	R5174048
Uranium (U)-Total	0.000397		0.000010	mg/L	03-AUG-20	04-AUG-20	R5174048
Vanadium (V)-Total	<0.00050		0.00050	mg/L	03-AUG-20	04-AUG-20	R5174048
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	03-AUG-20	04-AUG-20	R5174048

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2482453-1 W-11210029-20200730-20 Sampled By: CLIENT on 30-JUL-20 @ 14:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	03-AUG-20	04-AUG-20	R5174048
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		05-AUG-20	R5174674
Volatile Organic Compounds							
Acetone	<30		30	ug/L		10-AUG-20	R5177302
Benzene	<0.50		0.50	ug/L		10-AUG-20	R5177302
Bromodichloromethane	<2.0		2.0	ug/L		10-AUG-20	R5177302
Bromoform	<5.0		5.0	ug/L		10-AUG-20	R5177302
Bromomethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
Carbon tetrachloride	<0.20		0.20	ug/L		10-AUG-20	R5177302
Chlorobenzene	<0.50		0.50	ug/L		10-AUG-20	R5177302
Dibromochloromethane	<2.0		2.0	ug/L		10-AUG-20	R5177302
Chloroform	<1.0		1.0	ug/L		10-AUG-20	R5177302
1,2-Dibromoethane	<0.20		0.20	ug/L		10-AUG-20	R5177302
1,2-Dichlorobenzene	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,3-Dichlorobenzene	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,4-Dichlorobenzene	<0.50		0.50	ug/L		10-AUG-20	R5177302
Dichlorodifluoromethane	<2.0		2.0	ug/L		10-AUG-20	R5177302
1,1-Dichloroethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,2-Dichloroethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,1-Dichloroethylene	<0.50		0.50	ug/L		10-AUG-20	R5177302
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-AUG-20	R5177302
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		10-AUG-20	R5177302
Methylene Chloride	<5.0		5.0	ug/L		10-AUG-20	R5177302
1,2-Dichloropropane	<0.50		0.50	ug/L		10-AUG-20	R5177302
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		10-AUG-20	R5177302
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		10-AUG-20	R5177302
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		10-AUG-20	
Ethylbenzene	<0.50		0.50	ug/L		10-AUG-20	R5177302
n-Hexane	<0.50		0.50	ug/L		10-AUG-20	R5177302
Methyl Ethyl Ketone	<20		20	ug/L		10-AUG-20	R5177302
Methyl Isobutyl Ketone	<20		20	ug/L		10-AUG-20	R5177302
MTBE	<2.0		2.0	ug/L		10-AUG-20	R5177302
Styrene	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
Tetrachloroethylene	<0.50		0.50	ug/L		10-AUG-20	R5177302
Toluene	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,1,1-Trichloroethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
1,1,2-Trichloroethane	<0.50		0.50	ug/L		10-AUG-20	R5177302
Trichloroethylene	<0.50		0.50	ug/L		10-AUG-20	R5177302

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2482453-1 W-11210029-20200730-20							
Sampled By: CLIENT on 30-JUL-20 @ 14:00							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		10-AUG-20	R5177302
Vinyl chloride	<0.50		0.50	ug/L		10-AUG-20	R5177302
o-Xylene	<0.30		0.30	ug/L		10-AUG-20	R5177302
m+p-Xylenes	<0.40		0.40	ug/L		10-AUG-20	R5177302
Xylenes (Total)	<0.50		0.50	ug/L		10-AUG-20	
Surrogate: 4-Bromofluorobenzene	100.5		70-130	%		10-AUG-20	R5177302
Surrogate: 1,4-Difluorobenzene	100.8		70-130	%		10-AUG-20	R5177302
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		10-AUG-20	R5177302
F1-BTEX	<25		25	ug/L		10-AUG-20	
F2 (C10-C16)	<100		100	ug/L	05-AUG-20	06-AUG-20	R5175662
F2-Naphth	<100		100	ug/L		10-AUG-20	
F3 (C16-C34)	<250		250	ug/L	05-AUG-20	06-AUG-20	R5175662
F3-PAH	<250		250	ug/L		10-AUG-20	
F4 (C34-C50)	<250		250	ug/L	05-AUG-20	06-AUG-20	R5175662
Total Hydrocarbons (C6-C50)	<370		370	ug/L		10-AUG-20	
Chrom. to baseline at nC50	YES				05-AUG-20	06-AUG-20	R5175662
Surrogate: 2-Bromobenzotrifluoride	77.2		60-140	%	05-AUG-20	06-AUG-20	R5175662
Surrogate: 3,4-Dichlorotoluene	83.4		60-140	%		10-AUG-20	R5177302
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Acenaphthylene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Anthracene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Benzo(a)anthracene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Benzo(a)pyrene	<0.010		0.010	ug/L	05-AUG-20	10-AUG-20	R5175497
Benzo(b)fluoranthene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Benzo(k)fluoranthene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Chrysene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Fluoranthene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Fluorene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		10-AUG-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
2-Methylnaphthalene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Naphthalene	<0.050		0.050	ug/L	05-AUG-20	10-AUG-20	R5175497
Phenanthrene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Pyrene	<0.020		0.020	ug/L	05-AUG-20	10-AUG-20	R5175497
Surrogate: d10-Acenaphthene	97.3		60-140	%	05-AUG-20	10-AUG-20	R5175497
Surrogate: d12-Chrysene	84.1		60-140	%	05-AUG-20	10-AUG-20	R5175497

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2482453-1 W-11210029-20200730-20 Sampled By: CLIENT on 30-JUL-20 @ 14:00 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	94.0		60-140	%	05-AUG-20	10-AUG-20	R5175497
Surrogate: d10-Phenanthrene	94.6		60-140	%	05-AUG-20	10-AUG-20	R5175497
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
4-Chloroaniline	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
2-Chlorophenol	<0.30		0.30	ug/L	04-AUG-20	06-AUG-20	R5174850
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4-Dichlorophenol	<0.30		0.30	ug/L	04-AUG-20	06-AUG-20	R5174850
Diethylphthalate	<0.20		0.20	ug/L	04-AUG-20	06-AUG-20	R5174850
Dimethylphthalate	<0.20		0.20	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4-Dimethylphenol	<0.50		0.50	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4-Dinitrophenol	<1.0		1.0	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4-Dinitrotoluene	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
2,6-Dinitrotoluene	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	04-AUG-20	06-AUG-20	R5174850
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	04-AUG-20	06-AUG-20	R5174850
Pentachlorophenol	<0.50		0.50	ug/L	04-AUG-20	06-AUG-20	R5174850
Phenol	<0.50		0.50	ug/L	04-AUG-20	06-AUG-20	R5174850
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	04-AUG-20	06-AUG-20	R5174850
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	04-AUG-20	06-AUG-20	R5174850
Surrogate: 2-Fluorobiphenyl	102.1		50-140	%	04-AUG-20	06-AUG-20	R5174850
Surrogate: Nitrobenzene d5	114.9		50-140	%	04-AUG-20	06-AUG-20	R5174850
Surrogate: p-Terphenyl d14	133.1		60-140	%	04-AUG-20	06-AUG-20	R5174850
Surrogate: 2,4,6-Tribromophenol	143.6	SURR-ND	50-140	%	04-AUG-20	06-AUG-20	R5174850
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	05-AUG-20	05-AUG-20	R5174435
Aroclor 1248	<0.020		0.020	ug/L	05-AUG-20	05-AUG-20	R5174435
Aroclor 1254	<0.020		0.020	ug/L	05-AUG-20	05-AUG-20	R5174435
Aroclor 1260	<0.020		0.020	ug/L	05-AUG-20	05-AUG-20	R5174435
Surrogate: Decachlorobiphenyl	109.9		50-150	%	05-AUG-20	05-AUG-20	R5174435
Total PCBs	<0.040		0.040	ug/L	05-AUG-20	05-AUG-20	R5174435
Surrogate: Tetrachloro-m-xylene	91.2		50-150	%	05-AUG-20	05-AUG-20	R5174435

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	2,4-Dinitrotoluene	LCS-H	L2482453-1
Laboratory Control Sample	Diethylphthalate	LCS-H	L2482453-1
Laboratory Control Sample	Pentachlorophenol	LCS-H	L2482453-1
Laboratory Control Sample	1,1-Dichloroethane	MES	L2482453-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2482453-1
Matrix Spike	Boron (B)-Total	MS-B	L2482453-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2482453-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2482453-1
Matrix Spike	Lithium (Li)-Total	MS-B	L2482453-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2482453-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2482453-1
Matrix Spike	Molybdenum (Mo)-Total	MS-B	L2482453-1
Matrix Spike	Potassium (K)-Total	MS-B	L2482453-1
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2482453-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2482453-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2482453-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2482453-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2482453-1
Matrix Spike	Uranium (U)-Total	MS-B	L2482453-1

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
SURR-ND	Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Reference Information

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

XYLENES-SUM-CALC- WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2482453

Report Date: 10-AUG-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5174850							
WG3375544-2	LCS							
1,2,4-Trichlorobenzene			102.8		%		50-140	06-AUG-20
2-Chlorophenol			103.6		%		50-140	06-AUG-20
2,4-Dichlorophenol			117.8		%		50-140	06-AUG-20
2,4-Dimethylphenol			115.5		%		30-130	06-AUG-20
2,4-Dinitrophenol			136.4		%		50-140	06-AUG-20
2,4-Dinitrotoluene			142.7	LCS-H	%		50-140	06-AUG-20
2,4,5-Trichlorophenol			122.5		%		50-140	06-AUG-20
2,4,6-Trichlorophenol			121.1		%		50-140	06-AUG-20
2,6-Dinitrotoluene			121.9		%		50-140	06-AUG-20
3,3'-Dichlorobenzidine			96.6		%		30-130	06-AUG-20
4-Chloroaniline			80.4		%		30-130	06-AUG-20
Biphenyl			117.1		%		50-140	06-AUG-20
Bis(2-chloroethyl)ether			119.3		%		50-140	06-AUG-20
Bis(2-chloroisopropyl)ether			135.3		%		50-140	06-AUG-20
Bis(2-ethylhexyl)phthalate			131.1		%		50-140	06-AUG-20
Diethylphthalate			142.3	LCS-H	%		50-140	06-AUG-20
Dimethylphthalate			127.8		%		50-140	06-AUG-20
Pentachlorophenol			143.5	LCS-H	%		50-140	06-AUG-20
Phenol			113.4		%		30-130	06-AUG-20
WG3375544-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	06-AUG-20
2-Chlorophenol			<0.30		ug/L		0.3	06-AUG-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	06-AUG-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	06-AUG-20
2,4-Dinitrophenol			<1.0		ug/L		1	06-AUG-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	06-AUG-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	06-AUG-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	06-AUG-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	06-AUG-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	06-AUG-20
4-Chloroaniline			<0.40		ug/L		0.4	06-AUG-20
Biphenyl			<0.40		ug/L		0.4	06-AUG-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	06-AUG-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	06-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5174850								
WG3375544-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	06-AUG-20
Diethylphthalate			<0.20		ug/L		0.2	06-AUG-20
Dimethylphthalate			<0.20		ug/L		0.2	06-AUG-20
Pentachlorophenol			<0.50		ug/L		0.5	06-AUG-20
Phenol			<0.50		ug/L		0.5	06-AUG-20
Surrogate: 2-Fluorobiphenyl			70.2		%		50-140	06-AUG-20
Surrogate: 2,4,6-Tribromophenol			69.3		%		50-140	06-AUG-20
Surrogate: Nitrobenzene d5			78.5		%		50-140	06-AUG-20
Surrogate: p-Terphenyl d14			104.3		%		60-140	06-AUG-20
CR-CR6-IC-WT Water								
Batch R5174674								
WG3375769-4 DUP								
Chromium, Hexavalent		WG3375769-3	<0.00050	RPD-NA	mg/L	N/A	20	04-AUG-20
WG3375769-2 LCS								
Chromium, Hexavalent			104.2		%		80-120	04-AUG-20
WG3375769-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	04-AUG-20
WG3375769-5 MS								
Chromium, Hexavalent		WG3375769-3	105.3		%		70-130	04-AUG-20
F1-HS-511-WT Water								
Batch R5177302								
WG3379017-4 DUP								
F1 (C6-C10)		WG3379017-3	<25	RPD-NA	ug/L	N/A	30	10-AUG-20
WG3379017-1 LCS								
F1 (C6-C10)			109.0		%		80-120	10-AUG-20
WG3379017-2 MB								
F1 (C6-C10)			<25		ug/L		25	10-AUG-20
Surrogate: 3,4-Dichlorotoluene			81.0		%		60-140	10-AUG-20
WG3379017-5 MS								
F1 (C6-C10)		WG3379017-3	97.1		%		60-140	10-AUG-20
F2-F4-511-WT Water								
Batch R5175662								
WG3376478-2 LCS								
F2 (C10-C16)			102.4		%		70-130	06-AUG-20
F3 (C16-C34)			102.9		%		70-130	06-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch	R5175662							
WG3376478-2	LCS							
F4 (C34-C50)			105.3		%		70-130	06-AUG-20
WG3376478-1	MB							
F2 (C10-C16)			<100		ug/L		100	06-AUG-20
F3 (C16-C34)			<250		ug/L		250	06-AUG-20
F4 (C34-C50)			<250		ug/L		250	06-AUG-20
Surrogate: 2-Bromobenzotrifluoride			79.7		%		60-140	06-AUG-20
HG-T-CVAA-WT		Water						
Batch	R5173955							
WG3375674-4	DUP	WG3375674-3						
Mercury (Hg)-Total		0.0000067	0.0000081		mg/L	19	20	04-AUG-20
WG3375674-2	LCS							
Mercury (Hg)-Total			108.0		%		80-120	04-AUG-20
WG3375674-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	04-AUG-20
WG3375674-6	MS	WG3375674-5						
Mercury (Hg)-Total			113.0		%		70-130	04-AUG-20
MET-T-CCMS-WT		Water						
Batch	R5174048							
WG3375503-4	DUP	WG3375503-3						
Aluminum (Al)-Total		<0.25	<0.25	RPD-NA	mg/L	N/A	20	04-AUG-20
Antimony (Sb)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-AUG-20
Arsenic (As)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-AUG-20
Barium (Ba)-Total		0.0315	0.0324		mg/L	2.7	20	04-AUG-20
Beryllium (Be)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-AUG-20
Bismuth (Bi)-Total		<0.0025	<0.0025	RPD-NA	mg/L	N/A	20	04-AUG-20
Boron (B)-Total		23.2	23.7		mg/L	1.9	20	04-AUG-20
Cadmium (Cd)-Total		<0.00025	<0.00025	RPD-NA	mg/L	N/A	20	04-AUG-20
Calcium (Ca)-Total		355	363		mg/L	2.2	20	04-AUG-20
Chromium (Cr)-Total		<0.025	<0.025	RPD-NA	mg/L	N/A	20	04-AUG-20
Cesium (Cs)-Total		<0.00050	0.00057	RPD-NA	mg/L	N/A	20	04-AUG-20
Cobalt (Co)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-AUG-20
Copper (Cu)-Total		<0.025	<0.025	RPD-NA	mg/L	N/A	20	04-AUG-20
Iron (Fe)-Total		<0.50	0.54	RPD-NA	mg/L	N/A	20	04-AUG-20
Lead (Pb)-Total		<0.0025	<0.0025	RPD-NA	mg/L	N/A	20	04-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5174048							
WG3375503-4	DUP	WG3375503-3						
Lithium (Li)-Total		0.623	0.624		mg/L	0.2	20	04-AUG-20
Magnesium (Mg)-Total		34.4	35.3		mg/L	2.6	20	04-AUG-20
Manganese (Mn)-Total		0.284	0.313		mg/L	9.7	20	04-AUG-20
Molybdenum (Mo)-Total		0.204	0.209		mg/L	2.2	20	04-AUG-20
Nickel (Ni)-Total		<0.025	<0.025	RPD-NA	mg/L	N/A	20	04-AUG-20
Phosphorus (P)-Total		<2.5	<2.5	RPD-NA	mg/L	N/A	20	04-AUG-20
Potassium (K)-Total		48.9	50.9		mg/L	4.0	20	04-AUG-20
Rubidium (Rb)-Total		0.081	0.084		mg/L	2.8	20	04-AUG-20
Selenium (Se)-Total		<0.0025	<0.0025	RPD-NA	mg/L	N/A	20	04-AUG-20
Silicon (Si)-Total		<5.0	<5.0	RPD-NA	mg/L	N/A	20	04-AUG-20
Silver (Ag)-Total		<0.0025	<0.0025	RPD-NA	mg/L	N/A	20	04-AUG-20
Sodium (Na)-Total		146	148		mg/L	1.7	20	04-AUG-20
Strontium (Sr)-Total		6.38	6.68		mg/L	4.5	20	04-AUG-20
Sulfur (S)-Total		432	442		mg/L	2.2	25	04-AUG-20
Thallium (Tl)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	04-AUG-20
Tellurium (Te)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	04-AUG-20
Thorium (Th)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	25	04-AUG-20
Tin (Sn)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-AUG-20
Titanium (Ti)-Total		<0.015	<0.015	RPD-NA	mg/L	N/A	20	04-AUG-20
Tungsten (W)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	04-AUG-20
Uranium (U)-Total		0.00151	0.00158		mg/L	4.7	20	04-AUG-20
Vanadium (V)-Total		<0.025	<0.025	RPD-NA	mg/L	N/A	20	04-AUG-20
Zinc (Zn)-Total		<0.15	<0.15	RPD-NA	mg/L	N/A	20	04-AUG-20
Zirconium (Zr)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	04-AUG-20
WG3375503-2	LCS							
Aluminum (Al)-Total			99.1		%		80-120	04-AUG-20
Antimony (Sb)-Total			98.6		%		80-120	04-AUG-20
Arsenic (As)-Total			97.5		%		80-120	04-AUG-20
Barium (Ba)-Total			95.7		%		80-120	04-AUG-20
Beryllium (Be)-Total			94.7		%		80-120	04-AUG-20
Bismuth (Bi)-Total			94.3		%		80-120	04-AUG-20
Boron (B)-Total			91.9		%		80-120	04-AUG-20
Cadmium (Cd)-Total			95.4		%		80-120	04-AUG-20



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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5174048							
WG3375503-2	LCS							
Calcium (Ca)-Total			93.8		%		80-120	04-AUG-20
Chromium (Cr)-Total			97.2		%		80-120	04-AUG-20
Cesium (Cs)-Total			95.3		%		80-120	04-AUG-20
Cobalt (Co)-Total			95.5		%		80-120	04-AUG-20
Copper (Cu)-Total			94.8		%		80-120	04-AUG-20
Iron (Fe)-Total			95.4		%		80-120	04-AUG-20
Lead (Pb)-Total			96.5		%		80-120	04-AUG-20
Lithium (Li)-Total			95.7		%		80-120	04-AUG-20
Magnesium (Mg)-Total			104.3		%		80-120	04-AUG-20
Manganese (Mn)-Total			96.3		%		80-120	04-AUG-20
Molybdenum (Mo)-Total			95.0		%		80-120	04-AUG-20
Nickel (Ni)-Total			95.6		%		80-120	04-AUG-20
Phosphorus (P)-Total			105.0		%		70-130	04-AUG-20
Potassium (K)-Total			93.7		%		80-120	04-AUG-20
Rubidium (Rb)-Total			97.6		%		80-120	04-AUG-20
Selenium (Se)-Total			96.7		%		80-120	04-AUG-20
Silicon (Si)-Total			97.0		%		60-140	04-AUG-20
Silver (Ag)-Total			95.3		%		80-120	04-AUG-20
Sodium (Na)-Total			99.4		%		80-120	04-AUG-20
Strontium (Sr)-Total			98.5		%		80-120	04-AUG-20
Sulfur (S)-Total			95.3		%		80-120	04-AUG-20
Thallium (Tl)-Total			96.8		%		80-120	04-AUG-20
Tellurium (Te)-Total			90.6		%		80-120	04-AUG-20
Thorium (Th)-Total			93.0		%		70-130	04-AUG-20
Tin (Sn)-Total			93.9		%		80-120	04-AUG-20
Titanium (Ti)-Total			96.6		%		80-120	04-AUG-20
Tungsten (W)-Total			96.7		%		80-120	04-AUG-20
Uranium (U)-Total			94.6		%		80-120	04-AUG-20
Vanadium (V)-Total			98.2		%		80-120	04-AUG-20
Zinc (Zn)-Total			97.8		%		80-120	04-AUG-20
Zirconium (Zr)-Total			93.3		%		80-120	04-AUG-20
WG3375503-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	04-AUG-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	04-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5174048							
WG3375503-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	04-AUG-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	04-AUG-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	04-AUG-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	04-AUG-20
Boron (B)-Total			<0.010		mg/L		0.01	04-AUG-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	04-AUG-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	04-AUG-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	04-AUG-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	04-AUG-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	04-AUG-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	04-AUG-20
Iron (Fe)-Total			<0.010		mg/L		0.01	04-AUG-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	04-AUG-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	04-AUG-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	04-AUG-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	04-AUG-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	04-AUG-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	04-AUG-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	04-AUG-20
Potassium (K)-Total			<0.050		mg/L		0.05	04-AUG-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	04-AUG-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	04-AUG-20
Silicon (Si)-Total			<0.10		mg/L		0.1	04-AUG-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	04-AUG-20
Sodium (Na)-Total			<0.050		mg/L		0.05	04-AUG-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	04-AUG-20
Sulfur (S)-Total			<0.50		mg/L		0.5	04-AUG-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	04-AUG-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	04-AUG-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	04-AUG-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	04-AUG-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	04-AUG-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	04-AUG-20



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 455 PHILLIP STREET
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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5174048							
WG3375503-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	04-AUG-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	04-AUG-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	04-AUG-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	04-AUG-20
WG3375503-5 MS		WG3375503-3						
Aluminum (Al)-Total			116.8		%		70-130	04-AUG-20
Antimony (Sb)-Total			100.7		%		70-130	04-AUG-20
Arsenic (As)-Total			102.3		%		70-130	04-AUG-20
Barium (Ba)-Total			N/A	MS-B	%		-	04-AUG-20
Beryllium (Be)-Total			90.6		%		70-130	04-AUG-20
Bismuth (Bi)-Total			96.4		%		70-130	04-AUG-20
Boron (B)-Total			N/A	MS-B	%		-	04-AUG-20
Cadmium (Cd)-Total			101.5		%		70-130	04-AUG-20
Calcium (Ca)-Total			N/A	MS-B	%		-	04-AUG-20
Chromium (Cr)-Total			100.2		%		70-130	04-AUG-20
Cesium (Cs)-Total			101.1		%		70-130	04-AUG-20
Cobalt (Co)-Total			102.1		%		70-130	04-AUG-20
Iron (Fe)-Total			N/A	MS-B	%		-	04-AUG-20
Lead (Pb)-Total			96.4		%		70-130	04-AUG-20
Lithium (Li)-Total			N/A	MS-B	%		-	04-AUG-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	04-AUG-20
Manganese (Mn)-Total			N/A	MS-B	%		-	04-AUG-20
Molybdenum (Mo)-Total			N/A	MS-B	%		-	04-AUG-20
Nickel (Ni)-Total			101.6		%		70-130	04-AUG-20
Potassium (K)-Total			N/A	MS-B	%		-	04-AUG-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	04-AUG-20
Selenium (Se)-Total			105.4		%		70-130	04-AUG-20
Silicon (Si)-Total			N/A	MS-B	%		-	04-AUG-20
Silver (Ag)-Total			99.0		%		70-130	04-AUG-20
Sodium (Na)-Total			N/A	MS-B	%		-	04-AUG-20
Strontium (Sr)-Total			N/A	MS-B	%		-	04-AUG-20
Sulfur (S)-Total			N/A	MS-B	%		-	04-AUG-20
Thallium (Tl)-Total			97.6		%		70-130	04-AUG-20
Thorium (Th)-Total			82.9		%		70-130	04-AUG-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5174048							
WG3375503-5 MS		WG3375503-3						
Tin (Sn)-Total			99.1		%		70-130	04-AUG-20
Titanium (Ti)-Total			95.8		%		70-130	04-AUG-20
Tungsten (W)-Total			101.2		%		70-130	04-AUG-20
Uranium (U)-Total			N/A	MS-B	%		-	04-AUG-20
Vanadium (V)-Total			97.9		%		70-130	04-AUG-20
Zinc (Zn)-Total			109.1		%		70-130	04-AUG-20
Zirconium (Zr)-Total			80.8		%		70-130	04-AUG-20
P-T-COL-WT								
	Water							
Batch	R5174545							
WG3375010-3 DUP		L2482453-1						
Phosphorus, Total		0.0034	0.0038		mg/L	11	20	05-AUG-20
WG3375010-2 LCS								
Phosphorus, Total			100.8		%		80-120	05-AUG-20
WG3375010-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	05-AUG-20
WG3375010-4 MS		L2482453-1						
Phosphorus, Total			99.0		%		70-130	05-AUG-20
PAH-511-WT								
	Water							
Batch	R5175497							
WG3376478-2 LCS								
1-Methylnaphthalene			104.7		%		50-140	06-AUG-20
2-Methylnaphthalene			104.1		%		50-140	06-AUG-20
Acenaphthene			122.3		%		50-140	06-AUG-20
Acenaphthylene			114.5		%		50-140	06-AUG-20
Anthracene			121.1		%		50-140	06-AUG-20
Benzo(a)anthracene			130.7		%		50-140	06-AUG-20
Benzo(a)pyrene			118.8		%		50-140	06-AUG-20
Benzo(b)fluoranthene			133.5		%		50-140	06-AUG-20
Benzo(g,h,i)perylene			134.2		%		50-140	06-AUG-20
Benzo(k)fluoranthene			125.4		%		50-140	06-AUG-20
Chrysene			134.2		%		50-140	06-AUG-20
Dibenzo(ah)anthracene			111.5		%		50-140	06-AUG-20
Fluoranthene			126.6		%		50-140	06-AUG-20
Fluorene			119.8		%		50-140	06-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT		Water						
Batch	R5175497							
WG3376478-2	LCS							
Indeno(1,2,3-cd)pyrene			134.2		%		50-140	06-AUG-20
Naphthalene			108.9		%		50-140	06-AUG-20
Phenanthrene			125.0		%		50-140	06-AUG-20
Pyrene			128.7		%		50-140	06-AUG-20
WG3376478-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	06-AUG-20
2-Methylnaphthalene			<0.020		ug/L		0.02	06-AUG-20
Acenaphthene			<0.020		ug/L		0.02	06-AUG-20
Acenaphthylene			<0.020		ug/L		0.02	06-AUG-20
Anthracene			<0.020		ug/L		0.02	06-AUG-20
Benzo(a)anthracene			<0.020		ug/L		0.02	06-AUG-20
Benzo(a)pyrene			<0.010		ug/L		0.01	06-AUG-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	06-AUG-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	06-AUG-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	06-AUG-20
Chrysene			<0.020		ug/L		0.02	06-AUG-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	06-AUG-20
Fluoranthene			<0.020		ug/L		0.02	06-AUG-20
Fluorene			<0.020		ug/L		0.02	06-AUG-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	06-AUG-20
Naphthalene			<0.050		ug/L		0.05	06-AUG-20
Phenanthrene			<0.020		ug/L		0.02	06-AUG-20
Pyrene			<0.020		ug/L		0.02	06-AUG-20
Surrogate: d8-Naphthalene			97.5		%		60-140	06-AUG-20
Surrogate: d10-Phenanthrene			96.4		%		60-140	06-AUG-20
Surrogate: d12-Chrysene			91.7		%		60-140	06-AUG-20
Surrogate: d10-Acenaphthene			98.2		%		60-140	06-AUG-20
PCB-511-WT		Water						
Batch	R5174435							
WG3375619-2	LCS							
Aroclor 1242			118.2		%		60-140	05-AUG-20
Aroclor 1248			119.8		%		60-140	05-AUG-20
Aroclor 1254			116.4		%		60-140	05-AUG-20
Aroclor 1260			93.9		%		60-140	05-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5174435							
WG3375619-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	05-AUG-20
Aroclor 1248			<0.020		ug/L		0.02	05-AUG-20
Aroclor 1254			<0.020		ug/L		0.02	05-AUG-20
Aroclor 1260			<0.020		ug/L		0.02	05-AUG-20
Surrogate: Decachlorobiphenyl			85.6		%		50-150	05-AUG-20
Surrogate: Tetrachloro-m-xylene			85.3		%		50-150	05-AUG-20
VOC-511-HS-WT		Water						
Batch	R5177302							
WG3379017-4	DUP	WG3379017-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	10-AUG-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	10-AUG-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-AUG-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-AUG-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	10-AUG-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	10-AUG-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-AUG-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-AUG-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-AUG-20



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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5177302							
WG3379017-4	DUP	WG3379017-3						
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	10-AUG-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	10-AUG-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	10-AUG-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-AUG-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	10-AUG-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-AUG-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	10-AUG-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	10-AUG-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	10-AUG-20
WG3379017-1	LCS							
1,1,1,2-Tetrachloroethane			93.1		%		70-130	10-AUG-20
1,1,1,2,2-Tetrachloroethane			96.9		%		70-130	10-AUG-20
1,1,1-Trichloroethane			100.1		%		70-130	10-AUG-20
1,1,2-Trichloroethane			101.5		%		70-130	10-AUG-20
1,1-Dichloroethane			138.3	MES	%		70-130	10-AUG-20
1,1-Dichloroethylene			92.2		%		70-130	10-AUG-20
1,2-Dibromoethane			98.8		%		70-130	10-AUG-20
1,2-Dichlorobenzene			99.7		%		70-130	10-AUG-20
1,2-Dichloroethane			96.9		%		70-130	10-AUG-20
1,2-Dichloropropane			97.1		%		70-130	10-AUG-20
1,3-Dichlorobenzene			101.5		%		70-130	10-AUG-20
1,4-Dichlorobenzene			102.2		%		70-130	10-AUG-20
Acetone			114.2		%		60-140	10-AUG-20
Benzene			95.2		%		70-130	10-AUG-20
Bromodichloromethane			104.2		%		70-130	10-AUG-20
Bromoform			93.9		%		70-130	10-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5177302							
WG3379017-1	LCS							
Bromomethane			118.1		%		60-140	10-AUG-20
Carbon tetrachloride			97.3		%		70-130	10-AUG-20
Chlorobenzene			97.7		%		70-130	10-AUG-20
Chloroform			100.3		%		70-130	10-AUG-20
cis-1,2-Dichloroethylene			98.6		%		70-130	10-AUG-20
cis-1,3-Dichloropropene			95.2		%		70-130	10-AUG-20
Dibromochloromethane			94.7		%		70-130	10-AUG-20
Dichlorodifluoromethane			70.4		%		50-140	10-AUG-20
Ethylbenzene			95.4		%		70-130	10-AUG-20
n-Hexane			92.5		%		70-130	10-AUG-20
m+p-Xylenes			94.5		%		70-130	10-AUG-20
Methyl Ethyl Ketone			115.4		%		60-140	10-AUG-20
Methyl Isobutyl Ketone			101.2		%		60-140	10-AUG-20
Methylene Chloride			102.2		%		70-130	10-AUG-20
MTBE			96.9		%		70-130	10-AUG-20
o-Xylene			100.9		%		70-130	10-AUG-20
Styrene			93.9		%		70-130	10-AUG-20
Tetrachloroethylene			102.5		%		70-130	10-AUG-20
Toluene			98.2		%		70-130	10-AUG-20
trans-1,2-Dichloroethylene			96.1		%		70-130	10-AUG-20
trans-1,3-Dichloropropene			101.8		%		70-130	10-AUG-20
Trichloroethylene			100.7		%		70-130	10-AUG-20
Trichlorofluoromethane			94.9		%		60-140	10-AUG-20
Vinyl chloride			92.9		%		60-140	10-AUG-20
WG3379017-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	10-AUG-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	10-AUG-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	10-AUG-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	10-AUG-20
1,1-Dichloroethane			<0.50		ug/L		0.5	10-AUG-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	10-AUG-20
1,2-Dibromoethane			<0.20		ug/L		0.2	10-AUG-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	10-AUG-20
1,2-Dichloroethane			<0.50		ug/L		0.5	10-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5177302							
WG3379017-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	10-AUG-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	10-AUG-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	10-AUG-20
Acetone			<30		ug/L		30	10-AUG-20
Benzene			<0.50		ug/L		0.5	10-AUG-20
Bromodichloromethane			<2.0		ug/L		2	10-AUG-20
Bromoform			<5.0		ug/L		5	10-AUG-20
Bromomethane			<0.50		ug/L		0.5	10-AUG-20
Carbon tetrachloride			<0.20		ug/L		0.2	10-AUG-20
Chlorobenzene			<0.50		ug/L		0.5	10-AUG-20
Chloroform			<1.0		ug/L		1	10-AUG-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	10-AUG-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	10-AUG-20
Dibromochloromethane			<2.0		ug/L		2	10-AUG-20
Dichlorodifluoromethane			<2.0		ug/L		2	10-AUG-20
Ethylbenzene			<0.50		ug/L		0.5	10-AUG-20
n-Hexane			<0.50		ug/L		0.5	10-AUG-20
m+p-Xylenes			<0.40		ug/L		0.4	10-AUG-20
Methyl Ethyl Ketone			<20		ug/L		20	10-AUG-20
Methyl Isobutyl Ketone			<20		ug/L		20	10-AUG-20
Methylene Chloride			<5.0		ug/L		5	10-AUG-20
MTBE			<2.0		ug/L		2	10-AUG-20
o-Xylene			<0.30		ug/L		0.3	10-AUG-20
Styrene			<0.50		ug/L		0.5	10-AUG-20
Tetrachloroethylene			<0.50		ug/L		0.5	10-AUG-20
Toluene			<0.50		ug/L		0.5	10-AUG-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	10-AUG-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	10-AUG-20
Trichloroethylene			<0.50		ug/L		0.5	10-AUG-20
Trichlorofluoromethane			<5.0		ug/L		5	10-AUG-20
Vinyl chloride			<0.50		ug/L		0.5	10-AUG-20
Surrogate: 1,4-Difluorobenzene			100.3		%		70-130	10-AUG-20
Surrogate: 4-Bromofluorobenzene			98.6		%		70-130	10-AUG-20

WG3379017-5 MS

WG3379017-3



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5177302							
WG3379017-5 MS		WG3379017-3						
1,1,1,2-Tetrachloroethane			93.9		%		50-140	10-AUG-20
1,1,2,2-Tetrachloroethane			99.2		%		50-140	10-AUG-20
1,1,1-Trichloroethane			100.9		%		50-140	10-AUG-20
1,1,2-Trichloroethane			99.1		%		50-140	10-AUG-20
1,1-Dichloroethane			100.5		%		50-140	10-AUG-20
1,1-Dichloroethylene			90.6		%		50-140	10-AUG-20
1,2-Dibromoethane			95.8		%		50-140	10-AUG-20
1,2-Dichlorobenzene			99.5		%		50-140	10-AUG-20
1,2-Dichloroethane			92.9		%		50-140	10-AUG-20
1,2-Dichloropropane			94.9		%		50-140	10-AUG-20
1,3-Dichlorobenzene			101.7		%		50-140	10-AUG-20
1,4-Dichlorobenzene			101.8		%		50-140	10-AUG-20
Acetone			102.4		%		50-140	10-AUG-20
Benzene			94.5		%		50-140	10-AUG-20
Bromodichloromethane			102.3		%		50-140	10-AUG-20
Bromoform			92.3		%		50-140	10-AUG-20
Bromomethane			115.1		%		50-140	10-AUG-20
Carbon tetrachloride			98.8		%		50-140	10-AUG-20
Chlorobenzene			98.2		%		50-140	10-AUG-20
Chloroform			99.7		%		50-140	10-AUG-20
cis-1,2-Dichloroethylene			97.8		%		50-140	10-AUG-20
cis-1,3-Dichloropropene			91.2		%		50-140	10-AUG-20
Dibromochloromethane			93.9		%		50-140	10-AUG-20
Dichlorodifluoromethane			68.6		%		50-140	10-AUG-20
Ethylbenzene			97.5		%		50-140	10-AUG-20
n-Hexane			91.0		%		50-140	10-AUG-20
m+p-Xylenes			96.3		%		50-140	10-AUG-20
Methyl Ethyl Ketone			101.0		%		50-140	10-AUG-20
Methyl Isobutyl Ketone			92.8		%		50-140	10-AUG-20
Methylene Chloride			98.5		%		50-140	10-AUG-20
MTBE			97.3		%		50-140	10-AUG-20
o-Xylene			102.6		%		50-140	10-AUG-20
Styrene			94.2		%		50-140	10-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5177302							
WG3379017-5 MS		WG3379017-3						
Tetrachloroethylene			104.9		%		50-140	10-AUG-20
Toluene			99.3		%		50-140	10-AUG-20
trans-1,2-Dichloroethylene			94.9		%		50-140	10-AUG-20
trans-1,3-Dichloropropene			98.4		%		50-140	10-AUG-20
Trichloroethylene			100.8		%		50-140	10-AUG-20
Trichlorofluoromethane			94.1		%		50-140	10-AUG-20
Vinyl chloride			91.8		%		50-140	10-AUG-20

Quality Control Report

Workorder: L2482453

Report Date: 10-AUG-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 16 of 16

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

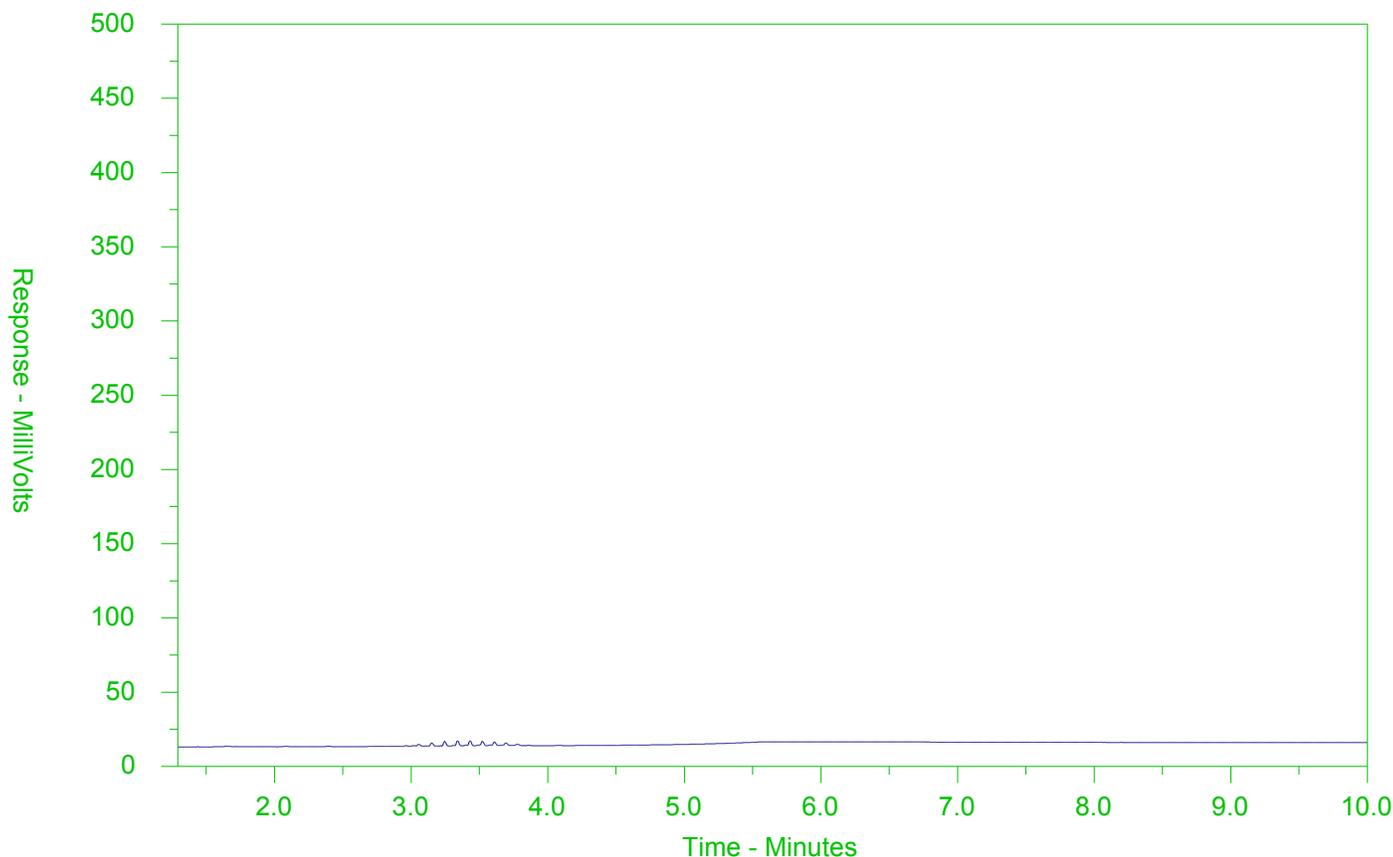
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2482453-1
 Client Sample ID: W-11210029-20200730-20



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 20-AUG-20
Report Date: 01-SEP-20 11:32 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2491984

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2491984-1 W-11210029-20200820-26 Sampled By: CLIENT on 20-AUG-20 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0038		0.0030	mg/L	21-AUG-20	24-AUG-20	R5198138
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	20-AUG-20	21-AUG-20	R5194819
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Arsenic (As)-Total	0.00280		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Barium (Ba)-Total	0.0492		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	20-AUG-20	21-AUG-20	R5194819
Boron (B)-Total	<0.010		0.010	mg/L	20-AUG-20	21-AUG-20	R5194819
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	20-AUG-20	21-AUG-20	R5194819
Calcium (Ca)-Total	68.2		0.050	mg/L	20-AUG-20	21-AUG-20	R5194819
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	20-AUG-20	21-AUG-20	R5194819
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	20-AUG-20	21-AUG-20	R5194819
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Copper (Cu)-Total	0.00222		0.00050	mg/L	20-AUG-20	21-AUG-20	R5194819
Iron (Fe)-Total	0.079		0.010	mg/L	20-AUG-20	21-AUG-20	R5194819
Lead (Pb)-Total	0.000166		0.000050	mg/L	20-AUG-20	21-AUG-20	R5194819
Lithium (Li)-Total	0.0045		0.0010	mg/L	20-AUG-20	21-AUG-20	R5194819
Magnesium (Mg)-Total	34.1		0.0050	mg/L	20-AUG-20	21-AUG-20	R5194819
Manganese (Mn)-Total	0.00968		0.00050	mg/L	20-AUG-20	21-AUG-20	R5194819
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		24-AUG-20	R5198457
Molybdenum (Mo)-Total	0.000589		0.000050	mg/L	20-AUG-20	21-AUG-20	R5194819
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	20-AUG-20	21-AUG-20	R5194819
Phosphorus (P)-Total	<0.050		0.050	mg/L	20-AUG-20	21-AUG-20	R5194819
Potassium (K)-Total	0.937		0.050	mg/L	20-AUG-20	21-AUG-20	R5194819
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	20-AUG-20	21-AUG-20	R5194819
Selenium (Se)-Total	<0.000050		0.000050	mg/L	20-AUG-20	21-AUG-20	R5194819
Silicon (Si)-Total	8.95		0.10	mg/L	20-AUG-20	21-AUG-20	R5194819
Silver (Ag)-Total	<0.000050		0.000050	mg/L	20-AUG-20	21-AUG-20	R5194819
Sodium (Na)-Total	7.88		0.050	mg/L	20-AUG-20	21-AUG-20	R5194819
Strontium (Sr)-Total	0.147		0.0010	mg/L	20-AUG-20	21-AUG-20	R5194819
Sulfur (S)-Total	20.4		0.50	mg/L	20-AUG-20	21-AUG-20	R5194819
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	20-AUG-20	21-AUG-20	R5194819
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	20-AUG-20	21-AUG-20	R5194819
Thorium (Th)-Total	<0.00010		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Tin (Sn)-Total	<0.00010		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	20-AUG-20	21-AUG-20	R5194819
Tungsten (W)-Total	<0.00010		0.00010	mg/L	20-AUG-20	21-AUG-20	R5194819
Uranium (U)-Total	0.000228		0.000010	mg/L	20-AUG-20	21-AUG-20	R5194819
Vanadium (V)-Total	<0.00050		0.00050	mg/L	20-AUG-20	21-AUG-20	R5194819
Zinc (Zn)-Total	0.0041		0.0030	mg/L	20-AUG-20	21-AUG-20	R5194819

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2491984-1 W-11210029-20200820-26 Sampled By: CLIENT on 20-AUG-20 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	20-AUG-20	21-AUG-20	R5194819
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		21-AUG-20	R5198664
Volatile Organic Compounds							
Acetone	<30		30	ug/L		25-AUG-20	R5199516
Benzene	<0.50		0.50	ug/L		25-AUG-20	R5199516
Bromodichloromethane	<2.0		2.0	ug/L		25-AUG-20	R5199516
Bromoform	<5.0		5.0	ug/L		25-AUG-20	R5199516
Bromomethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
Carbon tetrachloride	<0.20		0.20	ug/L		25-AUG-20	R5199516
Chlorobenzene	<0.50		0.50	ug/L		25-AUG-20	R5199516
Dibromochloromethane	<2.0		2.0	ug/L		25-AUG-20	R5199516
Chloroform	<1.0		1.0	ug/L		25-AUG-20	R5199516
1,2-Dibromoethane	<0.20		0.20	ug/L		25-AUG-20	R5199516
1,2-Dichlorobenzene	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,3-Dichlorobenzene	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,4-Dichlorobenzene	<0.50		0.50	ug/L		25-AUG-20	R5199516
Dichlorodifluoromethane	<2.0		2.0	ug/L		25-AUG-20	R5199516
1,1-Dichloroethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,2-Dichloroethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,1-Dichloroethylene	<0.50		0.50	ug/L		25-AUG-20	R5199516
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		25-AUG-20	R5199516
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		25-AUG-20	R5199516
Methylene Chloride	<5.0		5.0	ug/L		25-AUG-20	R5199516
1,2-Dichloropropane	<0.50		0.50	ug/L		25-AUG-20	R5199516
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		25-AUG-20	R5199516
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		25-AUG-20	R5199516
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		25-AUG-20	R5199516
Ethylbenzene	<0.50		0.50	ug/L		25-AUG-20	R5199516
n-Hexane	<0.50		0.50	ug/L		25-AUG-20	R5199516
Methyl Ethyl Ketone	<20		20	ug/L		25-AUG-20	R5199516
Methyl Isobutyl Ketone	<20		20	ug/L		25-AUG-20	R5199516
MTBE	<2.0		2.0	ug/L		25-AUG-20	R5199516
Styrene	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
Tetrachloroethylene	<0.50		0.50	ug/L		25-AUG-20	R5199516
Toluene	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,1,1-Trichloroethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
1,1,2-Trichloroethane	<0.50		0.50	ug/L		25-AUG-20	R5199516
Trichloroethylene	<0.50		0.50	ug/L		25-AUG-20	R5199516

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2491984-1 W-11210029-20200820-26							
Sampled By: CLIENT on 20-AUG-20							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		25-AUG-20	R5199516
Vinyl chloride	<0.50		0.50	ug/L		25-AUG-20	R5199516
o-Xylene	<0.30		0.30	ug/L		25-AUG-20	R5199516
m+p-Xylenes	<0.40		0.40	ug/L		25-AUG-20	R5199516
Xylenes (Total)	<0.50		0.50	ug/L		25-AUG-20	
Surrogate: 4-Bromofluorobenzene	99.2		70-130	%		25-AUG-20	R5199516
Surrogate: 1,4-Difluorobenzene	99.6		70-130	%		25-AUG-20	R5199516
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		25-AUG-20	R5199516
F1-BTEX	<25		25	ug/L		01-SEP-20	
F2 (C10-C16)	<100		100	ug/L	21-AUG-20	24-AUG-20	R5198199
F2-Naphth	<100		100	ug/L		01-SEP-20	
F3 (C16-C34)	<250		250	ug/L	21-AUG-20	24-AUG-20	R5198199
F3-PAH	<250		250	ug/L		01-SEP-20	
F4 (C34-C50)	<250		250	ug/L	21-AUG-20	24-AUG-20	R5198199
Total Hydrocarbons (C6-C50)	<370		370	ug/L		01-SEP-20	
Chrom. to baseline at nC50	YES				21-AUG-20	24-AUG-20	R5198199
Surrogate: 2-Bromobenzotrifluoride	84.0		60-140	%	21-AUG-20	24-AUG-20	R5198199
Surrogate: 3,4-Dichlorotoluene	86.9		60-140	%		25-AUG-20	R5199516
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Acenaphthylene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Anthracene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Benzo(a)anthracene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Benzo(a)pyrene	<0.010		0.010	ug/L	23-AUG-20	25-AUG-20	R5199308
Benzo(b)fluoranthene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Benzo(k)fluoranthene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Chrysene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Fluoranthene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Fluorene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		01-SEP-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
2-Methylnaphthalene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Naphthalene	<0.050		0.050	ug/L	23-AUG-20	25-AUG-20	R5199308
Phenanthrene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Pyrene	<0.020		0.020	ug/L	23-AUG-20	25-AUG-20	R5199308
Surrogate: d10-Acenaphthene	95.6		60-140	%	23-AUG-20	25-AUG-20	R5199308
Surrogate: d12-Chrysene	92.6		60-140	%	23-AUG-20	25-AUG-20	R5199308

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2491984-1 W-11210029-20200820-26 Sampled By: CLIENT on 20-AUG-20 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	88.7		60-140	%	23-AUG-20	25-AUG-20	R5199308
Surrogate: d10-Phenanthrene	89.2		60-140	%	23-AUG-20	25-AUG-20	R5199308
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
4-Chloroaniline	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
2-Chlorophenol	<0.30		0.30	ug/L	31-AUG-20	01-SEP-20	R5207785
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4-Dichlorophenol	<0.30		0.30	ug/L	31-AUG-20	01-SEP-20	R5207785
Diethylphthalate	0.25	RRR	0.20	ug/L	31-AUG-20	01-SEP-20	R5207785
Dimethylphthalate	<0.20		0.20	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4-Dimethylphenol	<0.50		0.50	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4-Dinitrophenol	<1.0		1.0	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4-Dinitrotoluene	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
2,6-Dinitrotoluene	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	31-AUG-20	01-SEP-20	R5207785
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	31-AUG-20	01-SEP-20	R5207785
Pentachlorophenol	<0.50		0.50	ug/L	31-AUG-20	01-SEP-20	R5207785
Phenol	<0.50		0.50	ug/L	31-AUG-20	01-SEP-20	R5207785
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	31-AUG-20	01-SEP-20	R5207785
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	31-AUG-20	01-SEP-20	R5207785
Surrogate: 2-Fluorobiphenyl	88.5		50-140	%	31-AUG-20	01-SEP-20	R5207785
Surrogate: Nitrobenzene d5	104.0		50-140	%	31-AUG-20	01-SEP-20	R5207785
Surrogate: p-Terphenyl d14	112.0		60-140	%	31-AUG-20	01-SEP-20	R5207785
Surrogate: 2,4,6-Tribromophenol	124.7		50-140	%	31-AUG-20	01-SEP-20	R5207785
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	27-AUG-20	27-AUG-20	R5199513
Aroclor 1248	<0.020		0.020	ug/L	27-AUG-20	27-AUG-20	R5199513
Aroclor 1254	<0.020		0.020	ug/L	27-AUG-20	27-AUG-20	R5199513
Aroclor 1260	<0.020		0.020	ug/L	27-AUG-20	27-AUG-20	R5199513
Surrogate: Decachlorobiphenyl	162.2	SURR-ND	50-150	%	27-AUG-20	27-AUG-20	R5199513
Total PCBs	<0.040		0.040	ug/L	27-AUG-20	27-AUG-20	R5199513
Surrogate: Tetrachloro-m-xylene	103.9		50-150	%	27-AUG-20	27-AUG-20	R5199513
Report Remarks : RRR: Although the method blank is non-detect there is a strong peak for Diethylphthalate causing uncertainty near the detection limit, interpret as a maximum value.							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Magnesium (Mg)-Total	B	L2491984-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2491984-1
Matrix Spike	Boron (B)-Total	MS-B	L2491984-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2491984-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2491984-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2491984-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2491984-1
Matrix Spike	Potassium (K)-Total	MS-B	L2491984-1
Matrix Spike	Rubidium (Rb)-Total	MS-B	L2491984-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2491984-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2491984-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2491984-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2491984-1
Matrix Spike	Phosphorus, Total	MS-B	L2491984-1
Matrix Spike	Vinyl chloride	MS-B	L2491984-1
Matrix Spike	cis-1,2-Dichloroethylene	MS-B	L2491984-1

Sample Parameter Qualifier key listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis
SURR-ND	Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Reference Information

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

Reference Information

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2491984

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5207785							
WG3393230-2 LCS								
1,2,4-Trichlorobenzene			50.7		%		50-140	01-SEP-20
2-Chlorophenol			93.4		%		50-140	01-SEP-20
2,4-Dichlorophenol			107.1		%		50-140	01-SEP-20
2,4-Dimethylphenol			112.4		%		30-130	01-SEP-20
2,4-Dinitrophenol			110.6		%		50-140	01-SEP-20
2,4-Dinitrotoluene			134.2		%		50-140	01-SEP-20
2,4,5-Trichlorophenol			112.5		%		50-140	01-SEP-20
2,4,6-Trichlorophenol			111.1		%		50-140	01-SEP-20
2,6-Dinitrotoluene			112.3		%		50-140	01-SEP-20
3,3'-Dichlorobenzidine			87.9		%		30-130	01-SEP-20
4-Chloroaniline			74.4		%		30-130	01-SEP-20
Biphenyl			68.8		%		50-140	01-SEP-20
Bis(2-chloroethyl)ether			101.6		%		50-140	01-SEP-20
Bis(2-chloroisopropyl)ether			86.0		%		50-140	01-SEP-20
Bis(2-ethylhexyl)phthalate			129.8		%		50-140	01-SEP-20
Diethylphthalate			113.6		%		50-140	01-SEP-20
Dimethylphthalate			108.0		%		50-140	01-SEP-20
Pentachlorophenol			135.2		%		50-140	01-SEP-20
Phenol			107.7		%		30-130	01-SEP-20
WG3393230-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	01-SEP-20
2-Chlorophenol			<0.30		ug/L		0.3	01-SEP-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	01-SEP-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	01-SEP-20
2,4-Dinitrophenol			<1.0		ug/L		1	01-SEP-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	01-SEP-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	01-SEP-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	01-SEP-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	01-SEP-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	01-SEP-20
4-Chloroaniline			<0.40		ug/L		0.4	01-SEP-20
Biphenyl			<0.40		ug/L		0.4	01-SEP-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	01-SEP-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	01-SEP-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5207785								
WG3393230-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	01-SEP-20
Diethylphthalate			<0.20		ug/L		0.2	01-SEP-20
Dimethylphthalate			<0.20		ug/L		0.2	01-SEP-20
Pentachlorophenol			<0.50		ug/L		0.5	01-SEP-20
Phenol			<0.50		ug/L		0.5	01-SEP-20
Surrogate: 2-Fluorobiphenyl			120.9		%		50-140	01-SEP-20
Surrogate: 2,4,6-Tribromophenol			91.9		%		50-140	01-SEP-20
Surrogate: Nitrobenzene d5			118.4		%		50-140	01-SEP-20
Surrogate: p-Terphenyl d14			126.9		%		60-140	01-SEP-20
CR-CR6-IC-WT Water								
Batch R5198664								
WG3388497-4 DUP								
Chromium, Hexavalent		WG3388497-3 0.00260	0.00263		mg/L	1.3	20	21-AUG-20
WG3388497-2 LCS								
Chromium, Hexavalent			97.4		%		80-120	21-AUG-20
WG3388497-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	21-AUG-20
WG3388497-5 MS								
Chromium, Hexavalent		WG3388497-3	95.6		%		70-130	21-AUG-20
F1-HS-511-WT Water								
Batch R5199516								
WG3389487-4 DUP								
F1 (C6-C10)		WG3389487-3 <25	<25	RPD-NA	ug/L	N/A	30	25-AUG-20
WG3389487-1 LCS								
F1 (C6-C10)			99.1		%		80-120	24-AUG-20
WG3389487-2 MB								
F1 (C6-C10)			<25		ug/L		25	25-AUG-20
Surrogate: 3,4-Dichlorotoluene			106.1		%		60-140	25-AUG-20
WG3389487-5 MS								
F1 (C6-C10)		WG3389487-3	73.4		%		60-140	25-AUG-20
F2-F4-511-WT Water								
Batch R5198199								
WG3388197-2 LCS								
F2 (C10-C16)			89.8		%		70-130	24-AUG-20
F3 (C16-C34)			98.2		%		70-130	24-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch	R5198199							
WG3388197-2	LCS							
F4 (C34-C50)			108.7		%		70-130	24-AUG-20
WG3388197-1	MB							
F2 (C10-C16)			<100		ug/L		100	24-AUG-20
F3 (C16-C34)			<250		ug/L		250	24-AUG-20
F4 (C34-C50)			<250		ug/L		250	24-AUG-20
Surrogate: 2-Bromobenzotrifluoride			65.7		%		60-140	24-AUG-20
HG-T-CVAA-WT		Water						
Batch	R5198457							
WG3388657-4	DUP	WG3388657-3						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	24-AUG-20
WG3388657-2	LCS							
Mercury (Hg)-Total			117.0		%		80-120	24-AUG-20
WG3388657-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	24-AUG-20
WG3388657-6	MS	WG3388657-5						
Mercury (Hg)-Total			105.4		%		70-130	24-AUG-20
MET-T-CCMS-WT		Water						
Batch	R5194819							
WG3388104-4	DUP	WG3388104-3						
Aluminum (Al)-Total		0.0106	0.0108		mg/L	2.0	20	21-AUG-20
Antimony (Sb)-Total		0.00035	0.00034		mg/L	1.5	20	21-AUG-20
Arsenic (As)-Total		0.00076	0.00073		mg/L	4.0	20	21-AUG-20
Barium (Ba)-Total		0.104	0.104		mg/L	0.4	20	21-AUG-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-AUG-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-AUG-20
Boron (B)-Total		0.067	0.067		mg/L	0.1	20	21-AUG-20
Cadmium (Cd)-Total		0.0000084	0.0000097		mg/L	14	20	21-AUG-20
Calcium (Ca)-Total		47.1	46.5		mg/L	1.1	20	21-AUG-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-AUG-20
Cesium (Cs)-Total		0.000156	0.000154		mg/L	0.9	20	21-AUG-20
Cobalt (Co)-Total		0.00053	0.00052		mg/L	3.1	20	21-AUG-20
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-AUG-20
Iron (Fe)-Total		0.162	0.154		mg/L	4.6	20	21-AUG-20
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5194819							
WG3388104-4	DUP	WG3388104-3						
Lithium (Li)-Total		0.0058	0.0058		mg/L	0.2	20	21-AUG-20
Magnesium (Mg)-Total		14.6	14.3		mg/L	1.9	20	21-AUG-20
Manganese (Mn)-Total		0.140	0.138		mg/L	1.5	20	21-AUG-20
Molybdenum (Mo)-Total		0.00394	0.00398		mg/L	1.1	20	21-AUG-20
Nickel (Ni)-Total		0.00218	0.00219		mg/L	0.4	20	21-AUG-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	21-AUG-20
Potassium (K)-Total		3.72	3.35		mg/L	10	20	21-AUG-20
Rubidium (Rb)-Total		0.00606	0.00587		mg/L	3.3	20	21-AUG-20
Selenium (Se)-Total		0.000120	0.000122		mg/L	1.5	20	21-AUG-20
Silicon (Si)-Total		2.40	2.38		mg/L	0.7	20	21-AUG-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-AUG-20
Sodium (Na)-Total		46.8	46.4		mg/L	1.0	20	21-AUG-20
Strontium (Sr)-Total		0.312	0.308		mg/L	1.5	20	21-AUG-20
Sulfur (S)-Total		25.8	25.6		mg/L	0.7	25	21-AUG-20
Thallium (Tl)-Total		0.000019	0.000019		mg/L	2.7	20	21-AUG-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	21-AUG-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	21-AUG-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-AUG-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	21-AUG-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-AUG-20
Uranium (U)-Total		0.000056	0.000058		mg/L	2.1	20	21-AUG-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-AUG-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	21-AUG-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	21-AUG-20
WG3388104-2	LCS							
Aluminum (Al)-Total			104.4		%		80-120	21-AUG-20
Antimony (Sb)-Total			100.1		%		80-120	21-AUG-20
Arsenic (As)-Total			100.4		%		80-120	21-AUG-20
Barium (Ba)-Total			100.5		%		80-120	21-AUG-20
Beryllium (Be)-Total			103.5		%		80-120	21-AUG-20
Bismuth (Bi)-Total			98.8		%		80-120	21-AUG-20
Boron (B)-Total			100.7		%		80-120	21-AUG-20
Cadmium (Cd)-Total			101.8		%		80-120	21-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5194819							
WG3388104-2	LCS							
Calcium (Ca)-Total			101.6		%		80-120	21-AUG-20
Chromium (Cr)-Total			102.1		%		80-120	21-AUG-20
Cesium (Cs)-Total			97.3		%		80-120	21-AUG-20
Cobalt (Co)-Total			99.5		%		80-120	21-AUG-20
Copper (Cu)-Total			100.2		%		80-120	21-AUG-20
Iron (Fe)-Total			96.7		%		80-120	21-AUG-20
Lead (Pb)-Total			101.4		%		80-120	21-AUG-20
Lithium (Li)-Total			106.6		%		80-120	21-AUG-20
Magnesium (Mg)-Total			106.7		%		80-120	21-AUG-20
Manganese (Mn)-Total			102.2		%		80-120	21-AUG-20
Molybdenum (Mo)-Total			100.8		%		80-120	21-AUG-20
Nickel (Ni)-Total			100.5		%		80-120	21-AUG-20
Phosphorus (P)-Total			105.0		%		70-130	21-AUG-20
Potassium (K)-Total			101.8		%		80-120	21-AUG-20
Rubidium (Rb)-Total			100.6		%		80-120	21-AUG-20
Selenium (Se)-Total			101.6		%		80-120	21-AUG-20
Silicon (Si)-Total			104.6		%		60-140	21-AUG-20
Silver (Ag)-Total			97.5		%		80-120	21-AUG-20
Sodium (Na)-Total			107.2		%		80-120	21-AUG-20
Strontium (Sr)-Total			97.0		%		80-120	21-AUG-20
Sulfur (S)-Total			96.4		%		80-120	21-AUG-20
Thallium (Tl)-Total			96.1		%		80-120	21-AUG-20
Tellurium (Te)-Total			96.4		%		80-120	21-AUG-20
Thorium (Th)-Total			97.1		%		70-130	21-AUG-20
Tin (Sn)-Total			97.2		%		80-120	21-AUG-20
Titanium (Ti)-Total			99.99		%		80-120	21-AUG-20
Tungsten (W)-Total			101.5		%		80-120	21-AUG-20
Uranium (U)-Total			98.4		%		80-120	21-AUG-20
Vanadium (V)-Total			102.4		%		80-120	21-AUG-20
Zinc (Zn)-Total			101.4		%		80-120	21-AUG-20
Zirconium (Zr)-Total			95.3		%		80-120	21-AUG-20
WG3388104-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	21-AUG-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	21-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5194819							
WG3388104-1	MB							
Arsenic (As)-Total			<0.00010		mg/L		0.0001	21-AUG-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	21-AUG-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	21-AUG-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	21-AUG-20
Boron (B)-Total			<0.010		mg/L		0.01	21-AUG-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	21-AUG-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	21-AUG-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	21-AUG-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	21-AUG-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	21-AUG-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	21-AUG-20
Iron (Fe)-Total			<0.010		mg/L		0.01	21-AUG-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	21-AUG-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	21-AUG-20
Magnesium (Mg)-Total			0.0066	B	mg/L		0.005	21-AUG-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	21-AUG-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	21-AUG-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	21-AUG-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	21-AUG-20
Potassium (K)-Total			<0.050		mg/L		0.05	21-AUG-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	21-AUG-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	21-AUG-20
Silicon (Si)-Total			<0.10		mg/L		0.1	21-AUG-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	21-AUG-20
Sodium (Na)-Total			<0.050		mg/L		0.05	21-AUG-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	21-AUG-20
Sulfur (S)-Total			<0.50		mg/L		0.5	21-AUG-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	21-AUG-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	21-AUG-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	21-AUG-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	21-AUG-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	21-AUG-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	21-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5194819							
WG3388104-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	21-AUG-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	21-AUG-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	21-AUG-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	21-AUG-20
WG3388104-5 MS		WG3388104-3						
Aluminum (Al)-Total			97.8		%		70-130	21-AUG-20
Antimony (Sb)-Total			100.9		%		70-130	21-AUG-20
Arsenic (As)-Total			97.2		%		70-130	21-AUG-20
Barium (Ba)-Total			N/A	MS-B	%		-	21-AUG-20
Beryllium (Be)-Total			99.0		%		70-130	21-AUG-20
Bismuth (Bi)-Total			90.0		%		70-130	21-AUG-20
Boron (B)-Total			N/A	MS-B	%		-	21-AUG-20
Cadmium (Cd)-Total			97.1		%		70-130	21-AUG-20
Calcium (Ca)-Total			N/A	MS-B	%		-	21-AUG-20
Chromium (Cr)-Total			98.6		%		70-130	21-AUG-20
Cesium (Cs)-Total			92.1		%		70-130	21-AUG-20
Cobalt (Co)-Total			93.2		%		70-130	21-AUG-20
Copper (Cu)-Total			95.1		%		70-130	21-AUG-20
Iron (Fe)-Total			N/A	MS-B	%		-	21-AUG-20
Lead (Pb)-Total			91.7		%		70-130	21-AUG-20
Lithium (Li)-Total			94.7		%		70-130	21-AUG-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	21-AUG-20
Manganese (Mn)-Total			N/A	MS-B	%		-	21-AUG-20
Molybdenum (Mo)-Total			97.2		%		70-130	21-AUG-20
Nickel (Ni)-Total			94.2		%		70-130	21-AUG-20
Phosphorus (P)-Total			99.4		%		70-130	21-AUG-20
Potassium (K)-Total			N/A	MS-B	%		-	21-AUG-20
Rubidium (Rb)-Total			N/A	MS-B	%		-	21-AUG-20
Selenium (Se)-Total			99.8		%		70-130	21-AUG-20
Silicon (Si)-Total			N/A	MS-B	%		-	21-AUG-20
Silver (Ag)-Total			91.3		%		70-130	21-AUG-20
Sodium (Na)-Total			N/A	MS-B	%		-	21-AUG-20
Strontium (Sr)-Total			N/A	MS-B	%		-	21-AUG-20
Sulfur (S)-Total			N/A	MS-B	%		-	21-AUG-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5194819							
WG3388104-5 MS		WG3388104-3						
Thallium (Tl)-Total			89.5		%		70-130	21-AUG-20
Tellurium (Te)-Total			92.4		%		70-130	21-AUG-20
Thorium (Th)-Total			89.5		%		70-130	21-AUG-20
Tin (Sn)-Total			93.7		%		70-130	21-AUG-20
Titanium (Ti)-Total			95.6		%		70-130	21-AUG-20
Tungsten (W)-Total			96.3		%		70-130	21-AUG-20
Uranium (U)-Total			91.9		%		70-130	21-AUG-20
Vanadium (V)-Total			99.5		%		70-130	21-AUG-20
Zinc (Zn)-Total			95.7		%		70-130	21-AUG-20
Zirconium (Zr)-Total			91.0		%		70-130	21-AUG-20
P-T-COL-WT								
	Water							
Batch	R5198138							
WG3387257-3 DUP		L2491529-1						
Phosphorus, Total		0.232	0.223		mg/L	3.7	20	24-AUG-20
WG3387257-2 LCS								
Phosphorus, Total			96.9		%		80-120	24-AUG-20
WG3387257-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	24-AUG-20
WG3387257-4 MS		L2491529-1						
Phosphorus, Total			N/A	MS-B	%		-	24-AUG-20
PAH-511-WT								
	Water							
Batch	R5199308							
WG3389415-2 LCS								
1-Methylnaphthalene			94.2		%		50-140	24-AUG-20
2-Methylnaphthalene			88.0		%		50-140	24-AUG-20
Acenaphthene			100.7		%		50-140	24-AUG-20
Acenaphthylene			98.1		%		50-140	24-AUG-20
Anthracene			107.4		%		50-140	24-AUG-20
Benzo(a)anthracene			106.0		%		50-140	24-AUG-20
Benzo(a)pyrene			95.8		%		50-140	24-AUG-20
Benzo(b)fluoranthene			82.2		%		50-140	24-AUG-20
Benzo(g,h,i)perylene			98.3		%		50-140	24-AUG-20
Benzo(k)fluoranthene			88.9		%		50-140	24-AUG-20
Chrysene			111.6		%		50-140	24-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5199308							
WG3389415-2	LCS							
Dibenzo(ah)anthracene			101.3		%		50-140	24-AUG-20
Fluoranthene			101.7		%		50-140	24-AUG-20
Fluorene			100.0		%		50-140	24-AUG-20
Indeno(1,2,3-cd)pyrene			109.3		%		50-140	24-AUG-20
Naphthalene			94.3		%		50-140	24-AUG-20
Phenanthrene			103.4		%		50-140	24-AUG-20
Pyrene			103.7		%		50-140	24-AUG-20
WG3389415-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	24-AUG-20
2-Methylnaphthalene			<0.020		ug/L		0.02	24-AUG-20
Acenaphthene			<0.020		ug/L		0.02	24-AUG-20
Acenaphthylene			<0.020		ug/L		0.02	24-AUG-20
Anthracene			<0.020		ug/L		0.02	24-AUG-20
Benzo(a)anthracene			<0.020		ug/L		0.02	24-AUG-20
Benzo(a)pyrene			<0.010		ug/L		0.01	24-AUG-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	24-AUG-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	24-AUG-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	24-AUG-20
Chrysene			<0.020		ug/L		0.02	24-AUG-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	24-AUG-20
Fluoranthene			<0.020		ug/L		0.02	24-AUG-20
Fluorene			<0.020		ug/L		0.02	24-AUG-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	24-AUG-20
Naphthalene			<0.050		ug/L		0.05	24-AUG-20
Phenanthrene			<0.020		ug/L		0.02	24-AUG-20
Pyrene			<0.020		ug/L		0.02	24-AUG-20
Surrogate: d8-Naphthalene			95.0		%		60-140	24-AUG-20
Surrogate: d10-Phenanthrene			103.6		%		60-140	24-AUG-20
Surrogate: d12-Chrysene			107.3		%		60-140	24-AUG-20
Surrogate: d10-Acenaphthene			105.9		%		60-140	24-AUG-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5199513							
WG3387743-2	LCS							
Aroclor 1242			105.9		%		60-140	25-AUG-20
Aroclor 1248			96.9		%		60-140	25-AUG-20
Aroclor 1254			99.2		%		60-140	25-AUG-20
Aroclor 1260			81.1		%		60-140	25-AUG-20
WG3387743-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	25-AUG-20
Aroclor 1248			<0.020		ug/L		0.02	25-AUG-20
Aroclor 1254			<0.020		ug/L		0.02	25-AUG-20
Aroclor 1260			<0.020		ug/L		0.02	25-AUG-20
Surrogate: Decachlorobiphenyl			118.0		%		50-150	25-AUG-20
Surrogate: Tetrachloro-m-xylene			90.0		%		50-150	25-AUG-20
VOC-511-HS-WT		Water						
Batch	R5199516							
WG3389487-4	DUP	WG3389487-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,1-Dichloroethane		0.53	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	25-AUG-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	25-AUG-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-AUG-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	25-AUG-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	25-AUG-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5199516							
WG3389487-4	DUP	WG3389487-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	25-AUG-20
cis-1,2-Dichloroethylene		131	129		ug/L	1.1	30	25-AUG-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-AUG-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-AUG-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-AUG-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	25-AUG-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	25-AUG-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	25-AUG-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	25-AUG-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-AUG-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-AUG-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
trans-1,2-Dichloroethylene		1.70	1.66		ug/L	2.4	30	25-AUG-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-AUG-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-AUG-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	25-AUG-20
Vinyl chloride		855	854		ug/L	0.1	30	25-AUG-20
WG3389487-1	LCS							
1,1,1,2-Tetrachloroethane			96.3		%		70-130	24-AUG-20
1,1,2,2-Tetrachloroethane			95.1		%		70-130	24-AUG-20
1,1,1-Trichloroethane			96.9		%		70-130	24-AUG-20
1,1,2-Trichloroethane			97.0		%		70-130	24-AUG-20
1,1-Dichloroethane			98.9		%		70-130	24-AUG-20
1,1-Dichloroethylene			92.9		%		70-130	24-AUG-20
1,2-Dibromoethane			99.2		%		70-130	24-AUG-20
1,2-Dichlorobenzene			95.5		%		70-130	24-AUG-20
1,2-Dichloroethane			100.2		%		70-130	24-AUG-20
1,2-Dichloropropane			99.5		%		70-130	24-AUG-20
1,3-Dichlorobenzene			93.0		%		70-130	24-AUG-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5199516							
WG3389487-1	LCS							
1,4-Dichlorobenzene			93.1		%		70-130	24-AUG-20
Acetone			114.1		%		60-140	24-AUG-20
Benzene			99.1		%		70-130	24-AUG-20
Bromodichloromethane			105.4		%		70-130	24-AUG-20
Bromoform			98.1		%		70-130	24-AUG-20
Bromomethane			111.5		%		60-140	24-AUG-20
Carbon tetrachloride			96.9		%		70-130	24-AUG-20
Chlorobenzene			95.4		%		70-130	24-AUG-20
Chloroform			101.0		%		70-130	24-AUG-20
cis-1,2-Dichloroethylene			91.5		%		70-130	24-AUG-20
cis-1,3-Dichloropropene			88.5		%		70-130	24-AUG-20
Dibromochloromethane			95.8		%		70-130	24-AUG-20
Dichlorodifluoromethane			86.1		%		50-140	24-AUG-20
Ethylbenzene			93.3		%		70-130	24-AUG-20
n-Hexane			94.5		%		70-130	24-AUG-20
m+p-Xylenes			93.2		%		70-130	24-AUG-20
Methyl Ethyl Ketone			106.2		%		60-140	24-AUG-20
Methyl Isobutyl Ketone			98.8		%		60-140	24-AUG-20
Methylene Chloride			99.6		%		70-130	24-AUG-20
MTBE			94.6		%		70-130	24-AUG-20
o-Xylene			101.2		%		70-130	24-AUG-20
Styrene			96.4		%		70-130	24-AUG-20
Tetrachloroethylene			97.3		%		70-130	24-AUG-20
Toluene			94.1		%		70-130	24-AUG-20
trans-1,2-Dichloroethylene			92.9		%		70-130	24-AUG-20
trans-1,3-Dichloropropene			100.2		%		70-130	24-AUG-20
Trichloroethylene			98.2		%		70-130	24-AUG-20
Trichlorofluoromethane			89.7		%		60-140	24-AUG-20
Vinyl chloride			101.4		%		60-140	24-AUG-20
WG3389487-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	25-AUG-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	25-AUG-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	25-AUG-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	25-AUG-20



Quality Control Report

Workorder: L2491984

Report Date: 01-SEP-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5199516							
WG3389487-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	25-AUG-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	25-AUG-20
1,2-Dibromoethane			<0.20		ug/L		0.2	25-AUG-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	25-AUG-20
1,2-Dichloroethane			<0.50		ug/L		0.5	25-AUG-20
1,2-Dichloropropane			<0.50		ug/L		0.5	25-AUG-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	25-AUG-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	25-AUG-20
Acetone			<30		ug/L		30	25-AUG-20
Benzene			<0.50		ug/L		0.5	25-AUG-20
Bromodichloromethane			<2.0		ug/L		2	25-AUG-20
Bromoform			<5.0		ug/L		5	25-AUG-20
Bromomethane			<0.50		ug/L		0.5	25-AUG-20
Carbon tetrachloride			<0.20		ug/L		0.2	25-AUG-20
Chlorobenzene			<0.50		ug/L		0.5	25-AUG-20
Chloroform			<1.0		ug/L		1	25-AUG-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	25-AUG-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	25-AUG-20
Dibromochloromethane			<2.0		ug/L		2	25-AUG-20
Dichlorodifluoromethane			<2.0		ug/L		2	25-AUG-20
Ethylbenzene			<0.50		ug/L		0.5	25-AUG-20
n-Hexane			<0.50		ug/L		0.5	25-AUG-20
m+p-Xylenes			<0.40		ug/L		0.4	25-AUG-20
Methyl Ethyl Ketone			<20		ug/L		20	25-AUG-20
Methyl Isobutyl Ketone			<20		ug/L		20	25-AUG-20
Methylene Chloride			<5.0		ug/L		5	25-AUG-20
MTBE			<2.0		ug/L		2	25-AUG-20
o-Xylene			<0.30		ug/L		0.3	25-AUG-20
Styrene			<0.50		ug/L		0.5	25-AUG-20
Tetrachloroethylene			<0.50		ug/L		0.5	25-AUG-20
Toluene			<0.50		ug/L		0.5	25-AUG-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	25-AUG-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	25-AUG-20



Environmental

Quality Control Report

Workorder: L2491984

Report Date: 01-SEP-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5199516							
WG3389487-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	25-AUG-20
Trichlorofluoromethane			<5.0		ug/L		5	25-AUG-20
Vinyl chloride			<0.50		ug/L		0.5	25-AUG-20
Surrogate: 1,4-Difluorobenzene			100.1		%		70-130	25-AUG-20
Surrogate: 4-Bromofluorobenzene			99.6		%		70-130	25-AUG-20
WG3389487-5 MS		WG3389487-3						
1,1,1,2-Tetrachloroethane			96.3		%		50-140	25-AUG-20
1,1,1,2,2-Tetrachloroethane			81.5		%		50-140	25-AUG-20
1,1,1-Trichloroethane			100.4		%		50-140	25-AUG-20
1,1,2-Trichloroethane			89.0		%		50-140	25-AUG-20
1,1-Dichloroethane			97.8		%		50-140	25-AUG-20
1,1-Dichloroethylene			92.3		%		50-140	25-AUG-20
1,2-Dibromoethane			88.8		%		50-140	25-AUG-20
1,2-Dichlorobenzene			95.7		%		50-140	25-AUG-20
1,2-Dichloroethane			90.7		%		50-140	25-AUG-20
1,2-Dichloropropane			95.1		%		50-140	25-AUG-20
1,3-Dichlorobenzene			97.1		%		50-140	25-AUG-20
1,4-Dichlorobenzene			95.5		%		50-140	25-AUG-20
Acetone			97.5		%		50-140	25-AUG-20
Benzene			97.5		%		50-140	25-AUG-20
Bromodichloromethane			100.7		%		50-140	25-AUG-20
Bromoform			87.7		%		50-140	25-AUG-20
Bromomethane			104.4		%		50-140	25-AUG-20
Carbon tetrachloride			101.4		%		50-140	25-AUG-20
Chlorobenzene			95.2		%		50-140	25-AUG-20
Chloroform			100.0		%		50-140	25-AUG-20
cis-1,2-Dichloroethylene			N/A	MS-B	%		-	25-AUG-20
cis-1,3-Dichloropropene			80.8		%		50-140	25-AUG-20
Dibromochloromethane			89.6		%		50-140	25-AUG-20
Dichlorodifluoromethane			76.5		%		50-140	25-AUG-20
Ethylbenzene			96.9		%		50-140	25-AUG-20
n-Hexane			94.2		%		50-140	25-AUG-20
m+p-Xylenes			96.1		%		50-140	25-AUG-20
Methyl Ethyl Ketone			83.9		%		50-140	25-AUG-20



Quality Control Report

Workorder: L2491984

Report Date: 01-SEP-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5199516							
WG3389487-5 MS		WG3389487-3						
Methyl Isobutyl Ketone			77.5		%		50-140	25-AUG-20
Methylene Chloride			93.7		%		50-140	25-AUG-20
MTBE			94.6		%		50-140	25-AUG-20
o-Xylene			103.5		%		50-140	25-AUG-20
Styrene			94.2		%		50-140	25-AUG-20
Tetrachloroethylene			102.7		%		50-140	25-AUG-20
Toluene			96.2		%		50-140	25-AUG-20
trans-1,2-Dichloroethylene			90.4		%		50-140	25-AUG-20
trans-1,3-Dichloropropene			91.3		%		50-140	25-AUG-20
Trichloroethylene			100.3		%		50-140	25-AUG-20
Trichlorofluoromethane			90.7		%		50-140	25-AUG-20
Vinyl chloride			N/A	MS-B	%		-	25-AUG-20

Quality Control Report

Workorder: L2491984

Report Date: 01-SEP-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

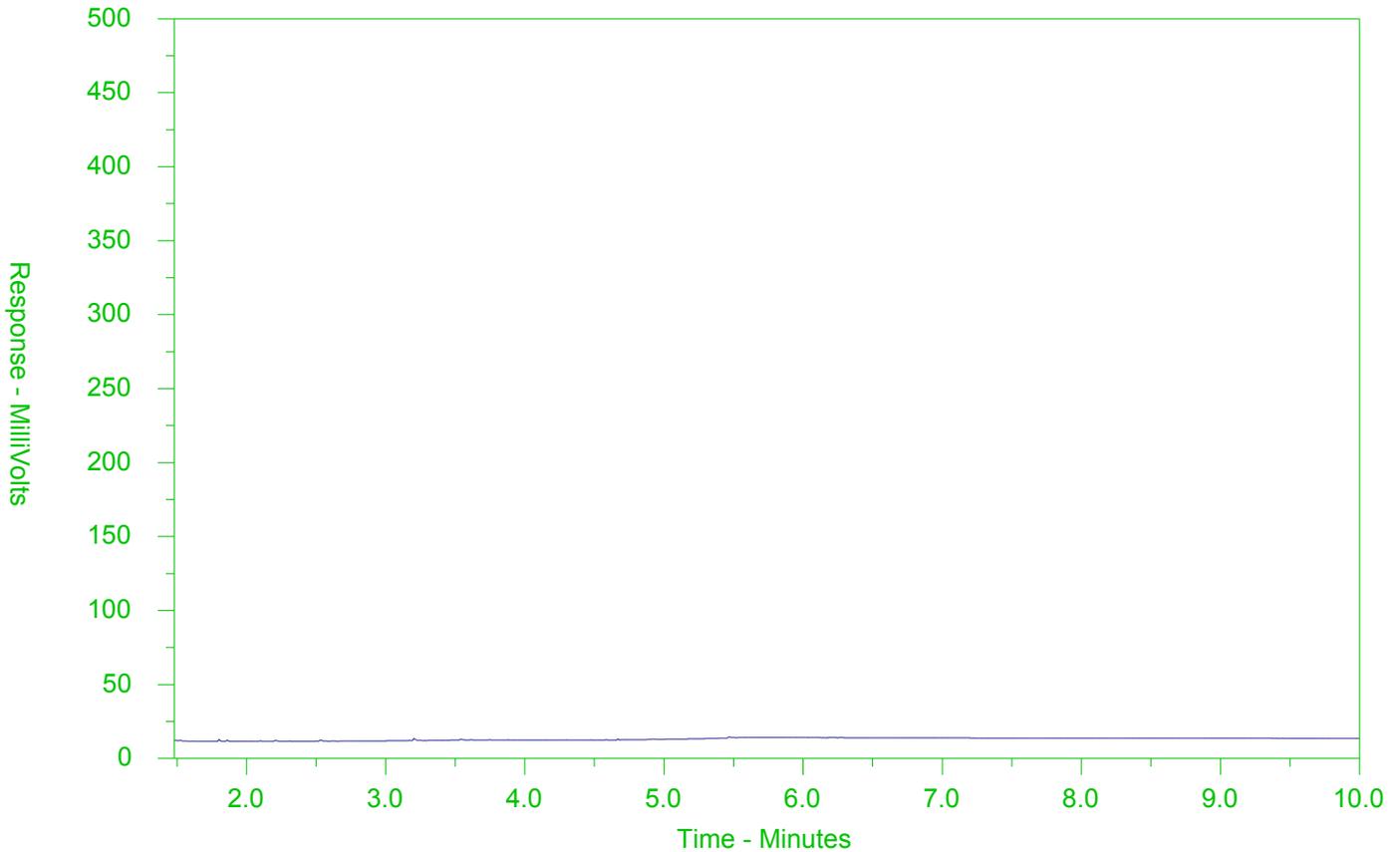
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2491984-1
 Client Sample ID: W-11210029-20200820-26



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 01-OCT-20
Report Date: 08-OCT-20 11:20 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2511128

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2511128-1 W-11210029-20201001-38 Sampled By: ERIC on 01-OCT-20 @ 11:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0058		0.0030	mg/L	02-OCT-20	06-OCT-20	R5247658
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	02-OCT-20	02-OCT-20	R5244026
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Arsenic (As)-Total	0.0111		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Barium (Ba)-Total	0.0514		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	02-OCT-20	02-OCT-20	R5244026
Boron (B)-Total	<0.010		0.010	mg/L	02-OCT-20	02-OCT-20	R5244026
Cadmium (Cd)-Total	0.0000068		0.0000050	mg/L	02-OCT-20	02-OCT-20	R5244026
Calcium (Ca)-Total	69.3		0.050	mg/L	02-OCT-20	02-OCT-20	R5244026
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	02-OCT-20	02-OCT-20	R5244026
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	02-OCT-20	02-OCT-20	R5244026
Cobalt (Co)-Total	0.00032		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Copper (Cu)-Total	0.00293		0.00050	mg/L	02-OCT-20	02-OCT-20	R5244026
Iron (Fe)-Total	1.76		0.010	mg/L	02-OCT-20	02-OCT-20	R5244026
Lead (Pb)-Total	0.000959		0.000050	mg/L	02-OCT-20	02-OCT-20	R5244026
Lithium (Li)-Total	0.0039		0.0010	mg/L	02-OCT-20	02-OCT-20	R5244026
Magnesium (Mg)-Total	32.1		0.0050	mg/L	02-OCT-20	02-OCT-20	R5244026
Manganese (Mn)-Total	0.0112		0.00050	mg/L	02-OCT-20	02-OCT-20	R5244026
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		02-OCT-20	R5244025
Molybdenum (Mo)-Total	0.000567		0.000050	mg/L	02-OCT-20	02-OCT-20	R5244026
Nickel (Ni)-Total	0.0125		0.00050	mg/L	02-OCT-20	02-OCT-20	R5244026
Phosphorus (P)-Total	<0.050		0.050	mg/L	02-OCT-20	02-OCT-20	R5244026
Potassium (K)-Total	0.986		0.050	mg/L	02-OCT-20	02-OCT-20	R5244026
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	02-OCT-20	02-OCT-20	R5244026
Selenium (Se)-Total	<0.000050		0.000050	mg/L	02-OCT-20	02-OCT-20	R5244026
Silicon (Si)-Total	9.16		0.10	mg/L	02-OCT-20	02-OCT-20	R5244026
Silver (Ag)-Total	<0.000050		0.000050	mg/L	02-OCT-20	02-OCT-20	R5244026
Sodium (Na)-Total	7.73		0.050	mg/L	02-OCT-20	02-OCT-20	R5244026
Strontium (Sr)-Total	0.154		0.0010	mg/L	02-OCT-20	02-OCT-20	R5244026
Sulfur (S)-Total	19.5		0.50	mg/L	02-OCT-20	02-OCT-20	R5244026
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	02-OCT-20	02-OCT-20	R5244026
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	02-OCT-20	02-OCT-20	R5244026
Thorium (Th)-Total	<0.00010		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Tin (Sn)-Total	0.00018		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	02-OCT-20	02-OCT-20	R5244026
Tungsten (W)-Total	<0.00010		0.00010	mg/L	02-OCT-20	02-OCT-20	R5244026
Uranium (U)-Total	0.000260		0.000010	mg/L	02-OCT-20	02-OCT-20	R5244026
Vanadium (V)-Total	<0.00050		0.00050	mg/L	02-OCT-20	02-OCT-20	R5244026
Zinc (Zn)-Total	0.346		0.0030	mg/L	02-OCT-20	02-OCT-20	R5244026

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2511128-1 W-11210029-20201001-38 Sampled By: ERIC on 01-OCT-20 @ 11:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	02-OCT-20	02-OCT-20	R5244026
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		02-OCT-20	R5245109
Volatile Organic Compounds							
Acetone	<30		30	ug/L		05-OCT-20	R5244888
Benzene	<0.50		0.50	ug/L		05-OCT-20	R5244888
Bromodichloromethane	<2.0		2.0	ug/L		05-OCT-20	R5244888
Bromoform	<5.0		5.0	ug/L		05-OCT-20	R5244888
Bromomethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
Carbon tetrachloride	<0.20		0.20	ug/L		05-OCT-20	R5244888
Chlorobenzene	<0.50		0.50	ug/L		05-OCT-20	R5244888
Dibromochloromethane	<2.0		2.0	ug/L		05-OCT-20	R5244888
Chloroform	<1.0		1.0	ug/L		05-OCT-20	R5244888
1,2-Dibromoethane	<0.20		0.20	ug/L		05-OCT-20	R5244888
1,2-Dichlorobenzene	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,3-Dichlorobenzene	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,4-Dichlorobenzene	<0.50		0.50	ug/L		05-OCT-20	R5244888
Dichlorodifluoromethane	<2.0		2.0	ug/L		05-OCT-20	R5244888
1,1-Dichloroethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,2-Dichloroethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,1-Dichloroethylene	<0.50		0.50	ug/L		05-OCT-20	R5244888
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		05-OCT-20	R5244888
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		05-OCT-20	R5244888
Methylene Chloride	<5.0		5.0	ug/L		05-OCT-20	R5244888
1,2-Dichloropropane	<0.50		0.50	ug/L		05-OCT-20	R5244888
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		05-OCT-20	R5244888
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		05-OCT-20	R5244888
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		05-OCT-20	
Ethylbenzene	<0.50		0.50	ug/L		05-OCT-20	R5244888
n-Hexane	<0.50		0.50	ug/L		05-OCT-20	R5244888
Methyl Ethyl Ketone	<20		20	ug/L		05-OCT-20	R5244888
Methyl Isobutyl Ketone	<20		20	ug/L		05-OCT-20	R5244888
MTBE	<2.0		2.0	ug/L		05-OCT-20	R5244888
Styrene	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
Tetrachloroethylene	<0.50		0.50	ug/L		05-OCT-20	R5244888
Toluene	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,1,1-Trichloroethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
1,1,2-Trichloroethane	<0.50		0.50	ug/L		05-OCT-20	R5244888
Trichloroethylene	<0.50		0.50	ug/L		05-OCT-20	R5244888

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2511128-1 W-11210029-20201001-38							
Sampled By: ERIC on 01-OCT-20 @ 11:00							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		05-OCT-20	R5244888
Vinyl chloride	<0.50		0.50	ug/L		05-OCT-20	R5244888
o-Xylene	<0.30		0.30	ug/L		05-OCT-20	R5244888
m+p-Xylenes	<0.40		0.40	ug/L		05-OCT-20	R5244888
Xylenes (Total)	<0.50		0.50	ug/L		05-OCT-20	
Surrogate: 4-Bromofluorobenzene	103.4		70-130	%		05-OCT-20	R5244888
Surrogate: 1,4-Difluorobenzene	101.6		70-130	%		05-OCT-20	R5244888
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		07-OCT-20	R5251188
F1-BTEX	<25		25	ug/L		08-OCT-20	
F2 (C10-C16)	<100		100	ug/L	02-OCT-20	05-OCT-20	R5245136
F2-Naphth	<100		100	ug/L		08-OCT-20	
F3 (C16-C34)	<250		250	ug/L	02-OCT-20	05-OCT-20	R5245136
F3-PAH	<250		250	ug/L		08-OCT-20	
F4 (C34-C50)	<250		250	ug/L	02-OCT-20	05-OCT-20	R5245136
Total Hydrocarbons (C6-C50)	<370		370	ug/L		08-OCT-20	
Chrom. to baseline at nC50	YES				02-OCT-20	05-OCT-20	R5245136
Surrogate: 2-Bromobenzotrifluoride	89.1		60-140	%	02-OCT-20	05-OCT-20	R5245136
Surrogate: 3,4-Dichlorotoluene	100.1		60-140	%		07-OCT-20	R5251188
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Acenaphthylene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Anthracene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Benzo(a)anthracene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Benzo(a)pyrene	<0.010		0.010	ug/L	02-OCT-20	08-OCT-20	R5243881
Benzo(b)fluoranthene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Benzo(k)fluoranthene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Chrysene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Fluoranthene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Fluorene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		08-OCT-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
2-Methylnaphthalene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Naphthalene	<0.050		0.050	ug/L	02-OCT-20	08-OCT-20	R5243881
Phenanthrene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Pyrene	<0.020		0.020	ug/L	02-OCT-20	08-OCT-20	R5243881
Surrogate: d10-Acenaphthene	99.0		60-140	%	02-OCT-20	08-OCT-20	R5243881
Surrogate: d12-Chrysene	92.5		60-140	%	02-OCT-20	08-OCT-20	R5243881

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2511128-1 W-11210029-20201001-38 Sampled By: ERIC on 01-OCT-20 @ 11:00 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	96.4		60-140	%	02-OCT-20	08-OCT-20	R5243881
Surrogate: d10-Phenanthrene	100.1		60-140	%	02-OCT-20	08-OCT-20	R5243881
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
4-Chloroaniline	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
2-Chlorophenol	<0.30		0.30	ug/L	02-OCT-20	05-OCT-20	R5244183
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4-Dichlorophenol	<0.30		0.30	ug/L	02-OCT-20	05-OCT-20	R5244183
Diethylphthalate	<0.20		0.20	ug/L	02-OCT-20	05-OCT-20	R5244183
Dimethylphthalate	<0.20		0.20	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4-Dimethylphenol	<0.50		0.50	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4-Dinitrophenol	<1.0		1.0	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4-Dinitrotoluene	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
2,6-Dinitrotoluene	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		05-OCT-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	02-OCT-20	05-OCT-20	R5244183
Pentachlorophenol	<2.0	RRR	2.0	ug/L	02-OCT-20	05-OCT-20	R5244183
Phenol	<0.50		0.50	ug/L	02-OCT-20	05-OCT-20	R5244183
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	02-OCT-20	05-OCT-20	R5244183
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	02-OCT-20	05-OCT-20	R5244183
Surrogate: 2-Fluorobiphenyl	104.5		50-140	%	02-OCT-20	05-OCT-20	R5244183
Surrogate: Nitrobenzene d5	111.0		50-140	%	02-OCT-20	05-OCT-20	R5244183
Surrogate: p-Terphenyl d14	104.5		60-140	%	02-OCT-20	05-OCT-20	R5244183
Surrogate: 2,4,6-Tribromophenol	112.4		50-140	%	02-OCT-20	05-OCT-20	R5244183
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	02-OCT-20	02-OCT-20	R5243953
Aroclor 1248	<0.020		0.020	ug/L	02-OCT-20	02-OCT-20	R5243953
Aroclor 1254	<0.020		0.020	ug/L	02-OCT-20	02-OCT-20	R5243953
Aroclor 1260	<0.020		0.020	ug/L	02-OCT-20	02-OCT-20	R5243953
Surrogate: Decachlorobiphenyl	137.0		50-150	%	02-OCT-20	02-OCT-20	R5243953
Total PCBs	<0.040		0.040	ug/L	02-OCT-20	02-OCT-20	R5243953
Surrogate: Tetrachloro-m-xylene	70.7		50-150	%	02-OCT-20	02-OCT-20	R5243953
Report Remarks : RRR: Detection limit raised due to suspected bias low results at or near the detection limit.							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Total	MS-B	L2511128-1
Matrix Spike	Boron (B)-Total	MS-B	L2511128-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2511128-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2511128-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2511128-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2511128-1
Matrix Spike	Potassium (K)-Total	MS-B	L2511128-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2511128-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2511128-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2511128-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2511128-1
Matrix Spike	Uranium (U)-Total	MS-B	L2511128-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Reference Information

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
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Reference Information

WT

ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:**GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2511128

Report Date: 08-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5244183							
WG3416467-2 LCS								
1,2,4-Trichlorobenzene			88.0		%		50-140	02-OCT-20
2-Chlorophenol			85.3		%		50-140	02-OCT-20
2,4-Dichlorophenol			92.5		%		50-140	02-OCT-20
2,4-Dimethylphenol			84.3		%		30-130	02-OCT-20
2,4-Dinitrophenol			82.8		%		50-140	02-OCT-20
2,4-Dinitrotoluene			116.9		%		50-140	02-OCT-20
2,4,5-Trichlorophenol			107.2		%		50-140	02-OCT-20
2,4,6-Trichlorophenol			103.3		%		50-140	02-OCT-20
2,6-Dinitrotoluene			107.3		%		50-140	02-OCT-20
3,3'-Dichlorobenzidine			96.1		%		30-130	02-OCT-20
4-Chloroaniline			89.7		%		30-130	02-OCT-20
Biphenyl			95.2		%		50-140	02-OCT-20
Bis(2-chloroethyl)ether			93.0		%		50-140	02-OCT-20
Bis(2-chloroisopropyl)ether			91.2		%		50-140	02-OCT-20
Bis(2-ethylhexyl)phthalate			104.5		%		50-140	02-OCT-20
Diethylphthalate			91.9		%		50-140	02-OCT-20
Dimethylphthalate			93.8		%		50-140	02-OCT-20
Pentachlorophenol			89.1		%		50-140	02-OCT-20
Phenol			98.8		%		30-130	02-OCT-20
WG3416467-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	02-OCT-20
2-Chlorophenol			<0.30		ug/L		0.3	02-OCT-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	02-OCT-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	02-OCT-20
2,4-Dinitrophenol			<1.0		ug/L		1	02-OCT-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	02-OCT-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	02-OCT-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	02-OCT-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	02-OCT-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	02-OCT-20
4-Chloroaniline			<0.40		ug/L		0.4	02-OCT-20
Biphenyl			<0.40		ug/L		0.4	02-OCT-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	02-OCT-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	02-OCT-20



Quality Control Report

Workorder: L2511128

Report Date: 08-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5244183								
WG3416467-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	02-OCT-20
Diethylphthalate			<0.20		ug/L		0.2	02-OCT-20
Dimethylphthalate			<0.20		ug/L		0.2	02-OCT-20
Pentachlorophenol			<0.50		ug/L		0.5	02-OCT-20
Phenol			<0.50		ug/L		0.5	02-OCT-20
Surrogate: 2-Fluorobiphenyl			87.5		%		50-140	02-OCT-20
Surrogate: 2,4,6-Tribromophenol			89.7		%		50-140	02-OCT-20
Surrogate: Nitrobenzene d5			95.1		%		50-140	02-OCT-20
Surrogate: p-Terphenyl d14			105.8		%		60-140	02-OCT-20
CR-CR6-IC-WT Water								
Batch R5245109								
WG3417242-4 DUP								
Chromium, Hexavalent		WG3417242-3	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-20
WG3417242-2 LCS								
Chromium, Hexavalent			102.5		%		80-120	02-OCT-20
WG3417242-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	02-OCT-20
WG3417242-5 MS								
Chromium, Hexavalent		WG3417242-3	99.4		%		70-130	02-OCT-20
F1-HS-511-WT Water								
Batch R5251188								
WG3419822-1 LCS								
F1 (C6-C10)			97.3		%		80-120	07-OCT-20
WG3419822-2 MB								
F1 (C6-C10)			<25		ug/L		25	07-OCT-20
Surrogate: 3,4-Dichlorotoluene			116.3		%		60-140	07-OCT-20
F2-F4-511-WT Water								
Batch R5245136								
WG3416713-2 LCS								
F2 (C10-C16)			98.9		%		70-130	05-OCT-20
F3 (C16-C34)			103.7		%		70-130	05-OCT-20
F4 (C34-C50)			106.8		%		70-130	05-OCT-20
WG3416713-1 MB								
F2 (C10-C16)			<100		ug/L		100	05-OCT-20
F3 (C16-C34)			<250		ug/L		250	05-OCT-20



Quality Control Report

Workorder: L2511128

Report Date: 08-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT								
Water								
Batch R5245136								
WG3416713-1 MB								
F4 (C34-C50)			<250		ug/L		250	05-OCT-20
Surrogate: 2-Bromobenzotrifluoride			82.4		%		60-140	05-OCT-20
HG-T-CVAA-WT								
Water								
Batch R5244025								
WG3417002-3 DUP								
Mercury (Hg)-Total		L2511170-1	<0.0000050	RPD-NA	mg/L	N/A	20	02-OCT-20
WG3417002-2 LCS								
Mercury (Hg)-Total			106.0		%		80-120	02-OCT-20
WG3417002-1 MB								
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	02-OCT-20
WG3417002-4 MS								
Mercury (Hg)-Total		L2510587-1	100.0		%		70-130	02-OCT-20
MET-T-CCMS-WT								
Water								
Batch R5244026								
WG3416819-4 DUP								
Aluminum (Al)-Total		WG3416819-3	0.214		mg/L	2.0	20	02-OCT-20
Antimony (Sb)-Total			<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-20
Arsenic (As)-Total			0.0018		mg/L	1.2	20	02-OCT-20
Barium (Ba)-Total			0.0887		mg/L	3.1	20	02-OCT-20
Beryllium (Be)-Total			<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-20
Bismuth (Bi)-Total			<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-20
Boron (B)-Total			0.12		mg/L	1.3	20	02-OCT-20
Cadmium (Cd)-Total			<0.000050	RPD-NA	mg/L	N/A	20	02-OCT-20
Calcium (Ca)-Total			199		mg/L	3.2	20	02-OCT-20
Chromium (Cr)-Total			<0.0050	RPD-NA	mg/L	N/A	20	02-OCT-20
Cesium (Cs)-Total			<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-20
Cobalt (Co)-Total			0.0619		mg/L	1.1	20	02-OCT-20
Copper (Cu)-Total			<0.0050	RPD-NA	mg/L	N/A	20	02-OCT-20
Iron (Fe)-Total			2.49		mg/L	3.1	20	02-OCT-20
Lead (Pb)-Total			0.00054		mg/L	3.6	20	02-OCT-20
Lithium (Li)-Total			<0.010	RPD-NA	mg/L	N/A	20	02-OCT-20
Magnesium (Mg)-Total			98.4		mg/L	2.0	20	02-OCT-20
Manganese (Mn)-Total			2.50		mg/L	1.7	20	02-OCT-20
Molybdenum (Mo)-Total			0.00207		mg/L	9.1	20	02-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5244026							
WG3416819-4	DUP	WG3416819-3						
Nickel (Ni)-Total		0.0084	0.0079		mg/L	7.3	20	02-OCT-20
Phosphorus (P)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	02-OCT-20
Potassium (K)-Total		3.84	3.75		mg/L	2.2	20	02-OCT-20
Rubidium (Rb)-Total		0.0036	0.0034		mg/L	3.9	20	02-OCT-20
Selenium (Se)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-20
Silicon (Si)-Total		7.6	7.5		mg/L	1.6	20	02-OCT-20
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	02-OCT-20
Sodium (Na)-Total		132	132		mg/L	0.6	20	02-OCT-20
Strontium (Sr)-Total		1.40	1.41		mg/L	1.1	20	02-OCT-20
Sulfur (S)-Total		162	159		mg/L	2.1	25	02-OCT-20
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	02-OCT-20
Tellurium (Te)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	02-OCT-20
Thorium (Th)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	25	02-OCT-20
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-20
Titanium (Ti)-Total		0.0066	0.0066		mg/L	0.3	20	02-OCT-20
Tungsten (W)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	02-OCT-20
Uranium (U)-Total		0.0163	0.0159		mg/L	2.9	20	02-OCT-20
Vanadium (V)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-OCT-20
Zinc (Zn)-Total		<0.030	<0.030	RPD-NA	mg/L	N/A	20	02-OCT-20
Zirconium (Zr)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	02-OCT-20
WG3416819-2	LCS							
Aluminum (Al)-Total			102.6		%		80-120	02-OCT-20
Antimony (Sb)-Total			100.4		%		80-120	02-OCT-20
Arsenic (As)-Total			97.6		%		80-120	02-OCT-20
Barium (Ba)-Total			98.7		%		80-120	02-OCT-20
Beryllium (Be)-Total			103.4		%		80-120	02-OCT-20
Bismuth (Bi)-Total			98.5		%		80-120	02-OCT-20
Boron (B)-Total			100.1		%		80-120	02-OCT-20
Cadmium (Cd)-Total			94.2		%		80-120	02-OCT-20
Calcium (Ca)-Total			99.9		%		80-120	02-OCT-20
Chromium (Cr)-Total			97.8		%		80-120	02-OCT-20
Cesium (Cs)-Total			97.5		%		80-120	02-OCT-20
Cobalt (Co)-Total			97.2		%		80-120	02-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5244026							
WG3416819-2	LCS							
Copper (Cu)-Total			96.9		%		80-120	02-OCT-20
Iron (Fe)-Total			98.8		%		80-120	02-OCT-20
Lead (Pb)-Total			99.4		%		80-120	02-OCT-20
Lithium (Li)-Total			103.9		%		80-120	02-OCT-20
Magnesium (Mg)-Total			102.0		%		80-120	02-OCT-20
Manganese (Mn)-Total			99.3		%		80-120	02-OCT-20
Molybdenum (Mo)-Total			99.7		%		80-120	02-OCT-20
Nickel (Ni)-Total			98.5		%		80-120	02-OCT-20
Phosphorus (P)-Total			106.1		%		70-130	02-OCT-20
Potassium (K)-Total			99.7		%		80-120	02-OCT-20
Rubidium (Rb)-Total			98.6		%		80-120	02-OCT-20
Selenium (Se)-Total			96.7		%		80-120	02-OCT-20
Silicon (Si)-Total			101.9		%		60-140	02-OCT-20
Silver (Ag)-Total			98.6		%		80-120	02-OCT-20
Sodium (Na)-Total			103.8		%		80-120	02-OCT-20
Strontium (Sr)-Total			102.8		%		80-120	02-OCT-20
Sulfur (S)-Total			96.1		%		80-120	02-OCT-20
Thallium (Tl)-Total			99.7		%		80-120	02-OCT-20
Tellurium (Te)-Total			91.6		%		80-120	02-OCT-20
Thorium (Th)-Total			98.0		%		70-130	02-OCT-20
Tin (Sn)-Total			93.9		%		80-120	02-OCT-20
Titanium (Ti)-Total			97.6		%		80-120	02-OCT-20
Tungsten (W)-Total			97.3		%		80-120	02-OCT-20
Uranium (U)-Total			101.1		%		80-120	02-OCT-20
Vanadium (V)-Total			99.9		%		80-120	02-OCT-20
Zinc (Zn)-Total			96.4		%		80-120	02-OCT-20
Zirconium (Zr)-Total			95.4		%		80-120	02-OCT-20
WG3416819-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	02-OCT-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	02-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5244026							
WG3416819-1	MB							
Boron (B)-Total			<0.010		mg/L		0.01	02-OCT-20
Cadmium (Cd)-Total			<0.000050		mg/L		0.000005	02-OCT-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	02-OCT-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	02-OCT-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	02-OCT-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	02-OCT-20
Iron (Fe)-Total			<0.010		mg/L		0.01	02-OCT-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	02-OCT-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	02-OCT-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	02-OCT-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	02-OCT-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	02-OCT-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	02-OCT-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	02-OCT-20
Potassium (K)-Total			<0.050		mg/L		0.05	02-OCT-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	02-OCT-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	02-OCT-20
Silicon (Si)-Total			<0.10		mg/L		0.1	02-OCT-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	02-OCT-20
Sodium (Na)-Total			<0.050		mg/L		0.05	02-OCT-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	02-OCT-20
Sulfur (S)-Total			<0.50		mg/L		0.5	02-OCT-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	02-OCT-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	02-OCT-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	02-OCT-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	02-OCT-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	02-OCT-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	02-OCT-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	02-OCT-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	02-OCT-20
WG3416819-5	MS	WG3416819-6						



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 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5244026							
WG3416819-5 MS		WG3416819-6						
Aluminum (Al)-Total			90.8		%		70-130	02-OCT-20
Antimony (Sb)-Total			98.9		%		70-130	02-OCT-20
Arsenic (As)-Total			95.3		%		70-130	02-OCT-20
Barium (Ba)-Total			N/A	MS-B	%		-	02-OCT-20
Beryllium (Be)-Total			105.1		%		70-130	02-OCT-20
Bismuth (Bi)-Total			97.6		%		70-130	02-OCT-20
Boron (B)-Total			N/A	MS-B	%		-	02-OCT-20
Cadmium (Cd)-Total			97.1		%		70-130	02-OCT-20
Calcium (Ca)-Total			N/A	MS-B	%		-	02-OCT-20
Chromium (Cr)-Total			96.0		%		70-130	02-OCT-20
Cesium (Cs)-Total			100.3		%		70-130	02-OCT-20
Cobalt (Co)-Total			93.1		%		70-130	02-OCT-20
Copper (Cu)-Total			96.7		%		70-130	02-OCT-20
Iron (Fe)-Total			N/A	MS-B	%		-	02-OCT-20
Lead (Pb)-Total			96.4		%		70-130	02-OCT-20
Lithium (Li)-Total			101.8		%		70-130	02-OCT-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	02-OCT-20
Manganese (Mn)-Total			N/A	MS-B	%		-	02-OCT-20
Molybdenum (Mo)-Total			98.6		%		70-130	02-OCT-20
Nickel (Ni)-Total			95.9		%		70-130	02-OCT-20
Phosphorus (P)-Total			110.2		%		70-130	02-OCT-20
Potassium (K)-Total			N/A	MS-B	%		-	02-OCT-20
Rubidium (Rb)-Total			100.4		%		70-130	02-OCT-20
Silicon (Si)-Total			N/A	MS-B	%		-	02-OCT-20
Silver (Ag)-Total			99.0		%		70-130	02-OCT-20
Sodium (Na)-Total			N/A	MS-B	%		-	02-OCT-20
Strontium (Sr)-Total			N/A	MS-B	%		-	02-OCT-20
Sulfur (S)-Total			N/A	MS-B	%		-	02-OCT-20
Thallium (Tl)-Total			97.8		%		70-130	02-OCT-20
Tellurium (Te)-Total			72.3		%		70-130	02-OCT-20
Thorium (Th)-Total			89.0		%		70-130	02-OCT-20
Tin (Sn)-Total			95.1		%		70-130	02-OCT-20
Titanium (Ti)-Total			89.4		%		70-130	02-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5244026							
WG3416819-5 MS		WG3416819-6						
Tungsten (W)-Total			98.0		%		70-130	02-OCT-20
Uranium (U)-Total			N/A	MS-B	%		-	02-OCT-20
Vanadium (V)-Total			98.0		%		70-130	02-OCT-20
Zinc (Zn)-Total			88.2		%		70-130	02-OCT-20
Zirconium (Zr)-Total			81.4		%		70-130	02-OCT-20
P-T-COL-WT								
	Water							
Batch	R5247658							
WG3416832-3 DUP		L2511128-1						
Phosphorus, Total		0.0058	0.0062		mg/L	6.6	20	06-OCT-20
WG3416832-2 LCS								
Phosphorus, Total			101.8		%		80-120	06-OCT-20
WG3416832-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	06-OCT-20
WG3416832-4 MS		L2511128-1						
Phosphorus, Total			91.3		%		70-130	06-OCT-20
PAH-511-WT								
	Water							
Batch	R5243881							
WG3416713-2 LCS								
1-Methylnaphthalene			110.2		%		50-140	02-OCT-20
2-Methylnaphthalene			109.4		%		50-140	02-OCT-20
Acenaphthene			119.0		%		50-140	02-OCT-20
Acenaphthylene			111.8		%		50-140	02-OCT-20
Anthracene			109.8		%		50-140	02-OCT-20
Benzo(a)anthracene			119.9		%		50-140	02-OCT-20
Benzo(a)pyrene			106.2		%		50-140	02-OCT-20
Benzo(b)fluoranthene			107.5		%		50-140	02-OCT-20
Benzo(g,h,i)perylene			118.3		%		50-140	02-OCT-20
Benzo(k)fluoranthene			109.2		%		50-140	02-OCT-20
Chrysene			115.8		%		50-140	02-OCT-20
Dibenzo(ah)anthracene			119.9		%		50-140	02-OCT-20
Fluoranthene			119.1		%		50-140	02-OCT-20
Fluorene			113.7		%		50-140	02-OCT-20
Indeno(1,2,3-cd)pyrene			131.8		%		50-140	02-OCT-20
Naphthalene			115.0		%		50-140	02-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT		Water						
Batch	R5243881							
WG3416713-2	LCS							
Phenanthrene			119.0		%		50-140	02-OCT-20
Pyrene			120.6		%		50-140	02-OCT-20
WG3416713-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	02-OCT-20
2-Methylnaphthalene			<0.020		ug/L		0.02	02-OCT-20
Acenaphthene			<0.020		ug/L		0.02	02-OCT-20
Acenaphthylene			<0.020		ug/L		0.02	02-OCT-20
Anthracene			<0.020		ug/L		0.02	02-OCT-20
Benzo(a)anthracene			<0.020		ug/L		0.02	02-OCT-20
Benzo(a)pyrene			<0.010		ug/L		0.01	02-OCT-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	02-OCT-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	02-OCT-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	02-OCT-20
Chrysene			<0.020		ug/L		0.02	02-OCT-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	02-OCT-20
Fluoranthene			<0.020		ug/L		0.02	02-OCT-20
Fluorene			<0.020		ug/L		0.02	02-OCT-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	02-OCT-20
Naphthalene			<0.050		ug/L		0.05	02-OCT-20
Phenanthrene			<0.020		ug/L		0.02	02-OCT-20
Pyrene			<0.020		ug/L		0.02	02-OCT-20
Surrogate: d8-Naphthalene			100.1		%		60-140	02-OCT-20
Surrogate: d10-Phenanthrene			94.6		%		60-140	02-OCT-20
Surrogate: d12-Chrysene			85.4		%		60-140	02-OCT-20
Surrogate: d10-Acenaphthene			97.1		%		60-140	02-OCT-20
PCB-511-WT		Water						
Batch	R5243953							
WG3416718-2	LCS							
Aroclor 1242			98.8		%		60-140	02-OCT-20
Aroclor 1248			87.8		%		60-140	02-OCT-20
Aroclor 1254			108.7		%		60-140	02-OCT-20
Aroclor 1260			108.4		%		60-140	02-OCT-20
WG3416718-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	02-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5243953							
WG3416718-1	MB							
Aroclor 1248			<0.020		ug/L		0.02	02-OCT-20
Aroclor 1254			<0.020		ug/L		0.02	02-OCT-20
Aroclor 1260			<0.020		ug/L		0.02	02-OCT-20
Surrogate: Decachlorobiphenyl			137.0		%		50-150	02-OCT-20
Surrogate: Tetrachloro-m-xylene			91.8		%		50-150	02-OCT-20
VOC-511-HS-WT		Water						
Batch	R5244888							
WG3416991-4	DUP	WG3416991-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	05-OCT-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	05-OCT-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-OCT-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	05-OCT-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	05-OCT-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	05-OCT-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	05-OCT-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-OCT-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-OCT-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5244888							
WG3416991-4	DUP	WG3416991-3						
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	05-OCT-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	05-OCT-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	05-OCT-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	05-OCT-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-OCT-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	05-OCT-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	05-OCT-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	05-OCT-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-OCT-20
WG3416991-1	LCS							
1,1,1,2-Tetrachloroethane			96.8		%		70-130	05-OCT-20
1,1,1,2-Tetrachloroethane			99.98		%		70-130	05-OCT-20
1,1,1-Trichloroethane			96.6		%		70-130	05-OCT-20
1,1,2-Trichloroethane			99.3		%		70-130	05-OCT-20
1,1-Dichloroethane			103.4		%		70-130	05-OCT-20
1,1-Dichloroethylene			96.8		%		70-130	05-OCT-20
1,2-Dibromoethane			96.7		%		70-130	05-OCT-20
1,2-Dichlorobenzene			102.3		%		70-130	05-OCT-20
1,2-Dichloroethane			94.7		%		70-130	05-OCT-20
1,2-Dichloropropane			95.1		%		70-130	05-OCT-20
1,3-Dichlorobenzene			99.2		%		70-130	05-OCT-20
1,4-Dichlorobenzene			102.5		%		70-130	05-OCT-20
Acetone			114.3		%		60-140	05-OCT-20
Benzene			102.4		%		70-130	05-OCT-20
Bromodichloromethane			101.8		%		70-130	05-OCT-20
Bromoform			104.1		%		70-130	05-OCT-20
Bromomethane			125.9		%		60-140	05-OCT-20



Quality Control Report

Workorder: L2511128

Report Date: 08-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5244888							
WG3416991-1	LCS							
Carbon tetrachloride			96.1		%		70-130	05-OCT-20
Chlorobenzene			101.6		%		70-130	05-OCT-20
Chloroform			102.9		%		70-130	05-OCT-20
cis-1,2-Dichloroethylene			94.6		%		70-130	05-OCT-20
cis-1,3-Dichloropropene			94.2		%		70-130	05-OCT-20
Dibromochloromethane			96.7		%		70-130	05-OCT-20
Dichlorodifluoromethane			97.3		%		50-140	05-OCT-20
Ethylbenzene			101.1		%		70-130	05-OCT-20
n-Hexane			101.7		%		70-130	05-OCT-20
m+p-Xylenes			101.1		%		70-130	05-OCT-20
Methyl Ethyl Ketone			108.7		%		60-140	05-OCT-20
Methyl Isobutyl Ketone			95.9		%		60-140	05-OCT-20
Methylene Chloride			94.3		%		70-130	05-OCT-20
MTBE			102.1		%		70-130	05-OCT-20
o-Xylene			109.0		%		70-130	05-OCT-20
Styrene			102.5		%		70-130	05-OCT-20
Tetrachloroethylene			101.4		%		70-130	05-OCT-20
Toluene			96.6		%		70-130	05-OCT-20
trans-1,2-Dichloroethylene			95.5		%		70-130	05-OCT-20
trans-1,3-Dichloropropene			98.7		%		70-130	05-OCT-20
Trichloroethylene			100.0		%		70-130	05-OCT-20
Trichlorofluoromethane			97.1		%		60-140	05-OCT-20
Vinyl chloride			110.1		%		60-140	05-OCT-20
WG3416991-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	05-OCT-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	05-OCT-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	05-OCT-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	05-OCT-20
1,1-Dichloroethane			<0.50		ug/L		0.5	05-OCT-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	05-OCT-20
1,2-Dibromoethane			<0.20		ug/L		0.2	05-OCT-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	05-OCT-20
1,2-Dichloroethane			<0.50		ug/L		0.5	05-OCT-20
1,2-Dichloropropane			<0.50		ug/L		0.5	05-OCT-20



Quality Control Report

Workorder: L2511128

Report Date: 08-OCT-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5244888							
WG3416991-2 MB								
1,3-Dichlorobenzene			<0.50		ug/L		0.5	05-OCT-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	05-OCT-20
Acetone			<30		ug/L		30	05-OCT-20
Benzene			<0.50		ug/L		0.5	05-OCT-20
Bromodichloromethane			<2.0		ug/L		2	05-OCT-20
Bromoform			<5.0		ug/L		5	05-OCT-20
Bromomethane			<0.50		ug/L		0.5	05-OCT-20
Carbon tetrachloride			<0.20		ug/L		0.2	05-OCT-20
Chlorobenzene			<0.50		ug/L		0.5	05-OCT-20
Chloroform			<1.0		ug/L		1	05-OCT-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	05-OCT-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	05-OCT-20
Dibromochloromethane			<2.0		ug/L		2	05-OCT-20
Dichlorodifluoromethane			<2.0		ug/L		2	05-OCT-20
Ethylbenzene			<0.50		ug/L		0.5	05-OCT-20
n-Hexane			<0.50		ug/L		0.5	05-OCT-20
m+p-Xylenes			<0.40		ug/L		0.4	05-OCT-20
Methyl Ethyl Ketone			<20		ug/L		20	05-OCT-20
Methyl Isobutyl Ketone			<20		ug/L		20	05-OCT-20
Methylene Chloride			<5.0		ug/L		5	05-OCT-20
MTBE			<2.0		ug/L		2	05-OCT-20
o-Xylene			<0.30		ug/L		0.3	05-OCT-20
Styrene			<0.50		ug/L		0.5	05-OCT-20
Tetrachloroethylene			<0.50		ug/L		0.5	05-OCT-20
Toluene			<0.50		ug/L		0.5	05-OCT-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	05-OCT-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	05-OCT-20
Trichloroethylene			<0.50		ug/L		0.5	05-OCT-20
Trichlorofluoromethane			<5.0		ug/L		5	05-OCT-20
Vinyl chloride			<0.50		ug/L		0.5	05-OCT-20
Surrogate: 1,4-Difluorobenzene			101.5		%		70-130	05-OCT-20
Surrogate: 4-Bromofluorobenzene			103.1		%		70-130	05-OCT-20
WG3416991-5 MS		WG3416991-3						
1,1,1,2-Tetrachloroethane			95.8		%		50-140	05-OCT-20



Quality Control Report

Workorder: L2511128

Report Date: 08-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5244888							
WG3416991-5 MS		WG3416991-3						
1,1,2,2-Tetrachloroethane			75.7		%		50-140	05-OCT-20
1,1,1-Trichloroethane			97.2		%		50-140	05-OCT-20
1,1,2-Trichloroethane			95.6		%		50-140	05-OCT-20
1,1-Dichloroethane			101.4		%		50-140	05-OCT-20
1,1-Dichloroethylene			96.2		%		50-140	05-OCT-20
1,2-Dibromoethane			91.5		%		50-140	05-OCT-20
1,2-Dichlorobenzene			102.9		%		50-140	05-OCT-20
1,2-Dichloroethane			90.1		%		50-140	05-OCT-20
1,2-Dichloropropane			94.2		%		50-140	05-OCT-20
1,3-Dichlorobenzene			110.1		%		50-140	05-OCT-20
1,4-Dichlorobenzene			111.4		%		50-140	05-OCT-20
Acetone			96.3		%		50-140	05-OCT-20
Benzene			102.0		%		50-140	05-OCT-20
Bromodichloromethane			100.9		%		50-140	05-OCT-20
Bromoform			95.5		%		50-140	05-OCT-20
Bromomethane			120.5		%		50-140	05-OCT-20
Carbon tetrachloride			97.0		%		50-140	05-OCT-20
Chlorobenzene			101.3		%		50-140	05-OCT-20
Chloroform			102.5		%		50-140	05-OCT-20
cis-1,2-Dichloroethylene			93.5		%		50-140	05-OCT-20
cis-1,3-Dichloropropene			92.6		%		50-140	05-OCT-20
Dibromochloromethane			94.2		%		50-140	05-OCT-20
Dichlorodifluoromethane			88.1		%		50-140	05-OCT-20
Ethylbenzene			102.0		%		50-140	05-OCT-20
n-Hexane			100.6		%		50-140	05-OCT-20
m+p-Xylenes			102.2		%		50-140	05-OCT-20
Methyl Ethyl Ketone			93.7		%		50-140	05-OCT-20
Methyl Isobutyl Ketone			88.4		%		50-140	05-OCT-20
Methylene Chloride			91.0		%		50-140	05-OCT-20
MTBE			102.3		%		50-140	05-OCT-20
o-Xylene			109.0		%		50-140	05-OCT-20
Styrene			101.6		%		50-140	05-OCT-20
Tetrachloroethylene			103.1		%		50-140	05-OCT-20



Quality Control Report

Workorder: L2511128

Report Date: 08-OCT-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5244888							
WG3416991-5 MS		WG3416991-3						
Toluene			97.3		%		50-140	05-OCT-20
trans-1,2-Dichloroethylene			95.5		%		50-140	05-OCT-20
trans-1,3-Dichloropropene			95.6		%		50-140	05-OCT-20
Trichloroethylene			100.6		%		50-140	05-OCT-20
Trichlorofluoromethane			95.8		%		50-140	05-OCT-20
Vinyl chloride			105.8		%		50-140	05-OCT-20

Quality Control Report

Workorder: L2511128

Report Date: 08-OCT-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

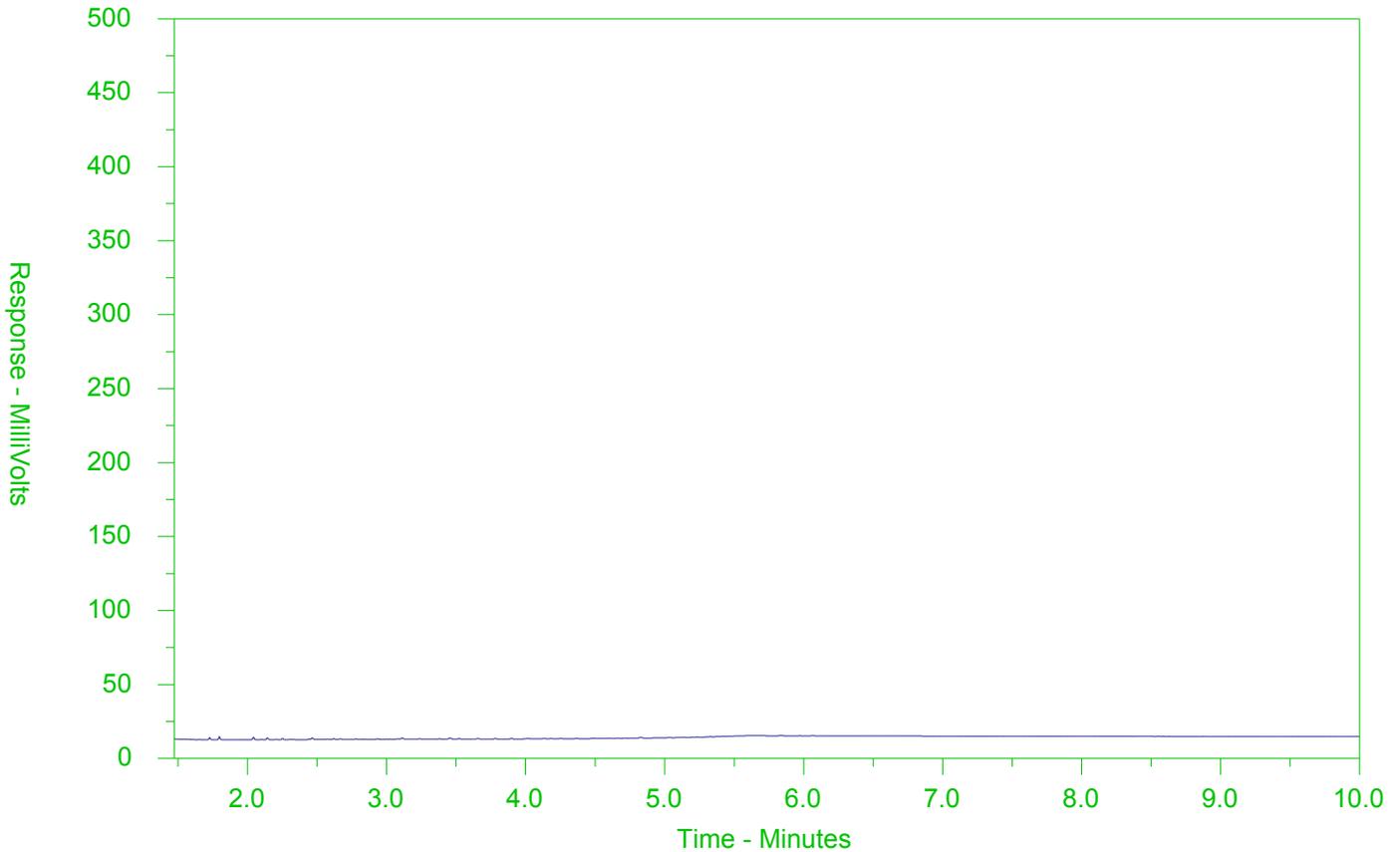
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2511128-1
 Client Sample ID: W-11210029-20201001-38



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 08-OCT-20
Report Date: 15-OCT-20 10:27 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2514428

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2514428-1 W-11210029-20201008-40 Sampled By: ERIC on 08-OCT-20 @ 10:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0063		0.0030	mg/L	09-OCT-20	13-OCT-20	R5253467
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	09-OCT-20	13-OCT-20	R5253130
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Arsenic (As)-Total	0.00501		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Barium (Ba)-Total	0.0511		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	09-OCT-20	13-OCT-20	R5253130
Boron (B)-Total	<0.010		0.010	mg/L	09-OCT-20	13-OCT-20	R5253130
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	09-OCT-20	13-OCT-20	R5253130
Calcium (Ca)-Total	71.7		0.050	mg/L	09-OCT-20	13-OCT-20	R5253130
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	09-OCT-20	13-OCT-20	R5253130
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	09-OCT-20	13-OCT-20	R5253130
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Copper (Cu)-Total	<0.00050		0.00050	mg/L	09-OCT-20	13-OCT-20	R5253130
Iron (Fe)-Total	0.387		0.010	mg/L	09-OCT-20	13-OCT-20	R5253130
Lead (Pb)-Total	0.000055		0.000050	mg/L	09-OCT-20	13-OCT-20	R5253130
Lithium (Li)-Total	0.0040		0.0010	mg/L	09-OCT-20	13-OCT-20	R5253130
Magnesium (Mg)-Total	33.9		0.0050	mg/L	09-OCT-20	13-OCT-20	R5253130
Manganese (Mn)-Total	0.0110		0.00050	mg/L	09-OCT-20	13-OCT-20	R5253130
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		09-OCT-20	R5252246
Molybdenum (Mo)-Total	0.000544		0.000050	mg/L	09-OCT-20	13-OCT-20	R5253130
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	09-OCT-20	13-OCT-20	R5253130
Phosphorus (P)-Total	<0.050		0.050	mg/L	09-OCT-20	13-OCT-20	R5253130
Potassium (K)-Total	0.980		0.050	mg/L	09-OCT-20	13-OCT-20	R5253130
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	09-OCT-20	13-OCT-20	R5253130
Selenium (Se)-Total	<0.000050		0.000050	mg/L	09-OCT-20	13-OCT-20	R5253130
Silicon (Si)-Total	8.70		0.10	mg/L	09-OCT-20	13-OCT-20	R5253130
Silver (Ag)-Total	<0.000050		0.000050	mg/L	09-OCT-20	13-OCT-20	R5253130
Sodium (Na)-Total	8.20		0.050	mg/L	09-OCT-20	13-OCT-20	R5253130
Strontium (Sr)-Total	0.147		0.0010	mg/L	09-OCT-20	13-OCT-20	R5253130
Sulfur (S)-Total	19.3		0.50	mg/L	09-OCT-20	13-OCT-20	R5253130
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	09-OCT-20	13-OCT-20	R5253130
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	09-OCT-20	13-OCT-20	R5253130
Thorium (Th)-Total	<0.00010		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Tin (Sn)-Total	<0.00010		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	09-OCT-20	13-OCT-20	R5253130
Tungsten (W)-Total	<0.00010		0.00010	mg/L	09-OCT-20	13-OCT-20	R5253130
Uranium (U)-Total	0.000254		0.000010	mg/L	09-OCT-20	13-OCT-20	R5253130
Vanadium (V)-Total	<0.00050		0.00050	mg/L	09-OCT-20	13-OCT-20	R5253130
Zinc (Zn)-Total	0.0063		0.0030	mg/L	09-OCT-20	13-OCT-20	R5253130

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2514428-1 W-11210029-20201008-40 Sampled By: ERIC on 08-OCT-20 @ 10:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	09-OCT-20	13-OCT-20	R5253130
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		09-OCT-20	R5253209
Volatile Organic Compounds							
Acetone	<30		30	ug/L		13-OCT-20	R5253112
Benzene	<0.50		0.50	ug/L		13-OCT-20	R5253112
Bromodichloromethane	<2.0		2.0	ug/L		13-OCT-20	R5253112
Bromoform	<5.0		5.0	ug/L		13-OCT-20	R5253112
Bromomethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
Carbon tetrachloride	<0.20		0.20	ug/L		13-OCT-20	R5253112
Chlorobenzene	<0.50		0.50	ug/L		13-OCT-20	R5253112
Dibromochloromethane	<2.0		2.0	ug/L		13-OCT-20	R5253112
Chloroform	<1.0		1.0	ug/L		13-OCT-20	R5253112
1,2-Dibromoethane	<0.20		0.20	ug/L		13-OCT-20	R5253112
1,2-Dichlorobenzene	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,3-Dichlorobenzene	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,4-Dichlorobenzene	<0.50		0.50	ug/L		13-OCT-20	R5253112
Dichlorodifluoromethane	<2.0		2.0	ug/L		13-OCT-20	R5253112
1,1-Dichloroethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,2-Dichloroethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,1-Dichloroethylene	<0.50		0.50	ug/L		13-OCT-20	R5253112
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		13-OCT-20	R5253112
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		13-OCT-20	R5253112
Methylene Chloride	<5.0		5.0	ug/L		13-OCT-20	R5253112
1,2-Dichloropropane	<0.50		0.50	ug/L		13-OCT-20	R5253112
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		13-OCT-20	R5253112
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		13-OCT-20	R5253112
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		13-OCT-20	
Ethylbenzene	<0.50		0.50	ug/L		13-OCT-20	R5253112
n-Hexane	<0.50		0.50	ug/L		13-OCT-20	R5253112
Methyl Ethyl Ketone	<20		20	ug/L		13-OCT-20	R5253112
Methyl Isobutyl Ketone	<20		20	ug/L		13-OCT-20	R5253112
MTBE	<2.0		2.0	ug/L		13-OCT-20	R5253112
Styrene	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
Tetrachloroethylene	<0.50		0.50	ug/L		13-OCT-20	R5253112
Toluene	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,1,1-Trichloroethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
1,1,2-Trichloroethane	<0.50		0.50	ug/L		13-OCT-20	R5253112
Trichloroethylene	<0.50		0.50	ug/L		13-OCT-20	R5253112

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2514428-1 W-11210029-20201008-40 Sampled By: ERIC on 08-OCT-20 @ 10:00 Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		13-OCT-20	R5253112
Vinyl chloride	<0.50		0.50	ug/L		13-OCT-20	R5253112
o-Xylene	<0.30		0.30	ug/L		13-OCT-20	R5253112
m+p-Xylenes	<0.40		0.40	ug/L		13-OCT-20	R5253112
Xylenes (Total)	<0.50		0.50	ug/L		13-OCT-20	
Surrogate: 4-Bromofluorobenzene	102.2		70-130	%		13-OCT-20	R5253112
Surrogate: 1,4-Difluorobenzene	100.9		70-130	%		13-OCT-20	R5253112
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		13-OCT-20	R5253112
F1-BTEX	<25		25	ug/L		15-OCT-20	
F2 (C10-C16)	<100		100	ug/L	09-OCT-20	13-OCT-20	R5253236
F2-Naphth	<100		100	ug/L		15-OCT-20	
F3 (C16-C34)	<250		250	ug/L	09-OCT-20	13-OCT-20	R5253236
F3-PAH	<250		250	ug/L		15-OCT-20	
F4 (C34-C50)	<250		250	ug/L	09-OCT-20	13-OCT-20	R5253236
Total Hydrocarbons (C6-C50)	<370		370	ug/L		15-OCT-20	
Chrom. to baseline at nC50	YES				09-OCT-20	13-OCT-20	R5253236
Surrogate: 2-Bromobenzotrifluoride	86.0		60-140	%	09-OCT-20	13-OCT-20	R5253236
Surrogate: 3,4-Dichlorotoluene	104.1		60-140	%		13-OCT-20	R5253112
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Acenaphthylene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Anthracene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Benzo(a)anthracene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Benzo(a)pyrene	<0.010		0.010	ug/L	09-OCT-20	15-OCT-20	R5252409
Benzo(b)fluoranthene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Benzo(k)fluoranthene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Chrysene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Fluoranthene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Fluorene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		15-OCT-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
2-Methylnaphthalene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Naphthalene	<0.050		0.050	ug/L	09-OCT-20	15-OCT-20	R5252409
Phenanthrene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Pyrene	<0.020		0.020	ug/L	09-OCT-20	15-OCT-20	R5252409
Surrogate: d10-Acenaphthene	101.8		60-140	%	09-OCT-20	15-OCT-20	R5252409
Surrogate: d12-Chrysene	95.1		60-140	%	09-OCT-20	15-OCT-20	R5252409

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2514428-1 W-11210029-20201008-40 Sampled By: ERIC on 08-OCT-20 @ 10:00 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	97.7		60-140	%	09-OCT-20	15-OCT-20	R5252409
Surrogate: d10-Phenanthrene	106.6		60-140	%	09-OCT-20	15-OCT-20	R5252409
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
4-Chloroaniline	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
2-Chlorophenol	<0.30		0.30	ug/L	09-OCT-20	15-OCT-20	R5253218
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4-Dichlorophenol	<0.30		0.30	ug/L	09-OCT-20	15-OCT-20	R5253218
Diethylphthalate	<0.20		0.20	ug/L	09-OCT-20	15-OCT-20	R5253218
Dimethylphthalate	<0.20		0.20	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4-Dimethylphenol	<0.50		0.50	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4-Dinitrophenol	<1.0		1.0	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4-Dinitrotoluene	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
2,6-Dinitrotoluene	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	09-OCT-20	15-OCT-20	R5253218
Bis(2-ethylhexyl)phthalate	2.3		2.0	ug/L	09-OCT-20	15-OCT-20	R5253218
Pentachlorophenol	<0.50		0.50	ug/L	09-OCT-20	15-OCT-20	R5253218
Phenol	<0.50		0.50	ug/L	09-OCT-20	15-OCT-20	R5253218
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	09-OCT-20	15-OCT-20	R5253218
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	09-OCT-20	15-OCT-20	R5253218
Surrogate: 2-Fluorobiphenyl	82.7		50-140	%	09-OCT-20	15-OCT-20	R5253218
Surrogate: Nitrobenzene d5	99.9		50-140	%	09-OCT-20	15-OCT-20	R5253218
Surrogate: p-Terphenyl d14	100.5		60-140	%	09-OCT-20	15-OCT-20	R5253218
Surrogate: 2,4,6-Tribromophenol	90.1		50-140	%	09-OCT-20	15-OCT-20	R5253218
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	14-OCT-20	14-OCT-20	R5254140
Aroclor 1248	<0.020		0.020	ug/L	14-OCT-20	14-OCT-20	R5254140
Aroclor 1254	<0.020		0.020	ug/L	14-OCT-20	14-OCT-20	R5254140
Aroclor 1260	<0.020		0.020	ug/L	14-OCT-20	14-OCT-20	R5254140
Surrogate: Decachlorobiphenyl	118.2		50-150	%	14-OCT-20	14-OCT-20	R5254140
Total PCBs	<0.040		0.040	ug/L	14-OCT-20	14-OCT-20	R5254140
Surrogate: Tetrachloro-m-xylene	86.7		50-150	%	14-OCT-20	14-OCT-20	R5254140

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	F1 (C6-C10)	LCS-L	L2514428-1
Matrix Spike	Aluminum (Al)-Total	MS-B	L2514428-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2514428-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2514428-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2514428-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2514428-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2514428-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2514428-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2514428-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2514428-1
Matrix Spike	Uranium (U)-Total	MS-B	L2514428-1

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-L	Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Reference Information

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
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Reference Information

WT

ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:**GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2514428

Report Date: 15-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5253218							
WG3421997-2 LCS								
1,2,4-Trichlorobenzene			86.7		%		50-140	13-OCT-20
2-Chlorophenol			89.8		%		50-140	13-OCT-20
2,4-Dichlorophenol			94.2		%		50-140	13-OCT-20
2,4-Dimethylphenol			102.3		%		30-130	13-OCT-20
2,4-Dinitrophenol			127.6		%		50-140	13-OCT-20
2,4-Dinitrotoluene			130.4		%		50-140	13-OCT-20
2,4,5-Trichlorophenol			103.1		%		50-140	13-OCT-20
2,4,6-Trichlorophenol			101.6		%		50-140	13-OCT-20
2,6-Dinitrotoluene			112.5		%		50-140	13-OCT-20
3,3'-Dichlorobenzidine			90.8		%		30-130	13-OCT-20
4-Chloroaniline			79.7		%		30-130	13-OCT-20
Biphenyl			100.5		%		50-140	13-OCT-20
Bis(2-chloroethyl)ether			101.5		%		50-140	13-OCT-20
Bis(2-chloroisopropyl)ether			99.3		%		50-140	13-OCT-20
Bis(2-ethylhexyl)phthalate			133.9		%		50-140	13-OCT-20
Diethylphthalate			100.3		%		50-140	13-OCT-20
Dimethylphthalate			99.4		%		50-140	13-OCT-20
Pentachlorophenol			106.6		%		50-140	13-OCT-20
Phenol			102.9		%		30-130	13-OCT-20
WG3421997-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	13-OCT-20
2-Chlorophenol			<0.30		ug/L		0.3	13-OCT-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	13-OCT-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	13-OCT-20
2,4-Dinitrophenol			<1.0		ug/L		1	13-OCT-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	13-OCT-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	13-OCT-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	13-OCT-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	13-OCT-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	13-OCT-20
4-Chloroaniline			<0.40		ug/L		0.4	13-OCT-20
Biphenyl			<0.40		ug/L		0.4	13-OCT-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	13-OCT-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	13-OCT-20



Quality Control Report

Workorder: L2514428

Report Date: 15-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5253218								
WG3421997-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	13-OCT-20
Diethylphthalate			<0.20		ug/L		0.2	13-OCT-20
Dimethylphthalate			<0.20		ug/L		0.2	13-OCT-20
Pentachlorophenol			<0.50		ug/L		0.5	13-OCT-20
Phenol			<0.50		ug/L		0.5	13-OCT-20
Surrogate: 2-Fluorobiphenyl			84.5		%		50-140	13-OCT-20
Surrogate: 2,4,6-Tribromophenol			83.0		%		50-140	13-OCT-20
Surrogate: Nitrobenzene d5			98.7		%		50-140	13-OCT-20
Surrogate: p-Terphenyl d14			116.3		%		60-140	13-OCT-20
CR-CR6-IC-WT Water								
Batch R5253209								
WG3422017-4 DUP								
Chromium, Hexavalent		WG3422017-3	<0.00050	RPD-NA	mg/L	N/A	20	09-OCT-20
WG3422017-2 LCS								
Chromium, Hexavalent			99.6		%		80-120	09-OCT-20
WG3422017-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	09-OCT-20
WG3422017-5 MS								
Chromium, Hexavalent		WG3422017-3	97.1		%		70-130	09-OCT-20
F1-HS-511-WT Water								
Batch R5253112								
WG3421565-4 DUP								
F1 (C6-C10)		WG3421565-3	<25	RPD-NA	ug/L	N/A	30	13-OCT-20
WG3421565-1 LCS								
F1 (C6-C10)			74.6	LCS-L	%		80-120	09-OCT-20
WG3421565-2 MB								
F1 (C6-C10)			<25		ug/L		25	09-OCT-20
Surrogate: 3,4-Dichlorotoluene			74.2		%		60-140	09-OCT-20
WG3421565-5 MS								
F1 (C6-C10)		WG3421565-3	85.2		%		60-140	13-OCT-20
F2-F4-511-WT Water								
Batch R5253236								
WG3421558-2 LCS								
F2 (C10-C16)			96.4		%		70-130	13-OCT-20
F3 (C16-C34)			97.8		%		70-130	13-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch R5253236								
WG3421558-2	LCS							
F4 (C34-C50)			102.9		%		70-130	13-OCT-20
WG3421558-1	MB							
F2 (C10-C16)			<100		ug/L		100	13-OCT-20
F3 (C16-C34)			<250		ug/L		250	13-OCT-20
F4 (C34-C50)			<250		ug/L		250	13-OCT-20
Surrogate: 2-Bromobenzotrifluoride			89.9		%		60-140	13-OCT-20
HG-T-CVAA-WT		Water						
Batch R5252246								
WG3421770-4	DUP	WG3421770-3						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	09-OCT-20
WG3421770-2	LCS							
Mercury (Hg)-Total			99.5		%		80-120	09-OCT-20
WG3421770-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	09-OCT-20
WG3421770-6	MS	WG3421770-5						
Mercury (Hg)-Total			96.6		%		70-130	09-OCT-20
MET-T-CCMS-WT		Water						
Batch R5253130								
WG3421493-4	DUP	WG3421493-3						
Aluminum (Al)-Total		0.149	0.156		mg/L	4.4	20	09-OCT-20
Antimony (Sb)-Total		0.00017	0.00016		mg/L	3.8	20	09-OCT-20
Arsenic (As)-Total		0.00065	0.00064		mg/L	1.6	20	09-OCT-20
Barium (Ba)-Total		0.0210	0.0210		mg/L	0.0	20	09-OCT-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	09-OCT-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	09-OCT-20
Boron (B)-Total		0.021	0.021		mg/L	0.2	20	09-OCT-20
Cadmium (Cd)-Total		0.0000149	0.0000151		mg/L	1.3	20	09-OCT-20
Calcium (Ca)-Total		28.6	28.4		mg/L	1.0	20	09-OCT-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	09-OCT-20
Cesium (Cs)-Total		0.000025	0.000024		mg/L	4.1	20	09-OCT-20
Cobalt (Co)-Total		0.00010	0.00010		mg/L	1.0	20	09-OCT-20
Copper (Cu)-Total		0.00130	0.00121		mg/L	7.0	20	09-OCT-20
Iron (Fe)-Total		0.197	0.199		mg/L	1.1	20	09-OCT-20
Lead (Pb)-Total		0.000303	0.000312		mg/L	2.8	20	09-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5253130							
WG3421493-4	DUP	WG3421493-3						
Lithium (Li)-Total		0.0018	0.0019		mg/L	3.2	20	09-OCT-20
Magnesium (Mg)-Total		8.28	8.30		mg/L	0.2	20	09-OCT-20
Manganese (Mn)-Total		0.00779	0.00772		mg/L	0.9	20	09-OCT-20
Molybdenum (Mo)-Total		0.00210	0.00208		mg/L	0.8	20	09-OCT-20
Nickel (Ni)-Total		0.00064	0.00060		mg/L	7.0	20	09-OCT-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	09-OCT-20
Potassium (K)-Total		1.30	1.32		mg/L	2.0	20	09-OCT-20
Rubidium (Rb)-Total		0.00145	0.00152		mg/L	4.3	20	09-OCT-20
Selenium (Se)-Total		0.000125	0.000114		mg/L	8.7	20	09-OCT-20
Silicon (Si)-Total		1.09	1.09		mg/L	0.4	20	09-OCT-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	09-OCT-20
Sodium (Na)-Total		14.1	14.0		mg/L	0.5	20	09-OCT-20
Strontium (Sr)-Total		0.139	0.141		mg/L	1.3	20	09-OCT-20
Sulfur (S)-Total		6.07	6.00		mg/L	1.2	25	09-OCT-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	09-OCT-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	09-OCT-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	09-OCT-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	09-OCT-20
Titanium (Ti)-Total		0.00288	0.00303		mg/L	5.2	20	09-OCT-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	09-OCT-20
Uranium (U)-Total		0.000289	0.000286		mg/L	1.1	20	09-OCT-20
Vanadium (V)-Total		0.00069	0.00069		mg/L	0.2	20	09-OCT-20
Zinc (Zn)-Total		0.0045	0.0044		mg/L	1.6	20	09-OCT-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	09-OCT-20
WG3421493-2	LCS							
Aluminum (Al)-Total			102.0		%		80-120	09-OCT-20
Antimony (Sb)-Total			99.9		%		80-120	09-OCT-20
Arsenic (As)-Total			100.9		%		80-120	09-OCT-20
Barium (Ba)-Total			98.5		%		80-120	09-OCT-20
Beryllium (Be)-Total			101.4		%		80-120	09-OCT-20
Bismuth (Bi)-Total			97.1		%		80-120	09-OCT-20
Boron (B)-Total			100.2		%		80-120	09-OCT-20
Cadmium (Cd)-Total			101.6		%		80-120	09-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5253130							
WG3421493-2	LCS							
Calcium (Ca)-Total			99.7		%		80-120	09-OCT-20
Chromium (Cr)-Total			99.9		%		80-120	09-OCT-20
Cesium (Cs)-Total			99.9		%		80-120	09-OCT-20
Cobalt (Co)-Total			99.8		%		80-120	09-OCT-20
Copper (Cu)-Total			99.9		%		80-120	09-OCT-20
Iron (Fe)-Total			101.0		%		80-120	09-OCT-20
Lead (Pb)-Total			98.1		%		80-120	09-OCT-20
Lithium (Li)-Total			101.4		%		80-120	09-OCT-20
Magnesium (Mg)-Total			104.7		%		80-120	09-OCT-20
Manganese (Mn)-Total			101.2		%		80-120	09-OCT-20
Molybdenum (Mo)-Total			98.4		%		80-120	09-OCT-20
Nickel (Ni)-Total			100.2		%		80-120	09-OCT-20
Phosphorus (P)-Total			111.0		%		70-130	09-OCT-20
Potassium (K)-Total			96.9		%		80-120	09-OCT-20
Rubidium (Rb)-Total			100.9		%		80-120	09-OCT-20
Selenium (Se)-Total			100.2		%		80-120	09-OCT-20
Silicon (Si)-Total			99.5		%		60-140	09-OCT-20
Silver (Ag)-Total			97.7		%		80-120	09-OCT-20
Sodium (Na)-Total			103.3		%		80-120	09-OCT-20
Strontium (Sr)-Total			101.7		%		80-120	09-OCT-20
Sulfur (S)-Total			101.9		%		80-120	09-OCT-20
Thallium (Tl)-Total			99.99		%		80-120	09-OCT-20
Tellurium (Te)-Total			99.4		%		80-120	09-OCT-20
Thorium (Th)-Total			100.1		%		70-130	09-OCT-20
Tin (Sn)-Total			95.4		%		80-120	09-OCT-20
Titanium (Ti)-Total			97.7		%		80-120	09-OCT-20
Tungsten (W)-Total			93.5		%		80-120	09-OCT-20
Uranium (U)-Total			102.0		%		80-120	09-OCT-20
Vanadium (V)-Total			101.7		%		80-120	09-OCT-20
Zinc (Zn)-Total			98.0		%		80-120	09-OCT-20
Zirconium (Zr)-Total			97.3		%		80-120	09-OCT-20
WG3421493-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	09-OCT-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	09-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5253130							
WG3421493-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	09-OCT-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	09-OCT-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	09-OCT-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	09-OCT-20
Boron (B)-Total			<0.010		mg/L		0.01	09-OCT-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	09-OCT-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	09-OCT-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	09-OCT-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	09-OCT-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	09-OCT-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	09-OCT-20
Iron (Fe)-Total			<0.010		mg/L		0.01	09-OCT-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	09-OCT-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	09-OCT-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	09-OCT-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	09-OCT-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	09-OCT-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	09-OCT-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	09-OCT-20
Potassium (K)-Total			<0.050		mg/L		0.05	09-OCT-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	09-OCT-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	09-OCT-20
Silicon (Si)-Total			<0.10		mg/L		0.1	09-OCT-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	09-OCT-20
Sodium (Na)-Total			<0.050		mg/L		0.05	09-OCT-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	09-OCT-20
Sulfur (S)-Total			<0.50		mg/L		0.5	09-OCT-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	09-OCT-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	09-OCT-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	09-OCT-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	09-OCT-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	09-OCT-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	09-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5253130							
WG3421493-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	09-OCT-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	09-OCT-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	09-OCT-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	09-OCT-20
WG3421493-5 MS		WG3421493-3						
Aluminum (Al)-Total			N/A	MS-B	%		-	09-OCT-20
Antimony (Sb)-Total			98.7		%		70-130	09-OCT-20
Arsenic (As)-Total			99.1		%		70-130	09-OCT-20
Barium (Ba)-Total			N/A	MS-B	%		-	09-OCT-20
Beryllium (Be)-Total			100.2		%		70-130	09-OCT-20
Bismuth (Bi)-Total			91.9		%		70-130	09-OCT-20
Boron (B)-Total			99.0		%		70-130	09-OCT-20
Cadmium (Cd)-Total			98.4		%		70-130	09-OCT-20
Calcium (Ca)-Total			N/A	MS-B	%		-	09-OCT-20
Chromium (Cr)-Total			99.6		%		70-130	09-OCT-20
Cesium (Cs)-Total			97.6		%		70-130	09-OCT-20
Cobalt (Co)-Total			97.7		%		70-130	09-OCT-20
Copper (Cu)-Total			97.1		%		70-130	09-OCT-20
Iron (Fe)-Total			N/A	MS-B	%		-	09-OCT-20
Lead (Pb)-Total			93.3		%		70-130	09-OCT-20
Lithium (Li)-Total			99.9		%		70-130	09-OCT-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	09-OCT-20
Manganese (Mn)-Total			94.9		%		70-130	09-OCT-20
Molybdenum (Mo)-Total			95.6		%		70-130	09-OCT-20
Nickel (Ni)-Total			96.5		%		70-130	09-OCT-20
Phosphorus (P)-Total			106.4		%		70-130	09-OCT-20
Potassium (K)-Total			97.4		%		70-130	09-OCT-20
Rubidium (Rb)-Total			102.4		%		70-130	09-OCT-20
Selenium (Se)-Total			97.8		%		70-130	09-OCT-20
Silicon (Si)-Total			N/A	MS-B	%		-	09-OCT-20
Silver (Ag)-Total			92.3		%		70-130	09-OCT-20
Sodium (Na)-Total			N/A	MS-B	%		-	09-OCT-20
Strontium (Sr)-Total			N/A	MS-B	%		-	09-OCT-20
Sulfur (S)-Total			N/A	MS-B	%		-	09-OCT-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5253130							
WG3421493-5 MS		WG3421493-3						
Thallium (Tl)-Total			94.5		%		70-130	09-OCT-20
Tellurium (Te)-Total			88.5		%		70-130	09-OCT-20
Thorium (Th)-Total			95.6		%		70-130	09-OCT-20
Tin (Sn)-Total			92.0		%		70-130	09-OCT-20
Titanium (Ti)-Total			96.3		%		70-130	09-OCT-20
Tungsten (W)-Total			91.8		%		70-130	09-OCT-20
Uranium (U)-Total			N/A	MS-B	%		-	09-OCT-20
Vanadium (V)-Total			101.4		%		70-130	09-OCT-20
Zinc (Zn)-Total			94.7		%		70-130	09-OCT-20
Zirconium (Zr)-Total			81.4		%		70-130	09-OCT-20
P-T-COL-WT								
	Water							
Batch	R5253467							
WG3421424-3 DUP		L2514428-1						
Phosphorus, Total		0.0063	0.0045	J	mg/L	0.0019	0.006	13-OCT-20
WG3421424-2 LCS								
Phosphorus, Total			102.0		%		80-120	13-OCT-20
WG3421424-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	13-OCT-20
WG3421424-4 MS		L2514428-1						
Phosphorus, Total			110.7		%		70-130	13-OCT-20
PAH-511-WT								
	Water							
Batch	R5252409							
WG3421558-2 LCS								
1-Methylnaphthalene			74.2		%		50-140	09-OCT-20
2-Methylnaphthalene			70.7		%		50-140	09-OCT-20
Acenaphthene			86.6		%		50-140	09-OCT-20
Acenaphthylene			85.9		%		50-140	09-OCT-20
Anthracene			88.6		%		50-140	09-OCT-20
Benzo(a)anthracene			109.0		%		50-140	09-OCT-20
Benzo(a)pyrene			86.0		%		50-140	09-OCT-20
Benzo(b)fluoranthene			103.3		%		50-140	09-OCT-20
Benzo(g,h,i)perylene			73.0		%		50-140	09-OCT-20
Benzo(k)fluoranthene			84.2		%		50-140	09-OCT-20
Chrysene			89.2		%		50-140	09-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT		Water						
Batch	R5252409							
WG3421558-2	LCS							
Dibenzo(ah)anthracene			70.6		%		50-140	09-OCT-20
Fluoranthene			90.2		%		50-140	09-OCT-20
Fluorene			88.4		%		50-140	09-OCT-20
Indeno(1,2,3-cd)pyrene			81.1		%		50-140	09-OCT-20
Naphthalene			71.1		%		50-140	09-OCT-20
Phenanthrene			97.0		%		50-140	09-OCT-20
Pyrene			90.6		%		50-140	09-OCT-20
WG3421558-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	09-OCT-20
2-Methylnaphthalene			<0.020		ug/L		0.02	09-OCT-20
Acenaphthene			<0.020		ug/L		0.02	09-OCT-20
Acenaphthylene			<0.020		ug/L		0.02	09-OCT-20
Anthracene			<0.020		ug/L		0.02	09-OCT-20
Benzo(a)anthracene			<0.020		ug/L		0.02	09-OCT-20
Benzo(a)pyrene			<0.010		ug/L		0.01	09-OCT-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	09-OCT-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	09-OCT-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	09-OCT-20
Chrysene			<0.020		ug/L		0.02	09-OCT-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	09-OCT-20
Fluoranthene			<0.020		ug/L		0.02	09-OCT-20
Fluorene			<0.020		ug/L		0.02	09-OCT-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	09-OCT-20
Naphthalene			<0.050		ug/L		0.05	09-OCT-20
Phenanthrene			<0.020		ug/L		0.02	09-OCT-20
Pyrene			<0.020		ug/L		0.02	09-OCT-20
Surrogate: d8-Naphthalene			101.5		%		60-140	09-OCT-20
Surrogate: d10-Phenanthrene			116.7		%		60-140	09-OCT-20
Surrogate: d12-Chrysene			100.9		%		60-140	09-OCT-20
Surrogate: d10-Acenaphthene			109.7		%		60-140	09-OCT-20

PCB-511-WT **Water**



Quality Control Report

Workorder: L2514428

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5254140							
WG3421539-2	LCS							
Aroclor 1242			86.3		%		60-140	14-OCT-20
Aroclor 1248			83.9		%		60-140	14-OCT-20
Aroclor 1254			87.2		%		60-140	14-OCT-20
Aroclor 1260			86.4		%		60-140	14-OCT-20
WG3421539-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	14-OCT-20
Aroclor 1248			<0.020		ug/L		0.02	14-OCT-20
Aroclor 1254			<0.020		ug/L		0.02	14-OCT-20
Aroclor 1260			<0.020		ug/L		0.02	14-OCT-20
Surrogate: Decachlorobiphenyl			107.1		%		50-150	14-OCT-20
Surrogate: Tetrachloro-m-xylene			81.6		%		50-150	14-OCT-20
VOC-511-HS-WT		Water						
Batch	R5253112							
WG3421565-4	DUP	WG3421565-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	13-OCT-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	13-OCT-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	13-OCT-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	13-OCT-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	13-OCT-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5253112							
WG3421565-4	DUP	WG3421565-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	13-OCT-20
cis-1,2-Dichloroethylene		2.84	2.81		ug/L	1.1	30	13-OCT-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	13-OCT-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	13-OCT-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	13-OCT-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	13-OCT-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	13-OCT-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	13-OCT-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	13-OCT-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	13-OCT-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	13-OCT-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	13-OCT-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	13-OCT-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	13-OCT-20
Vinyl chloride		6.93	6.83		ug/L	1.5	30	13-OCT-20
WG3421565-1	LCS							
1,1,1,2-Tetrachloroethane			92.8		%		70-130	09-OCT-20
1,1,2,2-Tetrachloroethane			102.5		%		70-130	09-OCT-20
1,1,1-Trichloroethane			97.8		%		70-130	09-OCT-20
1,1,2-Trichloroethane			98.2		%		70-130	09-OCT-20
1,1-Dichloroethane			101.4		%		70-130	09-OCT-20
1,1-Dichloroethylene			94.0		%		70-130	09-OCT-20
1,2-Dibromoethane			96.0		%		70-130	09-OCT-20
1,2-Dichlorobenzene			100.1		%		70-130	09-OCT-20
1,2-Dichloroethane			102.6		%		70-130	09-OCT-20
1,2-Dichloropropane			102.1		%		70-130	09-OCT-20
1,3-Dichlorobenzene			100.5		%		70-130	09-OCT-20

Quality Control Report

Workorder: L2514428

Report Date: 15-OCT-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5253112							
WG3421565-1	LCS							
1,4-Dichlorobenzene			100.5		%		70-130	09-OCT-20
Acetone			109.9		%		60-140	09-OCT-20
Benzene			100.8		%		70-130	09-OCT-20
Bromodichloromethane			110.1		%		70-130	09-OCT-20
Bromoform			103.8		%		70-130	09-OCT-20
Bromomethane			122.6		%		60-140	09-OCT-20
Carbon tetrachloride			97.9		%		70-130	09-OCT-20
Chlorobenzene			94.5		%		70-130	09-OCT-20
Chloroform			103.3		%		70-130	09-OCT-20
cis-1,2-Dichloroethylene			97.1		%		70-130	09-OCT-20
cis-1,3-Dichloropropene			102.4		%		70-130	09-OCT-20
Dibromochloromethane			93.9		%		70-130	09-OCT-20
Dichlorodifluoromethane			89.4		%		50-140	09-OCT-20
Ethylbenzene			91.1		%		70-130	09-OCT-20
n-Hexane			94.9		%		70-130	09-OCT-20
m+p-Xylenes			91.7		%		70-130	09-OCT-20
Methyl Ethyl Ketone			113.5		%		60-140	09-OCT-20
Methyl Isobutyl Ketone			104.9		%		60-140	09-OCT-20
Methylene Chloride			102.2		%		70-130	09-OCT-20
MTBE			107.3		%		70-130	09-OCT-20
o-Xylene			99.96		%		70-130	09-OCT-20
Styrene			94.8		%		70-130	09-OCT-20
Tetrachloroethylene			91.0		%		70-130	09-OCT-20
Toluene			91.1		%		70-130	09-OCT-20
trans-1,2-Dichloroethylene			96.3		%		70-130	09-OCT-20
trans-1,3-Dichloropropene			100.4		%		70-130	09-OCT-20
Trichloroethylene			99.5		%		70-130	09-OCT-20
Trichlorofluoromethane			91.4		%		60-140	09-OCT-20
Vinyl chloride			105.6		%		60-140	09-OCT-20
WG3421565-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	09-OCT-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	09-OCT-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	09-OCT-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	09-OCT-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5253112							
WG3421565-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	09-OCT-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	09-OCT-20
1,2-Dibromoethane			<0.20		ug/L		0.2	09-OCT-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	09-OCT-20
1,2-Dichloroethane			<0.50		ug/L		0.5	09-OCT-20
1,2-Dichloropropane			<0.50		ug/L		0.5	09-OCT-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	09-OCT-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	09-OCT-20
Acetone			<30		ug/L		30	09-OCT-20
Benzene			<0.50		ug/L		0.5	09-OCT-20
Bromodichloromethane			<2.0		ug/L		2	09-OCT-20
Bromoform			<5.0		ug/L		5	09-OCT-20
Bromomethane			<0.50		ug/L		0.5	09-OCT-20
Carbon tetrachloride			<0.20		ug/L		0.2	09-OCT-20
Chlorobenzene			<0.50		ug/L		0.5	09-OCT-20
Chloroform			<1.0		ug/L		1	09-OCT-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	09-OCT-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	09-OCT-20
Dibromochloromethane			<2.0		ug/L		2	09-OCT-20
Dichlorodifluoromethane			<2.0		ug/L		2	09-OCT-20
Ethylbenzene			<0.50		ug/L		0.5	09-OCT-20
n-Hexane			<0.50		ug/L		0.5	09-OCT-20
m+p-Xylenes			<0.40		ug/L		0.4	09-OCT-20
Methyl Ethyl Ketone			<20		ug/L		20	09-OCT-20
Methyl Isobutyl Ketone			<20		ug/L		20	09-OCT-20
Methylene Chloride			<5.0		ug/L		5	09-OCT-20
MTBE			<2.0		ug/L		2	09-OCT-20
o-Xylene			<0.30		ug/L		0.3	09-OCT-20
Styrene			<0.50		ug/L		0.5	09-OCT-20
Tetrachloroethylene			<0.50		ug/L		0.5	09-OCT-20
Toluene			<0.50		ug/L		0.5	09-OCT-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	09-OCT-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	09-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5253112							
WG3421565-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	09-OCT-20
Trichlorofluoromethane			<5.0		ug/L		5	09-OCT-20
Vinyl chloride			<0.50		ug/L		0.5	09-OCT-20
Surrogate: 1,4-Difluorobenzene			101.6		%		70-130	09-OCT-20
Surrogate: 4-Bromofluorobenzene			103.8		%		70-130	09-OCT-20
WG3421565-5 MS		WG3421565-3						
1,1,1,2-Tetrachloroethane			93.3		%		50-140	13-OCT-20
1,1,2,2-Tetrachloroethane			73.2		%		50-140	13-OCT-20
1,1,1-Trichloroethane			98.7		%		50-140	13-OCT-20
1,1,2-Trichloroethane			92.0		%		50-140	13-OCT-20
1,1-Dichloroethane			100.6		%		50-140	13-OCT-20
1,1-Dichloroethylene			93.9		%		50-140	13-OCT-20
1,2-Dibromoethane			87.8		%		50-140	13-OCT-20
1,2-Dichlorobenzene			99.2		%		50-140	13-OCT-20
1,2-Dichloroethane			95.0		%		50-140	13-OCT-20
1,2-Dichloropropane			99.1		%		50-140	13-OCT-20
1,3-Dichlorobenzene			111.2		%		50-140	13-OCT-20
1,4-Dichlorobenzene			109.5		%		50-140	13-OCT-20
Acetone			80.9		%		50-140	13-OCT-20
Benzene			99.7		%		50-140	13-OCT-20
Bromodichloromethane			105.7		%		50-140	13-OCT-20
Bromoform			89.7		%		50-140	13-OCT-20
Bromomethane			116.8		%		50-140	13-OCT-20
Carbon tetrachloride			98.7		%		50-140	13-OCT-20
Chlorobenzene			94.6		%		50-140	13-OCT-20
Chloroform			101.8		%		50-140	13-OCT-20
cis-1,2-Dichloroethylene			96.0		%		50-140	13-OCT-20
cis-1,3-Dichloropropene			91.9		%		50-140	13-OCT-20
Dibromochloromethane			88.0		%		50-140	13-OCT-20
Dichlorodifluoromethane			83.1		%		50-140	13-OCT-20
Ethylbenzene			93.7		%		50-140	13-OCT-20
n-Hexane			94.9		%		50-140	13-OCT-20
m+p-Xylenes			93.8		%		50-140	13-OCT-20
Methyl Ethyl Ketone			80.6		%		50-140	13-OCT-20



Quality Control Report

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5253112							
WG3421565-5 MS		WG3421565-3						
Methyl Isobutyl Ketone			72.5		%		50-140	13-OCT-20
Methylene Chloride			98.2		%		50-140	13-OCT-20
MTBE			107.3		%		50-140	13-OCT-20
o-Xylene			101.6		%		50-140	13-OCT-20
Styrene			94.3		%		50-140	13-OCT-20
Tetrachloroethylene			92.6		%		50-140	13-OCT-20
Toluene			92.5		%		50-140	13-OCT-20
trans-1,2-Dichloroethylene			94.9		%		50-140	13-OCT-20
trans-1,3-Dichloropropene			89.3		%		50-140	13-OCT-20
Trichloroethylene			98.8		%		50-140	13-OCT-20
Trichlorofluoromethane			91.6		%		50-140	13-OCT-20
Vinyl chloride			104.0		%		50-140	13-OCT-20

Quality Control Report

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-L	Lab Control Sample recovery was below ALS DQO. Reference Material and/or Matrix Spike results were acceptable. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

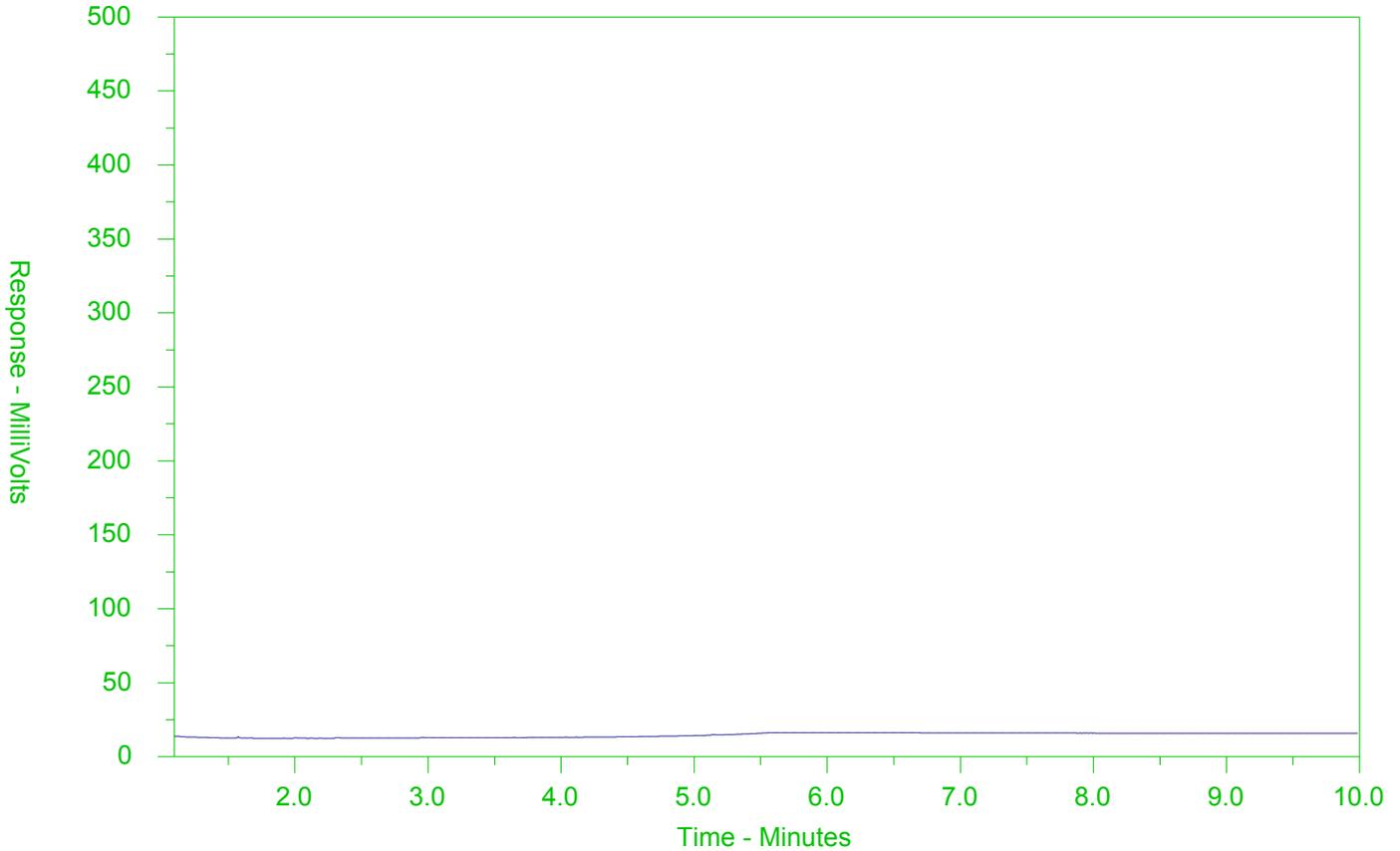
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2514428-1
 Client Sample ID: W-11210029-20201008-40



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytica Request Form

Canada Toll Free: 1 800 668 9878



L2514428-COFC

COC Number: 17 -

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www.alsglobal.com

Report To Contact and company name below will appear on the final report		Report Format / Distribution		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																																	
Company: GHD LIMITED - ACCT #13791		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)		Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply EMERGENCY 4 day [P4-20%] <input type="checkbox"/> 1 Business day [E - 100%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 -200% <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> (Laboratory opening fees may apply)] <input type="checkbox"/>																																	
Contact: Laura Ermeta		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm																																	
Phone: 519-884-0510		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked		For tests that can not be performed according to the service level selected, you will be contacted.																																	
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		Analysis Request																																	
Street: 455 Phillip St		Email 1 or Fax: laura.ermeta@ghd.com		<table border="1"> <thead> <tr> <th rowspan="2">NUMBER OF CONTAINERS</th> <th colspan="8">Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below</th> <th rowspan="2">SUSPECTED HAZARD (see Special Instructions)</th> </tr> <tr> <th>Total Metals (MET-T-CCMS-WT)</th> <th>Total Mercury (HG-T-CVAA-WT)</th> <th>Total Cr6 (CR-CR6-IC-WT)</th> <th>Total Phosphorous (P-T-COL-WT)</th> <th>PCBs (PCB-511-WT)</th> <th>VOCs and PHCs (VOC-F1-F4-511-P-WT)</th> <th>SVOCs (SVOG-511-GP-WT)</th> <th></th> </tr> </thead> <tbody> <tr> <td>12</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td></td> <td></td> </tr> </tbody> </table>						NUMBER OF CONTAINERS	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below								SUSPECTED HAZARD (see Special Instructions)	Total Metals (MET-T-CCMS-WT)	Total Mercury (HG-T-CVAA-WT)	Total Cr6 (CR-CR6-IC-WT)	Total Phosphorous (P-T-COL-WT)	PCBs (PCB-511-WT)	VOCs and PHCs (VOC-F1-F4-511-P-WT)	SVOCs (SVOG-511-GP-WT)		12	R	R	R	R	R	R	R		
NUMBER OF CONTAINERS	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below										SUSPECTED HAZARD (see Special Instructions)																										
	Total Metals (MET-T-CCMS-WT)	Total Mercury (HG-T-CVAA-WT)	Total Cr6 (CR-CR6-IC-WT)	Total Phosphorous (P-T-COL-WT)	PCBs (PCB-511-WT)	VOCs and PHCs (VOC-F1-F4-511-P-WT)	SVOCs (SVOG-511-GP-WT)																														
12	R	R	R	R	R	R	R																														
City/Province: Waterloo, Ontario		Email 2: See PO																																			
Postal Code: N2L 3X2		Email 3:																																			
Invoice To		Invoice Distribution																																			
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																																			
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Email 1 or Fax: apinvoiced-735@ghd.com																																			
Company: GHD Limited		Email 2:																																			
Contact: SEE SOW																																					
Project Information				Oil and Gas Required Fields (client use)																																	
ALS Account # / Quote #: 13791		AFE/Cost Center:		PO#:																																	
Job #: 11210029		Major/Minor Code:		Routing Code:																																	
PO / AFE: 73520086		Requisitioner:																																			
LSD:		Location:																																			
ALS Lab Work Order # (lab use only): 22514428		ALS Contact: Rick H		Sampler: EDC																																	
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)			Date (dd-mmm-yy)	Time (hh:mm)	Sample Type																															
	W-11210029-3021008-40			08/10/20	1000AM	Water																															
Drinking Water (DW) Samples (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)				SAMPLE CONDITION AS RECEIVED (lab use only)																															
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO						Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																															
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO						Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input checked="" type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																															
						Cooling Initiated <input type="checkbox"/>																															
						INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C																													
								9.2																													
SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)																															
Released by:		Date: OCT 8/20	Time: 1000AM	Received by:		Date: OCT 9/20	Time: 1400																														



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 15-OCT-20
Report Date: 21-OCT-20 14:22 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2517112

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2517112-1 W-11210029-20201015-42 Sampled By: CLIENT on 15-OCT-20 @ 11:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0042		0.0030	mg/L	19-OCT-20	20-OCT-20	R5258678
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	16-OCT-20	16-OCT-20	R5255771
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Arsenic (As)-Total	0.00535		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Barium (Ba)-Total	0.0537		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	16-OCT-20	16-OCT-20	R5255771
Boron (B)-Total	<0.010		0.010	mg/L	16-OCT-20	16-OCT-20	R5255771
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	16-OCT-20	16-OCT-20	R5255771
Calcium (Ca)-Total	70.5		0.050	mg/L	16-OCT-20	16-OCT-20	R5255771
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	16-OCT-20	16-OCT-20	R5255771
Chromium (Cr)-Total	0.00083		0.00050	mg/L	16-OCT-20	16-OCT-20	R5255771
Cobalt (Co)-Total	0.00011		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Copper (Cu)-Total	<0.00050		0.00050	mg/L	16-OCT-20	16-OCT-20	R5255771
Iron (Fe)-Total	0.520		0.010	mg/L	16-OCT-20	16-OCT-20	R5255771
Lead (Pb)-Total	0.000072		0.000050	mg/L	16-OCT-20	16-OCT-20	R5255771
Lithium (Li)-Total	0.0030		0.0010	mg/L	16-OCT-20	16-OCT-20	R5255771
Magnesium (Mg)-Total	33.3		0.0050	mg/L	16-OCT-20	16-OCT-20	R5255771
Manganese (Mn)-Total	0.0106		0.00050	mg/L	16-OCT-20	16-OCT-20	R5255771
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		19-OCT-20	R5256890
Molybdenum (Mo)-Total	0.000586		0.000050	mg/L	16-OCT-20	16-OCT-20	R5255771
Nickel (Ni)-Total	0.00139		0.00050	mg/L	16-OCT-20	16-OCT-20	R5255771
Phosphorus (P)-Total	<0.050		0.050	mg/L	16-OCT-20	16-OCT-20	R5255771
Potassium (K)-Total	0.930		0.050	mg/L	16-OCT-20	16-OCT-20	R5255771
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	16-OCT-20	16-OCT-20	R5255771
Selenium (Se)-Total	<0.000050		0.000050	mg/L	16-OCT-20	16-OCT-20	R5255771
Silicon (Si)-Total	9.13		0.10	mg/L	16-OCT-20	16-OCT-20	R5255771
Silver (Ag)-Total	<0.000050		0.000050	mg/L	16-OCT-20	16-OCT-20	R5255771
Sodium (Na)-Total	7.64		0.050	mg/L	16-OCT-20	16-OCT-20	R5255771
Strontium (Sr)-Total	0.150		0.0010	mg/L	16-OCT-20	16-OCT-20	R5255771
Sulfur (S)-Total	20.7		0.50	mg/L	16-OCT-20	16-OCT-20	R5255771
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	16-OCT-20	16-OCT-20	R5255771
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	16-OCT-20	16-OCT-20	R5255771
Thorium (Th)-Total	<0.00010		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Tin (Sn)-Total	<0.00010		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	16-OCT-20	16-OCT-20	R5255771
Tungsten (W)-Total	<0.00010		0.00010	mg/L	16-OCT-20	16-OCT-20	R5255771
Uranium (U)-Total	0.000247		0.000010	mg/L	16-OCT-20	16-OCT-20	R5255771
Vanadium (V)-Total	<0.00050		0.00050	mg/L	16-OCT-20	16-OCT-20	R5255771
Zinc (Zn)-Total	0.0142		0.0030	mg/L	16-OCT-20	16-OCT-20	R5255771

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2517112-1 W-11210029-20201015-42 Sampled By: CLIENT on 15-OCT-20 @ 11:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	16-OCT-20	16-OCT-20	R5255771
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		16-OCT-20	R5255928
Volatile Organic Compounds							
Acetone	<30		30	ug/L		21-OCT-20	R5260301
Benzene	<0.50		0.50	ug/L		21-OCT-20	R5260301
Bromodichloromethane	<2.0		2.0	ug/L		21-OCT-20	R5260301
Bromoform	<5.0		5.0	ug/L		21-OCT-20	R5260301
Bromomethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
Carbon tetrachloride	<0.20		0.20	ug/L		21-OCT-20	R5260301
Chlorobenzene	<0.50		0.50	ug/L		21-OCT-20	R5260301
Dibromochloromethane	<2.0		2.0	ug/L		21-OCT-20	R5260301
Chloroform	<1.0		1.0	ug/L		21-OCT-20	R5260301
1,2-Dibromoethane	<0.20		0.20	ug/L		21-OCT-20	R5260301
1,2-Dichlorobenzene	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,3-Dichlorobenzene	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,4-Dichlorobenzene	<0.50		0.50	ug/L		21-OCT-20	R5260301
Dichlorodifluoromethane	<2.0		2.0	ug/L		21-OCT-20	R5260301
1,1-Dichloroethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,2-Dichloroethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,1-Dichloroethylene	<0.50		0.50	ug/L		21-OCT-20	R5260301
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		21-OCT-20	R5260301
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		21-OCT-20	R5260301
Methylene Chloride	<5.0		5.0	ug/L		21-OCT-20	R5260301
1,2-Dichloropropane	<0.50		0.50	ug/L		21-OCT-20	R5260301
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		21-OCT-20	R5260301
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		21-OCT-20	R5260301
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		21-OCT-20	R5260301
Ethylbenzene	<0.50		0.50	ug/L		21-OCT-20	R5260301
n-Hexane	<0.50		0.50	ug/L		21-OCT-20	R5260301
Methyl Ethyl Ketone	<20		20	ug/L		21-OCT-20	R5260301
Methyl Isobutyl Ketone	<20		20	ug/L		21-OCT-20	R5260301
MTBE	<2.0		2.0	ug/L		21-OCT-20	R5260301
Styrene	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
Tetrachloroethylene	<0.50		0.50	ug/L		21-OCT-20	R5260301
Toluene	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,1,1-Trichloroethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
1,1,2-Trichloroethane	<0.50		0.50	ug/L		21-OCT-20	R5260301
Trichloroethylene	<0.50		0.50	ug/L		21-OCT-20	R5260301

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2517112-1 W-11210029-20201015-42							
Sampled By: CLIENT on 15-OCT-20 @ 11:00							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		21-OCT-20	R5260301
Vinyl chloride	<0.50		0.50	ug/L		21-OCT-20	R5260301
o-Xylene	<0.30		0.30	ug/L		21-OCT-20	R5260301
m+p-Xylenes	<0.40		0.40	ug/L		21-OCT-20	R5260301
Xylenes (Total)	<0.50		0.50	ug/L		21-OCT-20	
Surrogate: 4-Bromofluorobenzene	100.9		70-130	%		21-OCT-20	R5260301
Surrogate: 1,4-Difluorobenzene	100.9		70-130	%		21-OCT-20	R5260301
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		21-OCT-20	R5260301
F1-BTEX	<25		25	ug/L		21-OCT-20	
F2 (C10-C16)	<100		100	ug/L	16-OCT-20	19-OCT-20	R5257133
F2-Naphth	<100		100	ug/L		21-OCT-20	
F3 (C16-C34)	<250		250	ug/L	16-OCT-20	19-OCT-20	R5257133
F3-PAH	<250		250	ug/L		21-OCT-20	
F4 (C34-C50)	<250		250	ug/L	16-OCT-20	19-OCT-20	R5257133
Total Hydrocarbons (C6-C50)	<370		370	ug/L		21-OCT-20	
Chrom. to baseline at nC50	YES				16-OCT-20	19-OCT-20	R5257133
Surrogate: 2-Bromobenzotrifluoride	79.9		60-140	%	16-OCT-20	19-OCT-20	R5257133
Surrogate: 3,4-Dichlorotoluene	90.0		60-140	%		21-OCT-20	R5260301
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Acenaphthylene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Anthracene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Benzo(a)anthracene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Benzo(a)pyrene	<0.010		0.010	ug/L	16-OCT-20	21-OCT-20	R5256807
Benzo(b)fluoranthene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Benzo(k)fluoranthene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Chrysene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Fluoranthene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Fluorene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		21-OCT-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
2-Methylnaphthalene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Naphthalene	<0.050		0.050	ug/L	16-OCT-20	21-OCT-20	R5256807
Phenanthrene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Pyrene	<0.020		0.020	ug/L	16-OCT-20	21-OCT-20	R5256807
Surrogate: d10-Acenaphthene	94.4		60-140	%	16-OCT-20	21-OCT-20	R5256807
Surrogate: d12-Chrysene	93.0		60-140	%	16-OCT-20	21-OCT-20	R5256807

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2517112-1 W-11210029-20201015-42							
Sampled By: CLIENT on 15-OCT-20 @ 11:00							
Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	91.1		60-140	%	16-OCT-20	21-OCT-20	R5256807
Surrogate: d10-Phenanthrene	94.9		60-140	%	16-OCT-20	21-OCT-20	R5256807
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
4-Chloroaniline	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
2-Chlorophenol	<0.30		0.30	ug/L	16-OCT-20	21-OCT-20	R5259272
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4-Dichlorophenol	<0.30		0.30	ug/L	16-OCT-20	21-OCT-20	R5259272
Diethylphthalate	<0.20		0.20	ug/L	16-OCT-20	21-OCT-20	R5259272
Dimethylphthalate	<0.20		0.20	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4-Dimethylphenol	<0.50		0.50	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4-Dinitrophenol	<1.0		1.0	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4-Dinitrotoluene	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
2,6-Dinitrotoluene	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	16-OCT-20	21-OCT-20	R5259272
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	16-OCT-20	21-OCT-20	R5259272
Pentachlorophenol	<0.50		0.50	ug/L	16-OCT-20	21-OCT-20	R5259272
Phenol	<0.50		0.50	ug/L	16-OCT-20	21-OCT-20	R5259272
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	16-OCT-20	21-OCT-20	R5259272
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	16-OCT-20	21-OCT-20	R5259272
Surrogate: 2-Fluorobiphenyl	92.9		50-140	%	16-OCT-20	21-OCT-20	R5259272
Surrogate: Nitrobenzene d5	101.8		50-140	%	16-OCT-20	21-OCT-20	R5259272
Surrogate: p-Terphenyl d14	103.0		60-140	%	16-OCT-20	21-OCT-20	R5259272
Surrogate: 2,4,6-Tribromophenol	106.1		50-140	%	16-OCT-20	21-OCT-20	R5259272
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	20-OCT-20	20-OCT-20	R5257916
Aroclor 1248	<0.020		0.020	ug/L	20-OCT-20	20-OCT-20	R5257916
Aroclor 1254	<0.020		0.020	ug/L	20-OCT-20	20-OCT-20	R5257916
Aroclor 1260	<0.020		0.020	ug/L	20-OCT-20	20-OCT-20	R5257916
Surrogate: Decachlorobiphenyl	124.7		50-150	%	20-OCT-20	20-OCT-20	R5257916
Total PCBs	<0.040		0.040	ug/L	20-OCT-20	20-OCT-20	R5257916
Surrogate: Tetrachloro-m-xylene	89.0		50-150	%	20-OCT-20	20-OCT-20	R5257916

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Total	MS-B	L2517112-1
Matrix Spike	Boron (B)-Total	MS-B	L2517112-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2517112-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2517112-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2517112-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2517112-1
Matrix Spike	Potassium (K)-Total	MS-B	L2517112-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2517112-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2517112-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2517112-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2517112-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5259272							
WG3425274-2	LCS							
1,2,4-Trichlorobenzene			94.9		%		50-140	20-OCT-20
2-Chlorophenol			85.9		%		50-140	20-OCT-20
2,4-Dichlorophenol			97.2		%		50-140	20-OCT-20
2,4-Dimethylphenol			81.5		%		30-130	20-OCT-20
2,4-Dinitrophenol			98.0		%		50-140	20-OCT-20
2,4-Dinitrotoluene			107.9		%		50-140	20-OCT-20
2,4,5-Trichlorophenol			106.0		%		50-140	20-OCT-20
2,4,6-Trichlorophenol			99.2		%		50-140	20-OCT-20
2,6-Dinitrotoluene			95.9		%		50-140	20-OCT-20
3,3'-Dichlorobenzidine			87.1		%		30-130	20-OCT-20
4-Chloroaniline			81.5		%		30-130	20-OCT-20
Biphenyl			98.1		%		50-140	20-OCT-20
Bis(2-chloroethyl)ether			96.6		%		50-140	20-OCT-20
Bis(2-chloroisopropyl)ether			90.5		%		50-140	20-OCT-20
Bis(2-ethylhexyl)phthalate			111.3		%		50-140	20-OCT-20
Diethylphthalate			98.1		%		50-140	20-OCT-20
Dimethylphthalate			93.8		%		50-140	20-OCT-20
Pentachlorophenol			111.7		%		50-140	20-OCT-20
Phenol			103.9		%		30-130	20-OCT-20
WG3425274-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	20-OCT-20
2-Chlorophenol			<0.30		ug/L		0.3	20-OCT-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	20-OCT-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	20-OCT-20
2,4-Dinitrophenol			<1.0		ug/L		1	20-OCT-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	20-OCT-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	20-OCT-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	20-OCT-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	20-OCT-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	20-OCT-20
4-Chloroaniline			<0.40		ug/L		0.4	20-OCT-20
Biphenyl			<0.40		ug/L		0.4	20-OCT-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	20-OCT-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	20-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT		Water						
Batch	R5259272							
WG3425274-1	MB							
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	20-OCT-20
Diethylphthalate			<0.20		ug/L		0.2	20-OCT-20
Dimethylphthalate			<0.20		ug/L		0.2	20-OCT-20
Pentachlorophenol			<0.50		ug/L		0.5	20-OCT-20
Phenol			<0.50		ug/L		0.5	20-OCT-20
Surrogate: 2-Fluorobiphenyl			96.4		%		50-140	20-OCT-20
Surrogate: 2,4,6-Tribromophenol			80.5		%		50-140	20-OCT-20
Surrogate: Nitrobenzene d5			100.6		%		50-140	20-OCT-20
Surrogate: p-Terphenyl d14			130.3		%		60-140	20-OCT-20
CR-CR6-IC-WT		Water						
Batch	R5255928							
WG3426296-4	DUP	WG3426296-3						
Chromium, Hexavalent		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	16-OCT-20
WG3426296-2	LCS							
Chromium, Hexavalent			101.4		%		80-120	16-OCT-20
WG3426296-1	MB							
Chromium, Hexavalent			<0.00050		mg/L		0.0005	16-OCT-20
WG3426296-5	MS	WG3426296-3						
Chromium, Hexavalent			99.1		%		70-130	16-OCT-20
F1-HS-511-WT		Water						
Batch	R5260301							
WG3427874-4	DUP	WG3427874-3						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	21-OCT-20
WG3427874-1	LCS							
F1 (C6-C10)			82.7		%		80-120	21-OCT-20
WG3427874-2	MB							
F1 (C6-C10)			<25		ug/L		25	21-OCT-20
Surrogate: 3,4-Dichlorotoluene			90.9		%		60-140	21-OCT-20
WG3427874-5	MS	WG3427874-3						
F1 (C6-C10)			89.0		%		60-140	21-OCT-20
F2-F4-511-WT		Water						
Batch	R5257133							
WG3425649-2	LCS							
F2 (C10-C16)			93.8		%		70-130	19-OCT-20
F3 (C16-C34)			98.4		%		70-130	19-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch R5257133								
WG3425649-2	LCS							
F4 (C34-C50)			107.1		%		70-130	19-OCT-20
WG3425649-1	MB							
F2 (C10-C16)			<100		ug/L		100	19-OCT-20
F3 (C16-C34)			<250		ug/L		250	19-OCT-20
F4 (C34-C50)			<250		ug/L		250	19-OCT-20
Surrogate: 2-Bromobenzotrifluoride			74.1		%		60-140	19-OCT-20
HG-T-CVAA-WT		Water						
Batch R5256890								
WG3426102-4	DUP	WG3426102-3						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	19-OCT-20
WG3426102-2	LCS							
Mercury (Hg)-Total			114.0		%		80-120	19-OCT-20
WG3426102-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	19-OCT-20
WG3426102-6	MS	WG3426102-5						
Mercury (Hg)-Total			115.2		%		70-130	19-OCT-20
MET-T-CCMS-WT		Water						
Batch R5255771								
WG3425624-4	DUP	WG3425624-3						
Aluminum (Al)-Total		0.0066	0.0063		mg/L	5.1	20	16-OCT-20
Antimony (Sb)-Total		0.00049	0.00049		mg/L	1.2	20	16-OCT-20
Arsenic (As)-Total		0.00039	0.00043		mg/L	11	20	16-OCT-20
Barium (Ba)-Total		0.128	0.130		mg/L	1.4	20	16-OCT-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	16-OCT-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	16-OCT-20
Boron (B)-Total		0.053	0.053		mg/L	1.0	20	16-OCT-20
Cadmium (Cd)-Total		0.0000087	0.0000065	J	mg/L	0.0000022	0.00001	16-OCT-20
Calcium (Ca)-Total		46.2	45.7		mg/L	1.1	20	16-OCT-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	16-OCT-20
Cesium (Cs)-Total		0.000036	0.000033		mg/L	6.7	20	16-OCT-20
Cobalt (Co)-Total		0.00055	0.00054		mg/L	1.6	20	16-OCT-20
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	16-OCT-20
Iron (Fe)-Total		0.104	0.103		mg/L	1.2	20	16-OCT-20
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	16-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5255771							
WG3425624-4	DUP	WG3425624-3						
Lithium (Li)-Total		0.0043	0.0042		mg/L	1.1	20	16-OCT-20
Magnesium (Mg)-Total		12.1	12.4		mg/L	2.5	20	16-OCT-20
Manganese (Mn)-Total		0.0289	0.0283		mg/L	1.9	20	16-OCT-20
Molybdenum (Mo)-Total		0.00473	0.00468		mg/L	1.1	20	16-OCT-20
Nickel (Ni)-Total		0.00180	0.00179		mg/L	0.1	20	16-OCT-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	16-OCT-20
Potassium (K)-Total		3.31	3.39		mg/L	2.4	20	16-OCT-20
Rubidium (Rb)-Total		0.00325	0.00323		mg/L	0.5	20	16-OCT-20
Selenium (Se)-Total		0.000079	0.000071		mg/L	11	20	16-OCT-20
Silicon (Si)-Total		1.94	1.94		mg/L	0.1	20	16-OCT-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	16-OCT-20
Sodium (Na)-Total		38.1	38.4		mg/L	0.7	20	16-OCT-20
Strontium (Sr)-Total		0.275	0.271		mg/L	1.4	20	16-OCT-20
Sulfur (S)-Total		26.2	26.0		mg/L	0.9	25	16-OCT-20
Thallium (Tl)-Total		0.000012	0.000012		mg/L	5.8	20	16-OCT-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	16-OCT-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	16-OCT-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	16-OCT-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	16-OCT-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	16-OCT-20
Uranium (U)-Total		0.000024	0.000025		mg/L	1.2	20	16-OCT-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	16-OCT-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	16-OCT-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	16-OCT-20
WG3425624-2	LCS							
Aluminum (Al)-Total			100.2		%		80-120	16-OCT-20
Antimony (Sb)-Total			100.8		%		80-120	16-OCT-20
Arsenic (As)-Total			97.5		%		80-120	16-OCT-20
Barium (Ba)-Total			105.5		%		80-120	16-OCT-20
Beryllium (Be)-Total			92.7		%		80-120	16-OCT-20
Bismuth (Bi)-Total			100.8		%		80-120	16-OCT-20
Boron (B)-Total			92.2		%		80-120	16-OCT-20
Cadmium (Cd)-Total			99.7		%		80-120	16-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5255771							
WG3425624-2	LCS							
Calcium (Ca)-Total			98.7		%		80-120	16-OCT-20
Chromium (Cr)-Total			94.6		%		80-120	16-OCT-20
Cesium (Cs)-Total			98.9		%		80-120	16-OCT-20
Cobalt (Co)-Total			95.9		%		80-120	16-OCT-20
Copper (Cu)-Total			94.4		%		80-120	16-OCT-20
Iron (Fe)-Total			95.1		%		80-120	16-OCT-20
Lead (Pb)-Total			104.3		%		80-120	16-OCT-20
Lithium (Li)-Total			92.8		%		80-120	16-OCT-20
Magnesium (Mg)-Total			101.4		%		80-120	16-OCT-20
Manganese (Mn)-Total			98.2		%		80-120	16-OCT-20
Molybdenum (Mo)-Total			99.7		%		80-120	16-OCT-20
Nickel (Ni)-Total			95.1		%		80-120	16-OCT-20
Phosphorus (P)-Total			101.3		%		70-130	16-OCT-20
Potassium (K)-Total			91.8		%		80-120	16-OCT-20
Rubidium (Rb)-Total			98.5		%		80-120	16-OCT-20
Selenium (Se)-Total			95.1		%		80-120	16-OCT-20
Silicon (Si)-Total			98.9		%		60-140	16-OCT-20
Silver (Ag)-Total			97.4		%		80-120	16-OCT-20
Sodium (Na)-Total			93.9		%		80-120	16-OCT-20
Strontium (Sr)-Total			101.6		%		80-120	16-OCT-20
Sulfur (S)-Total			91.3		%		80-120	16-OCT-20
Thallium (Tl)-Total			103.7		%		80-120	16-OCT-20
Tellurium (Te)-Total			96.0		%		80-120	16-OCT-20
Thorium (Th)-Total			101.3		%		70-130	16-OCT-20
Tin (Sn)-Total			98.7		%		80-120	16-OCT-20
Titanium (Ti)-Total			94.7		%		80-120	16-OCT-20
Tungsten (W)-Total			100.2		%		80-120	16-OCT-20
Uranium (U)-Total			104.8		%		80-120	16-OCT-20
Vanadium (V)-Total			98.3		%		80-120	16-OCT-20
Zinc (Zn)-Total			95.0		%		80-120	16-OCT-20
Zirconium (Zr)-Total			94.5		%		80-120	16-OCT-20
WG3425624-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	16-OCT-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	16-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5255771							
WG3425624-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	16-OCT-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	16-OCT-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	16-OCT-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	16-OCT-20
Boron (B)-Total			<0.010		mg/L		0.01	16-OCT-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	16-OCT-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	16-OCT-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	16-OCT-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	16-OCT-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	16-OCT-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	16-OCT-20
Iron (Fe)-Total			<0.010		mg/L		0.01	16-OCT-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	16-OCT-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	16-OCT-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	16-OCT-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	16-OCT-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	16-OCT-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	16-OCT-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	16-OCT-20
Potassium (K)-Total			<0.050		mg/L		0.05	16-OCT-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	16-OCT-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	16-OCT-20
Silicon (Si)-Total			<0.10		mg/L		0.1	16-OCT-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	16-OCT-20
Sodium (Na)-Total			<0.050		mg/L		0.05	16-OCT-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	16-OCT-20
Sulfur (S)-Total			<0.50		mg/L		0.5	16-OCT-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	16-OCT-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	16-OCT-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	16-OCT-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	16-OCT-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	16-OCT-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	16-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5255771							
WG3425624-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	16-OCT-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	16-OCT-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	16-OCT-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	16-OCT-20
WG3425624-5 MS		WG3425624-3						
Aluminum (Al)-Total			99.3		%		70-130	16-OCT-20
Antimony (Sb)-Total			103.4		%		70-130	16-OCT-20
Arsenic (As)-Total			100.6		%		70-130	16-OCT-20
Barium (Ba)-Total			N/A	MS-B	%		-	16-OCT-20
Beryllium (Be)-Total			91.3		%		70-130	16-OCT-20
Bismuth (Bi)-Total			95.3		%		70-130	16-OCT-20
Boron (B)-Total			N/A	MS-B	%		-	16-OCT-20
Cadmium (Cd)-Total			100.3		%		70-130	16-OCT-20
Calcium (Ca)-Total			N/A	MS-B	%		-	16-OCT-20
Chromium (Cr)-Total			98.0		%		70-130	16-OCT-20
Cesium (Cs)-Total			99.99		%		70-130	16-OCT-20
Cobalt (Co)-Total			96.5		%		70-130	16-OCT-20
Copper (Cu)-Total			95.8		%		70-130	16-OCT-20
Iron (Fe)-Total			N/A	MS-B	%		-	16-OCT-20
Lead (Pb)-Total			97.0		%		70-130	16-OCT-20
Lithium (Li)-Total			90.3		%		70-130	16-OCT-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	16-OCT-20
Manganese (Mn)-Total			N/A	MS-B	%		-	16-OCT-20
Molybdenum (Mo)-Total			100.1		%		70-130	16-OCT-20
Nickel (Ni)-Total			93.7		%		70-130	16-OCT-20
Phosphorus (P)-Total			100.0		%		70-130	16-OCT-20
Potassium (K)-Total			N/A	MS-B	%		-	16-OCT-20
Rubidium (Rb)-Total			94.4		%		70-130	16-OCT-20
Selenium (Se)-Total			97.9		%		70-130	16-OCT-20
Silicon (Si)-Total			N/A	MS-B	%		-	16-OCT-20
Silver (Ag)-Total			94.6		%		70-130	16-OCT-20
Sodium (Na)-Total			N/A	MS-B	%		-	16-OCT-20
Strontium (Sr)-Total			N/A	MS-B	%		-	16-OCT-20
Sulfur (S)-Total			N/A	MS-B	%		-	16-OCT-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5255771							
WG3425624-5 MS		WG3425624-3						
Thallium (Tl)-Total			94.9		%		70-130	16-OCT-20
Tellurium (Te)-Total			97.4		%		70-130	16-OCT-20
Thorium (Th)-Total			98.4		%		70-130	16-OCT-20
Tin (Sn)-Total			99.2		%		70-130	16-OCT-20
Titanium (Ti)-Total			96.0		%		70-130	16-OCT-20
Tungsten (W)-Total			98.5		%		70-130	16-OCT-20
Uranium (U)-Total			101.0		%		70-130	16-OCT-20
Vanadium (V)-Total			101.8		%		70-130	16-OCT-20
Zinc (Zn)-Total			92.0		%		70-130	16-OCT-20
Zirconium (Zr)-Total			94.7		%		70-130	16-OCT-20
P-T-COL-WT								
	Water							
Batch	R5258678							
WG3425662-3 DUP		L2517112-1						
Phosphorus, Total		0.0042	0.0049		mg/L	16	20	20-OCT-20
WG3425662-2 LCS								
Phosphorus, Total			99.4		%		80-120	20-OCT-20
WG3425662-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	20-OCT-20
WG3425662-4 MS		L2517112-1						
Phosphorus, Total			91.0		%		70-130	20-OCT-20
PAH-511-WT								
	Water							
Batch	R5256807							
WG3425649-2 LCS								
1-Methylnaphthalene			87.0		%		50-140	19-OCT-20
2-Methylnaphthalene			85.3		%		50-140	19-OCT-20
Acenaphthene			95.3		%		50-140	19-OCT-20
Acenaphthylene			94.8		%		50-140	19-OCT-20
Anthracene			102.6		%		50-140	19-OCT-20
Benzo(a)anthracene			118.5		%		50-140	19-OCT-20
Benzo(a)pyrene			89.2		%		50-140	19-OCT-20
Benzo(b)fluoranthene			72.2		%		50-140	19-OCT-20
Benzo(g,h,i)perylene			92.6		%		50-140	19-OCT-20
Benzo(k)fluoranthene			76.6		%		50-140	19-OCT-20
Chrysene			105.0		%		50-140	19-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5256807							
WG3425649-2	LCS							
Dibenzo(ah)anthracene			97.7		%		50-140	19-OCT-20
Fluoranthene			97.2		%		50-140	19-OCT-20
Fluorene			96.5		%		50-140	19-OCT-20
Indeno(1,2,3-cd)pyrene			116.6		%		50-140	19-OCT-20
Naphthalene			82.8		%		50-140	19-OCT-20
Phenanthrene			97.0		%		50-140	19-OCT-20
Pyrene			99.8		%		50-140	19-OCT-20
WG3425649-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	19-OCT-20
2-Methylnaphthalene			<0.020		ug/L		0.02	19-OCT-20
Acenaphthene			<0.020		ug/L		0.02	19-OCT-20
Acenaphthylene			<0.020		ug/L		0.02	19-OCT-20
Anthracene			<0.020		ug/L		0.02	19-OCT-20
Benzo(a)anthracene			<0.020		ug/L		0.02	19-OCT-20
Benzo(a)pyrene			<0.010		ug/L		0.01	19-OCT-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	19-OCT-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	19-OCT-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	19-OCT-20
Chrysene			<0.020		ug/L		0.02	19-OCT-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	19-OCT-20
Fluoranthene			<0.020		ug/L		0.02	19-OCT-20
Fluorene			<0.020		ug/L		0.02	19-OCT-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	19-OCT-20
Naphthalene			<0.050		ug/L		0.05	19-OCT-20
Phenanthrene			<0.020		ug/L		0.02	19-OCT-20
Pyrene			<0.020		ug/L		0.02	19-OCT-20
Surrogate: d8-Naphthalene			89.3		%		60-140	19-OCT-20
Surrogate: d10-Phenanthrene			90.9		%		60-140	19-OCT-20
Surrogate: d12-Chrysene			92.3		%		60-140	19-OCT-20
Surrogate: d10-Acenaphthene			93.4		%		60-140	19-OCT-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5257916							
WG3425722-2	LCS							
Aroclor 1242			94.8		%		60-140	20-OCT-20
Aroclor 1248			87.4		%		60-140	20-OCT-20
Aroclor 1254			96.1		%		60-140	20-OCT-20
Aroclor 1260			101.4		%		60-140	20-OCT-20
WG3425722-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	20-OCT-20
Aroclor 1248			<0.020		ug/L		0.02	20-OCT-20
Aroclor 1254			<0.020		ug/L		0.02	20-OCT-20
Aroclor 1260			<0.020		ug/L		0.02	20-OCT-20
Surrogate: Decachlorobiphenyl			117.2		%		50-150	20-OCT-20
Surrogate: Tetrachloro-m-xylene			75.9		%		50-150	20-OCT-20
VOC-511-HS-WT		Water						
Batch	R5260301							
WG3427874-4	DUP		WG3427874-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	21-OCT-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	21-OCT-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	21-OCT-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	21-OCT-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	21-OCT-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5260301							
WG3427874-4	DUP	WG3427874-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	21-OCT-20
cis-1,2-Dichloroethylene		4.19	3.96		ug/L	5.6	30	21-OCT-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	21-OCT-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	21-OCT-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	21-OCT-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	21-OCT-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	21-OCT-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	21-OCT-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	21-OCT-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	21-OCT-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	21-OCT-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	21-OCT-20
Trichloroethylene		2.11	2.02		ug/L	4.4	30	21-OCT-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	21-OCT-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	21-OCT-20
WG3427874-1	LCS							
1,1,1,2-Tetrachloroethane			93.2		%		70-130	21-OCT-20
1,1,2,2-Tetrachloroethane			102.9		%		70-130	21-OCT-20
1,1,1-Trichloroethane			104.9		%		70-130	21-OCT-20
1,1,2-Trichloroethane			94.2		%		70-130	21-OCT-20
1,1-Dichloroethane			88.9		%		70-130	21-OCT-20
1,1-Dichloroethylene			101.4		%		70-130	21-OCT-20
1,2-Dibromoethane			91.7		%		70-130	21-OCT-20
1,2-Dichlorobenzene			99.9		%		70-130	21-OCT-20
1,2-Dichloroethane			102.1		%		70-130	21-OCT-20
1,2-Dichloropropane			104.6		%		70-130	21-OCT-20
1,3-Dichlorobenzene			105.6		%		70-130	21-OCT-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5260301							
WG3427874-1	LCS							
1,4-Dichlorobenzene			104.3		%		70-130	21-OCT-20
Acetone			108.0		%		60-140	21-OCT-20
Benzene			105.0		%		70-130	21-OCT-20
Bromodichloromethane			118.8		%		70-130	21-OCT-20
Bromoform			101.6		%		70-130	21-OCT-20
Bromomethane			136.8		%		60-140	21-OCT-20
Carbon tetrachloride			103.5		%		70-130	21-OCT-20
Chlorobenzene			95.0		%		70-130	21-OCT-20
Chloroform			107.1		%		70-130	21-OCT-20
cis-1,2-Dichloroethylene			109.8		%		70-130	21-OCT-20
cis-1,3-Dichloropropene			98.4		%		70-130	21-OCT-20
Dibromochloromethane			88.9		%		70-130	21-OCT-20
Dichlorodifluoromethane			118.6		%		50-140	21-OCT-20
Ethylbenzene			95.9		%		70-130	21-OCT-20
n-Hexane			105.1		%		70-130	21-OCT-20
m+p-Xylenes			95.7		%		70-130	21-OCT-20
Methyl Ethyl Ketone			103.3		%		60-140	21-OCT-20
Methyl Isobutyl Ketone			105.8		%		60-140	21-OCT-20
Methylene Chloride			103.5		%		70-130	21-OCT-20
MTBE			108.7		%		70-130	21-OCT-20
o-Xylene			102.3		%		70-130	21-OCT-20
Styrene			91.6		%		70-130	21-OCT-20
Tetrachloroethylene			96.5		%		70-130	21-OCT-20
Toluene			97.2		%		70-130	21-OCT-20
trans-1,2-Dichloroethylene			99.6		%		70-130	21-OCT-20
trans-1,3-Dichloropropene			92.4		%		70-130	21-OCT-20
Trichloroethylene			106.7		%		70-130	21-OCT-20
Trichlorofluoromethane			99.8		%		60-140	21-OCT-20
Vinyl chloride			117.6		%		60-140	21-OCT-20
WG3427874-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	21-OCT-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	21-OCT-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	21-OCT-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	21-OCT-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5260301							
WG3427874-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	21-OCT-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	21-OCT-20
1,2-Dibromoethane			<0.20		ug/L		0.2	21-OCT-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	21-OCT-20
1,2-Dichloroethane			<0.50		ug/L		0.5	21-OCT-20
1,2-Dichloropropane			<0.50		ug/L		0.5	21-OCT-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	21-OCT-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	21-OCT-20
Acetone			<30		ug/L		30	21-OCT-20
Benzene			<0.50		ug/L		0.5	21-OCT-20
Bromodichloromethane			<2.0		ug/L		2	21-OCT-20
Bromoform			<5.0		ug/L		5	21-OCT-20
Bromomethane			<0.50		ug/L		0.5	21-OCT-20
Carbon tetrachloride			<0.20		ug/L		0.2	21-OCT-20
Chlorobenzene			<0.50		ug/L		0.5	21-OCT-20
Chloroform			<1.0		ug/L		1	21-OCT-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	21-OCT-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	21-OCT-20
Dibromochloromethane			<2.0		ug/L		2	21-OCT-20
Dichlorodifluoromethane			<2.0		ug/L		2	21-OCT-20
Ethylbenzene			<0.50		ug/L		0.5	21-OCT-20
n-Hexane			<0.50		ug/L		0.5	21-OCT-20
m+p-Xylenes			<0.40		ug/L		0.4	21-OCT-20
Methyl Ethyl Ketone			<20		ug/L		20	21-OCT-20
Methyl Isobutyl Ketone			<20		ug/L		20	21-OCT-20
Methylene Chloride			<5.0		ug/L		5	21-OCT-20
MTBE			<2.0		ug/L		2	21-OCT-20
o-Xylene			<0.30		ug/L		0.3	21-OCT-20
Styrene			<0.50		ug/L		0.5	21-OCT-20
Tetrachloroethylene			<0.50		ug/L		0.5	21-OCT-20
Toluene			<0.50		ug/L		0.5	21-OCT-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	21-OCT-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	21-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5260301							
WG3427874-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	21-OCT-20
Trichlorofluoromethane			<5.0		ug/L		5	21-OCT-20
Vinyl chloride			<0.50		ug/L		0.5	21-OCT-20
Surrogate: 1,4-Difluorobenzene			102.2		%		70-130	21-OCT-20
Surrogate: 4-Bromofluorobenzene			102.7		%		70-130	21-OCT-20
WG3427874-5 MS		WG3427874-3						
1,1,1,2-Tetrachloroethane			92.3		%		50-140	21-OCT-20
1,1,2,2-Tetrachloroethane			98.7		%		50-140	21-OCT-20
1,1,1-Trichloroethane			106.1		%		50-140	21-OCT-20
1,1,2-Trichloroethane			90.4		%		50-140	21-OCT-20
1,1-Dichloroethane			88.0		%		50-140	21-OCT-20
1,1-Dichloroethylene			100.1		%		50-140	21-OCT-20
1,2-Dibromoethane			86.9		%		50-140	21-OCT-20
1,2-Dichlorobenzene			100.2		%		50-140	21-OCT-20
1,2-Dichloroethane			98.5		%		50-140	21-OCT-20
1,2-Dichloropropane			103.5		%		50-140	21-OCT-20
1,3-Dichlorobenzene			111.3		%		50-140	21-OCT-20
1,4-Dichlorobenzene			107.8		%		50-140	21-OCT-20
Acetone			103.2		%		50-140	21-OCT-20
Benzene			104.8		%		50-140	21-OCT-20
Bromodichloromethane			117.1		%		50-140	21-OCT-20
Bromoform			96.0		%		50-140	21-OCT-20
Bromomethane			128.9		%		50-140	21-OCT-20
Carbon tetrachloride			105.1		%		50-140	21-OCT-20
Chlorobenzene			94.7		%		50-140	21-OCT-20
Chloroform			107.1		%		50-140	21-OCT-20
cis-1,2-Dichloroethylene			109.0		%		50-140	21-OCT-20
cis-1,3-Dichloropropene			94.9		%		50-140	21-OCT-20
Dibromochloromethane			85.9		%		50-140	21-OCT-20
Dichlorodifluoromethane			103.2		%		50-140	21-OCT-20
Ethylbenzene			97.6		%		50-140	21-OCT-20
n-Hexane			104.4		%		50-140	21-OCT-20
m+p-Xylenes			97.5		%		50-140	21-OCT-20
Methyl Ethyl Ketone			99.8		%		50-140	21-OCT-20



Quality Control Report

Workorder: L2517112

Report Date: 21-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5260301							
WG3427874-5 MS		WG3427874-3						
Methyl Isobutyl Ketone			98.9		%		50-140	21-OCT-20
Methylene Chloride			101.0		%		50-140	21-OCT-20
MTBE			108.0		%		50-140	21-OCT-20
o-Xylene			102.9		%		50-140	21-OCT-20
Styrene			90.5		%		50-140	21-OCT-20
Tetrachloroethylene			98.6		%		50-140	21-OCT-20
Toluene			98.1		%		50-140	21-OCT-20
trans-1,2-Dichloroethylene			98.9		%		50-140	21-OCT-20
trans-1,3-Dichloropropene			87.9		%		50-140	21-OCT-20
Trichloroethylene			107.6		%		50-140	21-OCT-20
Trichlorofluoromethane			97.5		%		50-140	21-OCT-20
Vinyl chloride			109.6		%		50-140	21-OCT-20

Quality Control Report

Workorder: L2517112

Report Date: 21-OCT-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

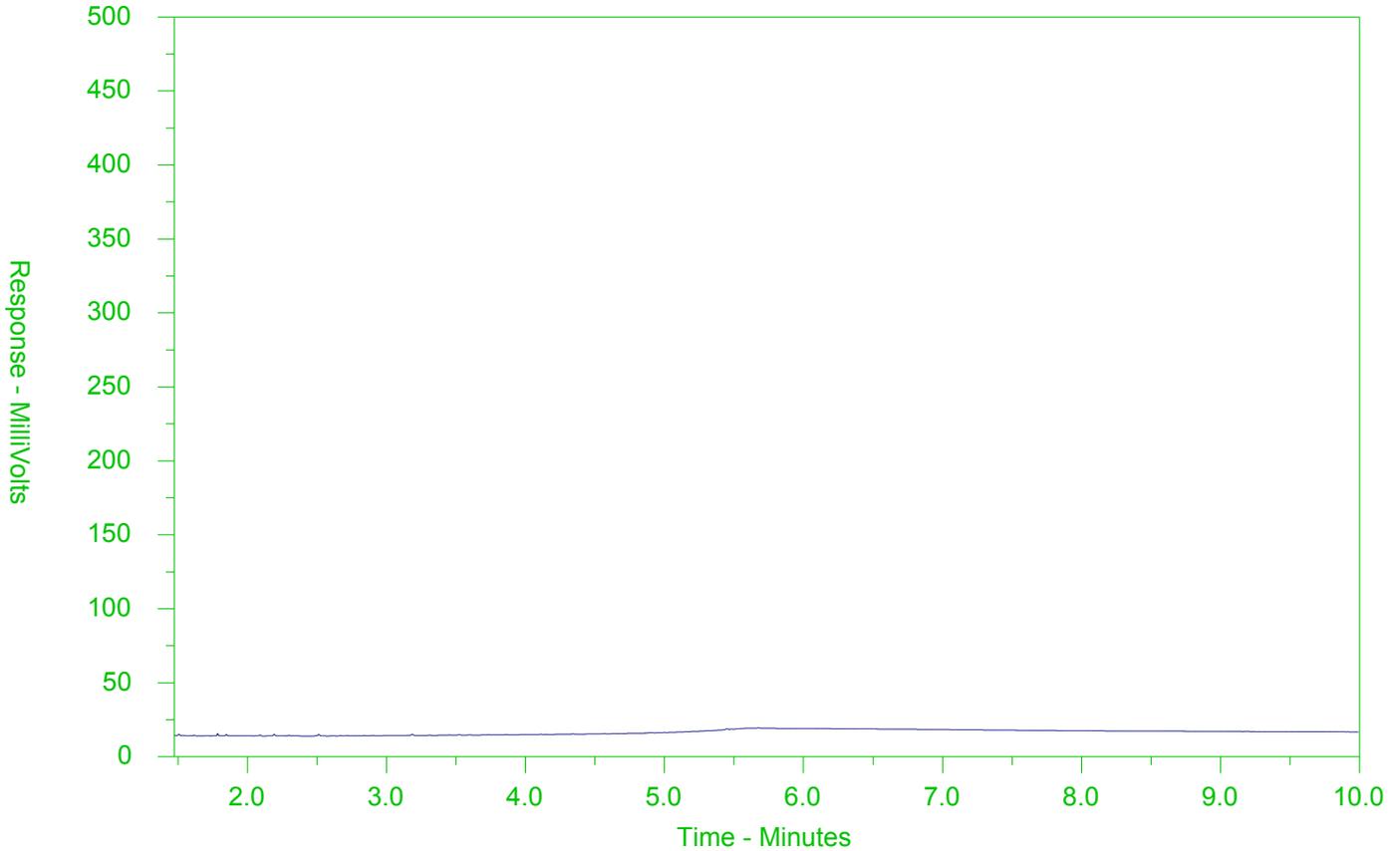
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2517112-1
 Client Sample ID: W-11210029-20201015-42



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 22-OCT-20
Report Date: 29-OCT-20 09:36 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2520323

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2520323-1 W-11210029-20201022-44 Sampled By: ERIC on 22-OCT-20 @ 11:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0062		0.0030	mg/L	23-OCT-20	26-OCT-20	R5268583
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	23-OCT-20	23-OCT-20	R5267102
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Arsenic (As)-Total	0.00548		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Barium (Ba)-Total	0.0523		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	23-OCT-20	23-OCT-20	R5267102
Boron (B)-Total	<0.010		0.010	mg/L	23-OCT-20	23-OCT-20	R5267102
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	23-OCT-20	23-OCT-20	R5267102
Calcium (Ca)-Total	74.8		0.050	mg/L	23-OCT-20	23-OCT-20	R5267102
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	23-OCT-20	23-OCT-20	R5267102
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	23-OCT-20	23-OCT-20	R5267102
Cobalt (Co)-Total	0.00019		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Copper (Cu)-Total	0.00166		0.00050	mg/L	23-OCT-20	23-OCT-20	R5267102
Iron (Fe)-Total	0.432		0.010	mg/L	23-OCT-20	23-OCT-20	R5267102
Lead (Pb)-Total	0.000647		0.000050	mg/L	23-OCT-20	23-OCT-20	R5267102
Lithium (Li)-Total	0.0042		0.0010	mg/L	23-OCT-20	23-OCT-20	R5267102
Magnesium (Mg)-Total	34.3		0.0050	mg/L	23-OCT-20	23-OCT-20	R5267102
Manganese (Mn)-Total	0.0107		0.00050	mg/L	23-OCT-20	23-OCT-20	R5267102
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		24-OCT-20	R5268046
Molybdenum (Mo)-Total	0.000580		0.000050	mg/L	23-OCT-20	23-OCT-20	R5267102
Nickel (Ni)-Total	0.00301		0.00050	mg/L	23-OCT-20	23-OCT-20	R5267102
Phosphorus (P)-Total	<0.050		0.050	mg/L	23-OCT-20	23-OCT-20	R5267102
Potassium (K)-Total	1.02		0.050	mg/L	23-OCT-20	23-OCT-20	R5267102
Rubidium (Rb)-Total	0.00021		0.00020	mg/L	23-OCT-20	23-OCT-20	R5267102
Selenium (Se)-Total	<0.000050		0.000050	mg/L	23-OCT-20	23-OCT-20	R5267102
Silicon (Si)-Total	9.29		0.10	mg/L	23-OCT-20	23-OCT-20	R5267102
Silver (Ag)-Total	<0.000050		0.000050	mg/L	23-OCT-20	23-OCT-20	R5267102
Sodium (Na)-Total	8.04		0.050	mg/L	23-OCT-20	23-OCT-20	R5267102
Strontium (Sr)-Total	0.153		0.0010	mg/L	23-OCT-20	23-OCT-20	R5267102
Sulfur (S)-Total	20.3		0.50	mg/L	23-OCT-20	23-OCT-20	R5267102
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	23-OCT-20	23-OCT-20	R5267102
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	23-OCT-20	23-OCT-20	R5267102
Thorium (Th)-Total	<0.00010		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Tin (Sn)-Total	0.00017		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	23-OCT-20	23-OCT-20	R5267102
Tungsten (W)-Total	<0.00010		0.00010	mg/L	23-OCT-20	23-OCT-20	R5267102
Uranium (U)-Total	0.000264		0.000010	mg/L	23-OCT-20	23-OCT-20	R5267102
Vanadium (V)-Total	<0.00050		0.00050	mg/L	23-OCT-20	23-OCT-20	R5267102
Zinc (Zn)-Total	0.0082		0.0030	mg/L	23-OCT-20	23-OCT-20	R5267102

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2520323-1 W-11210029-20201022-44 Sampled By: ERIC on 22-OCT-20 @ 11:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	23-OCT-20	23-OCT-20	R5267102
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		26-OCT-20	R5269203
Volatile Organic Compounds							
Acetone	<30		30	ug/L		28-OCT-20	R5269892
Benzene	<0.50		0.50	ug/L		28-OCT-20	R5269892
Bromodichloromethane	<2.0		2.0	ug/L		28-OCT-20	R5269892
Bromoform	<5.0		5.0	ug/L		28-OCT-20	R5269892
Bromomethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
Carbon tetrachloride	<0.20		0.20	ug/L		28-OCT-20	R5269892
Chlorobenzene	<0.50		0.50	ug/L		28-OCT-20	R5269892
Dibromochloromethane	<2.0		2.0	ug/L		28-OCT-20	R5269892
Chloroform	<1.0		1.0	ug/L		28-OCT-20	R5269892
1,2-Dibromoethane	<0.20		0.20	ug/L		28-OCT-20	R5269892
1,2-Dichlorobenzene	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,3-Dichlorobenzene	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,4-Dichlorobenzene	<0.50		0.50	ug/L		28-OCT-20	R5269892
Dichlorodifluoromethane	<2.0		2.0	ug/L		28-OCT-20	R5269892
1,1-Dichloroethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,2-Dichloroethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,1-Dichloroethylene	<0.50		0.50	ug/L		28-OCT-20	R5269892
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		28-OCT-20	R5269892
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		28-OCT-20	R5269892
Methylene Chloride	<5.0		5.0	ug/L		28-OCT-20	R5269892
1,2-Dichloropropane	<0.50		0.50	ug/L		28-OCT-20	R5269892
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		28-OCT-20	R5269892
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		28-OCT-20	R5269892
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		28-OCT-20	
Ethylbenzene	<0.50		0.50	ug/L		28-OCT-20	R5269892
n-Hexane	<0.50		0.50	ug/L		28-OCT-20	R5269892
Methyl Ethyl Ketone	<20		20	ug/L		28-OCT-20	R5269892
Methyl Isobutyl Ketone	<20		20	ug/L		28-OCT-20	R5269892
MTBE	<2.0		2.0	ug/L		28-OCT-20	R5269892
Styrene	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
Tetrachloroethylene	<0.50		0.50	ug/L		28-OCT-20	R5269892
Toluene	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,1,1-Trichloroethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
1,1,2-Trichloroethane	<0.50		0.50	ug/L		28-OCT-20	R5269892
Trichloroethylene	<0.50		0.50	ug/L		28-OCT-20	R5269892

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2520323-1 W-11210029-20201022-44 Sampled By: ERIC on 22-OCT-20 @ 11:00 Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		28-OCT-20	R5269892
Vinyl chloride	<0.50		0.50	ug/L		28-OCT-20	R5269892
o-Xylene	<0.30		0.30	ug/L		28-OCT-20	R5269892
m+p-Xylenes	<0.40		0.40	ug/L		28-OCT-20	R5269892
Xylenes (Total)	<0.50		0.50	ug/L		28-OCT-20	
Surrogate: 4-Bromofluorobenzene	96.9		70-130	%		28-OCT-20	R5269892
Surrogate: 1,4-Difluorobenzene	98.6		70-130	%		28-OCT-20	R5269892
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		28-OCT-20	R5269892
F1-BTEX	<25		25	ug/L		29-OCT-20	
F2 (C10-C16)	<100		100	ug/L	22-OCT-20	23-OCT-20	R5266144
F2-Naphth	<100		100	ug/L		29-OCT-20	
F3 (C16-C34)	<250		250	ug/L	22-OCT-20	23-OCT-20	R5266144
F3-PAH	<250		250	ug/L		29-OCT-20	
F4 (C34-C50)	<250		250	ug/L	22-OCT-20	23-OCT-20	R5266144
Total Hydrocarbons (C6-C50)	<370		370	ug/L		29-OCT-20	
Chrom. to baseline at nC50	YES				22-OCT-20	23-OCT-20	R5266144
Surrogate: 2-Bromobenzotrifluoride	91.9		60-140	%	22-OCT-20	23-OCT-20	R5266144
Surrogate: 3,4-Dichlorotoluene	88.5		60-140	%		28-OCT-20	R5269892
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Acenaphthylene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Anthracene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Benzo(a)anthracene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Benzo(a)pyrene	<0.010		0.010	ug/L	22-OCT-20	29-OCT-20	R5270502
Benzo(b)fluoranthene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Benzo(k)fluoranthene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Chrysene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Fluoranthene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Fluorene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		29-OCT-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
2-Methylnaphthalene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Naphthalene	<0.050		0.050	ug/L	22-OCT-20	29-OCT-20	R5270502
Phenanthrene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Pyrene	<0.020		0.020	ug/L	22-OCT-20	29-OCT-20	R5270502
Surrogate: d10-Acenaphthene	98.5		60-140	%	22-OCT-20	29-OCT-20	R5270502
Surrogate: d12-Chrysene	74.3		60-140	%	22-OCT-20	29-OCT-20	R5270502

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2520323-1 W-11210029-20201022-44 Sampled By: ERIC on 22-OCT-20 @ 11:00 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	98.1		60-140	%	22-OCT-20	29-OCT-20	R5270502
Surrogate: d10-Phenanthrene	101.4		60-140	%	22-OCT-20	29-OCT-20	R5270502
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
4-Chloroaniline	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
2-Chlorophenol	<0.30		0.30	ug/L	23-OCT-20	28-OCT-20	R5268448
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4-Dichlorophenol	<0.30		0.30	ug/L	23-OCT-20	28-OCT-20	R5268448
Diethylphthalate	<0.20		0.20	ug/L	23-OCT-20	28-OCT-20	R5268448
Dimethylphthalate	<0.20		0.20	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4-Dimethylphenol	<0.50		0.50	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4-Dinitrophenol	<1.0		1.0	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4-Dinitrotoluene	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
2,6-Dinitrotoluene	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	23-OCT-20	29-OCT-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	23-OCT-20	28-OCT-20	R5268448
Pentachlorophenol	<0.50		0.50	ug/L	23-OCT-20	28-OCT-20	R5268448
Phenol	<0.50		0.50	ug/L	23-OCT-20	28-OCT-20	R5268448
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	23-OCT-20	28-OCT-20	R5268448
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	23-OCT-20	28-OCT-20	R5268448
Surrogate: 2-Fluorobiphenyl	82.8		50-140	%	23-OCT-20	28-OCT-20	R5268448
Surrogate: Nitrobenzene d5	99.6		50-140	%	23-OCT-20	28-OCT-20	R5268448
Surrogate: p-Terphenyl d14	88.9		60-140	%	23-OCT-20	28-OCT-20	R5268448
Surrogate: 2,4,6-Tribromophenol	100.9		50-140	%	23-OCT-20	28-OCT-20	R5268448
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	28-OCT-20	28-OCT-20	R5270076
Aroclor 1248	<0.020		0.020	ug/L	28-OCT-20	28-OCT-20	R5270076
Aroclor 1254	<0.020		0.020	ug/L	28-OCT-20	28-OCT-20	R5270076
Aroclor 1260	<0.020		0.020	ug/L	28-OCT-20	28-OCT-20	R5270076
Surrogate: Decachlorobiphenyl	137.2		50-150	%	28-OCT-20	28-OCT-20	R5270076
Total PCBs	<0.040		0.040	ug/L	28-OCT-20	28-OCT-20	R5270076
Surrogate: Tetrachloro-m-xylene	86.1		50-150	%	28-OCT-20	28-OCT-20	R5270076

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	2,4-Dinitrophenol	LCS-H	L2520323-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2520323-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2520323-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2520323-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2520323-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2520323-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2520323-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2520323-1

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Reference Information

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2520323

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5268448							
WG3430650-2	LCS							
1,2,4-Trichlorobenzene			53.0		%		50-140	26-OCT-20
2-Chlorophenol			74.2		%		50-140	26-OCT-20
2,4-Dichlorophenol			88.8		%		50-140	26-OCT-20
2,4-Dimethylphenol			91.8		%		30-130	26-OCT-20
2,4-Dinitrophenol			141.8	LCS-H	%		50-140	26-OCT-20
2,4-Dinitrotoluene			104.4		%		50-140	26-OCT-20
2,4,5-Trichlorophenol			93.3		%		50-140	26-OCT-20
2,4,6-Trichlorophenol			92.6		%		50-140	26-OCT-20
2,6-Dinitrotoluene			96.6		%		50-140	26-OCT-20
3,3'-Dichlorobenzidine			82.4		%		30-130	26-OCT-20
4-Chloroaniline			82.0		%		30-130	26-OCT-20
Biphenyl			63.7		%		50-140	26-OCT-20
Bis(2-chloroethyl)ether			80.7		%		50-140	26-OCT-20
Bis(2-chloroisopropyl)ether			72.4		%		50-140	26-OCT-20
Bis(2-ethylhexyl)phthalate			99.5		%		50-140	26-OCT-20
Diethylphthalate			86.0		%		50-140	26-OCT-20
Dimethylphthalate			85.8		%		50-140	26-OCT-20
Pentachlorophenol			104.8		%		50-140	26-OCT-20
Phenol			108.1		%		30-130	26-OCT-20
WG3430650-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	26-OCT-20
2-Chlorophenol			<0.30		ug/L		0.3	26-OCT-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	26-OCT-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	26-OCT-20
2,4-Dinitrophenol			<1.0		ug/L		1	26-OCT-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	26-OCT-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	26-OCT-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	26-OCT-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	26-OCT-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	26-OCT-20
4-Chloroaniline			<0.40		ug/L		0.4	26-OCT-20
Biphenyl			<0.40		ug/L		0.4	26-OCT-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	26-OCT-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	26-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5268448								
WG3430650-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	26-OCT-20
Diethylphthalate			<0.20		ug/L		0.2	26-OCT-20
Dimethylphthalate			<0.20		ug/L		0.2	26-OCT-20
Pentachlorophenol			<0.50		ug/L		0.5	26-OCT-20
Phenol			<0.50		ug/L		0.5	26-OCT-20
Surrogate: 2-Fluorobiphenyl			78.5		%		50-140	26-OCT-20
Surrogate: 2,4,6-Tribromophenol			80.7		%		50-140	26-OCT-20
Surrogate: Nitrobenzene d5			83.4		%		50-140	26-OCT-20
Surrogate: p-Terphenyl d14			95.7		%		60-140	26-OCT-20
CR-CR6-IC-WT Water								
Batch R5269203								
WG3431955-3 DUP L2517387-1								
Chromium, Hexavalent		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	26-OCT-20
WG3431955-2 LCS								
Chromium, Hexavalent			101.8		%		80-120	26-OCT-20
WG3431955-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	26-OCT-20
WG3431955-4 MS L2517387-1								
Chromium, Hexavalent			100.0		%		70-130	26-OCT-20
F1-HS-511-WT Water								
Batch R5269892								
WG3433456-4 DUP WG3433456-3								
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	28-OCT-20
WG3433456-1 LCS								
F1 (C6-C10)			114.7		%		80-120	28-OCT-20
WG3433456-2 MB								
F1 (C6-C10)			<25		ug/L		25	28-OCT-20
Surrogate: 3,4-Dichlorotoluene			105.2		%		60-140	28-OCT-20
WG3433456-5 MS WG3433456-3								
F1 (C6-C10)			96.4		%		60-140	28-OCT-20
F2-F4-511-WT Water								
Batch R5266144								
WG3430360-2 LCS								
F2 (C10-C16)			96.4		%		70-130	23-OCT-20
F3 (C16-C34)			100.8		%		70-130	23-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch	R5266144							
WG3430360-2	LCS							
F4 (C34-C50)			111.5		%		70-130	23-OCT-20
WG3430360-1	MB							
F2 (C10-C16)			<100		ug/L		100	23-OCT-20
F3 (C16-C34)			<250		ug/L		250	23-OCT-20
F4 (C34-C50)			<250		ug/L		250	23-OCT-20
Surrogate: 2-Bromobenzotrifluoride			87.4		%		60-140	23-OCT-20
HG-T-CVAA-WT		Water						
Batch	R5268046							
WG3431020-4	DUP	WG3431020-3						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	24-OCT-20
WG3431020-2	LCS							
Mercury (Hg)-Total			105.0		%		80-120	24-OCT-20
WG3431020-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	24-OCT-20
WG3431020-6	MS	WG3431020-5						
Mercury (Hg)-Total			102.5		%		70-130	24-OCT-20
MET-T-CCMS-WT		Water						
Batch	R5267102							
WG3430569-4	DUP	WG3430569-3						
Aluminum (Al)-Total		<0.0060	0.0197	RPD-NA	mg/L	N/A	20	23-OCT-20
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-OCT-20
Arsenic (As)-Total		0.00056	0.00055		mg/L	0.8	20	23-OCT-20
Barium (Ba)-Total		0.0221	0.0219		mg/L	1.2	20	23-OCT-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-OCT-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	23-OCT-20
Boron (B)-Total		0.015	0.016		mg/L	3.8	20	23-OCT-20
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	23-OCT-20
Calcium (Ca)-Total		50.4	51.4		mg/L	1.9	20	23-OCT-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	23-OCT-20
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	23-OCT-20
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-OCT-20
Copper (Cu)-Total		0.00112	0.00165	J	mg/L	0.00053	0.001	23-OCT-20
Iron (Fe)-Total		0.023	0.022		mg/L	2.6	20	23-OCT-20
Lead (Pb)-Total		0.000215	0.000210		mg/L	2.2	20	23-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5267102							
WG3430569-4	DUP	WG3430569-3						
Lithium (Li)-Total		0.0027	0.0028		mg/L	3.7	20	23-OCT-20
Magnesium (Mg)-Total		16.0	16.1		mg/L	1.2	20	23-OCT-20
Manganese (Mn)-Total		0.00663	0.00675		mg/L	1.9	20	23-OCT-20
Molybdenum (Mo)-Total		0.000185	0.000192		mg/L	3.9	20	23-OCT-20
Nickel (Ni)-Total		<0.00050	0.00157	RPD-NA	mg/L	N/A	20	23-OCT-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	23-OCT-20
Potassium (K)-Total		0.937	0.934		mg/L	0.3	20	23-OCT-20
Rubidium (Rb)-Total		0.00047	0.00042		mg/L	13	20	23-OCT-20
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	23-OCT-20
Silicon (Si)-Total		5.75	5.81		mg/L	1.0	20	23-OCT-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	23-OCT-20
Sodium (Na)-Total		5.04	5.04		mg/L	0.0	20	23-OCT-20
Strontium (Sr)-Total		0.196	0.200		mg/L	2.4	20	23-OCT-20
Sulfur (S)-Total		20.9	20.8		mg/L	0.3	25	23-OCT-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	23-OCT-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	23-OCT-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	23-OCT-20
Tin (Sn)-Total		0.00011	<0.00010	RPD-NA	mg/L	N/A	20	23-OCT-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	23-OCT-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	23-OCT-20
Uranium (U)-Total		0.000107	0.000109		mg/L	1.9	20	23-OCT-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	23-OCT-20
Zinc (Zn)-Total		0.0034	0.0032		mg/L	8.1	20	23-OCT-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	23-OCT-20
WG3430569-2	LCS							
Aluminum (Al)-Total			102.1		%		80-120	23-OCT-20
Antimony (Sb)-Total			103.1		%		80-120	23-OCT-20
Arsenic (As)-Total			102.3		%		80-120	23-OCT-20
Barium (Ba)-Total			100.7		%		80-120	23-OCT-20
Beryllium (Be)-Total			101.3		%		80-120	23-OCT-20
Bismuth (Bi)-Total			100.2		%		80-120	23-OCT-20
Boron (B)-Total			99.4		%		80-120	23-OCT-20
Cadmium (Cd)-Total			99.6		%		80-120	23-OCT-20



Quality Control Report

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5267102							
WG3430569-2	LCS							
Calcium (Ca)-Total			99.7		%		80-120	23-OCT-20
Chromium (Cr)-Total			100.9		%		80-120	23-OCT-20
Cesium (Cs)-Total			98.7		%		80-120	23-OCT-20
Cobalt (Co)-Total			100.3		%		80-120	23-OCT-20
Copper (Cu)-Total			100.5		%		80-120	23-OCT-20
Iron (Fe)-Total			102.4		%		80-120	23-OCT-20
Lead (Pb)-Total			101.2		%		80-120	23-OCT-20
Lithium (Li)-Total			104.1		%		80-120	23-OCT-20
Magnesium (Mg)-Total			104.8		%		80-120	23-OCT-20
Manganese (Mn)-Total			102.5		%		80-120	23-OCT-20
Molybdenum (Mo)-Total			99.2		%		80-120	23-OCT-20
Nickel (Ni)-Total			99.8		%		80-120	23-OCT-20
Phosphorus (P)-Total			110.6		%		70-130	23-OCT-20
Potassium (K)-Total			97.9		%		80-120	23-OCT-20
Rubidium (Rb)-Total			97.3		%		80-120	23-OCT-20
Selenium (Se)-Total			98.6		%		80-120	23-OCT-20
Silicon (Si)-Total			98.8		%		60-140	23-OCT-20
Silver (Ag)-Total			103.0		%		80-120	23-OCT-20
Sodium (Na)-Total			102.4		%		80-120	23-OCT-20
Strontium (Sr)-Total			104.4		%		80-120	23-OCT-20
Sulfur (S)-Total			100.3		%		80-120	23-OCT-20
Thallium (Tl)-Total			101.6		%		80-120	23-OCT-20
Tellurium (Te)-Total			97.8		%		80-120	23-OCT-20
Thorium (Th)-Total			101.3		%		70-130	23-OCT-20
Tin (Sn)-Total			97.2		%		80-120	23-OCT-20
Titanium (Ti)-Total			99.0		%		80-120	23-OCT-20
Tungsten (W)-Total			99.0		%		80-120	23-OCT-20
Uranium (U)-Total			102.3		%		80-120	23-OCT-20
Vanadium (V)-Total			101.7		%		80-120	23-OCT-20
Zinc (Zn)-Total			98.3		%		80-120	23-OCT-20
Zirconium (Zr)-Total			97.6		%		80-120	23-OCT-20
WG3430569-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	23-OCT-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	23-OCT-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5267102							
WG3430569-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	23-OCT-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	23-OCT-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	23-OCT-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	23-OCT-20
Boron (B)-Total			<0.010		mg/L		0.01	23-OCT-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	23-OCT-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	23-OCT-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	23-OCT-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	23-OCT-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	23-OCT-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	23-OCT-20
Iron (Fe)-Total			<0.010		mg/L		0.01	23-OCT-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	23-OCT-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	23-OCT-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	23-OCT-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	23-OCT-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	23-OCT-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	23-OCT-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	23-OCT-20
Potassium (K)-Total			<0.050		mg/L		0.05	23-OCT-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	23-OCT-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	23-OCT-20
Silicon (Si)-Total			<0.10		mg/L		0.1	23-OCT-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	23-OCT-20
Sodium (Na)-Total			<0.050		mg/L		0.05	23-OCT-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	23-OCT-20
Sulfur (S)-Total			<0.50		mg/L		0.5	23-OCT-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	23-OCT-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	23-OCT-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	23-OCT-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	23-OCT-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	23-OCT-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	23-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5267102							
WG3430569-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	23-OCT-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	23-OCT-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	23-OCT-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	23-OCT-20
WG3430569-5 MS		WG3430569-3						
Aluminum (Al)-Total			101.2		%		70-130	23-OCT-20
Antimony (Sb)-Total			104.6		%		70-130	23-OCT-20
Arsenic (As)-Total			103.5		%		70-130	23-OCT-20
Barium (Ba)-Total			N/A	MS-B	%		-	23-OCT-20
Beryllium (Be)-Total			99.8		%		70-130	23-OCT-20
Bismuth (Bi)-Total			97.7		%		70-130	23-OCT-20
Boron (B)-Total			101.5		%		70-130	23-OCT-20
Cadmium (Cd)-Total			103.0		%		70-130	23-OCT-20
Calcium (Ca)-Total			N/A	MS-B	%		-	23-OCT-20
Chromium (Cr)-Total			100.8		%		70-130	23-OCT-20
Cesium (Cs)-Total			99.7		%		70-130	23-OCT-20
Cobalt (Co)-Total			100.1		%		70-130	23-OCT-20
Copper (Cu)-Total			96.4		%		70-130	23-OCT-20
Iron (Fe)-Total			101.0		%		70-130	23-OCT-20
Lead (Pb)-Total			99.2		%		70-130	23-OCT-20
Lithium (Li)-Total			99.8		%		70-130	23-OCT-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	23-OCT-20
Manganese (Mn)-Total			97.4		%		70-130	23-OCT-20
Molybdenum (Mo)-Total			100.1		%		70-130	23-OCT-20
Nickel (Ni)-Total			97.8		%		70-130	23-OCT-20
Phosphorus (P)-Total			102.6		%		70-130	23-OCT-20
Potassium (K)-Total			97.5		%		70-130	23-OCT-20
Rubidium (Rb)-Total			100.7		%		70-130	23-OCT-20
Selenium (Se)-Total			101.9		%		70-130	23-OCT-20
Silicon (Si)-Total			N/A	MS-B	%		-	23-OCT-20
Silver (Ag)-Total			99.4		%		70-130	23-OCT-20
Sodium (Na)-Total			N/A	MS-B	%		-	23-OCT-20
Strontium (Sr)-Total			N/A	MS-B	%		-	23-OCT-20
Sulfur (S)-Total			N/A	MS-B	%		-	23-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5267102							
WG3430569-5 MS		WG3430569-3						
Thallium (Tl)-Total			99.6		%		70-130	23-OCT-20
Tellurium (Te)-Total			87.8		%		70-130	23-OCT-20
Thorium (Th)-Total			102.9		%		70-130	23-OCT-20
Tin (Sn)-Total			97.8		%		70-130	23-OCT-20
Titanium (Ti)-Total			99.0		%		70-130	23-OCT-20
Tungsten (W)-Total			99.9		%		70-130	23-OCT-20
Uranium (U)-Total			106.6		%		70-130	23-OCT-20
Vanadium (V)-Total			104.1		%		70-130	23-OCT-20
Zinc (Zn)-Total			93.5		%		70-130	23-OCT-20
Zirconium (Zr)-Total			96.1		%		70-130	23-OCT-20
P-T-COL-WT								
	Water							
Batch	R5268583							
WG3430485-3 DUP		L2520205-1						
Phosphorus, Total		0.0505	0.0490		mg/L	3.0	20	26-OCT-20
WG3430485-2 LCS								
Phosphorus, Total			100.5		%		80-120	26-OCT-20
WG3430485-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	26-OCT-20
WG3430485-4 MS		L2520205-1						
Phosphorus, Total			94.5		%		70-130	26-OCT-20
PAH-511-WT								
	Water							
Batch	R5270502							
WG3430360-2 LCS								
1-Methylnaphthalene			81.2		%		50-140	29-OCT-20
2-Methylnaphthalene			80.2		%		50-140	29-OCT-20
Acenaphthene			95.3		%		50-140	29-OCT-20
Acenaphthylene			94.3		%		50-140	29-OCT-20
Anthracene			89.6		%		50-140	29-OCT-20
Benzo(a)anthracene			93.6		%		50-140	29-OCT-20
Benzo(a)pyrene			90.5		%		50-140	29-OCT-20
Benzo(b)fluoranthene			68.2		%		50-140	29-OCT-20
Benzo(g,h,i)perylene			96.4		%		50-140	29-OCT-20
Benzo(k)fluoranthene			91.6		%		50-140	29-OCT-20
Chrysene			104.5		%		50-140	29-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5270502							
WG3430360-2	LCS							
Dibenzo(ah)anthracene			92.6		%		50-140	29-OCT-20
Fluoranthene			98.4		%		50-140	29-OCT-20
Fluorene			93.1		%		50-140	29-OCT-20
Indeno(1,2,3-cd)pyrene			112.1		%		50-140	29-OCT-20
Naphthalene			76.7		%		50-140	29-OCT-20
Phenanthrene			97.3		%		50-140	29-OCT-20
Pyrene			101.4		%		50-140	29-OCT-20
WG3430360-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	29-OCT-20
2-Methylnaphthalene			<0.020		ug/L		0.02	29-OCT-20
Acenaphthene			<0.020		ug/L		0.02	29-OCT-20
Acenaphthylene			<0.020		ug/L		0.02	29-OCT-20
Anthracene			<0.020		ug/L		0.02	29-OCT-20
Benzo(a)anthracene			<0.020		ug/L		0.02	29-OCT-20
Benzo(a)pyrene			<0.010		ug/L		0.01	29-OCT-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	29-OCT-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	29-OCT-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	29-OCT-20
Chrysene			<0.020		ug/L		0.02	29-OCT-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	29-OCT-20
Fluoranthene			<0.020		ug/L		0.02	29-OCT-20
Fluorene			<0.020		ug/L		0.02	29-OCT-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	29-OCT-20
Naphthalene			<0.050		ug/L		0.05	29-OCT-20
Phenanthrene			<0.020		ug/L		0.02	29-OCT-20
Pyrene			<0.020		ug/L		0.02	29-OCT-20
Surrogate: d8-Naphthalene			90.7		%		60-140	29-OCT-20
Surrogate: d10-Phenanthrene			103.1		%		60-140	29-OCT-20
Surrogate: d12-Chrysene			82.2		%		60-140	29-OCT-20
Surrogate: d10-Acenaphthene			98.1		%		60-140	29-OCT-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5270076							
WG3430655-2	LCS							
Aroclor 1242			100.7		%		60-140	28-OCT-20
Aroclor 1248			107.1		%		60-140	28-OCT-20
Aroclor 1254			110.0		%		60-140	28-OCT-20
Aroclor 1260			110.5		%		60-140	28-OCT-20
WG3430655-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	28-OCT-20
Aroclor 1248			<0.020		ug/L		0.02	28-OCT-20
Aroclor 1254			<0.020		ug/L		0.02	28-OCT-20
Aroclor 1260			<0.020		ug/L		0.02	28-OCT-20
Surrogate: Decachlorobiphenyl			142.9		%		50-150	28-OCT-20
Surrogate: Tetrachloro-m-xylene			87.7		%		50-150	28-OCT-20
VOC-511-HS-WT		Water						
Batch	R5269892							
WG3433456-4	DUP	WG3433456-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	28-OCT-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	28-OCT-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-OCT-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	28-OCT-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	28-OCT-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5269892							
WG3433456-4	DUP	WG3433456-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	28-OCT-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-OCT-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-OCT-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-OCT-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	28-OCT-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	28-OCT-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	28-OCT-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	28-OCT-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	28-OCT-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-OCT-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	28-OCT-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	28-OCT-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	28-OCT-20
WG3433456-1	LCS							
1,1,1,2-Tetrachloroethane			93.4		%		70-130	28-OCT-20
1,1,2,2-Tetrachloroethane			94.8		%		70-130	28-OCT-20
1,1,1-Trichloroethane			98.4		%		70-130	28-OCT-20
1,1,2-Trichloroethane			98.1		%		70-130	28-OCT-20
1,1-Dichloroethane			104.0		%		70-130	28-OCT-20
1,1-Dichloroethylene			102.9		%		70-130	28-OCT-20
1,2-Dibromoethane			95.6		%		70-130	28-OCT-20
1,2-Dichlorobenzene			99.8		%		70-130	28-OCT-20
1,2-Dichloroethane			100.4		%		70-130	28-OCT-20
1,2-Dichloropropane			106.7		%		70-130	28-OCT-20
1,3-Dichlorobenzene			96.6		%		70-130	28-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5269892							
WG3433456-1	LCS							
1,4-Dichlorobenzene			98.0		%		70-130	28-OCT-20
Acetone			103.0		%		60-140	28-OCT-20
Benzene			105.0		%		70-130	28-OCT-20
Bromodichloromethane			110.3		%		70-130	28-OCT-20
Bromoform			92.0		%		70-130	28-OCT-20
Bromomethane			135.6		%		60-140	28-OCT-20
Carbon tetrachloride			95.8		%		70-130	28-OCT-20
Chlorobenzene			96.1		%		70-130	28-OCT-20
Chloroform			105.6		%		70-130	28-OCT-20
cis-1,2-Dichloroethylene			101.2		%		70-130	28-OCT-20
cis-1,3-Dichloropropene			100.7		%		70-130	28-OCT-20
Dibromochloromethane			89.0		%		70-130	28-OCT-20
Dichlorodifluoromethane			120.9		%		50-140	28-OCT-20
Ethylbenzene			96.4		%		70-130	28-OCT-20
n-Hexane			101.7		%		70-130	28-OCT-20
m+p-Xylenes			96.3		%		70-130	28-OCT-20
Methyl Ethyl Ketone			98.6		%		60-140	28-OCT-20
Methyl Isobutyl Ketone			98.4		%		60-140	28-OCT-20
Methylene Chloride			105.3		%		70-130	28-OCT-20
MTBE			101.7		%		70-130	28-OCT-20
o-Xylene			103.1		%		70-130	28-OCT-20
Styrene			94.1		%		70-130	28-OCT-20
Tetrachloroethylene			95.4		%		70-130	28-OCT-20
Toluene			92.6		%		70-130	28-OCT-20
trans-1,2-Dichloroethylene			98.3		%		70-130	28-OCT-20
trans-1,3-Dichloropropene			94.8		%		70-130	28-OCT-20
Trichloroethylene			99.9		%		70-130	28-OCT-20
Trichlorofluoromethane			103.6		%		60-140	28-OCT-20
Vinyl chloride			129.7		%		60-140	28-OCT-20
WG3433456-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	28-OCT-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	28-OCT-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	28-OCT-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	28-OCT-20

Quality Control Report

Workorder: L2520323

Report Date: 29-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5269892							
WG3433456-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	28-OCT-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	28-OCT-20
1,2-Dibromoethane			<0.20		ug/L		0.2	28-OCT-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	28-OCT-20
1,2-Dichloroethane			<0.50		ug/L		0.5	28-OCT-20
1,2-Dichloropropane			<0.50		ug/L		0.5	28-OCT-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	28-OCT-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	28-OCT-20
Acetone			<30		ug/L		30	28-OCT-20
Benzene			<0.50		ug/L		0.5	28-OCT-20
Bromodichloromethane			<2.0		ug/L		2	28-OCT-20
Bromoform			<5.0		ug/L		5	28-OCT-20
Bromomethane			<0.50		ug/L		0.5	28-OCT-20
Carbon tetrachloride			<0.20		ug/L		0.2	28-OCT-20
Chlorobenzene			<0.50		ug/L		0.5	28-OCT-20
Chloroform			<1.0		ug/L		1	28-OCT-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	28-OCT-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	28-OCT-20
Dibromochloromethane			<2.0		ug/L		2	28-OCT-20
Dichlorodifluoromethane			<2.0		ug/L		2	28-OCT-20
Ethylbenzene			<0.50		ug/L		0.5	28-OCT-20
n-Hexane			<0.50		ug/L		0.5	28-OCT-20
m+p-Xylenes			<0.40		ug/L		0.4	28-OCT-20
Methyl Ethyl Ketone			<20		ug/L		20	28-OCT-20
Methyl Isobutyl Ketone			<20		ug/L		20	28-OCT-20
Methylene Chloride			<5.0		ug/L		5	28-OCT-20
MTBE			<2.0		ug/L		2	28-OCT-20
o-Xylene			<0.30		ug/L		0.3	28-OCT-20
Styrene			<0.50		ug/L		0.5	28-OCT-20
Tetrachloroethylene			<0.50		ug/L		0.5	28-OCT-20
Toluene			<0.50		ug/L		0.5	28-OCT-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	28-OCT-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	28-OCT-20



Quality Control Report

Workorder: L2520323

Report Date: 29-OCT-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5269892							
WG3433456-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	28-OCT-20
Trichlorofluoromethane			<5.0		ug/L		5	28-OCT-20
Vinyl chloride			<0.50		ug/L		0.5	28-OCT-20
Surrogate: 1,4-Difluorobenzene			99.4		%		70-130	28-OCT-20
Surrogate: 4-Bromofluorobenzene			99.0		%		70-130	28-OCT-20
WG3433456-5 MS		WG3433456-3						
1,1,1,2-Tetrachloroethane			94.1		%		50-140	28-OCT-20
1,1,2,2-Tetrachloroethane			98.8		%		50-140	28-OCT-20
1,1,1-Trichloroethane			98.2		%		50-140	28-OCT-20
1,1,2-Trichloroethane			101.3		%		50-140	28-OCT-20
1,1-Dichloroethane			105.3		%		50-140	28-OCT-20
1,1-Dichloroethylene			101.1		%		50-140	28-OCT-20
1,2-Dibromoethane			99.4		%		50-140	28-OCT-20
1,2-Dichlorobenzene			98.9		%		50-140	28-OCT-20
1,2-Dichloroethane			104.2		%		50-140	28-OCT-20
1,2-Dichloropropane			109.7		%		50-140	28-OCT-20
1,3-Dichlorobenzene			93.8		%		50-140	28-OCT-20
1,4-Dichlorobenzene			95.2		%		50-140	28-OCT-20
Acetone			119.4		%		50-140	28-OCT-20
Benzene			104.8		%		50-140	28-OCT-20
Bromodichloromethane			114.1		%		50-140	28-OCT-20
Bromoform			94.2		%		50-140	28-OCT-20
Bromomethane			132.0		%		50-140	28-OCT-20
Carbon tetrachloride			94.5		%		50-140	28-OCT-20
Chlorobenzene			95.8		%		50-140	28-OCT-20
Chloroform			107.5		%		50-140	28-OCT-20
cis-1,2-Dichloroethylene			102.3		%		50-140	28-OCT-20
cis-1,3-Dichloropropene			98.0		%		50-140	28-OCT-20
Dibromochloromethane			90.4		%		50-140	28-OCT-20
Dichlorodifluoromethane			110.1		%		50-140	28-OCT-20
Ethylbenzene			94.9		%		50-140	28-OCT-20
n-Hexane			99.1		%		50-140	28-OCT-20
m+p-Xylenes			94.4		%		50-140	28-OCT-20
Methyl Ethyl Ketone			110.0		%		50-140	28-OCT-20



Quality Control Report

Workorder: L2520323

Report Date: 29-OCT-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5269892							
WG3433456-5 MS		WG3433456-3						
Methyl Isobutyl Ketone			105.1		%		50-140	28-OCT-20
Methylene Chloride			107.5		%		50-140	28-OCT-20
MTBE			101.5		%		50-140	28-OCT-20
o-Xylene			101.8		%		50-140	28-OCT-20
Styrene			92.3		%		50-140	28-OCT-20
Tetrachloroethylene			91.9		%		50-140	28-OCT-20
Toluene			91.9		%		50-140	28-OCT-20
trans-1,2-Dichloroethylene			95.6		%		50-140	28-OCT-20
trans-1,3-Dichloropropene			91.2		%		50-140	28-OCT-20
Trichloroethylene			98.5		%		50-140	28-OCT-20
Trichlorofluoromethane			101.6		%		50-140	28-OCT-20
Vinyl chloride			124.9		%		50-140	28-OCT-20

Quality Control Report

Workorder: L2520323

Report Date: 29-OCT-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

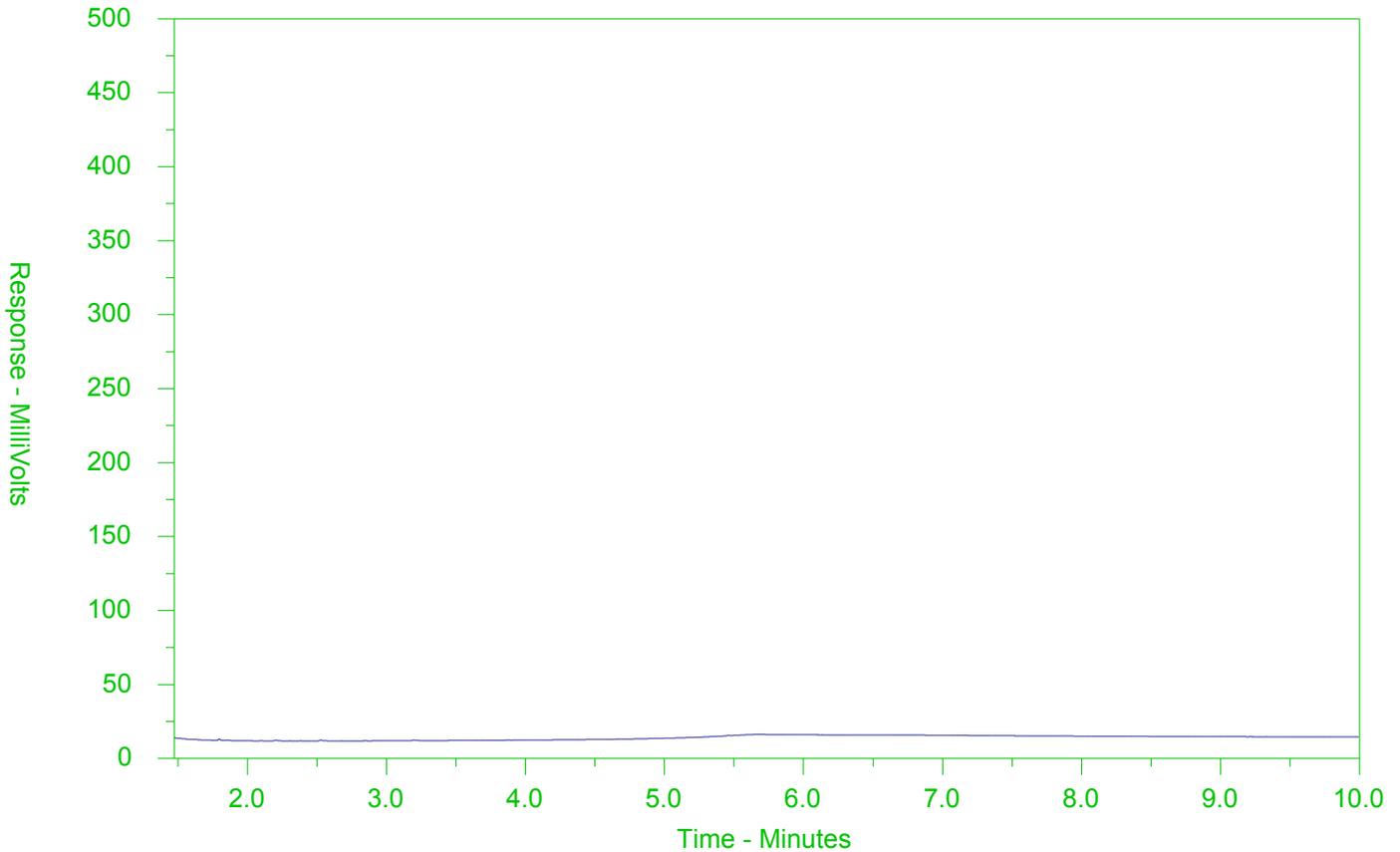
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2520323-1
 Client Sample ID: W-11210029-20201022-44



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2520323-COFC

Number: 17 -

Page of

Handwritten signature

www.alsglobal.com

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																																												
Company: GHD LIMITED - ACCT #13791		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																																												
Contact: Laura Ermeta		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days)		EMERGENCY		1 Business day [E - 100%] <input type="checkbox"/>																																								
Phone: 519-884-0510		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			4 day [P4-20%] <input type="checkbox"/>		3 day [P3-25%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200%] <input type="checkbox"/> (Laboratory opening fees may apply)																																								
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			2 day [P2-50%] <input type="checkbox"/>																																												
Street: 455 Phillip St		Email 1 or Fax laura.ermeta@ghd.com			Date and Time Required for all E&P TATs:					dd-mmm-yy hh:mm																																							
City/Province: Waterloo, Ontario		Email 2 See PO			For tests that can not be performed according to the service level selected, you will be contacted.																																												
Postal Code: N2L 3X2		Email 3			Analysis Request																																												
Invoice To		Invoice Distribution			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																												
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																																															
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Email 1 or Fax apinvoices-735@ghd.com			NUMBER OF CONTAINERS																																												
Company: GHD Limited		Email 2																																															
Contact: SEE SSOW		Email 3			SAMPLES ON HOLD																																												
Project Information					Oil and Gas Required Fields (client use)					SUSPECTED HAZARD (see Special Instructions)																																							
ALS Account # / Quote #: 13791		AFE/Cost Center:		PO#																																													
Job #: 11210029		Major/Minor Code:		Routing Code:																																													
PO / AFE: 73520086		Requisitioner:			Total Metals (MET-T-CCMS-WT)					Total Mercury (HG-T-CVAA-WT)					Total Cr6 (CR-CR6-IC-WT)					Total Phosphorous (P-T-COL-WT)					PCBs (PCB-511-WT)					VOCs and PHCs (VOC-F1-F4-511-P-WT)					SVOCs (SVOC-511-GP-WT)														
LSD:		Location:																																															
ALS Lab Work Order # (lab use only): L2520323^{MP} 45/32A		ALS Contact: Rick H		Sampler: ERK			Total Metals (MET-T-CCMS-WT)					Total Mercury (HG-T-CVAA-WT)					Total Cr6 (CR-CR6-IC-WT)					Total Phosphorous (P-T-COL-WT)					PCBs (PCB-511-WT)					VOCs and PHCs (VOC-F1-F4-511-P-WT)					SVOCs (SVOC-511-GP-WT)												
ALS Sample # (lab use only)		Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mmm-yy)		Time (hh:mm)																																				Sample Type							
W-11210029- 20201022-44				20/10/20		1100AM		Water		12					R					R					R					R					R					R					R				
Drinking Water (DW) Samples¹ (client use)					Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)										SAMPLE CONDITION AS RECEIVED (lab use only)																																		
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO															Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																																		
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO															Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																																		
															Cooling Initiated <input type="checkbox"/>																																		
															INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C																													
															6-9																																		
SHIPMENT RELEASE (client use)					INITIAL SHIPMENT RECEPTION (lab use only)					FINAL SHIPMENT RECEPTION (lab use only)																																							
Released by:		Date: Oct 20/20		Time: 1100AM		Received by:		Date:		Time:		Received by:		Date: 10/22/20		Time: 1445																																	

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

AAE 2018 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 29-OCT-20
Report Date: 05-NOV-20 13:46 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2523350

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2523350-1 W-11210029-20201029-46 Sampled By: EC on 29-OCT-20 @ 11:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0063		0.0030	mg/L	03-NOV-20	04-NOV-20	R5277776
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	30-OCT-20	30-OCT-20	R5272145
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Arsenic (As)-Total	0.00555		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Barium (Ba)-Total	0.0487		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	30-OCT-20	30-OCT-20	R5272145
Boron (B)-Total	<0.010		0.010	mg/L	30-OCT-20	30-OCT-20	R5272145
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	30-OCT-20	30-OCT-20	R5272145
Calcium (Ca)-Total	66.1		0.050	mg/L	30-OCT-20	30-OCT-20	R5272145
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	30-OCT-20	30-OCT-20	R5272145
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	30-OCT-20	30-OCT-20	R5272145
Cobalt (Co)-Total	0.00011		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Copper (Cu)-Total	0.00058		0.00050	mg/L	30-OCT-20	30-OCT-20	R5272145
Iron (Fe)-Total	0.478		0.010	mg/L	30-OCT-20	30-OCT-20	R5272145
Lead (Pb)-Total	0.000135		0.000050	mg/L	30-OCT-20	30-OCT-20	R5272145
Lithium (Li)-Total	0.0033		0.0010	mg/L	30-OCT-20	30-OCT-20	R5272145
Magnesium (Mg)-Total	31.9		0.0050	mg/L	30-OCT-20	30-OCT-20	R5272145
Manganese (Mn)-Total	0.00995		0.00050	mg/L	30-OCT-20	30-OCT-20	R5272145
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		30-OCT-20	R5271805
Molybdenum (Mo)-Total	0.000563		0.000050	mg/L	30-OCT-20	30-OCT-20	R5272145
Nickel (Ni)-Total	0.00198		0.00050	mg/L	30-OCT-20	30-OCT-20	R5272145
Phosphorus (P)-Total	<0.050		0.050	mg/L	30-OCT-20	30-OCT-20	R5272145
Potassium (K)-Total	0.967		0.050	mg/L	30-OCT-20	30-OCT-20	R5272145
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	30-OCT-20	30-OCT-20	R5272145
Selenium (Se)-Total	<0.000050		0.000050	mg/L	30-OCT-20	30-OCT-20	R5272145
Silicon (Si)-Total	8.47		0.10	mg/L	30-OCT-20	30-OCT-20	R5272145
Silver (Ag)-Total	<0.000050		0.000050	mg/L	30-OCT-20	30-OCT-20	R5272145
Sodium (Na)-Total	7.71		0.050	mg/L	30-OCT-20	30-OCT-20	R5272145
Strontium (Sr)-Total	0.144		0.0010	mg/L	30-OCT-20	30-OCT-20	R5272145
Sulfur (S)-Total	17.7		0.50	mg/L	30-OCT-20	30-OCT-20	R5272145
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	30-OCT-20	30-OCT-20	R5272145
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	30-OCT-20	30-OCT-20	R5272145
Thorium (Th)-Total	<0.00010		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Tin (Sn)-Total	<0.00010		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	30-OCT-20	30-OCT-20	R5272145
Tungsten (W)-Total	<0.00010		0.00010	mg/L	30-OCT-20	30-OCT-20	R5272145
Uranium (U)-Total	0.000268		0.000010	mg/L	30-OCT-20	30-OCT-20	R5272145
Vanadium (V)-Total	<0.00050		0.00050	mg/L	30-OCT-20	30-OCT-20	R5272145
Zinc (Zn)-Total	0.0091		0.0030	mg/L	30-OCT-20	30-OCT-20	R5272145

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2523350-1 W-11210029-20201029-46 Sampled By: EC on 29-OCT-20 @ 11:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	30-OCT-20	30-OCT-20	R5272145
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		30-OCT-20	R5272795
Volatile Organic Compounds							
Acetone	<30		30	ug/L		04-NOV-20	R5275576
Benzene	<0.50		0.50	ug/L		04-NOV-20	R5275576
Bromodichloromethane	<2.0		2.0	ug/L		04-NOV-20	R5275576
Bromoform	<5.0		5.0	ug/L		04-NOV-20	R5275576
Bromomethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
Carbon tetrachloride	<0.20		0.20	ug/L		04-NOV-20	R5275576
Chlorobenzene	<0.50		0.50	ug/L		04-NOV-20	R5275576
Dibromochloromethane	<2.0		2.0	ug/L		04-NOV-20	R5275576
Chloroform	<1.0		1.0	ug/L		04-NOV-20	R5275576
1,2-Dibromoethane	<0.20		0.20	ug/L		04-NOV-20	R5275576
1,2-Dichlorobenzene	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,3-Dichlorobenzene	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,4-Dichlorobenzene	<0.50		0.50	ug/L		04-NOV-20	R5275576
Dichlorodifluoromethane	<2.0		2.0	ug/L		04-NOV-20	R5275576
1,1-Dichloroethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,2-Dichloroethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,1-Dichloroethylene	<0.50		0.50	ug/L		04-NOV-20	R5275576
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		04-NOV-20	R5275576
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		04-NOV-20	R5275576
Methylene Chloride	<5.0		5.0	ug/L		04-NOV-20	R5275576
1,2-Dichloropropane	<0.50		0.50	ug/L		04-NOV-20	R5275576
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		04-NOV-20	R5275576
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		04-NOV-20	R5275576
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		04-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		04-NOV-20	R5275576
n-Hexane	<0.50		0.50	ug/L		04-NOV-20	R5275576
Methyl Ethyl Ketone	<20		20	ug/L		04-NOV-20	R5275576
Methyl Isobutyl Ketone	<20		20	ug/L		04-NOV-20	R5275576
MTBE	<2.0		2.0	ug/L		04-NOV-20	R5275576
Styrene	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
Tetrachloroethylene	<0.50		0.50	ug/L		04-NOV-20	R5275576
Toluene	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,1,1-Trichloroethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
1,1,2-Trichloroethane	<0.50		0.50	ug/L		04-NOV-20	R5275576
Trichloroethylene	<0.50		0.50	ug/L		04-NOV-20	R5275576

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2523350-1 W-11210029-20201029-46 Sampled By: EC on 29-OCT-20 @ 11:00 Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		04-NOV-20	R5275576
Vinyl chloride	<0.50		0.50	ug/L		04-NOV-20	R5275576
o-Xylene	<0.30		0.30	ug/L		04-NOV-20	R5275576
m+p-Xylenes	<0.40		0.40	ug/L		04-NOV-20	R5275576
Xylenes (Total)	<0.50		0.50	ug/L		04-NOV-20	
Surrogate: 4-Bromofluorobenzene	98.9		70-130	%		04-NOV-20	R5275576
Surrogate: 1,4-Difluorobenzene	100.4		70-130	%		04-NOV-20	R5275576
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		04-NOV-20	R5275576
F1-BTEX	<25		25	ug/L		05-NOV-20	
F2 (C10-C16)	<100		100	ug/L	30-OCT-20	02-NOV-20	R5272677
F2-Naphth	<100		100	ug/L		05-NOV-20	
F3 (C16-C34)	<250		250	ug/L	30-OCT-20	02-NOV-20	R5272677
F3-PAH	<250		250	ug/L		05-NOV-20	
F4 (C34-C50)	<250		250	ug/L	30-OCT-20	02-NOV-20	R5272677
Total Hydrocarbons (C6-C50)	<370		370	ug/L		05-NOV-20	
Chrom. to baseline at nC50	YES				30-OCT-20	02-NOV-20	R5272677
Surrogate: 2-Bromobenzotrifluoride	85.9		60-140	%	30-OCT-20	02-NOV-20	R5272677
Surrogate: 3,4-Dichlorotoluene	100.1		60-140	%		04-NOV-20	R5275576
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Acenaphthylene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Anthracene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Benzo(a)anthracene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Benzo(a)pyrene	<0.010		0.010	ug/L	30-OCT-20	05-NOV-20	R5272925
Benzo(b)fluoranthene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Benzo(k)fluoranthene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Chrysene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Fluoranthene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Fluorene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		05-NOV-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
2-Methylnaphthalene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Naphthalene	<0.050		0.050	ug/L	30-OCT-20	05-NOV-20	R5272925
Phenanthrene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Pyrene	<0.020		0.020	ug/L	30-OCT-20	05-NOV-20	R5272925
Surrogate: d10-Acenaphthene	88.4		60-140	%	30-OCT-20	05-NOV-20	R5272925
Surrogate: d12-Chrysene	87.3		60-140	%	30-OCT-20	05-NOV-20	R5272925

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2523350-1 W-11210029-20201029-46 Sampled By: EC on 29-OCT-20 @ 11:00 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	87.0		60-140	%	30-OCT-20	05-NOV-20	R5272925
Surrogate: d10-Phenanthrene	86.3		60-140	%	30-OCT-20	05-NOV-20	R5272925
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
4-Chloroaniline	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
2-Chlorophenol	<0.30		0.30	ug/L	30-OCT-20	02-NOV-20	R5272627
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4-Dichlorophenol	<0.30		0.30	ug/L	30-OCT-20	02-NOV-20	R5272627
Diethylphthalate	<0.20		0.20	ug/L	30-OCT-20	02-NOV-20	R5272627
Dimethylphthalate	<0.20		0.20	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4-Dimethylphenol	<0.50		0.50	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4-Dinitrophenol	<1.0		1.0	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4-Dinitrotoluene	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
2,6-Dinitrotoluene	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	30-OCT-20	02-NOV-20	R5272627
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	30-OCT-20	02-NOV-20	R5272627
Pentachlorophenol	<0.50		0.50	ug/L	30-OCT-20	02-NOV-20	R5272627
Phenol	<0.50		0.50	ug/L	30-OCT-20	02-NOV-20	R5272627
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	30-OCT-20	02-NOV-20	R5272627
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	30-OCT-20	02-NOV-20	R5272627
Surrogate: 2-Fluorobiphenyl	78.2		50-140	%	30-OCT-20	02-NOV-20	R5272627
Surrogate: Nitrobenzene d5	81.6		50-140	%	30-OCT-20	02-NOV-20	R5272627
Surrogate: p-Terphenyl d14	95.1		60-140	%	30-OCT-20	02-NOV-20	R5272627
Surrogate: 2,4,6-Tribromophenol	90.5		50-140	%	30-OCT-20	02-NOV-20	R5272627
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	04-NOV-20	04-NOV-20	R5278318
Aroclor 1248	<0.020		0.020	ug/L	04-NOV-20	04-NOV-20	R5278318
Aroclor 1254	<0.020		0.020	ug/L	04-NOV-20	04-NOV-20	R5278318
Aroclor 1260	<0.020		0.020	ug/L	04-NOV-20	04-NOV-20	R5278318
Surrogate: Decachlorobiphenyl	97.7		50-150	%	04-NOV-20	04-NOV-20	R5278318
Total PCBs	<0.040		0.040	ug/L	04-NOV-20	04-NOV-20	R5278318
Surrogate: Tetrachloro-m-xylene	86.4		50-150	%	04-NOV-20	04-NOV-20	R5278318

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	Benzo(a)anthracene	LCS-H	L2523350-1
Laboratory Control Sample	Chrysene	LCS-H	L2523350-1
Laboratory Control Sample	Methyl Ethyl Ketone	MES	L2523350-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2523350-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2523350-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2523350-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2523350-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2523350-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2523350-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2523350-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2523350-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2523350-1
Matrix Spike	Uranium (U)-Total	MS-B	L2523350-1
Laboratory Control Sample	1,2,4-Trichlorobenzene	RRQC	L2523350-1
Comments:	RRQC: Recoveries are outside ALS control limits. Associated non-detect sample results have not been affected.		
Laboratory Control Sample	Biphenyl	RRQC	L2523350-1
Comments:	RRQC: Recoveries are outside ALS control limits. Associated non-detect sample results have not been affected.		

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRQC	Refer to report remarks for information regarding this QC result.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.			
Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.

Reference Information

3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Reference Information

Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2523350

Report Date: 05-NOV-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5272627							
WG3435473-2	LCS							
1,2,4-Trichlorobenzene			35.2	RRQC	%		50-140	02-NOV-20
2-Chlorophenol			92.0		%		50-140	02-NOV-20
2,4-Dichlorophenol			95.0		%		50-140	02-NOV-20
2,4-Dimethylphenol			103.2		%		30-130	02-NOV-20
2,4-Dinitrophenol			131.1		%		50-140	02-NOV-20
2,4-Dinitrotoluene			112.1		%		50-140	02-NOV-20
2,4,5-Trichlorophenol			101.4		%		50-140	02-NOV-20
2,4,6-Trichlorophenol			99.0		%		50-140	02-NOV-20
2,6-Dinitrotoluene			89.0		%		50-140	02-NOV-20
3,3'-Dichlorobenzidine			94.3		%		30-130	02-NOV-20
4-Chloroaniline			57.2		%		30-130	02-NOV-20
Biphenyl			45.6	RRQC	%		50-140	02-NOV-20
Bis(2-chloroethyl)ether			110.5		%		50-140	02-NOV-20
Bis(2-chloroisopropyl)ether			75.8		%		50-140	02-NOV-20
Bis(2-ethylhexyl)phthalate			99.4		%		50-140	02-NOV-20
Diethylphthalate			97.5		%		50-140	02-NOV-20
Dimethylphthalate			88.1		%		50-140	02-NOV-20
Pentachlorophenol			114.5		%		50-140	02-NOV-20
Phenol			111.0		%		30-130	02-NOV-20
COMMENTS: RRQC: Recoveries are outside ALS control limits. Associated non-detect sample results have not been affected.								
WG3435473-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	02-NOV-20
2-Chlorophenol			<0.30		ug/L		0.3	02-NOV-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	02-NOV-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	02-NOV-20
2,4-Dinitrophenol			<1.0		ug/L		1	02-NOV-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	02-NOV-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	02-NOV-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	02-NOV-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	02-NOV-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	02-NOV-20
4-Chloroaniline			<0.40		ug/L		0.4	02-NOV-20
Biphenyl			<0.40		ug/L		0.4	02-NOV-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	02-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT		Water						
Batch	R5272627							
WG3435473-1	MB							
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	02-NOV-20
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	02-NOV-20
Diethylphthalate			<0.20		ug/L		0.2	02-NOV-20
Dimethylphthalate			<0.20		ug/L		0.2	02-NOV-20
Pentachlorophenol			<0.50		ug/L		0.5	02-NOV-20
Phenol			<0.50		ug/L		0.5	02-NOV-20
Surrogate: 2-Fluorobiphenyl			75.9		%		50-140	02-NOV-20
Surrogate: 2,4,6-Tribromophenol			68.7		%		50-140	02-NOV-20
Surrogate: Nitrobenzene d5			77.6		%		50-140	02-NOV-20
Surrogate: p-Terphenyl d14			92.6		%		60-140	02-NOV-20
CR-CR6-IC-WT		Water						
Batch	R5272795							
WG3436007-4	DUP	WG3436007-3						
Chromium, Hexavalent		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	30-OCT-20
WG3436007-2	LCS							
Chromium, Hexavalent			96.4		%		80-120	30-OCT-20
WG3436007-1	MB							
Chromium, Hexavalent			<0.00050		mg/L		0.0005	30-OCT-20
WG3436007-5	MS	WG3436007-3						
Chromium, Hexavalent			93.6		%		70-130	30-OCT-20
F1-HS-511-WT		Water						
Batch	R5275576							
WG3437544-4	DUP	WG3437544-3						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	04-NOV-20
WG3437544-1	LCS							
F1 (C6-C10)			91.6		%		80-120	03-NOV-20
WG3437544-2	MB							
F1 (C6-C10)			<25		ug/L		25	03-NOV-20
Surrogate: 3,4-Dichlorotoluene			108.5		%		60-140	03-NOV-20
WG3437544-5	MS	WG3437544-3						
F1 (C6-C10)			83.5		%		60-140	04-NOV-20
F2-F4-511-WT		Water						



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT Water								
Batch R5272677								
WG3435471-2 LCS								
F2 (C10-C16)			97.7		%		70-130	02-NOV-20
F3 (C16-C34)			107.3		%		70-130	02-NOV-20
F4 (C34-C50)			105.1		%		70-130	02-NOV-20
WG3435471-1 MB								
F2 (C10-C16)			<100		ug/L		100	02-NOV-20
F3 (C16-C34)			<250		ug/L		250	02-NOV-20
F4 (C34-C50)			<250		ug/L		250	02-NOV-20
Surrogate: 2-Bromobenzotrifluoride			87.6		%		60-140	02-NOV-20
HG-T-CVAA-WT Water								
Batch R5271805								
WG3435611-3 DUP L2522001-1								
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	30-OCT-20
WG3435611-2 LCS								
Mercury (Hg)-Total			109.0		%		80-120	30-OCT-20
WG3435611-1 MB								
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	30-OCT-20
WG3435611-4 MS L2522001-2								
Mercury (Hg)-Total			108.1		%		70-130	30-OCT-20
MET-T-CCMS-WT Water								
Batch R5272145								
WG3435426-4 DUP WG3435426-3								
Aluminum (Al)-Total		0.0370	0.0370		mg/L	0.0	20	30-OCT-20
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	30-OCT-20
Arsenic (As)-Total		0.00030	0.00029		mg/L	5.1	20	30-OCT-20
Barium (Ba)-Total		0.0364	0.0370		mg/L	1.7	20	30-OCT-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	30-OCT-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	30-OCT-20
Boron (B)-Total		0.010	<0.010	RPD-NA	mg/L	N/A	20	30-OCT-20
Cadmium (Cd)-Total		0.0000056	<0.0000050	RPD-NA	mg/L	N/A	20	30-OCT-20
Calcium (Ca)-Total		39.0	39.6		mg/L	1.4	20	30-OCT-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	30-OCT-20
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	30-OCT-20
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	30-OCT-20
Copper (Cu)-Total		0.00583	0.00590		mg/L	1.1	20	30-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5272145							
WG3435426-4	DUP	WG3435426-3						
Iron (Fe)-Total		0.074	0.074		mg/L	0.4	20	30-OCT-20
Lead (Pb)-Total		0.000245	0.000248		mg/L	1.1	20	30-OCT-20
Lithium (Li)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	30-OCT-20
Magnesium (Mg)-Total		4.48	4.38		mg/L	2.3	20	30-OCT-20
Manganese (Mn)-Total		0.0233	0.0234		mg/L	0.2	20	30-OCT-20
Molybdenum (Mo)-Total		0.00615	0.00633		mg/L	2.9	20	30-OCT-20
Nickel (Ni)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	30-OCT-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	30-OCT-20
Potassium (K)-Total		1.22	1.23		mg/L	0.2	20	30-OCT-20
Rubidium (Rb)-Total		0.00131	0.00142		mg/L	8.6	20	30-OCT-20
Selenium (Se)-Total		0.000067	0.000076		mg/L	13	20	30-OCT-20
Silicon (Si)-Total		1.31	1.32		mg/L	1.4	20	30-OCT-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	30-OCT-20
Sodium (Na)-Total		23.2	22.8		mg/L	1.7	20	30-OCT-20
Strontium (Sr)-Total		0.127	0.129		mg/L	1.6	20	30-OCT-20
Sulfur (S)-Total		3.71	3.62		mg/L	2.4	25	30-OCT-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	30-OCT-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	30-OCT-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	30-OCT-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	30-OCT-20
Titanium (Ti)-Total		0.00116	0.00097		mg/L	17	20	30-OCT-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	30-OCT-20
Uranium (U)-Total		0.000276	0.000283		mg/L	2.5	20	30-OCT-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	30-OCT-20
Zinc (Zn)-Total		0.0056	0.0057		mg/L	2.5	20	30-OCT-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	30-OCT-20
WG3435426-2	LCS							
Aluminum (Al)-Total			90.6		%		80-120	30-OCT-20
Antimony (Sb)-Total			99.3		%		80-120	30-OCT-20
Arsenic (As)-Total			98.5		%		80-120	30-OCT-20
Barium (Ba)-Total			96.2		%		80-120	30-OCT-20
Beryllium (Be)-Total			92.8		%		80-120	30-OCT-20
Bismuth (Bi)-Total			97.2		%		80-120	30-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5272145							
WG3435426-2	LCS							
Boron (B)-Total			93.0		%		80-120	30-OCT-20
Cadmium (Cd)-Total			96.8		%		80-120	30-OCT-20
Calcium (Ca)-Total			95.9		%		80-120	30-OCT-20
Chromium (Cr)-Total			98.0		%		80-120	30-OCT-20
Cesium (Cs)-Total			94.5		%		80-120	30-OCT-20
Cobalt (Co)-Total			93.3		%		80-120	30-OCT-20
Copper (Cu)-Total			93.5		%		80-120	30-OCT-20
Iron (Fe)-Total			91.8		%		80-120	30-OCT-20
Lead (Pb)-Total			98.9		%		80-120	30-OCT-20
Lithium (Li)-Total			89.9		%		80-120	30-OCT-20
Magnesium (Mg)-Total			92.3		%		80-120	30-OCT-20
Manganese (Mn)-Total			95.8		%		80-120	30-OCT-20
Molybdenum (Mo)-Total			94.3		%		80-120	30-OCT-20
Nickel (Ni)-Total			93.1		%		80-120	30-OCT-20
Phosphorus (P)-Total			100.6		%		70-130	30-OCT-20
Potassium (K)-Total			93.1		%		80-120	30-OCT-20
Rubidium (Rb)-Total			96.9		%		80-120	30-OCT-20
Selenium (Se)-Total			96.9		%		80-120	30-OCT-20
Silicon (Si)-Total			91.0		%		60-140	30-OCT-20
Silver (Ag)-Total			97.5		%		80-120	30-OCT-20
Sodium (Na)-Total			94.0		%		80-120	30-OCT-20
Strontium (Sr)-Total			92.2		%		80-120	30-OCT-20
Sulfur (S)-Total			91.8		%		80-120	30-OCT-20
Thallium (Tl)-Total			97.1		%		80-120	30-OCT-20
Tellurium (Te)-Total			90.2		%		80-120	30-OCT-20
Thorium (Th)-Total			94.7		%		70-130	30-OCT-20
Tin (Sn)-Total			96.4		%		80-120	30-OCT-20
Titanium (Ti)-Total			88.0		%		80-120	30-OCT-20
Tungsten (W)-Total			97.8		%		80-120	30-OCT-20
Uranium (U)-Total			96.3		%		80-120	30-OCT-20
Vanadium (V)-Total			95.3		%		80-120	30-OCT-20
Zinc (Zn)-Total			97.3		%		80-120	30-OCT-20
Zirconium (Zr)-Total			93.6		%		80-120	30-OCT-20

WG3435426-1 MB



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5272145							
WG3435426-1 MB								
Aluminum (Al)-Total			<0.0050		mg/L		0.005	30-OCT-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Boron (B)-Total			<0.010		mg/L		0.01	30-OCT-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	30-OCT-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	30-OCT-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	30-OCT-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	30-OCT-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	30-OCT-20
Iron (Fe)-Total			<0.010		mg/L		0.01	30-OCT-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	30-OCT-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	30-OCT-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	30-OCT-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	30-OCT-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	30-OCT-20
Potassium (K)-Total			<0.050		mg/L		0.05	30-OCT-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	30-OCT-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Silicon (Si)-Total			<0.10		mg/L		0.1	30-OCT-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	30-OCT-20
Sodium (Na)-Total			<0.050		mg/L		0.05	30-OCT-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	30-OCT-20
Sulfur (S)-Total			<0.50		mg/L		0.5	30-OCT-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	30-OCT-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	30-OCT-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	30-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5272145							
WG3435426-1 MB								
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	30-OCT-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	30-OCT-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	30-OCT-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	30-OCT-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	30-OCT-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	30-OCT-20
WG3435426-5 MS		WG3435426-3						
Aluminum (Al)-Total			84.4		%		70-130	30-OCT-20
Antimony (Sb)-Total			96.1		%		70-130	30-OCT-20
Arsenic (As)-Total			96.3		%		70-130	30-OCT-20
Barium (Ba)-Total			N/A	MS-B	%		-	30-OCT-20
Beryllium (Be)-Total			89.5		%		70-130	30-OCT-20
Bismuth (Bi)-Total			92.8		%		70-130	30-OCT-20
Boron (B)-Total			87.7		%		70-130	30-OCT-20
Cadmium (Cd)-Total			92.9		%		70-130	30-OCT-20
Calcium (Ca)-Total			N/A	MS-B	%		-	30-OCT-20
Chromium (Cr)-Total			93.5		%		70-130	30-OCT-20
Cesium (Cs)-Total			92.6		%		70-130	30-OCT-20
Cobalt (Co)-Total			92.7		%		70-130	30-OCT-20
Copper (Cu)-Total			90.1		%		70-130	30-OCT-20
Iron (Fe)-Total			N/A	MS-B	%		-	30-OCT-20
Lead (Pb)-Total			90.8		%		70-130	30-OCT-20
Lithium (Li)-Total			87.9		%		70-130	30-OCT-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	30-OCT-20
Manganese (Mn)-Total			N/A	MS-B	%		-	30-OCT-20
Molybdenum (Mo)-Total			93.6		%		70-130	30-OCT-20
Nickel (Ni)-Total			91.5		%		70-130	30-OCT-20
Phosphorus (P)-Total			89.7		%		70-130	30-OCT-20
Potassium (K)-Total			89.0		%		70-130	30-OCT-20
Rubidium (Rb)-Total			94.2		%		70-130	30-OCT-20
Selenium (Se)-Total			95.3		%		70-130	30-OCT-20
Silicon (Si)-Total			N/A	MS-B	%		-	30-OCT-20
Silver (Ag)-Total			91.0		%		70-130	30-OCT-20
Sodium (Na)-Total			N/A	MS-B	%		-	30-OCT-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5272145							
WG3435426-5 MS		WG3435426-3						
Strontium (Sr)-Total			N/A	MS-B	%		-	30-OCT-20
Sulfur (S)-Total			N/A	MS-B	%		-	30-OCT-20
Thallium (Tl)-Total			90.8		%		70-130	30-OCT-20
Tellurium (Te)-Total			87.3		%		70-130	30-OCT-20
Thorium (Th)-Total			87.6		%		70-130	30-OCT-20
Tin (Sn)-Total			93.5		%		70-130	30-OCT-20
Titanium (Ti)-Total			84.7		%		70-130	30-OCT-20
Tungsten (W)-Total			94.5		%		70-130	30-OCT-20
Uranium (U)-Total			N/A	MS-B	%		-	30-OCT-20
Vanadium (V)-Total			94.1		%		70-130	30-OCT-20
Zinc (Zn)-Total			90.2		%		70-130	30-OCT-20
Zirconium (Zr)-Total			81.9		%		70-130	30-OCT-20
P-T-COL-WT								
	Water							
Batch	R5277776							
WG3435894-3 DUP		L2523350-1						
Phosphorus, Total		0.0063	0.0055		mg/L	13	20	04-NOV-20
WG3435894-2 LCS								
Phosphorus, Total			96.3		%		80-120	04-NOV-20
WG3435894-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	04-NOV-20
WG3435894-4 MS		L2523350-1						
Phosphorus, Total			94.8		%		70-130	04-NOV-20
PAH-511-WT								
	Water							
Batch	R5272925							
WG3435471-2 LCS								
1-Methylnaphthalene			89.9		%		50-140	02-NOV-20
2-Methylnaphthalene			92.2		%		50-140	02-NOV-20
Acenaphthene			98.5		%		50-140	02-NOV-20
Acenaphthylene			95.9		%		50-140	02-NOV-20
Anthracene			127.6		%		50-140	02-NOV-20
Benzo(a)anthracene			181.0	LCS-H	%		50-140	02-NOV-20
Benzo(a)pyrene			95.0		%		50-140	02-NOV-20
Benzo(b)fluoranthene			106.0		%		50-140	02-NOV-20
Benzo(g,h,i)perylene			119.8		%		50-140	02-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5272925							
WG3435471-2 LCS								
Benzo(k)fluoranthene			85.9		%		50-140	02-NOV-20
Chrysene			142.8	LCS-H	%		50-140	02-NOV-20
Dibenzo(ah)anthracene			105.4		%		50-140	02-NOV-20
Fluoranthene			101.9		%		50-140	02-NOV-20
Fluorene			102.0		%		50-140	02-NOV-20
Indeno(1,2,3-cd)pyrene			124.5		%		50-140	02-NOV-20
Naphthalene			97.7		%		50-140	02-NOV-20
Phenanthrene			133.6		%		50-140	02-NOV-20
Pyrene			105.7		%		50-140	02-NOV-20
WG3435471-1 MB								
1-Methylnaphthalene			<0.020		ug/L		0.02	02-NOV-20
2-Methylnaphthalene			<0.020		ug/L		0.02	02-NOV-20
Acenaphthene			<0.020		ug/L		0.02	02-NOV-20
Acenaphthylene			<0.020		ug/L		0.02	02-NOV-20
Anthracene			<0.020		ug/L		0.02	02-NOV-20
Benzo(a)anthracene			<0.020		ug/L		0.02	02-NOV-20
Benzo(a)pyrene			<0.010		ug/L		0.01	02-NOV-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	02-NOV-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	02-NOV-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	02-NOV-20
Chrysene			<0.020		ug/L		0.02	02-NOV-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	02-NOV-20
Fluoranthene			<0.020		ug/L		0.02	02-NOV-20
Fluorene			<0.020		ug/L		0.02	02-NOV-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	02-NOV-20
Naphthalene			<0.050		ug/L		0.05	02-NOV-20
Phenanthrene			<0.020		ug/L		0.02	02-NOV-20
Pyrene			<0.020		ug/L		0.02	02-NOV-20
Surrogate: d8-Naphthalene			106.6		%		60-140	02-NOV-20
Surrogate: d10-Phenanthrene			99.2		%		60-140	02-NOV-20
Surrogate: d12-Chrysene			104.4		%		60-140	02-NOV-20
Surrogate: d10-Acenaphthene			94.6		%		60-140	02-NOV-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5278318							
WG3435482-2	LCS							
Aroclor 1242			101.5		%		60-140	04-NOV-20
Aroclor 1248			100.8		%		60-140	04-NOV-20
Aroclor 1254			108.6		%		60-140	04-NOV-20
Aroclor 1260			110.5		%		60-140	04-NOV-20
WG3435482-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	04-NOV-20
Aroclor 1248			<0.020		ug/L		0.02	04-NOV-20
Aroclor 1254			<0.020		ug/L		0.02	04-NOV-20
Aroclor 1260			<0.020		ug/L		0.02	04-NOV-20
Surrogate: Decachlorobiphenyl			76.3		%		50-150	04-NOV-20
Surrogate: Tetrachloro-m-xylene			80.3		%		50-150	04-NOV-20
VOC-511-HS-WT		Water						
Batch	R5275576							
WG3437544-4	DUP		WG3437544-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	04-NOV-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	04-NOV-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	04-NOV-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	04-NOV-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	04-NOV-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5275576							
WG3437544-4	DUP	WG3437544-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	04-NOV-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	04-NOV-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	04-NOV-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	04-NOV-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	04-NOV-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	04-NOV-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	04-NOV-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	04-NOV-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	04-NOV-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	04-NOV-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	04-NOV-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	04-NOV-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	04-NOV-20
Vinyl chloride		1.37	1.25		ug/L	9.2	30	04-NOV-20
WG3437544-1	LCS							
1,1,1,2-Tetrachloroethane			94.9		%		70-130	03-NOV-20
1,1,2,2-Tetrachloroethane			118.3		%		70-130	03-NOV-20
1,1,1-Trichloroethane			96.3		%		70-130	03-NOV-20
1,1,2-Trichloroethane			107.1		%		70-130	03-NOV-20
1,1-Dichloroethane			99.4		%		70-130	03-NOV-20
1,1-Dichloroethylene			92.4		%		70-130	03-NOV-20
1,2-Dibromoethane			108.8		%		70-130	03-NOV-20
1,2-Dichlorobenzene			99.5		%		70-130	03-NOV-20
1,2-Dichloroethane			115.2		%		70-130	03-NOV-20
1,2-Dichloropropane			108.0		%		70-130	03-NOV-20
1,3-Dichlorobenzene			96.4		%		70-130	03-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5275576							
WG3437544-1	LCS							
1,4-Dichlorobenzene			97.9		%		70-130	03-NOV-20
Benzene			103.5		%		70-130	03-NOV-20
Bromodichloromethane			119.3		%		70-130	03-NOV-20
Bromoform			115.3		%		70-130	03-NOV-20
Bromomethane			132.9		%		60-140	03-NOV-20
Carbon tetrachloride			96.3		%		70-130	03-NOV-20
Chlorobenzene			95.8		%		70-130	03-NOV-20
Chloroform			107.9		%		70-130	03-NOV-20
cis-1,2-Dichloroethylene			104.2		%		70-130	03-NOV-20
cis-1,3-Dichloropropene			108.3		%		70-130	03-NOV-20
Dibromochloromethane			101.8		%		70-130	03-NOV-20
Dichlorodifluoromethane			109.2		%		50-140	03-NOV-20
Ethylbenzene			85.3		%		70-130	03-NOV-20
n-Hexane			90.7		%		70-130	03-NOV-20
m+p-Xylenes			86.1		%		70-130	03-NOV-20
Methyl Ethyl Ketone			143.2	MES	%		60-140	03-NOV-20
Methyl Isobutyl Ketone			137.3		%		60-140	03-NOV-20
Methylene Chloride			110.2		%		70-130	03-NOV-20
MTBE			100.5		%		70-130	03-NOV-20
o-Xylene			95.3		%		70-130	03-NOV-20
Styrene			92.6		%		70-130	03-NOV-20
Tetrachloroethylene			87.7		%		70-130	03-NOV-20
Toluene			89.1		%		70-130	03-NOV-20
trans-1,2-Dichloroethylene			93.8		%		70-130	03-NOV-20
trans-1,3-Dichloropropene			103.6		%		70-130	03-NOV-20
Trichloroethylene			102.2		%		70-130	03-NOV-20
Trichlorofluoromethane			94.2		%		60-140	03-NOV-20
Vinyl chloride			113.9		%		60-140	03-NOV-20
WG3437544-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	03-NOV-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	03-NOV-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	03-NOV-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	03-NOV-20
1,1-Dichloroethane			<0.50		ug/L		0.5	03-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5275576							
WG3437544-2 MB								
1,1-Dichloroethylene			<0.50		ug/L		0.5	03-NOV-20
1,2-Dibromoethane			<0.20		ug/L		0.2	03-NOV-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	03-NOV-20
1,2-Dichloroethane			<0.50		ug/L		0.5	03-NOV-20
1,2-Dichloropropane			<0.50		ug/L		0.5	03-NOV-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	03-NOV-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	03-NOV-20
Acetone			<30		ug/L		30	03-NOV-20
Benzene			<0.50		ug/L		0.5	03-NOV-20
Bromodichloromethane			<2.0		ug/L		2	03-NOV-20
Bromoform			<5.0		ug/L		5	03-NOV-20
Bromomethane			<0.50		ug/L		0.5	03-NOV-20
Carbon tetrachloride			<0.20		ug/L		0.2	03-NOV-20
Chlorobenzene			<0.50		ug/L		0.5	03-NOV-20
Chloroform			<1.0		ug/L		1	03-NOV-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	03-NOV-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	03-NOV-20
Dibromochloromethane			<2.0		ug/L		2	03-NOV-20
Dichlorodifluoromethane			<2.0		ug/L		2	03-NOV-20
Ethylbenzene			<0.50		ug/L		0.5	03-NOV-20
n-Hexane			<0.50		ug/L		0.5	03-NOV-20
m+p-Xylenes			<0.40		ug/L		0.4	03-NOV-20
Methyl Ethyl Ketone			<20		ug/L		20	03-NOV-20
Methyl Isobutyl Ketone			<20		ug/L		20	03-NOV-20
Methylene Chloride			<5.0		ug/L		5	03-NOV-20
MTBE			<2.0		ug/L		2	03-NOV-20
o-Xylene			<0.30		ug/L		0.3	03-NOV-20
Styrene			<0.50		ug/L		0.5	03-NOV-20
Tetrachloroethylene			<0.50		ug/L		0.5	03-NOV-20
Toluene			<0.50		ug/L		0.5	03-NOV-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	03-NOV-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	03-NOV-20
Trichloroethylene			<0.50		ug/L		0.5	03-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5275576							
WG3437544-2 MB								
Trichlorofluoromethane			<5.0		ug/L		5	03-NOV-20
Vinyl chloride			<0.50		ug/L		0.5	03-NOV-20
Surrogate: 1,4-Difluorobenzene			100.8		%		70-130	03-NOV-20
Surrogate: 4-Bromofluorobenzene			100.8		%		70-130	03-NOV-20
WG3437544-5 MS		WG3437544-3						
1,1,1,2-Tetrachloroethane			92.2		%		50-140	04-NOV-20
1,1,1,2,2-Tetrachloroethane			97.9		%		50-140	04-NOV-20
1,1,1-Trichloroethane			98.5		%		50-140	04-NOV-20
1,1,2-Trichloroethane			97.3		%		50-140	04-NOV-20
1,1-Dichloroethane			97.2		%		50-140	04-NOV-20
1,1-Dichloroethylene			94.8		%		50-140	04-NOV-20
1,2-Dibromoethane			97.4		%		50-140	04-NOV-20
1,2-Dichlorobenzene			98.3		%		50-140	04-NOV-20
1,2-Dichloroethane			102.5		%		50-140	04-NOV-20
1,2-Dichloropropane			101.6		%		50-140	04-NOV-20
1,3-Dichlorobenzene			100.7		%		50-140	04-NOV-20
1,4-Dichlorobenzene			100.9		%		50-140	04-NOV-20
Acetone			117.6		%		50-140	04-NOV-20
Benzene			101.4		%		50-140	04-NOV-20
Bromodichloromethane			109.4		%		50-140	04-NOV-20
Bromoform			99.1		%		50-140	04-NOV-20
Bromomethane			126.8		%		50-140	04-NOV-20
Carbon tetrachloride			99.6		%		50-140	04-NOV-20
Chlorobenzene			95.3		%		50-140	04-NOV-20
Chloroform			103.9		%		50-140	04-NOV-20
cis-1,2-Dichloroethylene			100.7		%		50-140	04-NOV-20
cis-1,3-Dichloropropene			101.8		%		50-140	04-NOV-20
Dibromochloromethane			92.9		%		50-140	04-NOV-20
Dichlorodifluoromethane			104.2		%		50-140	04-NOV-20
Ethylbenzene			88.9		%		50-140	04-NOV-20
n-Hexane			96.1		%		50-140	04-NOV-20
m+p-Xylenes			89.3		%		50-140	04-NOV-20
Methyl Ethyl Ketone			110.0		%		50-140	04-NOV-20
Methyl Isobutyl Ketone			105.6		%		50-140	04-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5275576							
WG3437544-5 MS		WG3437544-3						
Methylene Chloride			103.0		%		50-140	04-NOV-20
MTBE			100.3		%		50-140	04-NOV-20
o-Xylene			96.4		%		50-140	04-NOV-20
Styrene			90.1		%		50-140	04-NOV-20
Tetrachloroethylene			94.8		%		50-140	04-NOV-20
Toluene			91.9		%		50-140	04-NOV-20
trans-1,2-Dichloroethylene			94.6		%		50-140	04-NOV-20
trans-1,3-Dichloropropene			94.8		%		50-140	04-NOV-20
Trichloroethylene			104.1		%		50-140	04-NOV-20
Trichlorofluoromethane			96.6		%		50-140	04-NOV-20
Vinyl chloride			112.9		%		50-140	04-NOV-20

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455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
RRQC	Refer to report remarks for information regarding this QC result.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

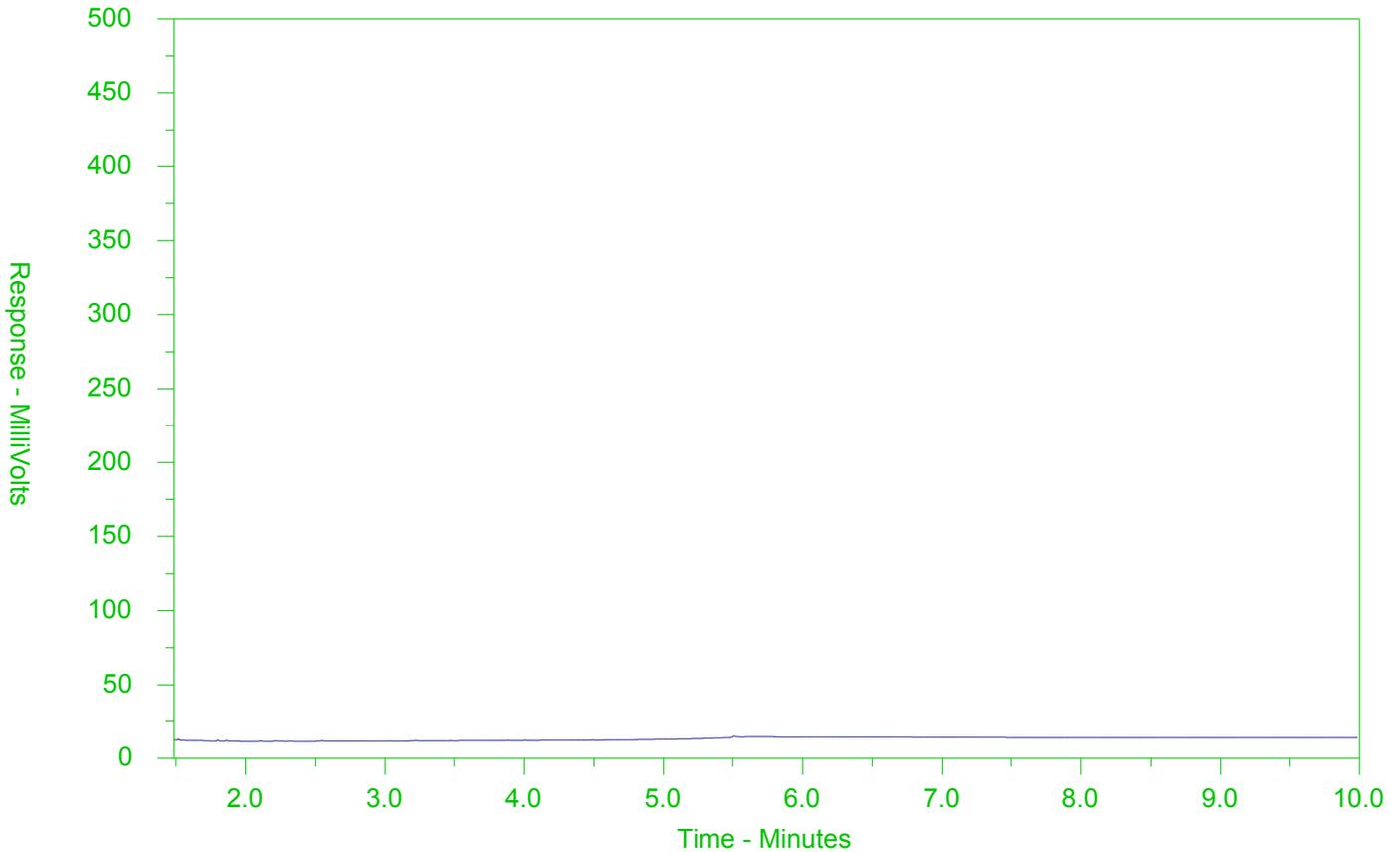
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2523350-1
 Client Sample ID: W-11210029-20201029-46



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



L2523350-COFC

UK

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Contact your AM to confirm all E&P TATs (surcharges may apply)																																																								
Company: GHD LIMITED - ACCT #13791		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply		Priority (Business Days):																																																						
Contact: Laura Ermeta		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			4 day [P4-20%] <input type="checkbox"/>		EMERGENCY: 1 Business day [E - 100%] <input type="checkbox"/>																																																						
Phone: 519-884-0510		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			3 day [P3-25%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/>																																																						
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm																																																								
Street: 455 Phillip St		Email 1 or Fax: laura.ermeta@ghd.com			For tests that can not be performed according to the service level selected, you will be contacted.																																																								
City/Province: Waterloo, Ontario		Email 2: See PO			Analysis Request																																																								
Postal Code: N2L 3X2		Email 3:			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																																								
Invoice To: Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Invoice Distribution			NUMBER OF CONTAINERS																																																								
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Company: GHD Limited		Email 1 or Fax: apinvoices-735@ghd.com													SUSPECTED HAZARD (see Special Instructions)																																														
Contact: SEE SSOW		Email 2:																		<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Total Metals (MET-T-CCMS-WT)</td> <td>Total Mercury (HG-T-CVAA-WT)</td> <td>Total Cr6 (CR-CR6-IC-WT)</td> <td>Total Phosphorous (P-T-COL-WT)</td> <td>PCBs (PCB-511-WT)</td> <td>VOCs and PHCs (VOC-F1-F4-511-P-WT)</td> <td>SVOCs (SVOC-511-GP-WT)</td> <td></td> </tr> <tr> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td></td> </tr> </table>					Total Metals (MET-T-CCMS-WT)	Total Mercury (HG-T-CVAA-WT)	Total Cr6 (CR-CR6-IC-WT)	Total Phosphorous (P-T-COL-WT)	PCBs (PCB-511-WT)	VOCs and PHCs (VOC-F1-F4-511-P-WT)	SVOCs (SVOC-511-GP-WT)															R	R	R	R	R	R	R									
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PO / AFE: 73520086															<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="2">Frozen <input type="checkbox"/></td> <td colspan="2">SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/></td> </tr> <tr> <td colspan="2">Ice Packs <input checked="" type="checkbox"/></td> <td colspan="2">Ice Cubes <input type="checkbox"/></td> </tr> <tr> <td colspan="2">Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/></td> <td colspan="2">Cooling Initiated <input type="checkbox"/></td> </tr> <tr> <td colspan="2">INITIAL COOLER TEMPERATURES °C</td> <td colspan="2">FINAL COOLER TEMPERATURES °C</td> </tr> </table>					Frozen <input type="checkbox"/>		SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>		Ice Packs <input checked="" type="checkbox"/>		Ice Cubes <input type="checkbox"/>		Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>		Cooling Initiated <input type="checkbox"/>		INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C																											
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GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 05-NOV-20
Report Date: 12-NOV-20 11:51 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2526411

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2526411-1 W-11210029-20201105- 48 Sampled By: ERIC on 05-NOV-20 @ 10:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0056		0.0030	mg/L	06-NOV-20	09-NOV-20	R5282679
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	06-NOV-20	06-NOV-20	R5281806
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Arsenic (As)-Total	0.00561		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Barium (Ba)-Total	0.0480		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	06-NOV-20	06-NOV-20	R5281806
Boron (B)-Total	<0.010		0.010	mg/L	06-NOV-20	06-NOV-20	R5281806
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	06-NOV-20	06-NOV-20	R5281806
Calcium (Ca)-Total	72.4		0.050	mg/L	06-NOV-20	06-NOV-20	R5281806
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	06-NOV-20	06-NOV-20	R5281806
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	06-NOV-20	06-NOV-20	R5281806
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Copper (Cu)-Total	<0.00050		0.00050	mg/L	06-NOV-20	06-NOV-20	R5281806
Iron (Fe)-Total	0.386		0.010	mg/L	06-NOV-20	06-NOV-20	R5281806
Lead (Pb)-Total	<0.000050		0.000050	mg/L	06-NOV-20	06-NOV-20	R5281806
Lithium (Li)-Total	0.0041		0.0010	mg/L	06-NOV-20	06-NOV-20	R5281806
Magnesium (Mg)-Total	31.8		0.0050	mg/L	06-NOV-20	06-NOV-20	R5281806
Manganese (Mn)-Total	0.00918		0.00050	mg/L	06-NOV-20	06-NOV-20	R5281806
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		06-NOV-20	R5281790
Molybdenum (Mo)-Total	0.000531		0.000050	mg/L	06-NOV-20	06-NOV-20	R5281806
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	06-NOV-20	06-NOV-20	R5281806
Phosphorus (P)-Total	<0.050		0.050	mg/L	06-NOV-20	06-NOV-20	R5281806
Potassium (K)-Total	0.921		0.050	mg/L	06-NOV-20	06-NOV-20	R5281806
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	06-NOV-20	06-NOV-20	R5281806
Selenium (Se)-Total	<0.000050		0.000050	mg/L	06-NOV-20	06-NOV-20	R5281806
Silicon (Si)-Total	8.25		0.10	mg/L	06-NOV-20	06-NOV-20	R5281806
Silver (Ag)-Total	<0.000050		0.000050	mg/L	06-NOV-20	06-NOV-20	R5281806
Sodium (Na)-Total	7.51		0.050	mg/L	06-NOV-20	06-NOV-20	R5281806
Strontium (Sr)-Total	0.147		0.0010	mg/L	06-NOV-20	06-NOV-20	R5281806
Sulfur (S)-Total	19.1		0.50	mg/L	06-NOV-20	06-NOV-20	R5281806
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	06-NOV-20	06-NOV-20	R5281806
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	06-NOV-20	06-NOV-20	R5281806
Thorium (Th)-Total	<0.00010		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Tin (Sn)-Total	<0.00010		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	06-NOV-20	06-NOV-20	R5281806
Tungsten (W)-Total	<0.00010		0.00010	mg/L	06-NOV-20	06-NOV-20	R5281806
Uranium (U)-Total	0.000261		0.000010	mg/L	06-NOV-20	06-NOV-20	R5281806
Vanadium (V)-Total	<0.00050		0.00050	mg/L	06-NOV-20	06-NOV-20	R5281806
Zinc (Zn)-Total	0.0030		0.0030	mg/L	06-NOV-20	06-NOV-20	R5281806

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2526411-1 W-11210029-20201105- 48 Sampled By: ERIC on 05-NOV-20 @ 10:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	06-NOV-20	06-NOV-20	R5281806
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		06-NOV-20	R5282667
Volatile Organic Compounds							
Acetone	<30		30	ug/L		12-NOV-20	R5283972
Benzene	<0.50		0.50	ug/L		12-NOV-20	R5283972
Bromodichloromethane	<2.0		2.0	ug/L		12-NOV-20	R5283972
Bromoform	<5.0		5.0	ug/L		12-NOV-20	R5283972
Bromomethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
Carbon tetrachloride	<0.20		0.20	ug/L		12-NOV-20	R5283972
Chlorobenzene	<0.50		0.50	ug/L		12-NOV-20	R5283972
Dibromochloromethane	<2.0		2.0	ug/L		12-NOV-20	R5283972
Chloroform	<1.0		1.0	ug/L		12-NOV-20	R5283972
1,2-Dibromoethane	<0.20		0.20	ug/L		12-NOV-20	R5283972
1,2-Dichlorobenzene	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,3-Dichlorobenzene	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,4-Dichlorobenzene	<0.50		0.50	ug/L		12-NOV-20	R5283972
Dichlorodifluoromethane	<2.0		2.0	ug/L		12-NOV-20	R5283972
1,1-Dichloroethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,2-Dichloroethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,1-Dichloroethylene	<0.50		0.50	ug/L		12-NOV-20	R5283972
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		12-NOV-20	R5283972
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		12-NOV-20	R5283972
Methylene Chloride	<5.0		5.0	ug/L		12-NOV-20	R5283972
1,2-Dichloropropane	<0.50		0.50	ug/L		12-NOV-20	R5283972
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		12-NOV-20	R5283972
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		12-NOV-20	R5283972
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		12-NOV-20	R5283972
Ethylbenzene	<0.50		0.50	ug/L		12-NOV-20	R5283972
n-Hexane	<0.50		0.50	ug/L		12-NOV-20	R5283972
Methyl Ethyl Ketone	<20		20	ug/L		12-NOV-20	R5283972
Methyl Isobutyl Ketone	<20		20	ug/L		12-NOV-20	R5283972
MTBE	<2.0		2.0	ug/L		12-NOV-20	R5283972
Styrene	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
Tetrachloroethylene	<0.50		0.50	ug/L		12-NOV-20	R5283972
Toluene	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,1,1-Trichloroethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
1,1,2-Trichloroethane	<0.50		0.50	ug/L		12-NOV-20	R5283972
Trichloroethylene	<0.50		0.50	ug/L		12-NOV-20	R5283972

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

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L2526411-1 W-11210029-20201105- 48 Sampled By: ERIC on 05-NOV-20 @ 10:00 Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		12-NOV-20	R5283972
Vinyl chloride	<0.50		0.50	ug/L		12-NOV-20	R5283972
o-Xylene	<0.30		0.30	ug/L		12-NOV-20	R5283972
m+p-Xylenes	<0.40		0.40	ug/L		12-NOV-20	R5283972
Xylenes (Total)	<0.50		0.50	ug/L		12-NOV-20	
Surrogate: 4-Bromofluorobenzene	97.7		70-130	%		12-NOV-20	R5283972
Surrogate: 1,4-Difluorobenzene	100.7		70-130	%		12-NOV-20	R5283972
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		12-NOV-20	R5283972
F1-BTEX	<25		25	ug/L		12-NOV-20	
F2 (C10-C16)	<100		100	ug/L	05-NOV-20	06-NOV-20	R5281702
F2-Naphth	<100		100	ug/L		12-NOV-20	
F3 (C16-C34)	<250		250	ug/L	05-NOV-20	06-NOV-20	R5281702
F3-PAH	<250		250	ug/L		12-NOV-20	
F4 (C34-C50)	<250		250	ug/L	05-NOV-20	06-NOV-20	R5281702
Total Hydrocarbons (C6-C50)	<370		370	ug/L		12-NOV-20	
Chrom. to baseline at nC50	YES				05-NOV-20	06-NOV-20	R5281702
Surrogate: 2-Bromobenzotrifluoride	96.6		60-140	%	05-NOV-20	06-NOV-20	R5281702
Surrogate: 3,4-Dichlorotoluene	85.0		60-140	%		12-NOV-20	R5283972
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Acenaphthylene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Anthracene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Benzo(a)anthracene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Benzo(a)pyrene	<0.010		0.010	ug/L	05-NOV-20	12-NOV-20	R5281608
Benzo(b)fluoranthene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Benzo(k)fluoranthene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Chrysene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Fluoranthene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Fluorene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		12-NOV-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
2-Methylnaphthalene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Naphthalene	<0.050		0.050	ug/L	05-NOV-20	12-NOV-20	R5281608
Phenanthrene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Pyrene	<0.020		0.020	ug/L	05-NOV-20	12-NOV-20	R5281608
Surrogate: d10-Acenaphthene	99.0		60-140	%	05-NOV-20	12-NOV-20	R5281608
Surrogate: d12-Chrysene	77.4		60-140	%	05-NOV-20	12-NOV-20	R5281608

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2526411-1 W-11210029-20201105- 48							
Sampled By: ERIC on 05-NOV-20 @ 10:00							
Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	101.2		60-140	%	05-NOV-20	12-NOV-20	R5281608
Surrogate: d10-Phenanthrene	101.4		60-140	%	05-NOV-20	12-NOV-20	R5281608
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
4-Chloroaniline	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
2-Chlorophenol	<0.30		0.30	ug/L	06-NOV-20	12-NOV-20	R5283503
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4-Dichlorophenol	<0.30		0.30	ug/L	06-NOV-20	12-NOV-20	R5283503
Diethylphthalate	<0.20		0.20	ug/L	06-NOV-20	12-NOV-20	R5283503
Dimethylphthalate	<0.20		0.20	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4-Dimethylphenol	<0.50		0.50	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4-Dinitrophenol	<1.0		1.0	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4-Dinitrotoluene	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
2,6-Dinitrotoluene	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		12-NOV-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	06-NOV-20	12-NOV-20	R5283503
Pentachlorophenol	<0.50		0.50	ug/L	06-NOV-20	12-NOV-20	R5283503
Phenol	<0.50		0.50	ug/L	06-NOV-20	12-NOV-20	R5283503
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	06-NOV-20	12-NOV-20	R5283503
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	06-NOV-20	12-NOV-20	R5283503
Surrogate: 2-Fluorobiphenyl	89.3		50-140	%	06-NOV-20	12-NOV-20	R5283503
Surrogate: Nitrobenzene d5	95.8		50-140	%	06-NOV-20	12-NOV-20	R5283503
Surrogate: p-Terphenyl d14	89.8		60-140	%	06-NOV-20	12-NOV-20	R5283503
Surrogate: 2,4,6-Tribromophenol	98.2		50-140	%	06-NOV-20	12-NOV-20	R5283503
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	10-NOV-20	10-NOV-20	R5282775
Aroclor 1248	<0.020		0.020	ug/L	10-NOV-20	10-NOV-20	R5282775
Aroclor 1254	<0.020		0.020	ug/L	10-NOV-20	10-NOV-20	R5282775
Aroclor 1260	<0.020		0.020	ug/L	10-NOV-20	10-NOV-20	R5282775
Surrogate: Decachlorobiphenyl	105.4		50-150	%	10-NOV-20	10-NOV-20	R5282775
Total PCBs	<0.040		0.040	ug/L	10-NOV-20	10-NOV-20	R5282775
Surrogate: Tetrachloro-m-xylene	89.0		50-150	%	10-NOV-20	10-NOV-20	R5282775

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Total	MS-B	L2526411-1
Matrix Spike	Boron (B)-Total	MS-B	L2526411-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2526411-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2526411-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2526411-1
Matrix Spike	Potassium (K)-Total	MS-B	L2526411-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2526411-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2526411-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2526411-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2526411-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2526411

Report Date: 12-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5283503							
WG3440218-2 LCS								
1,2,4-Trichlorobenzene			61.5		%		50-140	10-NOV-20
2-Chlorophenol			83.1		%		50-140	10-NOV-20
2,4-Dichlorophenol			96.9		%		50-140	10-NOV-20
2,4-Dimethylphenol			94.6		%		30-130	10-NOV-20
2,4-Dinitrophenol			94.3		%		50-140	10-NOV-20
2,4-Dinitrotoluene			107.9		%		50-140	10-NOV-20
2,4,5-Trichlorophenol			99.5		%		50-140	10-NOV-20
2,4,6-Trichlorophenol			97.8		%		50-140	10-NOV-20
2,6-Dinitrotoluene			94.6		%		50-140	10-NOV-20
3,3'-Dichlorobenzidine			73.2		%		30-130	10-NOV-20
4-Chloroaniline			57.9		%		30-130	10-NOV-20
Biphenyl			82.4		%		50-140	10-NOV-20
Bis(2-chloroethyl)ether			89.7		%		50-140	10-NOV-20
Bis(2-chloroisopropyl)ether			84.2		%		50-140	10-NOV-20
Bis(2-ethylhexyl)phthalate			99.9		%		50-140	10-NOV-20
Diethylphthalate			96.1		%		50-140	10-NOV-20
Dimethylphthalate			90.9		%		50-140	10-NOV-20
Pentachlorophenol			108.9		%		50-140	10-NOV-20
Phenol			109.9		%		30-130	10-NOV-20
WG3440218-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	10-NOV-20
2-Chlorophenol			<0.30		ug/L		0.3	10-NOV-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	10-NOV-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	10-NOV-20
2,4-Dinitrophenol			<1.0		ug/L		1	10-NOV-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	10-NOV-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	10-NOV-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	10-NOV-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	10-NOV-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	10-NOV-20
4-Chloroaniline			<0.40		ug/L		0.4	10-NOV-20
Biphenyl			<0.40		ug/L		0.4	10-NOV-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	10-NOV-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	10-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5283503								
WG3440218-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	10-NOV-20
Diethylphthalate			<0.20		ug/L		0.2	10-NOV-20
Dimethylphthalate			<0.20		ug/L		0.2	10-NOV-20
Pentachlorophenol			<0.50		ug/L		0.5	10-NOV-20
Phenol			<0.50		ug/L		0.5	10-NOV-20
Surrogate: 2-Fluorobiphenyl			85.3		%		50-140	10-NOV-20
Surrogate: 2,4,6-Tribromophenol			82.1		%		50-140	10-NOV-20
Surrogate: Nitrobenzene d5			89.3		%		50-140	10-NOV-20
Surrogate: p-Terphenyl d14			113.7		%		60-140	10-NOV-20
CR-CR6-IC-WT Water								
Batch R5282667								
WG3440824-4 DUP								
Chromium, Hexavalent		WG3440824-3 0.00073	0.00072		mg/L	0.6	20	06-NOV-20
WG3440824-2 LCS								
Chromium, Hexavalent			101.4		%		80-120	06-NOV-20
WG3440824-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	06-NOV-20
WG3440824-5 MS								
Chromium, Hexavalent		WG3440824-3	101.6		%		70-130	06-NOV-20
F1-HS-511-WT Water								
Batch R5283972								
WG3439321-4 DUP								
F1 (C6-C10)		WG3439321-3 <25	<25	RPD-NA	ug/L	N/A	30	12-NOV-20
WG3439321-1 LCS								
F1 (C6-C10)			103.9		%		80-120	12-NOV-20
WG3439321-2 MB								
F1 (C6-C10)			<25		ug/L		25	12-NOV-20
Surrogate: 3,4-Dichlorotoluene			96.3		%		60-140	12-NOV-20
WG3439321-5 MS								
F1 (C6-C10)		WG3439321-3	96.8		%		60-140	12-NOV-20
F2-F4-511-WT Water								
Batch R5281702								
WG3440004-2 LCS								
F2 (C10-C16)			94.4		%		70-130	06-NOV-20
F3 (C16-C34)			93.5		%		70-130	06-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch R5281702								
WG3440004-2	LCS							
F4 (C34-C50)			116.7		%		70-130	06-NOV-20
WG3440004-1	MB							
F2 (C10-C16)			<100		ug/L		100	06-NOV-20
F3 (C16-C34)			<250		ug/L		250	06-NOV-20
F4 (C34-C50)			<250		ug/L		250	06-NOV-20
Surrogate: 2-Bromobenzotrifluoride			88.4		%		60-140	06-NOV-20
HG-T-CVAA-WT		Water						
Batch R5281790								
WG3440407-4	DUP	WG3440407-3						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	06-NOV-20
WG3440407-2	LCS							
Mercury (Hg)-Total			111.0		%		80-120	06-NOV-20
WG3440407-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	06-NOV-20
WG3440407-6	MS	WG3440407-5						
Mercury (Hg)-Total			106.8		%		70-130	06-NOV-20
MET-T-CCMS-WT		Water						
Batch R5281806								
WG3440194-4	DUP	WG3440194-3						
Aluminum (Al)-Total		0.0189	0.0171		mg/L	10	20	06-NOV-20
Antimony (Sb)-Total		0.00059	0.00059		mg/L	0.5	20	06-NOV-20
Arsenic (As)-Total		0.00030	0.00031		mg/L	1.6	20	06-NOV-20
Barium (Ba)-Total		0.130	0.129		mg/L	0.2	20	06-NOV-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	06-NOV-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	06-NOV-20
Boron (B)-Total		0.061	0.062		mg/L	1.4	20	06-NOV-20
Cadmium (Cd)-Total		0.0000061	<0.0000050	RPD-NA	mg/L	N/A	20	06-NOV-20
Calcium (Ca)-Total		44.9	46.2		mg/L	3.0	20	06-NOV-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	06-NOV-20
Cesium (Cs)-Total		0.000066	0.000067		mg/L	2.7	20	06-NOV-20
Cobalt (Co)-Total		0.00047	0.00046		mg/L	0.9	20	06-NOV-20
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	06-NOV-20
Iron (Fe)-Total		0.104	0.102		mg/L	2.0	20	06-NOV-20
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	06-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5281806							
WG3440194-4	DUP	WG3440194-3						
Lithium (Li)-Total		0.0055	0.0055		mg/L	1.0	20	06-NOV-20
Magnesium (Mg)-Total		12.1	12.1		mg/L	0.3	20	06-NOV-20
Manganese (Mn)-Total		0.384	0.380		mg/L	1.2	20	06-NOV-20
Molybdenum (Mo)-Total		0.00418	0.00428		mg/L	2.4	20	06-NOV-20
Nickel (Ni)-Total		0.00233	0.00229		mg/L	2.1	20	06-NOV-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	06-NOV-20
Potassium (K)-Total		3.93	3.81		mg/L	3.2	20	06-NOV-20
Rubidium (Rb)-Total		0.00518	0.00514		mg/L	0.9	20	06-NOV-20
Selenium (Se)-Total		0.000081	0.000088		mg/L	8.1	20	06-NOV-20
Silicon (Si)-Total		1.31	1.29		mg/L	1.2	20	06-NOV-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	06-NOV-20
Sodium (Na)-Total		38.9	40.2		mg/L	3.1	20	06-NOV-20
Strontium (Sr)-Total		0.321	0.320		mg/L	0.2	20	06-NOV-20
Sulfur (S)-Total		30.7	30.0		mg/L	2.4	25	06-NOV-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	06-NOV-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	06-NOV-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	06-NOV-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	06-NOV-20
Titanium (Ti)-Total		0.00035	0.00040		mg/L	12	20	06-NOV-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	06-NOV-20
Uranium (U)-Total		0.000024	0.000022		mg/L	9.0	20	06-NOV-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	06-NOV-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	06-NOV-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	06-NOV-20
WG3440194-2	LCS							
Aluminum (Al)-Total			97.9		%		80-120	06-NOV-20
Antimony (Sb)-Total			100.0		%		80-120	06-NOV-20
Arsenic (As)-Total			98.2		%		80-120	06-NOV-20
Barium (Ba)-Total			99.8		%		80-120	06-NOV-20
Beryllium (Be)-Total			98.9		%		80-120	06-NOV-20
Bismuth (Bi)-Total			98.1		%		80-120	06-NOV-20
Boron (B)-Total			98.2		%		80-120	06-NOV-20
Cadmium (Cd)-Total			104.2		%		80-120	06-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5281806							
WG3440194-2	LCS							
Calcium (Ca)-Total			98.5		%		80-120	06-NOV-20
Chromium (Cr)-Total			98.1		%		80-120	06-NOV-20
Cesium (Cs)-Total			100.3		%		80-120	06-NOV-20
Cobalt (Co)-Total			99.4		%		80-120	06-NOV-20
Copper (Cu)-Total			97.5		%		80-120	06-NOV-20
Iron (Fe)-Total			97.5		%		80-120	06-NOV-20
Lead (Pb)-Total			100.2		%		80-120	06-NOV-20
Lithium (Li)-Total			109.4		%		80-120	06-NOV-20
Magnesium (Mg)-Total			104.4		%		80-120	06-NOV-20
Manganese (Mn)-Total			97.0		%		80-120	06-NOV-20
Molybdenum (Mo)-Total			99.4		%		80-120	06-NOV-20
Nickel (Ni)-Total			99.2		%		80-120	06-NOV-20
Phosphorus (P)-Total			104.5		%		70-130	06-NOV-20
Potassium (K)-Total			95.8		%		80-120	06-NOV-20
Rubidium (Rb)-Total			102.2		%		80-120	06-NOV-20
Selenium (Se)-Total			98.5		%		80-120	06-NOV-20
Silicon (Si)-Total			95.9		%		60-140	06-NOV-20
Silver (Ag)-Total			98.9		%		80-120	06-NOV-20
Sodium (Na)-Total			99.2		%		80-120	06-NOV-20
Strontium (Sr)-Total			100.2		%		80-120	06-NOV-20
Sulfur (S)-Total			90.9		%		80-120	06-NOV-20
Thallium (Tl)-Total			100.2		%		80-120	06-NOV-20
Tellurium (Te)-Total			96.3		%		80-120	06-NOV-20
Thorium (Th)-Total			100.0		%		70-130	06-NOV-20
Tin (Sn)-Total			98.7		%		80-120	06-NOV-20
Titanium (Ti)-Total			94.7		%		80-120	06-NOV-20
Tungsten (W)-Total			98.4		%		80-120	06-NOV-20
Uranium (U)-Total			102.3		%		80-120	06-NOV-20
Vanadium (V)-Total			99.9		%		80-120	06-NOV-20
Zinc (Zn)-Total			97.0		%		80-120	06-NOV-20
Zirconium (Zr)-Total			94.7		%		80-120	06-NOV-20
WG3440194-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	06-NOV-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	06-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5281806							
WG3440194-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	06-NOV-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	06-NOV-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	06-NOV-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	06-NOV-20
Boron (B)-Total			<0.010		mg/L		0.01	06-NOV-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	06-NOV-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	06-NOV-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	06-NOV-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	06-NOV-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	06-NOV-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	06-NOV-20
Iron (Fe)-Total			<0.010		mg/L		0.01	06-NOV-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	06-NOV-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	06-NOV-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	06-NOV-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	06-NOV-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	06-NOV-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	06-NOV-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	06-NOV-20
Potassium (K)-Total			<0.050		mg/L		0.05	06-NOV-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	06-NOV-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	06-NOV-20
Silicon (Si)-Total			<0.10		mg/L		0.1	06-NOV-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	06-NOV-20
Sodium (Na)-Total			<0.050		mg/L		0.05	06-NOV-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	06-NOV-20
Sulfur (S)-Total			<0.50		mg/L		0.5	06-NOV-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	06-NOV-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	06-NOV-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	06-NOV-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	06-NOV-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	06-NOV-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	06-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5281806							
WG3440194-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	06-NOV-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	06-NOV-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	06-NOV-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	06-NOV-20
WG3440194-5 MS		WG3440194-6						
Aluminum (Al)-Total			96.0		%		70-130	06-NOV-20
Antimony (Sb)-Total			99.8		%		70-130	06-NOV-20
Arsenic (As)-Total			99.6		%		70-130	06-NOV-20
Barium (Ba)-Total			N/A	MS-B	%		-	06-NOV-20
Beryllium (Be)-Total			96.1		%		70-130	06-NOV-20
Bismuth (Bi)-Total			93.3		%		70-130	06-NOV-20
Boron (B)-Total			N/A	MS-B	%		-	06-NOV-20
Cadmium (Cd)-Total			100.4		%		70-130	06-NOV-20
Calcium (Ca)-Total			N/A	MS-B	%		-	06-NOV-20
Chromium (Cr)-Total			98.3		%		70-130	06-NOV-20
Cesium (Cs)-Total			98.9		%		70-130	06-NOV-20
Cobalt (Co)-Total			95.9		%		70-130	06-NOV-20
Copper (Cu)-Total			95.3		%		70-130	06-NOV-20
Iron (Fe)-Total			90.8		%		70-130	06-NOV-20
Lead (Pb)-Total			92.8		%		70-130	06-NOV-20
Lithium (Li)-Total			95.8		%		70-130	06-NOV-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	06-NOV-20
Manganese (Mn)-Total			N/A	MS-B	%		-	06-NOV-20
Molybdenum (Mo)-Total			99.5		%		70-130	06-NOV-20
Nickel (Ni)-Total			94.2		%		70-130	06-NOV-20
Phosphorus (P)-Total			100.6		%		70-130	06-NOV-20
Potassium (K)-Total			N/A	MS-B	%		-	06-NOV-20
Rubidium (Rb)-Total			90.5		%		70-130	06-NOV-20
Selenium (Se)-Total			98.0		%		70-130	06-NOV-20
Silicon (Si)-Total			N/A	MS-B	%		-	06-NOV-20
Silver (Ag)-Total			93.2		%		70-130	06-NOV-20
Sodium (Na)-Total			N/A	MS-B	%		-	06-NOV-20
Strontium (Sr)-Total			N/A	MS-B	%		-	06-NOV-20
Sulfur (S)-Total			N/A	MS-B	%		-	06-NOV-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5281806							
WG3440194-5 MS		WG3440194-6						
Thallium (Tl)-Total			92.2		%		70-130	06-NOV-20
Tellurium (Te)-Total			92.1		%		70-130	06-NOV-20
Thorium (Th)-Total			95.9		%		70-130	06-NOV-20
Tin (Sn)-Total			97.5		%		70-130	06-NOV-20
Titanium (Ti)-Total			94.6		%		70-130	06-NOV-20
Tungsten (W)-Total			95.7		%		70-130	06-NOV-20
Uranium (U)-Total			98.1		%		70-130	06-NOV-20
Vanadium (V)-Total			100.4		%		70-130	06-NOV-20
Zinc (Zn)-Total			91.7		%		70-130	06-NOV-20
Zirconium (Zr)-Total			94.4		%		70-130	06-NOV-20
P-T-COL-WT								
	Water							
Batch	R5282679							
WG3439262-3 DUP		L2526324-1						
Phosphorus, Total		0.0476	0.0460		mg/L	3.4	20	09-NOV-20
WG3439262-2 LCS								
Phosphorus, Total			94.4		%		80-120	09-NOV-20
WG3439262-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	09-NOV-20
WG3439262-4 MS		L2526324-1						
Phosphorus, Total			90.1		%		70-130	09-NOV-20
PAH-511-WT								
	Water							
Batch	R5281608							
WG3440004-2 LCS								
1-Methylnaphthalene			92.6		%		50-140	12-NOV-20
2-Methylnaphthalene			94.4		%		50-140	12-NOV-20
Acenaphthene			118.6		%		50-140	12-NOV-20
Acenaphthylene			117.0		%		50-140	12-NOV-20
Anthracene			123.0		%		50-140	12-NOV-20
Benzo(a)anthracene			136.6		%		50-140	12-NOV-20
Benzo(a)pyrene			126.1		%		50-140	12-NOV-20
Benzo(b)fluoranthene			118.0		%		50-140	12-NOV-20
Benzo(g,h,i)perylene			125.3		%		50-140	12-NOV-20
Benzo(k)fluoranthene			120.6		%		50-140	12-NOV-20
Chrysene			130.1		%		50-140	12-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5281608							
WG3440004-2	LCS							
Dibenzo(ah)anthracene			128.9		%		50-140	12-NOV-20
Fluoranthene			134.7		%		50-140	12-NOV-20
Fluorene			117.1		%		50-140	12-NOV-20
Indeno(1,2,3-cd)pyrene			135.3		%		50-140	12-NOV-20
Naphthalene			104.4		%		50-140	12-NOV-20
Phenanthrene			127.8		%		50-140	12-NOV-20
Pyrene			134.4		%		50-140	12-NOV-20
WG3440004-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	12-NOV-20
2-Methylnaphthalene			<0.020		ug/L		0.02	12-NOV-20
Acenaphthene			<0.020		ug/L		0.02	12-NOV-20
Acenaphthylene			<0.020		ug/L		0.02	12-NOV-20
Anthracene			<0.020		ug/L		0.02	12-NOV-20
Benzo(a)anthracene			<0.020		ug/L		0.02	12-NOV-20
Benzo(a)pyrene			<0.010		ug/L		0.01	12-NOV-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	12-NOV-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	12-NOV-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	12-NOV-20
Chrysene			<0.020		ug/L		0.02	12-NOV-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	12-NOV-20
Fluoranthene			<0.020		ug/L		0.02	12-NOV-20
Fluorene			<0.020		ug/L		0.02	12-NOV-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	12-NOV-20
Naphthalene			<0.050		ug/L		0.05	12-NOV-20
Phenanthrene			<0.020		ug/L		0.02	12-NOV-20
Pyrene			<0.020		ug/L		0.02	12-NOV-20
Surrogate: d8-Naphthalene			104.5		%		60-140	12-NOV-20
Surrogate: d10-Phenanthrene			103.6		%		60-140	12-NOV-20
Surrogate: d12-Chrysene			90.8		%		60-140	12-NOV-20
Surrogate: d10-Acenaphthene			103.8		%		60-140	12-NOV-20

PCB-511-WT **Water**



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5282775							
WG3440256-2	LCS							
Aroclor 1242			106.0		%		60-140	09-NOV-20
Aroclor 1248			92.7		%		60-140	09-NOV-20
Aroclor 1254			120.2		%		60-140	09-NOV-20
Aroclor 1260			115.4		%		60-140	09-NOV-20
WG3440256-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	09-NOV-20
Aroclor 1248			<0.020		ug/L		0.02	09-NOV-20
Aroclor 1254			<0.020		ug/L		0.02	09-NOV-20
Aroclor 1260			<0.020		ug/L		0.02	09-NOV-20
Surrogate: Decachlorobiphenyl			132.6		%		50-150	09-NOV-20
Surrogate: Tetrachloro-m-xylene			86.8		%		50-150	09-NOV-20
VOC-511-HS-WT		Water						
Batch	R5283972							
WG3439321-4	DUP	WG3439321-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	12-NOV-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	12-NOV-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	12-NOV-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	12-NOV-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	12-NOV-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5283972							
WG3439321-4	DUP	WG3439321-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	12-NOV-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	12-NOV-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	12-NOV-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	12-NOV-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	12-NOV-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	12-NOV-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	12-NOV-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	12-NOV-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	12-NOV-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	12-NOV-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	12-NOV-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	12-NOV-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-NOV-20
WG3439321-1	LCS							
1,1,1,2-Tetrachloroethane			92.5		%		70-130	12-NOV-20
1,1,2,2-Tetrachloroethane			105.6		%		70-130	12-NOV-20
1,1,1-Trichloroethane			103.2		%		70-130	12-NOV-20
1,1,2-Trichloroethane			100.8		%		70-130	12-NOV-20
1,1-Dichloroethane			107.5		%		70-130	12-NOV-20
1,1-Dichloroethylene			103.3		%		70-130	12-NOV-20
1,2-Dibromoethane			102.1		%		70-130	12-NOV-20
1,2-Dichlorobenzene			101.1		%		70-130	12-NOV-20
1,2-Dichloroethane			111.9		%		70-130	12-NOV-20
1,2-Dichloropropane			109.9		%		70-130	12-NOV-20
1,3-Dichlorobenzene			104.7		%		70-130	12-NOV-20



Quality Control Report

Workorder: L2526411

Report Date: 12-NOV-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5283972							
WG3439321-1	LCS							
1,4-Dichlorobenzene			106.5		%		70-130	12-NOV-20
Acetone			116.6		%		60-140	12-NOV-20
Benzene			108.0		%		70-130	12-NOV-20
Bromodichloromethane			116.7		%		70-130	12-NOV-20
Bromoform			100.7		%		70-130	12-NOV-20
Bromomethane			133.8		%		60-140	12-NOV-20
Carbon tetrachloride			102.5		%		70-130	12-NOV-20
Chlorobenzene			98.9		%		70-130	12-NOV-20
Chloroform			105.1		%		70-130	12-NOV-20
cis-1,2-Dichloroethylene			106.0		%		70-130	12-NOV-20
cis-1,3-Dichloropropene			103.7		%		70-130	12-NOV-20
Dibromochloromethane			98.5		%		70-130	12-NOV-20
Dichlorodifluoromethane			120.9		%		50-140	12-NOV-20
Ethylbenzene			100.0		%		70-130	12-NOV-20
n-Hexane			105.7		%		70-130	12-NOV-20
m+p-Xylenes			100.3		%		70-130	12-NOV-20
Methyl Ethyl Ketone			112.5		%		60-140	12-NOV-20
Methyl Isobutyl Ketone			114.5		%		60-140	12-NOV-20
Methylene Chloride			113.7		%		70-130	12-NOV-20
MTBE			104.7		%		70-130	12-NOV-20
o-Xylene			105.8		%		70-130	12-NOV-20
Styrene			96.6		%		70-130	12-NOV-20
Tetrachloroethylene			106.2		%		70-130	12-NOV-20
Toluene			101.4		%		70-130	12-NOV-20
trans-1,2-Dichloroethylene			105.9		%		70-130	12-NOV-20
trans-1,3-Dichloropropene			101.5		%		70-130	12-NOV-20
Trichloroethylene			104.3		%		70-130	12-NOV-20
Trichlorofluoromethane			102.4		%		60-140	12-NOV-20
Vinyl chloride			120.2		%		60-140	12-NOV-20
WG3439321-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	12-NOV-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	12-NOV-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	12-NOV-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	12-NOV-20



Quality Control Report

Workorder: L2526411

Report Date: 12-NOV-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5283972							
WG3439321-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	12-NOV-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	12-NOV-20
1,2-Dibromoethane			<0.20		ug/L		0.2	12-NOV-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	12-NOV-20
1,2-Dichloroethane			<0.50		ug/L		0.5	12-NOV-20
1,2-Dichloropropane			<0.50		ug/L		0.5	12-NOV-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	12-NOV-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	12-NOV-20
Acetone			<30		ug/L		30	12-NOV-20
Benzene			<0.50		ug/L		0.5	12-NOV-20
Bromodichloromethane			<2.0		ug/L		2	12-NOV-20
Bromoform			<5.0		ug/L		5	12-NOV-20
Bromomethane			<0.50		ug/L		0.5	12-NOV-20
Carbon tetrachloride			<0.20		ug/L		0.2	12-NOV-20
Chlorobenzene			<0.50		ug/L		0.5	12-NOV-20
Chloroform			<1.0		ug/L		1	12-NOV-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	12-NOV-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	12-NOV-20
Dibromochloromethane			<2.0		ug/L		2	12-NOV-20
Dichlorodifluoromethane			<2.0		ug/L		2	12-NOV-20
Ethylbenzene			<0.50		ug/L		0.5	12-NOV-20
n-Hexane			<0.50		ug/L		0.5	12-NOV-20
m+p-Xylenes			<0.40		ug/L		0.4	12-NOV-20
Methyl Ethyl Ketone			<20		ug/L		20	12-NOV-20
Methyl Isobutyl Ketone			<20		ug/L		20	12-NOV-20
Methylene Chloride			<5.0		ug/L		5	12-NOV-20
MTBE			<2.0		ug/L		2	12-NOV-20
o-Xylene			<0.30		ug/L		0.3	12-NOV-20
Styrene			<0.50		ug/L		0.5	12-NOV-20
Tetrachloroethylene			<0.50		ug/L		0.5	12-NOV-20
Toluene			<0.50		ug/L		0.5	12-NOV-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	12-NOV-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	12-NOV-20



Quality Control Report

Workorder: L2526411

Report Date: 12-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5283972							
WG3439321-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	12-NOV-20
Trichlorofluoromethane			<5.0		ug/L		5	12-NOV-20
Vinyl chloride			<0.50		ug/L		0.5	12-NOV-20
Surrogate: 1,4-Difluorobenzene			99.8		%		70-130	12-NOV-20
Surrogate: 4-Bromofluorobenzene			100.0		%		70-130	12-NOV-20
WG3439321-5 MS		WG3439321-3						
1,1,1,2-Tetrachloroethane			93.4		%		50-140	12-NOV-20
1,1,2,2-Tetrachloroethane			98.1		%		50-140	12-NOV-20
1,1,1-Trichloroethane			106.5		%		50-140	12-NOV-20
1,1,2-Trichloroethane			102.4		%		50-140	12-NOV-20
1,1-Dichloroethane			119.1		%		50-140	12-NOV-20
1,1-Dichloroethylene			103.8		%		50-140	12-NOV-20
1,2-Dibromoethane			103.7		%		50-140	12-NOV-20
1,2-Dichlorobenzene			100.9		%		50-140	12-NOV-20
1,2-Dichloroethane			112.0		%		50-140	12-NOV-20
1,2-Dichloropropane			110.1		%		50-140	12-NOV-20
1,3-Dichlorobenzene			105.2		%		50-140	12-NOV-20
1,4-Dichlorobenzene			105.8		%		50-140	12-NOV-20
Acetone			126.6		%		50-140	12-NOV-20
Benzene			110.6		%		50-140	12-NOV-20
Bromodichloromethane			117.7		%		50-140	12-NOV-20
Bromoform			97.3		%		50-140	12-NOV-20
Bromomethane			131.0		%		50-140	12-NOV-20
Carbon tetrachloride			105.9		%		50-140	12-NOV-20
Chlorobenzene			98.9		%		50-140	12-NOV-20
Chloroform			109.1		%		50-140	12-NOV-20
cis-1,2-Dichloroethylene			108.3		%		50-140	12-NOV-20
cis-1,3-Dichloropropene			97.4		%		50-140	12-NOV-20
Dibromochloromethane			99.0		%		50-140	12-NOV-20
Dichlorodifluoromethane			114.9		%		50-140	12-NOV-20
Ethylbenzene			100.1		%		50-140	12-NOV-20
n-Hexane			103.9		%		50-140	12-NOV-20
m+p-Xylenes			99.3		%		50-140	12-NOV-20
Methyl Ethyl Ketone			115.0		%		50-140	12-NOV-20



Quality Control Report

Workorder: L2526411

Report Date: 12-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5283972							
WG3439321-5 MS		WG3439321-3						
Methyl Isobutyl Ketone			107.4		%		50-140	12-NOV-20
Methylene Chloride			117.0		%		50-140	12-NOV-20
MTBE			104.2		%		50-140	12-NOV-20
o-Xylene			105.3		%		50-140	12-NOV-20
Styrene			94.0		%		50-140	12-NOV-20
Tetrachloroethylene			105.9		%		50-140	12-NOV-20
Toluene			105.1		%		50-140	12-NOV-20
trans-1,2-Dichloroethylene			104.8		%		50-140	12-NOV-20
trans-1,3-Dichloropropene			94.4		%		50-140	12-NOV-20
Trichloroethylene			106.5		%		50-140	12-NOV-20
Trichlorofluoromethane			103.2		%		50-140	12-NOV-20
Vinyl chloride			115.4		%		50-140	12-NOV-20

Quality Control Report

Workorder: L2526411

Report Date: 12-NOV-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

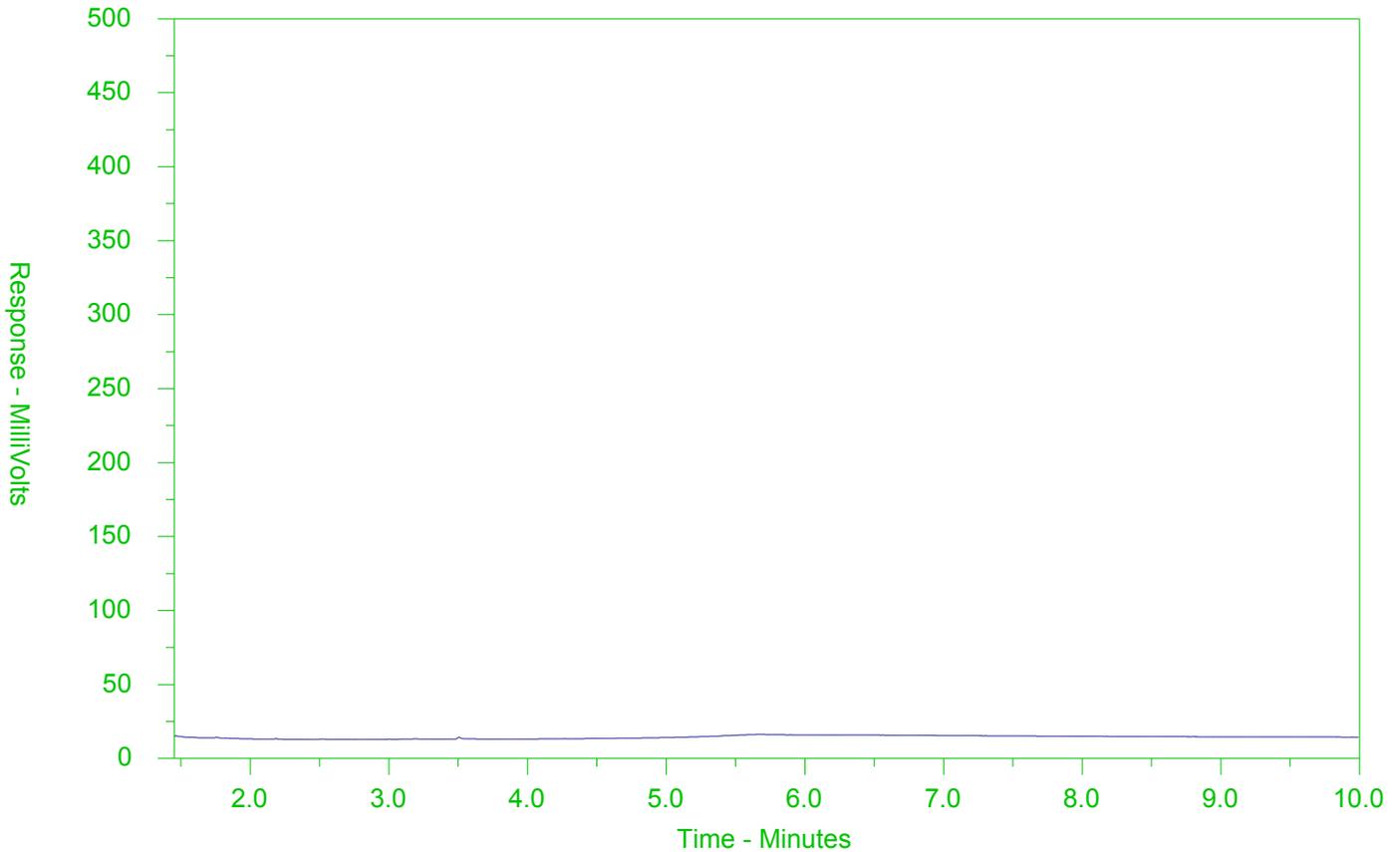
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2526411-1
 Client Sample ID: W-11210029-20201105- 48



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2526411-COFC

DC Number: 17 -

Page of

www.alsglobal.com

Report To Contact and company name below will appear on the final report		Report Format / Dis		.act your AM to confirm all E&P TATs (surcharges may apply)																																																																			
Company:	GHD LIMITED - ACCT #13791	Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL)		Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																																																																			
Contact:	Laura Ermeta	Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		4 day [P4-20%] <input type="checkbox"/>																																																																			
Phone:	519-884-0510	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked		3 day [P3-25%] <input type="checkbox"/>																																																																			
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		2 day [P2-50%] <input type="checkbox"/>																																																																			
Street:	455 Phillip St	Email 1 or Fax laura.ermeta@ghd.com		EMERGENCY 1 Business day [E - 100%] <input type="checkbox"/>																																																																			
City/Province:	Waterloo, Ontario	Email 2 See PO		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/>																																																																			
Postal Code:	N2L 3X2	Email 3		Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm																																																																			
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Invoice Distribution		For tests that can not be performed according to the service level selected, you will be contacted.																																																																			
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		Analysis Request																																																																			
Company:	GHD Limited	Email 1 or Fax apinvoices-735@ghd.com		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																																																			
Contact:	SEE SSOW	Email 2		<table border="1"> <tr> <td rowspan="7" style="writing-mode: vertical-rl; transform: rotate(180deg);">NUMBER OF CONTAINERS</td> <td>Total Metals (MET-T-CCMS-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td rowspan="7" style="writing-mode: vertical-rl; transform: rotate(180deg);">SAMPLES ON HOLD</td> <td rowspan="7" style="writing-mode: vertical-rl; transform: rotate(180deg);">SUSPECTED HAZARD (see Special Instructions)</td> </tr> <tr> <td>Total Mercury (HG-T-CVAA-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total Cr6 (CR-CR6-C-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total Phosphorus (P-T-COL-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PCBs (PCB-511-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>VOCs and PHCs (VOC.F1-F4-511-P-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>SVOCs (SVOC-511-GP-WT)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		NUMBER OF CONTAINERS	Total Metals (MET-T-CCMS-WT)									SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)	Total Mercury (HG-T-CVAA-WT)									Total Cr6 (CR-CR6-C-WT)									Total Phosphorus (P-T-COL-WT)									PCBs (PCB-511-WT)									VOCs and PHCs (VOC.F1-F4-511-P-WT)									SVOCs (SVOC-511-GP-WT)								
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	SVOCs (SVOC-511-GP-WT)																																																																						
Project Information		Oil and Gas Required Fields (client use)																																																																					
ALS Account # / Quote #:	13791	AFE/Cost Center:	PO#																																																																				
Job #:	11210029	Major/Minor Code:	Routing Code:																																																																				
PO / AFE:	73520086	Requisitioner:																																																																					
LSD:		Location:																																																																					
ALS Lab Work Order # (lab use only): <u>L2526411</u>		ALS Contact:	Rick H	Sampler:	<u>Eric</u>																																																																		
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type																																																																			
	W-11210029- <u>20001105-48</u>	<u>05/11/20</u>	<u>1000AM</u>	Water																																																																			
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		SAMPLE CONDITION AS RECEIVED (lab use only)																																																																			
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																																																																			
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																																																																			
				Cooling Initiated <input type="checkbox"/>																																																																			
				INITIAL COOLER TEMPERATURES °C																																																																			
				FINAL COOLER TEMPERATURES °C																																																																			
				8.5																																																																			
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)																																																																			
Released by:	Date: <u>Nov 5/20</u>	Time: <u>1100AM</u>	Received by:	Date: <u>Nov 5</u>	Time: <u>2:30pm</u>																																																																		



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 12-NOV-20
Report Date: 19-NOV-20 10:18 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2528910

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

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Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2528910-1 W-11210029-20201112-50 Sampled By: ERIC on 12-NOV-20 @ 11:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0057		0.0030	mg/L	13-NOV-20	16-NOV-20	R5285998
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	13-NOV-20	16-NOV-20	R5285205
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Arsenic (As)-Total	0.00656		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Barium (Ba)-Total	0.0571		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	13-NOV-20	16-NOV-20	R5285205
Boron (B)-Total	<0.010		0.010	mg/L	13-NOV-20	16-NOV-20	R5285205
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	13-NOV-20	16-NOV-20	R5285205
Calcium (Ca)-Total	73.0		0.050	mg/L	13-NOV-20	16-NOV-20	R5285205
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	13-NOV-20	16-NOV-20	R5285205
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	13-NOV-20	16-NOV-20	R5285205
Cobalt (Co)-Total	0.00011		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Copper (Cu)-Total	<0.00050		0.00050	mg/L	13-NOV-20	16-NOV-20	R5285205
Iron (Fe)-Total	0.620		0.010	mg/L	13-NOV-20	16-NOV-20	R5285205
Lead (Pb)-Total	0.000103		0.000050	mg/L	13-NOV-20	16-NOV-20	R5285205
Lithium (Li)-Total	0.0033		0.0010	mg/L	13-NOV-20	16-NOV-20	R5285205
Magnesium (Mg)-Total	34.0		0.0050	mg/L	13-NOV-20	16-NOV-20	R5285205
Manganese (Mn)-Total	0.0114		0.00050	mg/L	13-NOV-20	16-NOV-20	R5285205
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		13-NOV-20	R5285133
Molybdenum (Mo)-Total	0.000599		0.000050	mg/L	13-NOV-20	16-NOV-20	R5285205
Nickel (Ni)-Total	0.00089		0.00050	mg/L	13-NOV-20	16-NOV-20	R5285205
Phosphorus (P)-Total	<0.050		0.050	mg/L	13-NOV-20	16-NOV-20	R5285205
Potassium (K)-Total	1.04		0.050	mg/L	13-NOV-20	16-NOV-20	R5285205
Rubidium (Rb)-Total	0.00023		0.00020	mg/L	13-NOV-20	16-NOV-20	R5285205
Selenium (Se)-Total	<0.000050		0.000050	mg/L	13-NOV-20	16-NOV-20	R5285205
Silicon (Si)-Total	9.29		0.10	mg/L	13-NOV-20	16-NOV-20	R5285205
Silver (Ag)-Total	<0.000050		0.000050	mg/L	13-NOV-20	16-NOV-20	R5285205
Sodium (Na)-Total	8.03		0.050	mg/L	13-NOV-20	16-NOV-20	R5285205
Strontium (Sr)-Total	0.160		0.0010	mg/L	13-NOV-20	16-NOV-20	R5285205
Sulfur (S)-Total	19.9		0.50	mg/L	13-NOV-20	16-NOV-20	R5285205
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	13-NOV-20	16-NOV-20	R5285205
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	13-NOV-20	16-NOV-20	R5285205
Thorium (Th)-Total	<0.00010		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Tin (Sn)-Total	<0.00010		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	13-NOV-20	16-NOV-20	R5285205
Tungsten (W)-Total	<0.00010		0.00010	mg/L	13-NOV-20	16-NOV-20	R5285205
Uranium (U)-Total	0.000264		0.000010	mg/L	13-NOV-20	16-NOV-20	R5285205
Vanadium (V)-Total	<0.00050		0.00050	mg/L	13-NOV-20	16-NOV-20	R5285205
Zinc (Zn)-Total	0.0393		0.0030	mg/L	13-NOV-20	16-NOV-20	R5285205

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2528910-1 W-11210029-20201112-50 Sampled By: ERIC on 12-NOV-20 @ 11:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	13-NOV-20	16-NOV-20	R5285205
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		13-NOV-20	R5286043
Volatile Organic Compounds							
Acetone	<30		30	ug/L		18-NOV-20	R5287809
Benzene	<0.50		0.50	ug/L		18-NOV-20	R5287809
Bromodichloromethane	<2.0		2.0	ug/L		18-NOV-20	R5287809
Bromoform	<5.0		5.0	ug/L		18-NOV-20	R5287809
Bromomethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
Carbon tetrachloride	<0.20		0.20	ug/L		18-NOV-20	R5287809
Chlorobenzene	<0.50		0.50	ug/L		18-NOV-20	R5287809
Dibromochloromethane	<2.0		2.0	ug/L		18-NOV-20	R5287809
Chloroform	<1.0		1.0	ug/L		18-NOV-20	R5287809
1,2-Dibromoethane	<0.20		0.20	ug/L		18-NOV-20	R5287809
1,2-Dichlorobenzene	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,3-Dichlorobenzene	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,4-Dichlorobenzene	<0.50		0.50	ug/L		18-NOV-20	R5287809
Dichlorodifluoromethane	<2.0		2.0	ug/L		18-NOV-20	R5287809
1,1-Dichloroethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,2-Dichloroethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,1-Dichloroethylene	<0.50		0.50	ug/L		18-NOV-20	R5287809
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		18-NOV-20	R5287809
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		18-NOV-20	R5287809
Methylene Chloride	<5.0		5.0	ug/L		18-NOV-20	R5287809
1,2-Dichloropropane	<0.50		0.50	ug/L		18-NOV-20	R5287809
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		18-NOV-20	R5287809
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		18-NOV-20	R5287809
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		18-NOV-20	R5287809
Ethylbenzene	<0.50		0.50	ug/L		18-NOV-20	R5287809
n-Hexane	<0.50		0.50	ug/L		18-NOV-20	R5287809
Methyl Ethyl Ketone	<20		20	ug/L		18-NOV-20	R5287809
Methyl Isobutyl Ketone	<20		20	ug/L		18-NOV-20	R5287809
MTBE	<2.0		2.0	ug/L		18-NOV-20	R5287809
Styrene	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
Tetrachloroethylene	<0.50		0.50	ug/L		18-NOV-20	R5287809
Toluene	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,1,1-Trichloroethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
1,1,2-Trichloroethane	<0.50		0.50	ug/L		18-NOV-20	R5287809
Trichloroethylene	<0.50		0.50	ug/L		18-NOV-20	R5287809

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2528910-1 W-11210029-20201112-50							
Sampled By: ERIC on 12-NOV-20 @ 11:00							
Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		18-NOV-20	R5287809
Vinyl chloride	<0.50		0.50	ug/L		18-NOV-20	R5287809
o-Xylene	<0.30		0.30	ug/L		18-NOV-20	R5287809
m+p-Xylenes	<0.40		0.40	ug/L		18-NOV-20	R5287809
Xylenes (Total)	<0.50		0.50	ug/L		18-NOV-20	
Surrogate: 4-Bromofluorobenzene	85.5		70-130	%		18-NOV-20	R5287809
Surrogate: 1,4-Difluorobenzene	100.4		70-130	%		18-NOV-20	R5287809
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		18-NOV-20	R5287809
F1-BTEX	<25		25	ug/L		18-NOV-20	
F2 (C10-C16)	<100		100	ug/L	13-NOV-20	16-NOV-20	R5286366
F2-Naphth	<100		100	ug/L		18-NOV-20	
F3 (C16-C34)	<250		250	ug/L	13-NOV-20	16-NOV-20	R5286366
F3-PAH	<250		250	ug/L		18-NOV-20	
F4 (C34-C50)	<250		250	ug/L	13-NOV-20	16-NOV-20	R5286366
Total Hydrocarbons (C6-C50)	<370		370	ug/L		18-NOV-20	
Chrom. to baseline at nC50	YES				13-NOV-20	16-NOV-20	R5286366
Surrogate: 2-Bromobenzotrifluoride	85.1		60-140	%	13-NOV-20	16-NOV-20	R5286366
Surrogate: 3,4-Dichlorotoluene	103.4		60-140	%		18-NOV-20	R5287809
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Acenaphthylene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Anthracene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Benzo(a)anthracene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Benzo(a)pyrene	<0.010		0.010	ug/L	13-NOV-20	18-NOV-20	R5287457
Benzo(b)fluoranthene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Benzo(k)fluoranthene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Chrysene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Fluoranthene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Fluorene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		18-NOV-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
2-Methylnaphthalene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Naphthalene	<0.050		0.050	ug/L	13-NOV-20	18-NOV-20	R5287457
Phenanthrene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Pyrene	<0.020		0.020	ug/L	13-NOV-20	18-NOV-20	R5287457
Surrogate: d10-Acenaphthene	90.0		60-140	%	13-NOV-20	18-NOV-20	R5287457
Surrogate: d12-Chrysene	110.6		60-140	%	13-NOV-20	18-NOV-20	R5287457

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2528910-1 W-11210029-20201112-50 Sampled By: ERIC on 12-NOV-20 @ 11:00 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	95.7		60-140	%	13-NOV-20	18-NOV-20	R5287457
Surrogate: d10-Phenanthrene	92.8		60-140	%	13-NOV-20	18-NOV-20	R5287457
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
4-Chloroaniline	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
2-Chlorophenol	<0.30		0.30	ug/L	16-NOV-20	17-NOV-20	R5286558
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4-Dichlorophenol	<0.30		0.30	ug/L	16-NOV-20	17-NOV-20	R5286558
Diethylphthalate	<0.20		0.20	ug/L	16-NOV-20	17-NOV-20	R5286558
Dimethylphthalate	<0.20		0.20	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4-Dimethylphenol	<0.50		0.50	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4-Dinitrophenol	<1.0		1.0	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4-Dinitrotoluene	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
2,6-Dinitrotoluene	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	16-NOV-20	17-NOV-20	R5286558
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	16-NOV-20	17-NOV-20	R5286558
Pentachlorophenol	<0.50		0.50	ug/L	16-NOV-20	17-NOV-20	R5286558
Phenol	<0.50		0.50	ug/L	16-NOV-20	17-NOV-20	R5286558
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	16-NOV-20	17-NOV-20	R5286558
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	16-NOV-20	17-NOV-20	R5286558
Surrogate: 2-Fluorobiphenyl	88.2		50-140	%	16-NOV-20	17-NOV-20	R5286558
Surrogate: Nitrobenzene d5	97.8		50-140	%	16-NOV-20	17-NOV-20	R5286558
Surrogate: p-Terphenyl d14	98.7		60-140	%	16-NOV-20	17-NOV-20	R5286558
Surrogate: 2,4,6-Tribromophenol	111.2		50-140	%	16-NOV-20	17-NOV-20	R5286558
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	17-NOV-20	17-NOV-20	R5287018
Aroclor 1248	<0.020		0.020	ug/L	17-NOV-20	17-NOV-20	R5287018
Aroclor 1254	<0.020		0.020	ug/L	17-NOV-20	17-NOV-20	R5287018
Aroclor 1260	<0.020		0.020	ug/L	17-NOV-20	17-NOV-20	R5287018
Surrogate: Decachlorobiphenyl	146.5		50-150	%	17-NOV-20	17-NOV-20	R5287018
Total PCBs	<0.040		0.040	ug/L	17-NOV-20	17-NOV-20	R5287018
Surrogate: Tetrachloro-m-xylene	85.7		50-150	%	17-NOV-20	17-NOV-20	R5287018

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Total	MS-B	L2528910-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2528910-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2528910-1
Matrix Spike	Potassium (K)-Total	MS-B	L2528910-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2528910-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2528910-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2528910-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2528910-1
Laboratory Control Sample	1,2,4-Trichlorobenzene	RRQC	L2528910-1

Comments: RRQC: Recoveries are outside ALS control limits. Detection limits in associated samples have been raised accordingly if affected by the low analyte recovery.

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRQC	Refer to report remarks for information regarding this QC result.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)

Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
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This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG

Reference Information

must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Reference Information

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
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625-511-WT Water

Batch R5286558

WG3444233-2 LCS

1,2,4-Trichlorobenzene			40.1	RRQC	%		50-140	17-NOV-20
2-Chlorophenol			65.9		%		50-140	17-NOV-20
2,4-Dichlorophenol			76.6		%		50-140	17-NOV-20
2,4-Dimethylphenol			71.4		%		30-130	17-NOV-20
2,4-Dinitrophenol			86.9		%		50-140	17-NOV-20
2,4-Dinitrotoluene			89.5		%		50-140	17-NOV-20
2,4,5-Trichlorophenol			81.2		%		50-140	17-NOV-20
2,4,6-Trichlorophenol			79.0		%		50-140	17-NOV-20
2,6-Dinitrotoluene			82.1		%		50-140	17-NOV-20
3,3'-Dichlorobenzidine			68.0		%		30-130	17-NOV-20
4-Chloroaniline			73.9		%		30-130	17-NOV-20
Biphenyl			62.7		%		50-140	17-NOV-20
Bis(2-chloroethyl)ether			72.5		%		50-140	17-NOV-20
Bis(2-chloroisopropyl)ether			66.3		%		50-140	17-NOV-20
Bis(2-ethylhexyl)phthalate			91.9		%		50-140	17-NOV-20
Diethylphthalate			76.0		%		50-140	17-NOV-20
Dimethylphthalate			74.9		%		50-140	17-NOV-20
Pentachlorophenol			104.7		%		50-140	17-NOV-20
Phenol			103.7		%		30-130	17-NOV-20

COMMENTS: RRQC: Recoveries are outside ALS control limits. Detection limits in associated samples have been raised accordingly if affected by the low analyte recovery.

WG3444233-1 MB

1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	17-NOV-20
2-Chlorophenol			<0.30		ug/L		0.3	17-NOV-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	17-NOV-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	17-NOV-20
2,4-Dinitrophenol			<1.0		ug/L		1	17-NOV-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	17-NOV-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	17-NOV-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	17-NOV-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	17-NOV-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	17-NOV-20
4-Chloroaniline			<0.40		ug/L		0.4	17-NOV-20
Biphenyl			<0.40		ug/L		0.4	17-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT		Water						
Batch	R5286558							
WG3444233-1 MB								
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	17-NOV-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	17-NOV-20
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	17-NOV-20
Diethylphthalate			<0.20		ug/L		0.2	17-NOV-20
Dimethylphthalate			<0.20		ug/L		0.2	17-NOV-20
Pentachlorophenol			<0.50		ug/L		0.5	17-NOV-20
Phenol			<0.50		ug/L		0.5	17-NOV-20
Surrogate: 2-Fluorobiphenyl			82.8		%		50-140	17-NOV-20
Surrogate: 2,4,6-Tribromophenol			78.4		%		50-140	17-NOV-20
Surrogate: Nitrobenzene d5			89.5		%		50-140	17-NOV-20
Surrogate: p-Terphenyl d14			118.0		%		60-140	17-NOV-20
CR-CR6-IC-WT		Water						
Batch	R5286043							
WG3444647-4 DUP		WG3444647-3						
Chromium, Hexavalent		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	13-NOV-20
WG3444647-2 LCS								
Chromium, Hexavalent			99.9		%		80-120	13-NOV-20
WG3444647-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	13-NOV-20
WG3444647-5 MS		WG3444647-3						
Chromium, Hexavalent			97.2		%		70-130	13-NOV-20
F1-HS-511-WT		Water						
Batch	R5287809							
WG3447009-4 DUP		WG3447009-3						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	18-NOV-20
WG3447009-1 LCS								
F1 (C6-C10)			103.5		%		80-120	18-NOV-20
WG3447009-2 MB								
F1 (C6-C10)			<25		ug/L		25	18-NOV-20
Surrogate: 3,4-Dichlorotoluene			126.9		%		60-140	18-NOV-20
WG3447009-5 MS		WG3447009-3						
F1 (C6-C10)			88.2		%		60-140	18-NOV-20
F2-F4-511-WT		Water						



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT								
Water								
Batch R5286366								
WG3444222-2 LCS								
F2 (C10-C16)			105.5		%		70-130	16-NOV-20
F3 (C16-C34)			103.0		%		70-130	16-NOV-20
F4 (C34-C50)			110.5		%		70-130	16-NOV-20
WG3444222-1 MB								
F2 (C10-C16)			<100		ug/L		100	16-NOV-20
F3 (C16-C34)			<250		ug/L		250	16-NOV-20
F4 (C34-C50)			<250		ug/L		250	16-NOV-20
Surrogate: 2-Bromobenzotrifluoride			84.0		%		60-140	16-NOV-20
HG-T-CVAA-WT								
Water								
Batch R5285133								
WG3444277-3 DUP								
Mercury (Hg)-Total		L2527922-5	<0.0000050	RPD-NA	mg/L	N/A	20	13-NOV-20
WG3444277-2 LCS								
Mercury (Hg)-Total			114.0		%		80-120	13-NOV-20
WG3444277-1 MB								
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	13-NOV-20
WG3444277-4 MS								
Mercury (Hg)-Total		L2528322-1	119.1		%		70-130	13-NOV-20
MET-T-CCMS-WT								
Water								
Batch R5285205								
WG3444181-4 DUP								
Aluminum (Al)-Total		WG3444181-3	<0.0050	RPD-NA	mg/L	N/A	20	13-NOV-20
Antimony (Sb)-Total			<0.00010	RPD-NA	mg/L	N/A	20	13-NOV-20
Arsenic (As)-Total			<0.00010	RPD-NA	mg/L	N/A	20	13-NOV-20
Barium (Ba)-Total			0.0138		mg/L	0.0	20	13-NOV-20
Beryllium (Be)-Total			<0.00010	RPD-NA	mg/L	N/A	20	13-NOV-20
Bismuth (Bi)-Total			<0.000050	RPD-NA	mg/L	N/A	20	13-NOV-20
Boron (B)-Total			0.033		mg/L	0.4	20	13-NOV-20
Cadmium (Cd)-Total			0.0000108		mg/L	11	20	13-NOV-20
Calcium (Ca)-Total			88.2		mg/L	0.6	20	13-NOV-20
Chromium (Cr)-Total			0.00070		mg/L	7.5	20	13-NOV-20
Cesium (Cs)-Total			<0.000010	RPD-NA	mg/L	N/A	20	13-NOV-20
Cobalt (Co)-Total			<0.00010	RPD-NA	mg/L	N/A	20	13-NOV-20
Copper (Cu)-Total			<0.00050	RPD-NA	mg/L	N/A	20	13-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5285205							
WG3444181-4	DUP	WG3444181-3						
Iron (Fe)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	13-NOV-20
Lead (Pb)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	13-NOV-20
Lithium (Li)-Total		0.0011	0.0011		mg/L	4.2	20	13-NOV-20
Magnesium (Mg)-Total		16.9	16.7		mg/L	1.7	20	13-NOV-20
Manganese (Mn)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	13-NOV-20
Molybdenum (Mo)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	13-NOV-20
Nickel (Ni)-Total		0.00094	0.00088		mg/L	7.2	20	13-NOV-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	13-NOV-20
Potassium (K)-Total		2.72	2.69		mg/L	1.1	20	13-NOV-20
Rubidium (Rb)-Total		0.00079	0.00077		mg/L	3.0	20	13-NOV-20
Selenium (Se)-Total		0.000230	0.000249		mg/L	8.0	20	13-NOV-20
Silicon (Si)-Total		3.35	3.26		mg/L	2.5	20	13-NOV-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	13-NOV-20
Sodium (Na)-Total		83.8	83.6		mg/L	0.1	20	13-NOV-20
Strontium (Sr)-Total		0.150	0.155		mg/L	3.1	20	13-NOV-20
Sulfur (S)-Total		8.17	7.87		mg/L	3.7	25	13-NOV-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	13-NOV-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	13-NOV-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	13-NOV-20
Tin (Sn)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	13-NOV-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	13-NOV-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	13-NOV-20
Uranium (U)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	13-NOV-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	13-NOV-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	13-NOV-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	13-NOV-20
WG3444181-2	LCS							
Aluminum (Al)-Total			100.6		%		80-120	13-NOV-20
Antimony (Sb)-Total			97.8		%		80-120	13-NOV-20
Arsenic (As)-Total			105.5		%		80-120	13-NOV-20
Barium (Ba)-Total			108.9		%		80-120	13-NOV-20
Beryllium (Be)-Total			90.2		%		80-120	13-NOV-20
Bismuth (Bi)-Total			98.4		%		80-120	13-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5285205							
WG3444181-2	LCS							
Boron (B)-Total			85.0		%		80-120	13-NOV-20
Cadmium (Cd)-Total			104.0		%		80-120	13-NOV-20
Calcium (Ca)-Total			95.0		%		80-120	13-NOV-20
Chromium (Cr)-Total			102.8		%		80-120	13-NOV-20
Cesium (Cs)-Total			101.3		%		80-120	13-NOV-20
Cobalt (Co)-Total			100.7		%		80-120	13-NOV-20
Copper (Cu)-Total			100.4		%		80-120	13-NOV-20
Iron (Fe)-Total			98.0		%		80-120	13-NOV-20
Lead (Pb)-Total			99.2		%		80-120	13-NOV-20
Lithium (Li)-Total			83.7		%		80-120	13-NOV-20
Magnesium (Mg)-Total			100.6		%		80-120	13-NOV-20
Manganese (Mn)-Total			104.3		%		80-120	13-NOV-20
Molybdenum (Mo)-Total			98.0		%		80-120	13-NOV-20
Nickel (Ni)-Total			98.9		%		80-120	13-NOV-20
Phosphorus (P)-Total			110.6		%		70-130	13-NOV-20
Potassium (K)-Total			101.0		%		80-120	13-NOV-20
Rubidium (Rb)-Total			111.0		%		80-120	13-NOV-20
Selenium (Se)-Total			97.6		%		80-120	13-NOV-20
Silicon (Si)-Total			97.6		%		60-140	13-NOV-20
Silver (Ag)-Total			97.9		%		80-120	13-NOV-20
Sodium (Na)-Total			103.6		%		80-120	13-NOV-20
Strontium (Sr)-Total			104.8		%		80-120	13-NOV-20
Sulfur (S)-Total			96.7		%		80-120	13-NOV-20
Thallium (Tl)-Total			101.3		%		80-120	13-NOV-20
Tellurium (Te)-Total			93.2		%		80-120	13-NOV-20
Thorium (Th)-Total			100.7		%		70-130	13-NOV-20
Tin (Sn)-Total			93.5		%		80-120	13-NOV-20
Titanium (Ti)-Total			96.5		%		80-120	13-NOV-20
Tungsten (W)-Total			96.3		%		80-120	13-NOV-20
Uranium (U)-Total			102.0		%		80-120	13-NOV-20
Vanadium (V)-Total			103.2		%		80-120	13-NOV-20
Zinc (Zn)-Total			98.2		%		80-120	13-NOV-20
Zirconium (Zr)-Total			96.3		%		80-120	13-NOV-20

WG3444181-1 MB



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5285205							
WG3444181-1 MB								
Aluminum (Al)-Total			<0.0050		mg/L		0.005	13-NOV-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	13-NOV-20
Boron (B)-Total			<0.010		mg/L		0.01	13-NOV-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	13-NOV-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	13-NOV-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	13-NOV-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	13-NOV-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	13-NOV-20
Iron (Fe)-Total			<0.010		mg/L		0.01	13-NOV-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	13-NOV-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	13-NOV-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	13-NOV-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	13-NOV-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	13-NOV-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	13-NOV-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	13-NOV-20
Potassium (K)-Total			<0.050		mg/L		0.05	13-NOV-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	13-NOV-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	13-NOV-20
Silicon (Si)-Total			<0.10		mg/L		0.1	13-NOV-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	13-NOV-20
Sodium (Na)-Total			<0.050		mg/L		0.05	13-NOV-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	13-NOV-20
Sulfur (S)-Total			<0.50		mg/L		0.5	13-NOV-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	13-NOV-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	13-NOV-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	13-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5285205							
WG3444181-1 MB								
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	13-NOV-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	13-NOV-20
Uranium (U)-Total			<0.000010		mg/L		0.00001	13-NOV-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	13-NOV-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	13-NOV-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	13-NOV-20
WG3444181-5 MS		WG3444181-3						
Aluminum (Al)-Total			106.1		%		70-130	13-NOV-20
Antimony (Sb)-Total			104.1		%		70-130	13-NOV-20
Arsenic (As)-Total			105.4		%		70-130	13-NOV-20
Barium (Ba)-Total			N/A	MS-B	%		-	13-NOV-20
Beryllium (Be)-Total			102.2		%		70-130	13-NOV-20
Bismuth (Bi)-Total			96.3		%		70-130	13-NOV-20
Boron (B)-Total			94.2		%		70-130	13-NOV-20
Cadmium (Cd)-Total			101.5		%		70-130	13-NOV-20
Calcium (Ca)-Total			N/A	MS-B	%		-	13-NOV-20
Chromium (Cr)-Total			102.7		%		70-130	13-NOV-20
Cesium (Cs)-Total			106.5		%		70-130	13-NOV-20
Cobalt (Co)-Total			99.1		%		70-130	13-NOV-20
Copper (Cu)-Total			94.6		%		70-130	13-NOV-20
Iron (Fe)-Total			100.6		%		70-130	13-NOV-20
Lead (Pb)-Total			98.5		%		70-130	13-NOV-20
Lithium (Li)-Total			100.0		%		70-130	13-NOV-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	13-NOV-20
Manganese (Mn)-Total			105.4		%		70-130	13-NOV-20
Molybdenum (Mo)-Total			108.5		%		70-130	13-NOV-20
Nickel (Ni)-Total			96.1		%		70-130	13-NOV-20
Phosphorus (P)-Total			113.7		%		70-130	13-NOV-20
Potassium (K)-Total			N/A	MS-B	%		-	13-NOV-20
Rubidium (Rb)-Total			106.3		%		70-130	13-NOV-20
Selenium (Se)-Total			97.8		%		70-130	13-NOV-20
Silicon (Si)-Total			N/A	MS-B	%		-	13-NOV-20
Silver (Ag)-Total			96.4		%		70-130	13-NOV-20
Sodium (Na)-Total			N/A	MS-B	%		-	13-NOV-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5285205							
WG3444181-5 MS		WG3444181-3						
Strontium (Sr)-Total			N/A	MS-B	%		-	13-NOV-20
Sulfur (S)-Total			N/A	MS-B	%		-	13-NOV-20
Thallium (Tl)-Total			99.99		%		70-130	13-NOV-20
Tellurium (Te)-Total			89.0		%		70-130	13-NOV-20
Thorium (Th)-Total			106.2		%		70-130	13-NOV-20
Tin (Sn)-Total			99.7		%		70-130	13-NOV-20
Titanium (Ti)-Total			105.8		%		70-130	13-NOV-20
Tungsten (W)-Total			100.9		%		70-130	13-NOV-20
Uranium (U)-Total			107.5		%		70-130	13-NOV-20
Vanadium (V)-Total			107.3		%		70-130	13-NOV-20
Zinc (Zn)-Total			91.9		%		70-130	13-NOV-20
Zirconium (Zr)-Total			105.9		%		70-130	13-NOV-20
P-T-COL-WT		Water						
Batch	R5285998							
WG3444246-3 DUP		L2528880-2						
Phosphorus, Total		0.0337	0.0340		mg/L	0.9	20	16-NOV-20
WG3444246-2 LCS								
Phosphorus, Total			93.9		%		80-120	16-NOV-20
WG3444246-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	16-NOV-20
WG3444246-4 MS		L2528880-2						
Phosphorus, Total			105.5		%		70-130	16-NOV-20
PAH-511-WT		Water						
Batch	R5287457							
WG3444222-2 LCS								
1-Methylnaphthalene			88.6		%		50-140	18-NOV-20
2-Methylnaphthalene			85.9		%		50-140	18-NOV-20
Acenaphthene			102.0		%		50-140	18-NOV-20
Acenaphthylene			93.2		%		50-140	18-NOV-20
Anthracene			81.5		%		50-140	18-NOV-20
Benzo(a)anthracene			89.1		%		50-140	18-NOV-20
Benzo(a)pyrene			85.1		%		50-140	18-NOV-20
Benzo(b)fluoranthene			78.6		%		50-140	18-NOV-20
Benzo(g,h,i)perylene			90.8		%		50-140	18-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5287457							
WG3444222-2 LCS								
Benzo(k)fluoranthene			88.9		%		50-140	18-NOV-20
Chrysene			101.9		%		50-140	18-NOV-20
Dibenzo(ah)anthracene			93.9		%		50-140	18-NOV-20
Fluoranthene			94.3		%		50-140	18-NOV-20
Fluorene			87.7		%		50-140	18-NOV-20
Indeno(1,2,3-cd)pyrene			98.7		%		50-140	18-NOV-20
Naphthalene			88.3		%		50-140	18-NOV-20
Phenanthrene			91.0		%		50-140	18-NOV-20
Pyrene			92.6		%		50-140	18-NOV-20
WG3444222-1 MB								
1-Methylnaphthalene			<0.020		ug/L		0.02	18-NOV-20
2-Methylnaphthalene			<0.020		ug/L		0.02	18-NOV-20
Acenaphthene			<0.020		ug/L		0.02	18-NOV-20
Acenaphthylene			<0.020		ug/L		0.02	18-NOV-20
Anthracene			<0.020		ug/L		0.02	18-NOV-20
Benzo(a)anthracene			<0.020		ug/L		0.02	18-NOV-20
Benzo(a)pyrene			<0.010		ug/L		0.01	18-NOV-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	18-NOV-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	18-NOV-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	18-NOV-20
Chrysene			<0.020		ug/L		0.02	18-NOV-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	18-NOV-20
Fluoranthene			<0.020		ug/L		0.02	18-NOV-20
Fluorene			<0.020		ug/L		0.02	18-NOV-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	18-NOV-20
Naphthalene			<0.050		ug/L		0.05	18-NOV-20
Phenanthrene			<0.020		ug/L		0.02	18-NOV-20
Pyrene			<0.020		ug/L		0.02	18-NOV-20
Surrogate: d8-Naphthalene			106.5		%		60-140	18-NOV-20
Surrogate: d10-Phenanthrene			100.5		%		60-140	18-NOV-20
Surrogate: d12-Chrysene			121.3		%		60-140	18-NOV-20
Surrogate: d10-Acenaphthene			100.5		%		60-140	18-NOV-20

PCB-511-WT **Water**



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5287018							
WG3444212-2	LCS							
Aroclor 1242			95.3		%		60-140	17-NOV-20
Aroclor 1248			86.9		%		60-140	17-NOV-20
Aroclor 1254			81.9		%		60-140	17-NOV-20
Aroclor 1260			70.4		%		60-140	17-NOV-20
WG3444212-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	17-NOV-20
Aroclor 1248			<0.020		ug/L		0.02	17-NOV-20
Aroclor 1254			<0.020		ug/L		0.02	17-NOV-20
Aroclor 1260			<0.020		ug/L		0.02	17-NOV-20
Surrogate: Decachlorobiphenyl			115.5		%		50-150	17-NOV-20
Surrogate: Tetrachloro-m-xylene			82.1		%		50-150	17-NOV-20
VOC-511-HS-WT		Water						
Batch	R5287809							
WG3447009-4	DUP	WG3447009-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	18-NOV-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	18-NOV-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	18-NOV-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	18-NOV-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	18-NOV-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5287809							
WG3447009-4	DUP	WG3447009-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	18-NOV-20
cis-1,2-Dichloroethylene		1.48	1.40		ug/L	5.6	30	18-NOV-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	18-NOV-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	18-NOV-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	18-NOV-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	18-NOV-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	18-NOV-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	18-NOV-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	18-NOV-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	18-NOV-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	18-NOV-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	18-NOV-20
Trichloroethylene		2.66	2.50		ug/L	6.2	30	18-NOV-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	18-NOV-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-NOV-20
WG3447009-1	LCS							
1,1,1,2-Tetrachloroethane			100.6		%		70-130	18-NOV-20
1,1,2,2-Tetrachloroethane			94.7		%		70-130	18-NOV-20
1,1,1-Trichloroethane			100.2		%		70-130	18-NOV-20
1,1,2-Trichloroethane			94.1		%		70-130	18-NOV-20
1,1-Dichloroethane			93.6		%		70-130	18-NOV-20
1,1-Dichloroethylene			101.2		%		70-130	18-NOV-20
1,2-Dibromoethane			93.4		%		70-130	18-NOV-20
1,2-Dichlorobenzene			100.4		%		70-130	18-NOV-20
1,2-Dichloroethane			93.5		%		70-130	18-NOV-20
1,2-Dichloropropane			92.4		%		70-130	18-NOV-20
1,3-Dichlorobenzene			100.4		%		70-130	18-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5287809							
WG3447009-1	LCS							
1,4-Dichlorobenzene			99.98		%		70-130	18-NOV-20
Acetone			97.5		%		60-140	18-NOV-20
Benzene			96.2		%		70-130	18-NOV-20
Bromodichloromethane			102.7		%		70-130	18-NOV-20
Bromoform			104.0		%		70-130	18-NOV-20
Bromomethane			95.9		%		60-140	18-NOV-20
Carbon tetrachloride			105.4		%		70-130	18-NOV-20
Chlorobenzene			91.0		%		70-130	18-NOV-20
Chloroform			101.6		%		70-130	18-NOV-20
cis-1,2-Dichloroethylene			102.0		%		70-130	18-NOV-20
cis-1,3-Dichloropropene			95.4		%		70-130	18-NOV-20
Dibromochloromethane			95.6		%		70-130	18-NOV-20
Dichlorodifluoromethane			99.6		%		50-140	18-NOV-20
Ethylbenzene			94.8		%		70-130	18-NOV-20
n-Hexane			92.4		%		70-130	18-NOV-20
m+p-Xylenes			91.5		%		70-130	18-NOV-20
Methyl Ethyl Ketone			99.2		%		60-140	18-NOV-20
Methyl Isobutyl Ketone			87.2		%		60-140	18-NOV-20
Methylene Chloride			100.2		%		70-130	18-NOV-20
MTBE			99.97		%		70-130	18-NOV-20
o-Xylene			96.4		%		70-130	18-NOV-20
Styrene			95.8		%		70-130	18-NOV-20
Tetrachloroethylene			99.4		%		70-130	18-NOV-20
Toluene			90.9		%		70-130	18-NOV-20
trans-1,2-Dichloroethylene			100.1		%		70-130	18-NOV-20
trans-1,3-Dichloropropene			97.1		%		70-130	18-NOV-20
Trichloroethylene			95.3		%		70-130	18-NOV-20
Trichlorofluoromethane			98.7		%		60-140	18-NOV-20
Vinyl chloride			99.8		%		60-140	18-NOV-20
WG3447009-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	18-NOV-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	18-NOV-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	18-NOV-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	18-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5287809							
WG3447009-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	18-NOV-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	18-NOV-20
1,2-Dibromoethane			<0.20		ug/L		0.2	18-NOV-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	18-NOV-20
1,2-Dichloroethane			<0.50		ug/L		0.5	18-NOV-20
1,2-Dichloropropane			<0.50		ug/L		0.5	18-NOV-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	18-NOV-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	18-NOV-20
Acetone			<30		ug/L		30	18-NOV-20
Benzene			<0.50		ug/L		0.5	18-NOV-20
Bromodichloromethane			<2.0		ug/L		2	18-NOV-20
Bromoform			<5.0		ug/L		5	18-NOV-20
Bromomethane			<0.50		ug/L		0.5	18-NOV-20
Carbon tetrachloride			<0.20		ug/L		0.2	18-NOV-20
Chlorobenzene			<0.50		ug/L		0.5	18-NOV-20
Chloroform			<1.0		ug/L		1	18-NOV-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	18-NOV-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	18-NOV-20
Dibromochloromethane			<2.0		ug/L		2	18-NOV-20
Dichlorodifluoromethane			<2.0		ug/L		2	18-NOV-20
Ethylbenzene			<0.50		ug/L		0.5	18-NOV-20
n-Hexane			<0.50		ug/L		0.5	18-NOV-20
m+p-Xylenes			<0.40		ug/L		0.4	18-NOV-20
Methyl Ethyl Ketone			<20		ug/L		20	18-NOV-20
Methyl Isobutyl Ketone			<20		ug/L		20	18-NOV-20
Methylene Chloride			<5.0		ug/L		5	18-NOV-20
MTBE			<2.0		ug/L		2	18-NOV-20
o-Xylene			<0.30		ug/L		0.3	18-NOV-20
Styrene			<0.50		ug/L		0.5	18-NOV-20
Tetrachloroethylene			<0.50		ug/L		0.5	18-NOV-20
Toluene			<0.50		ug/L		0.5	18-NOV-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	18-NOV-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	18-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5287809							
WG3447009-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	18-NOV-20
Trichlorofluoromethane			<5.0		ug/L		5	18-NOV-20
Vinyl chloride			<0.50		ug/L		0.5	18-NOV-20
Surrogate: 1,4-Difluorobenzene			101.0		%		70-130	18-NOV-20
Surrogate: 4-Bromofluorobenzene			86.4		%		70-130	18-NOV-20
WG3447009-5 MS		WG3447009-3						
1,1,1,2-Tetrachloroethane			98.6		%		50-140	18-NOV-20
1,1,2,2-Tetrachloroethane			99.2		%		50-140	18-NOV-20
1,1,1-Trichloroethane			98.3		%		50-140	18-NOV-20
1,1,2-Trichloroethane			92.9		%		50-140	18-NOV-20
1,1-Dichloroethane			92.4		%		50-140	18-NOV-20
1,1-Dichloroethylene			98.4		%		50-140	18-NOV-20
1,2-Dibromoethane			92.5		%		50-140	18-NOV-20
1,2-Dichlorobenzene			98.3		%		50-140	18-NOV-20
1,2-Dichloroethane			93.1		%		50-140	18-NOV-20
1,2-Dichloropropane			91.1		%		50-140	18-NOV-20
1,3-Dichlorobenzene			97.7		%		50-140	18-NOV-20
1,4-Dichlorobenzene			97.7		%		50-140	18-NOV-20
Acetone			92.9		%		50-140	18-NOV-20
Benzene			94.8		%		50-140	18-NOV-20
Bromodichloromethane			101.6		%		50-140	18-NOV-20
Bromoform			104.0		%		50-140	18-NOV-20
Bromomethane			92.2		%		50-140	18-NOV-20
Carbon tetrachloride			103.0		%		50-140	18-NOV-20
Chlorobenzene			89.0		%		50-140	18-NOV-20
Chloroform			100.6		%		50-140	18-NOV-20
cis-1,2-Dichloroethylene			100.6		%		50-140	18-NOV-20
cis-1,3-Dichloropropene			93.5		%		50-140	18-NOV-20
Dibromochloromethane			93.6		%		50-140	18-NOV-20
Dichlorodifluoromethane			88.5		%		50-140	18-NOV-20
Ethylbenzene			92.3		%		50-140	18-NOV-20
n-Hexane			89.2		%		50-140	18-NOV-20
m+p-Xylenes			89.2		%		50-140	18-NOV-20
Methyl Ethyl Ketone			87.9		%		50-140	18-NOV-20



Quality Control Report

Workorder: L2528910

Report Date: 19-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5287809							
WG3447009-5 MS		WG3447009-3						
Methyl Isobutyl Ketone			85.4		%		50-140	18-NOV-20
Methylene Chloride			99.2		%		50-140	18-NOV-20
MTBE			98.0		%		50-140	18-NOV-20
o-Xylene			93.8		%		50-140	18-NOV-20
Styrene			92.9		%		50-140	18-NOV-20
Tetrachloroethylene			97.0		%		50-140	18-NOV-20
Toluene			88.9		%		50-140	18-NOV-20
trans-1,2-Dichloroethylene			98.1		%		50-140	18-NOV-20
trans-1,3-Dichloropropene			94.8		%		50-140	18-NOV-20
Trichloroethylene			92.7		%		50-140	18-NOV-20
Trichlorofluoromethane			95.4		%		50-140	18-NOV-20
Vinyl chloride			95.0		%		50-140	18-NOV-20

Quality Control Report

Workorder: L2528910

Report Date: 19-NOV-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
RRQC	Refer to report remarks for information regarding this QC result.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

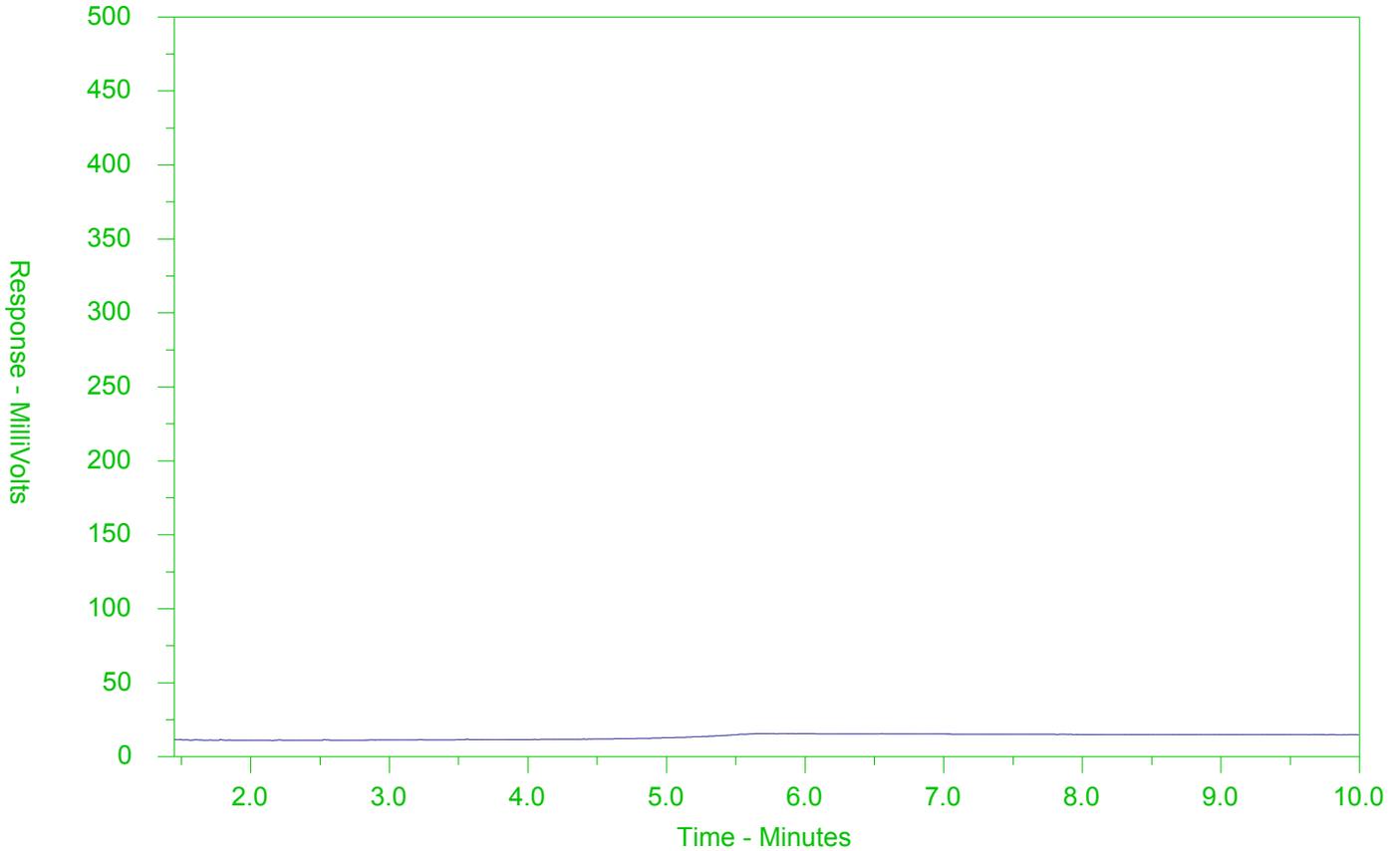
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2528910-1
 Client Sample ID: W-11210029-20201112-50



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 19-NOV-20
Report Date: 25-NOV-20 12:43 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2531509

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:



Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2531509-1 W-11210029-20201119-52 Sampled By: ERIC on 19-NOV-20 @ 09:30 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0294		0.0030	mg/L	20-NOV-20	23-NOV-20	R5294456
Total Metals							
Aluminum (Al)-Total	0.576		0.0050	mg/L	20-NOV-20	20-NOV-20	R5291178
Antimony (Sb)-Total	0.00023		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Arsenic (As)-Total	0.00108		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Barium (Ba)-Total	0.0253		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	20-NOV-20	20-NOV-20	R5291178
Boron (B)-Total	0.019		0.010	mg/L	20-NOV-20	20-NOV-20	R5291178
Cadmium (Cd)-Total	0.0000226		0.0000050	mg/L	20-NOV-20	20-NOV-20	R5291178
Calcium (Ca)-Total	38.6		0.050	mg/L	20-NOV-20	20-NOV-20	R5291178
Cesium (Cs)-Total	0.000060		0.000010	mg/L	20-NOV-20	20-NOV-20	R5291178
Chromium (Cr)-Total	0.00115		0.00050	mg/L	20-NOV-20	20-NOV-20	R5291178
Cobalt (Co)-Total	0.00035		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Copper (Cu)-Total	0.00217		0.00050	mg/L	20-NOV-20	20-NOV-20	R5291178
Iron (Fe)-Total	0.690		0.010	mg/L	20-NOV-20	20-NOV-20	R5291178
Lead (Pb)-Total	0.00182		0.000050	mg/L	20-NOV-20	20-NOV-20	R5291178
Lithium (Li)-Total	<0.0010		0.0010	mg/L	20-NOV-20	20-NOV-20	R5291178
Magnesium (Mg)-Total	8.28		0.0050	mg/L	20-NOV-20	20-NOV-20	R5291178
Manganese (Mn)-Total	0.0324		0.00050	mg/L	20-NOV-20	20-NOV-20	R5291178
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		20-NOV-20	R5291523
Molybdenum (Mo)-Total	0.00298		0.000050	mg/L	20-NOV-20	20-NOV-20	R5291178
Nickel (Ni)-Total	0.00132		0.00050	mg/L	20-NOV-20	20-NOV-20	R5291178
Phosphorus (P)-Total	<0.050		0.050	mg/L	20-NOV-20	20-NOV-20	R5291178
Potassium (K)-Total	2.96		0.050	mg/L	20-NOV-20	20-NOV-20	R5291178
Rubidium (Rb)-Total	0.00118		0.00020	mg/L	20-NOV-20	20-NOV-20	R5291178
Selenium (Se)-Total	0.000121		0.000050	mg/L	20-NOV-20	20-NOV-20	R5291178
Silicon (Si)-Total	1.26		0.10	mg/L	20-NOV-20	20-NOV-20	R5291178
Silver (Ag)-Total	<0.000050		0.000050	mg/L	20-NOV-20	20-NOV-20	R5291178
Sodium (Na)-Total	34.8		0.050	mg/L	20-NOV-20	20-NOV-20	R5291178
Strontium (Sr)-Total	0.111		0.0010	mg/L	20-NOV-20	20-NOV-20	R5291178
Sulfur (S)-Total	7.87		0.50	mg/L	20-NOV-20	20-NOV-20	R5291178
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	20-NOV-20	20-NOV-20	R5291178
Thallium (Tl)-Total	0.000010		0.000010	mg/L	20-NOV-20	20-NOV-20	R5291178
Thorium (Th)-Total	<0.00010		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Tin (Sn)-Total	0.00011		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Titanium (Ti)-Total	0.0175		0.00030	mg/L	20-NOV-20	20-NOV-20	R5291178
Tungsten (W)-Total	<0.00010		0.00010	mg/L	20-NOV-20	20-NOV-20	R5291178
Uranium (U)-Total	0.000653		0.000010	mg/L	20-NOV-20	20-NOV-20	R5291178
Vanadium (V)-Total	0.00156		0.00050	mg/L	20-NOV-20	20-NOV-20	R5291178
Zinc (Zn)-Total	0.0084		0.0030	mg/L	20-NOV-20	20-NOV-20	R5291178

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2531509-1 W-11210029-20201119-52 Sampled By: ERIC on 19-NOV-20 @ 09:30 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	0.00029		0.00020	mg/L	20-NOV-20	20-NOV-20	R5291178
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		20-NOV-20	R5294067
Volatile Organic Compounds							
Acetone	<30		30	ug/L		25-NOV-20	R5297311
Benzene	<0.50		0.50	ug/L		25-NOV-20	R5297311
Bromodichloromethane	<2.0		2.0	ug/L		25-NOV-20	R5297311
Bromoform	<5.0		5.0	ug/L		25-NOV-20	R5297311
Bromomethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
Carbon tetrachloride	<0.20		0.20	ug/L		25-NOV-20	R5297311
Chlorobenzene	<0.50		0.50	ug/L		25-NOV-20	R5297311
Dibromochloromethane	<2.0		2.0	ug/L		25-NOV-20	R5297311
Chloroform	<1.0		1.0	ug/L		25-NOV-20	R5297311
1,2-Dibromoethane	<0.20		0.20	ug/L		25-NOV-20	R5297311
1,2-Dichlorobenzene	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,3-Dichlorobenzene	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,4-Dichlorobenzene	<0.50		0.50	ug/L		25-NOV-20	R5297311
Dichlorodifluoromethane	<2.0		2.0	ug/L		25-NOV-20	R5297311
1,1-Dichloroethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,2-Dichloroethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,1-Dichloroethylene	<0.50		0.50	ug/L		25-NOV-20	R5297311
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		25-NOV-20	R5297311
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		25-NOV-20	R5297311
Methylene Chloride	<5.0		5.0	ug/L		25-NOV-20	R5297311
1,2-Dichloropropane	<0.50		0.50	ug/L		25-NOV-20	R5297311
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		25-NOV-20	R5297311
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		25-NOV-20	R5297311
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		25-NOV-20	
Ethylbenzene	<0.50		0.50	ug/L		25-NOV-20	R5297311
n-Hexane	<0.50		0.50	ug/L		25-NOV-20	R5297311
Methyl Ethyl Ketone	<20		20	ug/L		25-NOV-20	R5297311
Methyl Isobutyl Ketone	<20		20	ug/L		25-NOV-20	R5297311
MTBE	<2.0		2.0	ug/L		25-NOV-20	R5297311
Styrene	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
Tetrachloroethylene	<0.50		0.50	ug/L		25-NOV-20	R5297311
Toluene	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,1,1-Trichloroethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
1,1,2-Trichloroethane	<0.50		0.50	ug/L		25-NOV-20	R5297311
Trichloroethylene	<0.50		0.50	ug/L		25-NOV-20	R5297311

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2531509-1 W-11210029-20201119-52 Sampled By: ERIC on 19-NOV-20 @ 09:30 Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		25-NOV-20	R5297311
Vinyl chloride	<0.50		0.50	ug/L		25-NOV-20	R5297311
o-Xylene	<0.30		0.30	ug/L		25-NOV-20	R5297311
m+p-Xylenes	<0.40		0.40	ug/L		25-NOV-20	R5297311
Xylenes (Total)	<0.50		0.50	ug/L		25-NOV-20	
Surrogate: 4-Bromofluorobenzene	99.0		70-130	%		25-NOV-20	R5297311
Surrogate: 1,4-Difluorobenzene	102.7		70-130	%		25-NOV-20	R5297311
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		25-NOV-20	R5297311
F1-BTEX	<25		25	ug/L		25-NOV-20	
F2 (C10-C16)	<100		100	ug/L	20-NOV-20	23-NOV-20	R5292320
F2-Naphth	<100		100	ug/L		25-NOV-20	
F3 (C16-C34)	<250		250	ug/L	20-NOV-20	23-NOV-20	R5292320
F3-PAH	<250		250	ug/L		25-NOV-20	
F4 (C34-C50)	<250		250	ug/L	20-NOV-20	23-NOV-20	R5292320
Total Hydrocarbons (C6-C50)	<370		370	ug/L		25-NOV-20	
Chrom. to baseline at nC50	YES				20-NOV-20	23-NOV-20	R5292320
Surrogate: 2-Bromobenzotrifluoride	90.2		60-140	%	20-NOV-20	23-NOV-20	R5292320
Surrogate: 3,4-Dichlorotoluene	100.4		60-140	%		25-NOV-20	R5297311
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Acenaphthylene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Anthracene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Benzo(a)anthracene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Benzo(a)pyrene	<0.010		0.010	ug/L	20-NOV-20	24-NOV-20	R5296896
Benzo(b)fluoranthene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Benzo(k)fluoranthene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Chrysene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Fluoranthene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Fluorene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		24-NOV-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
2-Methylnaphthalene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Naphthalene	<0.050		0.050	ug/L	20-NOV-20	24-NOV-20	R5296896
Phenanthrene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Pyrene	<0.020		0.020	ug/L	20-NOV-20	24-NOV-20	R5296896
Surrogate: d10-Acenaphthene	95.4		60-140	%	20-NOV-20	24-NOV-20	R5296896
Surrogate: d12-Chrysene	89.7		60-140	%	20-NOV-20	24-NOV-20	R5296896

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2531509-1 W-11210029-20201119-52 Sampled By: ERIC on 19-NOV-20 @ 09:30 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	101.2		60-140	%	20-NOV-20	24-NOV-20	R5296896
Surrogate: d10-Phenanthrene	98.8		60-140	%	20-NOV-20	24-NOV-20	R5296896
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
4-Chloroaniline	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
2-Chlorophenol	<0.30		0.30	ug/L	20-NOV-20	23-NOV-20	R5295017
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4-Dichlorophenol	<0.30		0.30	ug/L	20-NOV-20	23-NOV-20	R5295017
Diethylphthalate	<0.20		0.20	ug/L	20-NOV-20	23-NOV-20	R5295017
Dimethylphthalate	<0.20		0.20	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4-Dimethylphenol	<0.50		0.50	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4-Dinitrophenol	<1.0		1.0	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4-Dinitrotoluene	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
2,6-Dinitrotoluene	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L		23-NOV-20	
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	20-NOV-20	23-NOV-20	R5295017
Pentachlorophenol	<0.50		0.50	ug/L	20-NOV-20	23-NOV-20	R5295017
Phenol	<0.50		0.50	ug/L	20-NOV-20	23-NOV-20	R5295017
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	20-NOV-20	23-NOV-20	R5295017
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	20-NOV-20	23-NOV-20	R5295017
Surrogate: 2-Fluorobiphenyl	86.0		50-140	%	20-NOV-20	23-NOV-20	R5295017
Surrogate: Nitrobenzene d5	88.0		50-140	%	20-NOV-20	23-NOV-20	R5295017
Surrogate: p-Terphenyl d14	87.3		60-140	%	20-NOV-20	23-NOV-20	R5295017
Surrogate: 2,4,6-Tribromophenol	65.0		50-140	%	20-NOV-20	23-NOV-20	R5295017
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	20-NOV-20	20-NOV-20	R5292639
Aroclor 1248	<0.020		0.020	ug/L	20-NOV-20	20-NOV-20	R5292639
Aroclor 1254	<0.020		0.020	ug/L	20-NOV-20	20-NOV-20	R5292639
Aroclor 1260	<0.020		0.020	ug/L	20-NOV-20	20-NOV-20	R5292639
Surrogate: Decachlorobiphenyl	125.1		50-150	%	20-NOV-20	20-NOV-20	R5292639
Total PCBs	<0.040		0.040	ug/L	20-NOV-20	20-NOV-20	R5292639
Surrogate: Tetrachloro-m-xylene	80.0		50-150	%	20-NOV-20	20-NOV-20	R5292639

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Total	MS-B	L2531509-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2531509-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2531509-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2531509-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2531509-1
Matrix Spike	Potassium (K)-Total	MS-B	L2531509-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2531509-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2531509-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2531509-1
Matrix Spike	Sulfur (S)-Total	MS-B	L2531509-1
Matrix Spike	Uranium (U)-Total	MS-B	L2531509-1
Matrix Spike	Zinc (Zn)-Total	MS-B	L2531509-1

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental

Reference Information

Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Reference Information

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2531509

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5295017							
WG3448601-2 LCS								
1,2,4-Trichlorobenzene			62.7		%		50-140	23-NOV-20
2-Chlorophenol			82.7		%		50-140	23-NOV-20
2,4-Dichlorophenol			94.3		%		50-140	23-NOV-20
2,4-Dimethylphenol			99.4		%		30-130	23-NOV-20
2,4-Dinitrophenol			133.9		%		50-140	23-NOV-20
2,4-Dinitrotoluene			117.2		%		50-140	23-NOV-20
2,4,5-Trichlorophenol			101.4		%		50-140	23-NOV-20
2,4,6-Trichlorophenol			99.2		%		50-140	23-NOV-20
2,6-Dinitrotoluene			105.3		%		50-140	23-NOV-20
3,3'-Dichlorobenzidine			84.4		%		30-130	23-NOV-20
4-Chloroaniline			70.6		%		30-130	23-NOV-20
Biphenyl			82.5		%		50-140	23-NOV-20
Bis(2-chloroethyl)ether			91.6		%		50-140	23-NOV-20
Bis(2-chloroisopropyl)ether			86.5		%		50-140	23-NOV-20
Bis(2-ethylhexyl)phthalate			84.5		%		50-140	23-NOV-20
Diethylphthalate			98.5		%		50-140	23-NOV-20
Dimethylphthalate			99.2		%		50-140	23-NOV-20
Pentachlorophenol			127.0		%		50-140	23-NOV-20
Phenol			106.4		%		30-130	23-NOV-20
WG3448601-1 MB								
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	23-NOV-20
2-Chlorophenol			<0.30		ug/L		0.3	23-NOV-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	23-NOV-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	23-NOV-20
2,4-Dinitrophenol			<1.0		ug/L		1	23-NOV-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	23-NOV-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	23-NOV-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	23-NOV-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	23-NOV-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	23-NOV-20
4-Chloroaniline			<0.40		ug/L		0.4	23-NOV-20
Biphenyl			<0.40		ug/L		0.4	23-NOV-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	23-NOV-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	23-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5295017								
WG3448601-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	23-NOV-20
Diethylphthalate			<0.20		ug/L		0.2	23-NOV-20
Dimethylphthalate			<0.20		ug/L		0.2	23-NOV-20
Pentachlorophenol			<0.50		ug/L		0.5	23-NOV-20
Phenol			<0.50		ug/L		0.5	23-NOV-20
Surrogate: 2-Fluorobiphenyl			84.6		%		50-140	23-NOV-20
Surrogate: 2,4,6-Tribromophenol			78.3		%		50-140	23-NOV-20
Surrogate: Nitrobenzene d5			84.5		%		50-140	23-NOV-20
Surrogate: p-Terphenyl d14			82.5		%		60-140	23-NOV-20
CR-CR6-IC-WT Water								
Batch R5294067								
WG3448825-4 DUP								
Chromium, Hexavalent		WG3448825-3 0.00117	0.00115		mg/L	1.5	20	20-NOV-20
WG3448825-2 LCS								
Chromium, Hexavalent			97.5		%		80-120	20-NOV-20
WG3448825-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	20-NOV-20
WG3448825-5 MS								
Chromium, Hexavalent		WG3448825-3	95.7		%		70-130	20-NOV-20
F1-HS-511-WT Water								
Batch R5297311								
WG3450642-4 DUP								
F1 (C6-C10)		WG3450642-3 <25	<25	RPD-NA	ug/L	N/A	30	25-NOV-20
WG3450642-1 LCS								
F1 (C6-C10)			114.7		%		80-120	25-NOV-20
WG3450642-2 MB								
F1 (C6-C10)			<25		ug/L		25	25-NOV-20
Surrogate: 3,4-Dichlorotoluene			112.8		%		60-140	25-NOV-20
WG3450642-5 MS								
F1 (C6-C10)		WG3450642-3	91.8		%		60-140	25-NOV-20
F2-F4-511-WT Water								
Batch R5292320								
WG3448597-2 LCS								
F2 (C10-C16)			104.1		%		70-130	20-NOV-20
F3 (C16-C34)			108.7		%		70-130	20-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch R5292320								
WG3448597-2	LCS							
F4 (C34-C50)			101.2		%		70-130	20-NOV-20
WG3448597-1	MB							
F2 (C10-C16)			<100		ug/L		100	20-NOV-20
F3 (C16-C34)			<250		ug/L		250	20-NOV-20
F4 (C34-C50)			<250		ug/L		250	20-NOV-20
Surrogate: 2-Bromobenzotrifluoride			80.1		%		60-140	20-NOV-20
HG-T-CVAA-WT		Water						
Batch R5291523								
WG3448714-4	DUP	WG3448714-3						
Mercury (Hg)-Total		<0.0000050	0.0000052	RPD-NA	mg/L	N/A	20	20-NOV-20
WG3448714-2	LCS							
Mercury (Hg)-Total			113.0		%		80-120	20-NOV-20
WG3448714-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	20-NOV-20
WG3448714-6	MS	WG3448714-5						
Mercury (Hg)-Total			103.5		%		70-130	20-NOV-20
MET-T-CCMS-WT		Water						
Batch R5291178								
WG3448570-4	DUP	WG3448570-3						
Aluminum (Al)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	20-NOV-20
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	20-NOV-20
Arsenic (As)-Total		0.00083	0.00086		mg/L	4.1	20	20-NOV-20
Barium (Ba)-Total		0.224	0.225		mg/L	0.5	20	20-NOV-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	20-NOV-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	20-NOV-20
Boron (B)-Total		0.031	0.030		mg/L	2.0	20	20-NOV-20
Cadmium (Cd)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	20-NOV-20
Calcium (Ca)-Total		97.8	97.6		mg/L	0.2	20	20-NOV-20
Chromium (Cr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	20-NOV-20
Cesium (Cs)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	20-NOV-20
Cobalt (Co)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	20-NOV-20
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	20-NOV-20
Iron (Fe)-Total		1.82	1.82		mg/L	0.0	20	20-NOV-20
Lead (Pb)-Total		0.000141	0.000134		mg/L	5.4	20	20-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5291178							
WG3448570-4	DUP	WG3448570-3						
Lithium (Li)-Total		0.0048	0.0046		mg/L	4.0	20	20-NOV-20
Magnesium (Mg)-Total		27.3	27.2		mg/L	0.3	20	20-NOV-20
Manganese (Mn)-Total		0.0474	0.0473		mg/L	0.3	20	20-NOV-20
Molybdenum (Mo)-Total		0.000604	0.000587		mg/L	3.0	20	20-NOV-20
Nickel (Ni)-Total		0.00060	0.00074	J	mg/L	0.00014	0.001	20-NOV-20
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	20-NOV-20
Potassium (K)-Total		8.27	8.34		mg/L	0.9	20	20-NOV-20
Rubidium (Rb)-Total		0.00103	0.00096		mg/L	7.3	20	20-NOV-20
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	20-NOV-20
Silicon (Si)-Total		6.43	6.32		mg/L	1.7	20	20-NOV-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	20-NOV-20
Sodium (Na)-Total		25.1	25.0		mg/L	0.3	20	20-NOV-20
Strontium (Sr)-Total		0.829	0.827		mg/L	0.3	20	20-NOV-20
Sulfur (S)-Total		15.2	15.0		mg/L	1.1	25	20-NOV-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	20-NOV-20
Tellurium (Te)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	20-NOV-20
Thorium (Th)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	25	20-NOV-20
Tin (Sn)-Total		<0.00010	0.00013	RPD-NA	mg/L	N/A	20	20-NOV-20
Titanium (Ti)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	20-NOV-20
Tungsten (W)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	20-NOV-20
Uranium (U)-Total		0.000453	0.000440		mg/L	2.8	20	20-NOV-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	20-NOV-20
Zinc (Zn)-Total		0.0383	0.0373		mg/L	2.6	20	20-NOV-20
Zirconium (Zr)-Total		<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	20-NOV-20
WG3448570-2	LCS							
Aluminum (Al)-Total			103.7		%		80-120	20-NOV-20
Antimony (Sb)-Total			104.1		%		80-120	20-NOV-20
Arsenic (As)-Total			105.8		%		80-120	20-NOV-20
Barium (Ba)-Total			104.2		%		80-120	20-NOV-20
Beryllium (Be)-Total			99.4		%		80-120	20-NOV-20
Bismuth (Bi)-Total			102.3		%		80-120	20-NOV-20
Boron (B)-Total			98.0		%		80-120	20-NOV-20
Cadmium (Cd)-Total			104.6		%		80-120	20-NOV-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5291178							
WG3448570-2	LCS							
Calcium (Ca)-Total			99.8		%		80-120	20-NOV-20
Chromium (Cr)-Total			104.4		%		80-120	20-NOV-20
Cesium (Cs)-Total			103.8		%		80-120	20-NOV-20
Cobalt (Co)-Total			103.3		%		80-120	20-NOV-20
Copper (Cu)-Total			104.5		%		80-120	20-NOV-20
Iron (Fe)-Total			103.8		%		80-120	20-NOV-20
Lead (Pb)-Total			103.5		%		80-120	20-NOV-20
Lithium (Li)-Total			97.2		%		80-120	20-NOV-20
Magnesium (Mg)-Total			107.6		%		80-120	20-NOV-20
Manganese (Mn)-Total			105.4		%		80-120	20-NOV-20
Molybdenum (Mo)-Total			101.5		%		80-120	20-NOV-20
Nickel (Ni)-Total			104.3		%		80-120	20-NOV-20
Phosphorus (P)-Total			109.6		%		70-130	20-NOV-20
Potassium (K)-Total			101.6		%		80-120	20-NOV-20
Rubidium (Rb)-Total			103.2		%		80-120	20-NOV-20
Selenium (Se)-Total			101.4		%		80-120	20-NOV-20
Silicon (Si)-Total			96.1		%		60-140	20-NOV-20
Silver (Ag)-Total			100.5		%		80-120	20-NOV-20
Sodium (Na)-Total			105.9		%		80-120	20-NOV-20
Strontium (Sr)-Total			100.5		%		80-120	20-NOV-20
Sulfur (S)-Total			96.5		%		80-120	20-NOV-20
Thallium (Tl)-Total			105.2		%		80-120	20-NOV-20
Tellurium (Te)-Total			102.1		%		80-120	20-NOV-20
Thorium (Th)-Total			104.7		%		70-130	20-NOV-20
Tin (Sn)-Total			99.98		%		80-120	20-NOV-20
Titanium (Ti)-Total			99.2		%		80-120	20-NOV-20
Tungsten (W)-Total			101.5		%		80-120	20-NOV-20
Uranium (U)-Total			108.2		%		80-120	20-NOV-20
Vanadium (V)-Total			105.5		%		80-120	20-NOV-20
Zinc (Zn)-Total			101.3		%		80-120	20-NOV-20
Zirconium (Zr)-Total			95.4		%		80-120	20-NOV-20
WG3448570-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	20-NOV-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	20-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5291178							
WG3448570-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	20-NOV-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	20-NOV-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	20-NOV-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	20-NOV-20
Boron (B)-Total			<0.010		mg/L		0.01	20-NOV-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	20-NOV-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	20-NOV-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	20-NOV-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	20-NOV-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	20-NOV-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	20-NOV-20
Iron (Fe)-Total			<0.010		mg/L		0.01	20-NOV-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	20-NOV-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	20-NOV-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	20-NOV-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	20-NOV-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	20-NOV-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	20-NOV-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	20-NOV-20
Potassium (K)-Total			<0.050		mg/L		0.05	20-NOV-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	20-NOV-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	20-NOV-20
Silicon (Si)-Total			<0.10		mg/L		0.1	20-NOV-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	20-NOV-20
Sodium (Na)-Total			<0.050		mg/L		0.05	20-NOV-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	20-NOV-20
Sulfur (S)-Total			<0.50		mg/L		0.5	20-NOV-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	20-NOV-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	20-NOV-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	20-NOV-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	20-NOV-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	20-NOV-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	20-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5291178							
WG3448570-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	20-NOV-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	20-NOV-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	20-NOV-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	20-NOV-20
WG3448570-5 MS		WG3448570-3						
Aluminum (Al)-Total			99.2		%		70-130	20-NOV-20
Antimony (Sb)-Total			106.5		%		70-130	20-NOV-20
Arsenic (As)-Total			103.3		%		70-130	20-NOV-20
Barium (Ba)-Total			N/A	MS-B	%		-	20-NOV-20
Beryllium (Be)-Total			100.4		%		70-130	20-NOV-20
Bismuth (Bi)-Total			94.8		%		70-130	20-NOV-20
Boron (B)-Total			97.2		%		70-130	20-NOV-20
Cadmium (Cd)-Total			102.0		%		70-130	20-NOV-20
Calcium (Ca)-Total			N/A	MS-B	%		-	20-NOV-20
Chromium (Cr)-Total			101.4		%		70-130	20-NOV-20
Cesium (Cs)-Total			105.5		%		70-130	20-NOV-20
Cobalt (Co)-Total			98.9		%		70-130	20-NOV-20
Copper (Cu)-Total			94.7		%		70-130	20-NOV-20
Iron (Fe)-Total			N/A	MS-B	%		-	20-NOV-20
Lead (Pb)-Total			97.7		%		70-130	20-NOV-20
Lithium (Li)-Total			97.4		%		70-130	20-NOV-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	20-NOV-20
Manganese (Mn)-Total			N/A	MS-B	%		-	20-NOV-20
Molybdenum (Mo)-Total			104.2		%		70-130	20-NOV-20
Nickel (Ni)-Total			97.9		%		70-130	20-NOV-20
Phosphorus (P)-Total			105.7		%		70-130	20-NOV-20
Potassium (K)-Total			N/A	MS-B	%		-	20-NOV-20
Rubidium (Rb)-Total			101.1		%		70-130	20-NOV-20
Selenium (Se)-Total			91.1		%		70-130	20-NOV-20
Silicon (Si)-Total			N/A	MS-B	%		-	20-NOV-20
Silver (Ag)-Total			98.0		%		70-130	20-NOV-20
Sodium (Na)-Total			N/A	MS-B	%		-	20-NOV-20
Strontium (Sr)-Total			N/A	MS-B	%		-	20-NOV-20
Sulfur (S)-Total			N/A	MS-B	%		-	20-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5291178							
WG3448570-5 MS		WG3448570-3						
Thallium (Tl)-Total			99.2		%		70-130	20-NOV-20
Tellurium (Te)-Total			89.5		%		70-130	20-NOV-20
Thorium (Th)-Total			105.3		%		70-130	20-NOV-20
Tin (Sn)-Total			102.1		%		70-130	20-NOV-20
Titanium (Ti)-Total			101.0		%		70-130	20-NOV-20
Tungsten (W)-Total			100.9		%		70-130	20-NOV-20
Uranium (U)-Total			N/A	MS-B	%		-	20-NOV-20
Vanadium (V)-Total			105.3		%		70-130	20-NOV-20
Zinc (Zn)-Total			N/A	MS-B	%		-	20-NOV-20
Zirconium (Zr)-Total			97.0		%		70-130	20-NOV-20
P-T-COL-WT								
	Water							
Batch	R5294456							
WG3448628-3 DUP		L2531285-9						
Phosphorus, Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	23-NOV-20
WG3448628-2 LCS								
Phosphorus, Total			95.1		%		80-120	23-NOV-20
WG3448628-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	23-NOV-20
WG3448628-4 MS		L2531285-9						
Phosphorus, Total			97.9		%		70-130	23-NOV-20
PAH-511-WT								
	Water							
Batch	R5296896							
WG3448597-2 LCS								
1-Methylnaphthalene			81.4		%		50-140	24-NOV-20
2-Methylnaphthalene			79.0		%		50-140	24-NOV-20
Acenaphthene			98.2		%		50-140	24-NOV-20
Acenaphthylene			90.2		%		50-140	24-NOV-20
Anthracene			78.4		%		50-140	24-NOV-20
Benzo(a)anthracene			85.0		%		50-140	24-NOV-20
Benzo(a)pyrene			81.8		%		50-140	24-NOV-20
Benzo(b)fluoranthene			77.3		%		50-140	24-NOV-20
Benzo(g,h,i)perylene			98.3		%		50-140	24-NOV-20
Benzo(k)fluoranthene			85.8		%		50-140	24-NOV-20
Chrysene			91.7		%		50-140	24-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	Water							
Batch	R5296896							
WG3448597-2	LCS							
Dibenzo(ah)anthracene			87.9		%		50-140	24-NOV-20
Fluoranthene			91.3		%		50-140	24-NOV-20
Fluorene			81.8		%		50-140	24-NOV-20
Indeno(1,2,3-cd)pyrene			106.2		%		50-140	24-NOV-20
Naphthalene			82.7		%		50-140	24-NOV-20
Phenanthrene			88.3		%		50-140	24-NOV-20
Pyrene			91.7		%		50-140	24-NOV-20
WG3448597-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	24-NOV-20
2-Methylnaphthalene			<0.020		ug/L		0.02	24-NOV-20
Acenaphthene			<0.020		ug/L		0.02	24-NOV-20
Acenaphthylene			<0.020		ug/L		0.02	24-NOV-20
Anthracene			<0.020		ug/L		0.02	24-NOV-20
Benzo(a)anthracene			<0.020		ug/L		0.02	24-NOV-20
Benzo(a)pyrene			<0.010		ug/L		0.01	24-NOV-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	24-NOV-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	24-NOV-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	24-NOV-20
Chrysene			<0.020		ug/L		0.02	24-NOV-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	24-NOV-20
Fluoranthene			<0.020		ug/L		0.02	24-NOV-20
Fluorene			<0.020		ug/L		0.02	24-NOV-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	24-NOV-20
Naphthalene			<0.050		ug/L		0.05	24-NOV-20
Phenanthrene			<0.020		ug/L		0.02	24-NOV-20
Pyrene			<0.020		ug/L		0.02	24-NOV-20
Surrogate: d8-Naphthalene			100.7		%		60-140	24-NOV-20
Surrogate: d10-Phenanthrene			97.6		%		60-140	24-NOV-20
Surrogate: d12-Chrysene			89.4		%		60-140	24-NOV-20
Surrogate: d10-Acenaphthene			92.7		%		60-140	24-NOV-20

PCB-511-WT **Water**



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5292639							
WG3448603-2	LCS							
Aroclor 1242			101.4		%		60-140	20-NOV-20
Aroclor 1248			91.4		%		60-140	20-NOV-20
Aroclor 1254			92.1		%		60-140	20-NOV-20
Aroclor 1260			76.1		%		60-140	20-NOV-20
WG3448603-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	20-NOV-20
Aroclor 1248			<0.020		ug/L		0.02	20-NOV-20
Aroclor 1254			<0.020		ug/L		0.02	20-NOV-20
Aroclor 1260			<0.020		ug/L		0.02	20-NOV-20
Surrogate: Decachlorobiphenyl			126.4		%		50-150	20-NOV-20
Surrogate: Tetrachloro-m-xylene			74.8		%		50-150	20-NOV-20
VOC-511-HS-WT		Water						
Batch	R5297311							
WG3450642-4	DUP	WG3450642-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	25-NOV-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	25-NOV-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-NOV-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	25-NOV-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	25-NOV-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5297311							
WG3450642-4	DUP	WG3450642-3						
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	25-NOV-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-NOV-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-NOV-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-NOV-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	25-NOV-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	25-NOV-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	25-NOV-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	25-NOV-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-NOV-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-NOV-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-NOV-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	25-NOV-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-NOV-20
WG3450642-1	LCS							
1,1,1,2-Tetrachloroethane			103.2		%		70-130	25-NOV-20
1,1,2,2-Tetrachloroethane			93.7		%		70-130	25-NOV-20
1,1,1-Trichloroethane			101.1		%		70-130	25-NOV-20
1,1,2-Trichloroethane			110.0		%		70-130	25-NOV-20
1,1-Dichloroethane			105.4		%		70-130	25-NOV-20
1,1-Dichloroethylene			93.8		%		70-130	25-NOV-20
1,2-Dibromoethane			110.4		%		70-130	25-NOV-20
1,2-Dichlorobenzene			99.3		%		70-130	25-NOV-20
1,2-Dichloroethane			91.9		%		70-130	25-NOV-20
1,2-Dichloropropane			94.3		%		70-130	25-NOV-20
1,3-Dichlorobenzene			95.4		%		70-130	25-NOV-20



Quality Control Report

Workorder: L2531509

Report Date: 25-NOV-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5297311							
WG3450642-1	LCS							
1,4-Dichlorobenzene			94.8		%		70-130	25-NOV-20
Acetone			106.6		%		60-140	25-NOV-20
Benzene			96.1		%		70-130	25-NOV-20
Bromodichloromethane			96.8		%		70-130	25-NOV-20
Bromoform			114.1		%		70-130	25-NOV-20
Bromomethane			114.2		%		60-140	25-NOV-20
Carbon tetrachloride			103.4		%		70-130	25-NOV-20
Chlorobenzene			96.7		%		70-130	25-NOV-20
Chloroform			102.5		%		70-130	25-NOV-20
cis-1,2-Dichloroethylene			105.0		%		70-130	25-NOV-20
cis-1,3-Dichloropropene			85.0		%		70-130	25-NOV-20
Dibromochloromethane			106.3		%		70-130	25-NOV-20
Dichlorodifluoromethane			136.3		%		50-140	25-NOV-20
Ethylbenzene			93.1		%		70-130	25-NOV-20
n-Hexane			95.9		%		70-130	25-NOV-20
m+p-Xylenes			91.2		%		70-130	25-NOV-20
Methyl Ethyl Ketone			114.2		%		60-140	25-NOV-20
Methyl Isobutyl Ketone			80.2		%		60-140	25-NOV-20
Methylene Chloride			105.4		%		70-130	25-NOV-20
MTBE			100.2		%		70-130	25-NOV-20
o-Xylene			98.3		%		70-130	25-NOV-20
Styrene			90.7		%		70-130	25-NOV-20
Tetrachloroethylene			105.3		%		70-130	25-NOV-20
Toluene			99.0		%		70-130	25-NOV-20
trans-1,2-Dichloroethylene			95.3		%		70-130	25-NOV-20
trans-1,3-Dichloropropene			101.9		%		70-130	25-NOV-20
Trichloroethylene			98.8		%		70-130	25-NOV-20
Trichlorofluoromethane			112.4		%		60-140	25-NOV-20
Vinyl chloride			126.3		%		60-140	25-NOV-20
WG3450642-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	25-NOV-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	25-NOV-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	25-NOV-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	25-NOV-20



Quality Control Report

Workorder: L2531509

Report Date: 25-NOV-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT								
	Water							
Batch	R5297311							
WG3450642-2 MB								
1,1-Dichloroethane			<0.50		ug/L		0.5	25-NOV-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	25-NOV-20
1,2-Dibromoethane			<0.20		ug/L		0.2	25-NOV-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	25-NOV-20
1,2-Dichloroethane			<0.50		ug/L		0.5	25-NOV-20
1,2-Dichloropropane			<0.50		ug/L		0.5	25-NOV-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	25-NOV-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	25-NOV-20
Acetone			<30		ug/L		30	25-NOV-20
Benzene			<0.50		ug/L		0.5	25-NOV-20
Bromodichloromethane			<2.0		ug/L		2	25-NOV-20
Bromoform			<5.0		ug/L		5	25-NOV-20
Bromomethane			<0.50		ug/L		0.5	25-NOV-20
Carbon tetrachloride			<0.20		ug/L		0.2	25-NOV-20
Chlorobenzene			<0.50		ug/L		0.5	25-NOV-20
Chloroform			<1.0		ug/L		1	25-NOV-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	25-NOV-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	25-NOV-20
Dibromochloromethane			<2.0		ug/L		2	25-NOV-20
Dichlorodifluoromethane			<2.0		ug/L		2	25-NOV-20
Ethylbenzene			<0.50		ug/L		0.5	25-NOV-20
n-Hexane			<0.50		ug/L		0.5	25-NOV-20
m+p-Xylenes			<0.40		ug/L		0.4	25-NOV-20
Methyl Ethyl Ketone			<20		ug/L		20	25-NOV-20
Methyl Isobutyl Ketone			<20		ug/L		20	25-NOV-20
Methylene Chloride			<5.0		ug/L		5	25-NOV-20
MTBE			<2.0		ug/L		2	25-NOV-20
o-Xylene			<0.30		ug/L		0.3	25-NOV-20
Styrene			<0.50		ug/L		0.5	25-NOV-20
Tetrachloroethylene			<0.50		ug/L		0.5	25-NOV-20
Toluene			<0.50		ug/L		0.5	25-NOV-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	25-NOV-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	25-NOV-20



Quality Control Report

Workorder: L2531509

Report Date: 25-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5297311							
WG3450642-2 MB								
Trichloroethylene			<0.50		ug/L		0.5	25-NOV-20
Trichlorofluoromethane			<5.0		ug/L		5	25-NOV-20
Vinyl chloride			<0.50		ug/L		0.5	25-NOV-20
Surrogate: 1,4-Difluorobenzene			100.9		%		70-130	25-NOV-20
Surrogate: 4-Bromofluorobenzene			96.0		%		70-130	25-NOV-20
WG3450642-5 MS		WG3450642-3						
1,1,1,2-Tetrachloroethane			103.5		%		50-140	25-NOV-20
1,1,2,2-Tetrachloroethane			95.6		%		50-140	25-NOV-20
1,1,1-Trichloroethane			102.2		%		50-140	25-NOV-20
1,1,2-Trichloroethane			108.9		%		50-140	25-NOV-20
1,1-Dichloroethane			106.0		%		50-140	25-NOV-20
1,1-Dichloroethylene			92.3		%		50-140	25-NOV-20
1,2-Dibromoethane			107.3		%		50-140	25-NOV-20
1,2-Dichlorobenzene			98.9		%		50-140	25-NOV-20
1,2-Dichloroethane			92.6		%		50-140	25-NOV-20
1,2-Dichloropropane			95.0		%		50-140	25-NOV-20
1,3-Dichlorobenzene			95.3		%		50-140	25-NOV-20
1,4-Dichlorobenzene			95.0		%		50-140	25-NOV-20
Acetone			108.5		%		50-140	25-NOV-20
Benzene			96.8		%		50-140	25-NOV-20
Bromodichloromethane			99.0		%		50-140	25-NOV-20
Bromoform			114.7		%		50-140	25-NOV-20
Bromomethane			107.3		%		50-140	25-NOV-20
Carbon tetrachloride			104.9		%		50-140	25-NOV-20
Chlorobenzene			96.9		%		50-140	25-NOV-20
Chloroform			104.3		%		50-140	25-NOV-20
cis-1,2-Dichloroethylene			104.8		%		50-140	25-NOV-20
cis-1,3-Dichloropropene			83.9		%		50-140	25-NOV-20
Dibromochloromethane			105.4		%		50-140	25-NOV-20
Dichlorodifluoromethane			116.9		%		50-140	25-NOV-20
Ethylbenzene			92.3		%		50-140	25-NOV-20
n-Hexane			92.9		%		50-140	25-NOV-20
m+p-Xylenes			91.5		%		50-140	25-NOV-20
Methyl Ethyl Ketone			105.9		%		50-140	25-NOV-20



Quality Control Report

Workorder: L2531509

Report Date: 25-NOV-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5297311							
WG3450642-5 MS		WG3450642-3						
Methyl Isobutyl Ketone			78.0		%		50-140	25-NOV-20
Methylene Chloride			105.9		%		50-140	25-NOV-20
MTBE			99.9		%		50-140	25-NOV-20
o-Xylene			97.5		%		50-140	25-NOV-20
Styrene			89.3		%		50-140	25-NOV-20
Tetrachloroethylene			105.0		%		50-140	25-NOV-20
Toluene			97.3		%		50-140	25-NOV-20
trans-1,2-Dichloroethylene			95.0		%		50-140	25-NOV-20
trans-1,3-Dichloropropene			96.8		%		50-140	25-NOV-20
Trichloroethylene			100.5		%		50-140	25-NOV-20
Trichlorofluoromethane			108.1		%		50-140	25-NOV-20
Vinyl chloride			115.7		%		50-140	25-NOV-20

Quality Control Report

Workorder: L2531509

Report Date: 25-NOV-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

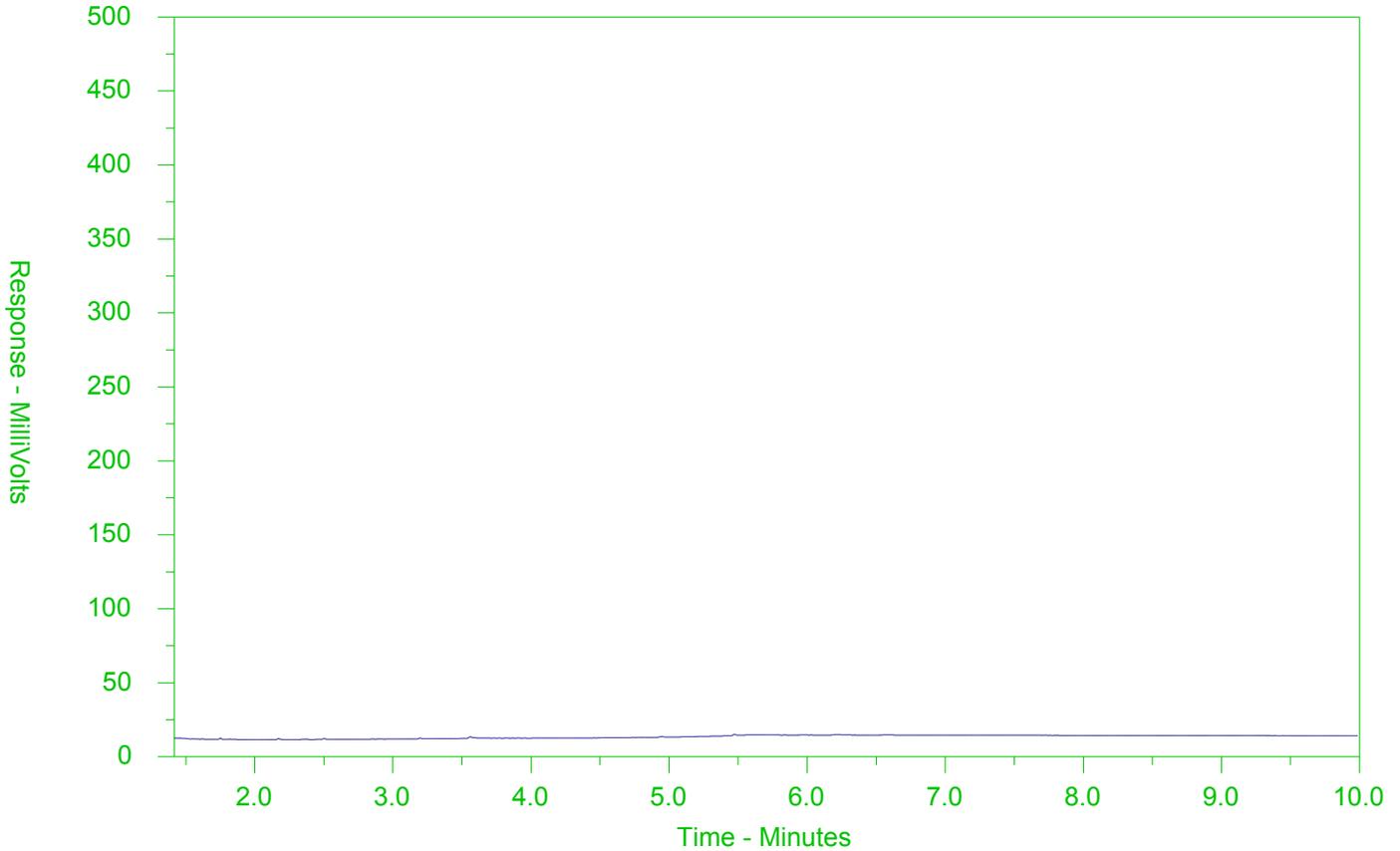
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2531509-1
 Client Sample ID: W-11210029-20201119-52



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2531509-COFC

COC Number: 17 -

Page of

Handwritten signature/initials

www.alsglobal.com

Report To Contact and company name below will appear on the final report		Report Format / Distribution		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)										
Company:	GHD LIMITED - ACCT #13791	Select Report Format:	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)	Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply										
Contact:	Laura Ermeta	Quality Control (QC) Report with Report	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	PRIORITY (Business Days)	4 day [P4-20%]	<input type="checkbox"/>	EMERGENCY	1 Business day [E - 100%]	<input type="checkbox"/>					
Phone:	519-884-0510	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			3 day [P3-25%]	<input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]	<input type="checkbox"/>					
Company address below will appear on the final report		Select Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		2 day [P2-50%]	<input type="checkbox"/>								
Street:	455 Phillip St	Email 1 or Fax	laura.ermeta@ghd.com	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm										
City/Province:	Waterloo, Ontario	Email 2	See PO	For tests that can not be performed according to the service level selected, you will be contacted.										
Postal Code:	N2L 3X2	Email 3		Analysis Request										
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Invoice Distribution		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below										
	Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Select Invoice Distribution:	<input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	NUMBER OF CONTAINERS							SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)		
Company:	GHD Limited	Email 1 or Fax	apinvoices-735@ghd.com		Total Metals (MET-T-CCMS-WT)									
Contact:	SEE SSOW	Email 2			Total Mercury (HG-T-CVAA-WT)									
Project Information		Oil and Gas Required Fields (client use)			Total Cr6 (CR-CR6-IC-WT)									
ALS Account # / Quote #:	13791	AFE/Cost Center:	PO#		Total Phosphorous (P-T-COL-WT)									
Job #:	11210029	Major/Minor Code:	Routing Code:		PCBs (PCB-511-WT)									
PO / AFE:	73520086	Requisitioner:			VOCs and PHCs (VOC,F1-F4-511-P-WT)									
LSD:		Location:			SVOCs (SVOC-511-GP-WT)									
ALS Lab Work Order # (lab use only):	L2531509	ALS Contact:	Rick H											
		Sampler:	ERIC											
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type										
	W-11210029-20201119-52	19/11/20	930AM	Water	12	R	R	R	R	R	R			
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)									
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>									
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>									
					Cooling Initiated <input type="checkbox"/>									
					INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C						
								62						
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)									
Released by:	Date: 2020 11/20	Time: 1100	Received by:	Date:	Time:	Received by:	Date: 11/19/20	Time: 1400						



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 26-NOV-20
Report Date: 03-DEC-20 11:08 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2534021

Project P.O. #: 73520086

Job Reference: 11210029

C of C Numbers:

Legal Site Desc:


Rick Hawthorne
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2534021-1 W-11210029-20201126-54 Sampled By: ERIC on 26-NOV-20 @ 10:00 Matrix: WATER							
Anions and Nutrients							
Phosphorus, Total	0.0049		0.0030	mg/L	30-NOV-20	01-DEC-20	R5300346
Total Metals							
Aluminum (Al)-Total	<0.0050		0.0050	mg/L	27-NOV-20	27-NOV-20	R5299085
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Arsenic (As)-Total	0.00556		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Barium (Ba)-Total	0.0536		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-NOV-20	27-NOV-20	R5299085
Boron (B)-Total	<0.010		0.010	mg/L	27-NOV-20	27-NOV-20	R5299085
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	27-NOV-20	27-NOV-20	R5299085
Calcium (Ca)-Total	67.4		0.050	mg/L	27-NOV-20	27-NOV-20	R5299085
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	27-NOV-20	27-NOV-20	R5299085
Chromium (Cr)-Total	<0.00050		0.00050	mg/L	27-NOV-20	27-NOV-20	R5299085
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Copper (Cu)-Total	<0.00050		0.00050	mg/L	27-NOV-20	27-NOV-20	R5299085
Iron (Fe)-Total	0.403		0.010	mg/L	27-NOV-20	27-NOV-20	R5299085
Lead (Pb)-Total	<0.000050		0.000050	mg/L	27-NOV-20	27-NOV-20	R5299085
Lithium (Li)-Total	0.0039		0.0010	mg/L	27-NOV-20	27-NOV-20	R5299085
Magnesium (Mg)-Total	32.3		0.0050	mg/L	27-NOV-20	27-NOV-20	R5299085
Manganese (Mn)-Total	0.00994		0.00050	mg/L	27-NOV-20	27-NOV-20	R5299085
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-NOV-20	R5298846
Molybdenum (Mo)-Total	0.000601		0.000050	mg/L	27-NOV-20	27-NOV-20	R5299085
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	27-NOV-20	27-NOV-20	R5299085
Phosphorus (P)-Total	<0.050		0.050	mg/L	27-NOV-20	27-NOV-20	R5299085
Potassium (K)-Total	0.984		0.050	mg/L	27-NOV-20	27-NOV-20	R5299085
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	27-NOV-20	27-NOV-20	R5299085
Selenium (Se)-Total	<0.000050		0.000050	mg/L	27-NOV-20	27-NOV-20	R5299085
Silicon (Si)-Total	9.01		0.10	mg/L	27-NOV-20	27-NOV-20	R5299085
Silver (Ag)-Total	<0.000050		0.000050	mg/L	27-NOV-20	27-NOV-20	R5299085
Sodium (Na)-Total	7.42		0.050	mg/L	27-NOV-20	27-NOV-20	R5299085
Strontium (Sr)-Total	0.155		0.0010	mg/L	27-NOV-20	27-NOV-20	R5299085
Sulfur (S)-Total	20.6		0.50	mg/L	27-NOV-20	27-NOV-20	R5299085
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	27-NOV-20	27-NOV-20	R5299085
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	27-NOV-20	27-NOV-20	R5299085
Thorium (Th)-Total	<0.00010		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Tin (Sn)-Total	<0.00010		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	27-NOV-20	27-NOV-20	R5299085
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-NOV-20	27-NOV-20	R5299085
Uranium (U)-Total	0.000241		0.000010	mg/L	27-NOV-20	27-NOV-20	R5299085
Vanadium (V)-Total	<0.00050		0.00050	mg/L	27-NOV-20	27-NOV-20	R5299085
Zinc (Zn)-Total	0.0037		0.0030	mg/L	27-NOV-20	27-NOV-20	R5299085

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2534021-1 W-11210029-20201126-54 Sampled By: ERIC on 26-NOV-20 @ 10:00 Matrix: WATER							
Total Metals							
Zirconium (Zr)-Total	<0.00020		0.00020	mg/L	27-NOV-20	27-NOV-20	R5299085
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		27-NOV-20	R5299541
Volatile Organic Compounds							
Acetone	<30		30	ug/L		01-DEC-20	R5300163
Benzene	<0.50		0.50	ug/L		01-DEC-20	R5300163
Bromodichloromethane	<2.0		2.0	ug/L		01-DEC-20	R5300163
Bromoform	<5.0		5.0	ug/L		01-DEC-20	R5300163
Bromomethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
Carbon tetrachloride	<0.20		0.20	ug/L		01-DEC-20	R5300163
Chlorobenzene	<0.50		0.50	ug/L		01-DEC-20	R5300163
Dibromochloromethane	<2.0		2.0	ug/L		01-DEC-20	R5300163
Chloroform	<1.0		1.0	ug/L		01-DEC-20	R5300163
1,2-Dibromoethane	<0.20		0.20	ug/L		01-DEC-20	R5300163
1,2-Dichlorobenzene	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,3-Dichlorobenzene	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,4-Dichlorobenzene	<0.50		0.50	ug/L		01-DEC-20	R5300163
Dichlorodifluoromethane	<2.0		2.0	ug/L		01-DEC-20	R5300163
1,1-Dichloroethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,2-Dichloroethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,1-Dichloroethylene	<0.50		0.50	ug/L		01-DEC-20	R5300163
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		01-DEC-20	R5300163
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		01-DEC-20	R5300163
Methylene Chloride	<5.0		5.0	ug/L		01-DEC-20	R5300163
1,2-Dichloropropane	<0.50		0.50	ug/L		01-DEC-20	R5300163
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		01-DEC-20	R5300163
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		01-DEC-20	R5300163
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		01-DEC-20	R5300163
Ethylbenzene	<0.50		0.50	ug/L		01-DEC-20	R5300163
n-Hexane	<0.50		0.50	ug/L		01-DEC-20	R5300163
Methyl Ethyl Ketone	<20		20	ug/L		01-DEC-20	R5300163
Methyl Isobutyl Ketone	<20		20	ug/L		01-DEC-20	R5300163
MTBE	<2.0		2.0	ug/L		01-DEC-20	R5300163
Styrene	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
Tetrachloroethylene	<0.50		0.50	ug/L		01-DEC-20	R5300163
Toluene	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,1,1-Trichloroethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
1,1,2-Trichloroethane	<0.50		0.50	ug/L		01-DEC-20	R5300163
Trichloroethylene	<0.50		0.50	ug/L		01-DEC-20	R5300163

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2534021-1 W-11210029-20201126-54 Sampled By: ERIC on 26-NOV-20 @ 10:00 Matrix: WATER							
Volatile Organic Compounds							
Trichlorofluoromethane	<5.0		5.0	ug/L		01-DEC-20	R5300163
Vinyl chloride	<0.50		0.50	ug/L		01-DEC-20	R5300163
o-Xylene	<0.30		0.30	ug/L		01-DEC-20	R5300163
m+p-Xylenes	<0.40		0.40	ug/L		01-DEC-20	R5300163
Xylenes (Total)	<0.50		0.50	ug/L		01-DEC-20	
Surrogate: 4-Bromofluorobenzene	93.1		70-130	%		01-DEC-20	R5300163
Surrogate: 1,4-Difluorobenzene	102.3		70-130	%		01-DEC-20	R5300163
Hydrocarbons							
F1 (C6-C10)	<25		25	ug/L		01-DEC-20	R5300163
F1-BTEX	<25		25	ug/L		03-DEC-20	
F2 (C10-C16)	<100		100	ug/L	27-NOV-20	30-NOV-20	R5299714
F2-Naphth	<100		100	ug/L		03-DEC-20	
F3 (C16-C34)	<250		250	ug/L	27-NOV-20	30-NOV-20	R5299714
F3-PAH	<250		250	ug/L		03-DEC-20	
F4 (C34-C50)	<250		250	ug/L	27-NOV-20	30-NOV-20	R5299714
Total Hydrocarbons (C6-C50)	<370		370	ug/L		03-DEC-20	
Chrom. to baseline at nC50	YES				27-NOV-20	30-NOV-20	R5299714
Surrogate: 2-Bromobenzotrifluoride	91.5		60-140	%	27-NOV-20	30-NOV-20	R5299714
Surrogate: 3,4-Dichlorotoluene	87.2		60-140	%		01-DEC-20	R5300163
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Acenaphthylene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Anthracene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Benzo(a)anthracene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Benzo(a)pyrene	<0.010		0.010	ug/L	27-NOV-20	02-DEC-20	R5304677
Benzo(b)fluoranthene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Benzo(k)fluoranthene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Chrysene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Fluoranthene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Fluorene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		03-DEC-20	
1-Methylnaphthalene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
2-Methylnaphthalene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Naphthalene	<0.050		0.050	ug/L	27-NOV-20	02-DEC-20	R5304677
Phenanthrene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Pyrene	<0.020		0.020	ug/L	27-NOV-20	02-DEC-20	R5304677
Surrogate: d10-Acenaphthene	83.2		60-140	%	27-NOV-20	02-DEC-20	R5304677
Surrogate: d12-Chrysene	92.9		60-140	%	27-NOV-20	02-DEC-20	R5304677

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2534021-1 W-11210029-20201126-54 Sampled By: ERIC on 26-NOV-20 @ 10:00 Matrix: WATER							
Polycyclic Aromatic Hydrocarbons							
Surrogate: d8-Naphthalene	78.5		60-140	%	27-NOV-20	02-DEC-20	R5304677
Surrogate: d10-Phenanthrene	90.0		60-140	%	27-NOV-20	02-DEC-20	R5304677
Semi-Volatile Organics							
Biphenyl	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
4-Chloroaniline	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
Bis(2-chloroisopropyl)ether	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
2-Chlorophenol	<0.30		0.30	ug/L	27-NOV-20	03-DEC-20	R5304582
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4-Dichlorophenol	<0.30		0.30	ug/L	27-NOV-20	03-DEC-20	R5304582
Diethylphthalate	<0.20		0.20	ug/L	27-NOV-20	03-DEC-20	R5304582
Dimethylphthalate	<0.20		0.20	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4-Dimethylphenol	<0.50		0.50	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4-Dinitrophenol	<1.0		1.0	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4-Dinitrotoluene	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
2,6-Dinitrotoluene	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4+2,6-Dinitrotoluene	<0.57		0.57	ug/L	27-NOV-20	03-DEC-20	R5304582
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	27-NOV-20	03-DEC-20	R5304582
Pentachlorophenol	<0.50		0.50	ug/L	27-NOV-20	03-DEC-20	R5304582
Phenol	<0.50		0.50	ug/L	27-NOV-20	03-DEC-20	R5304582
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4,5-Trichlorophenol	<0.20		0.20	ug/L	27-NOV-20	03-DEC-20	R5304582
2,4,6-Trichlorophenol	<0.20		0.20	ug/L	27-NOV-20	03-DEC-20	R5304582
Surrogate: 2-Fluorobiphenyl	99.1		50-140	%	27-NOV-20	03-DEC-20	R5304582
Surrogate: Nitrobenzene d5	103.8		50-140	%	27-NOV-20	03-DEC-20	R5304582
Surrogate: p-Terphenyl d14	113.2		60-140	%	27-NOV-20	03-DEC-20	R5304582
Surrogate: 2,4,6-Tribromophenol	111.3		50-140	%	27-NOV-20	03-DEC-20	R5304582
Polychlorinated Biphenyls							
Aroclor 1242	<0.020		0.020	ug/L	02-DEC-20	02-DEC-20	R5299149
Aroclor 1248	<0.020		0.020	ug/L	02-DEC-20	02-DEC-20	R5299149
Aroclor 1254	<0.020		0.020	ug/L	02-DEC-20	02-DEC-20	R5299149
Aroclor 1260	<0.020		0.020	ug/L	02-DEC-20	02-DEC-20	R5299149
Surrogate: Decachlorobiphenyl	108.0		50-150	%	02-DEC-20	02-DEC-20	R5299149
Total PCBs	<0.040		0.040	ug/L	02-DEC-20	02-DEC-20	R5299149
Surrogate: Tetrachloro-m-xylene	80.3		50-150	%	02-DEC-20	02-DEC-20	R5299149

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Laboratory Control Sample	2,4-Dinitrophenol	LCS-H	L2534021-1
Matrix Spike	Barium (Ba)-Total	MS-B	L2534021-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L2534021-1
Matrix Spike	Iron (Fe)-Total	MS-B	L2534021-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2534021-1
Matrix Spike	Manganese (Mn)-Total	MS-B	L2534021-1
Matrix Spike	Silicon (Si)-Total	MS-B	L2534021-1
Matrix Spike	Sodium (Na)-Total	MS-B	L2534021-1
Matrix Spike	Strontium (Sr)-Total	MS-B	L2534021-1
Matrix Spike	Uranium (U)-Total	MS-B	L2534021-1

Sample Parameter Qualifier key listed:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-511-WT	Water	ABN,CP,PAH-O.Reg 153/04	SW846 8270 (511)
<p>Ground water sample extraction is carried out at a pH <2 (acid extractables) and pH>11 (base neutral extractables). Extracts are dried, concentrated and exchanged into a solvent compatible with the cleanup. Analysis is by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
CR-CR6-IC-WT	Water	Chromium +6	EPA 7199
<p>This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
DINITROTOL-CALC-WT	Water	ABN-Calculated Parameters	SW846 8270
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG

Reference Information

must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
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P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
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Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PCB-511-WT	Water	PCB-O. Reg 153/04 (July 2011)	SW846 3510/8082
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Aqueous samples are extracted, then concentrated, reconstituted, and analyzed by GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
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VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
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Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
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Total xylenes represents the sum of o-xylene and m&p-xylene.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Reference Information

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2534021

Report Date: 03-DEC-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT	Water							
Batch	R5304582							
WG3452815-2	LCS							
1,2,4-Trichlorobenzene			56.1		%		50-140	03-DEC-20
2-Chlorophenol			85.9		%		50-140	03-DEC-20
2,4-Dichlorophenol			99.3		%		50-140	03-DEC-20
2,4-Dimethylphenol			80.2		%		30-130	03-DEC-20
2,4-Dinitrophenol			156.6	LCS-H	%		50-140	03-DEC-20
2,4-Dinitrotoluene			107.6		%		50-140	03-DEC-20
2,4,5-Trichlorophenol			108.8		%		50-140	03-DEC-20
2,4,6-Trichlorophenol			106.8		%		50-140	03-DEC-20
2,6-Dinitrotoluene			101.0		%		50-140	03-DEC-20
3,3'-Dichlorobenzidine			78.2		%		30-130	03-DEC-20
4-Chloroaniline			80.1		%		30-130	03-DEC-20
Biphenyl			63.6		%		50-140	03-DEC-20
Bis(2-chloroethyl)ether			97.8		%		50-140	03-DEC-20
Bis(2-chloroisopropyl)ether			78.6		%		50-140	03-DEC-20
Bis(2-ethylhexyl)phthalate			82.3		%		50-140	03-DEC-20
Diethylphthalate			89.7		%		50-140	03-DEC-20
Dimethylphthalate			95.4		%		50-140	03-DEC-20
Pentachlorophenol			132.6		%		50-140	03-DEC-20
Phenol			105.2		%		30-130	03-DEC-20
WG3452815-1	MB							
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	03-DEC-20
2-Chlorophenol			<0.30		ug/L		0.3	03-DEC-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	03-DEC-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	03-DEC-20
2,4-Dinitrophenol			<1.0		ug/L		1	03-DEC-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	03-DEC-20
2,4,5-Trichlorophenol			<0.20		ug/L		0.2	03-DEC-20
2,4,6-Trichlorophenol			<0.20		ug/L		0.2	03-DEC-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	03-DEC-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	03-DEC-20
4-Chloroaniline			<0.40		ug/L		0.4	03-DEC-20
Biphenyl			<0.40		ug/L		0.4	03-DEC-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	03-DEC-20
Bis(2-chloroisopropyl)ether			<0.40		ug/L		0.4	03-DEC-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-511-WT Water								
Batch R5304582								
WG3452815-1 MB								
Bis(2-ethylhexyl)phthalate			<2.0		ug/L		2	03-DEC-20
Diethylphthalate			<0.20		ug/L		0.2	03-DEC-20
Dimethylphthalate			<0.20		ug/L		0.2	03-DEC-20
Pentachlorophenol			<0.50		ug/L		0.5	03-DEC-20
Phenol			<0.50		ug/L		0.5	03-DEC-20
Surrogate: 2-Fluorobiphenyl			77.7		%		50-140	03-DEC-20
Surrogate: 2,4,6-Tribromophenol			62.8		%		50-140	03-DEC-20
Surrogate: Nitrobenzene d5			81.0		%		50-140	03-DEC-20
Surrogate: p-Terphenyl d14			99.9		%		60-140	03-DEC-20
CR-CR6-IC-WT Water								
Batch R5299541								
WG3452864-4 DUP								
Chromium, Hexavalent		WG3452864-3	<0.00050	RPD-NA	mg/L	N/A	20	27-NOV-20
WG3452864-2 LCS								
Chromium, Hexavalent			98.7		%		80-120	27-NOV-20
WG3452864-1 MB								
Chromium, Hexavalent			<0.00050		mg/L		0.0005	27-NOV-20
WG3452864-5 MS								
Chromium, Hexavalent		WG3452864-3	99.2		%		70-130	27-NOV-20
F1-HS-511-WT Water								
Batch R5300163								
WG3454412-4 DUP								
F1 (C6-C10)		WG3454412-3	<25	RPD-NA	ug/L	N/A	30	01-DEC-20
WG3454412-1 LCS								
F1 (C6-C10)			96.5		%		80-120	01-DEC-20
WG3454412-2 MB								
F1 (C6-C10)			<25		ug/L		25	01-DEC-20
Surrogate: 3,4-Dichlorotoluene			105.3		%		60-140	01-DEC-20
WG3454412-5 MS								
F1 (C6-C10)		WG3454412-3	90.3		%		60-140	01-DEC-20
F2-F4-511-WT Water								
Batch R5299714								
WG3452822-2 LCS								
F2 (C10-C16)			106.0		%		70-130	30-NOV-20
F3 (C16-C34)			109.3		%		70-130	30-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT		Water						
Batch R5299714								
WG3452822-2	LCS							
F4 (C34-C50)			104.6		%		70-130	30-NOV-20
WG3452822-1	MB							
F2 (C10-C16)			<100		ug/L		100	30-NOV-20
F3 (C16-C34)			<250		ug/L		250	30-NOV-20
F4 (C34-C50)			<250		ug/L		250	30-NOV-20
Surrogate: 2-Bromobenzotrifluoride			52.3	SURQC	%		60-140	30-NOV-20
HG-T-CVAA-WT		Water						
Batch R5298846								
WG3452978-3	DUP	L2533785-1						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	27-NOV-20
WG3452978-2	LCS							
Mercury (Hg)-Total			100.0		%		80-120	27-NOV-20
WG3452978-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	27-NOV-20
WG3452978-4	MS	L2533785-2						
Mercury (Hg)-Total			98.6		%		70-130	27-NOV-20
MET-T-CCMS-WT		Water						
Batch R5299085								
WG3452769-4	DUP	WG3452769-3						
Aluminum (Al)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	27-NOV-20
Antimony (Sb)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	27-NOV-20
Arsenic (As)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	27-NOV-20
Barium (Ba)-Total		0.363	0.360		mg/L	1.0	20	27-NOV-20
Beryllium (Be)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	27-NOV-20
Bismuth (Bi)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	27-NOV-20
Boron (B)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	27-NOV-20
Cadmium (Cd)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	27-NOV-20
Calcium (Ca)-Total		93.8	93.4		mg/L	0.3	20	27-NOV-20
Chromium (Cr)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	27-NOV-20
Cesium (Cs)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	27-NOV-20
Cobalt (Co)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	27-NOV-20
Copper (Cu)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	27-NOV-20
Iron (Fe)-Total		1.73	1.76		mg/L	1.6	20	27-NOV-20
Lead (Pb)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	27-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5299085							
WG3452769-4	DUP	WG3452769-3						
Lithium (Li)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	27-NOV-20
Magnesium (Mg)-Total		23.2	23.9		mg/L	3.2	20	27-NOV-20
Manganese (Mn)-Total		0.0155	0.0156		mg/L	0.6	20	27-NOV-20
Molybdenum (Mo)-Total		0.00183	0.00181		mg/L	0.9	20	27-NOV-20
Nickel (Ni)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	27-NOV-20
Phosphorus (P)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	27-NOV-20
Potassium (K)-Total		2.02	2.11		mg/L	4.4	20	27-NOV-20
Rubidium (Rb)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	27-NOV-20
Selenium (Se)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	27-NOV-20
Silicon (Si)-Total		3.8	3.9		mg/L	2.7	20	27-NOV-20
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	27-NOV-20
Sodium (Na)-Total		62.6	63.4		mg/L	1.2	20	27-NOV-20
Strontium (Sr)-Total		6.88	6.90		mg/L	0.3	20	27-NOV-20
Sulfur (S)-Total		<5.0	<5.0	RPD-NA	mg/L	N/A	25	27-NOV-20
Thallium (Tl)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	27-NOV-20
Tellurium (Te)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	27-NOV-20
Thorium (Th)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	25	27-NOV-20
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	27-NOV-20
Titanium (Ti)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	27-NOV-20
Tungsten (W)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	27-NOV-20
Uranium (U)-Total		0.00081	0.00085		mg/L	4.7	20	27-NOV-20
Vanadium (V)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	27-NOV-20
Zinc (Zn)-Total		0.592	0.608		mg/L	2.7	20	27-NOV-20
Zirconium (Zr)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	27-NOV-20
WG3452769-2	LCS							
Aluminum (Al)-Total			103.4		%		80-120	27-NOV-20
Antimony (Sb)-Total			105.7		%		80-120	27-NOV-20
Arsenic (As)-Total			102.0		%		80-120	27-NOV-20
Barium (Ba)-Total			107.8		%		80-120	27-NOV-20
Beryllium (Be)-Total			102.6		%		80-120	27-NOV-20
Bismuth (Bi)-Total			96.0		%		80-120	27-NOV-20
Boron (B)-Total			99.5		%		80-120	27-NOV-20
Cadmium (Cd)-Total			99.9		%		80-120	27-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5299085							
WG3452769-2	LCS							
Calcium (Ca)-Total			99.8		%		80-120	27-NOV-20
Chromium (Cr)-Total			99.0		%		80-120	27-NOV-20
Cesium (Cs)-Total			101.8		%		80-120	27-NOV-20
Cobalt (Co)-Total			98.3		%		80-120	27-NOV-20
Copper (Cu)-Total			97.1		%		80-120	27-NOV-20
Iron (Fe)-Total			98.7		%		80-120	27-NOV-20
Lead (Pb)-Total			96.2		%		80-120	27-NOV-20
Lithium (Li)-Total			103.9		%		80-120	27-NOV-20
Magnesium (Mg)-Total			103.3		%		80-120	27-NOV-20
Manganese (Mn)-Total			102.1		%		80-120	27-NOV-20
Molybdenum (Mo)-Total			102.9		%		80-120	27-NOV-20
Nickel (Ni)-Total			98.4		%		80-120	27-NOV-20
Phosphorus (P)-Total			103.2		%		70-130	27-NOV-20
Potassium (K)-Total			102.8		%		80-120	27-NOV-20
Rubidium (Rb)-Total			99.3		%		80-120	27-NOV-20
Selenium (Se)-Total			101.5		%		80-120	27-NOV-20
Silicon (Si)-Total			109.1		%		60-140	27-NOV-20
Silver (Ag)-Total			101.7		%		80-120	27-NOV-20
Sodium (Na)-Total			98.4		%		80-120	27-NOV-20
Strontium (Sr)-Total			103.2		%		80-120	27-NOV-20
Sulfur (S)-Total			105.5		%		80-120	27-NOV-20
Thallium (Tl)-Total			96.1		%		80-120	27-NOV-20
Tellurium (Te)-Total			101.3		%		80-120	27-NOV-20
Thorium (Th)-Total			95.3		%		70-130	27-NOV-20
Tin (Sn)-Total			102.1		%		80-120	27-NOV-20
Titanium (Ti)-Total			100.0		%		80-120	27-NOV-20
Tungsten (W)-Total			98.8		%		80-120	27-NOV-20
Uranium (U)-Total			96.6		%		80-120	27-NOV-20
Vanadium (V)-Total			103.0		%		80-120	27-NOV-20
Zinc (Zn)-Total			97.3		%		80-120	27-NOV-20
Zirconium (Zr)-Total			100.5		%		80-120	27-NOV-20
WG3452769-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	27-NOV-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	27-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5299085							
WG3452769-1 MB								
Arsenic (As)-Total			<0.00010		mg/L		0.0001	27-NOV-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	27-NOV-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	27-NOV-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	27-NOV-20
Boron (B)-Total			<0.010		mg/L		0.01	27-NOV-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	27-NOV-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	27-NOV-20
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	27-NOV-20
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	27-NOV-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	27-NOV-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	27-NOV-20
Iron (Fe)-Total			<0.010		mg/L		0.01	27-NOV-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	27-NOV-20
Lithium (Li)-Total			<0.0010		mg/L		0.001	27-NOV-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	27-NOV-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	27-NOV-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	27-NOV-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	27-NOV-20
Phosphorus (P)-Total			<0.050		mg/L		0.05	27-NOV-20
Potassium (K)-Total			<0.050		mg/L		0.05	27-NOV-20
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	27-NOV-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	27-NOV-20
Silicon (Si)-Total			<0.10		mg/L		0.1	27-NOV-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	27-NOV-20
Sodium (Na)-Total			<0.050		mg/L		0.05	27-NOV-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	27-NOV-20
Sulfur (S)-Total			<0.50		mg/L		0.5	27-NOV-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	27-NOV-20
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	27-NOV-20
Thorium (Th)-Total			<0.00010		mg/L		0.0001	27-NOV-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	27-NOV-20
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	27-NOV-20
Tungsten (W)-Total			<0.00010		mg/L		0.0001	27-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5299085							
WG3452769-1 MB								
Uranium (U)-Total			<0.000010		mg/L		0.00001	27-NOV-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	27-NOV-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	27-NOV-20
Zirconium (Zr)-Total			<0.00020		mg/L		0.0002	27-NOV-20
WG3452769-5 MS		WG3452769-6						
Aluminum (Al)-Total			103.3		%		70-130	27-NOV-20
Antimony (Sb)-Total			99.4		%		70-130	27-NOV-20
Arsenic (As)-Total			101.3		%		70-130	27-NOV-20
Barium (Ba)-Total			N/A	MS-B	%		-	27-NOV-20
Beryllium (Be)-Total			96.7		%		70-130	27-NOV-20
Bismuth (Bi)-Total			95.5		%		70-130	27-NOV-20
Boron (B)-Total			93.9		%		70-130	27-NOV-20
Cadmium (Cd)-Total			100.4		%		70-130	27-NOV-20
Calcium (Ca)-Total			N/A	MS-B	%		-	27-NOV-20
Chromium (Cr)-Total			102.9		%		70-130	27-NOV-20
Cesium (Cs)-Total			97.2		%		70-130	27-NOV-20
Cobalt (Co)-Total			96.7		%		70-130	27-NOV-20
Copper (Cu)-Total			94.7		%		70-130	27-NOV-20
Iron (Fe)-Total			N/A	MS-B	%		-	27-NOV-20
Lead (Pb)-Total			97.5		%		70-130	27-NOV-20
Lithium (Li)-Total			88.4		%		70-130	27-NOV-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	27-NOV-20
Manganese (Mn)-Total			N/A	MS-B	%		-	27-NOV-20
Molybdenum (Mo)-Total			95.7		%		70-130	27-NOV-20
Nickel (Ni)-Total			95.3		%		70-130	27-NOV-20
Phosphorus (P)-Total			107.6		%		70-130	27-NOV-20
Potassium (K)-Total			99.8		%		70-130	27-NOV-20
Rubidium (Rb)-Total			109.6		%		70-130	27-NOV-20
Silicon (Si)-Total			N/A	MS-B	%		-	27-NOV-20
Silver (Ag)-Total			95.9		%		70-130	27-NOV-20
Sodium (Na)-Total			N/A	MS-B	%		-	27-NOV-20
Strontium (Sr)-Total			N/A	MS-B	%		-	27-NOV-20
Sulfur (S)-Total			116.1		%		70-130	27-NOV-20
Thallium (Tl)-Total			97.0		%		70-130	27-NOV-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5299085							
WG3452769-5 MS		WG3452769-6						
Tellurium (Te)-Total			92.8		%		70-130	27-NOV-20
Thorium (Th)-Total			87.0		%		70-130	27-NOV-20
Tin (Sn)-Total			96.9		%		70-130	27-NOV-20
Titanium (Ti)-Total			111.4		%		70-130	27-NOV-20
Tungsten (W)-Total			98.2		%		70-130	27-NOV-20
Uranium (U)-Total			N/A	MS-B	%		-	27-NOV-20
Vanadium (V)-Total			102.6		%		70-130	27-NOV-20
Zinc (Zn)-Total			95.9		%		70-130	27-NOV-20
Zirconium (Zr)-Total			92.0		%		70-130	27-NOV-20
P-T-COL-WT								
	Water							
Batch	R5300346							
WG3453467-3 DUP		L2534021-1						
Phosphorus, Total		0.0049	0.0044		mg/L	8.8	20	01-DEC-20
WG3453467-2 LCS								
Phosphorus, Total			96.2		%		80-120	01-DEC-20
WG3453467-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	01-DEC-20
WG3453467-4 MS		L2534021-1						
Phosphorus, Total			105.1		%		70-130	01-DEC-20
PAH-511-WT								
	Water							
Batch	R5304677							
WG3452822-2 LCS								
1-Methylnaphthalene			81.9		%		50-140	02-DEC-20
2-Methylnaphthalene			80.7		%		50-140	02-DEC-20
Acenaphthene			90.8		%		50-140	02-DEC-20
Acenaphthylene			87.4		%		50-140	02-DEC-20
Anthracene			84.7		%		50-140	02-DEC-20
Benzo(a)anthracene			97.5		%		50-140	02-DEC-20
Benzo(a)pyrene			84.6		%		50-140	02-DEC-20
Benzo(b)fluoranthene			82.3		%		50-140	02-DEC-20
Benzo(g,h,i)perylene			91.9		%		50-140	02-DEC-20
Benzo(k)fluoranthene			87.9		%		50-140	02-DEC-20
Chrysene			87.4		%		50-140	02-DEC-20
Dibenzo(ah)anthracene			94.0		%		50-140	02-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT		Water						
Batch	R5304677							
WG3452822-2	LCS							
Fluoranthene			94.2		%		50-140	02-DEC-20
Fluorene			93.4		%		50-140	02-DEC-20
Indeno(1,2,3-cd)pyrene			106.2		%		50-140	02-DEC-20
Naphthalene			84.6		%		50-140	02-DEC-20
Phenanthrene			94.8		%		50-140	02-DEC-20
Pyrene			93.8		%		50-140	02-DEC-20
WG3452822-1	MB							
1-Methylnaphthalene			<0.020		ug/L		0.02	02-DEC-20
2-Methylnaphthalene			<0.020		ug/L		0.02	02-DEC-20
Acenaphthene			<0.020		ug/L		0.02	02-DEC-20
Acenaphthylene			<0.020		ug/L		0.02	02-DEC-20
Anthracene			<0.020		ug/L		0.02	02-DEC-20
Benzo(a)anthracene			<0.020		ug/L		0.02	02-DEC-20
Benzo(a)pyrene			<0.010		ug/L		0.01	02-DEC-20
Benzo(b)fluoranthene			<0.020		ug/L		0.02	02-DEC-20
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	02-DEC-20
Benzo(k)fluoranthene			<0.020		ug/L		0.02	02-DEC-20
Chrysene			<0.020		ug/L		0.02	02-DEC-20
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	02-DEC-20
Fluoranthene			<0.020		ug/L		0.02	02-DEC-20
Fluorene			<0.020		ug/L		0.02	02-DEC-20
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	02-DEC-20
Naphthalene			<0.050		ug/L		0.05	02-DEC-20
Phenanthrene			<0.020		ug/L		0.02	02-DEC-20
Pyrene			<0.020		ug/L		0.02	02-DEC-20
Surrogate: d8-Naphthalene			97.3		%		60-140	02-DEC-20
Surrogate: d10-Phenanthrene			103		%		60-140	02-DEC-20
Surrogate: d12-Chrysene			104.8		%		60-140	02-DEC-20
Surrogate: d10-Acenaphthene			102.2		%		60-140	02-DEC-20
PCB-511-WT		Water						
Batch	R5299149							
WG3452848-2	LCS							
Aroclor 1242			103.3		%		60-140	27-NOV-20
Aroclor 1248			86.9		%		60-140	27-NOV-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PCB-511-WT		Water						
Batch	R5299149							
WG3452848-2	LCS							
Aroclor 1254			98.4		%		60-140	27-NOV-20
Aroclor 1260			91.1		%		60-140	27-NOV-20
WG3452848-1	MB							
Aroclor 1242			<0.020		ug/L		0.02	27-NOV-20
Aroclor 1248			<0.020		ug/L		0.02	27-NOV-20
Aroclor 1254			<0.020		ug/L		0.02	27-NOV-20
Aroclor 1260			<0.020		ug/L		0.02	27-NOV-20
Surrogate: Decachlorobiphenyl			82.5		%		50-150	27-NOV-20
Surrogate: Tetrachloro-m-xylene			73.8		%		50-150	27-NOV-20
VOC-511-HS-WT		Water						
Batch	R5300163							
WG3454412-4	DUP		WG3454412-3					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	01-DEC-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	01-DEC-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	01-DEC-20
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	01-DEC-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	01-DEC-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	01-DEC-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5300163							
WG3454412-4	DUP	WG3454412-3						
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	01-DEC-20
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	01-DEC-20
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	01-DEC-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	01-DEC-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	01-DEC-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	01-DEC-20
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	01-DEC-20
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	01-DEC-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	01-DEC-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	01-DEC-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	01-DEC-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	01-DEC-20
WG3454412-1	LCS							
1,1,1,2-Tetrachloroethane			95.1		%		70-130	01-DEC-20
1,1,2,2-Tetrachloroethane			88.9		%		70-130	01-DEC-20
1,1,1-Trichloroethane			99.6		%		70-130	01-DEC-20
1,1,2-Trichloroethane			93.2		%		70-130	01-DEC-20
1,1-Dichloroethane			96.1		%		70-130	01-DEC-20
1,1-Dichloroethylene			97.3		%		70-130	01-DEC-20
1,2-Dibromoethane			92.4		%		70-130	01-DEC-20
1,2-Dichlorobenzene			102.8		%		70-130	01-DEC-20
1,2-Dichloroethane			92.7		%		70-130	01-DEC-20
1,2-Dichloropropane			96.7		%		70-130	01-DEC-20
1,3-Dichlorobenzene			99.0		%		70-130	01-DEC-20
1,4-Dichlorobenzene			98.1		%		70-130	01-DEC-20
Acetone			99.4		%		60-140	01-DEC-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5300163							
WG3454412-1	LCS							
Benzene			95.3		%		70-130	01-DEC-20
Bromodichloromethane			101.4		%		70-130	01-DEC-20
Bromoform			94.2		%		70-130	01-DEC-20
Bromomethane			90.3		%		60-140	01-DEC-20
Carbon tetrachloride			102.6		%		70-130	01-DEC-20
Chlorobenzene			98.9		%		70-130	01-DEC-20
Chloroform			98.5		%		70-130	01-DEC-20
cis-1,2-Dichloroethylene			98.2		%		70-130	01-DEC-20
cis-1,3-Dichloropropene			90.0		%		70-130	01-DEC-20
Dibromochloromethane			91.0		%		70-130	01-DEC-20
Dichlorodifluoromethane			73.2		%		50-140	01-DEC-20
Ethylbenzene			98.7		%		70-130	01-DEC-20
n-Hexane			92.2		%		70-130	01-DEC-20
m+p-Xylenes			100.7		%		70-130	01-DEC-20
Methyl Ethyl Ketone			95.4		%		60-140	01-DEC-20
Methyl Isobutyl Ketone			87.2		%		60-140	01-DEC-20
Methylene Chloride			96.0		%		70-130	01-DEC-20
MTBE			102.6		%		70-130	01-DEC-20
o-Xylene			108.0		%		70-130	01-DEC-20
Styrene			98.2		%		70-130	01-DEC-20
Tetrachloroethylene			95.3		%		70-130	01-DEC-20
Toluene			96.6		%		70-130	01-DEC-20
trans-1,2-Dichloroethylene			95.7		%		70-130	01-DEC-20
trans-1,3-Dichloropropene			91.6		%		70-130	01-DEC-20
Trichloroethylene			99.5		%		70-130	01-DEC-20
Trichlorofluoromethane			98.3		%		60-140	01-DEC-20
Vinyl chloride			95.8		%		60-140	01-DEC-20
WG3454412-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	01-DEC-20
1,1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	01-DEC-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	01-DEC-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	01-DEC-20
1,1-Dichloroethane			<0.50		ug/L		0.5	01-DEC-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	01-DEC-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5300163							
WG3454412-2 MB								
1,2-Dibromoethane			<0.20		ug/L		0.2	01-DEC-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	01-DEC-20
1,2-Dichloroethane			<0.50		ug/L		0.5	01-DEC-20
1,2-Dichloropropane			<0.50		ug/L		0.5	01-DEC-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	01-DEC-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	01-DEC-20
Acetone			<30		ug/L		30	01-DEC-20
Benzene			<0.50		ug/L		0.5	01-DEC-20
Bromodichloromethane			<2.0		ug/L		2	01-DEC-20
Bromoform			<5.0		ug/L		5	01-DEC-20
Bromomethane			<0.50		ug/L		0.5	01-DEC-20
Carbon tetrachloride			<0.20		ug/L		0.2	01-DEC-20
Chlorobenzene			<0.50		ug/L		0.5	01-DEC-20
Chloroform			<1.0		ug/L		1	01-DEC-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	01-DEC-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	01-DEC-20
Dibromochloromethane			<2.0		ug/L		2	01-DEC-20
Dichlorodifluoromethane			<2.0		ug/L		2	01-DEC-20
Ethylbenzene			<0.50		ug/L		0.5	01-DEC-20
n-Hexane			<0.50		ug/L		0.5	01-DEC-20
m+p-Xylenes			<0.40		ug/L		0.4	01-DEC-20
Methyl Ethyl Ketone			<20		ug/L		20	01-DEC-20
Methyl Isobutyl Ketone			<20		ug/L		20	01-DEC-20
Methylene Chloride			<5.0		ug/L		5	01-DEC-20
MTBE			<2.0		ug/L		2	01-DEC-20
o-Xylene			<0.30		ug/L		0.3	01-DEC-20
Styrene			<0.50		ug/L		0.5	01-DEC-20
Tetrachloroethylene			<0.50		ug/L		0.5	01-DEC-20
Toluene			<0.50		ug/L		0.5	01-DEC-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	01-DEC-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	01-DEC-20
Trichloroethylene			<0.50		ug/L		0.5	01-DEC-20
Trichlorofluoromethane			<5.0		ug/L		5	01-DEC-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT		Water						
Batch	R5300163							
WG3454412-2	MB							
Vinyl chloride			<0.50		ug/L		0.5	01-DEC-20
Surrogate: 1,4-Difluorobenzene			102.1		%		70-130	01-DEC-20
Surrogate: 4-Bromofluorobenzene			93.4		%		70-130	01-DEC-20
WG3454412-5	MS	WG3454412-3						
1,1,1,2-Tetrachloroethane			97.2		%		50-140	01-DEC-20
1,1,2,2-Tetrachloroethane			72.3		%		50-140	01-DEC-20
1,1,1-Trichloroethane			100.6		%		50-140	01-DEC-20
1,1,2-Trichloroethane			91.9		%		50-140	01-DEC-20
1,1-Dichloroethane			96.9		%		50-140	01-DEC-20
1,1-Dichloroethylene			94.8		%		50-140	01-DEC-20
1,2-Dibromoethane			89.3		%		50-140	01-DEC-20
1,2-Dichlorobenzene			101.9		%		50-140	01-DEC-20
1,2-Dichloroethane			92.8		%		50-140	01-DEC-20
1,2-Dichloropropane			97.9		%		50-140	01-DEC-20
1,3-Dichlorobenzene			110.2		%		50-140	01-DEC-20
1,4-Dichlorobenzene			106.4		%		50-140	01-DEC-20
Acetone			89.2		%		50-140	01-DEC-20
Benzene			95.8		%		50-140	01-DEC-20
Bromodichloromethane			102.8		%		50-140	01-DEC-20
Bromoform			89.2		%		50-140	01-DEC-20
Bromomethane			87.0		%		50-140	01-DEC-20
Carbon tetrachloride			102.9		%		50-140	01-DEC-20
Chlorobenzene			98.7		%		50-140	01-DEC-20
Chloroform			99.7		%		50-140	01-DEC-20
cis-1,2-Dichloroethylene			98.1		%		50-140	01-DEC-20
cis-1,3-Dichloropropene			88.7		%		50-140	01-DEC-20
Dibromochloromethane			89.8		%		50-140	01-DEC-20
Dichlorodifluoromethane			64.1		%		50-140	01-DEC-20
Ethylbenzene			99.4		%		50-140	01-DEC-20
n-Hexane			89.7		%		50-140	01-DEC-20
m+p-Xylenes			100.9		%		50-140	01-DEC-20
Methyl Ethyl Ketone			84.0		%		50-140	01-DEC-20
Methyl Isobutyl Ketone			75.1		%		50-140	01-DEC-20
Methylene Chloride			95.9		%		50-140	01-DEC-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	Water							
Batch	R5300163							
WG3454412-5 MS		WG3454412-3						
MTBE			102.9		%		50-140	01-DEC-20
o-Xylene			108.6		%		50-140	01-DEC-20
Styrene			98.8		%		50-140	01-DEC-20
Tetrachloroethylene			94.1		%		50-140	01-DEC-20
Toluene			95.4		%		50-140	01-DEC-20
trans-1,2-Dichloroethylene			94.2		%		50-140	01-DEC-20
trans-1,3-Dichloropropene			89.7		%		50-140	01-DEC-20
Trichloroethylene			99.9		%		50-140	01-DEC-20
Trichlorofluoromethane			95.3		%		50-140	01-DEC-20
Vinyl chloride			90.4		%		50-140	01-DEC-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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Legend:

Limit ALS Control Limit (Data Quality Objectives)
DUP Duplicate
RPD Relative Percent Difference
N/A Not Available
LCS Laboratory Control Sample
SRM Standard Reference Material
MS Matrix Spike
MSD Matrix Spike Duplicate
ADE Average Desorption Efficiency
MB Method Blank
IRM Internal Reference Material
CRM Certified Reference Material
CCV Continuing Calibration Verification
CVS Calibration Verification Standard
LCSD Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
SURQC	Surrogate recovery marginally exceeded DQO in QC sample (MB, LCS, RM, or MS). Surrogates are less important for QC samples than for test samples. Refer to regular (non-surrogate) analyte results in affected QC sample for assessment of potential impacts to those analytes.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

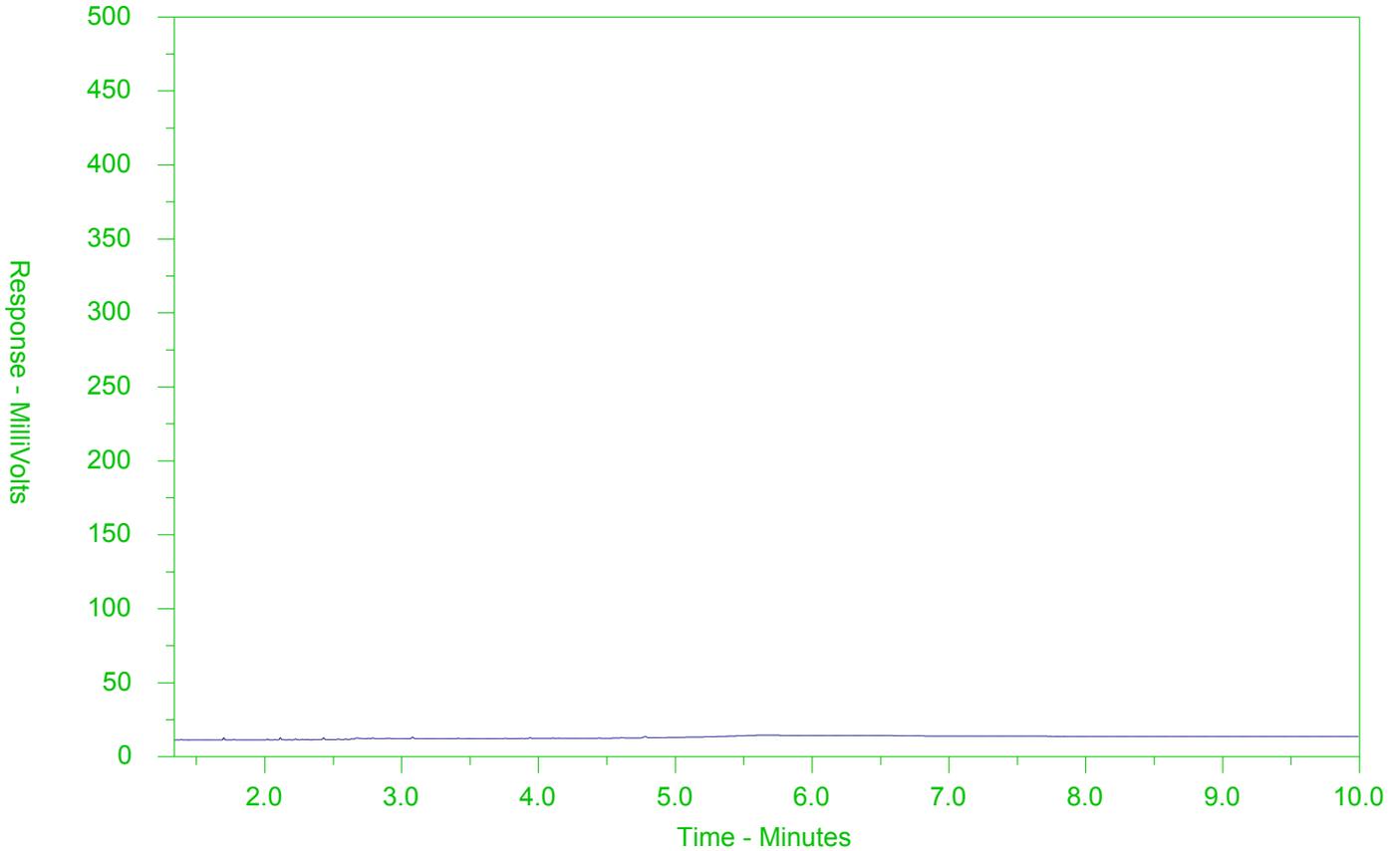
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2534021-1
 Client Sample ID: W-11210029-20201126-54



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.



about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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Appendix C

MECP Comments on the HIA Report and Responses

Memorandum

Date: January 25, 2021

To: Lynnette Armour, Senior Environmental Officer – Guelph District Office

From: Pam Grande, Hydrogeologist – West Central Region

Re: **Review of Hydrogeological Impact Assessment in support of ECAs for Waste Processing and Industrial Sewage Works (Stormwater) for Badger Hydrovac and Daylighting Services Facility**

In preparation of this memorandum I have reviewed the following document:

- Report titled: Hydrogeologic Impact Assessment for the Badger Hydrovac and Daylighting Services Facility (in Support of an ECA). Prepared for 2374868 Ontario Inc. by GHD (dated December 16, 2020).

I have also referred to the following documents in the course of this review:

- Report titled: Stormwater Management Plan Application for an Industrial Sewage Works – Stormwater Environmental Compliance Approval. Prepared for 2374868 Ontario Inc. by GHD (dated December 21, 2020).
- Pre-Consultation Summary. Prepared for 2374868 Ontario Inc. by GHD (emailed to MECP on October 15, 2020).

Background:

I have reviewed the Hydrogeological Impact Assessment report prepared by GHD for the site located at 6678 Wellington Road 34, Wellington County. The Hydrogeological Impact Assessment report was prepared in support of Environmental Compliance Approvals (ECA) applications for Waste Processing and Industrial Sewage Works - Stormwater. I previously provided preliminary comments to the Guelph District Office regarding the Pre-Consultation Summary document prepared by GHD and submitted to the MECP via email on October 5, 2020.

2374868 Ontario Inc. operates a hydrovac soil processing facility at the site under the trade name Badger Hydrovac and Daylighting Services (Badger). Badger dispatches trucks to and from the facility to perform hydrovac services at multiple sites across Southern Ontario. Hydrovac services involve removing subsurface soils by mixing soil with potable water to develop a liquid soil slurry

that is pumped into the trucks and then transported to the site for processing. The wet soil is stockpiled at the site and the water drains off the soil by gravity drainage.

The property where the site is located is divided by zoning into two sections: a northern section zoned as Extractive Industrial and a southern section zoned as Agriculture. The southern one third of the property is currently used for an equestrian stable and riding grounds. The northern two thirds of the property is currently an aggregate pit rehabilitation area under Ministry of Natural Resources and Forestry (MNRF) Aggregate Resources Act (ARA) license No. 20085 operated by Capital Paving Inc. (Wellington Pit #5). Badger's site facility and operations are situated within the northern section zoned for extraction.

The adjacent land use to the west is an aggregate extraction pit (part of the ARA license No. 20085), to the north is agricultural land, to the east is forested conservation land owned by the County of Wellington, and to the south across Wellington Road 34 are residential and agricultural lands.

Soil Processing:

Based on the available information, pending sampling and analysis, the majority of dried stockpiled soil is used for rehabilitation/filling of the former aggregate pit in accordance with the approved ARA licence rehabilitation plan. Badger has been conducting sampling of stockpiled soil on a weekly basis since 2014 as part of the screening protocol for soil processing. According to the information provided, Badger's hydrovac services are not conducted at sites with known soil or groundwater impacts. Badger staff screen soils in the field for visual and olfactory evidence of contamination. In general, soil is not retained on site for longer than 5 weeks at any time, and soils that exceed the MECP's Table 1 – Full Depth Background Site Condition Standards for Residential/ Parkland/ Institutional/ Industrial/ Commercial/ Community Property Use for Coarse Textured Soils, are segregated and transported to an off-site MECP permitted disposal facility.

Existing Site Drainage:

The existing drainage system for the site consists of a vegetated swale which runs east to west and drains into an on-site stormwater management (SWM) pond located at the west-central property boundary. The swale and pond collect the drainage from the soil stockpiles in addition to overland stormwater runoff in the area. Figure 3 of the Storm Water Management report displays the catchment delineation areas at the property. There is also a natural pond located in the northern area of the site which collects overland runoff in that area of the property. There are no direct point source discharges of stormwater or outfalls from the property to off-site areas. It is noted that Badger is not proposing any new drainage works for the site. Badger will be submitting the application to obtain an ECA for sewage works for the existing SWM system at the site (vegetated swale and SWM pond).

Comments and Recommendations:

The intent of the proceeding review is to provide comments and recommendations regarding the above referenced document from a hydrogeological perspective to the Guelph District Office. The following review comments may be forwarded to the technical consultant.

Hydrogeological Setting:

1. The site is situated with Horseshoe Moraines physiographic region. MNRF mapping identified surficial geology at the site to be ice-contact stratified deposits of a mixture of sand, gravel, silt, sandy silt and some clay/silt layers/seams. Conceptually, GHD has described three hydrostratigraphic units at the site: an upper water bearing ice-contact stratified unit where the water table aquifer is found, a deeper overburden aquifer which may be present separated by a confining unit of silt and/or clay deposits, and an underlying bedrock aquifer comprised of the Guelph Formation. According to MECP GIS mapping, the thickness of overburden in the area is approximately 22 to 33 metres.
2. The consultant installed three monitoring wells in the overburden to evaluate whether there is an impact to the water table aquifer as a result of the soil drainage operations and to determine hydraulic characteristics of the site overburden soils. GHD installed two monitoring wells downgradient of the site operations, MW1-20 and MW2-20, and one monitoring well upgradient (background) of the site operations, MW3-20. According to borehole log information, the monitoring wells were installed at depths between 12.2 to 14.3. meters below ground surface within the ice-contact stratified deposits. GHD describes surficial native soils as consisting of layers of sandy silt, silty sand and sand in borehole logs which was consistent with MNRF surficial geology mapping.

The depth to water table was reported to be approximately 7 to 10 metres below ground surface at the site. GHD interpreted that the shallow groundwater flow direction within the overburden to the south-southwest towards. GHD estimated the geometric mean hydraulic conductivity to be 5.8×10^{-4} cm/sec from in situ testing and predicted vertical hydraulic conductivity of 5.8×10^{-5} cm/sec . The average groundwater flow velocity was estimated to be 11 metres/year.

3. On-site surface water features include a vegetated swale which drains to the west to the on-site SWM pond. According to MNRF mapping, the site surficial soils infiltration rate is considered high, and therefore, there is a lower potential for runoff. Site conditions support MNRF mapping and indicate a prevalence of sand and gravels deposits in the shallow overburden and a several metre depth to the water table below grade. As the SWM pond does not have an outlet, it is inferred that the water is lost primarily through infiltration to the subsurface and to a lesser extent by evapotranspiration.

Potential Receptors:

4. Residents within the Township of Puslinch rely on groundwater wells for potable drinking water as the area is not serviced by municipal water supply. The deep overburden and shallow bedrock aquifers are the significant sources of water supply for domestic water wells in the area. The consultant conducted a desktop private water well survey, and completed on-site reconnaissance to confirm water wells on the property. GHD prepared a separate Water Well Record Search Update memorandum included in Appendix D of the Hydrogeological Impact Assessment report. GHD concluded that there are two active

water wells on the property (WWR# 6705884 and WWR# 670620). WWR# 6705884 is identified as an agricultural well for livestock screened in the deep overburden at 30.8 metres below ground surface. WWR# 670620 is identified as the “site supply well” and is completed as an open hole in bedrock at 24.1 metres below ground surface. GHD indicated that the site supply well is used primarily to fill hydrovac trucks for use at sites.

GHD did not conduct a door-to-door private water well survey for the residential properties and relied on the MECP WWR database for well installation information. GHD concluded there are approximately 13 off-site private WWRs within a 200 metre radius around the property boundary, which extends approximately 500 metres from the area of Badger’s site operations. In general, the WWRs indicated that the private wells were for potable purposes and are screened within the deep overburden or shallow bedrock aquifer at depths ranging from 26.8 metres to 59.1 metres from the ground surface. Although, the current use status of the private water wells were not verified by GHD with the residents, the fact that there is no municipal supply would suggest that some or possibly all of the resident rely on these wells for potable water supply.

5. The regional bedrock aquifer unit within the Guelph Formation is utilized by the City of Cambridge and the City of Guelph for municipal water supply. It is noted that the subject property is located within the Well Head Protection Area (WHPA) – D of the City of Cambridge’s Hespeler and Pinebush well fields, representing the 25 year time of travel for a contaminant to reach the well field. The Hespeler and Pinebush well fields are located about 3.8 and 4.7 kilometres southwest of the property, respectively.

Groundwater Impact Assessment:

6. GHD provided groundwater sampling analysis results in Table 4.1 of the hydrogeological impact assessment report for MW1-20, MW2-20 and MW3-20, for sampling events conducted in November and December 2020. GHD provided groundwater sampling analysis results for site supply wells WWR# 6705884 and WWR# 670620 from three sampling events conducted during July and August 2020 in Tables 4.2 and 4.3 of the hydrogeological impact assessment report. On-site groundwater samples were analyzed for general chemistry, total and dissolved metals, volatile organic compounds (VOCs), semi-volatiles/ polycyclic aromatic hydrocarbons/base neutral extractables (SVOCs/PAHs/BNAS), total petroleum hydrocarbons (TPH) (F1 to F4), polychlorinated biphenyls (PCBs), and oil and grease. Results of the on-site groundwater sampling analysis were reported to be below Ontario Drinking Water Quality Standards and Table 2 – Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Coarse Textured Soils.
7. GHD provided surface water sampling results from the SWM pond from January 2017 to November 2020 in Table 4.4 of the hydrogeological impact assessment report. Surface water samples were analyzed for metals, VOCs, TPH (F1 to F4), and SVOCs/PAHs/BNAS. No exceedances of Provincial Water Quality Objectives (PWQOs) or Table 2 potable groundwater standards were reported.

8. GHD provided stockpiled soil sampling results from January 2017 to November 2020 in Table 1 of the Pre-Consultation Summary document. The consultant indicated that they reviewed 65 soil sample results during this sampling period and compared them to Table 1 Full Depth Background Site Condition for Coarse Textured Soils. GHD stated that there were a few slight exceedances of Table 1 soil standards over the period of sampling.
9. GHD concluded that the operations at the site are not impacting either shallow or deep groundwater based on the on-site groundwater and surface water sampling results. The consultant concluded that in absence of impacts at the on-site wells, which are directly downgradient of the site operations, the likelihood for impact to off-site private water wells is very low. Based on the information provided, this is a reasonable conclusion in my opinion.

Proposed Monitoring Program:

10. GHD proposed the following monitoring program to be conducted at the site:
 - a. *Groundwater sampling of MW1-20, MW2-20, and MW3-20, and two on-Site supply wells be monitored once per year for SVOCs/PAHs only.*
 - b. *Surface water sampling of the operations pond be monitored once per year for SVOCs/PAHs only.*
 - c. *Groundwater levels be monitored in MW1-20, MW2-20, and MW3-20 four times per year.*
 - d. *It is also proposed that a monitoring program report be prepared every 5 years and provided to MECP.*

The proposed monitoring plan is reasonable, however I recommend that the groundwater and surface water sampling be conducted at a higher frequency for the first two years to assess the seasonal changes in groundwater quality and quantity at the site. I also recommend that the parameter list be expanded to also include: VOCs, TPH and metals, in addition to SVOCs/PAHs. This will ensure that there is a comprehensive set of monitoring data for the site. I recommend that the proposed monitoring program be conducted at the site for a period of two years after which time a monitoring report shall be submitted to the MECP for review. The monitoring report should include a summary of soil stockpile sampling results over the two-year period. The monitoring report must be prepared by a Qualified Person (Hydrogeologist or Professional Engineer with relevant expertise) and include analysis and interpretation of all of the monitoring data and an updated assessment of the potential for environmental impact and a technical opinion on whether continued monitoring is necessary.

Limitations:

The purpose of the preceding review is to provide advice to the Ministry of the Environment regarding subsurface conditions based on the information provided in the above referenced documents. The conclusions, opinions and recommendations of the reviewer are based on information provided by others, except where otherwise specifically

noted. The Ministry cannot guarantee that the information that has been provided by others is accurate or complete. A lack of specific comment by the reviewer is not to be construed as endorsing the content or views expressed in the reviewed material.

I trust that this hydrogeological review is sufficient for your purposes. If you have any further comments or questions, please feel free to contact me by phone at (905) 521-7671 or by e-mail at pamela.grande@ontario.ca.

Original signed by

Pamela Grande, M.Sc., P.Geol.
Hydrogeologist

cc: Belinda Koblik, WCR Water Supervisor



February 1, 2021

Reference No. 11210029

Ms. Lynnette Armour
Senior Environmental Officer
Ontario Ministry of the Environment, Conservation and Parks
1 Stone Road West
Guelph, Ontario
N1G 4Y2

Dear Ms. Armour:

**Re: Response to MECP Technical Review Comments
Badger Daylighting & Hydrovac Services
6678 Wellington Road 34, Cambridge, Ontario (Site or Facility)**

GHD Limited (GHD) has prepared this letter, on behalf of 2374868 Ontario Inc., to provide responses to the above-referenced comments which were received in a memorandum dated January 21, 2021. The memorandum provides the MECP West Central Region's technical review of the Hydrogeological Impact Assessment (GHD, December 2020) submitted in support of ECAs for Waste Processing and Industrial Sewage Works (Stormwater) for the Facility. The review also includes the review of the Stormwater Management Plan (GHD, December 2021) and a pre-consultation summary (GHD, October 2020).

The MECP's technical reviewed provide general concurrence with the information provided in the three submittals. Based on this review, the MECP District Office requested that a response be provided to the review comments and that the response would satisfy and complete the ECA pre-consultation requirements. Therefore, 2374868 Ontario Inc./GHD also have completed the preparation of the ECA applications and this response is included in the applications. Copies of the ECA applications also are being submitted to the MECP Guelph District Office.

For convenience, the MECP's review and comments on the Proposed Monitoring Program provided in the Hydrogeological Impact Assessment Report are copied in italics below and 2374868 Ontario Inc./GHD's responses follow.

Comment

10. *GHD proposed the following monitoring program to be conducted at the site:*
- a) *Groundwater sampling of MW1-20, MW2-20, and MW3-20, and two on-Site supply wells be monitored once per year for SVOCs/PAHs only.*
 - b) *Surface water sampling of the operations pond be monitored once per year for SVOCs/PAHs only.*
 - c) *Groundwater levels be monitored in MW1-20, MW2-20, and MW3-20 four times per year.*
 - d) *It is also proposed that a monitoring program report be prepared every 5 years and provided to MECP.*



The proposed monitoring plan is reasonable, however I recommend that the groundwater and surface water sampling be conducted at a higher frequency for the first two years to assess the seasonal changes in groundwater quality and quantity at the site. I also recommend that the parameter list be expanded to also include: VOCs, TPH and metals, in addition to SVOCs/PAHs. This will ensure that there is a comprehensive set of monitoring data for the site. I recommend that the proposed monitoring program be conducted at the site for a period of two years after which time a monitoring report shall be submitted to the MECP for review. The monitoring report should include a summary of soil stockpile sampling results over the two-year period. The monitoring report must be prepared by a Qualified Person (Hydrogeologist or Professional Engineer with relevant expertise) and include analysis and interpretation of all of the monitoring data and an updated assessment of the potential for environmental impact and a technical opinion on whether continued monitoring is necessary.

Response

The monitoring program will be revised to include at a minimum monthly surface water sampling and quarterly groundwater sampling. VOCs, TPH and metals also will be added to the monitoring parameter list. After two years of monitoring a monitoring report will be prepared by a Qualified Professional which will provide a review of the data, the soil stockpiling data, an assessment of the potential for environmental impact and an opinion on whether continued monitoring is necessary. Soil and surface water sampling is currently ongoing and the groundwater monitoring program will start upon issuance of final ECAs or sooner at 2374868 Ontario Inc.'s discretion.

Please contact the undersigned if you have any questions.

Sincerely,

GHD



Fred K. Taylor, P. Eng., QP

FT/cb/1

cc: Frank Ertl, Badger Hydrovacating
Gary Lagos, GHD

Appendix D

Hydrologic Model Input and Output Files

 Modelling Existing Conditions at 2374868 Ontario Inc. in Wellington County, Ontario

```
[OPTIONS]
;;Options          Value
;;-----
FLOW_UNITS        CMS
INFILTRATION      HORTON
FLOW_ROUTING      DYNWAVE
LINK_OFFSETS      DEPTH
MIN_SLOPE         0
ALLOW_PONDING     NO
SKIP_STEADY_STATE NO
START_DATE        12/14/2020
START_TIME        00:00:00
REPORT_START_DATE 12/14/2020
REPORT_START_TIME 00:00:00
END_DATE          12/24/2020
END_TIME          00:00:00
SWEEP_START       01/01
SWEEP_END         12/31
DRY_DAYS          0
REPORT_STEP       00:01:00
WET_STEP          00:05:00
DRY_STEP          00:05:00
ROUTING_STEP      5
RULE_STEP         00:00:00
INERTIAL_DAMPING  PARTIAL
NORMAL_FLOW_LIMITED BOTH
FORCE_MAIN_EQUATION H-W
VARIABLE_STEP     0.75
LENGTHENING_STEP 0
MIN_SURFAREA     0
MAX_TRIALS        8
HEAD_TOLERANCE    0.0015
SYS_FLOW_TOL     5
LAT_FLOW_TOL     5
MINIMUM_STEP     0.5
THREADS          2
```

```
[EVAPORATION]
;;Type            Parameters
;;-----
CONSTANT          0.0
DRY_ONLY          NO
```

```
[RAINGAGES]
;;
;;Name            Type      Time   Snow   Data
;;-----
;;              Type      Intrvl Catch Source
SCS_Type_II_108.0mm_25-Year INTENSITY 0:15  1.0   TIMESERIES SCS_Type_II_108.0mm_25-Year
SCS_Type_II_120.0mm_50-Year INTENSITY 0:15  1.0   TIMESERIES SCS_Type_II_120.0mm_50-Year
SCS_Type_II_131.7mm_100-Year INTENSITY 0:15  1.0   TIMESERIES SCS_Type_II_131.7mm_100-Year
SCS_Type_II_60.1mm_2-Year INTENSITY 0:15  1.0   TIMESERIES SCS_Type_II_60.1mm_2-Year
SCS_Type_II_79.4mm_5-Year INTENSITY 0:15  1.0   TIMESERIES SCS_Type_II_79.4mm_5-Year
SCS_Type_II_92.1mm_10-Year INTENSITY 0:15  1.0   TIMESERIES SCS_Type_II_92.1mm_10-Year
```

```
[SUBCATCHMENTS]
;;
;;Name            Raingage      Outlet      Total   Pcnt.   Pcnt.   Curb   Snow
;;-----
;;              Raingage      Outlet      Area    Imperv  Width  Slope  Length Pack
A101             SCS_Type_II_60.1mm_2-Year J1  2.1578  3       92.609  0.6   0
A102             SCS_Type_II_60.1mm_2-Year J1  3.7199  0       119.611 4.4   0
A103             SCS_Type_II_60.1mm_2-Year Pond 6.8533  0       117.754 7.7   0
```

```
[SUBAREAS]
;;Subcatchment  N-Imperv  N-Perv    S-Imperv  S-Perv    PctZero  RouteTo  PctRouted
;;-----
A101            0.013    0.24     2.5       5          25       OUTLET
A102            0.013    0.24     2.5       5          25       OUTLET
A103            0.013    0.24     2.5       5          25       OUTLET
```

```
[INFILTRATION]
;;Subcatchment  MaxRate   MinRate   Decay    DryTime   MaxInfil
;;-----
A101            76.2     29.97    4        7         0
A102            76.2     29.97    4        7         0
A103            76.2     29.97    4        7         0
```

```
[JUNCTIONS]
;;
;;Name            Invert    Max.      Init.     Surcharge  Ponded
;;-----
;;              Elev.     Depth    Depth    Depth     Area
J1              320      1         0         0         0
```

J2 315 1 0 0 0

[OUTFALLS]

```

;;
;;Name      Invert      Outfall      Stage/Table      Tide
;;Elev.     Type         Time Series  Gate Route To
;;-----
OF1        312.75      FREE         NO

```

[STORAGE]

```

;;
;;Name      Invert      Max.      Init.      Storage      Curve      Evap.
;;Elev.     Depth      Depth     Curve      Params      Frac.
Infiltration parameters
;;-----
Pond        306        6.75      3          TABULAR     Pond        0        0

```

[CONDUITS]

```

;;
;;Name      Inlet      Outlet      Length      Manning      Inlet      Outlet      Init.      Max.
;;Node      Node       Node       N           N           Offset    Offset     Flow      Flow
;;-----
C1          J1         J2          259.963     0.035       0         0         0         0
C2          J2         Pond        62.057      0.035       0         3         0         0
C3          Pond       OF1         62.953      0.013       6.75      0         0         0

```

[XSECTIONS]

```

;;Link      Shape      Geom1      Geom2      Geom3      Geom4      Barrels
;;-----
C1          TRAPEZOIDAL 0.5        2.5        3          3          1
C2          TRAPEZOIDAL 0.5        2.5        3          3          1
C3          CIRCULAR    1          0          0          0          1

```

[LOSSES]

```

;;Link      Inlet      Outlet      Average      Flap Gate      SeepageRate
;;-----

```

[CURVES]

```

;;Name      Type      X-Value      Y-Value
;;-----
Pond        Storage  0            557.65
Pond        Storage  0.25         1612.55
Pond        Storage  0.5          2054.09
Pond        Storage  0.75         2377.35
Pond        Storage  1            2680.36
Pond        Storage  1.25         2962.13
Pond        Storage  1.5          3228.01
Pond        Storage  1.75         3505
Pond        Storage  2            3796.64
Pond        Storage  2.25         4135.53
Pond        Storage  2.5          4539.54
Pond        Storage  2.75         5008.67
Pond        Storage  3            5542.92
Pond        Storage  3.25         6257.42
Pond        Storage  3.5          7018.79
Pond        Storage  3.75         7452.46
Pond        Storage  4            7910.46
Pond        Storage  4.25         8257.16
Pond        Storage  4.5          8613.42
Pond        Storage  4.75         8938.36
Pond        Storage  5            9271.18
Pond        Storage  5.25         9613.69
Pond        Storage  5.5          9963.99
Pond        Storage  5.75         10340.57
Pond        Storage  6            10729.41
Pond        Storage  6.25         11144.04
Pond        Storage  6.5          11574.24
Pond        Storage  6.75         12368.73

```

[TIMESERIES]

```

;;Name      Date      Time      Value
;;-----
;SCS_Type_II_108.0mm design storm, total rainfall = 108.0 mm, rain units = mm/hr.
SCS_Type_II_108.0mm_25-Year 0:00 1.188
SCS_Type_II_108.0mm_25-Year 0:15 1.188
SCS_Type_II_108.0mm_25-Year 0:30 1.188
SCS_Type_II_108.0mm_25-Year 0:45 1.188
SCS_Type_II_108.0mm_25-Year 1:00 1.188
SCS_Type_II_108.0mm_25-Year 1:15 1.188
SCS_Type_II_108.0mm_25-Year 1:30 1.188
SCS_Type_II_108.0mm_25-Year 1:45 1.188
SCS_Type_II_108.0mm_25-Year 2:00 1.404
SCS_Type_II_108.0mm_25-Year 2:15 1.404
SCS_Type_II_108.0mm_25-Year 2:30 1.404
SCS_Type_II_108.0mm_25-Year 2:45 1.404
SCS_Type_II_108.0mm_25-Year 3:00 1.404

```

SCS_Type_II_108.0mm_25-Year	3:15	1.404
SCS_Type_II_108.0mm_25-Year	3:30	1.404
SCS_Type_II_108.0mm_25-Year	3:45	1.404
SCS_Type_II_108.0mm_25-Year	4:00	1.728
SCS_Type_II_108.0mm_25-Year	4:15	1.728
SCS_Type_II_108.0mm_25-Year	4:30	1.728
SCS_Type_II_108.0mm_25-Year	4:45	1.728
SCS_Type_II_108.0mm_25-Year	5:00	1.728
SCS_Type_II_108.0mm_25-Year	5:15	1.728
SCS_Type_II_108.0mm_25-Year	5:30	1.728
SCS_Type_II_108.0mm_25-Year	5:45	1.728
SCS_Type_II_108.0mm_25-Year	6:00	1.944
SCS_Type_II_108.0mm_25-Year	6:15	1.944
SCS_Type_II_108.0mm_25-Year	6:30	1.944
SCS_Type_II_108.0mm_25-Year	6:45	1.944
SCS_Type_II_108.0mm_25-Year	7:00	2.376
SCS_Type_II_108.0mm_25-Year	7:15	2.376
SCS_Type_II_108.0mm_25-Year	7:30	2.376
SCS_Type_II_108.0mm_25-Year	7:45	2.376
SCS_Type_II_108.0mm_25-Year	8:00	2.808
SCS_Type_II_108.0mm_25-Year	8:15	2.808
SCS_Type_II_108.0mm_25-Year	8:30	3.024
SCS_Type_II_108.0mm_25-Year	8:45	3.024
SCS_Type_II_108.0mm_25-Year	9:00	3.456
SCS_Type_II_108.0mm_25-Year	9:15	3.456
SCS_Type_II_108.0mm_25-Year	9:30	3.888
SCS_Type_II_108.0mm_25-Year	9:45	3.888
SCS_Type_II_108.0mm_25-Year	10:00	4.968
SCS_Type_II_108.0mm_25-Year	10:15	4.968
SCS_Type_II_108.0mm_25-Year	10:30	6.696
SCS_Type_II_108.0mm_25-Year	10:45	6.696
SCS_Type_II_108.0mm_25-Year	11:00	10.368
SCS_Type_II_108.0mm_25-Year	11:15	10.368
SCS_Type_II_108.0mm_25-Year	11:30	31.968
SCS_Type_II_108.0mm_25-Year	11:45	132.192
SCS_Type_II_108.0mm_25-Year	12:00	15.552
SCS_Type_II_108.0mm_25-Year	12:15	15.552
SCS_Type_II_108.0mm_25-Year	12:30	7.992
SCS_Type_II_108.0mm_25-Year	12:45	7.992
SCS_Type_II_108.0mm_25-Year	13:00	5.832
SCS_Type_II_108.0mm_25-Year	13:15	5.832
SCS_Type_II_108.0mm_25-Year	13:30	4.536
SCS_Type_II_108.0mm_25-Year	13:45	4.536
SCS_Type_II_108.0mm_25-Year	14:00	3.24
SCS_Type_II_108.0mm_25-Year	14:15	3.24
SCS_Type_II_108.0mm_25-Year	14:30	3.24
SCS_Type_II_108.0mm_25-Year	14:45	3.24
SCS_Type_II_108.0mm_25-Year	15:00	3.24
SCS_Type_II_108.0mm_25-Year	15:15	3.24
SCS_Type_II_108.0mm_25-Year	15:30	3.24
SCS_Type_II_108.0mm_25-Year	15:45	3.24
SCS_Type_II_108.0mm_25-Year	16:00	1.944
SCS_Type_II_108.0mm_25-Year	16:15	1.944
SCS_Type_II_108.0mm_25-Year	16:30	1.944
SCS_Type_II_108.0mm_25-Year	16:45	1.944
SCS_Type_II_108.0mm_25-Year	17:00	1.944
SCS_Type_II_108.0mm_25-Year	17:15	1.944
SCS_Type_II_108.0mm_25-Year	17:30	1.944
SCS_Type_II_108.0mm_25-Year	17:45	1.944
SCS_Type_II_108.0mm_25-Year	18:00	1.944
SCS_Type_II_108.0mm_25-Year	18:15	1.944
SCS_Type_II_108.0mm_25-Year	18:30	1.944
SCS_Type_II_108.0mm_25-Year	18:45	1.944
SCS_Type_II_108.0mm_25-Year	19:00	1.944
SCS_Type_II_108.0mm_25-Year	19:15	1.944
SCS_Type_II_108.0mm_25-Year	19:30	1.944
SCS_Type_II_108.0mm_25-Year	19:45	1.944
SCS_Type_II_108.0mm_25-Year	20:00	1.296
SCS_Type_II_108.0mm_25-Year	20:15	1.296
SCS_Type_II_108.0mm_25-Year	20:30	1.296
SCS_Type_II_108.0mm_25-Year	20:45	1.296
SCS_Type_II_108.0mm_25-Year	21:00	1.296
SCS_Type_II_108.0mm_25-Year	21:15	1.296
SCS_Type_II_108.0mm_25-Year	21:30	1.296
SCS_Type_II_108.0mm_25-Year	21:45	1.296
SCS_Type_II_108.0mm_25-Year	22:00	1.296
SCS_Type_II_108.0mm_25-Year	22:15	1.296
SCS_Type_II_108.0mm_25-Year	22:30	1.296
SCS_Type_II_108.0mm_25-Year	22:45	1.296
SCS_Type_II_108.0mm_25-Year	23:00	1.296
SCS_Type_II_108.0mm_25-Year	23:15	1.296
SCS_Type_II_108.0mm_25-Year	23:30	1.296
SCS_Type_II_108.0mm_25-Year	23:45	1.296

;SCS_Type_II_120.0mm design storm, total rainfall = 120.0 mm, rain units = mm/hr.

SCS_Type II 120.0mm 50-Year	0:00	1.32
SCS_Type II 120.0mm 50-Year	0:15	1.32
SCS_Type II 120.0mm 50-Year	0:30	1.32
SCS_Type II 120.0mm 50-Year	0:45	1.32
SCS_Type II 120.0mm 50-Year	1:00	1.32
SCS_Type II 120.0mm 50-Year	1:15	1.32
SCS_Type II 120.0mm 50-Year	1:30	1.32
SCS_Type II 120.0mm 50-Year	1:45	1.32
SCS_Type II 120.0mm 50-Year	2:00	1.56
SCS_Type II 120.0mm 50-Year	2:15	1.56
SCS_Type II 120.0mm 50-Year	2:30	1.56
SCS_Type II 120.0mm 50-Year	2:45	1.56
SCS_Type II 120.0mm 50-Year	3:00	1.56
SCS_Type II 120.0mm 50-Year	3:15	1.56
SCS_Type II 120.0mm 50-Year	3:30	1.56
SCS_Type II 120.0mm 50-Year	3:45	1.56
SCS_Type II 120.0mm 50-Year	4:00	1.92
SCS_Type II 120.0mm 50-Year	4:15	1.92
SCS_Type II 120.0mm 50-Year	4:30	1.92
SCS_Type II 120.0mm 50-Year	4:45	1.92
SCS_Type II 120.0mm 50-Year	5:00	1.92
SCS_Type II 120.0mm 50-Year	5:15	1.92
SCS_Type II 120.0mm 50-Year	5:30	1.92
SCS_Type II 120.0mm 50-Year	5:45	1.92
SCS_Type II 120.0mm 50-Year	6:00	2.16
SCS_Type II 120.0mm 50-Year	6:15	2.16
SCS_Type II 120.0mm 50-Year	6:30	2.16
SCS_Type II 120.0mm 50-Year	6:45	2.16
SCS_Type II 120.0mm 50-Year	7:00	2.64
SCS_Type II 120.0mm 50-Year	7:15	2.64
SCS_Type II 120.0mm 50-Year	7:30	2.64
SCS_Type II 120.0mm 50-Year	7:45	2.64
SCS_Type II 120.0mm 50-Year	8:00	3.12
SCS_Type II 120.0mm 50-Year	8:15	3.12
SCS_Type II 120.0mm 50-Year	8:30	3.36
SCS_Type II 120.0mm 50-Year	8:45	3.36
SCS_Type II 120.0mm 50-Year	9:00	3.84
SCS_Type II 120.0mm 50-Year	9:15	3.84
SCS_Type II 120.0mm 50-Year	9:30	4.32
SCS_Type II 120.0mm 50-Year	9:45	4.32
SCS_Type II 120.0mm 50-Year	10:00	5.52
SCS_Type II 120.0mm 50-Year	10:15	5.52
SCS_Type II 120.0mm 50-Year	10:30	7.44
SCS_Type II 120.0mm 50-Year	10:45	7.44
SCS_Type II 120.0mm 50-Year	11:00	11.52
SCS_Type II 120.0mm 50-Year	11:15	11.52
SCS_Type II 120.0mm 50-Year	11:30	35.52
SCS_Type II 120.0mm 50-Year	11:45	146.88
SCS_Type II 120.0mm 50-Year	12:00	17.28
SCS_Type II 120.0mm 50-Year	12:15	17.28
SCS_Type II 120.0mm 50-Year	12:30	8.88
SCS_Type II 120.0mm 50-Year	12:45	8.88
SCS_Type II 120.0mm 50-Year	13:00	6.48
SCS_Type II 120.0mm 50-Year	13:15	6.48
SCS_Type II 120.0mm 50-Year	13:30	5.04
SCS_Type II 120.0mm 50-Year	13:45	5.04
SCS_Type II 120.0mm 50-Year	14:00	3.6
SCS_Type II 120.0mm 50-Year	14:15	3.6
SCS_Type II 120.0mm 50-Year	14:30	3.6
SCS_Type II 120.0mm 50-Year	14:45	3.6
SCS_Type II 120.0mm 50-Year	15:00	3.6
SCS_Type II 120.0mm 50-Year	15:15	3.6
SCS_Type II 120.0mm 50-Year	15:30	3.6
SCS_Type II 120.0mm 50-Year	15:45	3.6
SCS_Type II 120.0mm 50-Year	16:00	2.16
SCS_Type II 120.0mm 50-Year	16:15	2.16
SCS_Type II 120.0mm 50-Year	16:30	2.16
SCS_Type II 120.0mm 50-Year	16:45	2.16
SCS_Type II 120.0mm 50-Year	17:00	2.16
SCS_Type II 120.0mm 50-Year	17:15	2.16
SCS_Type II 120.0mm 50-Year	17:30	2.16
SCS_Type II 120.0mm 50-Year	17:45	2.16
SCS_Type II 120.0mm 50-Year	18:00	2.16
SCS_Type II 120.0mm 50-Year	18:15	2.16
SCS_Type II 120.0mm 50-Year	18:30	2.16
SCS_Type II 120.0mm 50-Year	18:45	2.16
SCS_Type II 120.0mm 50-Year	19:00	2.16
SCS_Type II 120.0mm 50-Year	19:15	2.16
SCS_Type II 120.0mm 50-Year	19:30	2.16
SCS_Type II 120.0mm 50-Year	19:45	2.16
SCS_Type II 120.0mm 50-Year	20:00	1.44
SCS_Type II 120.0mm 50-Year	20:15	1.44
SCS_Type II 120.0mm 50-Year	20:30	1.44
SCS_Type II 120.0mm 50-Year	20:45	1.44
SCS_Type II 120.0mm 50-Year	21:00	1.44

SCS_Type_II_120.0mm_50-Year	21:15	1.44
SCS_Type_II_120.0mm_50-Year	21:30	1.44
SCS_Type_II_120.0mm_50-Year	21:45	1.44
SCS_Type_II_120.0mm_50-Year	22:00	1.44
SCS_Type_II_120.0mm_50-Year	22:15	1.44
SCS_Type_II_120.0mm_50-Year	22:30	1.44
SCS_Type_II_120.0mm_50-Year	22:45	1.44
SCS_Type_II_120.0mm_50-Year	23:00	1.44
SCS_Type_II_120.0mm_50-Year	23:15	1.44
SCS_Type_II_120.0mm_50-Year	23:30	1.44
SCS_Type_II_120.0mm_50-Year	23:45	1.44

;SCS_Type_II_131.7mm design storm, total rainfall = 131.7 mm, rain units = mm/hr.

SCS_Type_II_131.7mm_100-Year	0:00	1.449
SCS_Type_II_131.7mm_100-Year	0:15	1.449
SCS_Type_II_131.7mm_100-Year	0:30	1.449
SCS_Type_II_131.7mm_100-Year	0:45	1.449
SCS_Type_II_131.7mm_100-Year	1:00	1.449
SCS_Type_II_131.7mm_100-Year	1:15	1.449
SCS_Type_II_131.7mm_100-Year	1:30	1.449
SCS_Type_II_131.7mm_100-Year	1:45	1.449
SCS_Type_II_131.7mm_100-Year	2:00	1.712
SCS_Type_II_131.7mm_100-Year	2:15	1.712
SCS_Type_II_131.7mm_100-Year	2:30	1.712
SCS_Type_II_131.7mm_100-Year	2:45	1.712
SCS_Type_II_131.7mm_100-Year	3:00	1.712
SCS_Type_II_131.7mm_100-Year	3:15	1.712
SCS_Type_II_131.7mm_100-Year	3:30	1.712
SCS_Type_II_131.7mm_100-Year	3:45	1.712
SCS_Type_II_131.7mm_100-Year	4:00	2.107
SCS_Type_II_131.7mm_100-Year	4:15	2.107
SCS_Type_II_131.7mm_100-Year	4:30	2.107
SCS_Type_II_131.7mm_100-Year	4:45	2.107
SCS_Type_II_131.7mm_100-Year	5:00	2.107
SCS_Type_II_131.7mm_100-Year	5:15	2.107
SCS_Type_II_131.7mm_100-Year	5:30	2.107
SCS_Type_II_131.7mm_100-Year	5:45	2.107
SCS_Type_II_131.7mm_100-Year	6:00	2.371
SCS_Type_II_131.7mm_100-Year	6:15	2.371
SCS_Type_II_131.7mm_100-Year	6:30	2.371
SCS_Type_II_131.7mm_100-Year	6:45	2.371
SCS_Type_II_131.7mm_100-Year	7:00	2.897
SCS_Type_II_131.7mm_100-Year	7:15	2.897
SCS_Type_II_131.7mm_100-Year	7:30	2.897
SCS_Type_II_131.7mm_100-Year	7:45	2.897
SCS_Type_II_131.7mm_100-Year	8:00	3.424
SCS_Type_II_131.7mm_100-Year	8:15	3.424
SCS_Type_II_131.7mm_100-Year	8:30	3.688
SCS_Type_II_131.7mm_100-Year	8:45	3.688
SCS_Type_II_131.7mm_100-Year	9:00	4.214
SCS_Type_II_131.7mm_100-Year	9:15	4.214
SCS_Type_II_131.7mm_100-Year	9:30	4.741
SCS_Type_II_131.7mm_100-Year	9:45	4.741
SCS_Type_II_131.7mm_100-Year	10:00	6.058
SCS_Type_II_131.7mm_100-Year	10:15	6.058
SCS_Type_II_131.7mm_100-Year	10:30	8.165
SCS_Type_II_131.7mm_100-Year	10:45	8.165
SCS_Type_II_131.7mm_100-Year	11:00	12.643
SCS_Type_II_131.7mm_100-Year	11:15	12.643
SCS_Type_II_131.7mm_100-Year	11:30	38.983
SCS_Type_II_131.7mm_100-Year	11:45	161.201
SCS_Type_II_131.7mm_100-Year	12:00	18.965
SCS_Type_II_131.7mm_100-Year	12:15	18.965
SCS_Type_II_131.7mm_100-Year	12:30	9.746
SCS_Type_II_131.7mm_100-Year	12:45	9.746
SCS_Type_II_131.7mm_100-Year	13:00	7.112
SCS_Type_II_131.7mm_100-Year	13:15	7.112
SCS_Type_II_131.7mm_100-Year	13:30	5.531
SCS_Type_II_131.7mm_100-Year	13:45	5.531
SCS_Type_II_131.7mm_100-Year	14:00	3.951
SCS_Type_II_131.7mm_100-Year	14:15	3.951
SCS_Type_II_131.7mm_100-Year	14:30	3.951
SCS_Type_II_131.7mm_100-Year	14:45	3.951
SCS_Type_II_131.7mm_100-Year	15:00	3.951
SCS_Type_II_131.7mm_100-Year	15:15	3.951
SCS_Type_II_131.7mm_100-Year	15:30	3.951
SCS_Type_II_131.7mm_100-Year	15:45	3.951
SCS_Type_II_131.7mm_100-Year	16:00	2.371
SCS_Type_II_131.7mm_100-Year	16:15	2.371
SCS_Type_II_131.7mm_100-Year	16:30	2.371
SCS_Type_II_131.7mm_100-Year	16:45	2.371
SCS_Type_II_131.7mm_100-Year	17:00	2.371
SCS_Type_II_131.7mm_100-Year	17:15	2.371
SCS_Type_II_131.7mm_100-Year	17:30	2.371
SCS_Type_II_131.7mm_100-Year	17:45	2.371

SCS_Type_II_131.7mm_100-Year	18:00	2.371
SCS_Type_II_131.7mm_100-Year	18:15	2.371
SCS_Type_II_131.7mm_100-Year	18:30	2.371
SCS_Type_II_131.7mm_100-Year	18:45	2.371
SCS_Type_II_131.7mm_100-Year	19:00	2.371
SCS_Type_II_131.7mm_100-Year	19:15	2.371
SCS_Type_II_131.7mm_100-Year	19:30	2.371
SCS_Type_II_131.7mm_100-Year	19:45	2.371
SCS_Type_II_131.7mm_100-Year	20:00	1.58
SCS_Type_II_131.7mm_100-Year	20:15	1.58
SCS_Type_II_131.7mm_100-Year	20:30	1.58
SCS_Type_II_131.7mm_100-Year	20:45	1.58
SCS_Type_II_131.7mm_100-Year	21:00	1.58
SCS_Type_II_131.7mm_100-Year	21:15	1.58
SCS_Type_II_131.7mm_100-Year	21:30	1.58
SCS_Type_II_131.7mm_100-Year	21:45	1.58
SCS_Type_II_131.7mm_100-Year	22:00	1.58
SCS_Type_II_131.7mm_100-Year	22:15	1.58
SCS_Type_II_131.7mm_100-Year	22:30	1.58
SCS_Type_II_131.7mm_100-Year	22:45	1.58
SCS_Type_II_131.7mm_100-Year	23:00	1.58
SCS_Type_II_131.7mm_100-Year	23:15	1.58
SCS_Type_II_131.7mm_100-Year	23:30	1.58
SCS_Type_II_131.7mm_100-Year	23:45	1.58

;SCS_Type_II_60.1mm design storm, total rainfall = 60.1 mm, rain units = mm/hr.

SCS_Type_II_60.1mm_2-Year	0:00	0.661
SCS_Type_II_60.1mm_2-Year	0:15	0.661
SCS_Type_II_60.1mm_2-Year	0:30	0.661
SCS_Type_II_60.1mm_2-Year	0:45	0.661
SCS_Type_II_60.1mm_2-Year	1:00	0.661
SCS_Type_II_60.1mm_2-Year	1:15	0.661
SCS_Type_II_60.1mm_2-Year	1:30	0.661
SCS_Type_II_60.1mm_2-Year	1:45	0.661
SCS_Type_II_60.1mm_2-Year	2:00	0.781
SCS_Type_II_60.1mm_2-Year	2:15	0.781
SCS_Type_II_60.1mm_2-Year	2:30	0.781
SCS_Type_II_60.1mm_2-Year	2:45	0.781
SCS_Type_II_60.1mm_2-Year	3:00	0.781
SCS_Type_II_60.1mm_2-Year	3:15	0.781
SCS_Type_II_60.1mm_2-Year	3:30	0.781
SCS_Type_II_60.1mm_2-Year	3:45	0.781
SCS_Type_II_60.1mm_2-Year	4:00	0.962
SCS_Type_II_60.1mm_2-Year	4:15	0.962
SCS_Type_II_60.1mm_2-Year	4:30	0.962
SCS_Type_II_60.1mm_2-Year	4:45	0.962
SCS_Type_II_60.1mm_2-Year	5:00	0.962
SCS_Type_II_60.1mm_2-Year	5:15	0.962
SCS_Type_II_60.1mm_2-Year	5:30	0.962
SCS_Type_II_60.1mm_2-Year	5:45	0.962
SCS_Type_II_60.1mm_2-Year	6:00	1.082
SCS_Type_II_60.1mm_2-Year	6:15	1.082
SCS_Type_II_60.1mm_2-Year	6:30	1.082
SCS_Type_II_60.1mm_2-Year	6:45	1.082
SCS_Type_II_60.1mm_2-Year	7:00	1.322
SCS_Type_II_60.1mm_2-Year	7:15	1.322
SCS_Type_II_60.1mm_2-Year	7:30	1.322
SCS_Type_II_60.1mm_2-Year	7:45	1.322
SCS_Type_II_60.1mm_2-Year	8:00	1.563
SCS_Type_II_60.1mm_2-Year	8:15	1.563
SCS_Type_II_60.1mm_2-Year	8:30	1.683
SCS_Type_II_60.1mm_2-Year	8:45	1.683
SCS_Type_II_60.1mm_2-Year	9:00	1.923
SCS_Type_II_60.1mm_2-Year	9:15	1.923
SCS_Type_II_60.1mm_2-Year	9:30	2.164
SCS_Type_II_60.1mm_2-Year	9:45	2.164
SCS_Type_II_60.1mm_2-Year	10:00	2.765
SCS_Type_II_60.1mm_2-Year	10:15	2.765
SCS_Type_II_60.1mm_2-Year	10:30	3.726
SCS_Type_II_60.1mm_2-Year	10:45	3.726
SCS_Type_II_60.1mm_2-Year	11:00	5.77
SCS_Type_II_60.1mm_2-Year	11:15	5.77
SCS_Type_II_60.1mm_2-Year	11:30	17.79
SCS_Type_II_60.1mm_2-Year	11:45	73.562
SCS_Type_II_60.1mm_2-Year	12:00	8.654
SCS_Type_II_60.1mm_2-Year	12:15	8.654
SCS_Type_II_60.1mm_2-Year	12:30	4.447
SCS_Type_II_60.1mm_2-Year	12:45	4.447
SCS_Type_II_60.1mm_2-Year	13:00	3.245
SCS_Type_II_60.1mm_2-Year	13:15	3.245
SCS_Type_II_60.1mm_2-Year	13:30	2.524
SCS_Type_II_60.1mm_2-Year	13:45	2.524
SCS_Type_II_60.1mm_2-Year	14:00	1.803
SCS_Type_II_60.1mm_2-Year	14:15	1.803
SCS_Type_II_60.1mm_2-Year	14:30	1.803

SCS_Type II 60.1mm 2-Year	14:45	1.803
SCS_Type II 60.1mm 2-Year	15:00	1.803
SCS_Type II 60.1mm 2-Year	15:15	1.803
SCS_Type II 60.1mm 2-Year	15:30	1.803
SCS_Type II 60.1mm 2-Year	15:45	1.803
SCS_Type II 60.1mm 2-Year	16:00	1.082
SCS_Type II 60.1mm 2-Year	16:15	1.082
SCS_Type II 60.1mm 2-Year	16:30	1.082
SCS_Type II 60.1mm 2-Year	16:45	1.082
SCS_Type II 60.1mm 2-Year	17:00	1.082
SCS_Type II 60.1mm 2-Year	17:15	1.082
SCS_Type II 60.1mm 2-Year	17:30	1.082
SCS_Type II 60.1mm 2-Year	17:45	1.082
SCS_Type II 60.1mm 2-Year	18:00	1.082
SCS_Type II 60.1mm 2-Year	18:15	1.082
SCS_Type II 60.1mm 2-Year	18:30	1.082
SCS_Type II 60.1mm 2-Year	18:45	1.082
SCS_Type II 60.1mm 2-Year	19:00	1.082
SCS_Type II 60.1mm 2-Year	19:15	1.082
SCS_Type II 60.1mm 2-Year	19:30	1.082
SCS_Type II 60.1mm 2-Year	19:45	1.082
SCS_Type II 60.1mm 2-Year	20:00	0.721
SCS_Type II 60.1mm 2-Year	20:15	0.721
SCS_Type II 60.1mm 2-Year	20:30	0.721
SCS_Type II 60.1mm 2-Year	20:45	0.721
SCS_Type II 60.1mm 2-Year	21:00	0.721
SCS_Type II 60.1mm 2-Year	21:15	0.721
SCS_Type II 60.1mm 2-Year	21:30	0.721
SCS_Type II 60.1mm 2-Year	21:45	0.721
SCS_Type II 60.1mm 2-Year	22:00	0.721
SCS_Type II 60.1mm 2-Year	22:15	0.721
SCS_Type II 60.1mm 2-Year	22:30	0.721
SCS_Type II 60.1mm 2-Year	22:45	0.721
SCS_Type II 60.1mm 2-Year	23:00	0.721
SCS_Type II 60.1mm 2-Year	23:15	0.721
SCS_Type II 60.1mm 2-Year	23:30	0.721
SCS_Type II 60.1mm 2-Year	23:45	0.721

;SCS_Type II 79.4mm design storm, total rainfall = 79.4 mm, rain units = mm/hr.

SCS_Type II 79.4mm 5-Year	0:00	0.873
SCS_Type II 79.4mm 5-Year	0:15	0.873
SCS_Type II 79.4mm 5-Year	0:30	0.873
SCS_Type II 79.4mm 5-Year	0:45	0.873
SCS_Type II 79.4mm 5-Year	1:00	0.873
SCS_Type II 79.4mm 5-Year	1:15	0.873
SCS_Type II 79.4mm 5-Year	1:30	0.873
SCS_Type II 79.4mm 5-Year	1:45	0.873
SCS_Type II 79.4mm 5-Year	2:00	1.032
SCS_Type II 79.4mm 5-Year	2:15	1.032
SCS_Type II 79.4mm 5-Year	2:30	1.032
SCS_Type II 79.4mm 5-Year	2:45	1.032
SCS_Type II 79.4mm 5-Year	3:00	1.032
SCS_Type II 79.4mm 5-Year	3:15	1.032
SCS_Type II 79.4mm 5-Year	3:30	1.032
SCS_Type II 79.4mm 5-Year	3:45	1.032
SCS_Type II 79.4mm 5-Year	4:00	1.27
SCS_Type II 79.4mm 5-Year	4:15	1.27
SCS_Type II 79.4mm 5-Year	4:30	1.27
SCS_Type II 79.4mm 5-Year	4:45	1.27
SCS_Type II 79.4mm 5-Year	5:00	1.27
SCS_Type II 79.4mm 5-Year	5:15	1.27
SCS_Type II 79.4mm 5-Year	5:30	1.27
SCS_Type II 79.4mm 5-Year	5:45	1.27
SCS_Type II 79.4mm 5-Year	6:00	1.429
SCS_Type II 79.4mm 5-Year	6:15	1.429
SCS_Type II 79.4mm 5-Year	6:30	1.429
SCS_Type II 79.4mm 5-Year	6:45	1.429
SCS_Type II 79.4mm 5-Year	7:00	1.747
SCS_Type II 79.4mm 5-Year	7:15	1.747
SCS_Type II 79.4mm 5-Year	7:30	1.747
SCS_Type II 79.4mm 5-Year	7:45	1.747
SCS_Type II 79.4mm 5-Year	8:00	2.064
SCS_Type II 79.4mm 5-Year	8:15	2.064
SCS_Type II 79.4mm 5-Year	8:30	2.223
SCS_Type II 79.4mm 5-Year	8:45	2.223
SCS_Type II 79.4mm 5-Year	9:00	2.541
SCS_Type II 79.4mm 5-Year	9:15	2.541
SCS_Type II 79.4mm 5-Year	9:30	2.858
SCS_Type II 79.4mm 5-Year	9:45	2.858
SCS_Type II 79.4mm 5-Year	10:00	3.652
SCS_Type II 79.4mm 5-Year	10:15	3.652
SCS_Type II 79.4mm 5-Year	10:30	4.923
SCS_Type II 79.4mm 5-Year	10:45	4.923
SCS_Type II 79.4mm 5-Year	11:00	7.622
SCS_Type II 79.4mm 5-Year	11:15	7.622

SCS_Type II 79.4mm 5-Year	11:30	23.502
SCS_Type II 79.4mm 5-Year	11:45	97.186
SCS_Type II 79.4mm 5-Year	12:00	11.434
SCS_Type II 79.4mm 5-Year	12:15	11.434
SCS_Type II 79.4mm 5-Year	12:30	5.876
SCS_Type II 79.4mm 5-Year	12:45	5.876
SCS_Type II 79.4mm 5-Year	13:00	4.288
SCS_Type II 79.4mm 5-Year	13:15	4.288
SCS_Type II 79.4mm 5-Year	13:30	3.335
SCS_Type II 79.4mm 5-Year	13:45	3.335
SCS_Type II 79.4mm 5-Year	14:00	2.382
SCS_Type II 79.4mm 5-Year	14:15	2.382
SCS_Type II 79.4mm 5-Year	14:30	2.382
SCS_Type II 79.4mm 5-Year	14:45	2.382
SCS_Type II 79.4mm 5-Year	15:00	2.382
SCS_Type II 79.4mm 5-Year	15:15	2.382
SCS_Type II 79.4mm 5-Year	15:30	2.382
SCS_Type II 79.4mm 5-Year	15:45	2.382
SCS_Type II 79.4mm 5-Year	16:00	1.429
SCS_Type II 79.4mm 5-Year	16:15	1.429
SCS_Type II 79.4mm 5-Year	16:30	1.429
SCS_Type II 79.4mm 5-Year	16:45	1.429
SCS_Type II 79.4mm 5-Year	17:00	1.429
SCS_Type II 79.4mm 5-Year	17:15	1.429
SCS_Type II 79.4mm 5-Year	17:30	1.429
SCS_Type II 79.4mm 5-Year	17:45	1.429
SCS_Type II 79.4mm 5-Year	18:00	1.429
SCS_Type II 79.4mm 5-Year	18:15	1.429
SCS_Type II 79.4mm 5-Year	18:30	1.429
SCS_Type II 79.4mm 5-Year	18:45	1.429
SCS_Type II 79.4mm 5-Year	19:00	1.429
SCS_Type II 79.4mm 5-Year	19:15	1.429
SCS_Type II 79.4mm 5-Year	19:30	1.429
SCS_Type II 79.4mm 5-Year	19:45	1.429
SCS_Type II 79.4mm 5-Year	20:00	0.953
SCS_Type II 79.4mm 5-Year	20:15	0.953
SCS_Type II 79.4mm 5-Year	20:30	0.953
SCS_Type II 79.4mm 5-Year	20:45	0.953
SCS_Type II 79.4mm 5-Year	21:00	0.953
SCS_Type II 79.4mm 5-Year	21:15	0.953
SCS_Type II 79.4mm 5-Year	21:30	0.953
SCS_Type II 79.4mm 5-Year	21:45	0.953
SCS_Type II 79.4mm 5-Year	22:00	0.953
SCS_Type II 79.4mm 5-Year	22:15	0.953
SCS_Type II 79.4mm 5-Year	22:30	0.953
SCS_Type II 79.4mm 5-Year	22:45	0.953
SCS_Type II 79.4mm 5-Year	23:00	0.953
SCS_Type II 79.4mm 5-Year	23:15	0.953
SCS_Type II 79.4mm 5-Year	23:30	0.953
SCS_Type II 79.4mm 5-Year	23:45	0.953

;SCS_Type II 92.1mm design storm, total rainfall = 92.1 mm, rain units = mm/hr.

SCS_Type II 92.1mm 10-Year	0:00	1.013
SCS_Type II 92.1mm 10-Year	0:15	1.013
SCS_Type II 92.1mm 10-Year	0:30	1.013
SCS_Type II 92.1mm 10-Year	0:45	1.013
SCS_Type II 92.1mm 10-Year	1:00	1.013
SCS_Type II 92.1mm 10-Year	1:15	1.013
SCS_Type II 92.1mm 10-Year	1:30	1.013
SCS_Type II 92.1mm 10-Year	1:45	1.013
SCS_Type II 92.1mm 10-Year	2:00	1.197
SCS_Type II 92.1mm 10-Year	2:15	1.197
SCS_Type II 92.1mm 10-Year	2:30	1.197
SCS_Type II 92.1mm 10-Year	2:45	1.197
SCS_Type II 92.1mm 10-Year	3:00	1.197
SCS_Type II 92.1mm 10-Year	3:15	1.197
SCS_Type II 92.1mm 10-Year	3:30	1.197
SCS_Type II 92.1mm 10-Year	3:45	1.197
SCS_Type II 92.1mm 10-Year	4:00	1.474
SCS_Type II 92.1mm 10-Year	4:15	1.474
SCS_Type II 92.1mm 10-Year	4:30	1.474
SCS_Type II 92.1mm 10-Year	4:45	1.474
SCS_Type II 92.1mm 10-Year	5:00	1.474
SCS_Type II 92.1mm 10-Year	5:15	1.474
SCS_Type II 92.1mm 10-Year	5:30	1.474
SCS_Type II 92.1mm 10-Year	5:45	1.474
SCS_Type II 92.1mm 10-Year	6:00	1.658
SCS_Type II 92.1mm 10-Year	6:15	1.658
SCS_Type II 92.1mm 10-Year	6:30	1.658
SCS_Type II 92.1mm 10-Year	6:45	1.658
SCS_Type II 92.1mm 10-Year	7:00	2.026
SCS_Type II 92.1mm 10-Year	7:15	2.026
SCS_Type II 92.1mm 10-Year	7:30	2.026
SCS_Type II 92.1mm 10-Year	7:45	2.026
SCS_Type II 92.1mm 10-Year	8:00	2.395

SCS_Type II 92.1mm 10-Year	8:15	2.395
SCS_Type II 92.1mm 10-Year	8:30	2.579
SCS_Type II 92.1mm 10-Year	8:45	2.579
SCS_Type II 92.1mm 10-Year	9:00	2.947
SCS_Type II 92.1mm 10-Year	9:15	2.947
SCS_Type II 92.1mm 10-Year	9:30	3.316
SCS_Type II 92.1mm 10-Year	9:45	3.316
SCS_Type II 92.1mm 10-Year	10:00	4.237
SCS_Type II 92.1mm 10-Year	10:15	4.237
SCS_Type II 92.1mm 10-Year	10:30	5.71
SCS_Type II 92.1mm 10-Year	10:45	5.71
SCS_Type II 92.1mm 10-Year	11:00	8.842
SCS_Type II 92.1mm 10-Year	11:15	8.842
SCS_Type II 92.1mm 10-Year	11:30	27.262
SCS_Type II 92.1mm 10-Year	11:45	112.73
SCS_Type II 92.1mm 10-Year	12:00	13.262
SCS_Type II 92.1mm 10-Year	12:15	13.262
SCS_Type II 92.1mm 10-Year	12:30	6.815
SCS_Type II 92.1mm 10-Year	12:45	6.815
SCS_Type II 92.1mm 10-Year	13:00	4.973
SCS_Type II 92.1mm 10-Year	13:15	4.973
SCS_Type II 92.1mm 10-Year	13:30	3.868
SCS_Type II 92.1mm 10-Year	13:45	3.868
SCS_Type II 92.1mm 10-Year	14:00	2.763
SCS_Type II 92.1mm 10-Year	14:15	2.763
SCS_Type II 92.1mm 10-Year	14:30	2.763
SCS_Type II 92.1mm 10-Year	14:45	2.763
SCS_Type II 92.1mm 10-Year	15:00	2.763
SCS_Type II 92.1mm 10-Year	15:15	2.763
SCS_Type II 92.1mm 10-Year	15:30	2.763
SCS_Type II 92.1mm 10-Year	15:45	2.763
SCS_Type II 92.1mm 10-Year	16:00	1.658
SCS_Type II 92.1mm 10-Year	16:15	1.658
SCS_Type II 92.1mm 10-Year	16:30	1.658
SCS_Type II 92.1mm 10-Year	16:45	1.658
SCS_Type II 92.1mm 10-Year	17:00	1.658
SCS_Type II 92.1mm 10-Year	17:15	1.658
SCS_Type II 92.1mm 10-Year	17:30	1.658
SCS_Type II 92.1mm 10-Year	17:45	1.658
SCS_Type II 92.1mm 10-Year	18:00	1.658
SCS_Type II 92.1mm 10-Year	18:15	1.658
SCS_Type II 92.1mm 10-Year	18:30	1.658
SCS_Type II 92.1mm 10-Year	18:45	1.658
SCS_Type II 92.1mm 10-Year	19:00	1.658
SCS_Type II 92.1mm 10-Year	19:15	1.658
SCS_Type II 92.1mm 10-Year	19:30	1.658
SCS_Type II 92.1mm 10-Year	19:45	1.658
SCS_Type II 92.1mm 10-Year	20:00	1.105
SCS_Type II 92.1mm 10-Year	20:15	1.105
SCS_Type II 92.1mm 10-Year	20:30	1.105
SCS_Type II 92.1mm 10-Year	20:45	1.105
SCS_Type II 92.1mm 10-Year	21:00	1.105
SCS_Type II 92.1mm 10-Year	21:15	1.105
SCS_Type II 92.1mm 10-Year	21:30	1.105
SCS_Type II 92.1mm 10-Year	21:45	1.105
SCS_Type II 92.1mm 10-Year	22:00	1.105
SCS_Type II 92.1mm 10-Year	22:15	1.105
SCS_Type II 92.1mm 10-Year	22:30	1.105
SCS_Type II 92.1mm 10-Year	22:45	1.105
SCS_Type II 92.1mm 10-Year	23:00	1.105
SCS_Type II 92.1mm 10-Year	23:15	1.105
SCS_Type II 92.1mm 10-Year	23:30	1.105
SCS_Type II 92.1mm 10-Year	23:45	1.105

[REPORT]

INPUT YES
 CONTROLS NO
 SUBCATCHMENTS ALL
 NODES ALL
 LINKS ALL

[TAGS]

[MAP]

DIMENSIONS 559932.735516301 4810753.41347309 560499.854650692 4811371.56003721
 UNITS Meters

[COORDINATES]

;;Node	X-Coord	Y-Coord
;;-----	-----	-----
J1	560405.636	4811081.541
J2	560146.326	4811095.893
OF1	560049.444	4811020.459
Pond	560105.366	4811049.312

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[VERTICES]
;;Link      X-Coord      Y-Coord
;;-----
C1          560270.923    4811084.402

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[POLYGONS]
;;Subcatchment X-Coord      Y-Coord
;;-----
A101         560441.3      4811101.498
A101         560445.526    4811087.608
A101         560458.452    4811055.579
A101         560459.783    4811033.856
A101         560466.569    4811011.955
A101         560470.176    4810989.799
A101         560474.077    4810985.533
A101         560464.792    4810982.053
A101         560445.732    4810979.165
A101         560434.137    4810979.967
A101         560420.945    4810981.434
A101         560401.209    4810977.86
A101         560378.072    4810973.578
A101         560310.497    4810958.483
A101         560297.938    4810965.389
A101         560291.654    4810982.087
A101         560289.213    4810984.477
A101         560288.139    4810997.447
A101         560282.169    4811010.459
A101         560274.099    4811022.752
A101         560273.585    4811022.708
A101         560259.299    4811021.492
A101         560257.149    4811032.901
A101         560262.997    4811052.025
A101         560279.684    4811054.057
A101         560297.261    4811055.133
A101         560299.225    4811058.35
A101         560299.261    4811066.207
A101         560307.797    4811076.795
A101         560331.79     4811084.789
A101         560357.042    4811092.304
A101         560370.699    4811094.189
A101         560377.855    4811093.251
A101         560398.302    4811089.603
A101         560413.714    4811094.478
A101         560410.201    4811114.254
A101         560412.306    4811121.629
A101         560434.289    4811128.101
A101         560434.428    4811128.115
A101         560434.264    4811127.72
A101         560437.468    4811114.093
A101         560441.3      4811101.498
A102         560257.149    4811032.901
A102         560259.299    4811021.492
A102         560240.409    4811019.884
A102         560199.021    4811013.915
A102         560191.22     4811022.244
A102         560181.432    4811043.388
A102         560156.955    4811083.764
A102         560151.063    4811088.144
A102         560139.33     4811091.072
A102         560140.746    4811092.378
A102         560139.785    4811092.506
A102         560147.932    4811124.075
A102         560151.385    4811150.352
A102         560158.041    4811171.934
A102         560174.517    4811214.6
A102         560194.285    4811242.597
A102         560197.031    4811244.985
A102         560200.953    4811218.446
A102         560211.632    4811204.827
A102         560253.235    4811190.546
A102         560350.464    4811188.709
A102         560424.58     4811192.64
A102         560440.415    4811142.517
A102         560434.428    4811128.115
A102         560434.289    4811128.101
A102         560412.306    4811121.629
A102         560410.201    4811114.254
A102         560413.714    4811094.478
A102         560398.302    4811089.603
A102         560377.855    4811093.251
A102         560370.699    4811094.189
A102         560357.042    4811092.304
A102         560331.79     4811084.789
A102         560307.797    4811076.795
A102         560299.261    4811066.207

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A102	560299.225	4811058.35
A102	560297.261	4811055.133
A102	560279.684	4811054.057
A102	560262.997	4811052.025
A102	560257.149	4811032.901
A103	560288.139	4810997.447
A103	560289.213	4810984.477
A103	560287.299	4810986.35
A103	560278.852	4810990.803
A103	560272.712	4810991.427
A103	560264.782	4810988.866
A103	560238.804	4810975.327
A103	560223.01	4810967.892
A103	560218.98	4810963.804
A103	560217.836	4810955.284
A103	560218.286	4810950.425
A103	560222.465	4810937.9
A103	560223.35	4810929.804
A103	560215.032	4810905.01
A103	560206.554	4810898.045
A103	560187.935	4810888.154
A103	560172.21	4810873.02
A103	560164.272	4810851.066
A103	560162.783	4810835.654
A103	560162.496	4810822.278
A103	560159.398	4810804.826
A103	560154.602	4810795.462
A103	560148.959	4810789.739
A103	560135.206	4810781.511
A103	560043.003	4811074.378
A103	559958.514	4811343.462
A103	559967.773	4811341.585
A103	560088.87	4811301.905
A103	560148.962	4811270.532
A103	560196.996	4811245.219
A103	560197.031	4811244.985
A103	560194.285	4811242.597
A103	560174.517	4811214.6
A103	560158.041	4811171.934
A103	560151.385	4811150.352
A103	560147.932	4811124.075
A103	560139.785	4811092.506
A103	560140.746	4811092.378
A103	560139.33	4811091.072
A103	560151.063	4811088.144
A103	560156.955	4811083.764
A103	560181.432	4811043.388
A103	560191.22	4811022.244
A103	560199.021	4811013.915
A103	560240.409	4811019.884
A103	560274.099	4811022.752
A103	560282.169	4811010.459
A103	560288.139	4810997.447

[SYMBOLS]

; ;Gage X-Coord Y-Coord
 ; ;-----

 WARNING 04: minimum elevation drop used for Conduit C3

 Element Count

Number of rain gages 6
 Number of subcatchments ... 3
 Number of nodes 4
 Number of links 3
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
SCS_Type_II_108.0mm_25-Year	SCS_Type_II_108.0mm_25-Year	INTENSITY	15 min.
SCS_Type_II_120.0mm_50-Year	SCS_Type_II_120.0mm_50-Year	INTENSITY	15 min.
SCS_Type_II_131.7mm_100-Year	SCS_Type_II_131.7mm_100-Year	INTENSITY	15 min.
SCS_Type_II_60.1mm_2-Year	SCS_Type_II_60.1mm_2-Year	INTENSITY	15 min.
SCS_Type_II_79.4mm_5-Year	SCS_Type_II_79.4mm_5-Year	INTENSITY	15 min.
SCS_Type_II_92.1mm_10-Year	SCS_Type_II_92.1mm_10-Year	INTENSITY	15 min.

 Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A101	2.16	92.61	3.00	0.6000	SCS_Type_II_60.1mm_2-Year	J1
A102	3.72	119.61	0.00	4.4000	SCS_Type_II_60.1mm_2-Year	J1
A103	6.85	117.75	0.00	7.7000	SCS_Type_II_60.1mm_2-Year	Pond

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	320.00	1.00	0.0	
J2	JUNCTION	315.00	1.00	0.0	
OF1	OUTFALL	312.75	1.00	0.0	
Pond	STORAGE	306.00	6.75	0.0	

 Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	J2	CONDUIT	260.0	1.9237	0.0350
C2	J2	Pond	CONDUIT	62.1	9.7140	0.0350
C3	Pond	OF1	CONDUIT	63.0	0.0005	0.0130

 Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	3.96
C2	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	8.90
C3	CIRCULAR	1.00	0.79	0.25	1.00	1	0.05

 NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

 Analysis Options

Flow Units CMS

Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
 Infiltration Method HORTON
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 12/14/2020 00:00:00
 Ending Date 12/24/2020 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:05:00
 Dry Time Step 00:05:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 m

	Volume hectare-m	Depth mm
Runoff Quantity Continuity		

Total Precipitation	0.765	60.100
Evaporation Loss	0.000	0.000
Infiltration Loss	0.760	59.694
Surface Runoff	0.005	0.409
Final Storage	0.000	0.010
Continuity Error (%)	-0.021	

	Volume hectare-m	Volume 10^6 ltr
Flow Routing Continuity		

Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.005	0.052
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.974	9.737
Final Stored Volume	0.979	9.789
Continuity Error (%)	0.000	

Highest Continuity Errors

 Node J2 (1.13%)

Time-Step Critical Elements

 None

Highest Flow Instability Indexes

 All links are stable.

Routing Time Step Summary

 Minimum Time Step : 4.50 sec
 Average Time Step : 5.00 sec
 Maximum Time Step : 5.00 sec
 Percent in Steady State : 0.00
 Average Iterations per Step : 2.00
 Percent Not Converging : 0.00

Subcatchment Runoff Summary

Peak Runoff	Runoff Coeff	Total Precip	Total Runon	Total Evap	Total Infil	Imperv Runoff	Perv Runoff	Total Runoff	Total Runoff
Subcatchment		mm	mm	mm	mm	mm	mm	mm	10^6 ltr
A101	0.02	60.10	0.00	0.00	58.23	1.75	0.07	1.82	0.04
A102	0.030	60.10	0.00	0.00	59.97	0.00	0.15	0.15	0.01
A103	0.002	60.10	0.00	0.00	60.01	0.00	0.11	0.11	0.01
0.02	0.002								

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.03	320.03	0 12:02	0.03
J2	JUNCTION	0.00	0.01	315.01	0 12:05	0.01
OF1	OUTFALL	0.00	0.00	312.75	0 00:00	0.00
Pond	STORAGE	3.01	3.01	309.01	9 00:32	3.01

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.029	0.029	0 12:00	0.0448	0.0448	-0.092
J2	JUNCTION	0.000	0.021	0 12:01	0	0.0449	1.144
OF1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000
Pond	STORAGE	0.016	0.027	0 12:00	0.00721	9.79	0.002

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Pond	9.786	22	0	0	9.789	22	9 00:32	0.000

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000

 System 0.00 0.000 0.000 0.000

 Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.021	0 12:01	0.41	0.01	0.04
C2	CONDUIT	0.017	0 12:05	0.50	0.00	0.03
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00

 Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl	
C1	1.00	0.80	0.04	0.00	0.16	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.00	0.80	0.00	0.15	0.00	0.00	0.05	0.95	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

 Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Dec 18 09:12:00 2020
 Analysis ended on: Fri Dec 18 09:12:02 2020
 Total elapsed time: 00:00:02

 WARNING 04: minimum elevation drop used for Conduit C3

 Element Count

 Number of rain gages 6
 Number of subcatchments ... 3
 Number of nodes 4
 Number of links 3
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
SCS_Type_II_108.0mm_25-Year	SCS_Type_II_108.0mm_25-Year	INTENSITY	15 min.
SCS_Type_II_120.0mm_50-Year	SCS_Type_II_120.0mm_50-Year	INTENSITY	15 min.
SCS_Type_II_131.7mm_100-Year	SCS_Type_II_131.7mm_100-Year	INTENSITY	15 min.
SCS_Type_II_60.1mm_2-Year	SCS_Type_II_60.1mm_2-Year	INTENSITY	15 min.
SCS_Type_II_79.4mm_5-Year	SCS_Type_II_79.4mm_5-Year	INTENSITY	15 min.
SCS_Type_II_92.1mm_10-Year	SCS_Type_II_92.1mm_10-Year	INTENSITY	15 min.

 Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A101	2.16	92.61	3.00	0.6000	SCS_Type_II_79.4mm_5-Year	J1
A102	3.72	119.61	0.00	4.4000	SCS_Type_II_79.4mm_5-Year	J1
A103	6.85	117.75	0.00	7.7000	SCS_Type_II_79.4mm_5-Year	Pond

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	320.00	1.00	0.0	
J2	JUNCTION	315.00	1.00	0.0	
OF1	OUTFALL	312.75	1.00	0.0	
Pond	STORAGE	306.00	6.75	0.0	

 Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	J2	CONDUIT	260.0	1.9237	0.0350
C2	J2	Pond	CONDUIT	62.1	9.7140	0.0350
C3	Pond	OF1	CONDUIT	63.0	0.0005	0.0130

 Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	3.96
C2	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	8.90
C3	CIRCULAR	1.00	0.79	0.25	1.00	1	0.05

 NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

 Analysis Options

Flow Units CMS

Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
 Infiltration Method HORTON
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 12/14/2020 00:00:00
 Ending Date 12/24/2020 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:05:00
 Dry Time Step 00:05:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 m

	Volume hectare-m	Depth mm
Runoff Quantity Continuity		
Total Precipitation	1.011	79.398
Evaporation Loss	0.000	0.000
Infiltration Loss	0.993	77.976
Surface Runoff	0.018	1.441
Final Storage	0.000	0.010
Continuity Error (%)	-0.036	

	Volume hectare-m	Volume 10 ⁶ ltr
Flow Routing Continuity		
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.018	0.183
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.974	9.737
Final Stored Volume	0.992	9.920
Continuity Error (%)	-0.001	

Highest Continuity Errors
 Node J2 (1.61%)

Time-Step Critical Elements
 None

Highest Flow Instability Indexes
 All links are stable.

Routing Time Step Summary
 Minimum Time Step : 4.50 sec
 Average Time Step : 5.00 sec
 Maximum Time Step : 5.00 sec
 Percent in Steady State : 0.00
 Average Iterations per Step : 2.00
 Percent Not Converging : 0.00

Subcatchment Runoff Summary

Peak Runoff	Runoff Coeff	Total Precip	Total Runon	Total Evap	Total Infil	Imperv Runoff	Perv Runoff	Total Runoff	Total Runoff
Subcatchment	CMS	mm	mm	mm	mm	mm	mm	mm	10^6 ltr
A101	0.03	79.40	0.00	0.00	76.32	2.33	0.72	3.05	0.07
A102	0.038	79.40	0.00	0.00	78.10	0.00	1.34	1.34	0.05
A103	0.06	79.40	0.00	0.00	78.43	0.00	0.99	0.99	0.07
	0.017								
	0.012								

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.06	320.06	0 12:02	0.06
J2	JUNCTION	0.00	0.03	315.03	0 12:05	0.03
OF1	OUTFALL	0.00	0.00	312.75	0 00:00	0.00
Pond	STORAGE	3.03	3.03	309.03	9 05:06	3.03

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.089	0.089	0 12:00	0.115	0.115	-0.092
J2	JUNCTION	0.000	0.072	0 12:02	0	0.116	1.640
OF1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000
Pond	STORAGE	0.073	0.120	0 12:03	0.068	9.92	0.007

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Pond	9.909	23	0	0	9.918	23	9 05:06	0.000

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000

 System 0.00 0.000 0.000 0.000

 Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.072	0 12:02	0.66	0.02	0.08
C2	CONDUIT	0.065	0 12:05	0.84	0.01	0.06
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00

 Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl	
C1	1.00	0.80	0.04	0.00	0.16	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.00	0.80	0.00	0.15	0.00	0.00	0.05	0.95	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

 Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Dec 18 09:20:40 2020
 Analysis ended on: Fri Dec 18 09:20:41 2020
 Total elapsed time: 00:00:01

 WARNING 04: minimum elevation drop used for Conduit C3

 Element Count

Number of rain gages 6
 Number of subcatchments ... 3
 Number of nodes 4
 Number of links 3
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
SCS_Type_II_108.0mm_25-Year	SCS_Type_II_108.0mm_25-Year	INTENSITY	15 min.
SCS_Type_II_120.0mm_50-Year	SCS_Type_II_120.0mm_50-Year	INTENSITY	15 min.
SCS_Type_II_131.7mm_100-Year	SCS_Type_II_131.7mm_100-Year	INTENSITY	15 min.
SCS_Type_II_60.1mm_2-Year	SCS_Type_II_60.1mm_2-Year	INTENSITY	15 min.
SCS_Type_II_79.4mm_5-Year	SCS_Type_II_79.4mm_5-Year	INTENSITY	15 min.
SCS_Type_II_92.1mm_10-Year	SCS_Type_II_92.1mm_10-Year	INTENSITY	15 min.

 Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A101	2.16	92.61	3.00	0.6000	SCS_Type_II_92.1mm_10-Year	J1
A102	3.72	119.61	0.00	4.4000	SCS_Type_II_92.1mm_10-Year	J1
A103	6.85	117.75	0.00	7.7000	SCS_Type_II_92.1mm_10-Year	Pond

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	320.00	1.00	0.0	
J2	JUNCTION	315.00	1.00	0.0	
OF1	OUTFALL	312.75	1.00	0.0	
Pond	STORAGE	306.00	6.75	0.0	

 Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	J2	CONDUIT	260.0	1.9237	0.0350
C2	J2	Pond	CONDUIT	62.1	9.7140	0.0350
C3	Pond	OF1	CONDUIT	63.0	0.0005	0.0130

 Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	3.96
C2	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	8.90
C3	CIRCULAR	1.00	0.79	0.25	1.00	1	0.05

 NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

 Analysis Options

Flow Units CMS

Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
 Infiltration Method HORTON
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 12/14/2020 00:00:00
 Ending Date 12/24/2020 00:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:01:00
 Wet Time Step 00:05:00
 Dry Time Step 00:05:00
 Routing Time Step 5.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 m

	Volume hectare-m	Depth mm
Runoff Quantity Continuity		

Total Precipitation	1.173	92.100
Evaporation Loss	0.000	0.000
Infiltration Loss	1.138	89.394
Surface Runoff	0.035	2.740
Final Storage	0.000	0.010
Continuity Error (%)	-0.047	

	Volume hectare-m	Volume 10^6 ltr
Flow Routing Continuity		

Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.035	0.349
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.000	0.000
Flooding Loss	0.000	0.000
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.974	9.737
Final Stored Volume	1.009	10.086
Continuity Error (%)	-0.003	

 Highest Continuity Errors

 Node J2 (1.47%)

 Time-Step Critical Elements

 None

 Highest Flow Instability Indexes

 All links are stable.

 Routing Time Step Summary

 Minimum Time Step : 4.50 sec
 Average Time Step : 5.00 sec
 Maximum Time Step : 5.00 sec
 Percent in Steady State : 0.00
 Average Iterations per Step : 2.00
 Percent Not Converging : 0.00

 Subcatchment Runoff Summary

Peak Runoff	Runoff Coeff	Total Precip	Total Runon	Total Evap	Total Infil	Imperv Runoff	Perv Runoff	Total Runoff	Total Runoff
Subcatchment	CMS	mm	mm	mm	mm	mm	mm	mm	10^6 ltr
A101	0.05	92.10	0.00	0.00	87.76	2.71	1.61	4.32	0.09
A102	0.09	92.10	0.00	0.00	89.30	0.00	2.86	2.86	0.11
A103	0.12	92.10	0.00	0.00	89.96	0.00	2.18	2.18	0.15

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.08	320.08	0 12:02	0.08
J2	JUNCTION	0.00	0.04	315.04	0 12:05	0.04
OF1	OUTFALL	0.00	0.00	312.75	0 00:00	0.00
Pond	STORAGE	3.06	3.06	309.06	9 10:24	3.06

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.140	0.140	0 12:00	0.199	0.199	-0.081
J2	JUNCTION	0.000	0.120	0 12:02	0	0.2	1.493
OF1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000
Pond	STORAGE	0.122	0.213	0 12:03	0.149	10.1	0.020

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Pond	10.064	23	0	0	10.082	23	9 10:24	0.000

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000

 System 0.00 0.000 0.000 0.000

 Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.120	0 12:02	0.79	0.03	0.12
C2	CONDUIT	0.112	0 12:05	1.03	0.01	0.08
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00

 Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl	
C1	1.00	0.80	0.04	0.00	0.16	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.00	0.80	0.00	0.15	0.00	0.00	0.05	0.95	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

 Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Dec 18 09:21:15 2020
 Analysis ended on: Fri Dec 18 09:21:16 2020
 Total elapsed time: 00:00:01

 WARNING 04: minimum elevation drop used for Conduit C3

 Element Count

Number of rain gages 6
 Number of subcatchments ... 3
 Number of nodes 4
 Number of links 3
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
SCS_Type_II_108.0mm_25-Year	SCS_Type_II_108.0mm_25-Year	INTENSITY	15 min.
SCS_Type_II_120.0mm_50-Year	SCS_Type_II_120.0mm_50-Year	INTENSITY	15 min.
SCS_Type_II_131.7mm_100-Year	SCS_Type_II_131.7mm_100-Year	INTENSITY	15 min.
SCS_Type_II_60.1mm_2-Year	SCS_Type_II_60.1mm_2-Year	INTENSITY	15 min.
SCS_Type_II_79.4mm_5-Year	SCS_Type_II_79.4mm_5-Year	INTENSITY	15 min.
SCS_Type_II_92.1mm_10-Year	SCS_Type_II_92.1mm_10-Year	INTENSITY	15 min.

 Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A101	2.16	92.61	3.00	0.6000	SCS_Type_II_108.0mm_25-Year	J1
A102	3.72	119.61	0.00	4.4000	SCS_Type_II_108.0mm_25-Year	J1
A103	6.85	117.75	0.00	7.7000	SCS_Type_II_108.0mm_25-Year	Pond

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	320.00	1.00	0.0	
J2	JUNCTION	315.00	1.00	0.0	
OF1	OUTFALL	312.75	1.00	0.0	
Pond	STORAGE	306.00	6.75	0.0	

 Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	J2	CONDUIT	260.0	1.9237	0.0350
C2	J2	Pond	CONDUIT	62.1	9.7140	0.0350
C3	Pond	OF1	CONDUIT	63.0	0.0005	0.0130

 Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	3.96
C2	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	8.90
C3	CIRCULAR	1.00	0.79	0.25	1.00	1	0.05

 NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

 Analysis Options

Flow Units CMS

```

Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
  Infiltration Method ..... HORTON
  Flow Routing Method ..... DYNWAVE
  Surcharge Method ..... EXTRAN
  Starting Date ..... 12/14/2020 00:00:00
  Ending Date ..... 12/24/2020 00:00:00
  Antecedent Dry Days ..... 0.0
  Report Time Step ..... 00:01:00
  Wet Time Step ..... 00:05:00
  Dry Time Step ..... 00:05:00
  Routing Time Step ..... 5.00 sec
  Variable Time Step ..... YES
  Maximum Trials ..... 8
  Number of Threads ..... 1
  Head Tolerance ..... 0.001500 m

```

```

*****
Volume          Depth
Runoff Quantity Continuity  hectare-m      mm
*****
Total Precipitation ..... 1.375          108.000
Evaporation Loss ..... 0.000           0.000
Infiltration Loss ..... 1.312          103.036
Surface Runoff ..... 0.064           5.022
Final Storage ..... 0.000           0.010
Continuity Error (%) ..... -0.063

```

```

*****
Volume          Volume
Flow Routing Continuity    hectare-m      10^6 ltr
*****
Dry Weather Inflow ..... 0.000           0.000
Wet Weather Inflow ..... 0.064           0.639
Groundwater Inflow ..... 0.000           0.000
RDII Inflow ..... 0.000           0.000
External Inflow ..... 0.000           0.000
External Outflow ..... 0.000           0.000
Flooding Loss ..... 0.000           0.000
Evaporation Loss ..... 0.000           0.000
Exfiltration Loss ..... 0.000           0.000
Initial Stored Volume .... 0.974           9.737
Final Stored Volume ..... 1.038          10.377
Continuity Error (%) ..... -0.007

```

```

*****
Highest Continuity Errors
*****
Node J2 (1.21%)

```

```

*****
Time-Step Critical Elements
*****
None

```

```

*****
Highest Flow Instability Indexes
*****
All links are stable.

```

```

*****
Routing Time Step Summary
*****
Minimum Time Step      : 4.50 sec
Average Time Step      : 5.00 sec
Maximum Time Step      : 5.00 sec
Percent in Steady State : 0.00
Average Iterations per Step : 2.00
Percent Not Converging : 0.00

```

```

*****
Subcatchment Runoff Summary
*****

```

Peak Runoff	Runoff Coeff	Total Precip	Total Runon	Total Evap	Total Infil	Imperv Runoff	Perv Runoff	Total Runoff	Total Runoff
Subcatchment	CMS	mm	mm	mm	mm	mm	mm	mm	10^6 ltr
A101	0.07	108.00	0.00	0.00	101.54	3.19	3.26	6.45	0.14
A102	0.15	108.00	0.00	0.00	102.59	0.00	5.49	5.49	0.20
A103	0.19	108.00	0.00	0.00	103.75	0.00	4.32	4.32	0.30

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.10	320.10	0 12:02	0.10
J2	JUNCTION	0.00	0.06	315.06	0 12:04	0.06
OF1	OUTFALL	0.00	0.00	312.75	0 00:00	0.00
Pond	STORAGE	3.10	3.11	309.11	9 16:38	3.11

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.213	0.213	0 12:00	0.344	0.344	-0.070
J2	JUNCTION	0.000	0.191	0 12:02	0	0.344	1.225
OF1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000
Pond	STORAGE	0.195	0.351	0 12:03	0.296	10.4	0.048

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Pond	10.336	24	0	0	10.368	24	9 16:38	0.000

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000

 System 0.00 0.000 0.000 0.000

 Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.191	0 12:02	0.92	0.05	0.15
C2	CONDUIT	0.181	0 12:04	1.23	0.02	0.12
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00

 Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl	
C1	1.00	0.80	0.04	0.00	0.16	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.01	0.80	0.00	0.15	0.00	0.00	0.04	0.95	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

 Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Dec 18 09:21:55 2020
 Analysis ended on: Fri Dec 18 09:21:58 2020
 Total elapsed time: 00:00:03

 WARNING 04: minimum elevation drop used for Conduit C3

 Element Count

Number of rain gages 6
 Number of subcatchments ... 3
 Number of nodes 4
 Number of links 3
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
SCS_Type_II_108.0mm_25-Year	SCS_Type_II_108.0mm_25-Year	INTENSITY	15 min.
SCS_Type_II_120.0mm_50-Year	SCS_Type_II_120.0mm_50-Year	INTENSITY	15 min.
SCS_Type_II_131.7mm_100-Year	SCS_Type_II_131.7mm_100-Year	INTENSITY	15 min.
SCS_Type_II_60.1mm_2-Year	SCS_Type_II_60.1mm_2-Year	INTENSITY	15 min.
SCS_Type_II_79.4mm_5-Year	SCS_Type_II_79.4mm_5-Year	INTENSITY	15 min.
SCS_Type_II_92.1mm_10-Year	SCS_Type_II_92.1mm_10-Year	INTENSITY	15 min.

 Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A101	2.16	92.61	3.00	0.6000	SCS_Type_II_120.0mm_50-Year	J1
A102	3.72	119.61	0.00	4.4000	SCS_Type_II_120.0mm_50-Year	J1
A103	6.85	117.75	0.00	7.7000	SCS_Type_II_120.0mm_50-Year	Pond

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	320.00	1.00	0.0	
J2	JUNCTION	315.00	1.00	0.0	
OF1	OUTFALL	312.75	1.00	0.0	
Pond	STORAGE	306.00	6.75	0.0	

 Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	J2	CONDUIT	260.0	1.9237	0.0350
C2	J2	Pond	CONDUIT	62.1	9.7140	0.0350
C3	Pond	OF1	CONDUIT	63.0	0.0005	0.0130

 Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	3.96
C2	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	8.90
C3	CIRCULAR	1.00	0.79	0.25	1.00	1	0.05

 NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

 Analysis Options

Flow Units CMS

```

Process Models:
  Rainfall/Runoff ..... YES
  RDII ..... NO
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
  Infiltration Method ..... HORTON
  Flow Routing Method ..... DYNWAVE
  Surcharge Method ..... EXTRAN
  Starting Date ..... 12/14/2020 00:00:00
  Ending Date ..... 12/24/2020 00:00:00
  Antecedent Dry Days ..... 0.0
  Report Time Step ..... 00:01:00
  Wet Time Step ..... 00:05:00
  Dry Time Step ..... 00:05:00
  Routing Time Step ..... 5.00 sec
  Variable Time Step ..... YES
  Maximum Trials ..... 8
  Number of Threads ..... 1
  Head Tolerance ..... 0.001500 m

```

```

*****
                Volume          Depth
Runoff Quantity Continuity  hectare-m          mm
*****
Total Precipitation .....      1.528      120.000
Evaporation Loss .....          0.000          0.000
Infiltration Loss .....        1.431      112.402
Surface Runoff .....           0.098          7.680
Final Storage .....            0.000          0.010
Continuity Error (%) .....      -0.076

```

```

*****
                Volume          Volume
Flow Routing Continuity    hectare-m          10^6 ltr
*****
Dry Weather Inflow .....          0.000          0.000
Wet Weather Inflow .....          0.098          0.978
Groundwater Inflow .....          0.000          0.000
RDII Inflow .....              0.000          0.000
External Inflow .....           0.000          0.000
External Outflow .....           0.000          0.000
Flooding Loss .....             0.000          0.000
Evaporation Loss .....           0.000          0.000
Exfiltration Loss .....          0.000          0.000
Initial Stored Volume ....         0.974          9.737
Final Stored Volume .....         1.072         10.716
Continuity Error (%) .....      -0.013

```

```

*****
Highest Continuity Errors
*****
Node J2 (1.04%)

```

```

*****
Time-Step Critical Elements
*****
None

```

```

*****
Highest Flow Instability Indexes
*****
All links are stable.

```

```

*****
Routing Time Step Summary
*****
Minimum Time Step      :    4.50 sec
Average Time Step      :    5.00 sec
Maximum Time Step      :    5.00 sec
Percent in Steady State :    0.00
Average Iterations per Step :    2.00
Percent Not Converging :    0.00

```

```

*****
Subcatchment Runoff Summary
*****

```

Peak Runoff	Runoff Coeff	Total Precip	Total Runon	Total Evap	Total Infil	Imperv Runoff	Perv Runoff	Total Runoff	Total Runoff
Subcatchment	CMS	mm	mm	mm	mm	mm	mm	mm	10^6 ltr
A101	0.09	120.00	0.00	0.00	111.17	3.55	5.29	8.84	0.19
A102	0.074	120.00	0.00	0.00	111.60	0.00	8.52	8.52	0.32
A103	0.20	120.00	0.00	0.00	113.23	0.00	6.86	6.86	0.47
	0.057								

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.12	320.12	0 12:02	0.12
J2	JUNCTION	0.00	0.07	315.07	0 12:04	0.07
OF1	OUTFALL	0.00	0.00	312.75	0 00:00	0.00
Pond	STORAGE	3.16	3.17	309.17	9 12:44	3.17

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 ltr	Total Inflow Volume 10^6 ltr	Flow Balance Error Percent
J1	JUNCTION	0.289	0.289	0 12:00	0.508	0.508	-0.060
J2	JUNCTION	0.000	0.265	0 12:02	0	0.508	1.056
OF1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000
Pond	STORAGE	0.272	0.498	0 12:03	0.47	10.7	0.085

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Pond	10.652	24	0	0	10.701	24	9 12:44	0.000

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
OF1	0.00	0.000	0.000	0.000

 System 0.00 0.000 0.000 0.000

 Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.265	0 12:02	1.03	0.07	0.19
C2	CONDUIT	0.255	0 12:04	1.40	0.03	0.18
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00

 Flow Classification Summary

Conduit	Adjusted /Actual Length	Fraction of Time in Flow Class								
		Up Dry	Down Dry	Sub Dry	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl	
C1	1.00	0.80	0.04	0.00	0.16	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.00	0.80	0.00	0.15	0.00	0.00	0.05	0.95	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

 Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Dec 18 09:22:58 2020
 Analysis ended on: Fri Dec 18 09:23:00 2020
 Total elapsed time: 00:00:02

 WARNING 04: minimum elevation drop used for Conduit C3

 Element Count

 Number of rain gages 6
 Number of subcatchments ... 3
 Number of nodes 4
 Number of links 3
 Number of pollutants 0
 Number of land uses 0

 Raingage Summary

Name	Data Source	Data Type	Recording Interval
SCS_Type_II_108.0mm_25-Year	SCS_Type_II_108.0mm_25-Year	INTENSITY	15 min.
SCS_Type_II_120.0mm_50-Year	SCS_Type_II_120.0mm_50-Year	INTENSITY	15 min.
SCS_Type_II_131.7mm_100-Year	SCS_Type_II_131.7mm_100-Year	INTENSITY	15 min.
SCS_Type_II_60.1mm_2-Year	SCS_Type_II_60.1mm_2-Year	INTENSITY	15 min.
SCS_Type_II_79.4mm_5-Year	SCS_Type_II_79.4mm_5-Year	INTENSITY	15 min.
SCS_Type_II_92.1mm_10-Year	SCS_Type_II_92.1mm_10-Year	INTENSITY	15 min.

 Subcatchment Summary

Name	Area	Width	%Imperv	%Slope	Rain Gage	Outlet
A101	2.16	92.61	3.00	0.6000	SCS_Type_II_131.7mm_100-Year	J1
A102	3.72	119.61	0.00	4.4000	SCS_Type_II_131.7mm_100-Year	J1
A103	6.85	117.75	0.00	7.7000	SCS_Type_II_131.7mm_100-Year	Pond

 Node Summary

Name	Type	Invert Elev.	Max. Depth	Ponded Area	External Inflow
J1	JUNCTION	320.00	1.00	0.0	
J2	JUNCTION	315.00	1.00	0.0	
OF1	OUTFALL	312.75	1.00	0.0	
Pond	STORAGE	306.00	6.75	0.0	

 Link Summary

Name	From Node	To Node	Type	Length	%Slope	Roughness
C1	J1	J2	CONDUIT	260.0	1.9237	0.0350
C2	J2	Pond	CONDUIT	62.1	9.7140	0.0350
C3	Pond	OF1	CONDUIT	63.0	0.0005	0.0130

 Cross Section Summary

Conduit	Shape	Full Depth	Full Area	Hyd. Rad.	Max. Width	No. of Barrels	Full Flow
C1	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	3.96
C2	TRAPEZOIDAL	0.50	2.00	0.35	5.50	1	8.90
C3	CIRCULAR	1.00	0.79	0.25	1.00	1	0.05

 NOTE: The summary statistics displayed in this report are based on results found at every computational time step, not just on results from each reporting time step.

 Analysis Options

Flow Units CMS

Subcatchment	mm	mm	mm	mm	mm	mm	mm	mm	10 ⁶ ltr
CMS									
A101	131.70	0.00	0.00	120.12	3.90	7.70	11.60		0.25
0.11 0.088									
A102	131.70	0.00	0.00	119.92	0.00	11.92	11.92		0.44
0.26 0.091									
A103	131.70	0.00	0.00	122.00	0.00	9.80	9.80		0.67
0.35 0.074									

Node Depth Summary

Node	Type	Average Depth Meters	Maximum Depth Meters	Maximum HGL Meters	Time of Max Occurrence days hr:min	Reported Max Depth Meters
J1	JUNCTION	0.00	0.14	320.14	0 12:01	0.14
J2	JUNCTION	0.00	0.08	315.08	0 12:03	0.08
OF1	OUTFALL	0.00	0.00	312.75	0 00:00	0.00
Pond	STORAGE	3.22	3.23	309.23	9 15:14	3.23

Node Inflow Summary

Node	Type	Maximum Lateral Inflow CMS	Maximum Total Inflow CMS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10 ⁶ ltr	Total Inflow Volume 10 ⁶ ltr	Flow Balance Error Percent
J1	JUNCTION	0.371	0.371	0 12:00	0.694	0.694	-0.055
J2	JUNCTION	0.000	0.344	0 12:02	0	0.694	0.912
OF1	OUTFALL	0.000	0.000	0 00:00	0	0	0.000 ltr
Pond	STORAGE	0.355	0.656	0 12:02	0.671	11.1	0.131

Node Surcharge Summary

No nodes were surcharged.

Node Flooding Summary

No nodes were flooded.

Storage Volume Summary

Storage Unit	Average Volume 1000 m3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 m3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CMS
Pond	11.013	25	0	0	11.082	25	9 15:14	0.000

Outfall Loading Summary

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10 ⁶ ltr
OF1	0.00	0.000	0.000	0.000
System	0.00	0.000	0.000	0.000

Link Flow Summary

Link	Type	Maximum Flow CMS	Time of Max Occurrence days hr:min	Maximum Veloc m/sec	Max/ Full Flow	Max/ Full Depth
C1	CONDUIT	0.344	0 12:02	1.13	0.09	0.22
C2	CONDUIT	0.333	0 12:03	1.54	0.04	0.24
C3	CONDUIT	0.000	0 00:00	0.00	0.00	0.00

Flow Classification Summary

Conduit	Adjusted /Actual Length	Up Dry	Down Dry	Fraction of Time Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Norm Ltd	Inlet Ctrl
C1	1.00	0.80	0.04	0.00	0.16	0.00	0.00	0.00	0.00	0.00
C2	1.00	0.01	0.80	0.00	0.15	0.00	0.00	0.04	0.95	0.00
C3	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Conduit Surcharge Summary

No conduits were surcharged.

Analysis begun on: Fri Dec 18 09:23:34 2020
Analysis ended on: Fri Dec 18 09:23:35 2020
Total elapsed time: 00:00:01



about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

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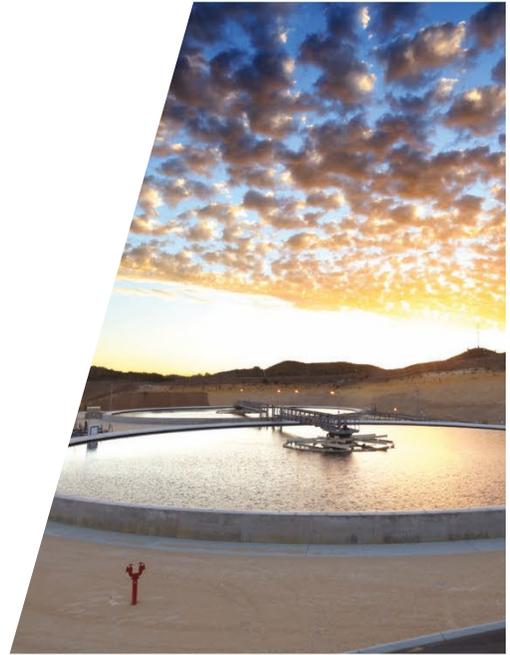
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Emission Summary and Dispersion Modelling Report

6678 Wellington Road 34
Cambridge, Ontario

2374868 Ontario Inc.



Emission Summary and Dispersion Modelling Report Checklist

Company Name

2374868 Ontario Inc.

Company Address

Unit Number	Street Number	Street Name	PO Box
	6678	Wellington Road 34	
City/Town		Province	Postal Code
Cambridge		Ontario	N6C 1K7

Location of Facility

6678 Wellington Road 34, Cambridge, Ontario

The attached Emission Summary and Dispersion Modeling Report was prepared in accordance with s. 26 of O. Reg. 419/05 and the guidance in the MOE document "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2009 and "Air Dispersion Modelling Guideline for Ontario" dated March 2009 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact

Company Contact

Company Contact Name

Last Name	First Name	Middle Initial
Nafziger	Eric	J
Title		Telephone Number
Manager		519-658-5023
Signature	Date (yyyy/mm/dd)	
	2021/01/06	

Technical Contact

Technical Contact

Erik Martinez

Technical Contact Name

Last Name	First Name	Middle Initial
Martinez	Erik	
Representing		Telephone Number
GHD Limited		519 340-4213
Signature	Date (yyyy/mm/dd)	
	2021/12/10	

* This checklist is taken from the document titled "Procedure for Preparing an Emission Summary and Dispersion Modelling Report" dated March 2009.

Emission Summary and Dispersion Modelling Report Checklist

	Required Information	Submitted	Explanation/Reference
	Executive Summary and Emission Summary Table		
	1.1 Overview of ESDM Report	<input checked="" type="checkbox"/> Yes	Executive Summary
	1.2 Emission Summary Table	<input checked="" type="checkbox"/> Yes	Executive Summary
1.0	Introduction and Facility Description		
	1.1 Purpose and Scope of ESDM Report (when report only represents a portion of facility)	<input checked="" type="checkbox"/> Yes	Section 1.1
	1.2 Description of Processes and NAICS code(s)	<input checked="" type="checkbox"/> Yes	Section 1.2
	1.3 Description of Products and Raw Materials	<input checked="" type="checkbox"/> Yes	Section 1.3
	1.4 Process Flow Diagram	<input checked="" type="checkbox"/> Yes	Section 1.4, Figure 4
	1.5 Operating Schedule	<input checked="" type="checkbox"/> Yes	Section 1.5
2.0	Initial Identification of Sources and Contaminants		
	2.1 Sources and Contaminants Identification Table	<input checked="" type="checkbox"/> Yes	Section 2.1, Table 1
3.0	Assessment of the Significance of Contaminants and Sources		
	3.1 Identification of Negligible Contaminants and Sources	<input checked="" type="checkbox"/> Yes	Section 3.1
	3.2 Rationale for Assessment	<input checked="" type="checkbox"/> Yes	Appendix B, Table B.1
4.0	Operating Conditions, Emission Rate Estimating and Data Quality		
	4.1 Description of operating conditions, for each significant contaminant that results in the maximum POI concentration for that contaminant	<input checked="" type="checkbox"/> Yes	Section 4.1
	4.2 Explanation of Method used to calculate the emission rate for each contaminant	<input checked="" type="checkbox"/> Yes	Section 4.2, Table 2, Appendix A
	4.3 Sample calculation for each method	<input checked="" type="checkbox"/> Yes	Appendix A
	4.4 Assessment of Data Quality for each emission rate	<input checked="" type="checkbox"/> Yes	Appendix A
5.0	Source Summary Table and Property Plan		
	5.1 Source Summary Table	<input checked="" type="checkbox"/> Yes	Table 2
	5.2 Site Plan (scalable)	<input checked="" type="checkbox"/> Yes	Figure 1, Figure 3
6.0	Dispersion Modelling		
	6.1 Dispersion Modelling Input Summary Table	<input checked="" type="checkbox"/> Yes	Table 3
	6.2 Land Use Zoning Designation Plan	<input checked="" type="checkbox"/> Yes	Figure 2
	6.3 Dispersion Modelling Input and Output Files	<input checked="" type="checkbox"/> Yes	Appendix C
7.0	Emission Summary Table and Conclusions		
	7.1 Emission Summary Table	<input checked="" type="checkbox"/> Yes	Table 4
	7.2 Assessment of Contaminants with no MOE POI Limits	<input checked="" type="checkbox"/> Yes	Section 7.2
	7.3 Conclusions	<input checked="" type="checkbox"/> Yes	Section 7.3
	Appendices (Provide supporting information or details such as...)		
	Supporting Calculations	<input checked="" type="checkbox"/> Yes	Appendix A
	Supporting Information for Assessment of Negligibility	<input checked="" type="checkbox"/> Yes	Appendix B
	Air Dispersion Modelling Results	<input checked="" type="checkbox"/> Yes	Appendix C



Version Control

Revision	Date	Revised Description	Reviewer Initials
1.0	January 2021	Original ESDM Report prepared to support ECA (Air & Noise) Application	EM
1.1	December 2021	ESDM revised to update stockpiling emission rates, revised locations, and boundary adjustments	EM



Executive Summary

This Emission Summary and Dispersion Modelling (ESDM) Report has been prepared to support an application by 2374868 Ontario Inc. for an application for a Ministry of the Environment Conservation and Parks (MECP) Environmental Compliance Approval (ECA) (Air & Noise). This ECA is for the existing environmental hydrovac excavation services and processing facility located at 6678 Wellington Road 34 in Cambridge, Ontario (Facility).

This ESDM Report has been prepared in accordance with s.26 of Ontario Regulation (O. Reg.) 419/05. In addition, guidance in the Ontario Ministry of Environment, Conservation and Parks (MECP) publication "Procedure for Preparing and Emission Summary and Dispersion Modelling Report" dated March 2018 (ESDM Procedure Document) was followed as appropriate.

2374868 Ontario Inc. operates a hydrovacating waste processing facility. Water and soil mixtures are dropped by the hydrovac trucks, the water naturally drains off to a pond, and the soil is used to rehabilitate a former aggregate pit on site with a small portion of the material being processed by sorting and screening to be recycled to local users as general fill, topsoil and aggregate. The Facility consists of stockpile areas and a diesel-powered rotary screener. The Facility also includes fuel storage tanks, comfort heating, and fugitive emissions from onsite roads and storage piles.

The NAICS code that applies to this Facility is 562210 – Waste treatment and disposal. The ESDM Report has been prepared using Section 20 of Ontario Regulation 419/05. The United States Environmental Protection Agency (USEPA) atmospheric dispersion model AERMOD was used and the Facility's compliance was assessed using Schedule 3 of O. Reg. 419/05.

The maximum POI concentrations were calculated based on the Operating Conditions where all significant sources are operating simultaneously at their individual maximum rates of production. The maximum emission rates from the significant sources were calculated in accordance with s.11 of O. Reg. 419/05 and the data quality assessment follows the process outlined in the requirements of the ESDM Procedure Document.

The POI concentration was calculated based on the calculated emission rates and the output from the approved dispersion model; the results are presented in the following Emission Summary Table in accordance with s.26 of O. Reg. 419/05.

The POI concentrations listed in the Emission Summary Tables were compared against criteria listed in the MECP Air Contaminants Benchmarks (ACB) List: Standards, Guidelines, and Screening Levels for Assessing POI Concentrations of Air Contaminants dated April 2018.

All of the predicted POI concentrations for contaminants listed in the Emission Summary Table that are included in the List of MECP POI Limits, are below the corresponding limits.

The following table summarizes the emissions sources and dispersion modelling results for the Facility. The Facility is expected to emit particulate matter, metals, and products of combustion. Some of the sources were considered negligible in accordance with s.8 of O. Reg. 419/05..



Executive Summary Table

Contaminant	CAS Number	Total Facility Emission Rate (g/s)	Maximum Concentration ($\mu\text{g}/\text{m}^3$)	Air Dispersion Model Used	Averaging Period (hrs)	MECP POI Limit ¹ ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Regulation Schedule	Percentage of MECP POI Limit
Nitrogen Oxides	10102-44-0	6.33E-02	9.97E+01	AERMOD v19191	24	200	Health	B1 - Sch. 3	50%
Nitrogen Oxides	10102-44-0	6.33E-02	1.36E+02	AERMOD v19191	1	400	Health	B1 - Sch. 3	34%
Particulate Matter	N/A	5.81E-02	8.88E+01	AERMOD v19191	24	120	Visibility	B1 - Sch. 3	74%

Notes:

Sch. 3: Refers to Standards in Schedule 3 of O. Reg. 419/05.

B1: Benchmark 1 Value - Standards and Guidelines.

¹ Criteria listed in Version 2.0 of the MECP Air Contaminants Benchmarks (ACB) List dated April 2018.



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Table Index

Table 1	Source and Contaminant Identification Table
Table 2	Source Summary Table
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Appendix A	Supporting Calculations
Appendix B	Supporting Information for Assessment of Negligibility
Appendix C	Dispersion Modelling Files (Electronic)
Appendix D	Roto-Screen Brochure



1. Introduction and Facility Description

This section provides a description of the facility as required by sub paragraph 1 of s.26 (1) of Ontario Regulation 419/05 (O. Reg. 419/05).

2374868 Ontario Inc. operates a hydrovacating waste processing facility at 6678 Wellington Road 34 in Cambridge, Ontario.

This application includes the existing equipment and operations at the site, assessed against Section 20 of Ontario Regulation 419/05 including the United States Environmental Protection Agency (USEPA) atmospheric dispersion model AERMOD and the standards listed in Schedule 3 of O. Reg. 419/05.

The Facility is located in an area zoned as Extractive and Agricultural. The location of the Facility is presented on Figure 1 and the land use designation of the site and surrounding area is presented on Figure 2. The source plan and site layout is presented on Figure 3.

The agriculture zoned front portion of the 100-acre property has been leased out to third party operations for various uses. Therefore, the front partition is treated as off-property for the purpose of the contaminant point of impingement concentrations.

1.1 Purpose and Scope of ESDM Report

This ESDM Report has been prepared to support an application for Environmental Compliance Approval (ECA) for Air and Noise.

Since the original submission in January 2021, this ESDM has been updated with the following revisions:

- ESDM revised to use maximum wind speed and variable emission rates for material drop operations.
- Additional locations for emissions assessed including storage bins.
- References to the previous equestrian facility have been removed and the boundary for POI assessment was reduced from the property boundary to the site operations boundary.

This ESDM Report was prepared in accordance with s.26 of O. Reg. 419/05 and guidance in the Ontario Ministry of Environment, Conservation and Parks (MECP) publication "*Procedure for Preparing an Emission Summary and Dispersion Modelling Report*" dated March 2018 (ESDM Procedure Document) PIBS 3614e04.1.

1.2 Description of Processes and NAICS Codes

2374868 Ontario Inc. operates a hydrovacating waste processing facility. The NAICS code that applies to this Facility is 562210 – Waste treatment and disposal. The Facility will be transferring and processing liquid industrial waste from environmental hydrovacating projects. Waste will be delivered to the Facility by the facility's owned hydrovac trucks. Acceptable hydrovac truck loads are placed in stockpiles at the Facility for sampling and dewatering. A majority of the dried soil is used for



rehabilitation of the former aggregate pit located on the north end of the property. A small portion of the material is processed by sorting and screening to be recycled to local users as general fill, topsoil and aggregate.

1.3 Description of Products and Raw Materials

The facility receives disposals from hydrovac trucks that work throughout southern Ontario where liquid soil is collected from utility, municipal and commercial sites. No hydrovacating is done at environmental or other sites with known soil impacts. Liquid soil loads that may contain impacted soil is rejected and sent to an appropriate disposal facility. Once the water has gravity drained from the received material, most soil is used to fill in a former aggregate pit. A small portion of the material is processed by sorting and screening to be recycled to local users as general fill, topsoil, and aggregate.

Product usages and process information are provided in greater detail in Appendix A. Refer to Table 1, which tabulates the individual sources of emissions at the Facility.

1.4 Process Flow Diagram

Refer to Figure 4 for a graphical representation of the Facility processes.

1.5 Operating Schedule

The Facility typically operates from 6 a.m. to 6 p.m., Monday through Friday. However, the facility also offers emergency response so it may, on occasion, work longer hours or operate on weekends.

1.6 Facility Production Limit

The Facility can receive a maximum amount of 250 tonnes per day of liquid soil from hydrovac truck waste (approximately 150 tonnes of water and 100 tonnes of soil). A maximum of 2,500 tonnes of accumulated dry soil is stored at the Site at any one time.

The Facility's maximum screening rate is 100 tonnes per day.

2. Initial Identification of Sources and Contaminants

This section provides an initial identification of all of the sources and contaminants emitted at the Facility, as required by subparagraphs 2 to 4 of s.26 (1) of O. Reg. 419/05.

There may be general ventilation from the Facility that only discharges uncontaminated air from the workspaces or air from the workspace that may include contaminants that come from commercial office supplies, building maintenance products or supplies and activities; these types of ventilation sources are considered to be negligible and were not identified as sources at the Facility.

It should be noted that general ventilation located in the process area that does not vent process emissions is also considered negligible.



2.1 Sources and Contaminants Identification Table

Table 1 tabulates all the emission sources at the Facility. Table 1 provides the information required for sub paragraphs 2 to 4 of s.26 (1) of O. Reg. 419/05.

The expected contaminants emitted from each source are also identified in Table 1. Each of the identified sources has been assigned a source reference number.

The location of the discharges from each of the sources is presented on Figure 3. The location of each of the sources is specified with the source reference number.

2.2 Sources and Contaminants Descriptions

2.2.1 Stockpiling & Material Transfer

The initial receiving from the hydrovac disposal transfers are have a high water content and therefore it is not expected that any fugitive particulate emissions would occur from the unloading process. Once the water has sufficiently drained from the soil, front end loaders and excavators are used to move the soil to either the final rehabilitation location, to the screening operation, or to material stockpiles. It is expected that some particulate would be generated from the dry soil dropping operations (S-1).

2.2.2 Screening

The screening operation is an ancillary process that operates during the daytime only. The rotary screening equipment is rated for a maximum throughput of 91 tonnes per hour (100 ton per hour). However, as the facility only receives up to 100 tonnes of soil per day, it is expected that the maximum throughput in a day would be 100 tonnes per day. The screening equipment is powered by a diesel engine with a 68 horsepower maximum power output rating. The diesel engine is expected to emit products of combustion (S-2A).

Particulate matter is expected to be emitted from the front-end loader transfer of mixed soil (S-1) from the stockpiles into a hopper that feeds to a rotating screen (S-2B). An inclined conveyor transfers the material that passes through the screen to a new pile or directly into a new stockpile (S-3).

2.2.3 Comfort Heating

Comfort heating in the site building is electrically powered. Therefore, there are no emissions from comfort heating.

3. Assessment of Significance of Sources and Contaminants

This section provides an explanation for each source identified as negligible in Table 1, as required by subparagraph 5 of s.26(1) of O. Reg. 419/05.



In Accordance with s.8 of O. Reg. 419/05, emission rate calculations and dispersion modelling does not have to be performed for emissions from negligible sources or for the emission of negligible contaminants from significant sources.

3.1 Identification of Negligible Contaminants and Sources

Each negligible source is identified in Table 1 – Sources and Contaminants Identification Table. The remaining sources are significant. These sources will be included in the dispersion modelling for the site.

3.2 Rationale for Assessment

For each source or contaminant in Table 1 that has been identified as being negligible there is an accompanying documented rationale. The technical information required to substantiate the argument that each of the identified sources or contaminants is negligible is presented in Appendix C – Supporting Information for Assessment of Negligibility.

4. Operating Conditions, Emissions Estimating and Data Quality

This section provides a description of the operating conditions used in the calculation of the emission estimates and an assessment of the data quality of the emission estimates for each significant contaminant from the facility as required by sub paragraphs 6 and 7 of s.26 (1) of O. Reg. 419/05. In accordance with s.8 of O. Reg. 419/05, emission rate calculations and dispersion modelling does not have to be performed for emissions from negligible sources or for the emission of negligible contaminants from significant sources.

4.1 Description of Operating Conditions

Section 10 of O. Reg. 419/05 states that an acceptable operating condition is a scenario that assumes operating conditions for the Facility that would result, for the relevant contaminant, in the highest concentration of the contaminant at POI that the Facility is capable of, the operating condition described in this ESDM Report meets this requirement.

Because material stockpiles and equipment locations can vary over time. Multiple source locations were assessed to determine the highest POI concentration. Additionally, variable emission rates were applied due to the emission rates being impacted by wind speed.

The averaging time for the operating condition is based on the applicable averaging times for each contaminant. The operating condition used for this Facility that results in the maximum concentration at a POI is the scenario where all significant sources are operating simultaneously at their individual maximum rates of production. The individual maximum rates of production for each significant source of emissions correspond to the maximum emission rate during the appropriate averaging time. The individual maximum rates of production for each significant source of emissions are explicitly described in Appendix A.



4.2 Explanation of the Methods Used to Calculate Emission Rates

The maximum emission rates for each significant contaminant emitted from the significant sources were calculated in accordance with requirements of the ESDM Procedure Document.

The emission rate for each significant contaminant emitted from a significant source was estimated and the methodology for the calculation is documented in Table 2.

4.3 Sample Calculations

The technical rationale, including sample calculations, required to substantiate the emission rates presented in Table 2, is documented in Appendix A.

4.4 Assessment of Data Quality

This section provides a description of the assessment of the data quality of the emission estimates for each significant contaminant from the facility.

The assessment of the data quality of the emission rate estimates for each significant contaminant emitted from the significant sources was performed in accordance with the requirements of sub paragraph 7iii of s.26 (1) of O. Reg. 419/05.

For each contaminant the emission rate was estimated and the data quality of the estimate is documented in Table 2. The assessment of data quality for each source listed in Table 2 is documented in Appendix A.

All emission rates listed in Table 2 are documented as having the highest available data quality and correspond to an operating scenario where all significant sources are operating simultaneously at their individual maximum rates of production. Therefore, emission rate estimates listed in Table 2 are not likely to be an underestimate of the actual emission rates and use of these emission rates will result in an estimated concentration at POI greater than actual concentrations.

5. Source Summary Table and Site Plan

This section provides the table required by sub paragraph 8 and the site plan required by sub paragraph 9 of s.26 (1) of O. Reg. 419/05.

5.1 Source Summary Table

Emission rate estimates for each source of significant contaminants are documented in Table 2 in accordance with requirements of sub paragraph 8 of s.26 (1) of O. Reg. 419/05.

For each source of significant contaminants the following parameters are referenced:

- Contaminant
- Chemical Abstract Service (CAS) reference number
- Source reference number
- Source description



- Stack parameters (flow rate, exhaust temperature, diameter, height above grade, height above roof)
- Location referenced to a Universal Transverse Mercator (UTM) coordinates system presented on Figure 2
- Maximum emission rate
- Averaging period
- Emission estimating technique
- Estimation data quality
- Percentage of overall emission

5.2 Site Plan

The locations of the emission sources listed in Table 2 are presented on Figure 3; the location of each of the sources is specified with the source reference number. The location of the property-line is indicated on Figure 3, with the end points of each section of the property-line clearly referenced in a UTM coordinate system. The location of each source is referenced to this coordinate system under a column in Table 2.

The heights of the structures, if applicable, are labelled on Figure 3.

6. Dispersion Modelling

This section provides a description of how the dispersion modelling was conducted at the Facility to calculate the maximum concentration at a POI.

The dispersion modelling was conducted in accordance with the ministry publication "Air Dispersion Modelling Guideline for Ontario" PIBS 5165e03 (The ADMGO). A general description of the input data used in the dispersion model is provided below and summarized in Table 3.

Since the Facility is subject to s.20 of O. Reg. 419/05, compliance has been assessed using the AERMOD dispersion model and the standards listed in Schedule 3 of O. Reg. 419/05. Air dispersion modelling was performed following the MECP document "Air Dispersion Modelling Guideline for Ontario, Version 3.0", PIBS 5165e03.

The AERMOD modelling system has been identified by the MECP as one of the approved dispersion models under O. Reg. 419/05, and currently includes the Plume Rise Model Enhancements (PRIME) algorithms for assessing the effects of buildings on air dispersion.

The AERMOD modelling system is made up of the AERMOD dispersion model, the AERMET meteorological pre-processor and the AERMAP terrain pre-processor. The following approved dispersion model and pre-processors were used in the assessment:

- AERMOD dispersion model (v. 19191)
- AERMAP surface pre-processor (v. 18081)



- BPIP building downwash pre-processor (v. 04274)

The Facility sources were modelled as point sources. A summary of the AERMOD source input parameters is provided in Appendix D.

AERMET was not used in this assessment, as a pre-processed MECP meteorological dataset was used.

The emission rates used in the dispersion model meet the requirements of Section 11(1) 1 of O. Reg. 419/05, which requires that the emission rate used in the dispersion model is at least as high as the maximum emission rate that the source of contaminant is reasonably capable of for the relevant contaminant. These emission rates are further described in Appendix B.

There is no child care facility, health care facility, senior's residence, long-term care facility, or an education facility located at the Facility. Furthermore, the nearest POI is located greater than 5 metres from the building on which the point of emissions are located. As such, same structure contamination was not considered.

6.1 Dispersion Modelling Input Summary Table

A description of how the approved dispersion model was performed is included in Table 3. This table meets both the requirements of s.26 (1) 11 and sections 8-17 of O. Reg. 419/05 and follows the format provided in the ESDM Procedure Document.

6.2 Coordinate System

The Universal Transverse Mercator (UTM) coordinate system, as per Section 5.2.2 of the ADMGO, was used to specify model object sources, buildings and receptors. All coordinates were defined in the North American Datum of 1983 (NAD83).

All sources and buildings are provided on Figure 3 and the property line coordinates are provided on Figure 3.

6.3 Meteorology and Land Use Zoning Plan

Subparagraph 10 of s.26 (1) of O. Reg. 419/05 requires a description of the local land use conditions if meteorological data described in paragraph 2 of s.13 (1) of O. Reg. 419/05 was used. The AERMOD model was run using a MECP pre-processed 5-year dispersion meteorological data set (i.e., surface and profile files) for West Central Region (Hamilton, Niagara, Guelph) for the years 1996 through 2000. The meteorological conditions, which would result in the maximum concentration, would typically be stable atmospheric conditions such as an inversion with low wind speed. The maximum hour or averaging period out of 43,800 hours of data would not occur at each grid point simultaneously since the wind can only blow in one direction during 1 hour.

A land use zoning plan is provided on Figure 2, which illustrates the extents of the Site property boundary and provides the zoning of adjacent land uses. The Site is located in an Extraction and Agricultural zoned area that is surrounded by Agricultural zones.



6.4 Terrain

AERMOD captures the essential physics of dispersion in complex terrain through the use of a separate height scale factor for each receptor (USEPA, 1998 – AERMAP UG). The highest scale factor represents the terrain that would dominate flow in the vicinity of the receptor.

The height scale factor that is used by AERMOD is generated by a AERMAP terrain pre-processor. AERMAP utilizes terrain data, or Digital Elevation Model (DEM) data in conjunction with a layout of receptors and sources to height scale factors that can be directly used in AERMOD. Terrain data used in this assessment was obtained from MECP (7.5-minute format).

6.5 Receptors

Receptors were chosen based on recommendations provided in Section 7.1 of the ADMGO, which is in accordance with s.14 of O. Reg. 419/05. A tiered receptor grid was defined starting with a rectangular boundary that encloses all the modelled sources (bounding box). A tiered grid was then defined starting from the edge of the bounding box with a fine resolution, to coarser resolutions further away. All tiered distances were defined relative to the bounding box. The receptor grid used is described as follows:

- 20-m spacing within 200 m of the edge of the bounding box
- 50-m spacing from 200 to 500 m
- 100-m spacing from 500 to 1,000 m
- 200-m spacing from 1,000 to 2,000 m
- 500-m spacing from 2,000 to 5,000 m

A property line ground level receptor grid with 10-m spacing was used to evaluate the maximum property boundary concentration. No receptors were placed inside the Site's property line.

6.6 Building Downwash

The Facility buildings were entered into the model using the USEPA Building Profile Input Program (BPIP-PRIME). The inputs into this pre-processor include the co-ordinates and heights of the buildings and stacks. The BPIP program was executed to evaluate any building cavity downwash effects. Cavity downwash can result in air contaminants being forced to ground level prematurely under certain meteorological conditions. The on-site buildings and structures were modelled with their respective average roof heights.

The PRIME plume rise algorithms include vertical wind shear calculations (important for buoyant releases from short stacks (i.e., stacks at release heights within the recirculation zones of the buildings). The PRIME algorithm also allows for the wind speed deficit factors to improve the accuracy of predicted concentrations within building wake zones that form in the lee of buildings. The BPIP input file is provided in Appendix D.



6.7 Deposition

AERMOD has the ability to account for wet and dry deposition of substances that would reduce ground level concentrations at POIs. However, the deposition algorithm has not been implemented in this assessment and therefore, the predicted POI concentrations are considered to be more conservative.

6.8 Averaging Time and Conversions

The shortest time scale that AERMOD predicts is a 1-hour average value. Schedule 3 standards of O. Reg. 419/05 apply to this Facility; many of these standards are based on 1-hour and 24-hour averaging times, which are averaging times that are easily provided by AERMOD. In cases where a standard has an averaging period less than 1-hour (e.g., 10-minute), a conversion to the appropriate averaging period was completed using the MECP recommended conversion factors, as documented in the ADMGO.

6.9 Dispersion Modelling Options

The options used in the AERMOD dispersion model are summarized in the table below.

Modelling Parameter	Description	Used in the Assessment?
DFAULT	Specifies that regulatory default options will be used	Yes
CONC	Specifies that concentration values will be calculated	Yes
DDPLETE	Specifies that dry deposition will be calculated	No
WDPLETE	Specifies that wet deposition will be calculated	No
FLAT	Specifies that the non-default option of assuming flat terrain will be used	No, the model will use elevated terrain as detailed in the AERMAP output
NOSTD	Specifies that the non-default option of no stack-tip downwash will be used	No
AVERTIME	Time averaging periods calculated	1-hour, 24-hour
URBANOPT	Allows model to incorporate the effects of increased surface heating from an urban area on pollutant dispersion under stable atmospheric conditions	No
URBANROUGHNESS	Specifies the urban roughness length (m)	Not Applicable
FLAGPOLE	Specifies that receptor heights above local ground level are allowed on the receptors	No



6.10 Dispersion Modelling Input and Output Files

The information input into the approved dispersion model is recorded in Appendix D. Appendix D also includes the input and output files from the AERMOD model in electronic form.

7. Emission Summary Table and Conclusions

This section provides the table required by subparagraph 14 of s.26 (1) of O. Reg. 419/05 and provides an interpretation of the results as required by the ESDM Procedure Report.

7.1 Emission Summary Table

A POI concentration for each significant contaminant emitted from the Facility was calculated based on the emission rates listed in Table 2A and Table 2B and the output from the approved dispersion model presented in Appendix D. The results are presented in Table 4. This Table follows the format provided in the ESDM Procedure Document. For each source of significant contaminants the following parameters are referenced:

- Contaminant name
- CAS number
- Total facility emission rate
- Approved dispersion model used
- Maximum POI concentration
- Averaging period for the dispersion modelling
- MECP POI limit
- Indication of limiting effect
- Schedule in Regulation 419/05
- The percentage of standard

The POI concentrations listed in Table 4 were compared against criteria listed in the MECP Air Contaminants Benchmarks (ACB) List: Standards, Guidelines, and Screening Levels for Assessing POI Concentrations of Air Contaminants dated April 2018.

7.2 Assessment of Contaminants with no MECP POI Limits

Subparagraph 14, subsection viii of s.26 (1) of O. Reg. 419/05 requires an indication of the likelihood, nature, and location of any adverse effect if the contaminant is not listed in any of Schedules 1, 2, and 3.

There are no contaminants that do not have corresponding criteria in the MECP ACB List.



7.3 Conclusions

This ESDM Report was prepared in accordance with s.26 of O. Reg. 419/05. In addition guidance in the ESDM Procedure Document was followed, as applicable.

The emission rate estimates for each source of significant contaminants are documented in Table 2. All the emission rates listed in Table 2 correspond to the operating scenario where all significant sources are operating simultaneously at their individual maximum rates of production. Therefore these emission rate estimates listed in Table 2 are not likely to be an underestimate of the actual emission rates.

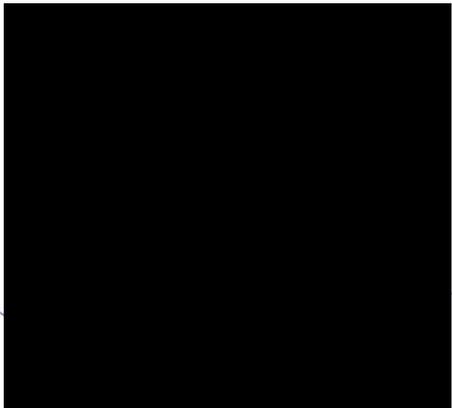
A POI concentration for each significant contaminant emitted from the Facility was calculated based on the calculated emission rates and the output from AERMOD model; the results are presented in Table 4.

The POI concentrations listed in Table 4 were compared against criteria listed in the MECP Air Contaminants Benchmarks (ACB) List: Standards, Guidelines, and Screening Levels for Assessing POI Concentrations of Air Contaminants dated April 2018.

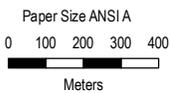
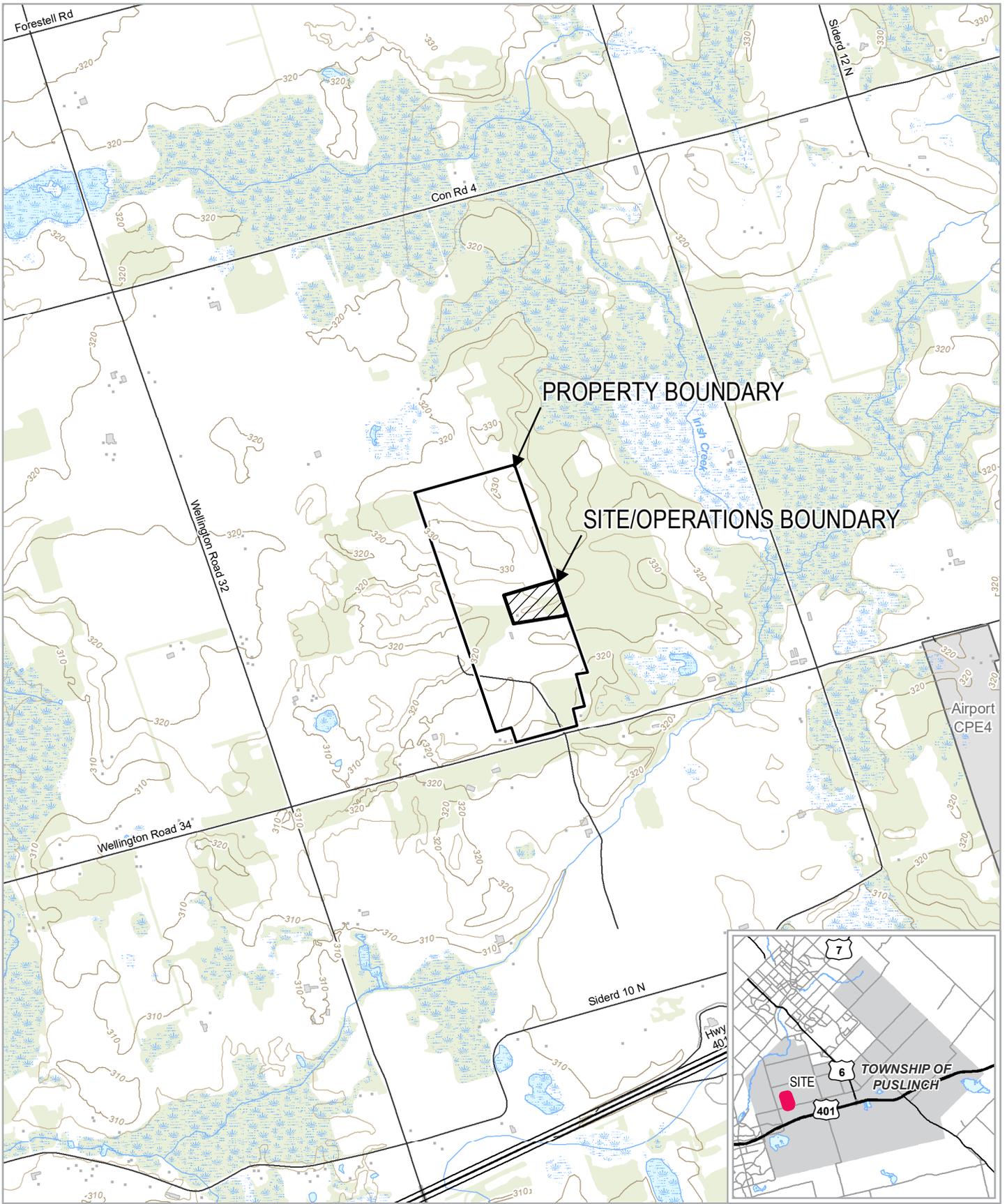
All the contaminants listed in Table 4 have predicted POI concentrations below the corresponding Ministry standards, jurisdictional screening levels, or previously approved maximum ground level concentration.

This ESDM Report demonstrates that the Facility can operate in compliance with O. Reg. 419/05 using the maximum operating scenarios.

All of which is respectfully submitted by



Erik Martinez, P.Eng.



2374868 ONTARIO INC.
6678 WELLINGTON ROAD 34, CAMBRIDGE, ONTARIO
EMISSION SUMMARY AND DISPERSION
MODELLING REPORT

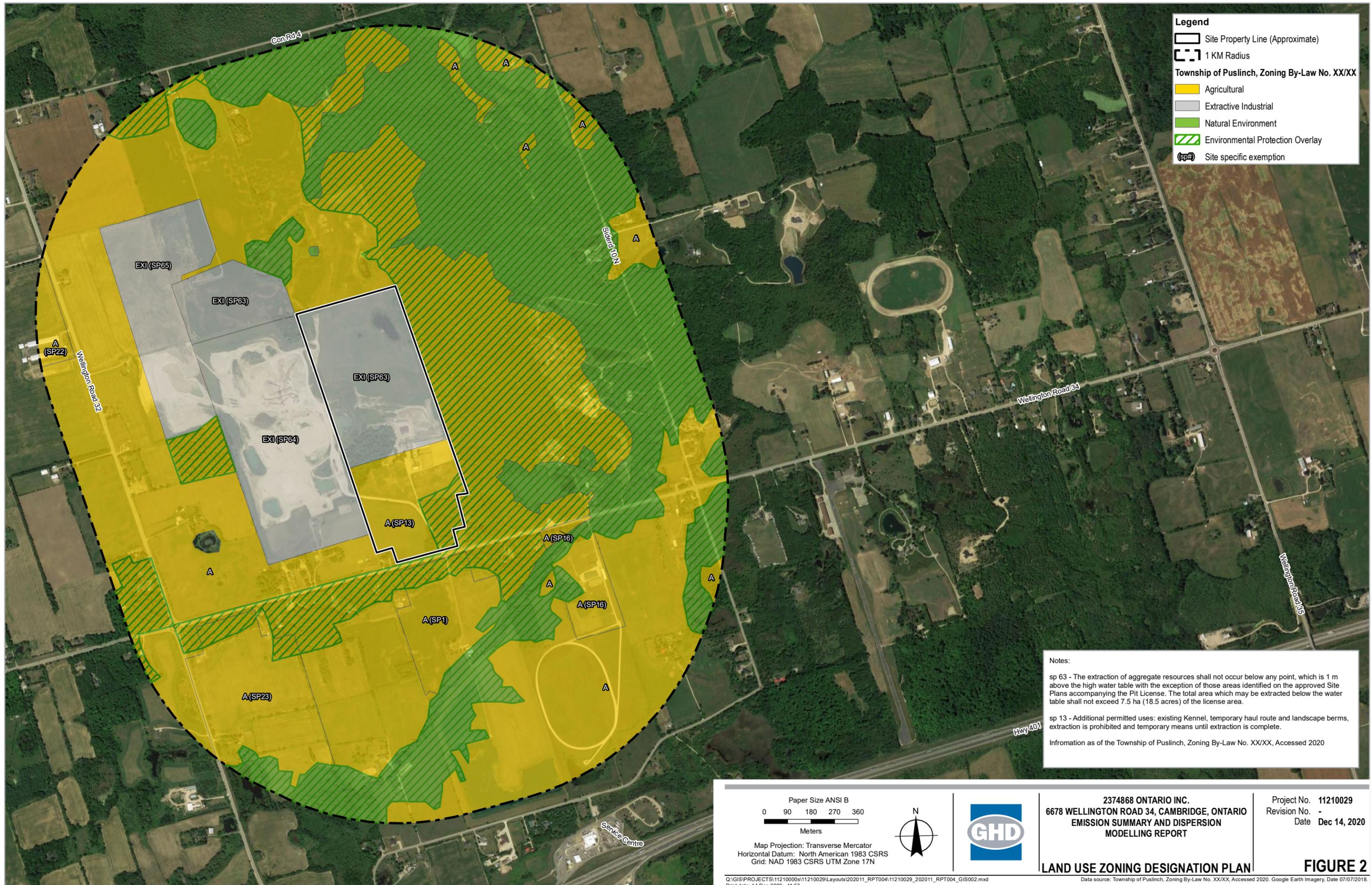
Project No. 11210029
Revision No. -
Date Dec 14, 2020

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983 CSRS
Grid: NAD 1983 CSRS UTM Zone 17N

SITE LOCATION MAP

FIGURE 1

Data source: WWIS, 2020. Ontario Ministry of the Environment (Accessed August, 2020); Imagery Google 2020. Capture date: 7/Jul/2018



Legend

- Site Property Line (Approximate)
- 1 KM Radius
- Township of Puslinch, Zoning By-Law No. XX/XX**
- Agricultural
- Extractive Industrial
- Natural Environment
- Environmental Protection Overlay
- Site specific exemption

Notes:

sp 63 - The extraction of aggregate resources shall not occur below any point, which is 1 m above the high water table with the exception of those areas identified on the approved Site Plans accompanying the Pit License. The total area which may be extracted below the water table shall not exceed 7.5 ha (18.5 acres) of the license area.

sp 13 - Additional permitted uses: existing Kennel, temporary haul route and landscape berms, extraction is prohibited and temporary means until extraction is complete.

Information as of the Township of Puslinch, Zoning By-Law No. XX/XX, Accessed 2020

Paper Size ANSI B
 0 90 180 270 360
 Meters

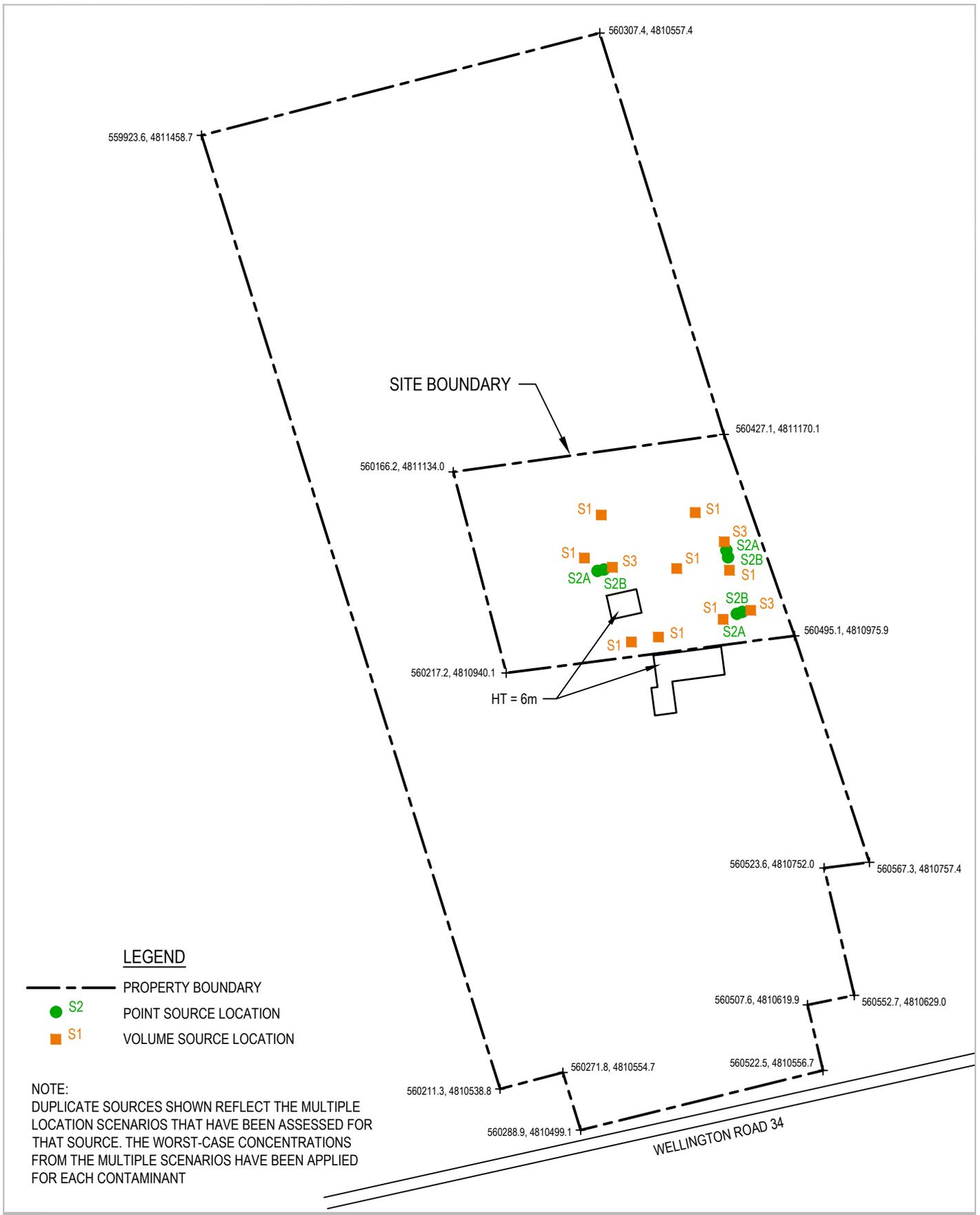
Map Projection: Transverse Mercator
 Horizontal Datum: North American 1983 CSRS
 Grid: NAD 1983 CSRS UTM Zone 17N



2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34, CAMBRIDGE, ONTARIO
 EMISSION SUMMARY AND DISPERSION
 MODELLING REPORT

Project No. 11210029
 Revision No. -
 Date Dec 14, 2020

Q:\GIS\PROJECTS\11210000s\11210029\Layouts\202011_RPT004\11210029_202011_RPT004_GIS002.mxd
 Print date: 14 Dec 2020 - 11:53
 Data source: Township of Puslinch, Zoning By-Law No. XX/XX, Accessed 2020. Google Earth Imagery, Date 07/07/2018.



Coordinate System:
UTM83-17



2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34, CAMBRIDGE, ON
 EMISSION SUMMARY AND
 DISPERSION MODELLING REPORT

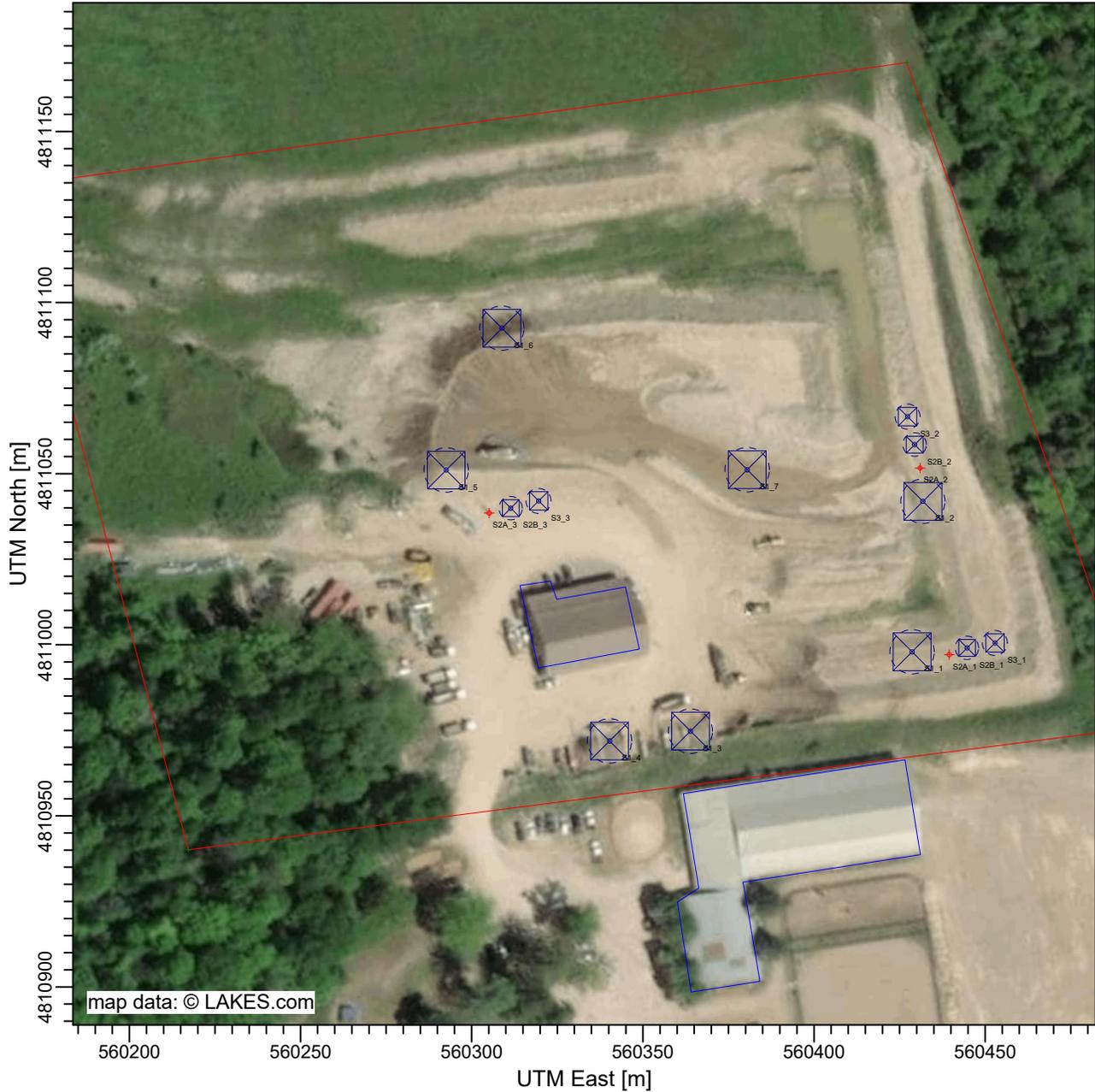
Project No. 11210029
 Date December 2021

SITE PLAN

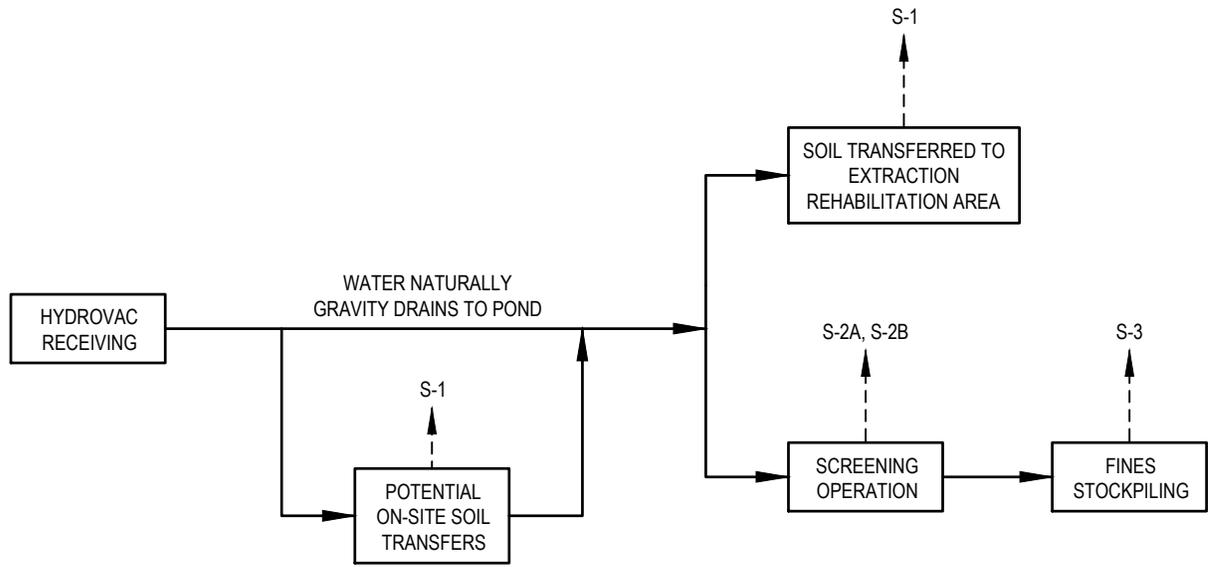
FIGURE 3A

PROJECT TITLE:

**Figure 3B - Dispersion Modelling Layout
6678 Wellington Road 34, Cambridge, Ontario**



<p>COMMENTS:</p> <p>Source Groups have been applied to evaluate each source location</p>	<p>SOURCES:</p> <p>16</p>	<p>COMPANY NAME:</p> <p>2374868 Ontario Inc.</p>	
	<p>RECEPTORS:</p> <p>2333</p>	<p>MODELER:</p> <p>A.B.</p>	
		<p>SCALE:</p> <p>1:1,878</p> <p>0  0.05 km</p>	
		<p>DATE:</p> <p>12/10/2021</p>	<p>PROJECT NO.:</p> <p>11210029</p>



2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34, CAMBRIDGE, ON
 EMISSION SUMMARY AND
 DISPERSION MODELLING REPORT

Project No. 11210029
 Date December 2020

PROCESS FLOW DIAGRAM

FIGURE 4

Table 1

Source and Contaminant Identification Table
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario

Source ID	Source Description	Expected Contaminants	Significant	Rationale
S-1	Front End Loader Material Transfers	Particulate matter	Y	
S-2A	Roto-Screener Diesel Engine	Products of combustion	Y	
S-2B	Roto-Screener	Particulate matter	Y	
S-3	Screening Operation Material Stockpiling	Particulate matter	Y	
NA	On-site roads and storage piles	Particulates	N	MECP Guideline A-10, Table 6.1 - Not a landfill

Table 2

Source Summary Table for the Maximum Emissions Scenario
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario

Contaminant		Source Data									Emissions Data					
Name	CAS Number	Source ID	Source Description	Configuration	Flow Rate (m ³ /s)	Diameter (m)	Exhaust Temperature (°C)	Height Above Roof (m)	Height Above Grade (m)	UTM Coordinates		Maximum Emission Rate (g/s)	Averaging Period	Estimation Technique ⁽¹⁾	Data Quality ⁽²⁾	% of Overall Emissions
										E (m)	N (m)					
Nitrogen Oxides	10102-44-0	S-2A	Roto-Screener Diesel Engine	Point	0.13	0.08 (3)	250 (3)	NA	1.5	various (4)		6.33E-02	1, 24	EF	E	100%
Particulate Matter	N/A	S-1	Front End Loader Material Transfers	Volume	NA	NA	NA	NA	2	various (4)		2.91E-02	24	EF	C	50%
Particulate Matter	N/A	S-2B	Roto-Screener	Volume	NA	NA	NA	NA	4	various (4)		1.45E-02	24	EF	E	25%
Particulate Matter	N/A	S-3	Screening Operation Material Stockpiling	Volume	NA	NA	NA	NA	2	various (4)		1.45E-02	24	EF	C	25%

Notes:

¹ Estimation technique: S - stack sampling, EF - emission factor, MB - mass balance

² Data quality: A = excellent C = average E = marginal

³ Engineering Assumption

Table 3

Dispersion Modelling Input Summary Table
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario

Relevant section of the regulation	Section title	Description of how the approved dispersion model was used
Section 8	Negligible Sources of Contaminant	Sources and contaminants that were considered negligible were explicitly identified, and therefore were not modelled, in accordance with s.8 of O. Reg. 419. See Table 1 - Sources and Contaminants Identification Table for more information
Section 9	Same Structure Contamination	Not applicable as operations are outdoors. There is no childcare facility, healthcare facility, senior's residence, long-term care facility, or educational facility located at the Facility.
Section 10	Operating Conditions	Daily maximum operations were assumed. See Section 4.1 and Appendix A of the ESDM Report. Conditions modelled represent a worst-case 24-hour operation.
Section 11	Source of Contaminant Emission Rate	The emission rate for each significant contaminant emitted from a significant source was estimated, the methodology for the calculation is documented in Table 2 - Source Summary Table. See Section 4.1 and Section 4.2 and Appendix A of the ESDM Report for more information.
Section 12	Combined Effect of Assumptions for Operating Conditions and Emission Rates	The operating conditions were estimated in accordance with s.10(1) and 1 and S.11 (1) 1 of O. Reg. 419 and are therefore considered to result in the highest concentrations at POI that the Facility is capable of for the contaminants emitted. See Section 4.1 and Section 4.2 of the ESDM Report.
Section 13	Meteorological Conditions	Regional Screening MET Data provided by the MECP has been applied. (Western Central, Crops)
Section 14	Area of Modelling Coverage	Receptor grid and property boundary receptors were defined as defined by O. Reg. 419/05
Section 15	Stack Height	Actual stack emission point height, per ADMGO
Section 16	Terrain Data	The Canadian Digital Elevation Model (CDEM) data in GeoTIFF format that included the Cambridge area was used (040P)
Section 17	Averaging Periods	Appropriate averaging periods were selected for each contaminant to demonstrate compliance with the O. Reg. 419/05 Schedule 3 standards.

Table 4
Emission Summary Table
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario

Contaminant	CAS Number	Total Facility Emission Rate (g/s)	Maximum POI Concentration ($\mu\text{g}/\text{m}^3$)	Air Dispersion Model Used	Averaging Period	MECP POI Limit ($\mu\text{g}/\text{m}^3$)	Limiting Effect	Regulation Schedule	Percentage of MECP POI Limit
Nitrogen Oxides	10102-44-0	6.33E-02	9.97E+01	AERMOD v19191	24-hr	200	Health	B1 - Sch. 3	50%
		6.33E-02	1.36E+02	AERMOD v19191	1	400	Health	B1 - Sch. 3	34%
Particulate Matter	N/A	5.81E-02	8.88E+01	AERMOD v19191	24-hr	120	Visibility	B1 - Sch. 3	74%

Notes:

Maximum POI concentrations listed are from the ACB list dated April 2018.

Appendices

Appendix A

Supporting Calculations

Appendix A Supporting Calculations

2374868 Ontario Inc.

Raw Material Usage

The facility receives up to 100 tonnes of soil per day. It is assumed that the maximum soil handling rates are 100 tonnes of screening per day and up to 200 tonnes of front-end loader transfers per day. This application corresponds to the operating conditions that would result in maximum 24-hour emission rate in accordance with s.10 and s.11 of O. Reg. 419/05.

Screening (S-2B)

Methodology: Emission Factor (EF)

The emissions from the rough screening operations are estimated using the US EPA AP-42 emission factor from Table 11.19.2-1 – Emission Factors for Crushed Stone Processing Operations. The emission factor applied is for uncontrolled screening.

Calculations are listed in Table A.1.

Sample calculation: Particulate Matter from Source S-2B

$$ER_{Iron\ Oxide} = \frac{0.0125\ kg\ PM}{tonne} \times \frac{100\ tonne}{day} \times \frac{1000\ g\ PM}{1\ kg\ PM} \times \frac{1\ day}{24\ hr \times 3600\ s} = 1.45 \times 10^{-2}\ g/s$$

Data Quality: Marginal

Section 9.2.4 of the procedure document titled "Marginal" or "Uncertain Data Quality" Emission Estimating Techniques includes emission estimates that are derived from emission factors developed from a small number of facilities where there is evidence of variability within the source category population (e.g., US EPA AP-42 emission factor quality ratings 'D' or 'E').

Operating Condition, Individual Maximum Rates of Production:

The emission rate calculations for these sources are based on the facility operating at maximum screening amount of 100 tonne per day.

Material Handling (S-1 & S-3)

Methodology: Emission Factor

Material is received and moved around on-site with excavators and front-end loaders. Therefore, the particulate released during receiving and material handling operations can be estimated using an equation for particulate release from dropping operations. The quantification of PM released to air from the Stockpiling Process is based on the US EPA AP-42 emission factor for dropping (Chapter 13.2.4 Equation 1) that determines the quantity of particulate generated based on the total quantity of raw material dropped.

$$EF \left[\frac{kg\ PM\ released}{tonne\ dropped} \right] = k \times 0.0016 \frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} = 0.0126 \frac{kg\ particulate\ released}{tonne\ material\ dropped}$$

Where:

EF = emission factor (kg released/tonne dropped)

k = particulate size multiplier

U = mean wind speed (m/s)

M = material moisture content (%)

A value of 19.0 m/s was taken from the maximum wind speed of the London Crops MET data file. A material moisture content (M) of 3.4 percent was used for the soil content. The particulate size multiplier used for the particulate emission calculations is k = 1.

Because the emission rate would be lower in low wind conditions, variable emission rates were used for seven categories of wind speeds. The equation above was applied using the highest wind speed of each category to calculate an adjustment factor. These factors are applied in the AERMOD modelling.

Calculations are listed in Table A.1.

Sample Calculation: Particulate from S-1

$$ER = \frac{200 \text{ tonne soil}}{\text{day}} \times \frac{0.0126 \text{ kg PM}}{\text{tonne material}} \times \frac{1 \text{ day}}{24 \times 3600 \text{ s}} \times \frac{1000 \text{ g}}{1 \text{ kg}} = 1.45 \times 10^{-2} \text{ g/s}$$

Sample Calculation: Adjustment factor for windspeed category $1.54 > U \geq 3.09$ m/s

$$EF_{3.09} = 0.0016 \times \frac{\left(\frac{3.09}{2.2}\right)^{1.3}}{\left(\frac{3.4}{2}\right)^{1.4}} = 1.18 \times 10^{-3} \text{ kg/tonne}$$

$$\text{Adjustment Factor} = \frac{1.18 \times 10^{-3}}{1.26 \times 10^{-2}} = 0.0943$$

Data Quality: Average

Section 9.2.3 of the procedure document titled "Average Data Quality" Emission Estimating Technique includes emission estimates that are derived from fundamental scientific and engineering principles and relevant empirical data that can be considered average data quality estimates. The US EPA equation has an Above Average quality rating. However, the data quality has been reduced a level due to uncertain and variable soil parameters.

Operating Condition, Individual Maximum Rates of Production:

The emission rate calculations for this source are based on the maximum amount of material received and processed in a day.

Diesel Engine Combustion (S-2A)

Methodology: Emission Factor

The estimated maximum emission rate of nitrogen oxides from the diesel engine is based on the generator operating at its maximum power output of 68 horsepower.

The estimated maximum emission rate for nitrogen oxides (NO_x) is 4.7 grams NO_x per kW-hr determined using the US EPA Tier 4 exhaust emission standard for NO_x and NHMC (assuming 100% NO_x). Environment Canada adopted this regulation in 2012. As the Roto-Screener model year is 2013, it is assumed that the engine meets these standards.

Sample Calculation: Nitrogen Oxides (CAS No. 10102-44-0)

$$68 \text{ hp} \times 0.7457 \frac{\text{kW}}{\text{hp}} \times 4.7 \frac{\text{g NO}_x}{\text{kWhr}} \times \frac{1 \text{ hr}}{3600 \text{ s}} = 0.0633 \text{ g/s}$$

Data Quality: Above Average

Section 9.2.2 of the ESDM procedure document titled "Above-Average Data Quality" Emission Estimating Techniques includes calculations if it is clear that the estimating technique will result in relatively conservative prediction.

Operating Condition, Individual Maximum Rates of Production:

The emission rate calculation for this source is based on the engine operating at its maximum firing rate.

Table A.1

**Estimated Maximum Screening & Stockpiling Particulate Emission Rates
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario**

Source ID	Source Description	Contaminant	CAS No.	Emission Factor (kg/tonne)	Maximum Material Handling Rate (tonne/day)	Emission Rate (g/s)
S-1	Front End Loader Material Transfers	Particulate Matter	NA	1.26E-02 (1)	200	2.91E-02
S-2B	Roto-Screener	Particulate Matter	NA	1.25E-02 (2)	100	1.45E-02
S-3	Screening Operation Material Stockpiling	Particulate Matter	NA	1.26E-02 (1)	100	1.45E-02

Notes:

(1) Emission factor calculated from US EPA AP-42 13.2.4-3, Equation #1:

$$EF \left(\frac{kg}{Mg} \right) = k(0.0016) \frac{\left(\frac{U}{2.2} \right)^{1.3}}{\left(\frac{M}{2} \right)^{1.4}}$$

A maximum wind speed of 19.0 m/s is applied based on the MET Data input file (London_crops_19191.pfl). The following adjustment factors are applied in AERMOD to create variable emission rates based on wind-speed category:

Wind Speed (maximum in category) (m/s)	Emission Factor for Wind Speed (kg/tonne)	AERMOD Variable Adjustment Factor
1.54	4.79E-04	3.81E-02
3.09	1.18E-03	9.43E-02
5.14	2.29E-03	1.83E-01
8.23	4.23E-03	3.37E-01
10.8	6.02E-03	4.80E-01
>10.8	1.26E-02	1.00E+00

Moisture content is assumed to be 3.4% (Table 13.2.4-1 Exposed Ground (coal mining))

(2) Emission Factor obtained from US EPA AP-42 Table 11.19.2-1 - Emission Factors for Crushed Stone Processing Operations - Screening (Uncontrolled) (Data Quality: E)

Table A.2

**Estimated Maximum Diesel Combustion Emissions
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario**

Source No.	Equipment	Contaminant	CAS Number	US EPA Tier 4 Emission Standard ¹ (g/kWh)	Maximum Output Rating (hp)	Maximum Emission Rate (g/s)
S-2A	Roto-Screener Diesel Engine	Nitrogen Oxides	10102-44-0	4.7	65	6.33E-02

Note:

(1) Based on US-EPA AP-42 Tier 4 Standard for NMHC+NOx (37 ≤ kW < 75) Emission for non road diesel engines

Appendix B

Supporting Information for Assessment of Negligibility

Appendix B Supporting Information for Assessment of Negligibility 2374868 Ontario Inc.

Sources were screened for negligibility using the following screening protocols listed in the ESDM Procedure Document:

- Fugitive dust from Facility roadways (Section 7.4)
- Specific Examples of Sources that Likely Emit Contaminants in Negligible Amounts
- Identifying significant contaminants using an emission threshold (Section 7.1.2)

The results of the screening are discussed in greater detail in the following text.

Fugitive Road Dust:

The Facility is not listed in Table 7-2 or 7-3 of Section 7.4 of the ESDM Procedure Document and accordingly dust emissions from these sources (parking lot, roads) can be considered as insignificant.

Specific Examples of Sources that Likely Emit Contaminants in Negligible Amounts

The on-site fuel tanks are assessed as negligible as they are specifically listed in Table B-3A of the ESDM Procedure Document.

Identifying Significant Contaminants Using an Emission Threshold:

Section 7.1.2 of the ESDM Procedure Document states that contaminants that are emitted from a specific facility may be identified as negligible when they are below emissions thresholds that are developed using the following formula:

$$\text{Emission Threshold } \left(\frac{g}{s}\right) = \frac{0.5 \times \text{MECP POI Limit } \left(\frac{\mu g}{m^3}\right)}{\text{Dispersion Factor } \left(\frac{\mu g}{m^3} / \frac{g}{s}\right)}$$

Table B-1 in the ESDM Procedure Document lists appropriate Dispersion Factors to be used for screening out contaminants in negligible amounts. The shortest distance from the emission source to the property line was determined to be 40 metres. The corresponding 1-hr rural dispersion factor provided in Table B-1 is linearly interpolated to be 20,000 $\mu\text{g}/\text{m}^3$.

The time averaging procedure, as outlined in Regulation 419 and the Air Dispersion Modelling Guideline for Ontario, was used to convert the 1-hr urban dispersion factor to a 24-hr averaging period. The resulting 24-hour dispersion factor is 3,620 $\mu\text{g}/\text{m}^3$.

$$C_{24} = C_1 \times \left(\frac{t_1}{t_0}\right)^n$$
$$C_{24} = 10,000 \frac{\mu g}{m^3} / \frac{g}{s} \times \left(\frac{1}{24}\right)^{0.28} = 4,107 \frac{\mu g}{m^3} / \frac{g}{s}$$

The converted urban dispersion factor was then incorporated into the emission threshold concentration calculations.

All contaminants whose emission rates did not exceed the calculated emission threshold were considered insignificant. These contaminants and the emission calculation thresholds are summarized on Table B.1.

Table B.1

Negligibility Assessment
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario

Compound	CAS Number	Emission Rate (g/s)	Averaging Period	POI Limit ¹ (µg/m ³)	Limiting Effect	Regulation Schedule	Emission Threshold ² (g/s)	Significant?
Nitrogen Oxides	10102-44-0	6.33E-02	24	200	Health	Sch. 3 - B1	2.43E-02	Y
		6.33E-02	1	400	Health	Sch. 3 - B1	2.00E-02	Y
Particulate Matter	N/A	5.81E-02	24	120	Visibility	Sch. 3 - B1	1.46E-02	Y

Notes:

Sch. 3: Refers to Standards in Schedule 3 of O. Reg. 419/05.

B1: Benchmark 1 Value - Standards and Guidelines

(1) From the MECP document "Air Contaminants Benchmarks (ACB) List: Standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants", dated April 2018.

(2) Emission Threshold based on the MECP Reg. 419 standard and the Urban Dispersion factor from Table B-1, 24-hr averaging period as required, as outlined in Section 7.1.2 of the MECP document "Procedure for Preparing an ESDM Report, Version 4.1" dated March 2018.

Appendix C

Dispersion Modelling Files

(Electronic)

Table C.1

AERMOD Source Input Summary Table
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario

POINT SOURCES

Source ID	Description	Scenario Source Groups ⁽¹⁾	Variable Emissions	Release Type	UTM Coordinates		Release Height (m)	Exhaust Temperature (K)	Exhaust Velocity (m/s)	Inside Diameter (m)
					X (m)	Y (m)				
S2A_1	Screener Motor	NOX1		Point, Vertical	560439.47	4810997.10	1.5	523.15	50.0	0.08
S2A_2	Screener Motor	NOX2		Point, Vertical	560430.96	4811051.66	1.5	523.15	50.0	0.08
S2A_3	Screener Motor	NOX3		Point, Vertical	560305.10	4811038.48	1.5	523.15	50.0	0.08

VOLUME SOURCES

Source ID	Description	Scenario Source Groups ⁽¹⁾	Variable Emissions	Release Type	UTM Coordinates		Release Height (m)	Length (m)	Sigma Y (deg)	Sigma Z (deg)
					X (m)	Y (m)				
S1_1	Material Transfer	PM1	Wind Speed Ratio ⁽²⁾	Volume	560428.66	4810997.93	0.6096	11.0	2.6	0.93
S1_2	Material Transfer	PM2	Wind Speed Ratio ⁽²⁾	Volume	560431.82	4811041.89	0.6096	11.0	2.6	0.93
S1_3	Material Transfer	PM3	Wind Speed Ratio ⁽²⁾	Volume	560363.93	4810974.75	0.6096	11.0	2.6	0.93
S1_4	Material Transfer	PM4	Wind Speed Ratio ⁽²⁾	Volume	560340.28	4810971.87	0.6096	11.0	2.6	0.93
S1_5	Material Transfer	PM5	Wind Speed Ratio ⁽²⁾	Volume	560292.55	4811051.04	0.6096	11.0	2.6	0.93
S1_6	Material Transfer	PM6	Wind Speed Ratio ⁽²⁾	Volume	560308.83	4811092.49	0.6096	11.0	2.6	0.93
S1_7	Material Transfer	PM7	Wind Speed Ratio ⁽²⁾	Volume	560380.49	4811051.15	0.6096	11.0	2.6	0.93
S2B_1	Screening	PM1, PM2, PM3		Volume	560444.71	4810999.07	1.2192	4.9	1.1	0.47
S2B_2	Screening	PM4, PM7		Volume	560429.41	4811058.48	1.2192	4.9	1.1	0.47
S2B_3	Screening	PM5, PM6		Volume	560311.42	4811039.91	1.2192	4.9	1.1	0.47
S3_1	Fines Stockpiling	PM1, PM2, PM3	Wind Speed Ratio ⁽²⁾	Volume	560452.86	4811000.51	0.6096	5.4	1.2	0.93
S3_2	Fines Stockpiling	PM4, PM7	Wind Speed Ratio ⁽²⁾	Volume	560427.35	4811066.66	0.6096	5.4	1.2	0.93
S3_3	Fines Stockpiling	PM5, PM6	Wind Speed Ratio ⁽²⁾	Volume	560319.55	4811042.04	0.6096	5.4	1.2	0.93

Note:

⁽¹⁾ All sources were modelled at various locations that they could be placed on the site and evaluated in groups that could reflect the worst-case POI concentrations. The '_X' labels on the source ID's denote unique locations for the otherwise identical sources. Only one of each type of source can emit at a time.

The worst-case PM source combination scenario was determined to be PM1.

The worst-case 1-hr NOx source was NOX1

The worst-case 24-hr NOx source was NOX2

⁽²⁾ Variable emissions based on wind speed were applied to this source. See table A.1 for details

Appendix D

Roto-Screen Brochure

ROTO-SCREEN : SERIES II

ROTO-SCREEN OVERVIEW

The Roto-Screen trommel screening plant is designed to be stronger and more versatile than other screeners now on the market. It is easy to transport, easier to operate, and offers savings in costs not seen with other comparable machines. Coupled with its high reliability, the Roto-Screen keeps screening revenues where they should be... in your pocket.

POWER SYSTEMS

Roto-Screen's power is a rugged, dependable and economical diesel work horse made by DEUTZ®.

This Sturdy motor is specially designed to withstand the dustiest of conditions. Its Air Cooled engine assures low maintenance. The DEUTZ® F4L912, a 4 cylinder Air Cooled Engine rated at 65hp, with one of the best fuel consumption in its class.

PERFORMANCE

85 - 150TPH depending on material and screen size. (Avg. 100TPH)

BENEFITS AND FEATURES

- Change screening size in 25 minutes
- Stockpiles product to 14ft or directly into trucks
- Load the machine from either side with Loader or Excavator
- Downhill variable speed belt feeder
- Variable speed on drum and output belt
- Flapper drum-cleaner device (NO WEAR -- better than brushes)
- Tire drive on drum, absorbs shock loads
- Retractable tow-hitch for on-site or highway moving
- Bolt-on drum extension available to make more products
- Spare drums are very affordable



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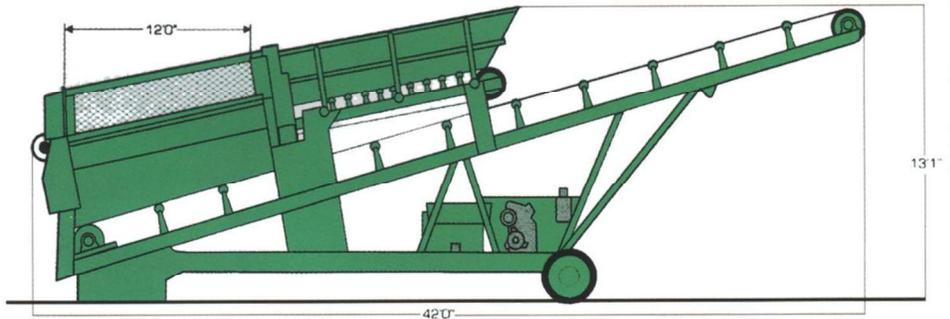
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843-812-5226 (mobile)



Technical Data

Length.....	42'0"
Width.....	102"
Weight.....	8500 kg 17000 lbs
Height.....	(travel) 13'4" (work) 14'0"
Work mode :	
Height of feeder bin	13'1"
Width of discharge conveyor.....	48"
Capacity of feeder.....	6 cubic yards, 8 cubic yards, heaped
Width of feeder conveyor	30"
Diameter of screening cylinder	5'0" int.
Length of cylinder	12'
Screening surface.....	135 square feet



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ROTO-SCREEN : IN ACTION



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about GHD

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Site Servicing Study

6678 Wellington Road 34, Cambridge

2374868 Ontario Inc

June 20, 2025

Project name		2374868 Ont Inc-Permitting S					
Document title		Site Servicing Study 6678 Wellington Road 34, Cambridge					
Project number		11210029-RPT-14					
File name		Document1					
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Appendices

Appendix A	Aggregate Licensed Area Rehabilitation Plan
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1. Introduction

2374868 Ontario Inc (Applicant) owns and operates the hydrovac processing facility located at 6678 Wellington Road 34 in Wellington County, Township of Puslinch, Ontario (Site). The Site is located on a portion of a larger Property owned by 2374868 Ontario Inc. The Site Servicing Study (Study) has been prepared in support of the Applicant's Application for zoning approval.

1.1 Purpose

The purpose of the Study is to demonstrate the impact of a proposed development on the infrastructure capacity of the area. The Study reviews existing and proposed conditions, and demonstrates that the demands of the development on water and wastewater, stormwater, and other infrastructure are all met without causing detrimental impact to existing servicing capacity

1.2 Scope and limitations

This report: has been prepared by GHD for 2374868 Ontario Inc and may only be used and relied on by 2374868 Ontario Inc for the purpose agreed between GHD and 2374868 Ontario Inc as set out in section 01 of this report.

GHD otherwise disclaims responsibility to any person other than 2374868 Ontario Inc arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

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If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

1.3 Overview of the proposed development

The proposed Facility receives soil mixed with water (liquid soil or nonhazardous waste) from hydrovacating operations conducted by Site personnel and trucks at multiple sites in southern Ontario. The soil water mixture is placed in stockpiles, water gravity drains off to a stormwater management pond, and the dry soil is sampled for chemical analysis to confirm that it is acceptable for use in rehabilitation of the Ontario Ministry of Natural Resources and Forestry (MNRF) licensed aggregate pit on the Property and for use at other appropriate receiving sites.

1.4 Summary of key servicing considerations

Site services consist of the following:

- Natural gas is not serviced to the property.
- The Site uses electricity as serviced from transmission lines on Wellington Road 34.
- The Site uses telecommunication services as serviced from lines on Wellington Road 34.

- The Site uses propane for heating the office space in the winter. A propane tank is located adjacent to the office building.
- Water is provided to the Site via a private supply well.
- A holding tank is used for collecting septage and it is regularly emptied for off-site disposal

Proposed changes to Site services as part of the proposed development are as follows:

- Installation of a septic leach field connected to the holding tank
- Installation of a firefighting water holding cistern

2. Site context & existing conditions

2.1 Location and legal description of the site

The Property is legally described as Lot 8, Concession 3 in Wellington County, the Township of Puslinch and consists of a 40-hectare property. A legal survey is provided with the application filing.

2.2 Existing land use and zoning designation

The northern two thirds of the Property is zoned as Extractive (EXI) and the southern one third is zoned as Agricultural (A). The current zoning also allows some of the Site operations and an application for a minor zoning amendment to include the specific allowed uses was submitted to the Township of Puslinch in December 2020.

2.3 Adjacent land uses and infrastructure

The adjacent property land use to the west is an operating aggregate extraction pit, to the north is agricultural land, to the east is forested conservation land, and to the south are residential and agricultural lands.

2.4 Existing topography, vegetation, and drainage patterns

2.4.1 Topography

The topography of the Site is generally flat around the buildings with roadways and parking areas. The topography is further detailed in the Stormwater Management Report (SMP) (GHD, December 2020). A copy of the SMP is provided with the application filing. The final Site topography will comply with the MNR approved Rehabilitation Plan for the aggregate licensed area of the Property (Appendix A).

2.4.2 Vegetation

Most of the Property surface cover is woodlots, vegetated areas, and grass. The open areas of the Site are gravel covered, grassed, or compacted soil. Vegetation conditions are described and evaluated in detail in the Environmental Impact Assessment (EIA) (GHD, August 2020) and with a 2025 addendum submitted with the Application filing. The final Site vegetation will comply with the MNR approved Rehabilitation Plan for the aggregate licensed area of the Property (Appendix A).

2.4.3 Drainage

There are no direct point source discharges of stormwater off site. Drainage on the property is mostly by sheet flow and some infiltration. The topography is further detailed in the Stormwater Management Report (SMP) (GHD, December 2020). A copy of the SMP is provided with the Application filing. It is noted that the SMP was developed for an application for a MECP Environmental Compliance Approval (Industrial Sewage Works) and a previous zoning application, however, MECP indicated that this ECA was not required since Site stormwater management would be adequately addressed with the ECA (Waste). The final Site drainage will comply with the MNR approved Rehabilitation Plan for the aggregate licensed area of the Property (Appendix A).

2.5 Existing municipal services and utilities

There are no municipal services to the Site and none will be required as part of the proposed development. The Site is serviced by electricity and communications line from local utilities.

3. Water supply & distribution

3.1 Existing water supply infrastructure

The Site is currently serviced by two private water supply wells, one which is used for water supply to the building for washrooms and one which is used for filling hydrovac trucks.

3.2 Proposed water servicing strategy

No additional servicing for water supply is required for the proposed development.

3.3 Water demand calculations

Not applicable

3.4 Fire flow requirements and hydrant locations

There are no fire hydrants located on the Property.

A firefighting water cistern will be designed and installed adjacent to the truck filling water supply well and requirements will be provided as part of a building permit application. The proposed cistern location is beside the supply well as shown on the Site Plan provided with the Application filing.

4. Sanitary sewer servicing

4.1 Existing sanitary sewer infrastructure

The Site is currently serviced by a septic system consisting of a holding tank that is regularly emptied by a permitted disposal company for off-site disposal.

4.2 Proposed sanitary servicing strategy

A new leach field will be designed and installed as part of an application for a building permit. The existing holding tank will discharge to the new leach field. The proposed leach field location is beside the vacant agricultural building as shown on the Site Plan provided with the Application filing.

4.3 Wastewater flow calculations

To be provided as part of building permit application.

5. Stormwater management

5.1 Existing drainage conditions

The existing drainage conditions are detailed in the SMP (GHD, December 2020) and summarized below.

Most of the Property surface cover is woodlots, vegetated areas, and grass. The open areas of the Site are gravel covered, grassed, or compacted soil. The water drainage from the soil stockpiles is collected in a vegetated drainage swale which runs east west and drains into an on-site pond.

There are no direct point source discharges of stormwater off site. The following items are noted regarding existing stormwater drainage:

- Sheet flow discharge along the vegetated drainage swale promotes settling of suspended solids, reduces erosion.
- Yard inspections and maintenance are conducted daily as needed to keep outside areas clean and minimize potential impacts to storm water.
- The accumulated sediment in the drainage swale to the pond is excavated on a weekly basis and processed with other liquid soils to minimize potential impacts to surface water quality.
- Weekly sampling of the pond water over several years has indicated no exceedances of applicable MECP Standards (Table 2).¹

5.2 Proposed stormwater management strategy

The SMP (GHD, December 2020) details the Site stormwater management. The Waste ECA requires that the Applicant provide a low permeability liner system beneath the liquid soil unloading/processing area, the drainage swale and temporary pond. The water in the final pond will be held (and no further process water added) until testing results are received to confirm water quality meets Table 2 Standards, and then the water will be released to the final pond and ultimately for irrigation of the vegetation in the rehabilitated licensed aggregate area.

5.3 Stormwater quantity and quality control measures

See Section 5.2.

¹ Full Depth Generic Site Condition Standards in a Potable Ground Water Condition All Types of Property Use, as provided in the Table 2 of the MECP document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011, and updates as issued.

5.4 Low-impact development (LID) techniques

See SMP in Application filing.

5.5 Compliance with Township and provincial stormwater regulations

The SMP complies with Township and MECP regulations and guidelines.

6. Transportation & access

6.1 Existing road network and access points

The Site is currently serviced by a haul road permitted under existing zoning that connects Wellington Road 34 to the Site. The haul road is a shared feature with the adjacent aggregate operation. The road is used by hydrovac and aggregate trucks and Site employees of both operations.

6.2 Proposed site access and circulation

No changes to the current site access are proposed.

6.3 Traffic impact assessment (if required)

Hydrovac trucks enter and exit the haul road from the via the access road at Wellington Road 34. There is a maximum of 25 hydrovac trucks operating from the Site as permitted by the MECP Waste ECA. A Traffic Study (GHD, July 2020) indicated that the hydrovac truck traffic would not cause significant impacts to existing traffic on Road 34. This study was updated in 2025 with current traffic data provided by Wellington County and there were no changes to the results. This study is included in the Application filing.

6.4 Parking layout and requirements

Proposed parking related to the operation for both employees and trucks are as shown on the Site Plan provided with the Application filing.

6.5 Emergency vehicle access considerations

The haul road providing access to the operation is wide enough to accommodate emergency vehicles access as shown on the Site Plan. Ample space is available around existing infrastructure and buildings for turning and staging as needed in an event of an emergency.

7. Utilities & servicing infrastructure

7.1 Existing electrical, gas, and telecommunications services

- Natural gas is not serviced to the property.
- The Site is serviced with electricity from the local utility from transmission lines on Wellington Road 34.
- The Site is serviced with telecommunication from the local utility from lines on Wellington Road 34.
- The Site uses propane for heating the office space in the winter. A propane tank is located adjacent to the office building.

7.2 Proposed utility connections and upgrades

No new proposed utility connections and upgrades are planned as part of the proposed development.

7.3 Street lighting and site servicing requirements

Some overhead lights including private streetlights and lighting on infrastructure or buildings are present at the Site.

No further lighting or servicing is proposed as part of the proposed development.

8. Site grading & erosion control

8.1 Existing and proposed grading plans

The Site is required to be rehabilitated to the grades provided on the MNR approved Rehabilitation Plan (Appendix A).

8.2 Erosion and sediment control measures

E&S control measures are provided in the SMP (GHD, December 2020) and the EIA (GHD, July 2020).

8.3 Compliance with Township grading standards

The Site is required to be rehabilitated to the grades provided on the MNR approved Rehabilitation Plan (Appendix A).

8.4 Mitigation of environmental impacts

The Waste ECA provides comprehensive measures to mitigate potential environmental impacts, including a Design and Operations (D&O) Plan, soil sampling in accordance with MECP Excess Soil regulations, installation of impermeable liners, surface water monitoring and a comprehensive Hydrogeological Impact Assessment (HIA) (GHD, May 2025) which includes a Groundwater Monitoring Program with a contingency plan, and operational procedures, inspections, and reporting. Additionally, the MECP Air & Noise ECA was issued based on providing comprehensive evaluations of potential air and noise emissions from trucks, operations and equipment to demonstrate compliance with MECP regulations and guidelines, as well as ongoing operation and maintenance provisions.

9. Environmental & sustainability considerations

9.1 Protection of natural heritage features

A comprehensive EIA (GHD, July 2020) and a 2025 Addendum was completed to assess natural heritage features (e.g., plant and wildlife habitats) at the Site and adjacent properties in accordance with accepted MECP and conservation agency regulations and guidelines. The EIA demonstrates that Site operations do not cause adverse effects to natural heritage features at the Site and recommended some measures be put in places (e.g., silt fencing in some areas) to maintain buffer areas. The EIA was submitted to the Township and some revisions were completed to address comments received from the Township's consultant and these are included in the Application filing.

9.2 Energy-efficient infrastructure

There are no planned additional energy efficient infrastructure included in the proposed development. Energy efficiency aspects of the building will be addressed in the application for a building permit.

9.3 Waste management and recycling provisions

Municipal waste or recycling is handled via private collection by a permitted disposal company.

10. Conclusion & Recommendations

1. No significant changes or new services are required by the proposed development except for a new septic leach field and firefighting water cistern, both of which are being addressed as part of a building permit application.
2. No significant impacts to environmental conditions are expected as part of the proposed development. Potential impacts are adequately managed by the following:
 - a. Waste ECA, D&O Report, HIA, and soil, surface water and groundwater monitoring and reporting
 - b. Air & Noise ECA, Emission Source Dispersion Modelling and Acoustical Assessment reports and O&M Plan
 - c. Environmental Impact Assessment (GHD, July 2020) and 2025 Addendum
 - d. Traffic Study (GHD, May 2025)
 - e. Licensed Aggregate Area Rehabilitation Plan

Appendix A

Aggregate Licensed Area Rehabilitation Plan



ghd.com

→ **The Power of Commitment**

Our ref: 11210029-LTR-3

October 30, 2023

Mrs. Lynne Banks
Development and Legislative Coordinator
Township of Puslinch
7404 Wellington Road 34
Puslinch, Ontario
N0B 2J0

**Response to Peer Review of Acoustic Assessment Report
Hydrovac Facility Zoning By-Law Amendment Application**

Dear Mrs. Banks

1. Introduction

GHD prepared an Acoustic Assessment Report (AAR), dated January 7, 2021, on behalf of 2374868 Ontario Inc., to support an application for a MECP ECA (Air & Noise) for the hydrovac facility (Facility) located at 6678 Wellington Road 34 in Cambridge, Ontario (Site). The ECA application and supporting documents also were provided to the Township of Puslinch when it was submitted to the MECP as part of an application for a Zoning By-Law Amendment, the Township of Puslinch retained Valcoustics Canada Ltd. (Valcoustics) to review and provide comments on the Acoustic Assessment Report. On July 19, 2022, the Township of Puslinch provided a letter dated June 27, 2022 (VCL File: 122-0269) which provided Valcoustics comments. On October 2, 2023, GHD had a without prejudice discussion with Valcoustics to clarify the comments. An updated Acoustic Assessment Report can be found in Attachment 1.

This letter provides GHD's response to the Valcoustics comments. For convenience, each comment is copied in italics below and the response follows.

2. Acoustic Assessment Review Comments

2.1 Peer Review Comments

Valcoustics Comment No. 1:

The noise assessment has applied the Ministry of Environment, Conservation and Parks (MECP) noise guideline requirements of NPC-300. This is considered appropriate.

GHD Response No. 1:

Concur.

Valcoustics Comment No. 2:

The proposed waste processing facility is considered a stationary noise source. NPC-300 defines a stationary noise source as “a source of sound or a combination of sources of sound that are included and normally operated within the property lines of a facility and includes the premises of one person as one stationary noise source, unless the dominant source of sound on those premises is construction”. From the information provided, it is not clear if the adjacent extractive operation is part of the same site as the proposed waste processing operation. As a minimum, it appears that truck traffic shares part of the site and the entrance. The noise assessment needs to assess all the sources operating on the site and not just the new sources associated with the proposed waste processing facility.

GHD Response No. 2:

Comprehensive and detailed information on the hydrovac operations, Site and adjacent Capital Paving (Capital) traffic are provided in the Design and Operations (D&O) Report and Traffic Study submitted with the Zoning By-Law Amendment application in December 2021. The adjacent aggregate extractive operation business is not part of the waste processing operation. Though the properties share an entrance, they are independent sites and owned by separate companies. However, GHD conservatively assessed the additional truck traffic from the Capital Paving to have 5 trucks/hour based on information provided in the Traffic Study. The cumulative assessment of the proposed Facility based on this increase in number of trucks does not change the compliance status with applicable noise limits for the proposed waste processing operation as reflected in the updated AAR.

Valcoustics Comment No. 3:

It is not clear from the information presented within the report if vacant lots that would permit a noise sensitive use exist in the area. As per NPC-300, such vacant lots need to be included as receptors in the noise impact assessment.

GHD Response No. 3:

Vacant lots that would permit a noise sensitive use have been considered in the selection process of worst-case Points of Reception. According to the Township of Puslinch bylaws, the permitted uses for land zoned as Extractive does not allow for residential dwellings or any other land uses that would likely be noise sensitive. Additionally, all agricultural zoned land on the southern part of the Property and properties adjacent to the Property currently already have dwellings. As Township of Puslinch agricultural zoning allows for a maximum of 1 single detached dwelling per lot, no additional dwellings will be built.

Valcoustics Comment No. 4:

The report indicates that the Class 2 guideline limits have been applied at all receptor locations. However, justification for Class 2 has not been provided. There is a concern that at least the receptors to the north of the facility may not be in a Class 2 area.

GHD Response No. 4:

The area noise profile is dominated by Regional Highways such as Wellington Road 34 and Wellington Road 32. GHD notes POR8 to the north is approximately equidistant from Wellington Road 32 as POR1 is to Wellington Road 34, therefore GHD believes it is reasonable to apply Class 2 guideline limits as both would be dominated during the daytime periods by road traffic and human activity, while during nighttime hours this area would be dominated by natural noises typical of a Class 2 Area. However, to be conservative GHD updated the evaluation of POR 7 and POR 8 (the PORs to the north of Site) against Class 3 areas sound level limits and both PORs still show compliance as reflected in the updated AAR.

Valcoustics Comment No. 5:

Section 6.1 of the report indicates the worst-case assessment was based on measured sound pressure levels. However, no measurement data is provided in the report. The report then goes on to say CadnaA was used to model the potential noise impacts which contradicts the prior statement.

Clarification is needed.

GHD Response No. 5:

This was an inadvertent typographical error in the report and all sound levels used were based on equivalent values from GHD's noise library data based on measured sound pressure levels of like representative equipment and was used along with published reference data.

Valcoustics Comment No. 6:

The modelling assumptions indicate a maximum reflection order of 1 was used to complete the assessment. A minimum 1 (and ideally at least 2) order of reflection should be used in the model.

GHD Response No. 6:

This was an inadvertent typographical error in the report, the CadnaA model used a max reflection order of 2.

Valcoustics Comment No. 7:

The ground absorption coefficients used in the model are not considered appropriate. Often 1 is used for absorptive ground (grass and crop land) and 0 is used for hard, sound reflective surfaces (gravel areas, haul road, ponds, etc.). Hard surfaces can provide some sound absorption. If hard ground absorption is to be accounted for then the soft ground cannot be assumed to be perfectly absorptive.

GHD Response No. 7:

GHD has completed numerous of acoustic assessments accepted by the MECP assigning the ground absorption for grass/soft ground to be 1, gravel ground to be 0.5, asphalt and other hard surfaces to be 0.25, and water surfaces to be 0. However, GHD has conservatively in this case updated all "hard" ground to have a ground absorption value of 0. This change does not alter the noise compliance as reflected in the updated AAR.

Valcoustics Comment No. 8:

The sound absorption coefficient used to model the reflective buildings is missing from the report.

GHD Response No. 8:

Buildings were modelled with a smooth façade with a standard 0.21 absorption coefficient.

Valcoustics Comment No. 9:

The report concludes that any future equipment that contributes less than 30 dBA at the PORs does not require further assessment. Even though it is agreed that a single source at this level is insignificant, if multiple sources at this level are added, they could contribute to the off-site noise impacts. Thus, our recommendation is that any changes to the proposed operation should not proceed without a proper acoustical assessment.

GHD Response No. 9:

GHD has updated the AAR to only recommend that any new equipment should contribute less than 30 dBA at the PORs and will evaluate any potential future equipment to ensure that the cumulative impacts are compliant.

Valcoustics Comment No. 10:

The noise source summary in Appendix C seems to indicate that the reference sound level for the truck route comes from a UK reference. North American references/standards should be used for motor vehicle traffic since sound emission requirements and vehicle types are different between Europe and North America.

GHD Response No. 10:

The United Kingdom's Department of Environment Food and Rural Affairs (DEFRA) *Update of Noise Database for Prediction of Noise on Construction and Open Sites, 2005 and 2006* is a standard noise reference database that is used and accepted globally based on numerous reviewed and approved ECA applications submitted to the MECP for like equipment. However, GHD has updated the sound level data with reference to the U.S. Department of Transportation, Federal Highway Administration (FHWA) Traffic Noise Model – Technical Manual which comparable sound power level.

3. Conclusion

We trust that the responses contained herein address the comments in Valcoustics review of the AAR. Should you have any questions on the above, please do not hesitate to contact us.

Regards

Patrick Chen
Acoustics EIT
+1 519 340-4259
patrick.chen@ghd.com

Encl.

Copy to: Eric Nafziger, 2374868 Ontario Inc.
Michael Masschaele, GHD

Attachment 1

Updated Acoustic Assessment Report



Acoustic Assessment Report

**6678 Wellington Road 34
Cambridge, Ontario**

2374868 Ontario Inc.

03 October 2023

Company Name

2374868 Ontario Inc.

Company Address

Unit Number	Street Number	Street Name	PO Box
	6678	Wellington Road 34	
City/Town		Province	Postal Code
Cambridge		Ontario	N6C 1K7

Location of Facility

6678 Wellington Road 34, Cambridge, Ontario

The attached Acoustic Assessment Report was prepared in accordance with the guidance in the ministry document "Information to be Submitted for Approval of Stationary Sources of Sound" (NPC-233) dated October 1995 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact

Company Contact

Last Name	First Name	Middle Initial
Nafziger	Eric	J
Title		Telephone Number
Manager		519-658-5023
Signature		Date (yyyy/mm/dd)
		2021/01/06

Technical Contact

Technical Contact

Patrick Chen

Last Name	First Name	Middle Initial
Chen	Patrick	
Representing		Telephone Number
GHD Limited		519 340-4259
Signature		Date (yyyy/mm/dd)
		2023/04/13

	Required Information	Submitted	Explanation/Reference
1.0	Introduction (Project Background and Overview)	<input checked="" type="checkbox"/> Yes	Executive Summary
2.0	Facility Description		
	2.1 Operating hours of Facility and significant Noise Sources	<input checked="" type="checkbox"/> Yes	Section 1
	2.2 Site Plan identifying all significant Noise Sources	<input checked="" type="checkbox"/> Yes	Figure 1
3.0	Noise Source Summary		
	3.1 Noise Source Summary Table	<input checked="" type="checkbox"/> Yes	Table 1
	3.2 Source noise emissions specifications	<input checked="" type="checkbox"/> Yes	Table 1
	3.3 Source power/capacity ratings	<input checked="" type="checkbox"/> Yes	Table 1
	3.4 Noise control equipment description and acoustical specifications	<input type="checkbox"/> Yes	N/A
4.0	Point of Reception Noise Impact Calculations		
	4.1 Point of Reception Noise Impact Table	<input checked="" type="checkbox"/> Yes	Table 2
	4.2 Point(s) of Reception (POR) list and description	<input checked="" type="checkbox"/> Yes	Section 3
	4.3 Land-use Zoning Plan	<input checked="" type="checkbox"/> Yes	Appendix A
	4.4 Scaled Area Location Plan	<input checked="" type="checkbox"/> Yes	Figure 1
	4.5 Procedure used to assess noise impacts at each POR	<input checked="" type="checkbox"/> Yes	Section 4
	4.6 List of parameters/assumptions used in calculations	<input checked="" type="checkbox"/> Yes	Section 4, Section 6
5.0	Acoustic Assessment Summary		
	5.1 Acoustic Assessment Summary Table	<input checked="" type="checkbox"/> Yes	Table 3
	5.2 Rationale for selecting applicable noise guideline limits	<input checked="" type="checkbox"/> Yes	Section 5
	5.3 Predictable Worst Case Impacts Operating Scenario	<input checked="" type="checkbox"/> Yes	Section 6, Appendix D
6.0	Conclusions		
	6.1 Statement of compliance with the selected noise performance limits	<input checked="" type="checkbox"/> Yes	Section 7
7.0	Appendices (Provide details such as)		
	Listing of Insignificant Noise Sources	<input checked="" type="checkbox"/> Yes	Appendix B
	Manufacturer's Noise Specifications	<input checked="" type="checkbox"/> Yes	Appendix E
	Calculations	<input checked="" type="checkbox"/> Yes	Appendix D
	Instrumentation	<input type="checkbox"/> Yes	N/A
	Meteorology during Sound Level Measurements	<input type="checkbox"/> Yes	N/A
	Raw Data from Measurements	<input type="checkbox"/> Yes	N/A
	Drawings (Facility / Equipment)	<input checked="" type="checkbox"/> Yes	Figure 1

Project name		Badger 2374868 Ont Inc-Permitting S					
Document title		Acoustic Assessment Report 6678 Wellington Road 34					
Project number		11210029-RPT-10					
File name		11210029-RPT-10-Acoustic Assessment Report					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	FINAL	Patrick Chen	Mike Masschaele		Mike Masschaele		Oct.3/ 23

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Appendix A	Land Use Zoning Designation Plan
Appendix B	Summary of Insignificant Noise Sources
Appendix C	Noise Specification and Worst-Case Simultaneous Operations Summary
Appendix D	CadnaA Sample Calculation for POR1
Appendix E	Manufacturer Sound Level Specifications

1. Introduction

GHD Limited (GHD) has prepared an Acoustic Assessment Report Update (AAR) for the 2374868 Ontario Inc. facility (Facility) located at 6678 Wellington Road 34 in the Cambridge, Ontario. This AAR has been prepared to include all significant sources of noise emissions at the Facility and to demonstrate compliance at all offsite noise sensitive locations. The North American Industry Classification System (NAICS) Code that applies to this Facility is 562210 – Waste treatment and disposal.

This AAR has been prepared to support an application by 2374868 Ontario Inc., for an application for a Ministry of the Environment Conservation and Parks (MECP) Environmental Compliance Approval (ECA) (Air & Noise).

The Facility typically operates between 7 AM and 6 PM, Monday through Friday. However, additional work outside of these hours is occasionally performed.

The AAR presented herein provides an evaluation of the potential noise impacts at the sensitive receptors located nearest to the Facility. The AAR was prepared consistent with the following MECP guidance:

- NPC-103, "Procedures", August 1978
- NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October 1995
- "Basic Comprehensive Certificates of Approval (Air), User Guide, Appendix A - Supporting Information for an Acoustic Assessment Report or Vibration Assessment Report Required by a Basic Comprehensive CofA prepared by the Environmental Assessment and Approvals Branch, Version 2.1, March 2011"
- NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources –Approval and Planning", August 2013

The Facility is located in an area zoned as Extractive and Agricultural. The land uses immediately surrounding the Facility is also Extractive and Agricultural. A zoning map and zoning definitions are provided in Appendix A. A site plan is provided on Figure 1.

The Facility is located in a mixed Acoustical Class 2 and 3 area. Class 2 areas are defined by NPC 300 as an area where the background sound level during the day is dominated by the activities of people and by natural sounds during the night. Class 3 areas are defined by NPC 300 as an area where the background sound level is dominated by natural sounds having little or no road traffic.

1.1 Scope and Limitations

This report: has been prepared by GHD for 2374868 Ontario Inc. and may only be used and relied on by 2374868 Ontario Inc. for the purpose agreed between GHD and 2374868 Ontario Inc.

GHD otherwise disclaims responsibility to any person other than 2374868 Ontario Inc. arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

2. Noise Source Summary

This AAR focuses on the sound emissions from the significant noise sources identified at the Facility with the potential to adversely impact the sensitive receptors and are inclusive of the noise emissions from the various heavy machinery onsite (cranes, loaders, and excavator-style equipment). The significant noise sources are identified in the Noise Source Summary Table 1 and the locations are identified on Figure 1.

It has been conservatively assumed that the onsite loaders and excavator equipment can operate any time of day. Screening operations are daytime only. Truck traffic is expected to have a maximum of up to 6 trucks per hour during the daytime hours and up to 2 trucks per hour in the evening and nighttime hours. Onsite vehicle activities including heavy trucks arriving and departing from site and traffic from Capitol Paving are summarized below:

Type of Vehicle	Day 7a.m.- 7 p.m. (Trips/hour)	Evening 7p.m.- 11 p.m. (Trips /hour)	Night 11 p.m.- 7 a.m. (Trips /hour)
Front End Loader Movements (S1)	15	5	5
Heavy Vehicle Truck Route (TR1)	6	2	2
Capital Paving Truck Traffic (TR2)	5	5	5

There are no sources of impulse noise or vibration at the Facility¹.

Comprehensive and detailed information on the hydrovac operations, Site and adjacent Capital Paving (Capital) traffic are provided in the Design and Operations (D&O) Report and Traffic Study submitted with the Zoning By-Law Amendment application in December 2021. The adjacent aggregate extractive operation business is not part of the waste processing operation. Though the properties share an entrance, they are independent sites and owned by separate companies. GHD has conservatively added the Capital traffic entering and exiting from the shared entrance. It is also noted that the land south of the hydrovac operations is not part of the Facility's operations.

The significant equipment sources are all either trucking related activities or outdoor equipment located beside the within the Site Boundary. The Site does not have any significant interior noise sources resulting in breakout noise anywhere from the building. The existing building at the Site is made of standard industrial construction materials. The other noise sources at the Facility have not been included since they are considered insignificant contributors to the overall Facility noise level at the sensitive receptors. A summary of insignificant noise sources is provided in Table B.1 of Appendix B.

3. Point of Reception Summary

The identification of appropriate sensitive point(s)-of-reception is necessary to conduct the AAR for the Facility. A "point-of-reception" is any point on the premises of a person where sound, originating from other than those premises, is received. The point-of-reception may be located on permanent or seasonal residences, nursing/retirement homes, rental residences, hospitals, campgrounds, schools, or places of worship.

The objective of this AAR is to determine the predictable worst-case 1-hour equivalent sound level (1-hour Leq) at the worst-case point(s)-of-reception. The worst-case point(s)-of-reception are defined as the sensitive receptors with the greatest potential exposure to the Facility noise sources due to proximity and direct line-of-sight exposure.

¹ Assessment of vibration if applicable is assessed according to NPC-207.

The worst-case sensitive points of reception (POR) are:

- POR1 – nearest façade of a two-storey residence on Sideroad 10 N approximately 900 meters (m) east of the site (4.5 m Above Ground (AG))
- POR2 – nearest façade of a two-storey residence on Highway 34 approximately 630 meters (m) east of the site (4.5 m Above Ground (AG))
- POR3 - outdoor point of reception associated with a two-storey residence on Highway 34 approximately 70 m south of the site (1.5 m AG) evaluated to be the worst-case in comparison to the residence façade
- POR4 – nearest façade of a two-storey residence on Highway 34 approximately 60 meters (m) south of the site (4.5 m Above Ground (AG))
- POR5 – nearest façade of a two-storey residence on Highway 34 approximately 60 meters (m) southwest of the site (4.5 m Above Ground (AG))
- POR6 – nearest façade of a two-storey residence on Highway 34 approximately 150 meters (m) west of the site (4.5 m Above Ground (AG))
- POR7 – nearest façade of a two-storey residence on Concession Road approximately 740 meters (m) northwest of the site (4.5 m Above Ground (AG))
- POR8 – nearest façade of a two-storey residence on Concession Road approximately 1,300 meters (m) north of the site (4.5 m Above Ground (AG))

The location of the worst case PORs are identified on Figure 2.

Vacant lots that would permit a noise sensitive use have been considered in the selection process of worst- case Points of Reception. According to the Township of Puslinch bylaws, the permitted uses for land zoned as Extractive does not allow for residential dwellings or any other land uses that would likely be noise sensitive. Additionally, all agricultural zoned land on the southern part of the Property and properties adjacent to the Property currently already have dwellings. As Township of Puslinch agricultural zoning allows for a maximum of 1 single detached dwelling per lot, no additional dwellings will be built.

In accordance with NPC-300 all PORs locations within 500 m of the Facility were considered including the planes of windows which were assessed for daytime and nighttime noise limits. In addition, the ground level amenity areas, within 30 m of each POR, were also evaluated for daytime noise limits; however, the noise impact at the worst-case and most exposed PORs are presented herein. GHD also evaluated the zoning surrounding the Facility to identify any potential vacant lots that permit a residential build and has included all relevant POR's.

4. Sound Level Data

Manufacturer's sound level data for the proposed equipment is provided in Appendix E. This data was supplemented with spectral data from GHD's sound level library. All equipment must meet (or be below) the specified sound levels. The proposed significant noise sources included in this assessment are:

- Front End Loader (S1) – Sound Power Level: 113.2 dBA
- Screening Equipment Motor (S2A) – Sound Power Level: 109.3 dBA
- Screening Operation (S2B) – Sound Power Level: 105.6 dBA
- Excavator (S4) – Sound Power Level: 103.2 dBA
- Truck Route (TR1) – Sound Power Level: 109.5 dBA
- Capitol Paving Truck Route (TR2) – Sound Power Level: 109.5 dBA

All noise sources are outdoor sources.

5. Assessment Criteria

Assessment criteria may be determined for a POR based on the MECP's minimum exclusionary sound level limits, as presented in Table B-1 of NPC-300, in comparison to the background sound levels experienced in the area. The "background sound level" is defined as the sound level present in the environment that is produced by noise sources other than those from the Facility, and would include traffic sound levels and sound from neighboring industrial/commercial activity. The higher of the two assessment criteria is selected for purpose of assessment.

5.1 Sound Level Limits for Stationary Noise Sources

5.1.1 MECP Standard Limits

NPC-300 defines stationary noise sources as sound from all sources that are normally operated within the property lines of a facility. The noise impact from stationary sources is evaluated based on operations during a predictable worst-case hour. Stationary noise assessment criteria are generally determined based on the MECP's minimum exclusionary sound level limits, as presented in NPC-300, in comparison to the background sound levels experienced in the area.

Limits are provided for two main types of noise sources:

- Non-impulsive, "continuous" noise sources such as ventilation fans, mechanical equipment, and vehicles while moving within the property boundary of an industry. Continuous noise is measured using 1-hour average sound exposures (Leq (1-hr) values), in dBA.
- Impulsive noise, which is a "banging" type noise characterized by rapid sound level rise time and decay. Impulsive noise is measured using a logarithmic mean (average) level (LLM) of the impulses in a one-hour period, in dBAI.

The guideline requires an assessment at, and provides separate guideline limits for:

- Outdoor points of reception (e.g., back yards, communal outdoor amenity areas).
- Façade points of reception such as the plane of windows on the outdoor façade which connect onto noise sensitive spaces, such as living rooms, dens, eat-in kitchens, dining rooms and bedrooms.

Acoustical Area Classification

Under the MECP Publication NPC-300 guidelines, noise sensitive receptors are defined using receptor area classifications. The receptor areas are classified as either:

- Class 1 – Urban areas
- Class 2 – Suburban / semi-rural areas
- Class 3 – Rural areas
- Class 4 – Infill areas (Subject to Municipal Planning Approval for New Developments)

Depending on the receptor area classification, different guideline limits apply. Classes 1, 2, and 3 were included in the predecessor guidelines to Publication NPC-300. The Class 4 area is intended to allow for infill and redevelopment, whilst still protecting residences from undue noise.

Table 5.1 below summarizes the MECP's minimum exclusionary sound level limits based on the Acoustical Class of the project area, which are expressed in terms of 1-hour equivalent sound levels (1-hour Leq):

Table 5.1 MECP Minimum Exclusionary Sound Level Limits for Steady Sound

Time of Day	Class 1 Sound Level Limits (dBA)		Class 2 Sound Level Limits (dBA)		Class 3 Sound Level Limits (dBA)		Class 4 Sound Level Limits (dBA)	
	Plane of Window	Outdoor POR						
07:00 – 19:00 (Day)	50	50	50	50	45	45	60	55
19:00 – 23:00 (Even)	50	50	50	45	40	40	60	55
23:00 – 07:00 (Night)	45	NA	45	NA	40	NA	55	NA

Based on the acoustic environment at the development, it is considered to be in a mixed acoustic Class 2 and 3 area as defined by NPC-300, as the acoustic environment is dominated by human activities (i.e., road traffic) during the day by Highway 34 and natural environment and infrequent human activity for Class 2 and dominated by natural sounds at all hours for a Class 3.

Class 2 and Class 3 noise limits appropriate for this project have been shaded for reference.

Table 5.2 Applicable Minimum MECP Sound Level Limits or Site Specific Limits for Impulsive or Steady State Sound

POR ID	POR Description	Sound Level Limits (dBA)		
		Day (7am – 7pm)	Evening (7pm – 11pm)	Night (11pm – 7am)
POR1	Nearest façade of a two-storey residence on Sideroad 10 N (4.5 metres above grade [m AG])	50	50	45
POR2	Nearest façade of a two-storey residence on Highway 34 (4.5 m AG)	50	50	45
POR3	Nearest façade of a two-storey residence on Highway 34 (4.5 m AG)	50	50	45
POR4	Nearest façade of a two-storey residence on Highway 34 (4.5 m AG)	50	50	45
POR5	Nearest façade of a two-storey residence on Highway 34 (4.5 m AG)	50	50	45
POR6	Nearest façade of a two-storey residence on Highway 34 (4.5 m AG)	50	50	45
POR7	Nearest façade of a two-storey residence on Concession Road (4.5 m AG)	45	40	40
POR8	Nearest façade of a two-storey residence on Concession Road (4.5 m AG)	45	40	40

The lowest sound levels generally occur at the ground floor level (1.5 metres above grade) and increase with height due to increased line of sight exposure to the roadways. GHD has presented the lowest noise limit relative to the worst-case Facility noise impact based on line-of-sight and exposure to the applicable receptor.

6. Impact Assessment

6.1 Steady-State Sound Levels

The worst-case assessment of steady-state noise sources at the selected points of reception was based on representative noise data. CadnaA Acoustical Modelling Software (CadnaA), version 2023, was used to model the potential impacts of the significant noise sources. CadnaA calculates sound level emissions based on the ISO 9613-2 standard "Acoustics – Attenuation of Sound during Propagation Outdoors".

A sample calculation for worst-case POR1 is provided in Appendix D.

The worst-case cumulative Facility-wide attenuated sound levels estimated at the receptor(s) included attenuation affects due to geometric divergence, atmospheric attenuation, barriers/berms, ground absorption and directivity, as applicable for all significant noise sources off-site buildings were input as intervening structures.

CadnaA modelling assumptions used in this AAR included:

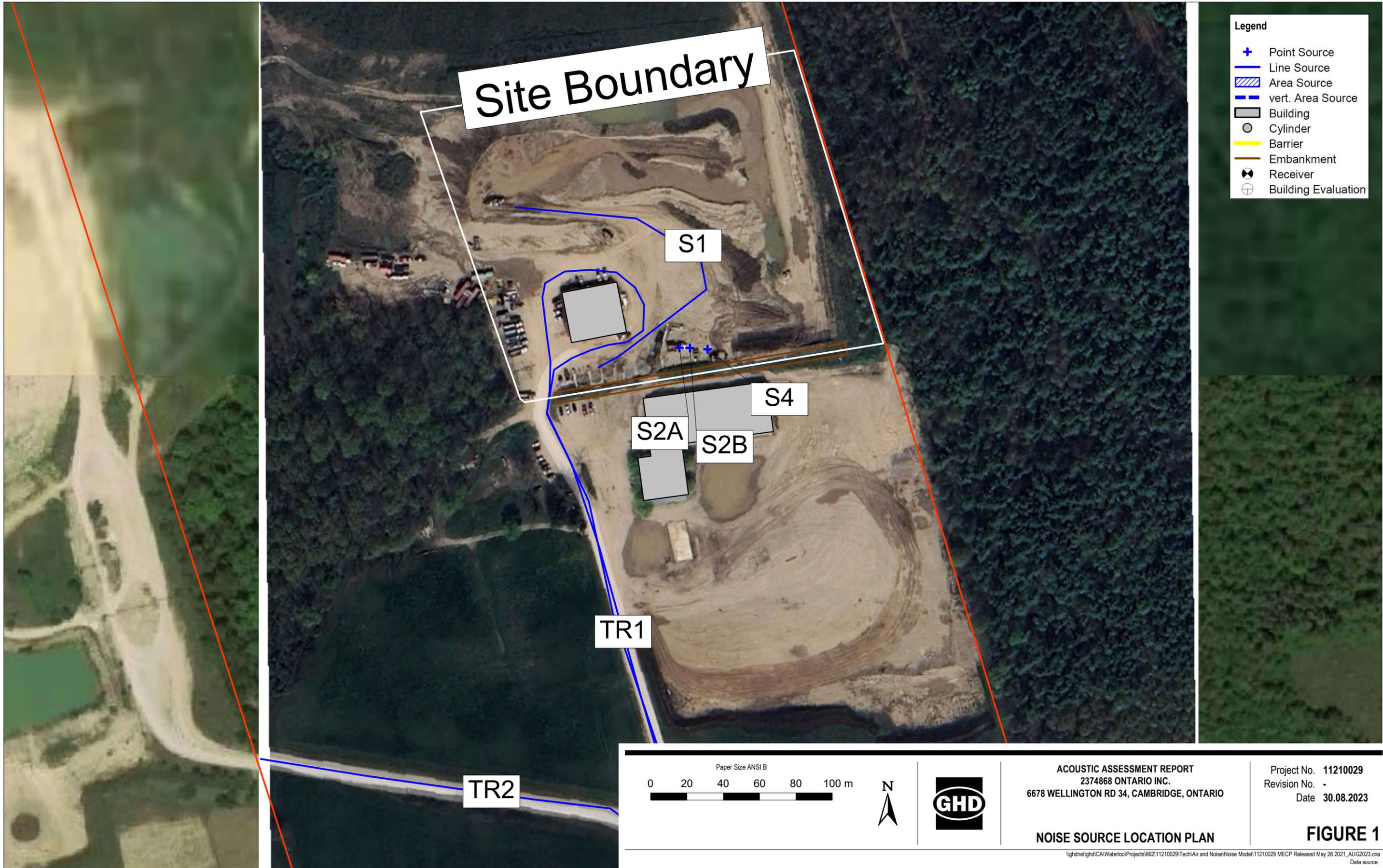
- **Noise Sources:** All sources were modelled using the 1/1 octave band data from source measurements, manufacturer's sound level data, or reference materials.
- **Noise Source Elevation:** The heights of the sources are summarized in Table C.1 of Appendix C.
- **Reflection Order:** A maximum reflection order of 2.0 was used to evaluate indirect noise impact from one reflecting surface.
- **Ground Absorption:** The model was set up with a ground absorption factor of 1 due to the area being primarily grass and crop land. A manual ground absorption area is included with a factor of 0 hard surfaces such as gravel areas, haul roads, and ponds.
- **Foliage:** The surrounding woodlots were modeled as foliage with a height of 8m.
- **Receptor Elevation:** POR receptor heights were modelled appropriately to represent the worst-case elevation.
- **Time-Weighted Adjustment:** Time-weighted adjustments for sources that do not operate continuously are summarized in Table C.1.
- **Terrain:** Flat terrain was assumed in order to be conservative.
- **Tonality:** A +5 dBA adjustment was applied for tonal sources, if applicable.
- **Building Surfaces:** The buildings are modelled as reflective surfaces with 0.21 absorption coefficient.

The steady stated noise impacts at each POR are summarized in Table 2. Compliance with the MECP sound level limits is demonstrated in Table 3 and Figure 3. Compliance with the MECP sound level limits is demonstrated in Table 3.

7. Conclusions

The unattenuated steady-state estimated at the PORs are below the MECP's minimum exclusionary sound level limits as summarized in Table 3.

GHD recommends that any future proposed equipment sound level specifications be evaluated to ensure that the sound level contribution at each applicable POR will not significantly add to the site wide cumulative noise impacts in order for the Facility to maintain compliance with NPC-300 noise limits.



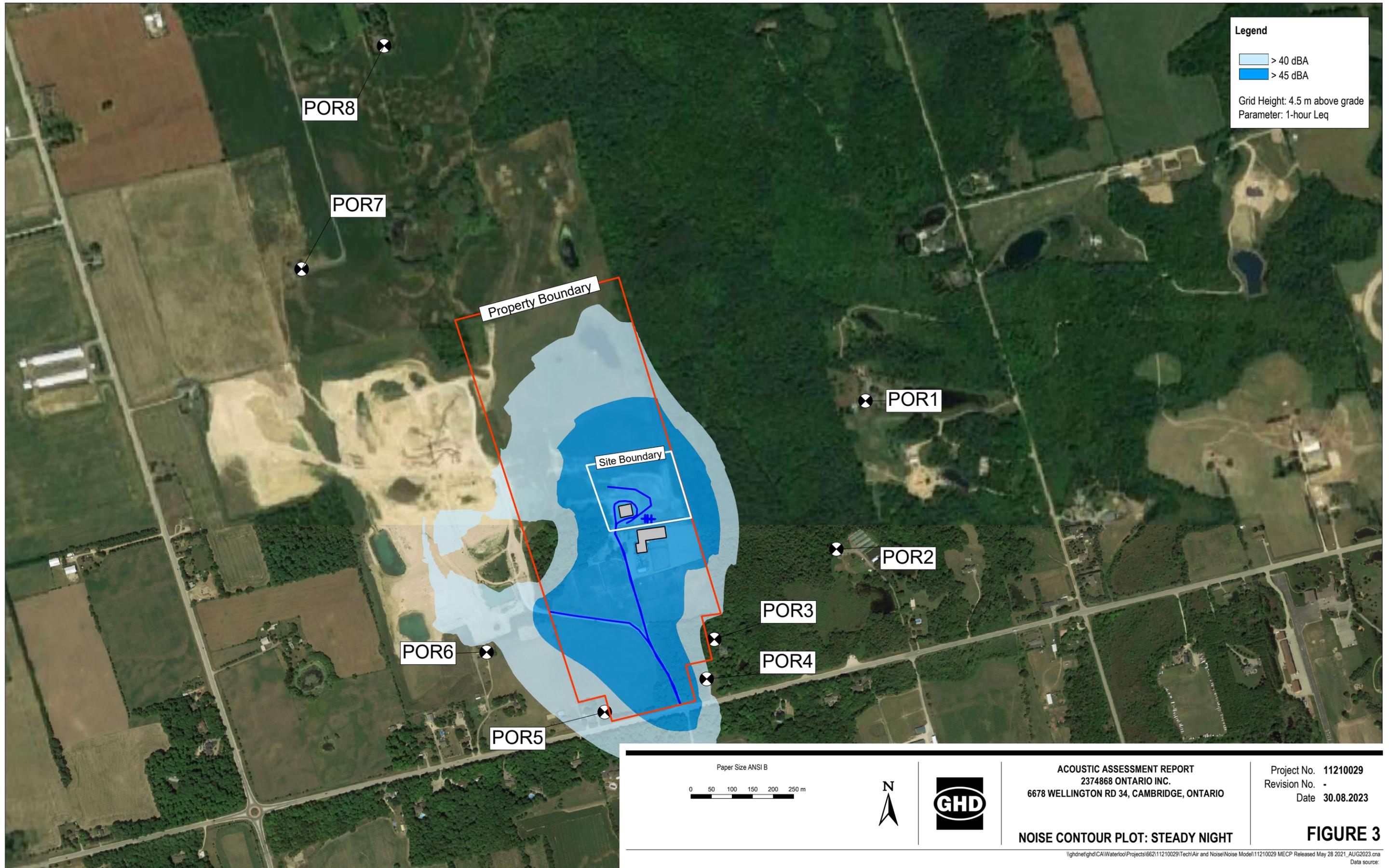


Table 1

Noise Source Summary
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario

Cadna A ID	Source Description	Sound Power Level¹ (dBA)	Source Characteristics²	Source Location³	Noise Control Measures⁴	Source Type
S1	Front End Loader	113.2	S	O	U	Point
S2A	Screening Equipment Motor	109.3	S	O	U	Point
S2B	Screening Operation	105.6	S	O	U	Point
S4	Excavator	103.2	S	O	U	Point
TR1	Truck Route	109.5	S	O	U	Line
TR2	Capitol Paving Truck Route	109.5	S	O	U	Line

Notes:

¹ Sound Power Level (PWL) in dBA, excludes +5 dBA total penalty if applicable.

² Sound characteristics:

- S – Steady
- Q – Quasi-steady impulsive
- I – Impulsive
- B – Buzzing
- T – Tonal
- C – Cyclic

³ Source location:

- O – Outside of building
- I – Inside of building

⁴ Noise control measures:

- S – Silencer, acoustic louvre, muffler
- A – Acoustic lining, plenum
- B – Barrier, berm, screening
- L – Lagging
- E – Acoustic enclosure
- O – Other
- U – Uncontrolled
- AC – Administrative control

Table 2
Point of Reception Unattenuated Noise Impact
 2374868 Ontario Inc.
 6678 Wellington Road 34, Cambridge, Ontario

Cadna A ID	Source Description	Sideroad 10 N Residence Facade POR1			Highway 34 Residence Facade POR2			Highway 34 Residence Outdoor Receptor POR3			Highway 34 Residence Facade POR4			Highway 34 Residence Facade POR5			Highway 34 Residence Facade POR6			Concession Road Residence Facade POR7			Concession Road 4 Residence Facade POR8										
		Distance (m)	Partial Sound Levels ¹ (dBA)			Distance (m)	Partial Sound Levels ¹ (dBA)			Distance (m)	Partial Sound Levels ¹ (dBA)			Distance (m)	Partial Sound Levels ¹ (dBA)			Distance (m)	Partial Sound Levels ¹ (dBA)			Distance (m)	Partial Sound Levels ¹ (dBA)										
			Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am		Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am		Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am		Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am		Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am		Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am	Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am					
Steady State Noise Impact																																	
S1	Front End Loader	576	36	31	31	466	34	29	29	351	32	27	27	425	30	25	25	463	36	31	31	468	35	30	30	941	31	26	26	1217	28	23	23
S2A	Screening Equipment Motor	606	38	—	—	470	28	—	—	337	28	—	—	416	23	—	—	478	30	—	—	502	38	—	—	1030	29	—	—	1309	31	—	—
S2B	Screening Operation	601	36	—	—	464	33	—	—	334	29	—	—	414	25	—	—	479	32	—	—	507	39	—	—	1034	27	—	—	1312	28	—	—
S4	Excavator	593	34	31	31	455	31	28	28	329	27	24	24	410	23	20	20	481	30	27	27	514	35	32	32	1043	25	22	22	1317	27	24	24
TR1	Truck Route	613	32	27	27	492	31	26	26	141	37	32	32	83	42	37	37	177	43	38	38	387	37	32	32	951	28	23	23	1243	25	20	20
TR2	Capitol Paving Truck Route	783	25	25	25	507	25	25	25	142	31	31	31	81	38	38	38	178	40	40	40	206	36	36	36	1047	22	22	22	1442	19	19	19
Total Facility Sound Level (1-hour Leq):			43	35	35		39	33	33		40	36	36		44	41	41		46	43	43		45	39	39		36	30	30		35	28	28

Note:

¹ Sound level at the receptor was calculated using Cadna A acoustical modelling software.

Table 3

Acoustic Assessment Summary
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario

Point of Reception ID	Point of Reception Description	Time of Day	SS Sound Levels (L _{EQ})	Performance Limit ¹ (L _{EQ})	Compliance with Performance Limit	Class Number	Verified by Acoustic Audit
			(dBA)	(dBA)	(Yes/No)		
Steady State Noise Impact							
POR1	Sideroad 10 N Residence Facade	07:00–19:00	43	50	Yes	Class 2	No
		19:00–23:00	35	50	Yes	Class 2	No
		23:00–07:00	35	45	Yes	Class 2	No
POR2	Highway 34 Residence Facade	07:00–19:00	39	50	Yes	Class 2	No
		19:00–23:00	33	50	Yes	Class 2	No
		23:00–07:00	33	45	Yes	Class 2	No
POR3	Highway 34 Residence Outdoor Receptor	07:00–19:00	40	50	Yes	Class 2	No
		19:00–23:00	36	45	Yes	Class 2	No
		23:00–07:00	36	45	Yes	Class 2	No
POR4	Highway 34 Residence Facade	07:00–19:00	44	50	Yes	Class 2	No
		19:00–23:00	41	50	Yes	Class 2	No
		23:00–07:00	41	45	Yes	Class 2	No
POR5	Highway 34 Residence Facade	07:00–19:00	46	50	Yes	Class 2	No
		19:00–23:00	43	50	Yes	Class 2	No
		23:00–07:00	43	45	Yes	Class 2	No
POR6	Highway 34 Residence Facade	07:00–19:00	45	50	Yes	Class 2	No
		19:00–23:00	39	50	Yes	Class 2	No
		23:00–07:00	39	45	Yes	Class 2	No
POR7	Concession Road Residence Facade	07:00–19:00	36	45	Yes	Class 3	No
		19:00–23:00	30	40	Yes	Class 3	No
		23:00–07:00	30	40	Yes	Class 3	No
POR8	Concession Road 4 Residence Facade	07:00–19:00	35	45	Yes	Class 3	No
		19:00–23:00	28	40	Yes	Class 3	No
		23:00–07:00	28	40	Yes	Class 3	No

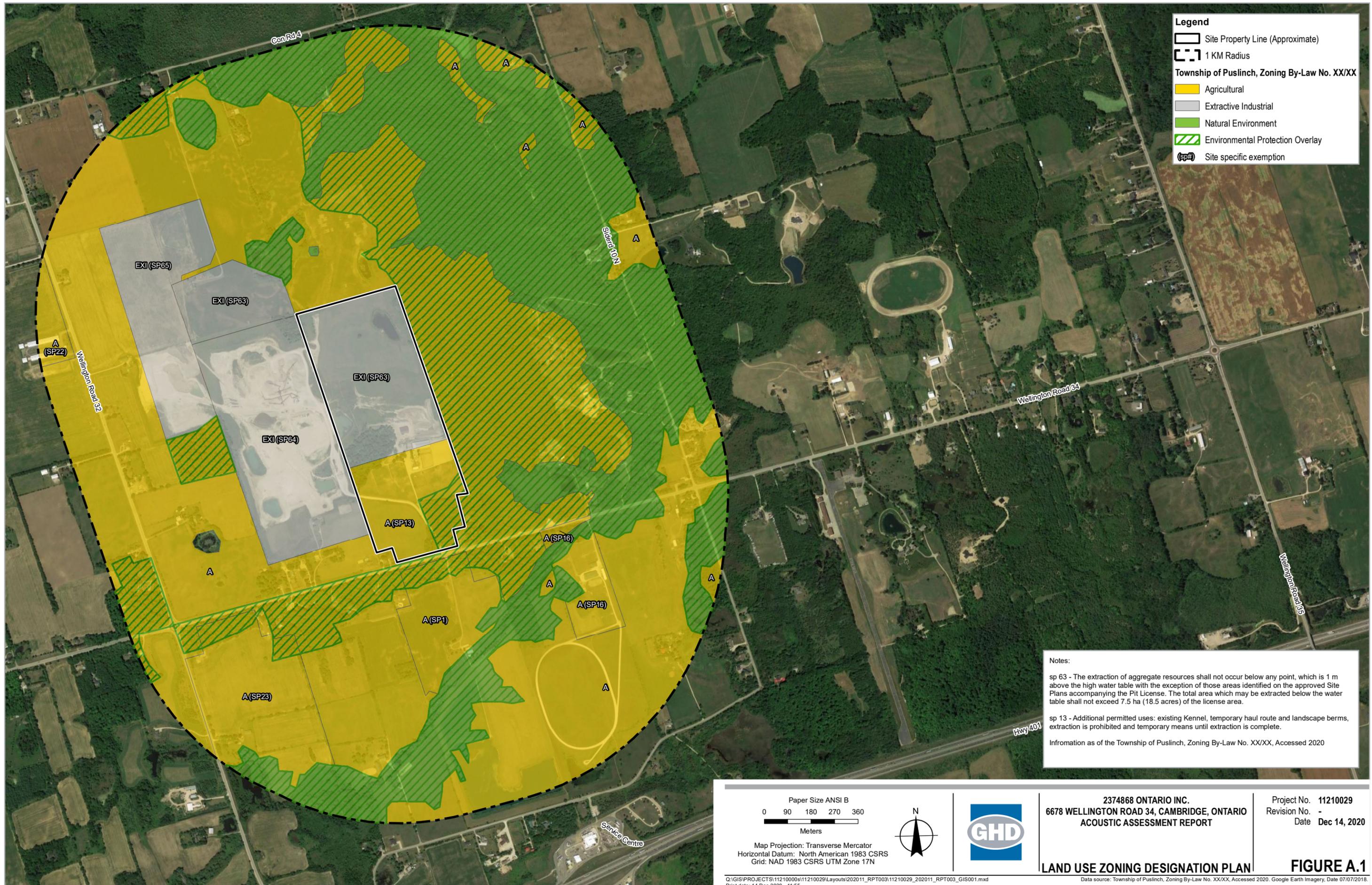
Note:

¹ Minimum MECP sound level limits as defined in NPC-300.

Appendices

Appendix A

Land Use Zoning Designation Plan



Legend

- Site Property Line (Approximate)
- 1 KM Radius
- Township of Puslinch, Zoning By-Law No. XX/XX**
- Agricultural
- Extractive Industrial
- Natural Environment
- Environmental Protection Overlay
- Site specific exemption

Notes:

sp 63 - The extraction of aggregate resources shall not occur below any point, which is 1 m above the high water table with the exception of those areas identified on the approved Site Plans accompanying the Pit License. The total area which may be extracted below the water table shall not exceed 7.5 ha (18.5 acres) of the license area.

sp 13 - Additional permitted uses: existing Kennel, temporary haul route and landscape berms, extraction is prohibited and temporary means until extraction is complete.

Information as of the Township of Puslinch, Zoning By-Law No. XX/XX, Accessed 2020

Paper Size ANSI B
 0 90 180 270 360
 Meters

Map Projection: Transverse Mercator
 Horizontal Datum: North American 1983 CSRS
 Grid: NAD 1983 CSRS UTM Zone 17N



2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34, CAMBRIDGE, ONTARIO
 ACOUSTIC ASSESSMENT REPORT

Project No. 11210029
 Revision No. -
 Date Dec 14, 2020

LAND USE ZONING DESIGNATION PLAN **FIGURE A.1**

Appendix B

Summary of Insignificant Noise Sources

Table B.1

Insignificant Noise Source Summary
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario

Source ID	Source Description	Comments
S3	Screening Operation Stockpiling	Air emission only. Not a source of noise.
NA	Comfort Heating for Onsite Buildings	Source Estimated to be < 20 dBA at worst-case POR

Appendix C

**Noise Specification and Worst-Case
Simultaneous Operations Summary**

Table C.1
Noise Source Sound Level Summary
 2374868 Ontario Inc.
 6678 Wellington Road 34, Cambridge, Ontario

Cadna A ID	Noise Source Description		1/1 Octave Band Data									Unadjusted Total Sound Power Level (dBA)	Tonal Penalty Assessment (dBA)	Height Absolute (m)	Operating Time / # Truck Movements Day (min)	Operating Time / #Truck Movements Evening (min)	Operating Time / #Truck Movements Night (min)	Reference/Comments
			32	63	125	250	500	1000	2000	4000	8000							
S1	Front End Loader	PWL (dB)	108.0	105.0	108.0	111.0	112.0	108.0	105.0	99.0	87.0	117.4						
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1							
		PWL (dBA)	68.6	78.8	91.9	102.4	108.8	108.0	106.2	100.0	85.9	113.2	No	0	1.0	60	30	30
S2A	Screening Equipment Motor	PWL (dB)	101.3	109.3	97.0	97.8	101.4	106.1	103.1	96.9	96.9	112.9						
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1							
		PWL (dBA)	61.9	83.1	80.9	89.2	98.2	106.1	104.3	97.9	95.8	109.3	No	0	1.0	60	0	0
S2B	Screening Operation	PWL (dB)	90.8	99.7	102.0	102.3	101.7	100.9	98.8	95.1	87.7	109.1						
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1							
		PWL (dBA)	51.4	73.5	85.9	93.7	98.5	100.9	100.0	96.1	86.6	105.6	No	0	3.0	60	0	0
S4	Excavator	PWL (dB)	98.0	95.0	98.0	101.0	102.0	98.0	95.0	89.0	77.0	107.4						
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1							
		PWL (dBA)	58.6	68.8	81.9	92.4	98.8	98.0	96.2	90.0	75.9	103.2	No	0	3.0	60	30	30
TR1	Truck Route	PWL (dB)	30.6	116.6	111.6	104.6	106.6	103.6	102.6	99.6	90.6	118.6						
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1							
		PWL (dBA)	—	90.4	95.5	96.0	103.4	103.6	103.8	100.6	89.5	109.5	No	0	2.5	6	2	2
TR2	Capitol Paving Truck Route	PWL (dB)	30.6	116.6	111.6	104.6	106.6	103.6	102.6	99.6	90.6	118.6						
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1							
		PWL (dBA)	—	90.4	95.5	96.0	103.4	103.6	103.8	100.6	89.5	109.5	No	0	2.5	5	5	5

Appendix D

CadnaA Sample Calculation for POR1

Line Source, ISO 9613, Name: "Truck Route", ID: "TR1"

Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
244	560343.24	4810833.27	2.50	0	N	A	68.6	19.4	0.0	0.0	0.0	61.2	1.9	0.2	0.0	0.0	0.0	0.0	0.0	24.7
244	560343.24	4810833.27	2.50	0	E	A	68.6	19.4	0.0	0.0	0.0	61.2	1.9	0.2	0.0	0.0	0.0	0.0	0.0	24.7
315	560332.22	4810870.26	2.50	0	D	A	73.3	18.0	0.0	0.0	0.0	62.1	2.1	0.4	0.0	0.0	0.0	0.0	0.0	26.8
315	560332.22	4810870.26	2.50	0	N	A	68.6	18.0	0.0	0.0	0.0	62.1	2.1	0.4	0.0	0.0	0.0	0.0	0.0	22.0
315	560332.22	4810870.26	2.50	0	E	A	68.6	18.0	0.0	0.0	0.0	62.1	2.1	0.4	0.0	0.0	0.0	0.0	0.0	22.0
376	560336.00	4810852.75	2.50	2	D	A	73.3	14.3	0.0	0.0	0.0	66.9	3.1	-2.1	0.0	0.0	4.7	0.0	28.2	-13.2
376	560336.00	4810852.75	2.50	2	N	A	68.6	14.3	0.0	0.0	0.0	66.9	3.1	-2.1	0.0	0.0	4.7	0.0	28.2	-18.0
376	560336.00	4810852.75	2.50	2	E	A	68.6	14.3	0.0	0.0	0.0	66.9	3.1	-2.1	0.0	0.0	4.7	0.0	28.2	-18.0
385	560337.84	4810844.25	2.50	2	D	A	73.3	9.7	0.0	0.0	0.0	66.9	3.1	-2.0	0.0	0.0	4.7	0.0	28.2	-17.9
385	560337.84	4810844.25	2.50	2	N	A	68.6	9.7	0.0	0.0	0.0	66.9	3.1	-2.0	0.0	0.0	4.7	0.0	28.2	-22.7
385	560337.84	4810844.25	2.50	2	E	A	68.6	9.7	0.0	0.0	0.0	66.9	3.1	-2.0	0.0	0.0	4.7	0.0	28.2	-22.7
394	560328.65	4810886.76	2.50	2	D	A	73.3	14.6	0.0	0.0	0.0	66.4	3.0	-2.3	0.0	0.0	4.7	0.0	27.2	-11.1
394	560328.65	4810886.76	2.50	2	N	A	68.6	14.6	0.0	0.0	0.0	66.4	3.0	-2.3	0.0	0.0	4.7	0.0	27.2	-15.9
394	560328.65	4810886.76	2.50	2	E	A	68.6	14.6	0.0	0.0	0.0	66.4	3.0	-2.3	0.0	0.0	4.7	0.0	27.2	-15.9
431	560323.89	4810898.19	2.50	0	D	A	73.3	16.8	0.0	0.0	0.0	62.7	2.2	0.2	0.0	0.0	0.0	0.0	0.0	25.1
431	560323.89	4810898.19	2.50	0	N	A	68.6	16.8	0.0	0.0	0.0	62.7	2.2	0.2	0.0	0.0	0.0	0.0	0.0	20.3
431	560323.89	4810898.19	2.50	0	E	A	68.6	16.8	0.0	0.0	0.0	62.7	2.2	0.2	0.0	0.0	0.0	0.0	0.0	20.3
447	560325.98	4810891.90	2.50	2	D	A	73.3	15.4	0.0	0.0	0.0	66.4	3.0	-2.3	0.0	0.0	4.7	0.0	27.0	-10.0
447	560325.98	4810891.90	2.50	2	N	A	68.6	15.4	0.0	0.0	0.0	66.4	3.0	-2.3	0.0	0.0	4.7	0.0	27.0	-14.8
447	560325.98	4810891.90	2.50	2	E	A	68.6	15.4	0.0	0.0	0.0	66.4	3.0	-2.3	0.0	0.0	4.7	0.0	27.0	-14.8
458	560316.60	4810920.06	2.50	2	D	A	73.3	2.9	0.0	0.0	0.0	65.9	2.9	-2.2	0.0	0.0	4.7	0.0	10.0	-5.1
458	560316.60	4810920.06	2.50	2	N	A	68.6	2.9	0.0	0.0	0.0	65.9	2.9	-2.2	0.0	0.0	4.7	0.0	10.0	-9.8
458	560316.60	4810920.06	2.50	2	E	A	68.6	2.9	0.0	0.0	0.0	65.9	2.9	-2.2	0.0	0.0	4.7	0.0	10.0	-9.8
459	560309.43	4810935.19	2.50	0	D	A	73.3	15.0	0.0	0.0	0.0	63.5	2.4	0.0	0.0	0.0	0.0	0.0	0.0	22.5
459	560309.43	4810935.19	2.50	0	N	A	68.6	15.0	0.0	0.0	0.0	63.5	2.4	0.0	0.0	0.0	0.0	0.0	0.0	17.7
459	560309.43	4810935.19	2.50	0	E	A	68.6	15.0	0.0	0.0	0.0	63.5	2.4	0.0	0.0	0.0	0.0	0.0	0.0	17.7
468	560313.96	4810925.81	2.50	2	D	A	73.3	10.3	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	10.0	2.5
468	560313.96	4810925.81	2.50	2	N	A	68.6	10.3	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	10.0	-2.3
468	560313.96	4810925.81	2.50	2	E	A	68.6	10.3	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	10.0	-2.3
475	560319.72	4810913.38	2.50	0	D	A	73.3	14.4	0.0	0.0	0.0	63.0	2.3	-0.0	0.0	0.0	0.0	0.0	0.0	22.5
475	560319.72	4810913.38	2.50	0	N	A	68.6	14.4	0.0	0.0	0.0	63.0	2.3	-0.0	0.0	0.0	0.0	0.0	0.0	17.7
475	560319.72	4810913.38	2.50	0	E	A	68.6	14.4	0.0	0.0	0.0	63.0	2.3	-0.0	0.0	0.0	0.0	0.0	0.0	17.7
477	560323.16	4810906.07	2.50	2	D	A	73.3	10.6	0.0	0.0	0.0	66.2	2.9	-2.3	0.0	0.0	4.7	0.0	26.6	-14.2
477	560323.16	4810906.07	2.50	2	N	A	68.6	10.6	0.0	0.0	0.0	66.2	2.9	-2.3	0.0	0.0	4.7	0.0	26.6	-19.0
477	560323.16	4810906.07	2.50	2	E	A	68.6	10.6	0.0	0.0	0.0	66.2	2.9	-2.3	0.0	0.0	4.7	0.0	26.6	-19.0
479	560315.38	4810922.61	2.50	2	D	A	73.3	8.6	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	10.0	0.7
479	560315.38	4810922.61	2.50	2	N	A	68.6	8.6	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	10.0	-4.0
479	560315.38	4810922.61	2.50	2	E	A	68.6	8.6	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	10.0	-4.0
481	560308.21	4810937.15	2.50	0	D	A	73.3	14.0	0.0	0.0	0.0	63.5	2.4	0.1	0.0	0.0	0.0	0.0	0.0	21.4
481	560308.21	4810937.15	2.50	0	N	A	68.6	14.0	0.0	0.0	0.0	63.5	2.4	0.1	0.0	0.0	0.0	0.0	0.0	16.6
481	560308.21	4810937.15	2.50	0	E	A	68.6	14.0	0.0	0.0	0.0	63.5	2.4	0.1	0.0	0.0	0.0	0.0	0.0	16.6
484	560312.72	4810928.12	2.50	2	D	A	73.3	7.0	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	9.9	-0.7
484	560312.72	4810928.12	2.50	2	N	A	68.6	7.0	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	9.9	-5.5
484	560312.72	4810928.12	2.50	2	E	A	68.6	7.0	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	9.9	-5.5
495	560304.53	4810961.16	2.50	0	D	A	73.3	13.8	0.0	0.0	0.0	64.0	2.4	-0.3	0.0	0.0	0.0	0.0	0.0	21.0
495	560304.53	4810961.16	2.50	0	N	A	68.6	13.8	0.0	0.0	0.0	64.0	2.4	-0.3	0.0	0.0	0.0	0.0	0.0	16.2
495	560304.53	4810961.16	2.50	0	E	A	68.6	13.8	0.0	0.0	0.0	64.0	2.4	-0.3	0.0	0.0	0.0	0.0	0.0	16.2
497	560301.35	4811002.08	2.50	0	D	A	73.3	13.3	0.0	0.0	0.0	64.7	2.6	-1.1	0.0	0.0	0.0	0.0	0.0	20.4
497	560301.35	4811002.08	2.50	0	N	A	68.6	13.3	0.0	0.0	0.0	64.7	2.6	-1.1	0.0	0.0	0.0	0.0	0.0	15.6
497	560301.35	4811002.08	2.50	0	E	A	68.6	13.3	0.0	0.0	0.0	64.7	2.6	-1.1	0.0	0.0	0.0	0.0	0.0	15.6
499	560300.22	4811011.79	2.50	1	D	A	73.3	2.2	0.0	0.0	0.0	65.3	2.7	-2.1	0.0	0.0	4.7	0.0	8.7	-3.8
499	560300.22	4811011.79	2.50	1	N	A	68.6	2.2	0.0	0.0	0.0	65.3	2.7	-2.1	0.0	0.0	4.7	0.0	8.7	-8.6
499	560300.22	4811011.79	2.50	1	E	A	68.6	2.2	0.0	0.0	0.0	65.3	2.7	-2.1	0.0	0.0	4.7	0.0	8.7	-8.6
501	560304.29	4810969.25	2.50	0	D	A	73.3	12.1	0.0	0.0	0.0	64.1	2.5	-0.5	0.0	0.0	0.0	0.0	0.0	19.3
501	560304.29	4810969.25	2.50	0	N	A	68.6	12.1	0.0	0.0	0.0	64.1	2.5	-0.5	0.0	0.0	0.0	0.0	0.0	14.5
501	560304.29	4810969.25	2.50	0	E	A	68.6	12.1	0.0	0.0	0.0	64.1	2.5	-0.5	0.0	0.0	0.0	0.0	0.0	14.5
502	560303.31	4810954.79	2.50	0	D	A	73.3	11.1	0.0	0.0	0.0	63.8	2.4	-0.1	0.0	0.0	0.0	0.0	0.0	18.3
502	560303.31	4810954.79	2.50	0	N	A	68.6	11.1	0.0	0.0	0.0	63.8	2.4	-0.1	0.0	0.0	0.0	0.0	0.0	13.5
502	560303.31	4810954.79	2.50	0	E	A	68.6	11.1	0.0	0.0	0.0	63.8	2.4	-0.1	0.0	0.0	0.0	0.0	0.0	13.5
503	560303.55	4810984.44	2.50	0	D	A	73.3	11.6	0.0	0.0	0.0	64.4	2.5	-0.8	0.0	0.0	0.0	0.0	0.0	18.7
503	560303.55	4810984.44	2.50	0	N	A	68.6	11.6	0.0	0.0	0.0	64.4	2.5	-0.8	0.0	0.0	0.0	0.0	0.0	14.0
503	560303.55	4810984.44	2.50	0	E	A	68.6	11.6	0.0	0.0	0.0	64.4	2.5	-0.8	0.0	0.0	0.0	0.0	0.0	14.0
504	560355.74	4811001.59	2.50	0	D	A	73.3	11.5	0.0	0.0	0.0	64.8	2.6	-1.8	0.0	0.0	4.7	0.0	0.0	14.5
504	560355.74	4811001.59	2.50	0	N	A	68.6	11.5	0.0	0.0	0.0	64.8	2.6	-1.8	0.0	0.0	4.7	0.0	0.0	9.7
504	560355.74	4811001.59	2.50	0	E	A	68.6	11.5	0.0	0.0	0.0	64.8	2.6	-1.8	0.0	0.0	4.7	0.0	0.0	9.7
505	560312.74	4810976.98	2.50	0	D	A	73.3	9.3	0.0	0.0</										

Line Source, ISO 9613, Name: "Truck Route", ID: "TR1"

Nr.	X	Y	Z	Ref.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	dB(A)						
505	560312.74	4810976.98	2.50	0	E	A	68.6	9.3	0.0	0.0	0.0	64.3	2.5	-1.0	0.0	0.0	3.6	0.0	0.0	8.5
506	560308.61	4810974.30	2.50	0	D	A	73.3	1.3	0.0	0.0	0.0	64.2	2.5	-0.8	0.0	0.0	0.0	0.0	0.0	8.7
506	560308.61	4810974.30	2.50	0	N	A	68.6	1.3	0.0	0.0	0.0	64.2	2.5	-0.8	0.0	0.0	0.0	0.0	0.0	4.0
506	560308.61	4810974.30	2.50	0	E	A	68.6	1.3	0.0	0.0	0.0	64.2	2.5	-0.8	0.0	0.0	0.0	0.0	0.0	4.0
507	560307.27	4810973.42	2.50	0	D	A	73.3	2.7	0.0	0.0	0.0	64.2	2.5	-0.7	0.0	0.0	0.0	0.0	0.0	10.0
507	560307.27	4810973.42	2.50	0	N	A	68.6	2.7	0.0	0.0	0.0	64.2	2.5	-0.7	0.0	0.0	0.0	0.0	0.0	5.2
507	560307.27	4810973.42	2.50	0	E	A	68.6	2.7	0.0	0.0	0.0	64.2	2.5	-0.7	0.0	0.0	0.0	0.0	0.0	5.2
516	560315.85	4810979.00	2.50	2	D	A	73.3	0.2	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.7	0.0	9.6	-6.3
516	560315.85	4810979.00	2.50	2	N	A	68.6	0.2	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.7	0.0	9.6	-11.1
516	560315.85	4810979.00	2.50	2	E	A	68.6	0.2	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.7	0.0	9.6	-11.1
524	560319.48	4811027.31	2.50	0	D	A	73.3	11.5	0.0	0.0	0.0	65.2	2.7	-1.6	0.0	0.0	12.2	0.0	0.0	6.4
524	560319.48	4811027.31	2.50	0	N	A	68.6	11.5	0.0	0.0	0.0	65.2	2.7	-1.6	0.0	0.0	12.2	0.0	0.0	1.7
524	560319.48	4811027.31	2.50	0	E	A	68.6	11.5	0.0	0.0	0.0	65.2	2.7	-1.6	0.0	0.0	12.2	0.0	0.0	1.7
538	560333.69	4811027.07	2.50	0	D	A	73.3	11.5	0.0	0.0	0.0	65.2	2.7	-1.7	0.0	0.0	14.8	0.0	0.0	4.0
538	560333.69	4811027.07	2.50	0	N	A	68.6	11.5	0.0	0.0	0.0	65.2	2.7	-1.7	0.0	0.0	14.8	0.0	0.0	-0.8
538	560333.69	4811027.07	2.50	0	E	A	68.6	11.5	0.0	0.0	0.0	65.2	2.7	-1.7	0.0	0.0	14.8	0.0	0.0	-0.8
540	560321.44	4810981.50	2.50	0	D	A	73.3	10.5	0.0	0.0	0.0	64.4	2.5	-1.4	0.0	0.0	4.7	0.0	0.0	13.7
540	560321.44	4810981.50	2.50	0	N	A	68.6	10.5	0.0	0.0	0.0	64.4	2.5	-1.4	0.0	0.0	4.7	0.0	0.0	8.9
540	560321.44	4810981.50	2.50	0	E	A	68.6	10.5	0.0	0.0	0.0	64.4	2.5	-1.4	0.0	0.0	4.7	0.0	0.0	8.9
542	560323.13	4810982.22	2.50	1	D	A	73.3	8.8	0.0	0.0	0.0	64.6	2.6	-1.5	0.0	0.0	4.7	0.0	1.4	10.3
542	560323.13	4810982.22	2.50	1	N	A	68.6	8.8	0.0	0.0	0.0	64.6	2.6	-1.5	0.0	0.0	4.7	0.0	1.4	5.5
542	560323.13	4810982.22	2.50	1	E	A	68.6	8.8	0.0	0.0	0.0	64.6	2.6	-1.5	0.0	0.0	4.7	0.0	1.4	5.5
547	560320.43	4810981.06	2.50	1	D	A	73.3	9.5	0.0	0.0	0.0	64.6	2.6	-1.9	0.0	0.0	4.7	0.0	8.5	4.3
547	560320.43	4810981.06	2.50	1	N	A	68.6	9.5	0.0	0.0	0.0	64.6	2.6	-1.9	0.0	0.0	4.7	0.0	8.5	-0.4
547	560320.43	4810981.06	2.50	1	E	A	68.6	9.5	0.0	0.0	0.0	64.6	2.6	-1.9	0.0	0.0	4.7	0.0	8.5	-0.4
549	560318.70	4810980.32	2.50	2	D	A	73.3	7.2	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.7	0.0	9.6	0.6
549	560318.70	4810980.32	2.50	2	N	A	68.6	7.2	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.7	0.0	9.6	-4.1
549	560318.70	4810980.32	2.50	2	E	A	68.6	7.2	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.7	0.0	9.6	-4.1
551	560345.38	4811022.62	2.50	0	D	A	73.3	10.7	0.0	0.0	0.0	65.2	2.7	-1.8	0.0	0.0	11.7	0.0	0.0	6.3
551	560345.38	4811022.62	2.50	0	N	A	68.6	10.7	0.0	0.0	0.0	65.2	2.7	-1.8	0.0	0.0	11.7	0.0	0.0	1.6
551	560345.38	4811022.62	2.50	0	E	A	68.6	10.7	0.0	0.0	0.0	65.2	2.7	-1.8	0.0	0.0	11.7	0.0	0.0	1.6
562	560350.53	4811018.45	2.50	0	D	A	73.3	1.6	0.0	0.0	0.0	65.1	2.7	-1.8	0.0	0.0	4.7	0.0	0.0	4.2
562	560350.53	4811018.45	2.50	0	N	A	68.6	1.6	0.0	0.0	0.0	65.1	2.7	-1.8	0.0	0.0	4.7	0.0	0.0	-0.6
562	560350.53	4811018.45	2.50	0	E	A	68.6	1.6	0.0	0.0	0.0	65.1	2.7	-1.8	0.0	0.0	4.7	0.0	0.0	-0.6
564	560306.58	4811023.40	2.50	0	D	A	73.3	10.6	0.0	0.0	0.0	65.1	2.7	-1.5	0.0	0.0	0.0	0.0	0.0	17.7
564	560306.58	4811023.40	2.50	0	N	A	68.6	10.6	0.0	0.0	0.0	65.1	2.7	-1.5	0.0	0.0	0.0	0.0	0.0	12.9
564	560306.58	4811023.40	2.50	0	E	A	68.6	10.6	0.0	0.0	0.0	65.1	2.7	-1.5	0.0	0.0	0.0	0.0	0.0	12.9
566	560311.97	4811026.58	2.50	0	D	A	73.3	-0.3	0.0	0.0	0.0	65.2	2.7	-1.5	0.0	0.0	4.1	0.0	0.0	2.6
566	560311.97	4811026.58	2.50	0	N	A	68.6	-0.3	0.0	0.0	0.0	65.2	2.7	-1.5	0.0	0.0	4.1	0.0	0.0	-2.2
566	560311.97	4811026.58	2.50	0	E	A	68.6	-0.3	0.0	0.0	0.0	65.2	2.7	-1.5	0.0	0.0	4.1	0.0	0.0	-2.2
584	560303.69	4811021.69	2.50	1	D	A	73.3	6.9	0.0	0.0	0.0	65.1	2.7	-1.6	0.0	0.0	4.7	0.0	1.7	7.6
584	560303.69	4811021.69	2.50	1	N	A	68.6	6.9	0.0	0.0	0.0	65.1	2.7	-1.6	0.0	0.0	4.7	0.0	1.7	2.8
584	560303.69	4811021.69	2.50	1	E	A	68.6	6.9	0.0	0.0	0.0	65.1	2.7	-1.6	0.0	0.0	4.7	0.0	1.7	2.8
592	560306.32	4811023.24	2.50	1	D	A	73.3	0.8	0.0	0.0	0.0	65.1	2.7	-1.5	0.0	0.0	0.0	0.0	1.4	6.5
592	560306.32	4811023.24	2.50	1	N	A	68.6	0.8	0.0	0.0	0.0	65.1	2.7	-1.5	0.0	0.0	0.0	0.0	1.4	1.8
592	560306.32	4811023.24	2.50	1	E	A	68.6	0.8	0.0	0.0	0.0	65.1	2.7	-1.5	0.0	0.0	0.0	0.0	1.4	1.8
595	560303.46	4811021.56	2.50	1	D	A	73.3	6.4	0.0	0.0	0.0	65.4	2.7	-2.1	0.0	0.0	8.8	0.0	12.9	-8.1
595	560303.46	4811021.56	2.50	1	N	A	68.6	6.4	0.0	0.0	0.0	65.4	2.7	-2.1	0.0	0.0	8.8	0.0	12.9	-12.8
595	560303.46	4811021.56	2.50	1	E	A	68.6	6.4	0.0	0.0	0.0	65.4	2.7	-2.1	0.0	0.0	8.8	0.0	12.9	-12.8
597	560351.08	4810991.30	2.50	0	D	A	73.3	10.4	0.0	0.0	0.0	64.6	2.6	-1.7	0.0	0.0	4.7	0.0	0.0	13.5
597	560351.08	4810991.30	2.50	0	N	A	68.6	10.4	0.0	0.0	0.0	64.6	2.6	-1.7	0.0	0.0	4.7	0.0	0.0	8.7
597	560351.08	4810991.30	2.50	0	E	A	68.6	10.4	0.0	0.0	0.0	64.6	2.6	-1.7	0.0	0.0	4.7	0.0	0.0	8.7
599	560347.68	4810988.84	2.50	1	D	A	73.3	4.0	0.0	0.0	0.0	64.7	2.6	-1.7	0.0	0.0	4.7	0.0	1.2	5.8
599	560347.68	4810988.84	2.50	1	N	A	68.6	4.0	0.0	0.0	0.0	64.7	2.6	-1.7	0.0	0.0	4.7	0.0	1.2	1.0
599	560347.68	4810988.84	2.50	1	E	A	68.6	4.0	0.0	0.0	0.0	64.7	2.6	-1.7	0.0	0.0	4.7	0.0	1.2	1.0
601	560331.48	4810985.17	2.50	0	D	A	73.3	10.1	0.0	0.0	0.0	64.5	2.5	-1.5	0.0	0.0	4.7	0.0	0.0	13.3
601	560331.48	4810985.17	2.50	0	N	A	68.6	10.1	0.0	0.0	0.0	64.5	2.5	-1.5	0.0	0.0	4.7	0.0	0.0	8.5
601	560331.48	4810985.17	2.50	0	E	A	68.6	10.1	0.0	0.0	0.0	64.5	2.5	-1.5	0.0	0.0	4.7	0.0	0.0	8.5
603	560331.48	4810985.17	2.50	1	D	A	73.3	10.1	0.0	0.0	0.0	64.7	2.6	-1.6	0.0	0.0	4.7	0.0	1.2	11.9
603	560331.48	4810985.17	2.50	1	N	A	68.6	10.1	0.0	0.0	0.0	64.7	2.6	-1.6	0.0	0.0	4.7	0.0	1.2	7.1
603	560331.48	4810985.17	2.50	1	E	A	68.6	10.1	0.0	0.0	0.0	64.7	2.6	-1.6	0.0	0.0	4.7	0.0	1.2	7.1
605	560333.19	4810985.68	2.50	1	D	A	73.3	8.2	0.0	0.0	0.0	64.7	2.6	-1.9	0.0	0.0	5.0	0.0	4.2	7.0
605	560333.19	4810985.68	2.50	1	N	A	68.6	8.2	0.0	0.0	0.0	64.7	2.6	-1.9	0.0	0.0	5.0	0.0	4.2	2.3
605	560333.19	4810985.68	2.50	1	E	A	68.6	8.2	0.0	0.0	0.0	64.7	2.6	-1.9	0.0	0.0	5.0	0.0	4.2	2.3
608	560331.60	4810985.21	2.50	2	D	A	73.3	10.0	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.8	0.0	9.7	3.2
608	560331.60	4810985.21	2.50	2	N	A	68.6	10.0	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.8	0.0	9.7	

Line Source, ISO 9613, Name: "Truck Route", ID: "TR1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	dB(A)						
610	560341.53	4810987.38	2.50	0	D	A	73.3	10.2	0.0	0.0	0.0	64.5	2.6	-1.6	0.0	0.0	4.7	0.0	0.0	13.3
610	560341.53	4810987.38	2.50	0	N	A	68.6	10.2	0.0	0.0	0.0	64.5	2.6	-1.6	0.0	0.0	4.7	0.0	0.0	8.6
610	560341.53	4810987.38	2.50	0	E	A	68.6	10.2	0.0	0.0	0.0	64.5	2.6	-1.6	0.0	0.0	4.7	0.0	0.0	8.6
612	560341.53	4810987.38	2.50	1	D	A	73.3	10.2	0.0	0.0	0.0	64.7	2.6	-1.7	0.0	0.0	4.7	0.0	1.2	12.0
612	560341.53	4810987.38	2.50	1	N	A	68.6	10.2	0.0	0.0	0.0	64.7	2.6	-1.7	0.0	0.0	4.7	0.0	1.2	7.2
612	560341.53	4810987.38	2.50	1	E	A	68.6	10.2	0.0	0.0	0.0	64.7	2.6	-1.7	0.0	0.0	4.7	0.0	1.2	7.2
614	560338.82	4810986.99	2.50	1	D	A	73.3	6.9	0.0	0.0	0.0	64.6	2.6	-1.8	0.0	0.0	4.7	0.0	4.1	6.1
614	560338.82	4810986.99	2.50	1	N	A	68.6	6.9	0.0	0.0	0.0	64.6	2.6	-1.8	0.0	0.0	4.7	0.0	4.1	1.3
614	560338.82	4810986.99	2.50	1	E	A	68.6	6.9	0.0	0.0	0.0	64.6	2.6	-1.8	0.0	0.0	4.7	0.0	4.1	1.3
616	560337.50	4810986.80	2.50	2	D	A	73.3	3.5	0.0	0.0	0.0	64.8	2.6	-1.9	0.0	0.0	4.7	0.0	5.1	1.5
616	560337.50	4810986.80	2.50	2	N	A	68.6	3.5	0.0	0.0	0.0	64.8	2.6	-1.9	0.0	0.0	4.7	0.0	5.1	-3.2
616	560337.50	4810986.80	2.50	2	E	A	68.6	3.5	0.0	0.0	0.0	64.8	2.6	-1.9	0.0	0.0	4.7	0.0	5.1	-3.2
618	560353.53	4811013.35	2.50	0	D	A	73.3	10.2	0.0	0.0	0.0	65.0	2.7	-1.8	0.0	0.0	4.7	0.0	0.0	13.0
618	560353.53	4811013.35	2.50	0	N	A	68.6	10.2	0.0	0.0	0.0	65.0	2.7	-1.8	0.0	0.0	4.7	0.0	0.0	8.2
618	560353.53	4811013.35	2.50	0	E	A	68.6	10.2	0.0	0.0	0.0	65.0	2.7	-1.8	0.0	0.0	4.7	0.0	0.0	8.2
620	560300.86	4811016.53	2.50	0	D	A	73.3	9.0	0.0	0.0	0.0	65.0	2.7	-1.1	0.0	0.0	0.0	0.0	0.0	15.9
620	560300.86	4811016.53	2.50	0	N	A	68.6	9.0	0.0	0.0	0.0	65.0	2.7	-1.1	0.0	0.0	0.0	0.0	0.0	11.1
620	560300.86	4811016.53	2.50	0	E	A	68.6	9.0	0.0	0.0	0.0	65.0	2.7	-1.1	0.0	0.0	0.0	0.0	0.0	11.1
622	560301.35	4811019.15	2.50	1	D	A	73.3	4.2	0.0	0.0	0.0	65.1	2.7	-1.6	0.0	0.0	4.7	0.0	4.1	2.5
622	560301.35	4811019.15	2.50	1	N	A	68.6	4.2	0.0	0.0	0.0	65.1	2.7	-1.6	0.0	0.0	4.7	0.0	4.1	-2.2
622	560301.35	4811019.15	2.50	1	E	A	68.6	4.2	0.0	0.0	0.0	65.1	2.7	-1.6	0.0	0.0	4.7	0.0	4.1	-2.2
624	560300.63	4811015.33	2.50	1	D	A	73.3	7.4	0.0	0.0	0.0	65.3	2.7	-2.1	0.0	0.0	4.7	0.0	8.8	1.4
624	560300.63	4811015.33	2.50	1	N	A	68.6	7.4	0.0	0.0	0.0	65.3	2.7	-2.1	0.0	0.0	4.7	0.0	8.8	-3.4
624	560300.63	4811015.33	2.50	1	E	A	68.6	7.4	0.0	0.0	0.0	65.3	2.7	-2.1	0.0	0.0	4.7	0.0	8.8	-3.4
626	560301.37	4811019.25	2.50	1	D	A	73.3	3.9	0.0	0.0	0.0	65.4	2.7	-2.1	0.0	0.0	6.4	0.0	11.7	-6.8
626	560301.37	4811019.25	2.50	1	N	A	68.6	3.9	0.0	0.0	0.0	65.4	2.7	-2.1	0.0	0.0	6.4	0.0	11.7	-11.6
626	560301.37	4811019.25	2.50	1	E	A	68.6	3.9	0.0	0.0	0.0	65.4	2.7	-2.1	0.0	0.0	6.4	0.0	11.7	-11.6

Point Source, ISO 9613, Name: "Screening Operation", ID: "S2B"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	dB(A)						
124	560381.18	4810984.87	3.00	0	D	A	105.6	0.0	0.0	0.0	0.0	64.6	2.6	-1.9	0.0	0.0	8.2	0.0	0.0	32.1
124	560381.18	4810984.87	3.00	0	N	A	105.6	0.0	-188.0	0.0	0.0	64.6	2.6	-1.9	0.0	0.0	8.2	0.0	0.0	-155.9
124	560381.18	4810984.87	3.00	0	E	A	105.6	0.0	-188.0	0.0	0.0	64.6	2.6	-1.9	0.0	0.0	8.2	0.0	0.0	-155.9

Line Source, ISO 9613, Name: "Front End Loader", ID: "S1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	dB(A)						
138	560299.58	4811060.75	2.50	0	D	A	82.0	14.6	0.0	0.0	0.0	65.7	2.1	-1.2	0.0	0.0	0.0	0.0	0.0	29.9
138	560299.58	4811060.75	2.50	0	N	A	77.2	14.6	0.0	0.0	0.0	65.7	2.1	-1.2	0.0	0.0	0.0	0.0	0.0	25.1
138	560299.58	4811060.75	2.50	0	E	A	77.2	14.6	0.0	0.0	0.0	65.7	2.1	-1.2	0.0	0.0	0.0	0.0	0.0	25.1
140	560314.43	4811059.38	2.50	0	D	A	82.0	1.1	0.0	0.0	0.0	65.7	2.1	-1.7	0.0	0.0	2.2	0.0	0.0	14.8
140	560314.43	4811059.38	2.50	0	N	A	77.2	1.1	0.0	0.0	0.0	65.7	2.1	-1.7	0.0	0.0	2.2	0.0	0.0	10.0
140	560314.43	4811059.38	2.50	0	E	A	77.2	1.1	0.0	0.0	0.0	65.7	2.1	-1.7	0.0	0.0	2.2	0.0	0.0	10.0
148	560333.43	4811057.63	2.50	0	D	A	82.0	15.7	0.0	0.0	0.0	65.7	2.1	-1.9	0.0	0.0	6.0	0.0	0.0	25.7
148	560333.43	4811057.63	2.50	0	N	A	77.2	15.7	0.0	0.0	0.0	65.7	2.1	-1.9	0.0	0.0	6.0	0.0	0.0	20.9
148	560333.43	4811057.63	2.50	0	E	A	77.2	15.7	0.0	0.0	0.0	65.7	2.1	-1.9	0.0	0.0	6.0	0.0	0.0	20.9
150	560286.14	4811061.99	2.50	1	D	A	82.0	1.8	0.0	0.0	0.0	65.8	2.1	-1.7	0.0	0.0	4.8	0.0	11.0	1.8
150	560286.14	4811061.99	2.50	1	N	A	77.2	1.8	0.0	0.0	0.0	65.8	2.1	-1.7	0.0	0.0	4.8	0.0	11.0	-3.0
150	560286.14	4811061.99	2.50	1	E	A	77.2	1.8	0.0	0.0	0.0	65.8	2.1	-1.7	0.0	0.0	4.8	0.0	11.0	-3.0
159	560287.66	4811061.85	2.50	1	D	A	82.0	1.8	0.0	0.0	0.0	65.8	2.1	-1.7	0.0	0.0	0.0	0.0	4.7	12.8
159	560287.66	4811061.85	2.50	1	N	A	77.2	1.8	0.0	0.0	0.0	65.8	2.1	-1.7	0.0	0.0	0.0	0.0	4.7	8.0
159	560287.66	4811061.85	2.50	1	E	A	77.2	1.8	0.0	0.0	0.0	65.8	2.1	-1.7	0.0	0.0	0.0	0.0	4.7	8.0
162	560285.88	4811062.02	2.50	1	D	A	82.0	0.0	0.0	0.0	0.0	66.1	2.2	-2.2	0.0	0.0	4.9	0.0	31.2	-20.2
162	560285.88	4811062.02	2.50	1	N	A	77.2	0.0	0.0	0.0	0.0	66.1	2.2	-2.2	0.0	0.0	4.9	0.0	31.2	-25.0
162	560285.88	4811062.02	2.50	1	E	A	77.2	0.0	0.0	0.0	0.0	66.1	2.2	-2.2	0.0	0.0	4.9	0.0	31.2	-25.0
215	560366.20	4810998.53	2.50	0	D	A	82.0	10.0	0.0	0.0	0.0	64.8	1.9	-1.9	0.0	0.0	6.1	0.0	0.0	21.0
215	560366.20	4810998.53	2.50	0	N	A	77.2	10.0	0.0	0.0	0.0	64.8	1.9	-1.9	0.0	0.0	6.1	0.0	0.0	16.2
215	560366.20	4810998.53	2.50	0	E	A	77.2	10.0	0.0	0.0	0.0	64.8	1.9	-1.9	0.0	0.0	6.1	0.0	0.0	16.2
218	560352.23	4810988.00	2.50	0	D	A	82.0	14.0	0.0	0.0	0.0	64.6	1.9	-1.7	0.0	0.0	4.8	0.0	0.0	26.4
218	560352.23	4810988.00	2.50	0	N	A	77.2	14.0	0.0	0.0	0.0	64.6	1.9	-1.7	0.0	0.0	4.8	0.0	0.0	21.6
218	560352.23	4810988.00	2.50	0	E	A	77.2	14.0	0.0	0.0	0.0	64.6	1.9	-1.7	0.0	0.0	4.8	0.0	0.0	21.6
220	560346.32	4810983.54	2.50	1	D	A	82.0	10.1	0.0	0.0	0.0	64.8	2.0	-1.7	0.0	0.0	4.8	0.0	1.0	21.2
220	560346.32	4810983.54	2.50	1	N	A	77.2	10.1	0.0	0.0	0.0	64.8	2.0	-1.7	0.0	0.0	4.8	0.0	1.0	16.5
220	560346.32	4810983.54	2.50	1	E	A	77.2	10.1	0.0	0.0	0.0	64.8	2.0	-1.7	0.0	0.0	4.8	0.0	1.0	16.5
227	560367.75	4810999.70	2.50	2	D	A	82.0	7.8	0.0	0.0	0.0	66.0	2.2	-2.0	0.0	0.0	4.8	0.0	12.1	6.8
227	560367.75	4810999.70	2.50	2	N	A	77.2	7.8	0.0	0.0	0.0	66.0	2.2	-2.0	0.0	0.0	4.8	0.0	12.1	2.0
227	560367.75	4810999.70	2.50	2	E	A	77.2	7.8	0.0	0.0	0.0	66.0	2.2	-2.0	0.0	0.0	4.8	0.0	12.1	2.0

Line Source, ISO 9613, Name: "Front End Loader", ID: "S1"																				
Nr.	X	Y	Z	Ref.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	dB(A)						
237	560369.26	4811000.84	2.50	2	D	A	82.0	3.6	0.0	0.0	0.0	66.9	2.4	-2.1	0.0	0.0	5.3	0.0	35.1	-22.0
237	560369.26	4811000.84	2.50	2	N	A	77.2	3.6	0.0	0.0	0.0	66.9	2.4	-2.1	0.0	0.0	5.3	0.0	35.1	-26.7
237	560369.26	4811000.84	2.50	2	E	A	77.2	3.6	0.0	0.0	0.0	66.9	2.4	-2.1	0.0	0.0	5.3	0.0	35.1	-26.7
241	560343.08	4810981.09	2.50	1	D	A	82.0	3.2	0.0	0.0	0.0	64.5	1.9	-1.8	0.0	0.0	4.8	0.0	4.6	11.3
241	560343.08	4810981.09	2.50	1	N	A	77.2	3.2	0.0	0.0	0.0	64.5	1.9	-1.8	0.0	0.0	4.8	0.0	4.6	6.5
241	560343.08	4810981.09	2.50	1	E	A	77.2	3.2	0.0	0.0	0.0	64.5	1.9	-1.8	0.0	0.0	4.8	0.0	4.6	6.5
246	560353.42	4811054.97	2.50	0	D	A	82.0	5.8	0.0	0.0	0.0	65.7	2.1	-2.0	0.0	0.0	5.0	0.0	0.0	16.9
246	560353.42	4811054.97	2.50	0	N	A	77.2	5.8	0.0	0.0	0.0	65.7	2.1	-2.0	0.0	0.0	5.0	0.0	0.0	12.2
246	560353.42	4811054.97	2.50	0	E	A	77.2	5.8	0.0	0.0	0.0	65.7	2.1	-2.0	0.0	0.0	5.0	0.0	0.0	12.2
248	560362.99	4811049.28	2.50	0	D	A	82.0	12.7	0.0	0.0	0.0	65.6	2.1	-2.0	0.0	0.0	4.8	0.0	0.0	24.1
248	560362.99	4811049.28	2.50	0	N	A	77.2	12.7	0.0	0.0	0.0	65.6	2.1	-2.0	0.0	0.0	4.8	0.0	0.0	19.4
248	560362.99	4811049.28	2.50	0	E	A	77.2	12.7	0.0	0.0	0.0	65.6	2.1	-2.0	0.0	0.0	4.8	0.0	0.0	19.4
258	560378.88	4811039.83	2.50	0	D	A	82.0	12.7	0.0	0.0	0.0	65.5	2.1	-2.1	0.0	0.0	4.8	0.0	0.0	24.4
258	560378.88	4811039.83	2.50	0	N	A	77.2	12.7	0.0	0.0	0.0	65.5	2.1	-2.1	0.0	0.0	4.8	0.0	0.0	19.6
258	560378.88	4811039.83	2.50	0	E	A	77.2	12.7	0.0	0.0	0.0	65.5	2.1	-2.1	0.0	0.0	4.8	0.0	0.0	19.6
267	560381.36	4811038.36	2.50	2	D	A	82.0	11.0	0.0	0.0	0.0	66.6	2.3	-2.2	0.0	0.0	4.8	0.0	12.3	9.1
267	560381.36	4811038.36	2.50	2	N	A	77.2	11.0	0.0	0.0	0.0	66.6	2.3	-2.2	0.0	0.0	4.8	0.0	12.3	4.4
267	560381.36	4811038.36	2.50	2	E	A	77.2	11.0	0.0	0.0	0.0	66.6	2.3	-2.2	0.0	0.0	4.8	0.0	12.3	4.4
282	560380.58	4811038.83	2.50	2	D	A	82.0	9.4	0.0	0.0	0.0	67.4	2.5	-2.3	0.0	0.0	4.8	0.0	34.3	-15.4
282	560380.58	4811038.83	2.50	2	N	A	77.2	9.4	0.0	0.0	0.0	67.4	2.5	-2.3	0.0	0.0	4.8	0.0	34.3	-20.2
282	560380.58	4811038.83	2.50	2	E	A	77.2	9.4	0.0	0.0	0.0	67.4	2.5	-2.3	0.0	0.0	4.8	0.0	34.3	-20.2
284	560380.22	4811009.25	2.50	0	D	A	82.0	14.0	0.0	0.0	0.0	65.0	2.0	-2.1	0.0	0.0	5.6	0.0	0.0	25.5
284	560380.22	4811009.25	2.50	0	N	A	77.2	14.0	0.0	0.0	0.0	65.0	2.0	-2.1	0.0	0.0	5.6	0.0	0.0	20.7
284	560380.22	4811009.25	2.50	0	E	A	77.2	14.0	0.0	0.0	0.0	65.0	2.0	-2.1	0.0	0.0	5.6	0.0	0.0	20.7
293	560374.98	4811005.22	2.50	2	D	A	82.0	10.8	0.0	0.0	0.0	66.1	2.2	-2.1	0.0	0.0	4.8	0.0	12.1	9.7
293	560374.98	4811005.22	2.50	2	N	A	77.2	10.8	0.0	0.0	0.0	66.1	2.2	-2.1	0.0	0.0	4.8	0.0	12.1	4.9
293	560374.98	4811005.22	2.50	2	E	A	77.2	10.8	0.0	0.0	0.0	66.1	2.2	-2.1	0.0	0.0	4.8	0.0	12.1	4.9
312	560374.00	4811004.47	2.50	2	D	A	82.0	9.8	0.0	0.0	0.0	67.0	2.4	-2.2	0.0	0.0	5.2	0.0	34.8	-15.3
312	560374.00	4811004.47	2.50	2	N	A	77.2	9.8	0.0	0.0	0.0	67.0	2.4	-2.2	0.0	0.0	5.2	0.0	34.8	-20.1
312	560374.00	4811004.47	2.50	2	E	A	77.2	9.8	0.0	0.0	0.0	67.0	2.4	-2.2	0.0	0.0	5.2	0.0	34.8	-20.1
397	560388.56	4811026.04	2.50	0	D	A	82.0	12.7	0.0	0.0	0.0	65.3	2.0	-2.2	0.0	0.0	5.0	0.0	0.0	24.5
397	560388.56	4811026.04	2.50	0	N	A	77.2	12.7	0.0	0.0	0.0	65.3	2.0	-2.2	0.0	0.0	5.0	0.0	0.0	19.7
397	560388.56	4811026.04	2.50	0	E	A	77.2	12.7	0.0	0.0	0.0	65.3	2.0	-2.2	0.0	0.0	5.0	0.0	0.0	19.7
405	560336.60	4810977.39	2.50	0	D	A	82.0	11.1	0.0	0.0	0.0	64.3	1.9	-1.5	0.0	0.0	4.8	0.0	0.0	23.6
405	560336.60	4810977.39	2.50	0	N	A	77.2	11.1	0.0	0.0	0.0	64.3	1.9	-1.5	0.0	0.0	4.8	0.0	0.0	18.9
405	560336.60	4810977.39	2.50	0	E	A	77.2	11.1	0.0	0.0	0.0	64.3	1.9	-1.5	0.0	0.0	4.8	0.0	0.0	18.9
408	560336.60	4810977.39	2.50	1	D	A	82.0	11.1	0.0	0.0	0.0	64.8	2.0	-1.6	0.0	0.0	4.8	0.0	1.4	21.7
408	560336.60	4810977.39	2.50	1	N	A	77.2	11.1	0.0	0.0	0.0	64.8	2.0	-1.6	0.0	0.0	4.8	0.0	1.4	16.9
408	560336.60	4810977.39	2.50	1	E	A	77.2	11.1	0.0	0.0	0.0	64.8	2.0	-1.6	0.0	0.0	4.8	0.0	1.4	16.9
413	560338.27	4810978.30	2.50	1	D	A	82.0	9.6	0.0	0.0	0.0	64.5	1.9	-1.9	0.0	0.0	5.2	0.0	4.9	16.9
413	560338.27	4810978.30	2.50	1	N	A	77.2	9.6	0.0	0.0	0.0	64.5	1.9	-1.9	0.0	0.0	5.2	0.0	4.9	12.1
413	560338.27	4810978.30	2.50	1	E	A	77.2	9.6	0.0	0.0	0.0	64.5	1.9	-1.9	0.0	0.0	5.2	0.0	4.9	12.1
420	560334.52	4810976.26	2.50	2	D	A	82.0	9.1	0.0	0.0	0.0	65.0	2.0	-2.0	0.0	0.0	4.8	0.0	11.7	9.6
420	560334.52	4810976.26	2.50	2	N	A	77.2	9.1	0.0	0.0	0.0	65.0	2.0	-2.0	0.0	0.0	4.8	0.0	11.7	4.8
420	560334.52	4810976.26	2.50	2	E	A	77.2	9.1	0.0	0.0	0.0	65.0	2.0	-2.0	0.0	0.0	4.8	0.0	11.7	4.8

Appendix E

Manufacturer Sound Level Specifications

973D

Track Loader

GHD:Source S01

CATERPILLAR[®]



Engine

Engine Model	Cat [®] C9 ACERT [™]	
Net Power – SAE J1349	196 kW	263 hp

Weights

Operating Weight	28 058 kg	61,857 lb
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- Operating Weight: Includes coolant, lubricants, 100% fuel tank, General Purpose Bucket with long bolt-on teeth and segments and 75 kg/165 lb operator.

Buckets

Capacity – General Purpose	3.21 m ³	4.2 yd ³
Capacity – Multi-Purpose	3.05 m ³	3.92 yd ³

- Bucket capacities are with long bolt-on teeth and segments.

Ripper Specifications

Type	Parallelogram	
Number of pockets	3	
Overall Width/Beam	2200 mm	86.6 in
Shank cross section	74 × 175 mm 2.9 × 6.9 in	
Ground Clearance	888 mm	34.96 in
Penetration	397 mm	15.6 in
Ripping Width	1840 mm	72.4 in
Penetration Force at ground level	100 kN	22,500 lb
Cylinders – Bore	130 mm	5.1 in
Cylinders – Stroke	236 mm	9.3 in
Addition to Machine Length due to Ripper (in Transportation Position)	586 mm	23.1 in
Ramp Angle	28.5 Degrees	
Ripper weight (with 3 shanks)	1700 kg	3,747.8 lb

Standards

ROPS/FOPS	ROPS/FOPS
Brakes	Brakes
Cab	Cab

- ROPS (Rollover Protective Structure) offered by Caterpillar for the machine meets ROPS criteria SAE J1040 MAY94, ISO 3471-1994.
- FOPS (Falling Object Protective Structure) offered by Caterpillar for the machine meets FOPS criteria SAE J/ISO3449 APR98 level II, ISO 3449-1992 Level II.
- Brakes meet the standard ISO 10265-2008.
- The operator sound exposure Leq (equivalent sound pressure level) measured according to the work cycle procedures specified in ANSI/SAE J1166 OCT 98 is 83 dB(A), for cab offered by Caterpillar, when properly installed and maintained and tested with the doors and windows closed.
- Hearing protection is recommended when operating with open operator station and cab (when not properly maintained or doors/windows open) for extended periods or in noisy environment.
- The exterior sound pressure level for the standard machine measured at a distance of 15 meters (49.2 ft) according to the test procedures specified in SAE J88 APR95, mid-gear-moving operation, is 85 dB(A).
- The labeled sound power level is 112 dB(A) measured according to the test procedure and conditions specified in 2000/14/EC.
- The operator sound exposure Leq (equivalent sound pressure level) measured according to the work cycle procedures specified in ISO 6396:2008 is 77 dB(A) and in ISO 6394:2008 is 74 dB(A), for cab offered by Caterpillar, when properly installed and maintained and tested with the doors and windows closed.

← S01

DX225LC-5 Crawler Excavator

[Request a Quote](#)

Specifications for DX225LC-5 Crawler Excavator

Engine

RATED FLYWHEEL POWER (GROSS)	166.3 hp @ 1,800 rpm
RATED HORSE POWER (NET)	162.1 hp @ 1,800 rpm
MAX. TORQUE (NET)	557 lbf-ft @ 1,400 rpm
ENGINE EMISSIONS TIER (EPA)	T4

Hydraulic System

MAIN PUMP: DISPLACEMENT	7 in ³ /rev
CONTROL VALVE: RELIEF VALVE PRESSURE (NORMAL)	4,694 psi
CONTROL VALVE: RELIEF VALVE PRESSURE (BOOST)	4,978 psi
MAIN PUMP: MAX. FLOW RATE (EACH)	54.55 gal/min
MAIN PUMP: MAIN RELIEF PRESSURE	--

Undercarriage

UPPER ROLLERS: QUANTITY PER SIDE	2
LOWER ROLLERS: QUANTITY PER SIDE	8
TRACK LENGTH	14' 7"
TRACK LINK: TRACK GAUGE	7' 10"

Swing Mechanism

SWING PERFORMANCE: MAX SWING TORQUE	60757 lbf-ft
SWING PERFORMANCE: MAX SWING SPEED (AT EFFICIENCY)	10.9 rpm

ENGINE COOLANT	10.14 gal
ENGINE OIL	7.13 gal
HYDRAULIC TANK	51.51 gal

Environment

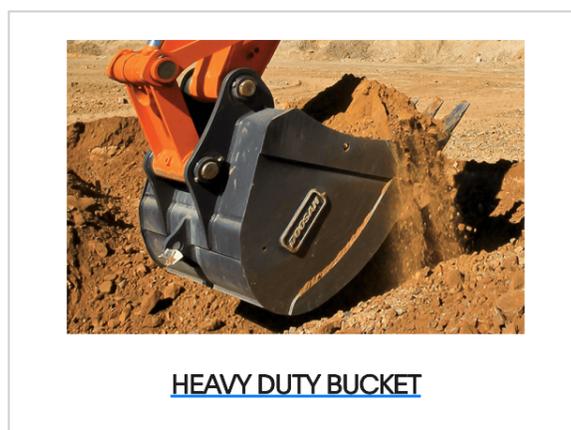
NOISE LEVEL: GUARANTEED SOUND POWER LEVEL	103 dBA
NOISE LEVEL: OPERATOR	70 dBA

← **S04**

Lift Capacity

LIFTING CAPACITY OVER FRONT @ HORIZONTAL DISTANCE - 10 FT ABOVE GROUND	14,660 lb @ 20 ft
LIFTING CAPACITY OVER FRONT @ HORIZONTAL DISTANCE - GROUND LEVEL	16,130 lb @ 20 ft
LIFTING CAPACITY OVER FRONT @ HORIZONTAL DISTANCE - 10 FT BELOW GROUND	15,810 lb @ 20 ft

Attachments



[View All](#)



ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER A-500-3223236868

Version: 1.0

Issue Date: October 11, 2024

Pursuant to section 20.3 of the Environmental Protection Act, Revised Statutes of Ontario (R.S.O.) 1990, c. E. 19 and subject to all other applicable Acts or regulations this Environmental Compliance Approval is issued to:

2374868 ONTARIO INC.

6678 WELLINGTON RD 34 ROAD
CAMBRIDGE ONTARIO
N3C 2V4

For the following site:

6678 Wellington Road 34

Town of Puslinch, County of Wellington

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

- One (1) Diesel-fired engine, rated at 50 kilowatts and serving the screening operations;
- Fugitive emissions resulting from the delivery, storage, transfer and stockpiling of materials associated with waste processing operations;

all in accordance with the Application for Approval (Air & Noise) submitted by 2374868 Ontario Inc., dated April 13, 2023 and signed by Eric Nafziger - Site Manager; the supporting information, including the Emission Summary and Dispersion Modelling Report, submitted by GHD Limited, dated December 10, 2021 and signed by Erik Martinez; the Acoustic Assessment Report submitted by GHD Limited, dated April 3, 2024 and signed by Patrick Chen; the additional information provided by Patrick Chen of GHD Limited in the emails dated April 3, 2024, April 12, 2024, May 27, 2024 and July 15, 2024; and, all other documentation associated with the Application.

DEFINITIONS

For the purpose of this environmental compliance approval, the following definitions apply:

1. "Acoustic Assessment Report" means the report, prepared in accordance with Publication NPC-233 submitted in support of the application, that documents all sources of noise emissions and Noise Control Measures present at the Facility. "Acoustic Assessment Report" also means the Acoustic Assessment Report prepared by GHD Limited, dated April 3, 2024 and signed by Patrick Chen;
2. "Acoustic Audit" means an investigative procedure consisting of measurements and/or acoustic modelling of all sources of noise emissions due to the operation of the Facility, assessed to determine compliance with the performance limits for the Facility regarding noise emissions, completed in accordance with the procedures set in Publication NPC-103 and reported in accordance with Publication NPC-233;
3. "Acoustic Audit Report" means a report presenting the results of an Acoustic Audit, prepared in accordance with

Publication NPC-233;

4. "Acoustical Consultant" means a person currently active in the field of environmental acoustics and noise/vibration control, who is familiar with Ministry noise guidelines and procedures and has a combination of formal university education, training and experience necessary to assess noise emissions from a Facility;
5. "Approval" means this Environmental Compliance Approval, including the application and supporting documentation listed above;
6. "Best Management Practices Plan" means a document or a set of documents which describe measures to minimize dust emissions from the Facility and/or Equipment;
7. "Company" means 2374868 Ontario Inc. that is responsible for the construction or operation of the Facility and includes any successors and assigns in accordance with section 19 of the EPA;
8. "Director" means a person appointed for the purpose of section 20.3 of the EPA by the Minister pursuant to section 5 of the EPA;
9. "District Manager" means the District Manager of the appropriate local district office of the Ministry, where the Facility is geographically located;
10. "EPA" means the *Environmental Protection Act*, R.S.O. 1990, c.E.19;
11. "Equipment" means the equipment and processes described in the Company's application, this Approval and in the supporting documentation submitted with the application, to the extent approved by this Approval;
12. "Facility" means the entire operation located on the property where the Equipment is located;
13. "Independent Acoustical Consultant" means an Acoustical Consultant who is not representing the Company and was not involved in preparing the Acoustic Assessment Report or the design/implementation of Noise Control Measures for the Facility and/or Equipment. The Independent Acoustical Consultant shall not be retained by the Acoustical Consultant involved in the noise impact assessment or the design/implementation of Noise Control Measures for the Facility and/or Equipment;
14. "Manual" means a document or a set of documents that provide written instructions to staff of the Company;
15. "Minister" means the Minister of the Environment, Conservation and Parks or such other member of the Executive Council as may be assigned the administration of the EPA under the Executive Council Act;
16. "Ministry" means the ministry of the government of Ontario responsible for the EPA and includes all officials, employees or other persons acting on its behalf;
17. "Noise Control Measures" means measures to reduce the noise emissions from the Facility and/or Equipment including, but not limited to, silencers, acoustic louvers, enclosures, absorptive treatment, plenums and barriers;
18. "Point of Reception" means Point of Reception as defined by Publication NPC-300;
19. "Publication NPC-103" means the Ministry Publication NPC-103 of the Model Municipal Noise Control By-Law, Final Report, August 1978, published by the Ministry as amended;
20. "Publication NPC-233" means the Ministry Publication NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October, 1995, as amended;
21. "Publication NPC-300" means the Ministry Publication NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources - Approval and Planning, Publication NPC-300", August 2013, as amended;
22. "Technical Bulletin: Management Approaches for Industrial Fugitive Dust Sources" means the Ministry publication "Technical Bulletin: management approaches for industrial fugitive dust sources", March 8, 2017, as amended;
23. "Truck(s)" means heavy truck(s).

TERMS AND CONDITIONS

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

1. OPERATION AND MAINTENANCE

1. The Company shall ensure that the Equipment is properly operated and maintained at all times. The Company shall:
 - a. prepare, not later than three (3) months after the date of this Approval, and update, as necessary, a Manual outlining the operating procedures and a maintenance program for the Equipment, including:
 - i. routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the Equipment suppliers;
 - ii. emergency procedures, including spill clean-up procedures;
 - iii. procedures for any record keeping activities relating to operation and maintenance of the Equipment; and,
 - iv. all appropriate measures to minimize noise and odorous emissions from all potential sources;
 - b. implement the recommendations of the Manual.

2. FUGITIVE DUST CONTROL

1. The Company shall develop in consultation with the District Manager, a Best Management Practices Plan for the control of fugitive dust emissions. This Best Management Practices Plan shall:
 - a. at minimum, be prepared in accordance with Ministry Technical Bulletin: Management Approaches for Industrial Fugitive Dust Sources; and
 - b. include a list of all Ministry comments received, if any, on the development of the Best Management Practices Plan, and a description of how each Ministry comment was addressed in the Best Management Practices Plan.
2. The Company shall submit the Best Management Practices Plan to the District Manager not later than three (3) months after the date of this Approval or as otherwise indicated by the District Manager.
3. Upon acceptance of the Best Management Practices Plan by the District Manager, the Company shall immediately implement the Best Management Practices Plan for the control of fugitive dust emissions to provide effective dust suppression measures to any potential sources of fugitive dust emissions resulting from the operation of the Facility.
4. The Company shall update the Best Management Practices Plan as necessary or at the direction of the District Manager.

3. RECORD RETENTION

1. The Company shall retain, for a minimum of two (2) years from the date of their creation, all records and information related to or resulting from the recording activities required by this Approval, and make these records available for review by staff of the Ministry upon request. The Company shall retain:
 - a. all records on the maintenance, repair and inspection of the Equipment; and
 - b. all records of any environmental complaints, including:
 - i. a description, time and date of each incident to which the complaint relates;
 - ii. wind direction at the time of the incident to which the complaint relates; and

- iii. a description of the measures taken to address the cause of the incident to which the complaint relates and to prevent a similar occurrence in the future.

4. NOTIFICATION OF COMPLAINTS

1. The Company shall notify the District Manager, in writing, of each environmental complaint within two (2) business days of the complaint. The notification shall include:
 - a. a description of the nature of the complaint; and
 - b. the time and date of the incident to which the complaint relates.

5. NOISE

1. The Company shall:
 - a. at all times, ensure that the noise emissions from the Facility comply with the limits set out in Ministry Publication NPC-300;
 - b. maintain the locations of the Equipment, buildings, 3 metre high embankment, and Truck routes as depicted in Figure 1 of the Acoustic Assessment Report at all times that the Facility is operating;
 - c. ensure that the sound emission levels of the Equipment shall not exceed the values specified in Table 1 of the Acoustic Assessment Report;
 - d. limit Truck arrivals and departures during the day-time hours of 7 a.m. to 7 p.m. in accordance with the following:
 - i. a maximum of six (6) heavy truck movements per sixty (60) minute period on truck route "TR1" as depicted in Figure 1 of the Acoustic Assessment Report;
 - ii. a maximum of five (5) heavy truck movements per sixty (60) minute period on truck route "TR2" as depicted in Figure 1 of the Acoustic Assessment Report;
 - e. limit Truck arrivals and departures during the evening-time hours of 7 p.m. to 11 p.m. in accordance with the following:
 - i. a maximum of two (2) heavy truck movements per sixty (60) minute period on truck route "TR1" as depicted in Figure 1 of the Acoustic Assessment Report;
 - ii. a maximum of five (5) heavy truck movements per sixty (60) minute period on truck route "TR2" as depicted in Figure 1 of the Acoustic Assessment Report;
 - f. limit Truck arrivals and departures during the night-time hours of 11 p.m. to 7 a.m. in accordance with the following:
 - i. a maximum of two (2) heavy truck movements per sixty (60) minute period on truck route "TR1" as depicted in Figure 1 of the Acoustic Assessment Report; and
 - ii. a maximum of five (5) heavy truck movements per sixty (60) minute period on truck route "TR2" as depicted in Figure 1 of the Acoustic Assessment Report.
2. The Company shall restrict the operation of the screening Equipment to the day-time hours of 7 a.m. to 7 p.m.

6. CHANGE OF OWNERSHIP

1. The Company shall notify the Director in writing, and forward a copy of the notification to the District Manager, within thirty (30) days of the occurrence of any of the following changes to the Facility operations:
 - a. the ownership of the Facility;
 - b. the operator of the Facility;

- c. the address of the Company;
- d. the partners, where the Company is or at any time becomes a partnership and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c. B.17, shall be included in the notification; or
- e. the name of the corporation where the Company is or at any time becomes a corporation, other than a municipal corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C.39, shall be included in the notification.

2. In the event of any change in ownership of the Facility, the Company shall notify the successor of the existence of this Approval and provide the successor with a copy of this Approval, and the Company shall provide a copy of the notification to the District Manager and the Director.

7. ACOUSTIC AUDIT

1. The Company shall carry out Acoustic Audit measurements on the actual noise emissions due to the operation of the Facility. The Company:

- a. shall carry out Acoustic Audit measurements in accordance with the procedures in Publication NPC-103 at a time when foliage attenuation is at a minimum between the Facility and the Points of Reception;
- b. shall submit an Acoustic Audit Report on the results of the Acoustic Audit, prepared by an Independent Acoustical Consultant, in accordance with the requirements of Publication NPC-233, to the District Manager and the Director, not later than six (6) months after the commencement of operation of the Facility. The Acoustic Audit shall include verification of the sound emission levels of the Equipment and the sound level limits of the Points of Reception; and
- c. shall submit, in conjunction with an Acoustic Audit Report, an Environmental Compliance Approval application requesting an amendment to the Approval to rescind the requirement for an Acoustic Audit Report as per Condition 7.1.b of this Approval.

2. The Director:

- a. may not accept the results of the Acoustic Audit if the requirements of Publication NPC-233 were not followed; and
- b. may require the Company to repeat the Acoustic Audit if the results of the Acoustic Audit are found unacceptable to the Director.

REASONS

The reasons for the imposition of these terms and conditions are as follows:

1. Condition Nos. 1 and 2 are included to emphasize that the Equipment must be maintained and operated according to a procedure that will result in compliance with the EPA, the Regulations and this Approval.
2. Condition No. 3 is included to require the Company to keep records and to provide information to staff of the Ministry so that compliance with the EPA, the Regulations and this Approval can be verified.
3. Condition No. 4 is included to require the Company to notify staff of the Ministry so as to assist the Ministry with the review of the site's compliance.
4. Condition No. 5.1 is included to provide the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the Facility.
5. Condition No. 5.2 is included to ensure that operation of the screening Equipment is not extended beyond the stated hours to prevent an adverse effect resulting from the operation of the Equipment.
6. Condition No. 6 is included to require the Company to notify/report to the Ministry so that compliance with the EPA, the

regulations and this Approval can be verified.

7. Condition No. 7 is included to require the Company to gather accurate information and submit an Acoustic Audit Report in accordance with procedures set in the Ministry's noise guidelines, so that the environmental impact and subsequent compliance with this Approval can be verified.

APPEAL PROVISIONS

In accordance with Section 139 of the *Environmental Protection Act*, you may by written notice served upon me and the Ontario Land Tribunal, within 15 days after the service of this notice, require a hearing by the Tribunal. You must also provide notice to, the Minister of the Environment, Conservation and Parks in accordance with Section 47 of the *Environmental Bill of Rights, 1993* who will place notice of your appeal on the Environmental Registry. Section 142 of the *Environmental Protection Act* provides that the notice requiring the hearing ("the Notice") shall state:

- I. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
- II. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

- I. The name of the appellant;
- II. The address of the appellant;
- III. The environmental compliance approval number;
- IV. The date of the environmental compliance approval;
- V. The name of the Director, and;
- VI. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

Registrar* Ontario Land Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario M5G 1E5 OLT.Registrar@ontario.ca	and	The Minister of the Environment, Conservation and Parks 777 Bay Street, 5th Floor Toronto, Ontario M7A 2J3	and	The Director appointed for the purposes of Part II.1 of the <i>Environmental Protection Act</i> Ministry of the Environment, Conservation and Parks 135 St. Clair Avenue West, 1st Floor Toronto, Ontario M4V 1P5
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*** Further information on the Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.olt.gov.on.ca**

This instrument is subject to Section 38 of the *Environmental Bill of Rights, 1993*, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek leave to appeal within 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry at ero.ontario.ca, you can determine when the leave to appeal period ends.

The above noted activity is approved under s.20.3 of Part II.1 of the *Environmental Protection Act*.

Dated at Toronto this 11th day of October, 2024



Nancy Orpana

Director

appointed for the purposes of Part II.1 of the Environmental Protection Act

c: Eric Nafziger

Mike Masschaele, GHD Limited

Erik Martinez, GHD Limited



Acoustic Assessment Report

**6678 Wellington Road 34
Cambridge, Ontario**

2374868 Ontario Inc.

03 April 2024

Company Name

2374868 Ontario Inc.

Company Address

Unit Number	Street Number	Street Name	PO Box
	6678	Wellington Road 34	
City/Town		Province	Postal Code
Cambridge		Ontario	N6C 1K7

Location of Facility

6678 Wellington Road 34, Cambridge, Ontario

The attached Acoustic Assessment Report was prepared in accordance with the guidance in the ministry document "Information to be Submitted for Approval of Stationary Sources of Sound" (NPC-233) dated October 1995 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact

Company Contact

Last Name	First Name	Middle Initial
Nafziger	Eric	J
Title		Telephone Number
Manager		519-658-5023
Signature		Date (yyyy/mm/dd)
		2021/01/06

Technical Contact

Technical Contact

Patrick Chen

Last Name	First Name	Middle Initial
Chen	Patrick	
Representing		Telephone Number
GHD Limited		519 340-4259
Signature		Date (yyyy/mm/dd)
		2023/04/13

	Required Information	Submitted	Explanation/Reference
1.0	Introduction (Project Background and Overview)	<input checked="" type="checkbox"/> Yes	Executive Summary
2.0	Facility Description		
	2.1 Operating hours of Facility and significant Noise Sources	<input checked="" type="checkbox"/> Yes	Section 1
	2.2 Site Plan identifying all significant Noise Sources	<input checked="" type="checkbox"/> Yes	Figure 1
3.0	Noise Source Summary		
	3.1 Noise Source Summary Table	<input checked="" type="checkbox"/> Yes	Table 1
	3.2 Source noise emissions specifications	<input checked="" type="checkbox"/> Yes	Table 1
	3.3 Source power/capacity ratings	<input checked="" type="checkbox"/> Yes	Table 1
	3.4 Noise control equipment description and acoustical specifications	<input type="checkbox"/> Yes	N/A
4.0	Point of Reception Noise Impact Calculations		
	4.1 Point of Reception Noise Impact Table	<input checked="" type="checkbox"/> Yes	Table 2
	4.2 Point(s) of Reception (POR) list and description	<input checked="" type="checkbox"/> Yes	Section 3
	4.3 Land-use Zoning Plan	<input checked="" type="checkbox"/> Yes	Appendix A
	4.4 Scaled Area Location Plan	<input checked="" type="checkbox"/> Yes	Figure 1
	4.5 Procedure used to assess noise impacts at each POR	<input checked="" type="checkbox"/> Yes	Section 4
	4.6 List of parameters/assumptions used in calculations	<input checked="" type="checkbox"/> Yes	Section 4, Section 6
5.0	Acoustic Assessment Summary		
	5.1 Acoustic Assessment Summary Table	<input checked="" type="checkbox"/> Yes	Table 3
	5.2 Rationale for selecting applicable noise guideline limits	<input checked="" type="checkbox"/> Yes	Section 5
	5.3 Predictable Worst Case Impacts Operating Scenario	<input checked="" type="checkbox"/> Yes	Section 6, Appendix D
6.0	Conclusions		
	6.1 Statement of compliance with the selected noise performance limits	<input checked="" type="checkbox"/> Yes	Section 7
7.0	Appendices (Provide details such as)		
	Listing of Insignificant Noise Sources	<input checked="" type="checkbox"/> Yes	Appendix B
	Manufacturer's Noise Specifications	<input checked="" type="checkbox"/> Yes	Appendix E
	Calculations	<input checked="" type="checkbox"/> Yes	Appendix D
	Instrumentation	<input type="checkbox"/> Yes	N/A
	Meteorology during Sound Level Measurements	<input type="checkbox"/> Yes	N/A
	Raw Data from Measurements	<input type="checkbox"/> Yes	N/A
	Drawings (Facility / Equipment)	<input checked="" type="checkbox"/> Yes	Figure 1

Project name		Badger 2374868 Ont Inc-Permitting S					
Document title		Acoustic Assessment Report 6678 Wellington Road 34					
Project number		11210029-RPT-10					
File name		11210029-RPT-10-Acoustic Assessment Report					
Status Code	Revision	Author	Reviewer		Approved for issue		
			Name	Signature	Name	Signature	Date
S4	FINAL	Patrick Chen	Mike Masschaele		Mike Masschaele		Apr.3/24

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Appendix B	Summary of Insignificant Noise Sources
Appendix C	Noise Specification and Worst-Case Simultaneous Operations Summary
Appendix D	CadnaA Sample Calculation for POR1
Appendix E	Manufacturer Sound Level Specifications

1. Introduction

GHD Limited (GHD) has prepared an Acoustic Assessment Report Update (AAR) for the 2374868 Ontario Inc. facility (Facility) located at 6678 Wellington Road 34 in the Cambridge, Ontario. This AAR has been prepared to include all significant sources of noise emissions at the Facility and to demonstrate compliance at all offsite noise sensitive locations. The North American Industry Classification System (NAICS) Code that applies to this Facility is 562210 – Waste treatment and disposal.

This AAR has been prepared to support an application by 2374868 Ontario Inc., for an application for a Ministry of the Environment Conservation and Parks (MECP) Environmental Compliance Approval (ECA) (Air & Noise).

The Facility typically operates between 7 AM and 6 PM, Monday through Friday. However, additional work outside of these hours is occasionally performed.

The AAR presented herein provides an evaluation of the potential noise impacts at the sensitive receptors located nearest to the Facility. The AAR was prepared consistent with the following MECP guidance:

- NPC-103, "Procedures", August 1978
- NPC-233, "Information to be Submitted for Approval of Stationary Sources of Sound", October 1995
- "Basic Comprehensive Certificates of Approval (Air), User Guide, Appendix A - Supporting Information for an Acoustic Assessment Report or Vibration Assessment Report Required by a Basic Comprehensive CofA prepared by the Environmental Assessment and Approvals Branch, Version 2.1, March 2011"
- NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources –Approval and Planning", August 2013

The Facility is located in an area zoned as Extractive and Agricultural. The land uses immediately surrounding the Facility is also Extractive and Agricultural. A zoning map and zoning definitions are provided in Appendix A. A site plan is provided on Figure 1.

The Facility is located in a mixed Acoustical Class 2 and 3 area. Class 2 areas are defined by NPC 300 as an area where the background sound level during the day is dominated by the activities of people and by natural sounds during the night. Class 3 areas are defined by NPC 300 as an area where the background sound level is dominated by natural sounds having little or no road traffic.

1.1 Scope and Limitations

This report: has been prepared by GHD for 2374868 Ontario Inc. and may only be used and relied on by 2374868 Ontario Inc. for the purpose agreed between GHD and 2374868 Ontario Inc.

GHD otherwise disclaims responsibility to any person other than 2374868 Ontario Inc. arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

2. Noise Source Summary

This AAR focuses on the sound emissions from the significant noise sources identified at the Facility with the potential to adversely impact the sensitive receptors and are inclusive of the noise emissions from the various heavy machinery onsite (cranes, loaders, and excavator-style equipment). The significant noise sources are identified in the Noise Source Summary Table 1 and the locations are identified on Figure 1.

It has been conservatively assumed that the onsite loaders and excavator equipment can operate any time of day. Screening operations are daytime only. Truck traffic is expected to have a maximum of up to 6 trucks per hour during the daytime hours and up to 2 trucks per hour in the evening and nighttime hours. Onsite vehicle activities including heavy trucks arriving and departing from site and traffic from Capitol Paving are summarized below:

Type of Vehicle	Day 7a.m.- 7 p.m. (Trips/hour)	Evening 7p.m.- 11 p.m. (Trips /hour)	Night 11 p.m.- 7 a.m. (Trips /hour)
Front End Loader Movements (S1)	15	5	5
Heavy Vehicle Truck Route (TR1)	6	2	2
Capital Paving Truck Traffic (TR2)	5	5	5

There are no sources of impulse noise or vibration at the Facility¹.

Comprehensive and detailed information on the hydrovac operations, Site and adjacent Capital Paving (Capital) traffic are provided in the Design and Operations (D&O) Report and Traffic Study submitted with the Zoning By-Law Amendment application in December 2021. The adjacent aggregate extractive operation business is not part of the waste processing operation. Though the properties share an entrance, they are independent sites and owned by separate companies. GHD has conservatively added the Capital traffic entering and exiting from the shared entrance. It is also noted that the land south of the hydrovac operations is not part of the Facility's operations.

The significant equipment sources are all either trucking related activities or outdoor equipment located beside the within the Site Boundary. The Site does not have any significant interior noise sources resulting in breakout noise anywhere from the building. The existing building at the Site is made of standard industrial construction materials. The other noise sources at the Facility have not been included since they are considered insignificant contributors to the overall Facility noise level at the sensitive receptors. A summary of insignificant noise sources is provided in Table B.1 of Appendix B.

3. Point of Reception Summary

The identification of appropriate sensitive point(s)-of-reception is necessary to conduct the AAR for the Facility. A "point-of-reception" is any point on the premises of a person where sound, originating from other than those premises, is received. The point-of-reception may be located on permanent or seasonal residences, nursing/retirement homes, rental residences, hospitals, campgrounds, schools, or places of worship.

The objective of this AAR is to determine the predictable worst-case 1-hour equivalent sound level (1-hour Leq) at the worst-case point(s)-of-reception. The worst-case point(s)-of-reception are defined as the sensitive receptors with the greatest potential exposure to the Facility noise sources due to proximity and direct line-of-sight exposure.

¹ Assessment of vibration if applicable is assessed according to NPC-207.

The worst-case sensitive points of reception (POR) are:

- POR1 – nearest façade of a two-storey residence on Sideroad 10 N approximately 900 meters (m) east of the site (4.5 m Above Ground (AG))
- POR2 – nearest façade of a two-storey residence on Highway 34 approximately 630 meters (m) east of the site (4.5 m Above Ground (AG))
- POR3 - outdoor point of reception associated with a two-storey residence on Highway 34 approximately 70 m south of the site (1.5 m AG) evaluated to be the worst-case in comparison to the residence façade
- POR4 – nearest façade of a two-storey residence on Highway 34 approximately 60 meters (m) south of the site (4.5 m Above Ground (AG))
- POR5 – nearest façade of a two-storey residence on Highway 34 approximately 60 meters (m) southwest of the site (4.5 m Above Ground (AG))
- POR6 – nearest façade of a two-storey residence on Highway 34 approximately 150 meters (m) west of the site (4.5 m Above Ground (AG))
- POR7 – nearest façade of a two-storey residence on Concession Road approximately 740 meters (m) northwest of the site (4.5 m Above Ground (AG))
- POR8 – nearest façade of a two-storey residence on Concession Road approximately 1,300 meters (m) north of the site (4.5 m Above Ground (AG))

The location of the worst case PORs are identified on Figure 2.

Vacant lots that would permit a noise sensitive use have been considered in the selection process of worst- case Points of Reception. According to the Township of Puslinch bylaws, the permitted uses for land zoned as Extractive does not allow for residential dwellings or any other land uses that would likely be noise sensitive. Additionally, all agricultural zoned land on the southern part of the Property and properties adjacent to the Property currently already have dwellings. As Township of Puslinch agricultural zoning allows for a maximum of 1 single detached dwelling per lot, no additional dwellings will be built.

In accordance with NPC-300 all PORs locations within 500 m of the Facility were considered including the planes of windows which were assessed for daytime and nighttime noise limits. In addition, the ground level amenity areas, within 30 m of each POR, were also evaluated for daytime noise limits; however, the noise impact at the worst-case and most exposed PORs are presented herein. GHD also evaluated the zoning surrounding the Facility to identify any potential vacant lots that permit a residential build and has included all relevant POR's.

4. Sound Level Data

Manufacturer's sound level data for the proposed equipment is provided in Appendix E. This data was supplemented with spectral data from GHD's sound level library. All equipment must meet (or be below) the specified sound levels. The proposed significant noise sources included in this assessment are:

- Front End Loader (S1) – Sound Power Level: 113.2 dBA
- Screening Equipment Motor (S2A) – Sound Power Level: 109.3 dBA
- Screening Operation (S2B) – Sound Power Level: 105.6 dBA
- Excavator (S4) – Sound Power Level: 103.2 dBA
- Truck Route (TR1) – Sound Power Level: 109.5 dBA
- Capitol Paving Truck Route (TR2) – Sound Power Level: 109.5 dBA

All noise sources are outdoor sources.

5. Assessment Criteria

Assessment criteria may be determined for a POR based on the MECP's minimum exclusionary sound level limits, as presented in Table B-1 of NPC-300, in comparison to the background sound levels experienced in the area. The "background sound level" is defined as the sound level present in the environment that is produced by noise sources other than those from the Facility, and would include traffic sound levels and sound from neighboring industrial/commercial activity. The higher of the two assessment criteria is selected for purpose of assessment.

5.1 Sound Level Limits for Stationary Noise Sources

5.1.1 MECP Standard Limits

NPC-300 defines stationary noise sources as sound from all sources that are normally operated within the property lines of a facility. The noise impact from stationary sources is evaluated based on operations during a predictable worst-case hour. Stationary noise assessment criteria are generally determined based on the MECP's minimum exclusionary sound level limits, as presented in NPC-300, in comparison to the background sound levels experienced in the area.

Limits are provided for two main types of noise sources:

- Non-impulsive, "continuous" noise sources such as ventilation fans, mechanical equipment, and vehicles while moving within the property boundary of an industry. Continuous noise is measured using 1-hour average sound exposures (Leq (1-hr) values), in dBA.
- Impulsive noise, which is a "banging" type noise characterized by rapid sound level rise time and decay. Impulsive noise is measured using a logarithmic mean (average) level (LLM) of the impulses in a one-hour period, in dBAI.

The guideline requires an assessment at, and provides separate guideline limits for:

- Outdoor points of reception (e.g., back yards, communal outdoor amenity areas).
- Façade points of reception such as the plane of windows on the outdoor façade which connect onto noise sensitive spaces, such as living rooms, dens, eat-in kitchens, dining rooms and bedrooms.

Acoustical Area Classification

Under the MECP Publication NPC-300 guidelines, noise sensitive receptors are defined using receptor area classifications. The receptor areas are classified as either:

- Class 1 – Urban areas
- Class 2 – Suburban / semi-rural areas
- Class 3 – Rural areas
- Class 4 – Infill areas (Subject to Municipal Planning Approval for New Developments)

Depending on the receptor area classification, different guideline limits apply. Classes 1, 2, and 3 were included in the predecessor guidelines to Publication NPC-300. The Class 4 area is intended to allow for infill and redevelopment, whilst still protecting residences from undue noise.

Table 5.1 below summarizes the MECP's minimum exclusionary sound level limits based on the Acoustical Class of the project area, which are expressed in terms of 1-hour equivalent sound levels (1-hour Leq):

Table 5.1 MECP Minimum Exclusionary Sound Level Limits for Steady Sound

Time of Day	Class 1 Sound Level Limits (dBA)		Class 2 Sound Level Limits (dBA)		Class 3 Sound Level Limits (dBA)		Class 4 Sound Level Limits (dBA)	
	Plane of Window	Outdoor POR						
07:00 – 19:00 (Day)	50	50	50	50	45	45	60	55
19:00 – 23:00 (Even)	50	50	50	45	40	40	60	55
23:00 – 07:00 (Night)	45	NA	45	NA	40	NA	55	NA

Based on the acoustic environment at the development, it is considered to be in a mixed acoustic Class 2 and 3 area as defined by NPC-300, as the acoustic environment is dominated by human activities (i.e., road traffic) during the day by Highway 34 and natural environment and infrequent human activity for Class 2 and dominated by natural sounds at all hours for a Class 3.

Class 2 and Class 3 noise limits appropriate for this project have been shaded for reference.

Table 5.2 Applicable Minimum MECP Sound Level Limits or Site Specific Limits for Impulsive or Steady State Sound

POR ID	POR Description	Sound Level Limits (dBA)		
		Day (7am – 7pm)	Evening (7pm – 11pm)	Night (11pm – 7am)
POR1	Nearest façade of a two-storey residence on Sideroad 10 N (4.5 metres above grade [m AG])	50	50	45
POR2	Nearest façade of a two-storey residence on Highway 34 (4.5 m AG)	50	50	45
POR3	Nearest façade of a two-storey residence on Highway 34 (4.5 m AG)	50	50	45
POR4	Nearest façade of a two-storey residence on Highway 34 (4.5 m AG)	50	50	45
POR5	Nearest façade of a two-storey residence on Highway 34 (4.5 m AG)	50	50	45
POR6	Nearest façade of a two-storey residence on Highway 34 (4.5 m AG)	50	50	45
POR7	Nearest façade of a two-storey residence on Concession Road (4.5 m AG)	45	40	40
POR8	Nearest façade of a two-storey residence on Concession Road (4.5 m AG)	45	40	40

The lowest sound levels generally occur at the ground floor level (1.5 metres above grade) and increase with height due to increased line of sight exposure to the roadways. GHD has presented the lowest noise limit relative to the worst-case Facility noise impact based on line-of-sight and exposure to the applicable receptor.

6. Impact Assessment

6.1 Steady-State Sound Levels

The worst-case assessment of steady-state noise sources at the selected points of reception was based on representative noise data. CadnaA Acoustical Modelling Software (CadnaA), version 2023, was used to model the potential impacts of the significant noise sources. CadnaA calculates sound level emissions based on the ISO 9613-2 standard "Acoustics – Attenuation of Sound during Propagation Outdoors".

A sample calculation for worst-case POR1 is provided in Appendix D.

The worst-case cumulative Facility-wide attenuated sound levels estimated at the receptor(s) included attenuation affects due to geometric divergence, atmospheric attenuation, barriers/berms, ground absorption and directivity, as applicable for all significant noise sources off-site buildings were input as intervening structures.

CadnaA modelling assumptions used in this AAR included:

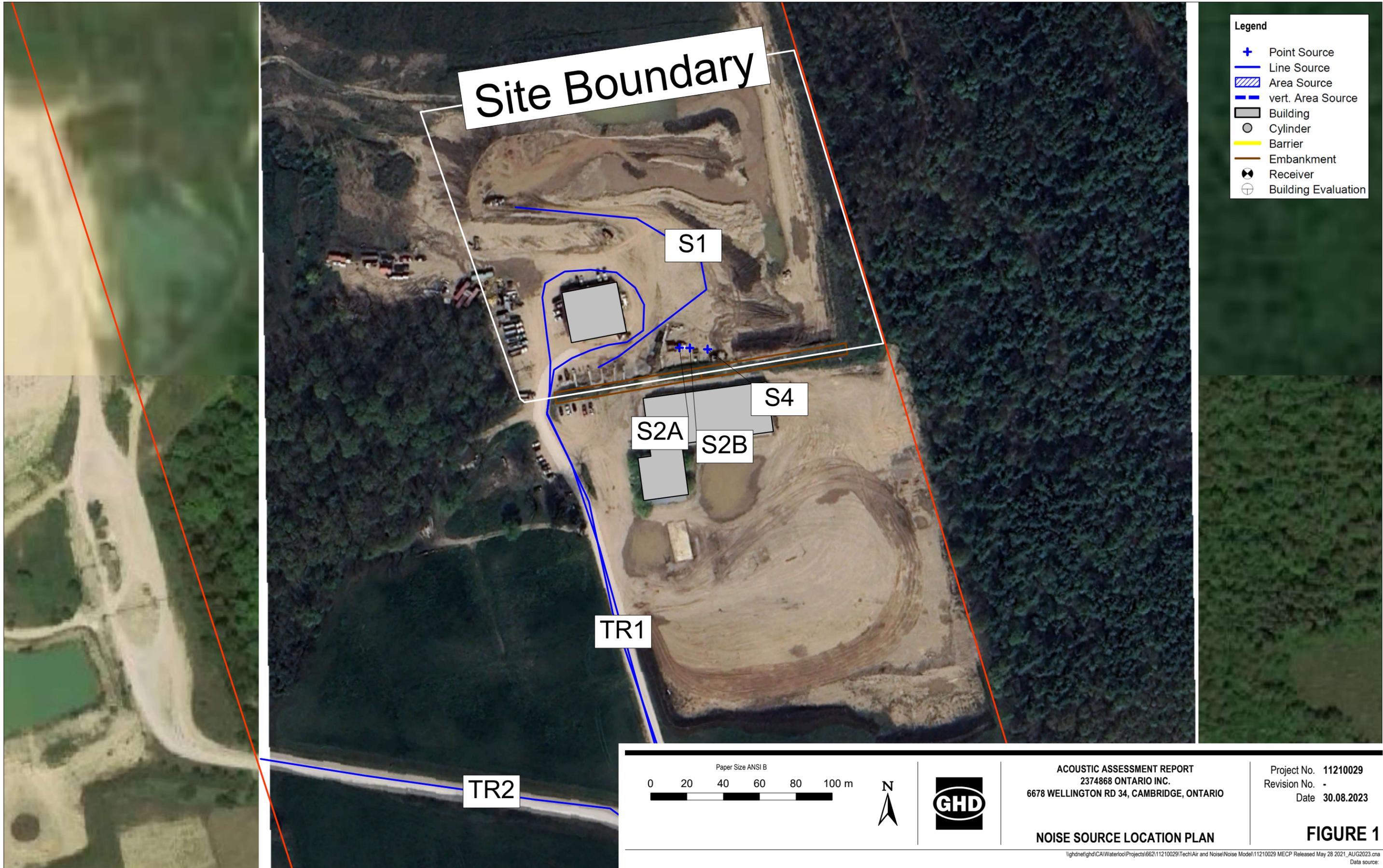
- **Noise Sources:** All sources were modelled using the 1/1 octave band data from source measurements, manufacturer's sound level data, or reference materials.
- **Noise Source Elevation:** The heights of the sources are summarized in Table C.1 of Appendix C.
- **Reflection Order:** A maximum reflection order of 2.0 was used to evaluate indirect noise impact from one reflecting surface.
- **Ground Absorption:** The model was set up with a ground absorption factor of 1 due to the area being primarily grass and crop land. A manual ground absorption area is included with a factor of 0 hard surfaces such as gravel areas, haul roads, and ponds.
- **Foliage:** The surrounding woodlots were modeled as foliage with a height of 8m.
- **Receptor Elevation:** POR receptor heights were modelled appropriately to represent the worst-case elevation.
- **Time-Weighted Adjustment:** Time-weighted adjustments for sources that do not operate continuously are summarized in Table C.1.
- **Terrain:** Flat terrain was assumed in order to be conservative.
- **Tonality:** A +5 dBA adjustment was applied for tonal sources, if applicable.
- **Building Surfaces:** The buildings are modelled as reflective surfaces with 0.21 absorption coefficient.

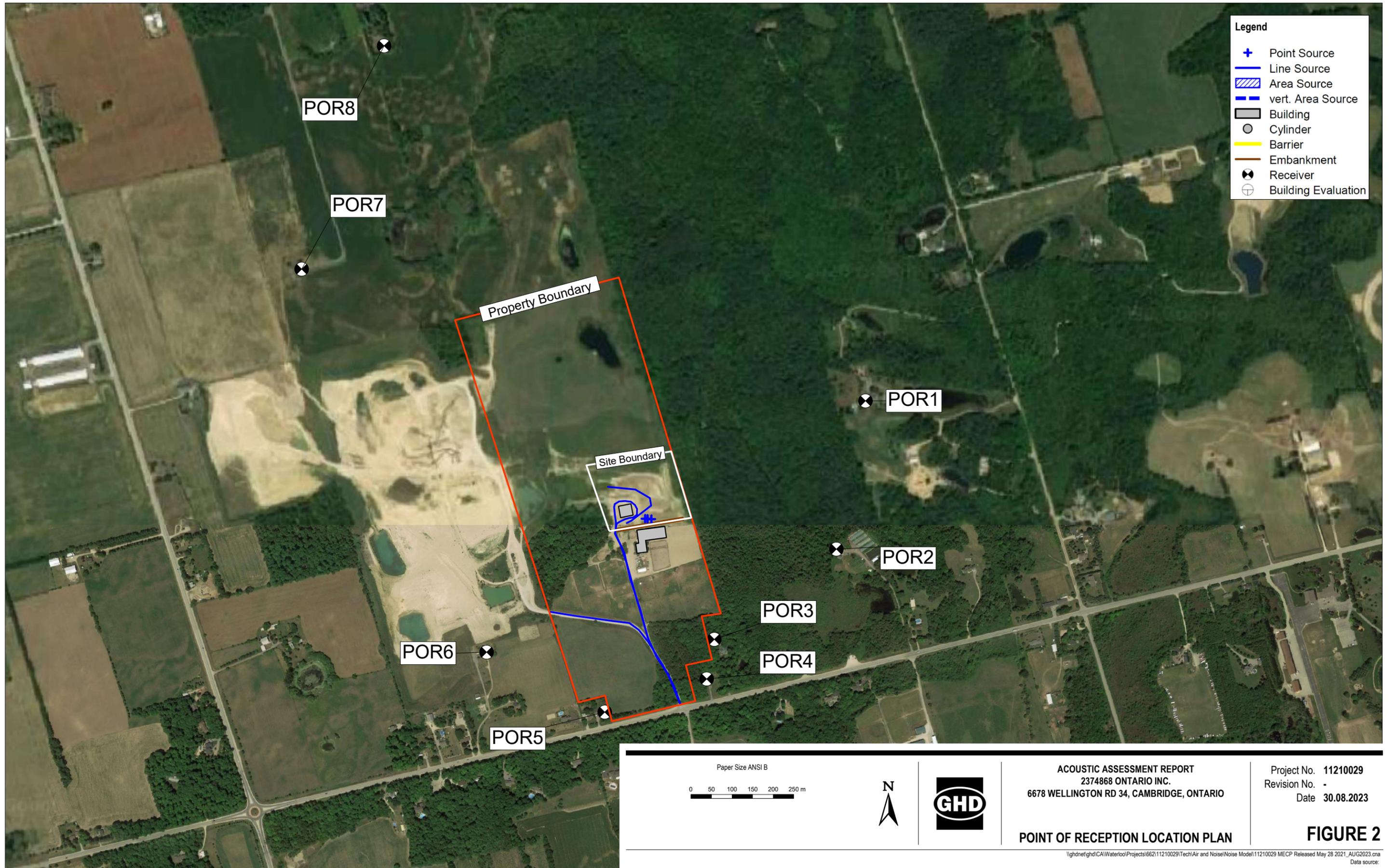
The steady stated noise impacts at each POR are summarized in Table 2. Compliance with the MECP sound level limits is demonstrated in Table 3 and Figure 3. Compliance with the MECP sound level limits is demonstrated in Table 3.

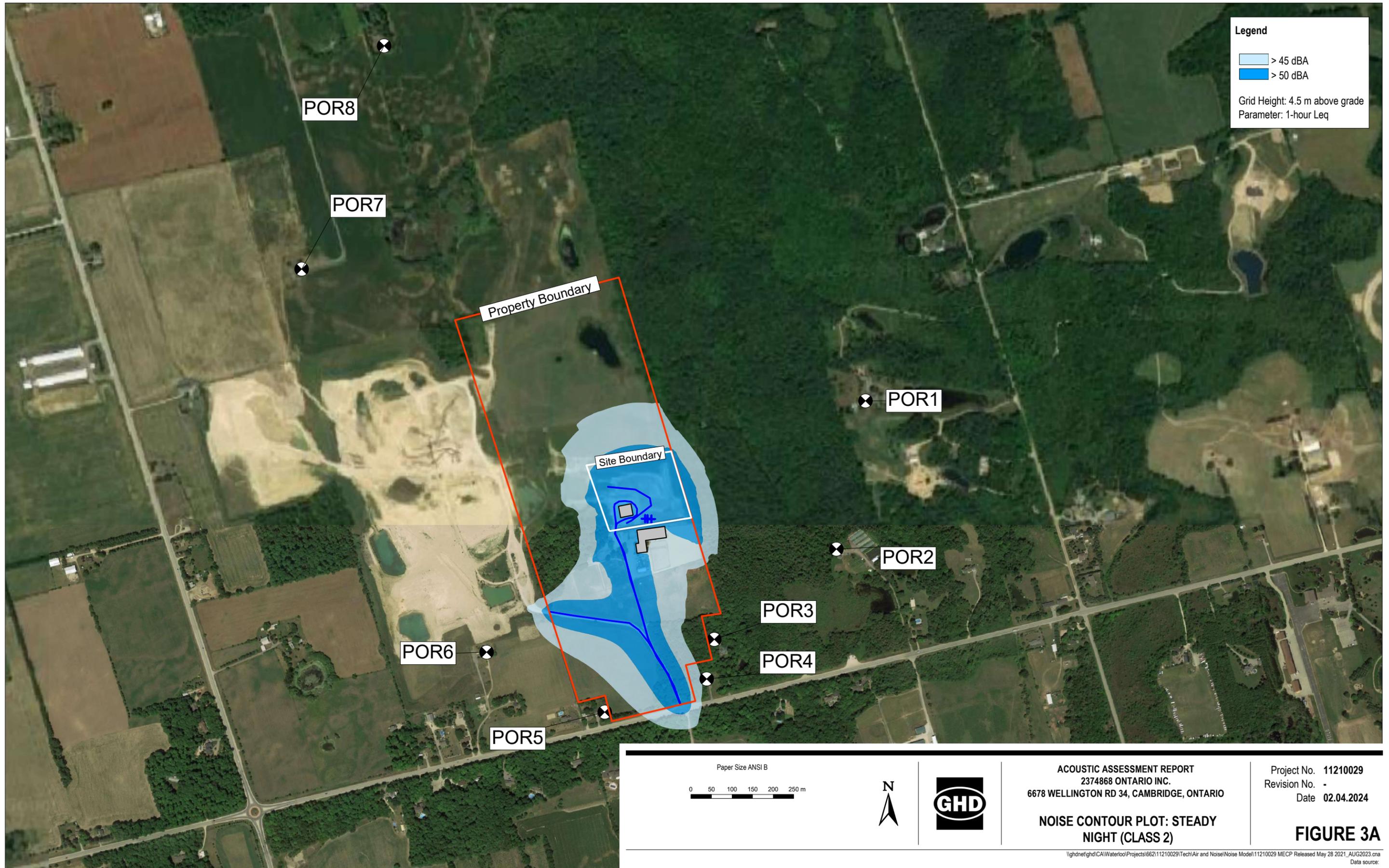
7. Conclusions

The unattenuated steady-state estimated at the PORs are below the MECP's minimum exclusionary sound level limits as summarized in Table 3.

GHD recommends that any future proposed equipment sound level specifications be evaluated to ensure that the sound level contribution at each applicable POR will not significantly add to the site wide cumulative noise impacts in order for the Facility to maintain compliance with NPC-300 noise limits.







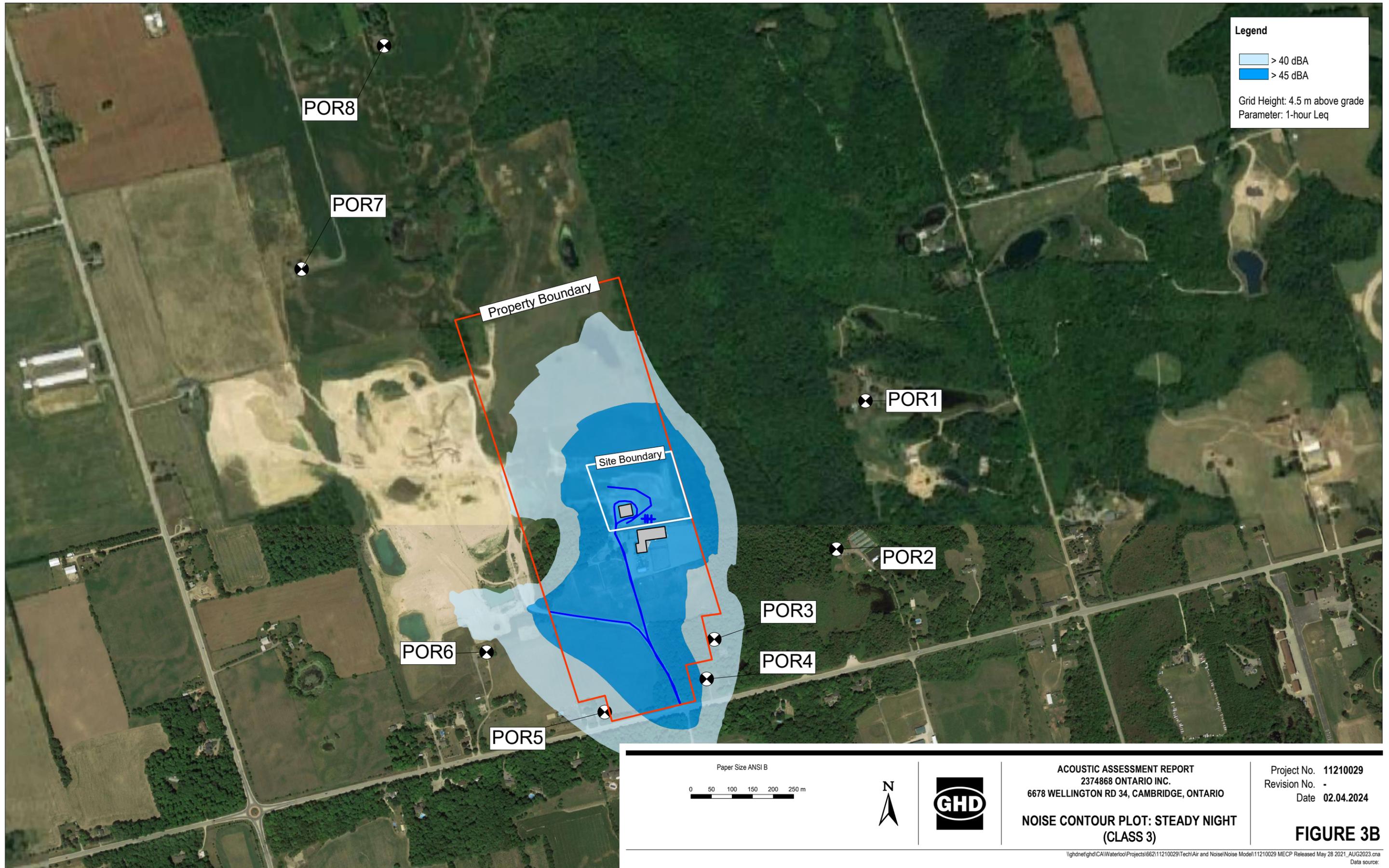


Table 1

Noise Source Summary
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario

Cadna A ID	Source Description	Sound Power Level¹ (dBA)	Source Characteristics²	Source Location³	Noise Control Measures⁴	Source Type
S1	Front End Loader	113.2	S	O	U	Point
S2A	Screening Equipment Motor	109.3	S	O	U	Point
S2B	Screening Operation	105.6	S	O	U	Point
S4	Excavator	103.2	S	O	U	Point
TR1	Truck Route	109.5	S	O	U	Line
TR2	Capitol Paving Truck Route	109.5	S	O	U	Line

Notes:

¹ Sound Power Level (PWL) in dBA, excludes +5 dBA total penalty if applicable.

² Sound characteristics:

- S – Steady
- Q – Quasi-steady impulsive
- I – Impulsive
- B – Buzzing
- T – Tonal
- C – Cyclic

³ Source location:

- O – Outside of building
- I – Inside of building

⁴ Noise control measures:

- S – Silencer, acoustic louvre, muffler
- A – Acoustic lining, plenum
- B – Barrier, berm, screening
- L – Lagging
- E – Acoustic enclosure
- O – Other
- U – Uncontrolled
- AC – Administrative control

Table 2
Point of Reception Unattenuated Noise Impact
 2374868 Ontario Inc.
 6678 Wellington Road 34, Cambridge, Ontario

Cadna A ID	Source Description	Sideroad 10 N Residence Facade POR1			Highway 34 Residence Facade POR2			Highway 34 Residence Outdoor Receptor POR3			Highway 34 Residence Facade POR4			Highway 34 Residence Facade POR5			Highway 34 Residence Facade POR6			Concession Road Residence Facade POR7			Concession Road 4 Residence Facade POR8										
		Distance (m)	Partial Sound Levels ¹ (dBA)			Distance (m)	Partial Sound Levels ¹ (dBA)			Distance (m)	Partial Sound Levels ¹ (dBA)			Distance (m)	Partial Sound Levels ¹ (dBA)			Distance (m)	Partial Sound Levels ¹ (dBA)			Distance (m)	Partial Sound Levels ¹ (dBA)										
			Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am		Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am		Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am		Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am		Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am		Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am	Day 7am-7pm	Evening 7pm-11pm	Night 11pm-7am					
Steady State Noise Impact																																	
S1	Front End Loader	576	36	31	31	466	33	28	28	351	35	30	30	425	35	30	30	463	35	30	30	468	34	30	30	941	30	26	26	1217	27	23	23
S2A	Screening Equipment Motor	606	37	—	—	470	27	—	—	337	31	—	—	416	30	—	—	478	29	—	—	502	37	—	—	1030	28	—	—	1309	30	—	—
S2B	Screening Operation	601	35	—	—	464	33	—	—	334	32	—	—	414	32	—	—	479	32	—	—	507	39	—	—	1034	26	—	—	1312	28	—	—
S4	Excavator	593	34	31	31	455	31	28	28	329	30	27	27	410	31	28	28	481	30	27	27	514	35	32	32	1043	25	22	22	1317	26	23	23
TR1	Truck Route	613	31	26	26	492	31	26	26	141	43	38	38	83	46	41	41	177	43	38	38	387	37	32	32	951	27	23	23	1243	24	20	20
TR2	Capitol Paving Truck Route	783	25	25	25	507	26	26	26	142	37	37	37	81	42	42	42	178	40	40	40	206	36	36	36	1047	22	22	22	1442	18	18	18
Total Facility Sound Level (1-hour Leq):			42	35	35		39	33	33		45	41	41		48	45	45		46	42	42		44	39	39		35	29	29		35	27	27

Note:
¹ Sound level at the receptor was calculated using Cadna A acoustical modelling software.

Table 3

Acoustic Assessment Summary
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario

Point of Reception ID	Point of Reception Description	Time of Day	SS Sound Levels (L _{EQ})	Performance Limit ¹ (L _{EQ})	Compliance with Performance Limit	Class Number	Verified by Acoustic Audit
			(dBA)	(dBA)	(Yes/No)		
Steady State Noise Impact							
POR1	Sideroad 10 N Residence Facade	07:00–19:00	42	50	Yes	Class 2	No
		19:00–23:00	35	50	Yes	Class 2	No
		23:00–07:00	35	45	Yes	Class 2	No
POR2	Highway 34 Residence Facade	07:00–19:00	39	50	Yes	Class 2	No
		19:00–23:00	33	50	Yes	Class 2	No
		23:00–07:00	33	45	Yes	Class 2	No
POR3	Highway 34 Residence Outdoor Receptor	07:00–19:00	45	50	Yes	Class 2	No
		19:00–23:00	41	45	Yes	Class 2	No
		23:00–07:00	41	45	Yes	Class 2	No
POR4	Highway 34 Residence Facade	07:00–19:00	48	50	Yes	Class 2	No
		19:00–23:00	45	50	Yes	Class 2	No
		23:00–07:00	45	45	Yes	Class 2	No
POR5	Highway 34 Residence Facade	07:00–19:00	46	50	Yes	Class 2	No
		19:00–23:00	42	50	Yes	Class 2	No
		23:00–07:00	42	45	Yes	Class 2	No
POR6	Highway 34 Residence Facade	07:00–19:00	44	50	Yes	Class 2	No
		19:00–23:00	39	50	Yes	Class 2	No
		23:00–07:00	39	45	Yes	Class 2	No
POR7	Concession Road Residence Facade	07:00–19:00	35	45	Yes	Class 3	No
		19:00–23:00	29	40	Yes	Class 3	No
		23:00–07:00	29	40	Yes	Class 3	No
POR8	Concession Road 4 Residence Facade	07:00–19:00	35	45	Yes	Class 3	No
		19:00–23:00	27	40	Yes	Class 3	No
		23:00–07:00	27	40	Yes	Class 3	No

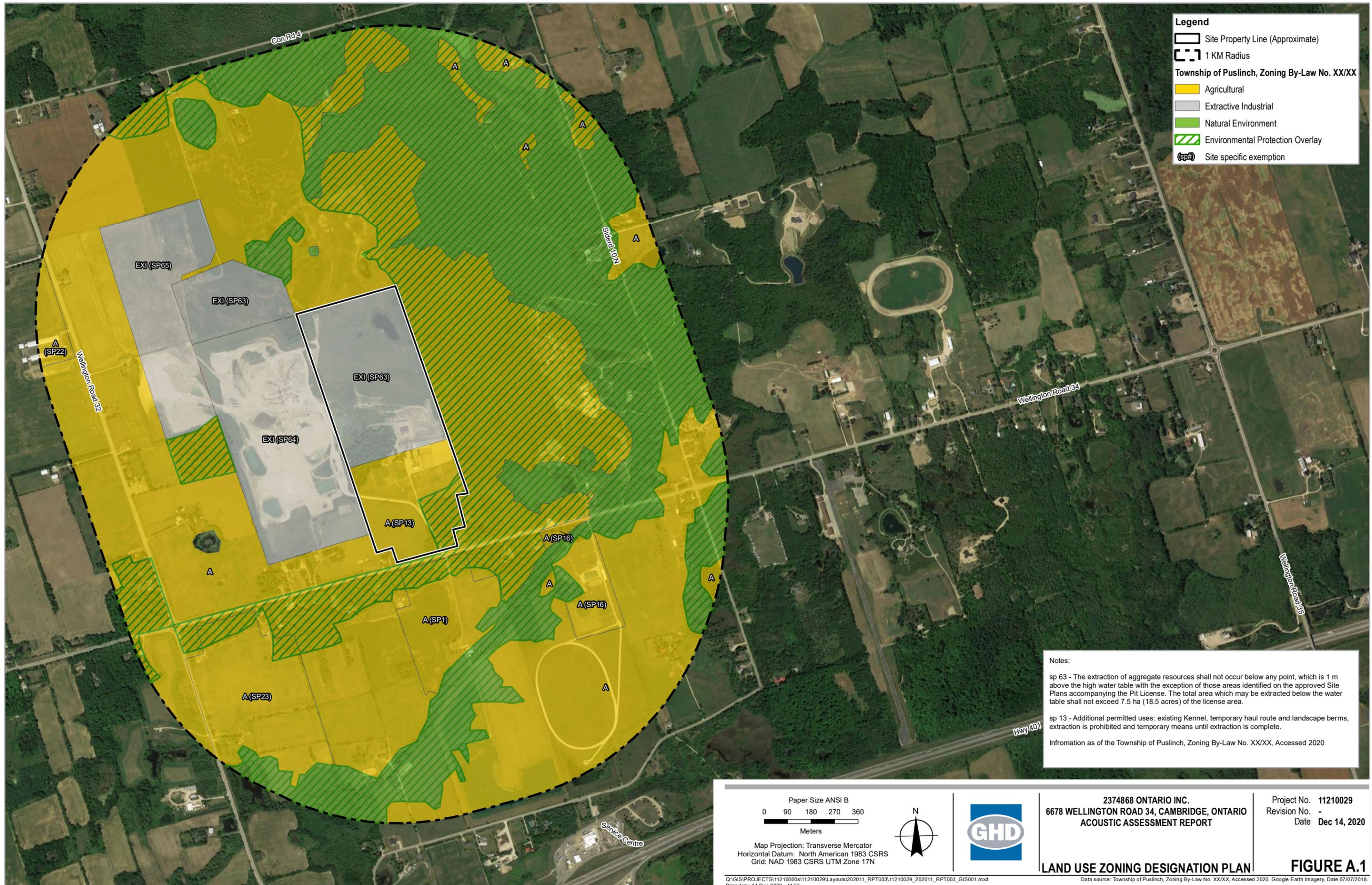
Note:

¹ Minimum MECP sound level limits as defined in NPC-300.

Appendices

Appendix A

Land Use Zoning Designation Plan



Legend

- Site Property Line (Approximate)
- 1 KM Radius
- Township of Puslinch, Zoning By-Law No. XX/XX**
- Agricultural
- Extractive Industrial
- Natural Environment
- Environmental Protection Overlay
- (SP#) Site specific exemption

Notes:

sp 63 - The extraction of aggregate resources shall not occur below any point, which is 1 m above the high water table with the exception of those areas identified on the approved Site Plans accompanying the Pit License. The total area which may be extracted below the water table shall not exceed 7.5 ha (18.5 acres) of the license area.

sp 13 - Additional permitted uses: existing Kennel, temporary haul route and landscape berms, extraction is prohibited and temporary means until extraction is complete.

Information as of the Township of Puslinch, Zoning By-Law No. XX/XX, Accessed 2020

Paper Size ANSI B
 0 90 180 270 360
 Meters

Map Projection: Transverse Mercator
 Horizontal Datum: North American 1983 CSRS
 Grid: NAD 1983 CSRS UTM Zone 17N



2374868 ONTARIO INC.
 6678 WELLINGTON ROAD 34, CAMBRIDGE, ONTARIO
 ACOUSTIC ASSESSMENT REPORT

Project No. 11210029
 Revision No. -
 Date Dec 14, 2020

LAND USE ZONING DESIGNATION PLAN **FIGURE A.1**

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 Print date: 14 Dec 2020 - 11:55

Appendix B

Summary of Insignificant Noise Sources

Table B.1

Insignificant Noise Source Summary
2374868 Ontario Inc.
6678 Wellington Road 34, Cambridge, Ontario

Source ID	Source Description	Comments
S3	Screening Operation Stockpiling	Air emission only. Not a source of noise.
NA	Comfort Heating for Onsite Buildings	Source Estimated to be < 20 dBA at worst-case POR

Appendix C

**Noise Specification and Worst-Case
Simultaneous Operations Summary**

Table C.1
Noise Source Sound Level Summary
 2374868 Ontario Inc.
 6678 Wellington Road 34, Cambridge, Ontario

Cadna A ID	Noise Source Description		1/1 Octave Band Data								Unadjusted Total Sound Power Level (dBA)	Tonal Penalty Assessment (dBA)	Height Absolute (m)	Operating Time / # Truck Movements Day (min)	Operating Time / #Truck Movements Evening (min)	Operating Time / #Truck Movements Night (min)	Reference/Comments		
			32	63	125	250	500	1000	2000	4000								8000	
S1	Front End Loader	PWL (dB)	108.0	105.0	108.0	111.0	112.0	108.0	105.0	99.0	87.0	117.4							
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1								
		PWL (dBA)	68.6	78.8	91.9	102.4	108.8	108.0	106.2	100.0	85.9	85.9	113.2	No	0	1.0	60	30	30
S2A	Screening Equipment Motor	PWL (dB)	101.3	109.3	97.0	97.8	101.4	106.1	103.1	96.9	96.9	112.9							
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1								
		PWL (dBA)	61.9	83.1	80.9	89.2	98.2	106.1	104.3	97.9	95.8	95.8	109.3	No	0	1.0	60	0	0
S2B	Screening Operation	PWL (dB)	90.8	99.7	102.0	102.3	101.7	100.9	98.8	95.1	87.7	109.1							
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1								
		PWL (dBA)	51.4	73.5	85.9	93.7	98.5	100.9	100.0	96.1	86.6	86.6	105.6	No	0	3.0	60	0	0
S4	Excavator	PWL (dB)	98.0	95.0	98.0	101.0	102.0	98.0	95.0	89.0	77.0	107.4							
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1								
		PWL (dBA)	58.6	68.8	81.9	92.4	98.8	98.0	96.2	90.0	75.9	75.9	103.2	No	0	3.0	60	30	30
TR1	Truck Route	PWL (dB)	30.6	116.6	111.6	104.6	106.6	103.6	102.6	99.6	90.6	118.6							
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1								
		PWL (dBA)	—	90.4	95.5	96.0	103.4	103.6	103.8	100.6	89.5	89.5	109.5	No	0	2.5	6	2	2
TR2	Capitol Paving Truck Route	PWL (dB)	30.6	116.6	111.6	104.6	106.6	103.6	102.6	99.6	90.6	118.6							
		A-weighted correction	-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1								
		PWL (dBA)	—	90.4	95.5	96.0	103.4	103.6	103.8	100.6	89.5	89.5	109.5	No	0	2.5	5	5	5

Appendix D

CadnaA Sample Calculation for POR1

Line Source, ISO 9613, Name: "Truck Route", ID: "TR1"

Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
244	560343.24	4810833.27	2.50	0	N	A	68.6	19.4	0.0	0.0	0.0	61.2	1.9	0.2	0.0	0.0	0.0	0.0	0.0	24.7
244	560343.24	4810833.27	2.50	0	E	A	68.6	19.4	0.0	0.0	0.0	61.2	1.9	0.2	0.0	0.0	0.0	0.0	0.0	24.7
315	560332.22	4810870.26	2.50	0	D	A	73.3	18.0	0.0	0.0	0.0	62.1	2.1	0.4	0.0	0.0	0.0	0.0	0.0	26.8
315	560332.22	4810870.26	2.50	0	N	A	68.6	18.0	0.0	0.0	0.0	62.1	2.1	0.4	0.0	0.0	0.0	0.0	0.0	22.0
315	560332.22	4810870.26	2.50	0	E	A	68.6	18.0	0.0	0.0	0.0	62.1	2.1	0.4	0.0	0.0	0.0	0.0	0.0	22.0
376	560336.00	4810852.75	2.50	2	D	A	73.3	14.3	0.0	0.0	0.0	66.9	3.1	-2.1	0.0	0.0	4.7	0.0	28.2	-13.2
376	560336.00	4810852.75	2.50	2	N	A	68.6	14.3	0.0	0.0	0.0	66.9	3.1	-2.1	0.0	0.0	4.7	0.0	28.2	-18.0
376	560336.00	4810852.75	2.50	2	E	A	68.6	14.3	0.0	0.0	0.0	66.9	3.1	-2.1	0.0	0.0	4.7	0.0	28.2	-18.0
385	560337.84	4810844.25	2.50	2	D	A	73.3	9.7	0.0	0.0	0.0	66.9	3.1	-2.0	0.0	0.0	4.7	0.0	28.2	-17.9
385	560337.84	4810844.25	2.50	2	N	A	68.6	9.7	0.0	0.0	0.0	66.9	3.1	-2.0	0.0	0.0	4.7	0.0	28.2	-22.7
385	560337.84	4810844.25	2.50	2	E	A	68.6	9.7	0.0	0.0	0.0	66.9	3.1	-2.0	0.0	0.0	4.7	0.0	28.2	-22.7
394	560328.65	4810886.76	2.50	2	D	A	73.3	14.6	0.0	0.0	0.0	66.4	3.0	-2.3	0.0	0.0	4.7	0.0	27.2	-11.1
394	560328.65	4810886.76	2.50	2	N	A	68.6	14.6	0.0	0.0	0.0	66.4	3.0	-2.3	0.0	0.0	4.7	0.0	27.2	-15.9
394	560328.65	4810886.76	2.50	2	E	A	68.6	14.6	0.0	0.0	0.0	66.4	3.0	-2.3	0.0	0.0	4.7	0.0	27.2	-15.9
431	560323.89	4810898.19	2.50	0	D	A	73.3	16.8	0.0	0.0	0.0	62.7	2.2	0.2	0.0	0.0	0.0	0.0	0.0	25.1
431	560323.89	4810898.19	2.50	0	N	A	68.6	16.8	0.0	0.0	0.0	62.7	2.2	0.2	0.0	0.0	0.0	0.0	0.0	20.3
431	560323.89	4810898.19	2.50	0	E	A	68.6	16.8	0.0	0.0	0.0	62.7	2.2	0.2	0.0	0.0	0.0	0.0	0.0	20.3
447	560325.98	4810891.90	2.50	2	D	A	73.3	15.4	0.0	0.0	0.0	66.4	3.0	-2.3	0.0	0.0	4.7	0.0	27.0	-10.0
447	560325.98	4810891.90	2.50	2	N	A	68.6	15.4	0.0	0.0	0.0	66.4	3.0	-2.3	0.0	0.0	4.7	0.0	27.0	-14.8
447	560325.98	4810891.90	2.50	2	E	A	68.6	15.4	0.0	0.0	0.0	66.4	3.0	-2.3	0.0	0.0	4.7	0.0	27.0	-14.8
458	560316.60	4810920.06	2.50	2	D	A	73.3	2.9	0.0	0.0	0.0	65.9	2.9	-2.2	0.0	0.0	4.7	0.0	10.0	-5.1
458	560316.60	4810920.06	2.50	2	N	A	68.6	2.9	0.0	0.0	0.0	65.9	2.9	-2.2	0.0	0.0	4.7	0.0	10.0	-9.8
458	560316.60	4810920.06	2.50	2	E	A	68.6	2.9	0.0	0.0	0.0	65.9	2.9	-2.2	0.0	0.0	4.7	0.0	10.0	-9.8
459	560309.43	4810935.19	2.50	0	D	A	73.3	15.0	0.0	0.0	0.0	63.5	2.4	0.0	0.0	0.0	0.0	0.0	0.0	22.5
459	560309.43	4810935.19	2.50	0	N	A	68.6	15.0	0.0	0.0	0.0	63.5	2.4	0.0	0.0	0.0	0.0	0.0	0.0	17.7
459	560309.43	4810935.19	2.50	0	E	A	68.6	15.0	0.0	0.0	0.0	63.5	2.4	0.0	0.0	0.0	0.0	0.0	0.0	17.7
468	560313.96	4810925.81	2.50	2	D	A	73.3	10.3	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	10.0	2.5
468	560313.96	4810925.81	2.50	2	N	A	68.6	10.3	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	10.0	-2.3
468	560313.96	4810925.81	2.50	2	E	A	68.6	10.3	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	10.0	-2.3
475	560319.72	4810913.38	2.50	0	D	A	73.3	14.4	0.0	0.0	0.0	63.0	2.3	-0.0	0.0	0.0	0.0	0.0	0.0	22.5
475	560319.72	4810913.38	2.50	0	N	A	68.6	14.4	0.0	0.0	0.0	63.0	2.3	-0.0	0.0	0.0	0.0	0.0	0.0	17.7
475	560319.72	4810913.38	2.50	0	E	A	68.6	14.4	0.0	0.0	0.0	63.0	2.3	-0.0	0.0	0.0	0.0	0.0	0.0	17.7
477	560323.16	4810906.07	2.50	2	D	A	73.3	10.6	0.0	0.0	0.0	66.2	2.9	-2.3	0.0	0.0	4.7	0.0	26.6	-14.2
477	560323.16	4810906.07	2.50	2	N	A	68.6	10.6	0.0	0.0	0.0	66.2	2.9	-2.3	0.0	0.0	4.7	0.0	26.6	-19.0
477	560323.16	4810906.07	2.50	2	E	A	68.6	10.6	0.0	0.0	0.0	66.2	2.9	-2.3	0.0	0.0	4.7	0.0	26.6	-19.0
479	560315.38	4810922.61	2.50	2	D	A	73.3	8.6	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	10.0	0.7
479	560315.38	4810922.61	2.50	2	N	A	68.6	8.6	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	10.0	-4.0
479	560315.38	4810922.61	2.50	2	E	A	68.6	8.6	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	10.0	-4.0
481	560308.21	4810937.15	2.50	0	D	A	73.3	14.0	0.0	0.0	0.0	63.5	2.4	0.1	0.0	0.0	0.0	0.0	0.0	21.4
481	560308.21	4810937.15	2.50	0	N	A	68.6	14.0	0.0	0.0	0.0	63.5	2.4	0.1	0.0	0.0	0.0	0.0	0.0	16.6
481	560308.21	4810937.15	2.50	0	E	A	68.6	14.0	0.0	0.0	0.0	63.5	2.4	0.1	0.0	0.0	0.0	0.0	0.0	16.6
484	560312.72	4810928.12	2.50	2	D	A	73.3	7.0	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	9.9	-0.7
484	560312.72	4810928.12	2.50	2	N	A	68.6	7.0	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	9.9	-5.5
484	560312.72	4810928.12	2.50	2	E	A	68.6	7.0	0.0	0.0	0.0	65.8	2.8	-2.2	0.0	0.0	4.7	0.0	9.9	-5.5
495	560304.53	4810961.16	2.50	0	D	A	73.3	13.8	0.0	0.0	0.0	64.0	2.4	-0.3	0.0	0.0	0.0	0.0	0.0	21.0
495	560304.53	4810961.16	2.50	0	N	A	68.6	13.8	0.0	0.0	0.0	64.0	2.4	-0.3	0.0	0.0	0.0	0.0	0.0	16.2
495	560304.53	4810961.16	2.50	0	E	A	68.6	13.8	0.0	0.0	0.0	64.0	2.4	-0.3	0.0	0.0	0.0	0.0	0.0	16.2
497	560301.35	4811002.08	2.50	0	D	A	73.3	13.3	0.0	0.0	0.0	64.7	2.6	-1.1	0.0	0.0	0.0	0.0	0.0	20.4
497	560301.35	4811002.08	2.50	0	N	A	68.6	13.3	0.0	0.0	0.0	64.7	2.6	-1.1	0.0	0.0	0.0	0.0	0.0	15.6
497	560301.35	4811002.08	2.50	0	E	A	68.6	13.3	0.0	0.0	0.0	64.7	2.6	-1.1	0.0	0.0	0.0	0.0	0.0	15.6
499	560300.22	4811011.79	2.50	1	D	A	73.3	2.2	0.0	0.0	0.0	65.3	2.7	-2.1	0.0	0.0	4.7	0.0	8.7	-3.8
499	560300.22	4811011.79	2.50	1	N	A	68.6	2.2	0.0	0.0	0.0	65.3	2.7	-2.1	0.0	0.0	4.7	0.0	8.7	-8.6
499	560300.22	4811011.79	2.50	1	E	A	68.6	2.2	0.0	0.0	0.0	65.3	2.7	-2.1	0.0	0.0	4.7	0.0	8.7	-8.6
501	560304.29	4810969.25	2.50	0	D	A	73.3	12.1	0.0	0.0	0.0	64.1	2.5	-0.5	0.0	0.0	0.0	0.0	0.0	19.3
501	560304.29	4810969.25	2.50	0	N	A	68.6	12.1	0.0	0.0	0.0	64.1	2.5	-0.5	0.0	0.0	0.0	0.0	0.0	14.5
501	560304.29	4810969.25	2.50	0	E	A	68.6	12.1	0.0	0.0	0.0	64.1	2.5	-0.5	0.0	0.0	0.0	0.0	0.0	14.5
502	560303.31	4810954.79	2.50	0	D	A	73.3	11.1	0.0	0.0	0.0	63.8	2.4	-0.1	0.0	0.0	0.0	0.0	0.0	18.3
502	560303.31	4810954.79	2.50	0	N	A	68.6	11.1	0.0	0.0	0.0	63.8	2.4	-0.1	0.0	0.0	0.0	0.0	0.0	13.5
502	560303.31	4810954.79	2.50	0	E	A	68.6	11.1	0.0	0.0	0.0	63.8	2.4	-0.1	0.0	0.0	0.0	0.0	0.0	13.5
503	560303.55	4810984.44	2.50	0	D	A	73.3	11.6	0.0	0.0	0.0	64.4	2.5	-0.8	0.0	0.0	0.0	0.0	0.0	18.7
503	560303.55	4810984.44	2.50	0	N	A	68.6	11.6	0.0	0.0	0.0	64.4	2.5	-0.8	0.0	0.0	0.0	0.0	0.0	14.0
503	560303.55	4810984.44	2.50	0	E	A	68.6	11.6	0.0	0.0	0.0	64.4	2.5	-0.8	0.0	0.0	0.0	0.0	0.0	14.0
504	560355.74	4811001.59	2.50	0	D	A	73.3	11.5	0.0	0.0	0.0	64.8	2.6	-1.8	0.0	0.0	4.7	0.0	0.0	14.5
504	560355.74	4811001.59	2.50	0	N	A	68.6	11.5	0.0	0.0	0.0	64.8	2.6	-1.8	0.0	0.0	4.7	0.0	0.0	9.7
504	560355.74	4811001.59	2.50	0	E	A	68.6	11.5	0.0	0.0	0.0	64.8	2.6	-1.8	0.0	0.0	4.7	0.0	0.0	9.7
505	560312.74	4810976.98	2.50	0	D	A	73.3	9.3	0.0	0.0</										

Line Source, ISO 9613, Name: "Truck Route", ID: "TR1"

Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	dB(A)						
505	560312.74	4810976.98	2.50	0	E	A	68.6	9.3	0.0	0.0	0.0	64.3	2.5	-1.0	0.0	0.0	3.6	0.0	0.0	8.5
506	560308.61	4810974.30	2.50	0	D	A	73.3	1.3	0.0	0.0	0.0	64.2	2.5	-0.8	0.0	0.0	0.0	0.0	0.0	8.7
506	560308.61	4810974.30	2.50	0	N	A	68.6	1.3	0.0	0.0	0.0	64.2	2.5	-0.8	0.0	0.0	0.0	0.0	0.0	4.0
506	560308.61	4810974.30	2.50	0	E	A	68.6	1.3	0.0	0.0	0.0	64.2	2.5	-0.8	0.0	0.0	0.0	0.0	0.0	4.0
507	560307.27	4810973.42	2.50	0	D	A	73.3	2.7	0.0	0.0	0.0	64.2	2.5	-0.7	0.0	0.0	0.0	0.0	0.0	10.0
507	560307.27	4810973.42	2.50	0	N	A	68.6	2.7	0.0	0.0	0.0	64.2	2.5	-0.7	0.0	0.0	0.0	0.0	0.0	5.2
507	560307.27	4810973.42	2.50	0	E	A	68.6	2.7	0.0	0.0	0.0	64.2	2.5	-0.7	0.0	0.0	0.0	0.0	0.0	5.2
516	560315.85	4810979.00	2.50	2	D	A	73.3	0.2	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.7	0.0	9.6	-6.3
516	560315.85	4810979.00	2.50	2	N	A	68.6	0.2	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.7	0.0	9.6	-11.1
516	560315.85	4810979.00	2.50	2	E	A	68.6	0.2	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.7	0.0	9.6	-11.1
524	560319.48	4811027.31	2.50	0	D	A	73.3	11.5	0.0	0.0	0.0	65.2	2.7	-1.6	0.0	0.0	12.2	0.0	0.0	6.4
524	560319.48	4811027.31	2.50	0	N	A	68.6	11.5	0.0	0.0	0.0	65.2	2.7	-1.6	0.0	0.0	12.2	0.0	0.0	1.7
524	560319.48	4811027.31	2.50	0	E	A	68.6	11.5	0.0	0.0	0.0	65.2	2.7	-1.6	0.0	0.0	12.2	0.0	0.0	1.7
538	560333.69	4811027.07	2.50	0	D	A	73.3	11.5	0.0	0.0	0.0	65.2	2.7	-1.7	0.0	0.0	14.8	0.0	0.0	4.0
538	560333.69	4811027.07	2.50	0	N	A	68.6	11.5	0.0	0.0	0.0	65.2	2.7	-1.7	0.0	0.0	14.8	0.0	0.0	-0.8
538	560333.69	4811027.07	2.50	0	E	A	68.6	11.5	0.0	0.0	0.0	65.2	2.7	-1.7	0.0	0.0	14.8	0.0	0.0	-0.8
540	560321.44	4810981.50	2.50	0	D	A	73.3	10.5	0.0	0.0	0.0	64.4	2.5	-1.4	0.0	0.0	4.7	0.0	0.0	13.7
540	560321.44	4810981.50	2.50	0	N	A	68.6	10.5	0.0	0.0	0.0	64.4	2.5	-1.4	0.0	0.0	4.7	0.0	0.0	8.9
540	560321.44	4810981.50	2.50	0	E	A	68.6	10.5	0.0	0.0	0.0	64.4	2.5	-1.4	0.0	0.0	4.7	0.0	0.0	8.9
542	560323.13	4810982.22	2.50	1	D	A	73.3	8.8	0.0	0.0	0.0	64.6	2.6	-1.5	0.0	0.0	4.7	0.0	1.4	10.3
542	560323.13	4810982.22	2.50	1	N	A	68.6	8.8	0.0	0.0	0.0	64.6	2.6	-1.5	0.0	0.0	4.7	0.0	1.4	5.5
542	560323.13	4810982.22	2.50	1	E	A	68.6	8.8	0.0	0.0	0.0	64.6	2.6	-1.5	0.0	0.0	4.7	0.0	1.4	5.5
547	560320.43	4810981.06	2.50	1	D	A	73.3	9.5	0.0	0.0	0.0	64.6	2.6	-1.9	0.0	0.0	4.7	0.0	8.5	4.3
547	560320.43	4810981.06	2.50	1	N	A	68.6	9.5	0.0	0.0	0.0	64.6	2.6	-1.9	0.0	0.0	4.7	0.0	8.5	-0.4
547	560320.43	4810981.06	2.50	1	E	A	68.6	9.5	0.0	0.0	0.0	64.6	2.6	-1.9	0.0	0.0	4.7	0.0	8.5	-0.4
549	560318.70	4810980.32	2.50	2	D	A	73.3	7.2	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.7	0.0	9.6	0.6
549	560318.70	4810980.32	2.50	2	N	A	68.6	7.2	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.7	0.0	9.6	-4.1
549	560318.70	4810980.32	2.50	2	E	A	68.6	7.2	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.7	0.0	9.6	-4.1
551	560345.38	4811022.62	2.50	0	D	A	73.3	10.7	0.0	0.0	0.0	65.2	2.7	-1.8	0.0	0.0	11.7	0.0	0.0	6.3
551	560345.38	4811022.62	2.50	0	N	A	68.6	10.7	0.0	0.0	0.0	65.2	2.7	-1.8	0.0	0.0	11.7	0.0	0.0	1.6
551	560345.38	4811022.62	2.50	0	E	A	68.6	10.7	0.0	0.0	0.0	65.2	2.7	-1.8	0.0	0.0	11.7	0.0	0.0	1.6
562	560350.53	4811018.45	2.50	0	D	A	73.3	1.6	0.0	0.0	0.0	65.1	2.7	-1.8	0.0	0.0	4.7	0.0	0.0	4.2
562	560350.53	4811018.45	2.50	0	N	A	68.6	1.6	0.0	0.0	0.0	65.1	2.7	-1.8	0.0	0.0	4.7	0.0	0.0	-0.6
562	560350.53	4811018.45	2.50	0	E	A	68.6	1.6	0.0	0.0	0.0	65.1	2.7	-1.8	0.0	0.0	4.7	0.0	0.0	-0.6
564	560306.58	4811023.40	2.50	0	D	A	73.3	10.6	0.0	0.0	0.0	65.1	2.7	-1.5	0.0	0.0	0.0	0.0	0.0	17.7
564	560306.58	4811023.40	2.50	0	N	A	68.6	10.6	0.0	0.0	0.0	65.1	2.7	-1.5	0.0	0.0	0.0	0.0	0.0	12.9
564	560306.58	4811023.40	2.50	0	E	A	68.6	10.6	0.0	0.0	0.0	65.1	2.7	-1.5	0.0	0.0	0.0	0.0	0.0	12.9
566	560311.97	4811026.58	2.50	0	D	A	73.3	-0.3	0.0	0.0	0.0	65.2	2.7	-1.5	0.0	0.0	4.1	0.0	0.0	2.6
566	560311.97	4811026.58	2.50	0	N	A	68.6	-0.3	0.0	0.0	0.0	65.2	2.7	-1.5	0.0	0.0	4.1	0.0	0.0	-2.2
566	560311.97	4811026.58	2.50	0	E	A	68.6	-0.3	0.0	0.0	0.0	65.2	2.7	-1.5	0.0	0.0	4.1	0.0	0.0	-2.2
584	560303.69	4811021.69	2.50	1	D	A	73.3	6.9	0.0	0.0	0.0	65.1	2.7	-1.6	0.0	0.0	4.7	0.0	1.7	7.6
584	560303.69	4811021.69	2.50	1	N	A	68.6	6.9	0.0	0.0	0.0	65.1	2.7	-1.6	0.0	0.0	4.7	0.0	1.7	2.8
584	560303.69	4811021.69	2.50	1	E	A	68.6	6.9	0.0	0.0	0.0	65.1	2.7	-1.6	0.0	0.0	4.7	0.0	1.7	2.8
592	560306.32	4811023.24	2.50	1	D	A	73.3	0.8	0.0	0.0	0.0	65.1	2.7	-1.5	0.0	0.0	0.0	0.0	1.4	6.5
592	560306.32	4811023.24	2.50	1	N	A	68.6	0.8	0.0	0.0	0.0	65.1	2.7	-1.5	0.0	0.0	0.0	0.0	1.4	1.8
592	560306.32	4811023.24	2.50	1	E	A	68.6	0.8	0.0	0.0	0.0	65.1	2.7	-1.5	0.0	0.0	0.0	0.0	1.4	1.8
595	560303.46	4811021.56	2.50	1	D	A	73.3	6.4	0.0	0.0	0.0	65.4	2.7	-2.1	0.0	0.0	8.8	0.0	12.9	-8.1
595	560303.46	4811021.56	2.50	1	N	A	68.6	6.4	0.0	0.0	0.0	65.4	2.7	-2.1	0.0	0.0	8.8	0.0	12.9	-12.8
595	560303.46	4811021.56	2.50	1	E	A	68.6	6.4	0.0	0.0	0.0	65.4	2.7	-2.1	0.0	0.0	8.8	0.0	12.9	-12.8
597	560351.08	4810991.30	2.50	0	D	A	73.3	10.4	0.0	0.0	0.0	64.6	2.6	-1.7	0.0	0.0	4.7	0.0	0.0	13.5
597	560351.08	4810991.30	2.50	0	N	A	68.6	10.4	0.0	0.0	0.0	64.6	2.6	-1.7	0.0	0.0	4.7	0.0	0.0	8.7
597	560351.08	4810991.30	2.50	0	E	A	68.6	10.4	0.0	0.0	0.0	64.6	2.6	-1.7	0.0	0.0	4.7	0.0	0.0	8.7
599	560347.68	4810988.84	2.50	1	D	A	73.3	4.0	0.0	0.0	0.0	64.7	2.6	-1.7	0.0	0.0	4.7	0.0	1.2	5.8
599	560347.68	4810988.84	2.50	1	N	A	68.6	4.0	0.0	0.0	0.0	64.7	2.6	-1.7	0.0	0.0	4.7	0.0	1.2	1.0
599	560347.68	4810988.84	2.50	1	E	A	68.6	4.0	0.0	0.0	0.0	64.7	2.6	-1.7	0.0	0.0	4.7	0.0	1.2	1.0
601	560331.48	4810985.17	2.50	0	D	A	73.3	10.1	0.0	0.0	0.0	64.5	2.5	-1.5	0.0	0.0	4.7	0.0	0.0	13.3
601	560331.48	4810985.17	2.50	0	N	A	68.6	10.1	0.0	0.0	0.0	64.5	2.5	-1.5	0.0	0.0	4.7	0.0	0.0	8.5
601	560331.48	4810985.17	2.50	0	E	A	68.6	10.1	0.0	0.0	0.0	64.5	2.5	-1.5	0.0	0.0	4.7	0.0	0.0	8.5
603	560331.48	4810985.17	2.50	1	D	A	73.3	10.1	0.0	0.0	0.0	64.7	2.6	-1.6	0.0	0.0	4.7	0.0	1.2	11.9
603	560331.48	4810985.17	2.50	1	N	A	68.6	10.1	0.0	0.0	0.0	64.7	2.6	-1.6	0.0	0.0	4.7	0.0	1.2	7.1
603	560331.48	4810985.17	2.50	1	E	A	68.6	10.1	0.0	0.0	0.0	64.7	2.6	-1.6	0.0	0.0	4.7	0.0	1.2	7.1
605	560333.19	4810985.68	2.50	1	D	A	73.3	8.2	0.0	0.0	0.0	64.7	2.6	-1.9	0.0	0.0	5.0	0.0	4.2	7.0
605	560333.19	4810985.68	2.50	1	N	A	68.6	8.2	0.0	0.0	0.0	64.7	2.6	-1.9	0.0	0.0	5.0	0.0	4.2	2.3
605	560333.19	4810985.68	2.50	1	E	A	68.6	8.2	0.0	0.0	0.0	64.7	2.6	-1.9	0.0	0.0	5.0	0.0	4.2	2.3
608	560331.60	4810985.21	2.50	2	D	A	73.3	10.0	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.8	0.0	9.7	3.2
608	560331.60	4810985.21	2.50	2	N	A	68.6	10.0	0.0	0.0	0.0	64.9	2.6	-2.0	0.0	0.0	4.8	0.0	9.	

Line Source, ISO 9613, Name: "Truck Route", ID: "TR1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	dB(A)						
610	560341.53	4810987.38	2.50	0	D	A	73.3	10.2	0.0	0.0	0.0	64.5	2.6	-1.6	0.0	0.0	4.7	0.0	0.0	13.3
610	560341.53	4810987.38	2.50	0	N	A	68.6	10.2	0.0	0.0	0.0	64.5	2.6	-1.6	0.0	0.0	4.7	0.0	0.0	8.6
610	560341.53	4810987.38	2.50	0	E	A	68.6	10.2	0.0	0.0	0.0	64.5	2.6	-1.6	0.0	0.0	4.7	0.0	0.0	8.6
612	560341.53	4810987.38	2.50	1	D	A	73.3	10.2	0.0	0.0	0.0	64.7	2.6	-1.7	0.0	0.0	4.7	0.0	1.2	12.0
612	560341.53	4810987.38	2.50	1	N	A	68.6	10.2	0.0	0.0	0.0	64.7	2.6	-1.7	0.0	0.0	4.7	0.0	1.2	7.2
612	560341.53	4810987.38	2.50	1	E	A	68.6	10.2	0.0	0.0	0.0	64.7	2.6	-1.7	0.0	0.0	4.7	0.0	1.2	7.2
614	560338.82	4810986.99	2.50	1	D	A	73.3	6.9	0.0	0.0	0.0	64.6	2.6	-1.8	0.0	0.0	4.7	0.0	4.1	6.1
614	560338.82	4810986.99	2.50	1	N	A	68.6	6.9	0.0	0.0	0.0	64.6	2.6	-1.8	0.0	0.0	4.7	0.0	4.1	1.3
614	560338.82	4810986.99	2.50	1	E	A	68.6	6.9	0.0	0.0	0.0	64.6	2.6	-1.8	0.0	0.0	4.7	0.0	4.1	1.3
616	560337.50	4810986.80	2.50	2	D	A	73.3	3.5	0.0	0.0	0.0	64.8	2.6	-1.9	0.0	0.0	4.7	0.0	5.1	1.5
616	560337.50	4810986.80	2.50	2	N	A	68.6	3.5	0.0	0.0	0.0	64.8	2.6	-1.9	0.0	0.0	4.7	0.0	5.1	-3.2
616	560337.50	4810986.80	2.50	2	E	A	68.6	3.5	0.0	0.0	0.0	64.8	2.6	-1.9	0.0	0.0	4.7	0.0	5.1	-3.2
618	560353.53	4811013.35	2.50	0	D	A	73.3	10.2	0.0	0.0	0.0	65.0	2.7	-1.8	0.0	0.0	4.7	0.0	0.0	13.0
618	560353.53	4811013.35	2.50	0	N	A	68.6	10.2	0.0	0.0	0.0	65.0	2.7	-1.8	0.0	0.0	4.7	0.0	0.0	8.2
618	560353.53	4811013.35	2.50	0	E	A	68.6	10.2	0.0	0.0	0.0	65.0	2.7	-1.8	0.0	0.0	4.7	0.0	0.0	8.2
620	560300.86	4811016.53	2.50	0	D	A	73.3	9.0	0.0	0.0	0.0	65.0	2.7	-1.1	0.0	0.0	0.0	0.0	0.0	15.9
620	560300.86	4811016.53	2.50	0	N	A	68.6	9.0	0.0	0.0	0.0	65.0	2.7	-1.1	0.0	0.0	0.0	0.0	0.0	11.1
620	560300.86	4811016.53	2.50	0	E	A	68.6	9.0	0.0	0.0	0.0	65.0	2.7	-1.1	0.0	0.0	0.0	0.0	0.0	11.1
622	560301.35	4811019.15	2.50	1	D	A	73.3	4.2	0.0	0.0	0.0	65.1	2.7	-1.6	0.0	0.0	4.7	0.0	4.1	2.5
622	560301.35	4811019.15	2.50	1	N	A	68.6	4.2	0.0	0.0	0.0	65.1	2.7	-1.6	0.0	0.0	4.7	0.0	4.1	-2.2
622	560301.35	4811019.15	2.50	1	E	A	68.6	4.2	0.0	0.0	0.0	65.1	2.7	-1.6	0.0	0.0	4.7	0.0	4.1	-2.2
624	560300.63	4811015.33	2.50	1	D	A	73.3	7.4	0.0	0.0	0.0	65.3	2.7	-2.1	0.0	0.0	4.7	0.0	8.8	1.4
624	560300.63	4811015.33	2.50	1	N	A	68.6	7.4	0.0	0.0	0.0	65.3	2.7	-2.1	0.0	0.0	4.7	0.0	8.8	-3.4
624	560300.63	4811015.33	2.50	1	E	A	68.6	7.4	0.0	0.0	0.0	65.3	2.7	-2.1	0.0	0.0	4.7	0.0	8.8	-3.4
626	560301.37	4811019.25	2.50	1	D	A	73.3	3.9	0.0	0.0	0.0	65.4	2.7	-2.1	0.0	0.0	6.4	0.0	11.7	-6.8
626	560301.37	4811019.25	2.50	1	N	A	68.6	3.9	0.0	0.0	0.0	65.4	2.7	-2.1	0.0	0.0	6.4	0.0	11.7	-11.6
626	560301.37	4811019.25	2.50	1	E	A	68.6	3.9	0.0	0.0	0.0	65.4	2.7	-2.1	0.0	0.0	6.4	0.0	11.7	-11.6

Point Source, ISO 9613, Name: "Screening Operation", ID: "S2B"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	dB(A)						
124	560381.18	4810984.87	3.00	0	D	A	105.6	0.0	0.0	0.0	0.0	64.6	2.6	-1.9	0.0	0.0	8.2	0.0	0.0	32.1
124	560381.18	4810984.87	3.00	0	N	A	105.6	0.0	-188.0	0.0	0.0	64.6	2.6	-1.9	0.0	0.0	8.2	0.0	0.0	-155.9
124	560381.18	4810984.87	3.00	0	E	A	105.6	0.0	-188.0	0.0	0.0	64.6	2.6	-1.9	0.0	0.0	8.2	0.0	0.0	-155.9

Line Source, ISO 9613, Name: "Front End Loader", ID: "S1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	dB(A)						
138	560299.58	4811060.75	2.50	0	D	A	82.0	14.6	0.0	0.0	0.0	65.7	2.1	-1.2	0.0	0.0	0.0	0.0	0.0	29.9
138	560299.58	4811060.75	2.50	0	N	A	77.2	14.6	0.0	0.0	0.0	65.7	2.1	-1.2	0.0	0.0	0.0	0.0	0.0	25.1
138	560299.58	4811060.75	2.50	0	E	A	77.2	14.6	0.0	0.0	0.0	65.7	2.1	-1.2	0.0	0.0	0.0	0.0	0.0	25.1
140	560314.43	4811059.38	2.50	0	D	A	82.0	1.1	0.0	0.0	0.0	65.7	2.1	-1.7	0.0	0.0	2.2	0.0	0.0	14.8
140	560314.43	4811059.38	2.50	0	N	A	77.2	1.1	0.0	0.0	0.0	65.7	2.1	-1.7	0.0	0.0	2.2	0.0	0.0	10.0
140	560314.43	4811059.38	2.50	0	E	A	77.2	1.1	0.0	0.0	0.0	65.7	2.1	-1.7	0.0	0.0	2.2	0.0	0.0	10.0
148	560333.43	4811057.63	2.50	0	D	A	82.0	15.7	0.0	0.0	0.0	65.7	2.1	-1.9	0.0	0.0	6.0	0.0	0.0	25.7
148	560333.43	4811057.63	2.50	0	N	A	77.2	15.7	0.0	0.0	0.0	65.7	2.1	-1.9	0.0	0.0	6.0	0.0	0.0	20.9
148	560333.43	4811057.63	2.50	0	E	A	77.2	15.7	0.0	0.0	0.0	65.7	2.1	-1.9	0.0	0.0	6.0	0.0	0.0	20.9
150	560286.14	4811061.99	2.50	1	D	A	82.0	1.8	0.0	0.0	0.0	65.8	2.1	-1.7	0.0	0.0	4.8	0.0	11.0	1.8
150	560286.14	4811061.99	2.50	1	N	A	77.2	1.8	0.0	0.0	0.0	65.8	2.1	-1.7	0.0	0.0	4.8	0.0	11.0	-3.0
150	560286.14	4811061.99	2.50	1	E	A	77.2	1.8	0.0	0.0	0.0	65.8	2.1	-1.7	0.0	0.0	4.8	0.0	11.0	-3.0
159	560287.66	4811061.85	2.50	1	D	A	82.0	1.8	0.0	0.0	0.0	65.8	2.1	-1.7	0.0	0.0	0.0	0.0	4.7	12.8
159	560287.66	4811061.85	2.50	1	N	A	77.2	1.8	0.0	0.0	0.0	65.8	2.1	-1.7	0.0	0.0	0.0	0.0	4.7	8.0
159	560287.66	4811061.85	2.50	1	E	A	77.2	1.8	0.0	0.0	0.0	65.8	2.1	-1.7	0.0	0.0	0.0	0.0	4.7	8.0
162	560285.88	4811062.02	2.50	1	D	A	82.0	0.0	0.0	0.0	0.0	66.1	2.2	-2.2	0.0	0.0	4.9	0.0	31.2	-20.2
162	560285.88	4811062.02	2.50	1	N	A	77.2	0.0	0.0	0.0	0.0	66.1	2.2	-2.2	0.0	0.0	4.9	0.0	31.2	-25.0
162	560285.88	4811062.02	2.50	1	E	A	77.2	0.0	0.0	0.0	0.0	66.1	2.2	-2.2	0.0	0.0	4.9	0.0	31.2	-25.0
215	560366.20	4810998.53	2.50	0	D	A	82.0	10.0	0.0	0.0	0.0	64.8	1.9	-1.9	0.0	0.0	6.1	0.0	0.0	21.0
215	560366.20	4810998.53	2.50	0	N	A	77.2	10.0	0.0	0.0	0.0	64.8	1.9	-1.9	0.0	0.0	6.1	0.0	0.0	16.2
215	560366.20	4810998.53	2.50	0	E	A	77.2	10.0	0.0	0.0	0.0	64.8	1.9	-1.9	0.0	0.0	6.1	0.0	0.0	16.2
218	560352.23	4810988.00	2.50	0	D	A	82.0	14.0	0.0	0.0	0.0	64.6	1.9	-1.7	0.0	0.0	4.8	0.0	0.0	26.4
218	560352.23	4810988.00	2.50	0	N	A	77.2	14.0	0.0	0.0	0.0	64.6	1.9	-1.7	0.0	0.0	4.8	0.0	0.0	21.6
218	560352.23	4810988.00	2.50	0	E	A	77.2	14.0	0.0	0.0	0.0	64.6	1.9	-1.7	0.0	0.0	4.8	0.0	0.0	21.6
220	560346.32	4810983.54	2.50	1	D	A	82.0	10.1	0.0	0.0	0.0	64.8	2.0	-1.7	0.0	0.0	4.8	0.0	1.0	21.2
220	560346.32	4810983.54	2.50	1	N	A	77.2	10.1	0.0	0.0	0.0	64.8	2.0	-1.7	0.0	0.0	4.8	0.0	1.0	16.5
220	560346.32	4810983.54	2.50	1	E	A	77.2	10.1	0.0	0.0	0.0	64.8	2.0	-1.7	0.0	0.0	4.8	0.0	1.0	16.5
227	560367.75	4810999.70	2.50	2	D	A	82.0	7.8	0.0	0.0	0.0	66.0	2.2	-2.0	0.0	0.0	4.8	0.0	12.1	6.8
227	560367.75	4810999.70	2.50	2	N	A	77.2	7.8	0.0	0.0	0.0	66.0	2.2	-2.0	0.0	0.0	4.8	0.0	12.1	2.0
227	560367.75	4810999.70	2.50	2	E	A	77.2	7.8	0.0	0.0	0.0	66.0	2.2	-2.0	0.0	0.0	4.8	0.0	12.1	2.0

Line Source, ISO 9613, Name: "Front End Loader", ID: "S1"																				
Nr.	X	Y	Z	Ref.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	dB(A)						
237	560369.26	4811000.84	2.50	2	D	A	82.0	3.6	0.0	0.0	0.0	66.9	2.4	-2.1	0.0	0.0	5.3	0.0	35.1	-22.0
237	560369.26	4811000.84	2.50	2	N	A	77.2	3.6	0.0	0.0	0.0	66.9	2.4	-2.1	0.0	0.0	5.3	0.0	35.1	-26.7
237	560369.26	4811000.84	2.50	2	E	A	77.2	3.6	0.0	0.0	0.0	66.9	2.4	-2.1	0.0	0.0	5.3	0.0	35.1	-26.7
241	560343.08	4810981.09	2.50	1	D	A	82.0	3.2	0.0	0.0	0.0	64.5	1.9	-1.8	0.0	0.0	4.8	0.0	4.6	11.3
241	560343.08	4810981.09	2.50	1	N	A	77.2	3.2	0.0	0.0	0.0	64.5	1.9	-1.8	0.0	0.0	4.8	0.0	4.6	6.5
241	560343.08	4810981.09	2.50	1	E	A	77.2	3.2	0.0	0.0	0.0	64.5	1.9	-1.8	0.0	0.0	4.8	0.0	4.6	6.5
246	560353.42	4811054.97	2.50	0	D	A	82.0	5.8	0.0	0.0	0.0	65.7	2.1	-2.0	0.0	0.0	5.0	0.0	0.0	16.9
246	560353.42	4811054.97	2.50	0	N	A	77.2	5.8	0.0	0.0	0.0	65.7	2.1	-2.0	0.0	0.0	5.0	0.0	0.0	12.2
246	560353.42	4811054.97	2.50	0	E	A	77.2	5.8	0.0	0.0	0.0	65.7	2.1	-2.0	0.0	0.0	5.0	0.0	0.0	12.2
248	560362.99	4811049.28	2.50	0	D	A	82.0	12.7	0.0	0.0	0.0	65.6	2.1	-2.0	0.0	0.0	4.8	0.0	0.0	24.1
248	560362.99	4811049.28	2.50	0	N	A	77.2	12.7	0.0	0.0	0.0	65.6	2.1	-2.0	0.0	0.0	4.8	0.0	0.0	19.4
248	560362.99	4811049.28	2.50	0	E	A	77.2	12.7	0.0	0.0	0.0	65.6	2.1	-2.0	0.0	0.0	4.8	0.0	0.0	19.4
258	560378.88	4811039.83	2.50	0	D	A	82.0	12.7	0.0	0.0	0.0	65.5	2.1	-2.1	0.0	0.0	4.8	0.0	0.0	24.4
258	560378.88	4811039.83	2.50	0	N	A	77.2	12.7	0.0	0.0	0.0	65.5	2.1	-2.1	0.0	0.0	4.8	0.0	0.0	19.6
258	560378.88	4811039.83	2.50	0	E	A	77.2	12.7	0.0	0.0	0.0	65.5	2.1	-2.1	0.0	0.0	4.8	0.0	0.0	19.6
267	560381.36	4811038.36	2.50	2	D	A	82.0	11.0	0.0	0.0	0.0	66.6	2.3	-2.2	0.0	0.0	4.8	0.0	12.3	9.1
267	560381.36	4811038.36	2.50	2	N	A	77.2	11.0	0.0	0.0	0.0	66.6	2.3	-2.2	0.0	0.0	4.8	0.0	12.3	4.4
267	560381.36	4811038.36	2.50	2	E	A	77.2	11.0	0.0	0.0	0.0	66.6	2.3	-2.2	0.0	0.0	4.8	0.0	12.3	4.4
282	560380.58	4811038.83	2.50	2	D	A	82.0	9.4	0.0	0.0	0.0	67.4	2.5	-2.3	0.0	0.0	4.8	0.0	34.3	-15.4
282	560380.58	4811038.83	2.50	2	N	A	77.2	9.4	0.0	0.0	0.0	67.4	2.5	-2.3	0.0	0.0	4.8	0.0	34.3	-20.2
282	560380.58	4811038.83	2.50	2	E	A	77.2	9.4	0.0	0.0	0.0	67.4	2.5	-2.3	0.0	0.0	4.8	0.0	34.3	-20.2
284	560380.22	4811009.25	2.50	0	D	A	82.0	14.0	0.0	0.0	0.0	65.0	2.0	-2.1	0.0	0.0	5.6	0.0	0.0	25.5
284	560380.22	4811009.25	2.50	0	N	A	77.2	14.0	0.0	0.0	0.0	65.0	2.0	-2.1	0.0	0.0	5.6	0.0	0.0	20.7
284	560380.22	4811009.25	2.50	0	E	A	77.2	14.0	0.0	0.0	0.0	65.0	2.0	-2.1	0.0	0.0	5.6	0.0	0.0	20.7
293	560374.98	4811005.22	2.50	2	D	A	82.0	10.8	0.0	0.0	0.0	66.1	2.2	-2.1	0.0	0.0	4.8	0.0	12.1	9.7
293	560374.98	4811005.22	2.50	2	N	A	77.2	10.8	0.0	0.0	0.0	66.1	2.2	-2.1	0.0	0.0	4.8	0.0	12.1	4.9
293	560374.98	4811005.22	2.50	2	E	A	77.2	10.8	0.0	0.0	0.0	66.1	2.2	-2.1	0.0	0.0	4.8	0.0	12.1	4.9
312	560374.00	4811004.47	2.50	2	D	A	82.0	9.8	0.0	0.0	0.0	67.0	2.4	-2.2	0.0	0.0	5.2	0.0	34.8	-15.3
312	560374.00	4811004.47	2.50	2	N	A	77.2	9.8	0.0	0.0	0.0	67.0	2.4	-2.2	0.0	0.0	5.2	0.0	34.8	-20.1
312	560374.00	4811004.47	2.50	2	E	A	77.2	9.8	0.0	0.0	0.0	67.0	2.4	-2.2	0.0	0.0	5.2	0.0	34.8	-20.1
397	560388.56	4811026.04	2.50	0	D	A	82.0	12.7	0.0	0.0	0.0	65.3	2.0	-2.2	0.0	0.0	5.0	0.0	0.0	24.5
397	560388.56	4811026.04	2.50	0	N	A	77.2	12.7	0.0	0.0	0.0	65.3	2.0	-2.2	0.0	0.0	5.0	0.0	0.0	19.7
397	560388.56	4811026.04	2.50	0	E	A	77.2	12.7	0.0	0.0	0.0	65.3	2.0	-2.2	0.0	0.0	5.0	0.0	0.0	19.7
405	560336.60	4810977.39	2.50	0	D	A	82.0	11.1	0.0	0.0	0.0	64.3	1.9	-1.5	0.0	0.0	4.8	0.0	0.0	23.6
405	560336.60	4810977.39	2.50	0	N	A	77.2	11.1	0.0	0.0	0.0	64.3	1.9	-1.5	0.0	0.0	4.8	0.0	0.0	18.9
405	560336.60	4810977.39	2.50	0	E	A	77.2	11.1	0.0	0.0	0.0	64.3	1.9	-1.5	0.0	0.0	4.8	0.0	0.0	18.9
408	560336.60	4810977.39	2.50	1	D	A	82.0	11.1	0.0	0.0	0.0	64.8	2.0	-1.6	0.0	0.0	4.8	0.0	1.4	21.7
408	560336.60	4810977.39	2.50	1	N	A	77.2	11.1	0.0	0.0	0.0	64.8	2.0	-1.6	0.0	0.0	4.8	0.0	1.4	16.9
408	560336.60	4810977.39	2.50	1	E	A	77.2	11.1	0.0	0.0	0.0	64.8	2.0	-1.6	0.0	0.0	4.8	0.0	1.4	16.9
413	560338.27	4810978.30	2.50	1	D	A	82.0	9.6	0.0	0.0	0.0	64.5	1.9	-1.9	0.0	0.0	5.2	0.0	4.9	16.9
413	560338.27	4810978.30	2.50	1	N	A	77.2	9.6	0.0	0.0	0.0	64.5	1.9	-1.9	0.0	0.0	5.2	0.0	4.9	12.1
413	560338.27	4810978.30	2.50	1	E	A	77.2	9.6	0.0	0.0	0.0	64.5	1.9	-1.9	0.0	0.0	5.2	0.0	4.9	12.1
420	560334.52	4810976.26	2.50	2	D	A	82.0	9.1	0.0	0.0	0.0	65.0	2.0	-2.0	0.0	0.0	4.8	0.0	11.7	9.6
420	560334.52	4810976.26	2.50	2	N	A	77.2	9.1	0.0	0.0	0.0	65.0	2.0	-2.0	0.0	0.0	4.8	0.0	11.7	4.8
420	560334.52	4810976.26	2.50	2	E	A	77.2	9.1	0.0	0.0	0.0	65.0	2.0	-2.0	0.0	0.0	4.8	0.0	11.7	4.8

Appendix E

Manufacturer Sound Level Specifications

973D

Track Loader

GHD:Source S01

CATERPILLAR[®]



Engine

Engine Model	Cat [®] C9 ACERT [™]	
Net Power – SAE J1349	196 kW	263 hp

Weights

Operating Weight	28 058 kg	61,857 lb
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- Operating Weight: Includes coolant, lubricants, 100% fuel tank, General Purpose Bucket with long bolt-on teeth and segments and 75 kg/165 lb operator.

Buckets

Capacity – General Purpose	3.21 m ³	4.2 yd ³
Capacity – Multi-Purpose	3.05 m ³	3.92 yd ³

- Bucket capacities are with long bolt-on teeth and segments.

Ripper Specifications

Type	Parallelogram	
Number of pockets	3	
Overall Width/Beam	2200 mm	86.6 in
Shank cross section	74 × 175 mm 2.9 × 6.9 in	
Ground Clearance	888 mm	34.96 in
Penetration	397 mm	15.6 in
Ripping Width	1840 mm	72.4 in
Penetration Force at ground level	100 kN	22,500 lb
Cylinders – Bore	130 mm	5.1 in
Cylinders – Stroke	236 mm	9.3 in
Addition to Machine Length due to Ripper (in Transportation Position)	586 mm	23.1 in
Ramp Angle	28.5 Degrees	
Ripper weight (with 3 shanks)	1700 kg	3,747.8 lb

Standards

ROPS/FOPS	ROPS/FOPS
Brakes	Brakes
Cab	Cab

- ROPS (Rollover Protective Structure) offered by Caterpillar for the machine meets ROPS criteria SAE J1040 MAY94, ISO 3471-1994.
- FOPS (Falling Object Protective Structure) offered by Caterpillar for the machine meets FOPS criteria SAE J/ISO3449 APR98 level II, ISO 3449-1992 Level II.
- Brakes meet the standard ISO 10265-2008.
- The operator sound exposure Leq (equivalent sound pressure level) measured according to the work cycle procedures specified in ANSI/SAE J1166 OCT 98 is 83 dB(A), for cab offered by Caterpillar, when properly installed and maintained and tested with the doors and windows closed.
- Hearing protection is recommended when operating with open operator station and cab (when not properly maintained or doors/windows open) for extended periods or in noisy environment.
- The exterior sound pressure level for the standard machine measured at a distance of 15 meters (49.2 ft) according to the test procedures specified in SAE J88 APR95, mid-gear-moving operation, is 85 dB(A).
- The labeled sound power level is 112 dB(A) measured according to the test procedure and conditions specified in 2000/14/EC.
- The operator sound exposure Leq (equivalent sound pressure level) measured according to the work cycle procedures specified in ISO 6396:2008 is 77 dB(A) and in ISO 6394:2008 is 74 dB(A), for cab offered by Caterpillar, when properly installed and maintained and tested with the doors and windows closed.

← S01

DX225LC-5 Crawler Excavator

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Specifications for DX225LC-5 Crawler Excavator

Engine

RATED FLYWHEEL POWER (GROSS)	166.3 hp @ 1,800 rpm
RATED HORSE POWER (NET)	162.1 hp @ 1,800 rpm
MAX. TORQUE (NET)	557 lbf-ft @ 1,400 rpm
ENGINE EMISSIONS TIER (EPA)	T4

Hydraulic System

MAIN PUMP: DISPLACEMENT	7 in ³ /rev
CONTROL VALVE: RELIEF VALVE PRESSURE (NORMAL)	4,694 psi
CONTROL VALVE: RELIEF VALVE PRESSURE (BOOST)	4,978 psi
MAIN PUMP: MAX. FLOW RATE (EACH)	54.55 gal/min
MAIN PUMP: MAIN RELIEF PRESSURE	--

Undercarriage

UPPER ROLLERS: QUANTITY PER SIDE	2
LOWER ROLLERS: QUANTITY PER SIDE	8
TRACK LENGTH	14' 7"
TRACK LINK: TRACK GAUGE	7' 10"

Swing Mechanism

SWING PERFORMANCE: MAX SWING TORQUE	60757 lbf-ft
SWING PERFORMANCE: MAX SWING SPEED (AT EFFICIENCY)	10.9 rpm

ENGINE COOLANT	10.14 gal
ENGINE OIL	7.13 gal
HYDRAULIC TANK	51.51 gal

Environment

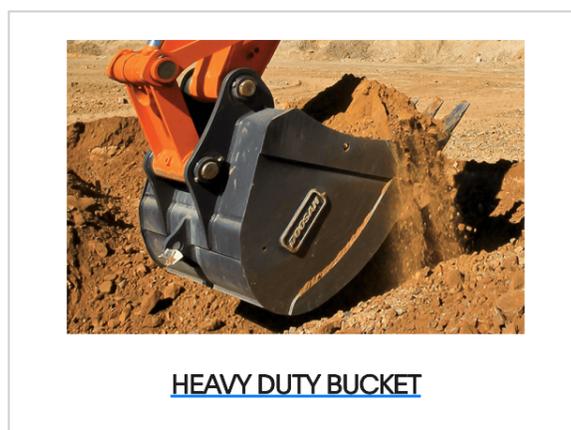
NOISE LEVEL: GUARANTEED SOUND POWER LEVEL	103 dBA
NOISE LEVEL: OPERATOR	70 dBA

← **S04**

Lift Capacity

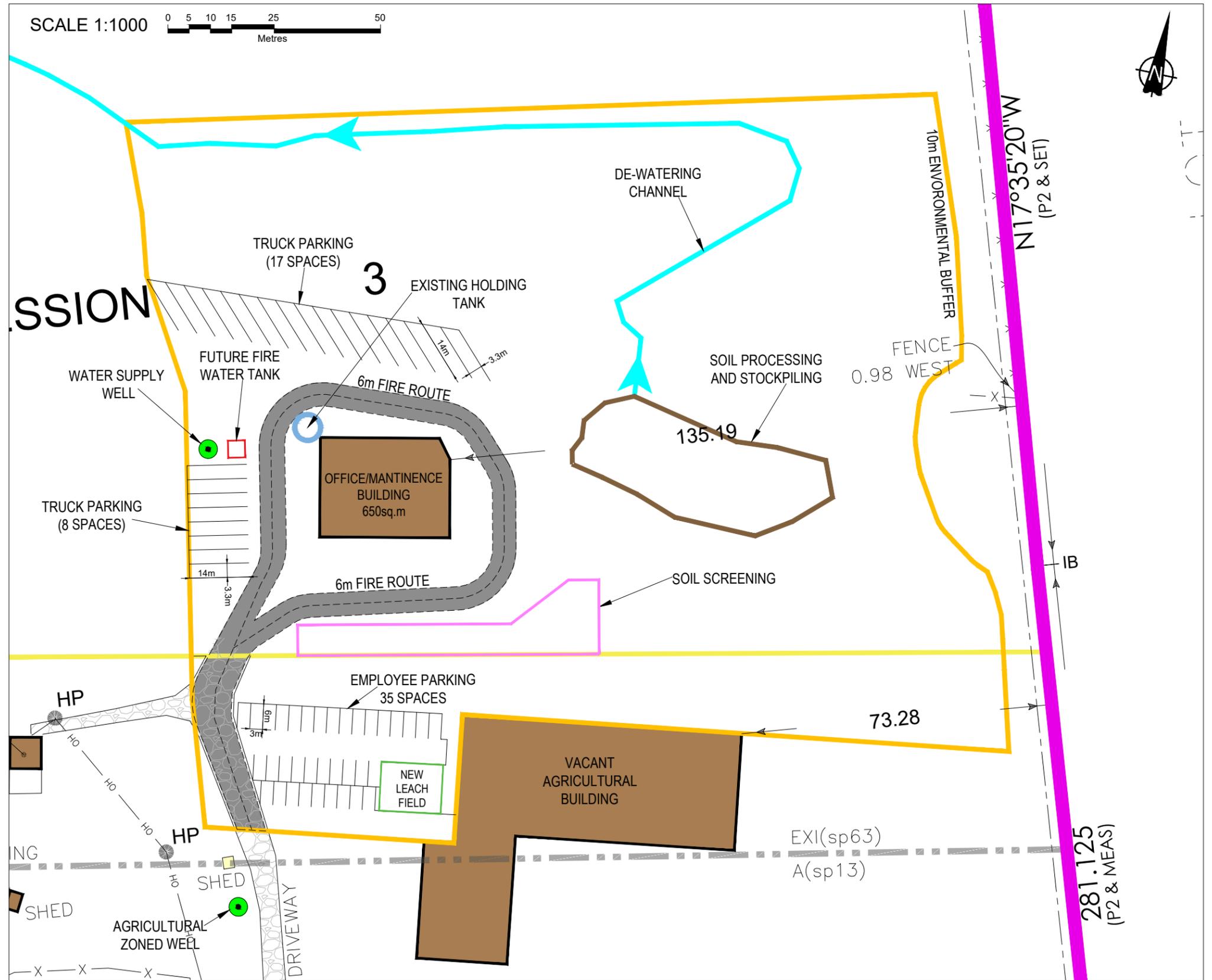
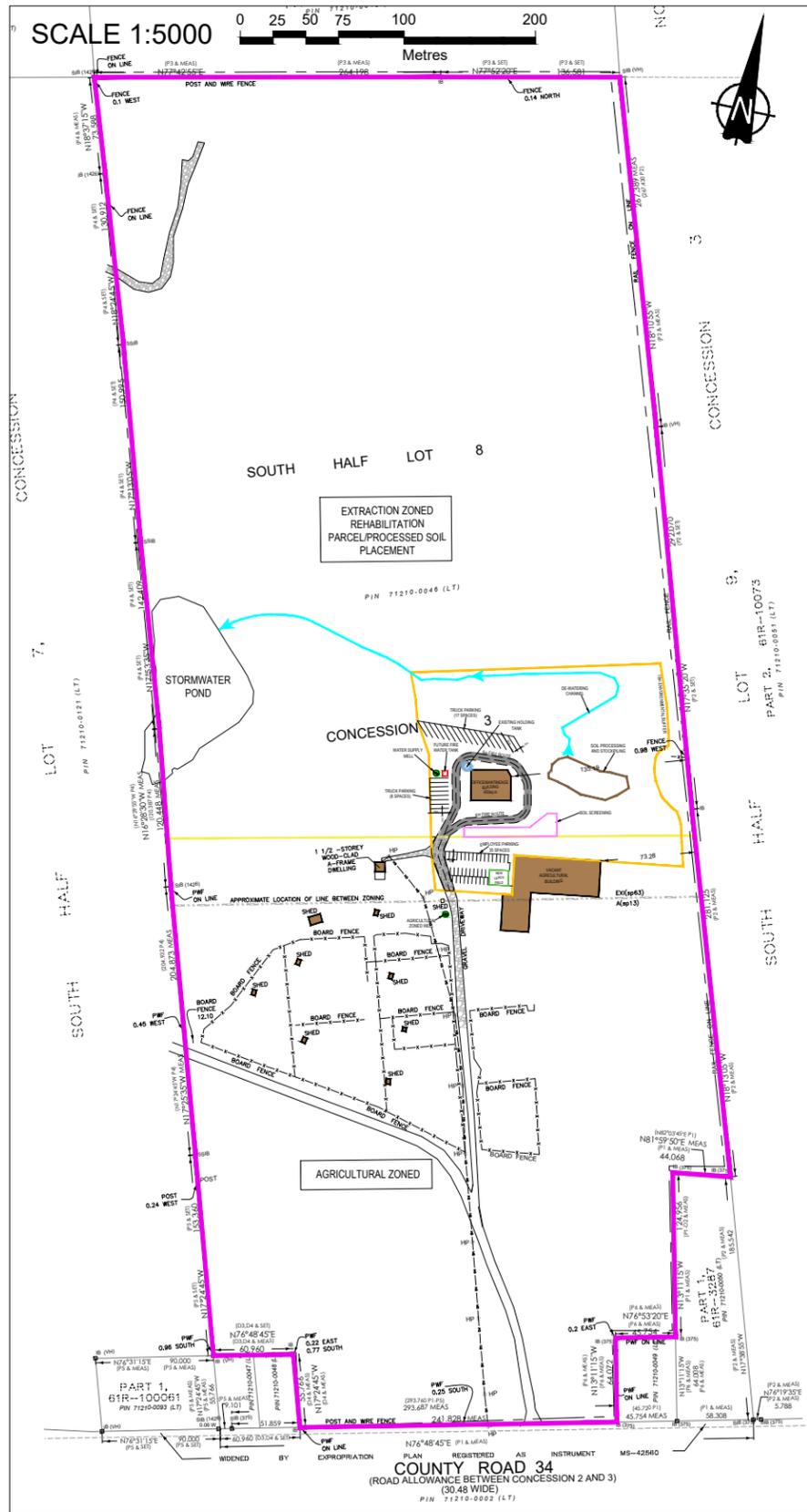
LIFTING CAPACITY OVER FRONT @ HORIZONTAL DISTANCE - 10 FT ABOVE GROUND	14,660 lb @ 20 ft
LIFTING CAPACITY OVER FRONT @ HORIZONTAL DISTANCE - GROUND LEVEL	16,130 lb @ 20 ft
LIFTING CAPACITY OVER FRONT @ HORIZONTAL DISTANCE - 10 FT BELOW GROUND	15,810 lb @ 20 ft

Attachments



[View All](#)

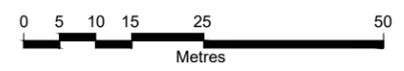




DEVELOPMENT CONCEPT

6678 Wellington Road 34, Puslinch

- WATER SUPPLY WELL
- DE-WATERING CHANNEL
- SITE/OPERATIONS BOUNDARY (2.89ha.)
- PROPERTY BOUNDARY
- NEW LEACH FIELD
- SOIL PROCESSING AND STOCKPILING
- LICENSE BOUNDARY
- SOIL SCREENING AREA



NOTE: This concept should be considered as a preliminary demonstration model that illustrates an 'order of magnitude' development scenario for the site. The number of units, floor area and parking supply are approximate and subject to more detailed design as well as municipal planning approvals.

June 6, 2023 | Project No. 24038 | Drawn By: EF



Planning Justification Report

6678 Wellington Road 34, Puslinch

2374868 Ontario Inc.

Township of Puslinch
County of Wellington

Temporary Use By-law Amendment

July 2025



Planning Justification Report

6678 Wellington Road 34, Puslinch

Temporary Use Zoning By-law Amendment

Township of Puslinch
County of Wellington

July 2025

Prepared for:

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1. Introduction

1.1 Background

GSP Group has been retained by 2374868 Ontario Inc. (the “**Owner**”) to coordinate the preparation and submission of a Temporary Use Zoning By-law Amendment application for a portion of the property legally described as Part of South Half Lot 8, Concession 3, or municipally known as 6678 Wellington Road 34 in the Township of Puslinch within the County of Wellington (the “**Property**”)

The Property is 39.4 hectares in area and has frontage onto Wellington Road 34 (**Figure 1**). The northern part of the Property is a gravel pit mostly under rehabilitation pursuant to a License under the *Aggregate Resource Act* (“**ARA**”) issued by the Ministry of Natural Resources (the “**MNR**”). A portion of the Property was used for the proposed liquid soil management operation (vacuum truck materials handling and a sorting facility) for many years under the approved pit license. The operation ceased since the introduction of new MNR Policy that prohibits the management of liquid soil within Licensed aggregate sites. Ontario Ministry of Environment, Conservation and Parks (**MECP**) Environmental Compliance Approvals (**ECAs**) also have been received to govern the liquid soil operation as required by the MNR Policy.

The Property is designated Secondary Agricultural and Greenlands on Schedule B7 (Puslinch Land Use) in the County of Wellington Official Plan (**Figure 4**). It is also located within the Paris Galt Moraine Policy Area according to Schedule C7 of the County Official Plan (**Figure 5**). The northern portion of the Property is located within the Mineral Aggregate Resource Overlay on Schedule D (**Figure 6**) and is further identified as a Licensed Aggregate Operation in Appendix 2 of the County of Wellington Official Plan (**Figure 7**).

The Property currently has dual zoning within the Township of Puslinch Comprehensive Zoning By-law No. 023-18. The south portion of the Property is zoned Agricultural with special provision 13 (A)(sp13). Within the A(sp13) zone, agricultural uses, normal farm practices and farm related businesses are permitted, in addition to an existing kennel, temporary haul route and landscape berm. The south-east corner of the A(sp13) zone is identified with an Environmental Protection Overlay. This overlay represents natural heritage features included in the “Greenlands” designation of the County of Wellington Official Plan, as well as lands to which were previously considered under Grand River Conservation Authority Regulation 150/06 and now considered under O. Reg. 41/24. The north portion of the Property is currently zoned Extractive Industrial with special provision 63 (EXI)(sp63). The special exemption Extractive Industrial zone permits all uses within the EXI Zone.

The Owner is proposing to permit the temporary use of a liquid soil management operation (the “**Proposed Use**”) on a portion of the Property for a period up to three years that would include the following:

- A 1-storey, 650 square feet office and maintenance building.
- 25 hydrovac truck parking spaces.
- 35 employee/visitor parking spaces.
- Private servicing including water supply wells, a firefighting water cistern, a holding tank and leach field.
- Area for soil offloading and management.
- Area of soil processing and stockpiling (unloading and drainage area).
- Temporary Pond and Drainage Swale leading to an existing stormwater management pond; and an
- Area for soil screening.

The Proposed Use would be located central to the Property and comprise of an area of approximately 2.9 hectares (the “**Site**”). The Site is located within the site-specific Extractive Industrial EXI (sp63) zone and generally represents the area previously used for the management of liquid soil when it was a permitted use under the ARA license and governed by the MECP Waste and Air & Noise ECAs. Please refer to **Figure 1** for the boundaries of the entire Property, and **Figure 2** for the conceptual plan of the Proposed Use and boundary of the Site that is subject to the Temporary Use By-law Amendment.

On October 10, 2024, the Ministry of Environment, Conservation and Parks (the “**MECP**”) issued a Waste Environmental Compliance Approval (“**ECA**”) for the Site. The application for the ECA was applied for under section 20.2 of Part II of the Environmental Protection Act, for approval of a waste disposal site to be used for the processing of excess soil, including liquid soil. The ECA provides for, among other items, comprehensive soil, surface water and groundwater sampling, monitoring, reporting and contingency programs.

On October 10, 2024, the MECP also issued an Air and Noise ECA for the Site. The approval governs the air and noise emissions from the equipment and operations in processing the soil which are demonstrated to be in compliance with applicable regulations. The ECA also provides for acoustic monitoring to provide ongoing demonstrations of compliance.

On November 5th, 2024, the MNR approved the spilt of License #20085 between Capital Paving Inc. and the Owner, creating License #626648 which governs all of the licensed area on the

Owner's Property. Capital Paving is located to the west immediately adjacent to the Property and operates an aggregate extraction operation. Capital Paving and the Owner share a mutual access and haul route under an existing agreement.

As acknowledged in the Pre-Consultation notes dated March 26, 2025 issued by the Township of Puslinch, a Planning Justification Report is required in support of the proposed Temporary Use Zoning By-law Amendment application. To this end, the Report has been structured to provide:

- A description of the Property and Site, its existing physical conditions and its context within the surrounding community.
- An overview of the relevant policy and regulations that affect the proposed planning application, including Provincial, County, and local policies, regulations and guidelines; and
- A planning opinion and justification for the proposed planning application.

The following supporting technical reports have been considered in our analysis:

- Environmental Impact Assessment prepared by GHD dated May 9, 2022, and the associated Addendum Letter dated June 11, 2025.
- Updated Traffic Operations Assessment prepared by GHD dated May 28, 2025.
- Emission Summary and Dispersion Modelling Report prepared by GHD dated December 10, 2021.
- Acoustic Assessment Report prepared by GHD dated April 3, 2024, additional clarification information provided to MECP, and response to Valcoustic comments, prepared by GHD and dated June 12, 2025.
- Design and Operations Report: Waste Processing Facility prepared by GHD dated March 26, 2024.
- Site Servicing Study prepared by GHD dated June 20, 2025.
- Stormwater Management Report prepared by GHD dated February 9, 2021.
- Hydrogeological Impact Assessment Revision 2 prepared by GHD dated March 31, 2025, and response to Harden Environmental comments, prepared by GHD dated June 9, 2025.
- Response to Source Water Protection comments, prepared by GHD dated June 9, 2025.
- October 2024 Waste ECA
- October 2024 Air & Noise ECA

1.2 Proposed Application

The proposed Temporary Use By-law Amendment (the “**Application**”) would permit the management of liquid soil on the Site, for a period up to 3 years. The Proposed Use is not expected to continue to life of the gravel pit, but extensions may be sought. Any extension would require Council approval for up to another 3 years.

The Proposed Use on the Site is complementary to the rehabilitation of the gravel pit. Trucks arrive on the Site and offload in a designated soil management area. Materials can dewater for a few days to a week until the materials have dried sufficiently to excavate and place in stable stockpiles. Water gravity drains from stockpiled soil and is directed to the lined drainage swale. Stockpiles of dry soil are generated for sampling. The Site uses a system of marked stockpiled locations to allow for soil and data tracking and processing. Based on sampling results, dried soil is transported to rehabilitation areas or appropriate off-site disposal/receiving sites.

The dried soil is suitable for use as pit rehabilitation material under the MNRF approved Pit Rehabilitation Plan. Some small quantities of aggregate or topsoil products also are generated from some loads and are separated using a trommel screen for recycling or beneficial reuse, largely for pit rehabilitation activities.

It is anticipated that it will take up to 10 years to complete the rehabilitation of the Licensed Area, which involves soil importation, placement, grading and final drainage. The liquid waste operation imports a relatively small volume of soil. The maximum allowed by the ECA is 125 tonnes per day of liquid soil which is two-thirds water per day. Therefore, approximately 40 tons per day of dry soil or 10,000 tonnes could be processed at the Site per year. In comparison the License allows extraction of 50,000 tonnes per year of sand and aggregate material. Based on this calculation, an extension of the Temporary Use By-law Amendment may be required.

1.3 Site Description and Surrounding Land Uses

The Property is located north of Wellington Road 34 between Wellington Road 32 and Sideroad 10 North in the Township of Puslinch within the County of Wellington. The Property is 39.45 hectares in area and has frontage onto Wellington Road 34. The Site subject to the Application is 2.9 hectares in area. The Property currently contains a single detached dwelling that is accessible by a separate driveway from Wellington Road 34. A shared driveway and haul road with the adjacent landowner (Capital Paving) leads to a central location on the Property where there is an existing vacant agricultural building (former horse stable). North of the agricultural building is the location of the Proposed Use where there is an existing office and maintenance building, employee and truck parking, as well as an area

for soil offloading and management. The remaining portion of the Property to the north is the location of the gravel pit extraction and rehabilitation area.

The Property is surrounded by agricultural and rural land uses, as well as environmental protection areas as described below:

North: Agricultural and environmentally protected natural features.

East: Environmentally protected area that contains a passive recreational trail (Little Tract). This area spans from Wellington Road 34 to Concession Road 4. Beyond Little Tract, there are a few estate homes that front onto Sideroad 10 North.

West: Extractive aggregate operations (Capital Paving) and agricultural land uses, and Wellington Road 32.

South: Wellington Road 34, agricultural and environmentally protected land uses.

The Property and the surrounding land uses can be seen in **Figure 3**.

2. Land Use Policy Review

2.1 *Planning Act, 1990*

The *Planning Act* R.S.O, 1990, c.P.13 (the “**Planning Act**”) establishes the policy-led land use planning system in Ontario, matters of provincial interest in municipal planning decisions, and the requirements for statutory planning processes in Ontario.

Section 1.1 of the *Planning Act* outlines the purpose of the Act, which are:

- a) *To promote sustainable economic in a healthy natural environment with the policy and by the means provided under this Act;*
- b) *To provide for a land use planning system led by provincial policy;*
- c) *To integrate matters of provincial interest in provincial and municipal planning decisions;*
- d) *To provide for planning processes that are fair by making them open, accessible, timely and efficient;*
- e) *To encourage co-operation and co-ordination among various interests;*
- f) *To recognize the decision-making authority and accountability of municipal councils in planning.*

Section 2 of the *Planning Act* identified matters of provincial interest which a municipality must “*have regard to*” in carrying out its responsibility under the *Planning Act*. These matters are general in nature and broad in range and are captured in more detail through the policy statements and provincial plans issued under Section 3 of the *Planning Act* and through the official plans of the County of Wellington.

Section 3(5) of the *Planning Act* requires that the decisions of municipal councils regarding the exercise of authority concerning planning matters, including decisions of *Planning Act* applications:

- a) *Subject to a regulation made under subsection (6.1), shall be consistent with the policy statements issued under subsection (1) that are in effect on the date of the decision; and*
- b) *Shall conform with the provincial plans that are in effect on that date, or shall not conflict with them, as the case may be.*

Section 39 of the *Planning Act* authorizes Council, in a by-law passed under section 34, to permit the temporary use of land, buildings or structures for any purpose that is otherwise prohibited by

the by-law. The by-law authorizing a temporary use shall define the area to which it applies and specifies the period for which the authorization shall be in effect, which shall not exceed three years from the day of the passing of the by-law. Council may grant further periods of not more than three years each during which the temporary use is authorized. The 2024 Provincial Planning Statement issued under Section 3(5) of the *Planning Act* is applicable and relevant to the consideration of the proposed Application. The Greenbelt Plan, 2017 Oak Ridges Moraine Conservation Plan, and 2017 Niagara Escarpment Plan were also issued under Section 3(5). Of these, the 2024 Provincial Planning Statement applies which came into effect on October 20th, 2024.

2.2 Provincial Planning Statement, 2024

The Provincial Planning Statement (the “PPS”) provide policy direction on matters of provincial interest related to land use planning and development. The PPS is used under the authority of Section 3 of the *Planning Act* and came into effect on October 20th, 2024. Section 3 of the *Planning Act* requires that, “*decisions affecting planning matters shall be consistent with policy statements issued under the Act.*”

2.2.1 Rural Areas in Municipalities

Section 2.5.1 of the PPS states the healthy, integrated and viable rural areas should be supported by:

- a) *Building upon rural character, and leveraging rural amenities and assets;*
- b) *Promoting regeneration, including the redevelopment of brownfield sites;*
- c) *Accommodating an appropriate range and mix of housing in rural settlement areas;*
- d) *Using rural infrastructure and public service facilities effectively;*
- e) *Promoting diversification of the economic base and employment opportunities through goods and services, including value-added products and the sustainable management or use of resources;*
- f) *Providing opportunities for diversified tourism, including leveraging historical, cultural, and natural assets;*
- g) *Conserving biodiversity and the ecological benefits provided by nature; and,*
- h) *Providing opportunities for economic activities in prime agricultural areas, in accordance with Policy 4.3.*

Section 2.5.3 of the PPS states growth and development may be directed to rural lands in accordance with Section 2.6 (Rural Lands in Municipalities).

Consistency: The Site is in area designated for the extraction of aggregates. The Proposed Use will utilize existing transportation linkages including Wellington Road 34 and the existing haul route on the Property without requiring any improvements. The Proposed Use will have minimal

disruption to the Site as the truck traffic is already occurring due to the current aggregate extraction on the adjacent property and this Property, and the rehabilitation of the gravel pit. The Proposed Use will provide a convenient and accessible site for the management of liquid soil from critical infrastructure services within the municipality, as well as continue to provide employment opportunities. The goal is to rehabilitate the gravel pit back to agricultural land uses and restore the rural character of the area. Therefore, it is our opinion that the proposed Application is consistent with Section 2.5.1 of the PPS.

2.2.2 Rural Lands in Municipalities

Section 2.6 of the PPS lists the permitted uses on rural lands that include:

- a) *the management or use of resources;*
- b) *resource-based recreational uses (including recreational dwellings not intended as permanent residences);*
- c) *residential development, including lot creation, where site conditions are suitable for the provision of appropriate sewage and water services;*
- d) *agricultural uses, agriculture-related uses, on-farm diversified uses and normal farm practices, in accordance with provincial standards;*
- e) *home occupations and home industries;*
- f) *cemeteries; and*
- g) *other rural land uses.*

The PPS provides further policy direction for rural lands in municipalities that includes:

- Policy 2.6.2 states “*development that can be sustained by rural service levels should be promoted.*”
- Policy 2.6.3 states “*development shall be appropriate to the infrastructure which is planned or available, and avoid the need for the uneconomical expansion of this infrastructure.*”
- Policy 2.6.4 states “*planning authorities shall support a diversified rural economy by protecting agricultural and other resource-related uses and directing non-related development to areas where it will minimize constraints on these uses.*”
- Policy 2.6.5 states “*new land uses, including the creation of lots, and new or expanding livestock facilities shall comply with the minimum distance separation formulae.*”

Consistency: The Site is part of the Rural System as defined under the PPS. Section 2.6 of the PPS states the management or use of resources is a permitted use on rural lands (which is defined as lands which are located outside *settlement areas* and which are outside *prime agricultural areas*). The facility receives soil mixed with water (liquid soil or nonhazardous waste) from hydrovac operations working at multiple sites within the municipality and regionally. The soil is dried and then

sampled to confirm that it is acceptable for use in rehabilitation for the gravel pit on the Property and other receiving sites.

The Proposed Use will have access to the existing wells for any required water usage. The office building is equipped with a holding tank to manage wastewater from the office/maintenance building. The water drainage from the soil stockpiles is collected in a lined drainage swale which runs east west and drains into an on-site pond. Currently, the office/maintenance building is serviced with a holding tank for wastewater. A new leach field is being proposed where the wastewater will be discharged. Aside from the new leach field and firefighting water cistern being proposed, there are no other services required to accommodate the Proposed Use.

The Proposed Use will utilize the transportation network that exists along Wellington County Road 34 and enter the Property through a previously approved haul road that is a shared with the adjacent landowner, Capital Paving. Based on the Traffic Operations Assessment prepared for the Site, the existing access requires no improvement and is operating at a good level of service.

According to the Minimum Distance Separation Guidelines prepared by the Ontario Ministry of Agricultural, Food and Rural Affairs (OMAFRA) MDS Guideline #10 states “*Amendments to rezone or redesignate land already zoned or designated for non-agricultural uses, shall only need to meet the MDS 1 setbacks if the amendment(s) will permit a more sensitive land use than existed before.*” The Application is not proposing a new more sensitive land use or Type B land use that is characterized by a high density of human occupancy, habitation, or activity.

Based on the reasons above, it is our opinion that the proposed Application is consistent with the Rural Land policies including Section 2.6.2, 2.6.3, 2.6.4 and 2.6.5 of the PPS.

2.2.3 Employment

Section 2.8.1.1 of the PPS directs planning authorities to promote economic development and competitiveness by:

- b) providing opportunities for a diversified economic base, including maintaining a range and choice of suitable sites for employment uses which support a wide range of economic activities and ancillary uses, and take into account the needs of existing and future businesses.*

Consistency: Currently, there is a high demand for liquid soil management, and it is expected to increase due to a number of factors, including:

- a) A Growing Volume of Waste. As urban areas expand and infrastructure projects are completed, so does the amount of liquid waste generated from hydrovac operations.

Hydrovac operations are a critical infrastructure service used by municipalities, utilities and landowners to prevent underground utility strikes and support emergency services such as power line failures and watermain breaks;

- b) Environmental Awareness. With approved ECAs, there are extensive and comprehensive environmental measures in place that will ensure protection of natural environment. Providing an approved liquid soil management site will prevent illegal dumping. Illegal dumping can cause health concerns and long-term environmental damage;
- c) Lack of Local Sites. A liquid soil management site will service local municipalities who are actively involved in ongoing infrastructure projects. This also includes utilities including gas and hydro companies. Currently, liquid soil collected in the County of Wellington is hauled to the closest waste disposal site located outside the municipality. This means greater cost to haul the waste to another municipality, as well as greater impact to the environment due to truck travel and associated consumption of gas, diesel fuel and emissions.

Based on the above reasons, it is our opinion that the Township of Puslinch and County of Wellington would benefit by diversifying their economic base to include a temporary liquid soil management site in their jurisdiction. It would provide a service that is currently under-served and provide employment opportunities for residents in the Township and County. The Proposed Use is ancillary to the approved aggregate extraction activities as clean soil generated from the Site is transported to the rehabilitated areas of the gravel pit. For these reasons, it is our opinion that the Application is consistent with Section 2.8.1.1 of the PPS.

2.2.4 Land Uses Compatibility

Section 3.5 of the PPS states that major facilities and sensitive land uses shall be planned to mitigate any adverse impacts from odour, noise and other contaminants to ensure the operational and economic viability of major facilities.

Consistency: As part of the Air & Noise ECA for the Site, an Emission Summary and Dispersion Modelling Report was prepared by GHD that concluded that the contaminants generated from identified sources associated with the liquid soil management operation are below the corresponding Ministry standards, therefore, demonstrating that the Proposed Use can operate in compliance with O. Reg. 419/05 using the maximum operating scenarios.

Also, as part of the Air & Noise ECA, an Acoustic Assessment Report was prepared by GHD for the Site that assessed all significant sources of noise emissions based on MECP's accepted methodologies and sound level limits. Based on the assessment, it was concluded that unattenuated sources of noise are below MECP's minimum sound level limits. To ensure noise levels remain below the acceptable limits, the report recommends that any future proposed equipment sound level specifications be evaluated to ensure that the sound level contribution at

each applicable Point of Reception will not significantly add to the cumulative noise impacts for the Site to maintain compliance with NPC-300 noise limits.

Based on the reasons above, it is our opinion that the proposed Application is consistent with Section 3.5 of the PPS.

2.2.5 Sewage, Water and Wastewater

Section 3.6.1(b) of the PPS states that planning for sewage and water services shall ensure that services are provided in a manner that:

- 1. Can be sustained by the water resources upon which such services rely.*
- 2. Is feasible and financially viable over their life cycle.*
- 3. Protects human health and safety, and the natural environment, including the quality and quantity of water.*
- 4. Aligns with comprehensive municipal planning for these services, where applicable.*

Section 3.6.4 of the PPS states that when municipal sewage and municipal water services or private communal sewage services and private communal water services are not available, planning or feasible, individual on-site sewage services and individual on-site water services may be used provided that the site conditions are suitable for the long-term provision of such services with no negative impacts. Furthermore, Section 3.6.8 of the PPS identifies that planning for stormwater management shall:

- a) Be integrated with planning for sewage and water services and ensure that system are optimized, retrofitted as appropriate, feasible and financially viable over their full life cycle.*
- b) Minimize, or, where possible, prevent or reduce increases in stormwater volumes and contaminant loads.*
- c) Minimize erosion and changes in water balance including through the use of green infrastructure.*
- d) Mitigate risks to human health, safety, property and the environment.*
- e) Maximize the extent and function of vegetative and pervious surfaces.*
- f) Promote best practices, including stormwater attenuation and re-use, water conservation and efficiency, and low impact development.*
- g) Align with any comprehensive municipal plans for stormwater management that consider cumulative impacts of stormwater from development on a watershed scale.*

Consistency: Municipal sewage services, municipal water services, private communal sewage services, or private communal water services are not available or planned to be made available to the Site. The Site is currently serviced by 2 water supply wells owned by the Applicant and a septic system consisting of a holding tank that is regularly emptied by a permitted disposal company for off-site disposal. A new leach field will be designed and installed where the existing holding tank will be discharged. No other services are being proposed for the Proposed Use. In circumstances where no municipal or communal services are available, Section 3.6.4 of the PPS enables private services where site conditions are suitable with no negative impacts. The Site Servicing Study prepared by GHD indicates that the Site is capable of being serviced by septic and water in accordance with applicable regulatory requirements and standards.

The Stormwater Management Plan prepared by GHD details that there are three catchment areas on the Property. Catchment A101 on the Site discharges overland towards a vegetative swale and run-off is conveyed to the existing SWM pond. Catchment A102 is also captured by the vegetative swale and conveyed to the SWM pond. The remaining area, Catchment A103 discharges via sheet flow into the SWM pond. The existing SWM on the Property is a wet pond with normal water levels. The hydrological modelling conducted concluded that the on-site stormwater features have sufficient capacity to capture, convey and mitigate the stormwater runoff from the Site including additional areas serviced by the stormwater features. Overall, the stormwater features provide water quality treatment accumulatively through a vegetative swale by promoting settling of suspended solids and infiltration of stormwater runoff via the SWM pond. The SWM pond has sufficient capacity to capture and store stormwater runoff generated by storm events larger than the 100-year from all contributing drainage areas. The SWM features and surface water monitoring program are governed by the provisions of the Waste ECA, including lining of the swale and pond.

Based on these reasons cited above, it is our opinion that the Application is consistent with policies 3.6.1(b), 3.6.4 and 3.6.8 of the PPS.

2.2.6 Natural Heritage

Section 4.1.1 of the PPS states that natural features and areas shall be protected for the long term.

Consistency: Based on the findings of the Environmental Impact Assessment (the “EIA”) prepared by GHD, a 10-metre buffer will be required from the adjacent eastern woodland. It was concluded that the Proposed Use will not result in significant negative impacts on the identified natural heritage features provided mitigations outlined in the EIA are implemented.

2.2.7 Water

Section 4.2.2 of the PPS states that development shall be restricted in or near sensitive surface water features and sensitive ground water features and their related hydrologic functions will be protected, improved or restored which may require mitigative measures.

Consistency: The Site is situated in a WHPA-D area. There are no significant drinking water threat policies associated with WHPA-Ds. The Site is situated in the Paris Galt Moraine Policy Area. This policy area is intended to protect the processes and features of the moraine, and where possible, restore and enhance groundwater and surface water resources. The Hydrogeological Impact Assessment (Revision No. 2) prepared by GHD states that the ground water and surface water monitoring for the management of liquid soil that previously occurred on the Site had no significant impact on groundwater or surface water quality. Therefore, there are no anticipated impacts to groundwater resources from the Site operations, provided that environmental practices related to soil and slurry importation and handling meet or exceed those practices undertaken in the past. The report also concludes that the groundwater and surface water regimes can be adequately monitored to ensure a timely response to potential degradation in water quality. A contingency measure in the event there is an impact on groundwater resources is to replace the downgradient water supply well in a deeper aquifer. The groundwater monitoring program is governed by the provisions of the Waste ECA. It also is noted that water which is provided by the on-site supply well is used for hydrovac services and the majority of this water is returned to the site, verified to meet applicable standards and recharges Site groundwater.

Based on the Hydrogeological Impact Assessment prepared for the Site and the provisions of the Waste ECA; it is our opinion that the proposed Application is consistent with policies 4.2.2 of the PPS.

2.2.8 Mineral Aggregate Resources

Section 4.5.2.4 of the PPS states that mineral aggregate operations shall be protected from development and activities that would preclude or hinder their expansion or continued use or which would be incompatible for reasons of public, public safety or environmental impact.

Consistency: The Proposed Use is compatible with the licensed aggregate operation on the Property. As stated in Section 1.2 of this Report, the clean dried soil generated by the Proposed Use is used for the rehabilitation of the gravel pit on the Property. This is a mutual benefiting relationship that will provide for a temporary regulated liquid soil management site while facilitating the rehabilitation of the Property back to agricultural uses. It is our opinion that the Proposed Use would not preclude or hinder or impact the licensed gravel pit on the Property. The use of the dry soil in rehabilitation also reduces the environmental impacts that would be associated with trucking

soil in form other sources. Therefore, in our opinion, the Application is consistent with Section 4.5.2.4 of the PPS.

2.3 County of Wellington Official Plan

The County of Wellington Official Plan (“**Official Plan**”) was first adopted in 1988 with several changes being made since its inception. The Official Plan is intended to ensure that existing and future residents have access to an adequate supply and variety of jobs, homes, services, educational and cultural facilities. The Official Plan states that the policies will be the basis on which the County and local councils make decisions on land use planning matters. A comprehensive review of the Official Plan has initiated several Official Plan Amendments to the County’s growth structure, growth forecasts and expansions of the urban boundary. The Official Plan review and related amendments are still currently in progress.

The policies in Section 6.2 of the Official Plan (Rural System) are intended to maintain the essential character of these areas and to ensure that the economic activities and employment opportunities which depend on Wellington’s natural resources are maintained and enhanced.

According to the Official Plan, the Property is located within the Rural System as per Schedule A7 (County Growth Structure) and designated Secondary Agricultural with a small portion of the Property designated Greenlands on Schedule B7 (Puslinch Land Use) (**Figure 4**). It is also located within the Paris Galt Moraine Policy Area according to Schedule C7 of the County Official Plan (**Figure 5**). The northern portion of the Property is identified within the Mineral Aggregate Resource Overlay on Schedule D and is further identified as a Licensed Aggregate Operation in Appendix 2 of the County of Wellington Official Plan (**Figures 6 & 7**).

2.3.1 County Growth, Structure and Land Use

Land within the County of Wellington is placed in broad categories: urban, rural, and greenlands systems. The Property is largely located within the Rural System, with a small portion of the Property being located within the Greenlands System. Section 6.1 of the Official Plan defines the Rural System as primarily natural land and some other uses typically found in non-rurban areas, and includes prime agricultural areas, secondary agricultural areas, mineral aggregate areas, season and recreational uses areas, rural housing, rural employment areas, waste management sites, special use areas, secondary urban centres, and hamlets.

According to the Official Plan, the Property is designated Secondary Agricultural and Greenlands on Schedule B7 (Puslinch Land Use) in the County of Wellington Official Plan. It is also located within the Paris Galt Moraine Policy Area according to Schedule C7 of the County Official Plan. The northern portion of the Property is located within the Mineral Aggregate Resource Overlay on

Schedule D and is further identified as a Licensed Aggregate Operation in Appendix 2 of the County of Wellington Official Plan.

Secondary Agricultural Area

Section 6.5.1 of the Official Plan defines Secondary Agricultural Area as “*lands within the Rural System which are determined to be non-prime agricultural areas but which can sustain certain agricultural activities.*” Permitted uses within this designation may include a) all uses allowed in the Prime Agricultural Area that includes agricultural uses, secondary uses including home businesses and farm businesses, agricultural-related uses, licensed aggregate operations, wayside pit and quarries, portable asphalt plants and portable concrete plants among other uses b) small scale commercial, industrial and institutional uses; and c) public service facilities.

Greenlands

Section 5.5 of the Official Plan defines Greenlands as other significant natural heritage features including habitat, areas of natural and scientific interest, streams and valleylands, woodlands, environmentally sensitive areas, ponds, lakes and reservoirs and natural links.

When development is proposed in the Greenland system or on adjacent lands, the County or local municipality will require the developer to identify the nature of the feature potentially impacted by the development and prepare an environmental impact assessment.

Mineral Aggregate Areas

Section 6.6.3 of the Official Plan states that existing licensed mineral aggregate operations are permitted and shall be recognized in municipal zoning by-laws. These operations are to be protected from new uses which would preclude or hinder their expansion or continued use. In addition to the uses allowed by the underlying designation (Secondary Agricultural), the following uses may be allowed within the Mineral Aggregate designation through rezoning:

- a) *Aggregate extraction;*
- b) *Associated uses such as stripping, berm construction, screen planting, landscaping, drilling, blasting, haulage, crushing, screening, washing, stockpiling, storage, loading, weighing, equipment parking, repair and maintenance, office facilities, importing and blending materials, environmental and safety control features and rehabilitation uses;*
- c) *Ancillary uses such as asphalt plants, concrete plants, aggregate transfer stations, stockpiling and blending of aggregates with materials such as salt, sand-salt mixture and recycled road material.*

Section 6.6.7 of the Official Plan also states that ancillary uses may be established if the following matters are addressed:

- a) *The protection of adjoining lands from the negative effects of a reduced water supply, noise, dust, odour, lighting and unsightly storage;*
- b) *The protection of the environment from negative effects of dust, chemical spills, runoff, or contaminated surface or ground water; and*
- c) *Ensuring that access can be obtained directly to a road capable of carrying the anticipated truck traffic.*

Conformity: The Property is designated Secondary Agricultural and identified within the Mineral Aggregate Resource Overlay as a sand and gravel resource of primary and secondary significance in the County of Wellington Official Plan. Approximately, half of the Property and most of the Site is licensed as a mineral aggregate operation. The Proposed Use on the Site would be classified as an ancillary use and permitted under Section 6.6.7 of the Official Plan. In our opinion, the Proposed Use will not pose any negative effects as it relates to a reduced water supply, noise, dust, odour, lighting and/or unsightly storage.

The Hydrological Impact Assessment prepared for the Site by GHD concluded that the Proposed Use will have no significant impact on groundwater or surface water quality. Additionally, there are no anticipated impacts to groundwater resources, provided that environmental practices that relate to soil and slurry importation and handling meet or exceed those practices undertaken in the past when the use was permitted.

A Trigger Response Plan (“the **TRP**”) was also prepared by GHD for the Proposed Use as requested by the MECP in support of the ECA (Waste Processing and Transfer) for the Site. Based on historical and weekly surface water monitoring, the TRP requires additional groundwater sampling protocols if there is an exceedance of MECP standards. Additionally, a groundwater response assessment, inclusive of a risk screening evaluation if the exceedance is determined to be the result of Site operations, will be conducted to determine potential response actions to be completed. The groundwater and surface water monitoring and reporting requirements, including the TRP, are governed by the provisions of the Waste ECA.

As part of the Site Air & Noise ECA, an Emission Summary and Dispersion Modelling Report prepared by GHD concluded that the contaminants generated from identified sources associated with the Proposed Use are below the corresponding Ministry standards, therefore, demonstrating that the liquid soil management site can operate in compliance with O. Reg. 419/05 using the maximum operating scenarios. Furthermore, dust emissions from the Site, from sources such as

parking lots and roads, were considered insignificant in the report and are managed as described in the Design and Operations Report which is part of the Waste ECA requirements.

The Acoustic Assessment Report prepared by GHD for the Site assessed all significant sources of noise emissions based on MECP's accepted methodologies and minimum exclusionary sound level limits. Based on the assessment, it was concluded that any noise generated from equipment on the Site is below MECP's minimum exclusionary sound level limits. It is recommended that any future proposed equipment sound level specifications be evaluated to ensure that the sound level contribution at each applicable Point of Reception will not significantly add to the cumulative noise impacts, and for the Site to maintain compliance with NPC-300 noise limits.

The Proposed Use is centrally located on the Property and is heavily buffered from Wellington Road 34 due to distance and tree cover. The Site is accessible from Wellington Road 34, which is shared with the adjacent landowner, Capital Paving. The Traffic Impact Assessment prepared by GHD indicates good levels of service or better with substantial reserve capacity at the access point and Wellington Road 34. The access has been operational for several years with no known reports of collisions. Therefore, no road improvements are being recommended.

Based on the findings of the EIA prepared by GHD, a 10-metre buffer will be required from the adjacent eastern woodland. It was concluded that the Proposed Use will not result in significant negative impacts on the identified natural heritage features provided that mitigations outlined in the EIA are implemented. The proposed operations are also well setback from the buffer zone.

Based on the reasons above, it is our opinion that the Proposed use on the Site is considered an ancillary use to the existing licensed aggregate operation on the Property as it meets the requirements set out in Section 6.6.7 of the Official Plan. Therefore, in our opinion, an Official Plan Amendment is not required to facilitate the temporary use of a liquid soil management operation on the Site. The Proposed Use will require a Temporary Use By-law Amendment as the use is not permitted use under the applicable special provision Extractive Industrial (EXI) (sp63) zone that governs the Site.

2.3.2 Economic Development

Section 4.2.3 of the Official Plan directs the County to encourage a variety of employment opportunities in a variety of locations in appropriate locations, including lands in the Rural System, which can offer advantages to a business with larger sites, compatibility or proximity to resources or major transportation facilities.

Section 4.2.5 of the Official Plan further states that the main employment generator in the rural system will be resource based industries such as agriculture, aggregate operations and forestry.

These sites provide larger lots, larger buffers for compatibility, proximity to rural resources or access to major roads.

Conformity: The Proposed Use will benefit by being in close proximity to the licensed gravel pit as the clean soil generated on the Site is directly used for the rehabilitation of the licensed portion of the Property. The site operations are well buffered from Wellington Road 34 and from the adjacent neighbouring properties. The Site is strategically located on Wellington Road 34 which connects to Highway 6 and Highway 401 which are considered major highways. The Site's location in proximity to these major transportation corridors will allow for the efficient movement of hydrovac trucks to various sites within and outside of the municipality. Based on these reasons, it is our opinion that the Application conforms to Sections 4.2.3 and 4.2.5 of the Official Plan.

2.3.3 Impact Assessment

Section 4.6 of the Official Plan contains policies to require studies to be undertaken to measure the impacts to reduce or eliminate any negative impacts. Such studies may include planning impacts, environmental impacts, traffic impacts, agricultural and fiscal impacts.

Conformity: As part of the Pre-Consultation meeting with the Township, County and external agencies outlined the required studies to be submitted as part of a complete application. A copy of the Pre-Consultation record is included in **Appendix A**.

2.3.4 Paris and Galt Moraine Policy Area

As noted, the Site is located within the Paris and Galt Moraine Policy Area, policies for which are included in Section 4.9.7 of the Official Plan. The purpose of these policies are to (1) protect moraine processes and features to maintain and where possible restore and enhance groundwater and surface water resources, and (2) promote stewardship activities on the moraines that maintain, restore or enhance groundwater and surface water resources. Section 4.9.7.2 a) requires that large scale development proposals, including mineral aggregate operations, be required to demonstrate that ground and surface water functions will be maintained, and where possible, restored and enhanced.

Conformity: Geotechnical and hydrogeological considerations and evaluations have been provided in the Hydrogeological Impact Assessment prepared by GHD in support of the Application, which is summarized in Section 2.4.5 of this Report. A Drinking Water Threats Disclosure Report for the Proposed Use will be submitted as part of the Site Plan Control application.

2.3.5 Environmental System

Section 11 of the Official Plan relates to environmental services, which refers to water and waste water services, stormwater management facilities, and waste management services. Section 11.2

refer to Water and Services, and Section 11.3 refers to Storm Water Management. Policies and analysis for both Sections are covered below:

Servicing

Section 11.2.2 c) encourages development to use the highest level of service practical based on a priority of municipal, then private communal, and then individual on-site services. Section 11.2.6 a) states that in the rural system, outside of secondary urban areas and hamlets, development is anticipated to be individual on-site systems where soil conditions are suitable over the long-term.

Stormwater Management

Section 11.3 of the Official Plan required the County or local municipality, the Conservation Authority and Ministry of Environment to be consulted with respect to the final stormwater management design. Furthermore, Section 11.3.4 of the Official Plan requires a stormwater management report submitted prior to approval of a zoning amendment, site plans or building permits.

Conformity: The Site contains private services for both water and sewage. Details of the servicing strategy are further explained in Section 2.4.1 of this Report. The on-site stormwater features including a vegetated swale and SWM pond will provide sufficient capacity to capture and store stormwater runoff generated from the Site as further detailed in Section 2.4.2 of this Report and as required by the MECP Waste ECA. In our opinion, the proposed private services and stormwater management strategy on the Site is in conformity with Section 11 of the Official Plan.

2.3.6 Transportation

Section 12 of the Official Plan encourages the development of safe and efficient transportation systems which are environmentally responsible and convenient for users. As per Section 12.5.3 of the Official Plan, Wellington Road 34 would be classified as a major roadway as it is under the jurisdiction of the County of Wellington. A major roadway according to the Official Plan is expected to provide and serve high volumes of traffic including truck traffic. Section 12.5.3(e) of the Official Plan states where access to a major roadway is necessary, the following facilities may be required; i) traffic signals ii) turning lanes and tapers iii) road widenings.

Conformity: The Traffic Operations Assessment prepared by GHD for the Site illustrates the location of site access on Wellington County Road 34. The report has taken into consideration that access will service the Proposed Use and Capital Paving. The Proposed Use will consist of a fleet of 25 trucks. Capital Paving operates an aggregate operation that also generates truck traffic. The results of the analysis indicate good levels of service “B” or less indicating substantial capacity. The access does have a tapered pavement for the entering of vehicles and the exiting vehicles turning

southbound. No improvements to the access are proposed. Therefore, it is our opinion, the Application conforms to Section 12.5.3(e) of the Official Plan.

2.3.6 Temporary Use By-laws

According to Section 13.4 of the Official Plan, by-laws may be passed by a local council to allow the temporary use of land for a purpose that is not permitted by the Official Plan or Zoning By-law. The temporary use by-law may not exceed three years but may be extended. In consideration of a temporary use by-law, Council shall have regard for the following:

- The likely duration
- Compatibility
- The adequacy of services
- Access and parking
- Impact assessment
- General conformity with the County Official Plan

Conformity: The Application would permit the Proposed Use for a period of up to three years. It is anticipated that the temporary use may need to be extended beyond the requested three years, as this will allow for the continued rehabilitation of the gravel pit. The Owner is required to reapply for an extension every three years to seek permission to extend the Proposed Use on the Site as per Section 13.4 of the Official Plan and Section 39 of the *Planning Act*. In our opinion, the Proposed Use is compatible with the existing gravel pit use and the surrounding area with no impacts to surrounding properties with respect to noise, dust and air emissions. In our opinion, the use is ancillary to the aggregate operation and benefits from the large lot and access to a major transportation corridor, and such as, is in general conformity with the policies of the Official Plan. The Traffic Operations Assessment concluded that the site access does not require any improvements and operates at a good level of service. There is adequate off-street parking being provided for the trucks and employees/visitors as it relates to the Proposed Use within the Site boundaries. Therefore, it is our opinion that the Proposed Use conforms to Section 13.4 of the Official Plan and a Temporary Use By-Law is the appropriate mechanism to facilitate the use.

2.4 Technical Studies/Analysis

2.4.1 Site Servicing Study

The Site Servicing Study prepared by GHD discusses the required infrastructure to support the Proposed Use on the Site. The Study reviews existing and proposed conditions and demonstrates

that the demands of the temporary use on water and wastewater, stormwater, and other infrastructure will be without impact to existing servicing capacity.

As detailed in the report, the Site is currently serviced with two supply wells, one that is used to supply the existing office/maintenance building for washrooms, and one that is used for filling the trucks. No additional water supply wells are required for the Proposed Use.

A firefighting water cistern will be designed and installed adjacent to the water supply well that fills the trucks. Currently, there are no fire hydrants on the Property.

The Site is currently serviced with sewage holding tank that is emptied by a permitted disposal company for off-site disposal. There is a new leach field that will be designed and installed adjacent to the vacant agricultural building. The existing holding tank will be discharged to the new leach field.

The Site Servicing Study concludes that there are no significant changes or new services required for the Proposed Use except for a new septic leach field and firefighting water cistern.

2.4.2 Stormwater Management Report

GHD prepared the Stormwater Management in support of an application for the (the “**MECP**”) Environmental Compliance Approval (the “**ECA**”) (Industrial Sewage Works-Stormwater). It provides an overview of the existing SWM features in accordance with MECP requirements. Given the current SWM features on the Site, no new works or modification to the Site are proposed. The report concludes that the on-site stormwater features provide water quality treatment accumulatively through a vegetated swale by promoting settling of suspended solids and infiltration of stormwater runoff via the SWM pond. The SWM pond has sufficient capacity to capture and store stormwater runoff generated by storm events larger than 100-year from all contributing drainage areas. MECP indicated that an ECA (Industrial Sewage Works) to govern stormwater management was not required as there are no off-site point source discharges and stormwater and hydrovac water would be adequately governed under the Waste ECA.

2.4.3 Design and Operations Report

The Design and Operations Report (the “**D & O Report**”) prepared by GHD was prepared in support for an MECP ECA (Waste). The D & O Report describes the Proposed Use on the Site.

The report provides details of the facility design, soil operations and other operations such as inspections and maintenance, staff training, soil, surface water and groundwater monitoring programs, environmental emergency and contingency plan, compliance procedures, annual reporting and a closure plan.

2.4.4 Environmental Impact Assessment

GHD prepared an EIA in August 2022, and an Addendum letter dated June 11, 2025 in support of the Proposed Use on the Site. The addendum letter provides an update to address the direct and indirect impacts of the eastern woodland based on the outstanding comments on the EIA from the previous zoning by-law amendment for permanent use, in addition to a discussion on cumulative impacts. Additional recommendations have been made to implement restoration and enhancement measures to occur immediately after the operation ceases, which are similar to the measures contained in the EIA and consistent with the MNR approved Rehabilitation Plan.

2.4.5 Hydrogeological Impact Assessment

A Hydrogeological Impact Assessment (Revision No. 2) (**HIA**) and Addendum Letter was prepared by GHD that provides summaries of the Site's geological and hydrogeological conditions and corresponding assessments that included the results of groundwater and surface water quality monitoring undertaken to date.

The results of the surface water and groundwater monitoring program demonstrated that there is no evidence of unacceptable impact to groundwater or surface water quality resulting from the Site operations. The HIA was reviewed by MECP and supported the issuance of the Waste ECA which provides provisions for ongoing surface water and groundwater management, protection and monitoring programs.

Based on the results of monitoring during the years when the Proposed Use was operational, there are no anticipated impacts to groundwater resources from the operations, provided that environmental practices related to soil and slurry importation and handling meet or exceed those practices undertaken in the past. Additionally, the conditions imposed through the Waste ECA provide for ongoing monitoring programs and further supplementary protections.

2.4.6 Acoustic Assessment Report

An Acoustic Assessment Report was prepared by GHD and was prepared for an application for a MECP ECA (Air & Noise) that provides an evaluation of the potential noise impact at sensitive receptors located nearest the Site.

The report concluded that noise levels are below MECP's minimum sound level limits but recommends that any future proposed equipment sound level specifications be evaluated to ensure that the sound level contribution will not significantly add to the cumulative noise impacts in order for the Proposed Use to maintain compliance with NPC-300 noise limits. A noise monitoring program and equipment operations plan also are required by the ECA to provide ongoing noise management of noise from the Proposed Use.

2.4.7 Emission Summary and Dispersion Modelling Report

The purpose of the Emission Summary and Dispersion Modelling Report prepared by GHD was to assess equipment and operations at the Site against Section 20 of Ontario Regulation 419/05 including the United States Environmental Protection Agency (USEPA) atmospheric dispersion model AERMOD and the standards listed in Schedule of O. Reg. 419/05.

The report concluded that the Proposed Use could operate in compliance with O. Reg. 419/08 using the maximum operational scenarios.

2.4.8 Traffic Operations Assessment

The Traffic Operations Assessment prepared by GHD was based on the available traffic data of Wellington County 34 in the vicinity of the existing access to the Site. This access is shared by two businesses including the Site and Capital Paving. Capital Paving operates an aggregate extraction business that is seasonal and business dependent.

Based on the results of the analysis in the report, the site access is operational with no need for any improvements based on the Proposed Use.

2.5 Township of Puslinch Comprehensive Zoning By-law

In the Township of Puslinch Comprehensive Zoning By-law No. 023-18, the Site has dual zoning. The south portion of the Property is zoned Agricultural with special provision 13 (A)(sp13). Within the A(sp13) zone, agricultural uses, normal farm practices and farm related businesses are permitted, in addition to an existing kennel, temporary haul route and landscape berm. The south-east corner of the A(sp13) zone is identified with an Environmental Protection Overlay. This overlay represents natural heritage features included in the “Greenlands” designation of the County of Wellington Official Plan, as well as lands to which Grand River Conservation Authority Regulation 150/06 applies. The north portion of the Property is currently zoned Extractive Industrial with special provision 63 (EXI)(sp63). The special exemption Extractive Industrial zone permits all uses within the EXI Zone. There are site-specific provisions that apply to regulate the extraction of resources near the water table.

A Temporary Use By-law Amendment is being requested to rezone the Site to permit the Proposed Use on a temporary basis for up to three years. The Temporary Use By-law would also regulate the permitted use as well the off-street parking being proposed on the Site. A copy of the draft Zoning By-law is attached in **Appendix B**.

3. Conclusions

The Owner is requesting a Temporary Use By-law Amendment to facilitate a liquid soil management operation on the Site. Based on our review of applicable policies and regulations, we conclude that the proposed Temporary Use By-law Amendment application is justified for the following reasons:

- It has had regard to the *Planning Act and specifically Section 39*.
- It is consistent with the policies of the Provincial Policy Statement, 2024.
- It conforms to the policies of the County of Wellington Official Plan and is considered an ancillary use to the licensed aggregate operation on the Site and the approved Rehabilitation Plan which requires the land to be returned back to agricultural uses.
- The Proposed Use is located close to major transportation routes and located on a larger lot that is compatible with the surrounding land uses.
- The Proposed Use will have no negative impact on the natural features on the Site or adjacent to the Site.
- The Proposed Use can be serviced with on-site private servicing.
- The Proposed Use will facilitate the management of liquid waste and provide additional employment opportunities within the Township of Puslinch and the region. It will also provide a critical infrastructure support service for which there is currently very limited available capacity.

Based on the foregoing, it is our opinion that the Proposed Temporary Use By-law is appropriate, represents good land use planning and is in the public interest. The proposed Application will facilitate the management of liquid soil on the Site on a temporary basis for a period up to three years, with anticipated extensions until the rehabilitation of the licensed gravel pit back to agricultural land is complete.

Sincerely,
GSP Group Inc.



Hugh Handy, MCIP, RPP
Vice President
July 2, 2025



Valerie Schmidt, MCIP, RPP
Development Planning Manager
July 2, 2025

Appendix “A” – Pre-Consultation Record

Concession 7 – Future Planning Application Requirements

Nethery Planning Consultants:

- A Zoning By-law Amendment application is required to amend the existing zoning to specifically include a hydrovac truck liquid soil operations use, which includes the importing, sorting, distribution or liquid soil for pit rehabilitation, and associated truck and employee parking.
- Site Plan approval required.
- If the conclusion of the Planning Report is that the use does not conform to the Wellington County Official Plan, an official plan amendment would be required.
- Planning Report.
- Environmental Impact Report.
- Traffic Impact Assessment.
- Dust Study.
- Site Servicing and Stormwater Management Report (Functional Servicing Report)
- Hydrogeological Impact Report.
- Land Use Compatibility Study (air quality, noise, dust) including items noted in the letter from John Emeljanow, dated February 19, 2025.
- Noise Study.
- Site Plan drawings, including but not limited to: site plan, elevations, operations plan, fire protection plan, grading plan, landscape plan, lighting plan, servicing plan (including items raised in the letter from Andrea Reed and Parth Ladd, dated February 13, 2025), and tree preservation and replacement plan (for lands outside of the Aggregate Resources Act licence).
- Source Water Protection information (as detailed in the comments from Kim Funk, undated), including (but not limited to) any fuel handling plans.
- The following additional reports/correspondence referred to in the Waste ECA:
 1. A copy of the Environmental Compliance Approval application submitted March 27, 2024, requesting approval of a liquid soil processing site, signed by Eric Nafziger, Site Manager, 2374868 Ontario Inc., including all supporting documentation.
 2. Rehabilitation and monitoring plans for areas to be rezoned, including any trigger response plans ("Email dated June 25, 2024 from Dan Puddephatt, P.Geo., GHD, to Pamela Grande, P.Geo., MECP, including the attached letter dated June 25, 2024 from Dan Puddephatt, P.Geo., GHD to Pamela Grande, P.Geo., MECP detailing the proposed trigger response plan ("GHD, 2024a. Proposed Trigger Response Plan – Conestoga Badger Inc. June 25").
 3. email dated July 5, 2024 from Dan Puddephatt, P.Geo., GHD, to Pamela Grande, P.Geo., MECP, including the attached document entitled "Hydrogeological Impact Assessment Revision No.1" dated July 2, 2024 ("GHD, 2024b. Hydrogeological Impact Assessment Revision No. 1, 2374868 Ontario Inc., Badger Conestoga Inc. July 5").

County of Wellington Planning:

Pending

GEI (Engineering):

- Site Plan, generally showing existing and proposed aboveground and underground infrastructure, including but not limited to
 - Buildings
 - Soil offloading, processing, stockpiling and screening locations
 - Outdoor storage areas Parking areas, loading areas, driveways and walkways
 - Lighting, signage, and fencing
 - Wells and septic system
 - Fire routes and fire protection infrastructure
 - Stormwater management infrastructure
 - Property boundaries and limits of operations and zoning.
- Site Grading and Servicing Plan, generally showing existing and proposed drainage patterns on the subject lands, confirming legal drainage outlet, and showing existing and proposed infrastructure and services, including but not limited to water lines, septic systems, sanitary sewers, storm sewers and stormwater management facilities.
- Erosion and Sediment Control Plan, providing provisions for the control of sediment and potential erosion during construction to limit impacts on surrounding areas and infrastructure.
- Spills Management Plan, to document the control of potential spills or contaminated liquid soils on the property.
- Site Servicing and Stormwater Management Report, detailing:
 - The existing conditions of the site and any proposed changes to existing infrastructure or operations.
 - How stormwater management and management of imported liquid soil and associated runoff is and will be provided for the site as required by Township standards and MECP guidelines, including:
 - Stormwater and liquid soil runoff quantity control (including stormwater management pond volumes, drawdown times and flow rates under existing and proposed conditions).
 - Stormwater and liquid soil runoff quality control (including TSS removal calculations and sediment removal frequency calculations under proposed conditions).
 - Water balance (including groundwater recharge rates and volumes).
 - Protections and controls related to offloading, stockpiling and processing of potentially contaminated liquid soils.
 - Grading and drainage considerations, including overland flow route and legal outlet.
 - Erosion and sediment controls.
 - Geotechnical and hydrogeological considerations.
 - How the site is serviced by potable water and wastewater servicing.

- Transportation considerations.

Ecology:

A revised EIS is required to demonstrate natural heritage policy compliance and address potential direct, indirect and cumulative impacts to natural heritage features.

Hydrogeologist

1) Environmental Compliance Approval received March 27, 2024 requesting approval of a liquid soil processing site, signed by Eric Nafziger, Site Manager, 2374868 Ontario Inc., including all supporting documentation.

2) Email dated June 25, 2024 from Dan Puddephatt, P.Geo., GHD, to Pamela Grande, P.Geo., MECP, including the attached letter dated June 25, 2024 from Dan Puddephatt, P.Geo., GHD to Pamela Grande, P.Geo., MECP detailing the proposed trigger response plan ("GHD, 2024a. Proposed Trigger Response Plan – Conestoga Badger Inc. June 25").

3) Email dated July 5, 2024 from Dan Puddephatt, P.Geo., GHD, to Pamela Grande, P.Geo., MECP, including the attached document entitled "Hydrogeological Impact Assessment Revision No.1" dated July 2, 2024 ("GHD, 2024b. Hydrogeological Impact Assessment Revision No. 1, 2374868 Ontario Inc., Badger Conestoga Inc. July 5").

Township Building Department:

1. Clarify the use of the "office" building that is labelled on "Figure 2" drawing provided. Will this be used only as an office? Provide preliminary floor plans to support the proposed/existing use.
2. Building Permits are required for the office, septic system and any retaining walls greater than 1m in height that have been built without the benefit building permit.
3. The existing office exceeds 600m² and will be considered a part 3 building under the building code which will require adequate fire water storage on site and fire routes. Ensure the site plan is updated to reflect the office's actual building area.
4. Provide an updated site plan showing all the site features including retaining walls, fire routes (show 6m widths and slope), existing buildings and areas, septic systems, fire water storage (size and location), fuel storage and any other site feature related to the proposed operations.

Sourcewater

See application requirements attached to Comment Summary.

John Emeljanow – Township Noise Consultant

- A noise study supporting the proposed temporary use and addresses the outstanding previously identified issues should be included as part of the submission requirements. The temporary use should be considered a stationary noise source as defined in MECP Publication NPC-300.

Comment Summary – 6676-6678 Wellington Rd 34

Preconsultation

Joe Nethery – Township Planning Consultant	<ol style="list-style-type: none">1. see letter attached2. Per the planners call on Thursday, March 20, in terms of the applicant decision on whether to file for a zoning by-law amendment or a temporary use by-law, please consider the Township’s questions regarding the amount of rehabilitation left, extraction remaining to occur, the amount of fill to be imported, and the annual amounts of each to if this is a short-term or a long-term operation.3. Further, the Township needs to understand why the rehabilitation has to occur in this manner and on this site, instead of elsewhere.
GEI – Township Engineers	See letter attached
County Planning Comments	Comments pending
Hydrogeology Comments	See letter attached
Ecology Comments	See letter attached
Township of Puslinch Fire Department	No comments
Township of Puslinch Building Department	<ol style="list-style-type: none">1. Clarify the use of the “office” building that is labelled on “Figure 2” drawing provided. Will this be used only as an office? Provide preliminary floor plans to support the proposed/existing use.

	<p>2. Building Permits are required for the office, septic system and any retaining walls greater than 1m in height that have been built without the benefit building permit.</p> <p>3. The existing office exceeds 600m² and will be considered a part 3 building under the building code which will require adequate fire water storage on site and fire routes. Ensure the site plan is updated to reflect the office's actual building area.</p> <p>4. Provide an updated site plan showing all the site features including retaining walls, fire routes (show 6m widths and slope), existing buildings and areas, septic systems, fire water storage (size and location), fuel storage and any other site feature related to the proposed operations.</p>
Township of Puslinch Property Standards & By-law Enforcement	No comments
Township of Puslinch Public Works Department	No comments
Sourcewater	See attached
County Transportation Department	No comments
Township Noise Consultant	See letter attached
GRCA	No comments

February 26, 2025

Justine Brotherston
Interim Director of Corporate Services/Municipal Clerk
Township of Puslinch
7404 Wellington Rd 34
Puslinch, ON N0B 2J0

Dear Justine:

Re: Preconsultation Comments
6678 Wellington Road 34
Applicant File No.: 24038
Township File No.: 12358
Our File No.: 124

I have the following comments for consideration for the preconsultation meeting on February 27, 2025.

The current operations are not a use permitted in the existing Zoning By-law provisions. A Zoning By-law Amendment application is required to amend the existing zoning to specifically include a hydrovac truck liquid soil operations use, which includes the importing, sorting, distribution or liquid soil for pit rehabilitation, and associated truck and employee parking.

The application requested is a zoning by-law amendment/temporary use by-law. Note that site plan approval is additionally required, per Township By-law 2022-027.

Should the conclusion of the Planning Report be that the use does not conform to the Wellington County Official Plan, an official plan amendment would also be required.

QUESTIONS OF THE APPLICANT

I have the following questions of the applicant:

1. Why pursue a temporary use permission?
2. The zoning sketch appears outdated (May 2023) and still contains a proposed area to be rezoned that excludes the swale and SWM pond—assuming the orange boundary

- is the area proposed to be rezoned. This was flagged as problematic by County planning staff at the time of the first application.
- a. If the orange boundary is the area proposed to be rezoned, why is this infrastructure (assumed to be part of the ECA) not included within the proposed zoning by-law amendment?
 - b. If it is a different or larger boundary, can that be clarified and will the lands proposed to be rezoned include all site infrastructure?
3. Similar to the above, why is employee parking located outside of the area to be rezoned?
 4. Four wells are identified within the purple property boundary on the 2023 plan drawing. Two are labelled.
 - a. What is the function of the two unlabelled wells?
 - b. Are those wells connected as a system on site?
 5. Does the stormwater management solution cross property boundaries (as noted in the letter from Andrea Reed and Parth Ladd, dated February 13, 2025)?
 6. The letter refers to an Air and Noise ECA in addition to the Waste ECA. Can the applicant provide a copy of this ECA?
 7. On page 2, it appears the owner is in the process of surrendering the license in the area subject to the rezoning. Is this premature until the final boundaries of the area to be rezoned is determined?
 8. What percentage of the soil generated from liquid soil is to be used for rehab of this pit (volumetric calculation of the annual cubic metres of excess soil expected to be generated, versus the estimated cubic metres of soil needed for rehab at this half of the split license)?
 9. What are the extents of filling already completed on the subject lands and how much additional extraction and rehabilitation is anticipated for this license?
 10. Kindly provide copies of the detailed engineering drawings that were filed in support of the ECA, to show the proposed locations and engineering specifications of the impermeable drainage area, swales and pond.

APPLICATION REQUIREMENTS

Additional to items required by technical consultants, I would request the following reports (Policy 13.18.5 of the Wellington County Official Plan):

1. Planning Report
 - a. Should the conclusion be that the use does not conform to the Wellington County Official Plan, an official plan amendment is required
2. Environmental Impact Report (refer to letter from Christina Olar and Todd Fell, dated February 14, 2025)
3. Traffic Impact Assessment

4. Dust Study
5. Site Servicing and Stormwater Management Report (Functional Servicing Report), as detailed in the letter from Andrea Reed and Parth Ladd, dated February 13, 2025
6. Hydrogeological Impact Report (updated scoping/guidance will follow the preconsultation meeting), including all reports prepared for the Environmental Compliance Approval
7. Land Use Compatibility Study (air quality, noise, dust), including items noted in the letter from John Emeljanow, dated February 19, 2025
8. Noise Study
9. Site plan drawings, including but not limited to: site plan, elevations, operations plan, fire protection plan, grading plan, landscape plan, lighting plan, servicing plan (including items raised in the letter from Andrea Reed and Parth Ladd, dated February 13, 2025), and tree preservation and replacement plan (for lands outside of the *Aggregate Resources Act* licence)
10. Source Water Protection information (as detailed in the comments from Kim Funk, undated), including (but not limited to) any fuel handling plans
11. The following additional reports/correspondence referred to in the Waste ECA:
 1. A copy of the Environmental Compliance Approval application submitted March 27, 2024, requesting approval of a liquid soil processing site, signed by Eric Nafziger, Site Manager, 2374868 Ontario Inc., including all supporting documentation.
 2. Rehabilitation and monitoring plans for areas to be rezoned, including any trigger response plans ("Email dated June 25, 2024 from Dan Puddephatt, P.Geo., GHD, to Pamela Grande, P.Geo., MECP, including the attached letter dated June 25, 2024 from Dan Puddephatt, P.Geo., GHD to Pamela Grande, P.Geo., MECP detailing the proposed trigger response plan ("GHD, 2024a. Proposed Trigger Response Plan – Conestoga Badger Inc. June 25").
 3. Email dated July 5, 2024 from Dan Puddephatt, P.Geo., GHD, to Pamela Grande, P.Geo., MECP, including the attached document entitled "Hydrogeological Impact Assessment Revision No.1" dated July 2, 2024 ("GHD, 2024b. Hydrogeological Impact Assessment Revision No. 1, 2374868 Ontario Inc., Badger Conestoga Inc. July 5").



THANK YOU

Additional questions, items, drawings, or reports may be identified during the course of application review.

Thank you for the opportunity to consult prior to filing any *Planning Act* applications.

Sincerely,



Joe Nethery, MCIP, RPP
President

encl.

February 13, 2025

Project No. 2402574 / 120006-017

VIA CLOUDPERMIT: Township of Puslinch

Lynne Banks
Township of Puslinch
4704 Wellington Road 34
Puslinch, ON N0B 2J0

**Re: Pre-Consultation Request
Township File No. D00-ONT
6676-6678 Wellington Road 34
Puslinch, ON**

Dear Ms. Banks:

Following our review of pre-consultation application documents received on January 30, 2025, we are providing comments related to an existing operation on the subject lands located at 6676-6678 Wellington Road 34 in the Township of Puslinch. It is our understanding that the proposed application is a Temporary Use By-Law Amendment for a portion of the site to permit management of liquid waste.

A Zoning By-Law Amendment application was previously submitted for this property and was denied by the Township. A Temporary Use By-Law would permit a land-use that is otherwise prohibited by the Zoning By-Law on the subject lands for a duration of three years.

In support of the identification of engineering requirements, the following documents were received and reviewed:

- Cover Letter, prepared by GSP Group, dated January 27, 2025.
- Figure 2 (Site Layout), prepared by GHD, dated April 13, 2023.

We provide the following requirements in support of Temporary By-Law Amendment:

- **Site Plan**, generally showing existing and proposed aboveground and underground infrastructure, including but not limited to:
 - Buildings
 - Soil offloading, processing, stockpiling and screening locations
 - Outdoor storage areas
 - Parking areas, loading areas, driveways and walkways
 - Lighting, signage, and fencing
 - Wells and septic system
 - Fire routes and fire protection infrastructure
 - Stormwater management infrastructure
 - Property boundaries and limits of operations and zoning.
- **Site Grading and Servicing Plan**, generally showing existing and proposed drainage patterns on the subject lands, confirming legal drainage outlet, and showing existing and proposed infrastructure and services, including but not limited to water lines, septic systems, sanitary sewers, storm sewers and stormwater management facilities.
- **Erosion and Sediment Control Plan**, providing provisions for the control of sediment and potential erosion during construction to limit impacts on surrounding areas and infrastructure.
- **Spills Management Plan**, to document the control of potential spills or contaminated liquid soils on the property.
- **Site Servicing and Stormwater Management Report**, detailing:
 - The existing conditions of the site and any proposed changes to existing infrastructure or operations.
 - How stormwater management and management of imported liquid soil and associated runoff is and will be provided for the site as required by Township standards and MECP guidelines, including:
 - Stormwater and liquid soil runoff quantity control (including stormwater management pond volumes, drawdown times and flow rates under existing and proposed conditions).
 - Stormwater and liquid soil runoff quality control (including TSS removal calculations and sediment removal frequency calculations under proposed conditions).
 - Water balance (including groundwater recharge rates and volumes).
 - Protections and controls related to offloading, stockpiling and processing of potentially contaminated liquid soils.
 - Grading and drainage considerations, including overland flow route and legal outlet.
 - Erosion and sediment controls.
 - Geotechnical and hydrogeological considerations.
 - How the site is serviced by potable water and wastewater servicing.
 - Transportation considerations.

The existing stormwater management pond appears to encroach onto adjacent property. Are there any concerns that this could be an issue in present day or in the future if either property is sold?

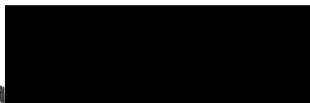
The Township Hydrogeologist should comment on hydrogeological study requirements and potential groundwater contamination concerns related to site operations.

The Puslinch Fire Department should comment on requirements for fire protection and access.

If you have any questions or require additional information, please do not hesitate to contact us.

Sincerely,

GEI Consultants Canada Ltd.



Andrea Reed, P.Eng.
Project Engineer



Parth Lad, E.I.T.
Technical Specialist



Harden Environmental Services Ltd.
4622 Nassagaweya-Puslinch Townline
Moffat, Ontario, L0P 1J0
Phone: (519) 826-0099 Fax: (519) 826-9099

Groundwater Studies
Geochemistry
Phase I / II
Regional Flow Studies
Contaminant Investigations
OMB Hearings
Water Quality Sampling
Monitoring
Groundwater Protection
Studies
Groundwater Modeling
Groundwater Mapping
Permits to Take Water
Environmental Compliance
Approvals

Our File: 2135

March 7, 2025

Township of Puslinch
7404 Wellington Road 34
Guelph, ON, N1H 6H9

Attention: Courtenay Hoytfox
Acting CAO

Dear Courtenay;

**Temporary Zoning Bylaw: Preconsultation
6678 County Road 34, Puslinch Township**

An ECA has been issued for the requested liquid waste disposal at this site. We understand that the zoning does not permit this activity, and the applicant has requested a temporary zoning amendment to allow for the activity. A three-year term has been requested with an additional three-year term upon request.

The monitoring provisions in the ECA issued by the Ministry of the Environment, Conservation and Parks must be carefully reviewed with respect to groundwater pathways between the site and the nearest downgradient private water wells. Is the monitoring system adequately designed to protect these private wells?

To provide comments on the temporary zoning amendment we request that the Township be provided with all supporting documentation listed in the ECA as follows:

- 1) Environmental Compliance Approval received March 27, 2024 requesting approval of a liquid soil processing site, signed by Eric Nafziger, Site Manager, 2374868 Ontario Inc., including all supporting documentation.
- 2) Email dated June 25, 2024 from Dan Puddephatt, P.Geo., GHD, to Pamela Grande, P.Geo., MECP, including the attached letter dated June 25, 2024 from Dan Puddephatt, P.Geo., GHD to Pamela Grande, P.Geo., MECP detailing the

proposed trigger response plan ("GHD, 2024a. Proposed Trigger Response Plan – Conestoga Badger Inc. June 25").

- 3) Email dated July 5, 2024 from Dan Puddephatt, P.Geo., GHD, to Pamela Grande, P.Geo., MECP, including the attached document entitled "Hydrogeological Impact Assessment Revision No.1" dated July 2, 2024 ("GHD, 2024b. Hydrogeological Impact Assessment Revision No. 1, 2374868 Ontario Inc., Badger Conestoga Inc. July 5").

Our focus of the review will be the monitoring program and its adequacy in protecting local and regional groundwater resources.

Sincerely,

Harden Environmental Services Ltd.

A black rectangular redaction box covers the signature area. A thin horizontal line is visible to the right of the box, extending towards the right edge of the page.

Stan Denhoed, P.Eng., M.Sc.
Senior Hydrogeologist



3 - 7 Edinburgh Road South, Guelph, ON, N1H 5N8

February 14, 2025

Lynne Banks
Development and Legislative Coordinator
Township of Puslinch
7404 Wellington Rd. 34, Puslinch, ON
N0B 2J0

RE: 6678 Wellington Rd. 34 Puslinch Pre-Consultation Request - File # D00-ONT

Thank you for inviting Dougan Ecology to provide comments on the pre-consultation request for the above listed property.

A Zoning By-law Amendment was previously submitted for this property alongside an EIS prepared by GHD (2022). This application was refused by the Township following review. The Owner is now proposing a Temporary Use By-law Amendment for a portion of the site, representing 2.16 ha previously used for management of liquid soil. The temporary use provisions would allow the management of liquid waste on the site, for a period of up to 3 years. Following this it would be eligible for an extension of an addition 3 years following Council approval.

The proposed liquid waste management area is located within 120 m of natural heritage features that may be impacted by this work, including:

- Oil Well Bog Little Tract Regional Life Science ANSI;
- Significant Woodlands;
- Significant Wildlife Habitat (confirmed and candidate);
- Species at Risk habitat;
- Waterbodies; and
- Wildlife Corridors

Natural heritage policy applicable to the site includes:

- Migratory Birds Convention Act (1994)



- Provincial Planning Statement Natural Heritage policies (2024)
- Growth Plan for the Greater Golden Horseshoe (2020)
- Paris Galt Moraine Conservation Act (2019)
- Wellington County Official Plan Greenlands (2021)
- County of Wellington Forest Conservation Bylaw 5115-09
- Township of Puslinch Zoning By-law (2018)

The previous EIS was prepared by GHD (2022) in support of a Zoning By-law Amendment for proposed hydro-vac operations on the site. Given that the proposed activities have changed (i.e. the current proposal is for liquid waste disposal), a revised EIS is required to demonstrate natural heritage policy compliance and address potential direct, indirect and cumulative impacts to natural heritage features.

It is expected that the EIS could be largely based on existing background data presented in GHD's EIS (2022) with a revised assessment of impacts, appropriate avoidance, mitigation and enhancement strategies to demonstrate no negative impact to existing natural heritage features and ecological functions. The EIS should clearly demonstrate how the proposal is compliant with federal, provincial, regional, and local natural heritage policy.

We trust this assists the Township in developing the next steps regarding this application.

Sincerely,



Christina Olar, B.Sc. Eco. Mgmt. Tech. ISA
Manager of Ecology



Todd Fell, OALA, CSLA, CERP
Principal, Manager of Landscape
Architecture



Source Water Protection – Planning Application Requirements

As part of the *Clean Water Act* and Source Protection Plan requirements, all proposed development that is subject to a *Planning Act* application on lands located within a vulnerable area shall ensure that proposed development work does not result in a threat to municipal drinking water quality and/or quantity.

Section 1: Property and Application Information

Property Address: 6678 Wellington Road 34

Application Type:

- Official Plan Amendment
 Zoning By-law Amendment
 Site Plan

- Plan of Subdivision
 Plan of Condominium
 Type: _____

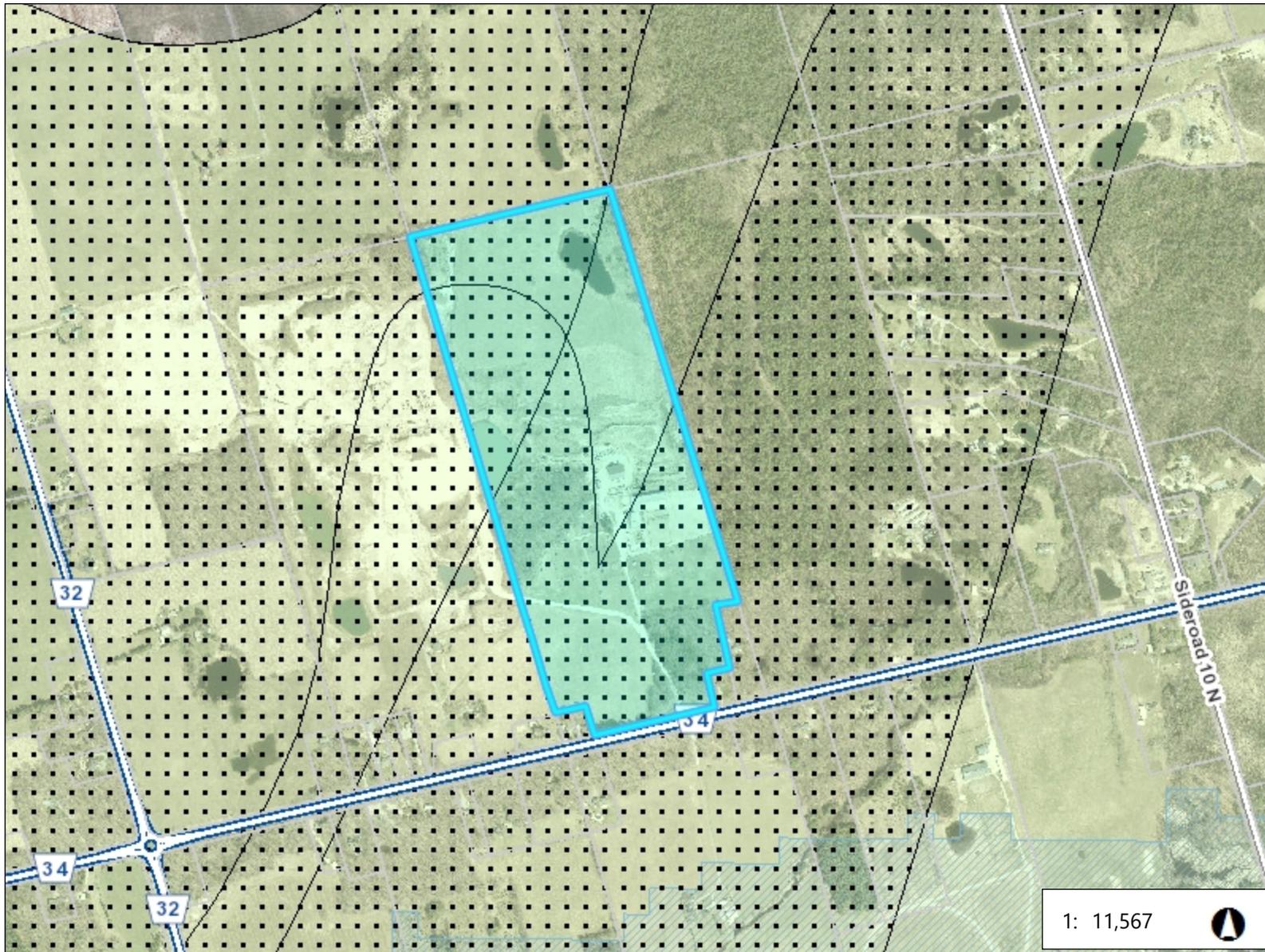
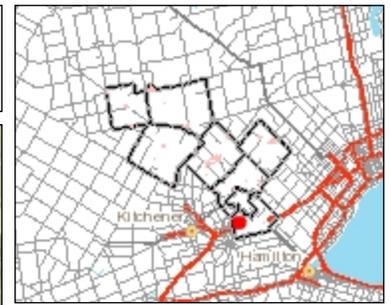
Section 2: Documentation to be provided by the Risk Management Office

	ZBA Application	Site Plan Application	Not Required
Section 59 Notice	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Risk Management Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Section 3: Documentation required to be provided by the owner or their agents

	ZBA Application	Site Plan Application	Not Required
Appendix A: Contact & Proposal Information	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drinking Water Threats Disclosure Report	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Liquid Fuel Handling/Storage Spill Response Plan (>250L)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Winter Maintenance Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Chemical/ Waste Management Storage Spill Response Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hydrogeological Assessment Report	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water Balance Assessment Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Recharge Infiltration Measures	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Flow Meter Installation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Groundwater Monitoring Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Record of Site Condition	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Phase 1 and/or Phase 2 Environmental Assessments	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Please see [Appendix B](#) for required documentation descriptions. Please note, if it is determined that a Site Plan Application is not required, the above noted studies must be completed in support of the ZBA application.



Legend

- Parcels
- Roads**
 - Local Road
 - County Road
 - Highway
- Well Locations**
 - Existing
 - Proposed
- Issue Contributing Area**
 - Chloride
 - Nitrate
 - Sodium
 - TCE
- Wellhead Protection Area**
 - A
 - B
 - C
 - D
- Vulnerability Score**
 - 10
 - 8, D; 8; 8, C
 - 2, 4, 6 (A, B or C)
 - 2,4,6, D; 2,4, D; 2, 4, 6 (D); 4, D; 6,
- HVA
- RoadsLookup

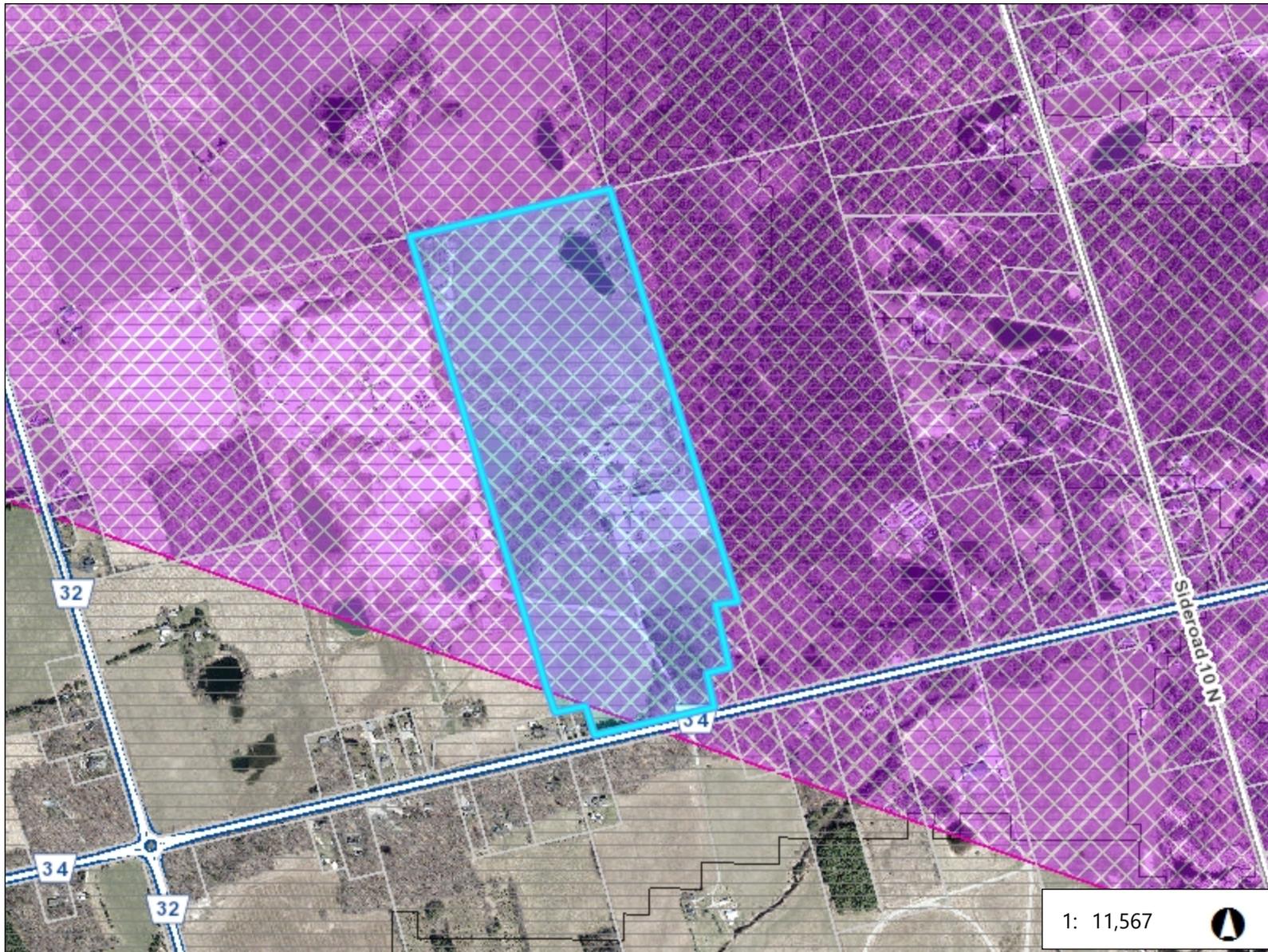
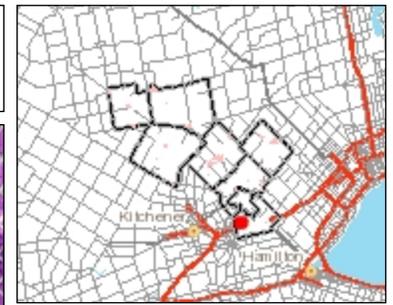
0.6 0 0.29 0.6 Kilometers

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Produced using information under License with the Grand River Conservation Authority. Copyright © Grand River Conservation Authority, 2022.

THIS IS NOT SURVEY DATA. Parcels - Teranet 2002, Wellington County 2022

Notes



Legend

- Parcels
- Roads**
 - Local Road
 - County Road
 - Highway
- Well Locations**
 - Existing
 - Proposed
- WHPA Q1_Q2_Boundary
- WHPA Q1_Q2**
 - Approved
 - Draft
- SGRA
- RoadsLookup

1: 11,567



Notes

February 19, 2025

Township of Puslinch
7404 Wellington Road 34
Puslinch, Ontario
N0B 2J0

Attention: Lynne Banks
lbanks@puslinch.ca

VIA E-MAIL

**Re: Temporary Use By-Law Amendment Application
Liquid Waste Management Facility
Puslinch, Ontario
VCL File: 122-0269**

Dear Ms. Banks:

We have completed our review of the January 27, 2025 letter, prepared by GSP Group, requesting a Pre-Consultation meeting to discuss a Temporary Use By-Law Amendment application. Comments regarding the request are outlined herein.

It appears that the proposed temporary use for a portion of the site is the same or similar to the one previously proposed. The temporary use would initially be permitted for up to three years when the use could be reviewed and extended for a further three years. Even though the use is temporary, it is of long enough duration where potential noise impacts on sensitive receptors in the vicinity is a concern. Thus, the sound emissions from the facility should be mitigated to ensure the noise guideline limits for stationary noise sources in NPC-300 are met.

A noise study was previously prepared in support of the proposed waste processing facility to be located at this location. The noise study was peer reviewed by Valcoustics Canada Ltd. with outstanding items outlined in our letter dated March 16, 2023. A noise study supporting the proposed temporary use and addresses the outstanding previously identified issues should be included as part of the submission requirements. The temporary use should be considered a stationary noise source as defined in MECP Publication NPC-300.

As stated in the GSP Group letter, compatibility is an item that Council would have regard for. The noise study would be part of demonstrating land use compatibility for the proposed temporary use.

If there are any questions, please do not hesitate to call.

Yours truly,

VALCOUSTICS CANADA LTD.

Per:



John Emeljanow, P.Eng.

JEV
2025-02-19 Pre Con Request Review V1.0.docx

Appendix “B” – Draft Temporary Use By-law

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW NUMBER _____

**A BY-LAW TO AMEND BY-LAW NUMBER 023/18, AS AMENDED,
BEING THE ZONING BY-LAW OF THE TOWNSHIP OF PUSLINCH**

WHEREAS, the Council of the Corporation of Puslinch deem it appropriate and in the public interest to amend By-Law Number 023/18 pursuant to Section 34 & 39 of the Planning Act, R.S.O. 1990 as amended;

**NOW THEREFORE THE COUNCIL OF THE CORPORATION OF THE
TOWNSHIP OF PUSLINCH ENACTS AS FOLLOWS:**

1. That Schedule “A” of By-law 023/18, as amended, be further amended by rezoning the lands described legally as Part of South Half Lot 8, Concession 3, and known municipally as 6678 Wellington Road 34 in the Township of Puslinch, from Extractive Special Provision (EXI)(sp63) to a Temporary Special Provision (EXI^T) as shown on Schedule “A” to this By-law.
2. That Table 16.1 of By-law 023/18 be amended by adding the following Temporary Special Provision (EXI^T):

No.	Zone	Temporary Uses	Date Enacted	Date Expired
X	EXI(sp63)	In addition to the uses permitted in subsection 9.2, permitted uses include a liquid soil management operation/business limited to a 1-storey, 650 square feet office/maintenance building, area for soil offloading and management, soil processing and stockpiling and screening including a temporary pond and drainage swale. A maximum of 25 truck parking spaces and 35 employee/visitor are permitted.	_____, 2025	_____, 2025

3. That except as amended by this By-law, the subject lands as shown on Schedule “A” to this By-law, shall be subject to all other applicable regulations of By-law 023/18, as amended.

4. Schedule "A" attached hereto forms part of this By-law.

5. This By-law shall take effect from its date of passage by Council and shall come into force either upon approval by the Ontario Land Tribunal or upon compliance with Sections 34 and 39 of the Planning, R.S.O. 1990, C.P 13.

READ A FIRST AND SECOND TIME THIS _____ OF _____, 2025.

MAYOR

CLERK

READ A THIRD TIME AND PASSED THIS _____ OF _____, 2025.

MAYOR

CLERK

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW NUMBER _____

Schedule "A"

INSERT MAP

This is Schedule "A" to By-law No. _____

Passed this ____ day of _____, 2025.

MAYOR

CLERK

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

EXPLANATION OF BY-LAW NO. _____

By-law Number _____ amends the Township of Puslinch Zoning By-law 23/18 by rezoning Part of South Half Lot 8, Concession 3, and municipally referred to as 6678 Wellington Road 34 to permit the temporary use of a liquid soil management operation including parking for truck and vehicles for a temporary period of three (3) years.

The area subject to be rezoned for the temporary use is approximately 2.9 hectares (7.2 acres) in size with one building on-site as shown on Schedule A.

Within the County's Official Plan, the area to be rezoned is designated as Secondary Agricultural and Greenlands. The land use permissions for the Secondary Agricultural designation allows for aggregate extraction and ancillary uses.