

Feasibility Noise Study – Phase 1

NewCold Cold Storage Facility Project

NewCold Advanced Cold Logistics

Project number: 60682143

April 19, 2023

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Revision History

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1. Introduction

AECOM Canada Ltd. (AECOM) was retained by NewCold Advanced Cold Logistics (NewCold) to provide a Feasibility Noise Study in support of their Cold Storage Facility project (the Project), located at 384 Crawley Road, in the Southgate Business Park, the City of Guelph. Currently the Project is in the stage of Site Plan Application (SPA) for Phase 1.

This report assesses the status of compliance of the Project with respect to the City of Guelph Noise Control Guidelines (the Noise Guidelines) and the Ontario Ministry of the Environment, Conservation and Parks (MECP) noise guidelines NPC-300. The noise study was prepared in consistent with the methods described in the Noise Guidelines and NPC-300.

This Feasibility Noise Study of Phase 1 was completed to support the process of the SPA of Phase 1 for the Project. The focus of this noise study was based on the location of the noise sensitive land uses, and the Project needs. The purpose of this study is to provide information to the SPA process and support the site concept plan development; support the development review engineering in a way that will minimize the requirements for noise mitigation; and update the study during the detailed engineering design phase.

Based on the type of the Project with food production/storage facility, vibration caused by the Project operations is insignificant on the surrounding environment, therefore, a vibration assessment is not included in this study.

2. Facility Description

The Project is located in an industrial land use zoning category according to the City of Guelph and will operate 24 hours, 7 days a week. The Project is a multi-phase project and will be developed with several operational facilities, including ambient storage facility, frozen storage facilities, chilled storage facilities, food production facilities, and other ancillary facilities. Phase 1 of the Project will operate a frozen storage facility. The proposed site plan outlining each phase of the project is presented in **Figure 1**.

3. Noise Source Summary

Significant noise sources in Phase 1 of the Project incorporated in this assessment includes the following equipment:

- HVAC units
- Exhaust Fans
- Condensers
- Compressors
- Evaporators
- Pumps
- Chiller
- Conveyors
- Onsite vehicle traffic movements (e.g., transportation vehicles, loading vehicles, etc.)

Modelled noise source emissions were established based on past measurements of similar equipment, or commonly accepted engineering prediction methods. No equipment on site is planned for emergency use or operation. **Figure 2** illustrates outside noise source locations at the Project site. The noise sources may be reviewed and updated in the detailed engineering design phase with more specifications available. **Table 3-1** summarizes the significant noise sources and associated sound power levels included in the acoustic modelling assessment.

Table 3-1: Project Noise Sources Sound Power Levels- dB (re. 10⁻¹² W)

Equipment	Qty	Octave Band Centre Frequency, Hz										dBA	Noise Control Measures	Sound Characteristics	Location
		31.5	63	125	250	500	1000	2000	4000	8000					
Frozen Hi-Bay Building															
Compressor	2	81	82	86	95	94	91	86	81	79	96	Uncontrolled	Steady	Indoor	
Pumps	3	94	96	96	97	95	94	90	86	85	98	Uncontrolled	Steady	Indoor	
Chiller	1	86	88	96	97	94	91	88	82	77	96	Uncontrolled	Steady	Indoor	
Conveyor	3	84	83	78	76	77	78	68	68	67	81	Uncontrolled	Steady	Indoor	
Other equipment and forklift operation	1	80	82	85	88	90	87	85	82	78	92	Uncontrolled	Steady	Indoor	
Total	-	95	97	99	101	100	97	94	89	87	102				
Evaporator	2	75	76	80	84	85	84	80	75	73	88	Uncontrolled	Steady	Outdoor	
Condensers	3	100	102	105	102	98	98	92	86	81	102	Uncontrolled	Steady	Outdoor	
Rooftop HVAC units	6	88	87	97	94	92	89	83	79	75	94	Uncontrolled	Steady	Outdoor	
Rooftop exhaust	3	89	87	86	84	86	87	84	77	71	91	Uncontrolled	Steady	Outdoor	
Pump Station															
Louver	2	93	95	95	96	94	93	89	85	84	98	Uncontrolled	Steady	Outdoor	
Rooftop exhaust	2	89	87	86	84	86	87	84	77	71	91	Uncontrolled	Steady	Outdoor	
Pumps	3	89	91	91	92	90	89	85	81	80	93	Uncontrolled	Steady	Indoor	
Transportation sources															
Freight trucks exiting and entering site (per hour)	13	117	117	122	117	113	111	109	104	99	117	Uncontrolled	Steady	Outdoor	
Idling Trucks (per hour)	3	90	101	92	83	83	88	84	78	71	91	Uncontrolled	Steady	Outdoor	
Notes:															
<ul style="list-style-type: none"> Sound levels are for single unit sound power level, unadjusted for quantity. 															

4. Points of Reception

Four (4) residential locations have been identified as representative noise sensitive Points of Reception (POR) surrounding the Facility. As defined in in MECP Publication NPC-300, and further discussed in Section 5, noise from stationary noise sources is required to be addressed at both Plane of Window (POW), and Outdoor (OUT) locations. As per NPC-300, both the POW and OUT locations have been assessed as:

- Plane of Window (POW) – A point in space corresponding with the centre location of a first storey window, at a height of 1.5 metres above grade; or a second storey window, at a height of 4.5 metres above grade.
- Outdoor (OUT) – A point in space within 30 metres of the dwelling, at a height of 1.5 metres above grade.

The PORs near the Facility are defined as Class 2 area, based on the definitions provided in NPC-300 and the land-use zoning maps for the City of Guelph and Township of Puslinch. NPC-300 describes a Class 2 area as “an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 areas with “sound levels characteristics of Class 1 during daytime (07:00 to 19:00 or to 23:00 hours); and low evening and night background sound level defined by natural environment and infrequent human activity as early as 19:00 hours (19:00 or 23:00 to 07:00 hours)”.

Table 4-1: Project Points of Reception

Point of Reception ID		Distance to Nearest Facility Structure (m)	Point of Reception Location	Point of Reception Description	Location
R1	R1_POW	187	Plane of Window	Façade of two storey detached home at a height of 4.5 m	South of the Project Area.
	R1_OUT	182	Outdoor	Backyard of dwelling at a height of 1.5 m approximately 3 m from façade.	
R2	R2_POW	31	Plane of Window	Façade of two storey detached home at a height of 4.5 m	West of the Project Area.
	R2_OUT	39	Outdoor	Side yard of dwelling at a height of 1.5 m approximately 3 m from façade.	
R3	R3_POW	525	Plane of Window	Façade of two storey detached home at a height of 4.5 m	East of the Project Area.
	R3_OUT	555	Outdoor	Backyard of dwelling at a height of 1.5 m approximately 3 m from façade.	
R4	R4_POW	77	Plane of Window	Façade of two storey detached home at a height of 4.5 m	South-east of the Project Area.
	R4_OUT	72	Outdoor	Backyard of dwelling at a height of 1.5 m approximately 3 m from façade.	

The locations of the receptors are presented in **Figure 3**.

5. Assessment Criteria

The City of Guelph Noise Control Guidelines, version 1.0, in effect as of January 1, 2019 (the Noise Guidelines) provides guidance for development applications which relate to the compatibility of land uses and noise generating sources such as roads and industrial facilities. Noise emissions from any development shall comply with the Noise Guidelines, as well as the applicable Provincial and Federal legislation, policies, regulations, and standards.

The Noise Guidelines are practically intended to work together in concert with the MECP noise guideline: “Environmental Noise Guidelines Stationary and Transportation Sources – Approval and Planning” Publication NPC-300.

The subject area is best described as Class 2 (Urban), based on the definitions provided in NPC-300. NPC-300 defines separate minimum sound level limits (Exclusion Limit within NPC-300) for the noise emissions from stationary sources of noise and the testing of emergency equipment. However, the Facility does not contain any equipment for emergencies. **Table 5-1** summarizes the applicable minimum one-hour L_{eq} exclusion sound level limits for PORs located in Class 2 areas for stationary noise sources.

Table 5-1: MECP Stationary Source Sound Level Exclusion Limits for Class 2 (Urban) Areas

Time Period	Point of Reception Location	Minimum One Hour L_{eq} Sound Level Limit (dBA)
Daytime (07:00 h – 19:00 h)	Plane of Window	50
Evening (19:00 h – 23:00 h)	Plane of Window	50
Nighttime (23:00 h – 07:00 h)	Plane of Window	45
Daytime (07:00 h – 19:00 h)	Outdoor	50
Evening (19:00 h – 23:00 h)	Outdoor	45
Nighttime (23:00 h – 07:00 h)	Outdoor	-

In accordance with the MECP, the sound level limits at each POR may be determined as the greater of either:

- The minimum background sound level that occurs or is likely to occur during operation of the source under assessment; or
- The applicable minimum sound level limit, as indicated in **Table 5-1** (Table B-1 within publication NPC-300)

For this assessment, the minimum sound level limit, as indicated in **Table 5-1** have been adopted as the Sound Level Limit Objective for the assessed PORs.

6. Impact Assessment

6.1 Acoustic Modelling

Sound propagation calculations were conducted in accordance with International Organisation for Standardisation (ISO) publication Standard 9613-2, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation (ISO 1996).

Sound propagation predictions were performed using Cadna/A modelling software, authored by DataKustik, which implements the ISO prediction algorithms and is widely used in industrial noise assessment. Noise sources were represented in the acoustic model as follows:

- Sources that emit noise from a stationary position were represented as a point source (e.g., HVAC units).
- Building walls were modelled as vertical area sources.
- Building roofs were modelled as area sources.
- Mobile sources were modelled as line sources (e.g., trucks).

Table 6-1 summarizes the Cadna/A acoustic modelling parameters.

Table 6-1: Modelling Parameters

Item	Model Parameter	Model Setting
1	Temperature	10°C
2	Relative Humidity	70%
3	Propagation Standard	ISO 9613-2
4	Ground Conditions and Attenuation Factor	Ground Absorption (G): 0.75 (e.g. moderate absorptive ground covered by grass, trees or other vegetation) outside of the Project site. 0.35 (e.g. relatively reflective ground covered with paved road) immediate surrounding of the Project site.
5	Receptor Height	1.5 m Outdoor 4.5 m Plane of Window one storey house
6	Topography	Flat
7	Operating Conditions	All equipment operating during day, evening, and nighttime periods at maximum throughput

6.2 Modelling Results

Acoustic modelling assessed the 1-hour equivalent sound levels representing normal operation of Phase 1 of the Project during the daytime, evening, and nighttime periods. Noise sources associated with the Project’s operation summarized in **Table 3-1** were used as inputs to the acoustic model.

The predicted 1-hour equivalent sound levels at identified PORs during normal operation are listed in **Table 6-2**. **Figure 4 and Figure 5** illustrates the predicted sound levels and noise contours at the PORs. Individual noise source contributions are provided in Appendix C.

Table 6-2: Acoustic Assessment Summary Table

Point of Reception ID	Point of Reception Description	Time Period	Predicted Sound Level ($L_{eq, 1-HR}$, dBA)	MECP Sound Level Limits ($L_{eq, 1-HR}$, dBA)	Compliance (Yes/No)
R1_POW	Plane of Window	Daytime	41	50	Yes
		Evening	41	50	Yes
		Nighttime	41	45	Yes
R1_OUT	Outdoor	Daytime	40	50	Yes
		Evening	40	45	Yes

Point of Reception ID	Point of Reception Description	Time Period	Predicted Sound Level ($L_{eq, 1-HR}$, dBA)	MECP Sound Level Limits ($L_{eq, 1-HR}$, dBA)	Compliance (Yes/No)
R2_POW	Plane of Window	Daytime	43	50	Yes
		Evening	43	50	Yes
		Nighttime	43	45	Yes
R2_OUT	Outdoor	Daytime	43	50	Yes
		Evening	43	45	Yes
R3_POW	Plane of Window	Daytime	36	50	Yes
		Evening	36	50	Yes
		Nighttime	36	45	Yes
R3_OUT	Outdoor	Daytime	33	50	Yes
		Evening	33	45	Yes
R4_POW	Plane of Window	Daytime	43	50	Yes
		Evening	43	50	Yes
		Nighttime	43	45	Yes
R4_OUT	Outdoor	Daytime	42	50	Yes
		Evening	42	45	Yes

Modelling results in **Table 6-2** indicate that the predicted sound levels at the PORs would not exceed the MECP sound level limits during operation. **Table B- 1** in Appendix B provides the sound level contributions of each noise source at the receptor locations.

Note that from the modeling results, it was found that the onsite freight truck movements made notable noise contributions at the PORs. However, following the completion of the building structures of other phases, the buildings will provide natural shielding for the onsite vehicle movements and will significantly reduce the noise contributions of these sources at the PORs.

7. Mitigation and Noise Abatement Action Plan

Results in Section 6 indicate that sound level limits are not exceeded at any of the PORs. Therefore, noise mitigation is not expected for Phase 1 of the Project. During the detailed engineering design phase, following the timeline that the SPA has been developed and approved with sufficient design details of the Project, noise mitigation will be further reviewed and identified, if required. The Feasibility Noise Study will be then finalized to fulfil the requirements of the Site Plan submission.

8. Noise Impact Assessment for New East-west Extension of Southgate Road

Note that the Project proposes the east-west extension of the Southgate Road to fulfill the future transportation requirements for the Project. Noise impact from the traffic due to the new road on nearby noise sensitive lands and receptors is assessed, a noise model is developed and include the traffic volume data based on the latest traffic study or traffic projection. The results of the traffic noise study are incorporated with the Feasibility Noise Study for Phase 1 of the Project and included in an independent noise analysis report.

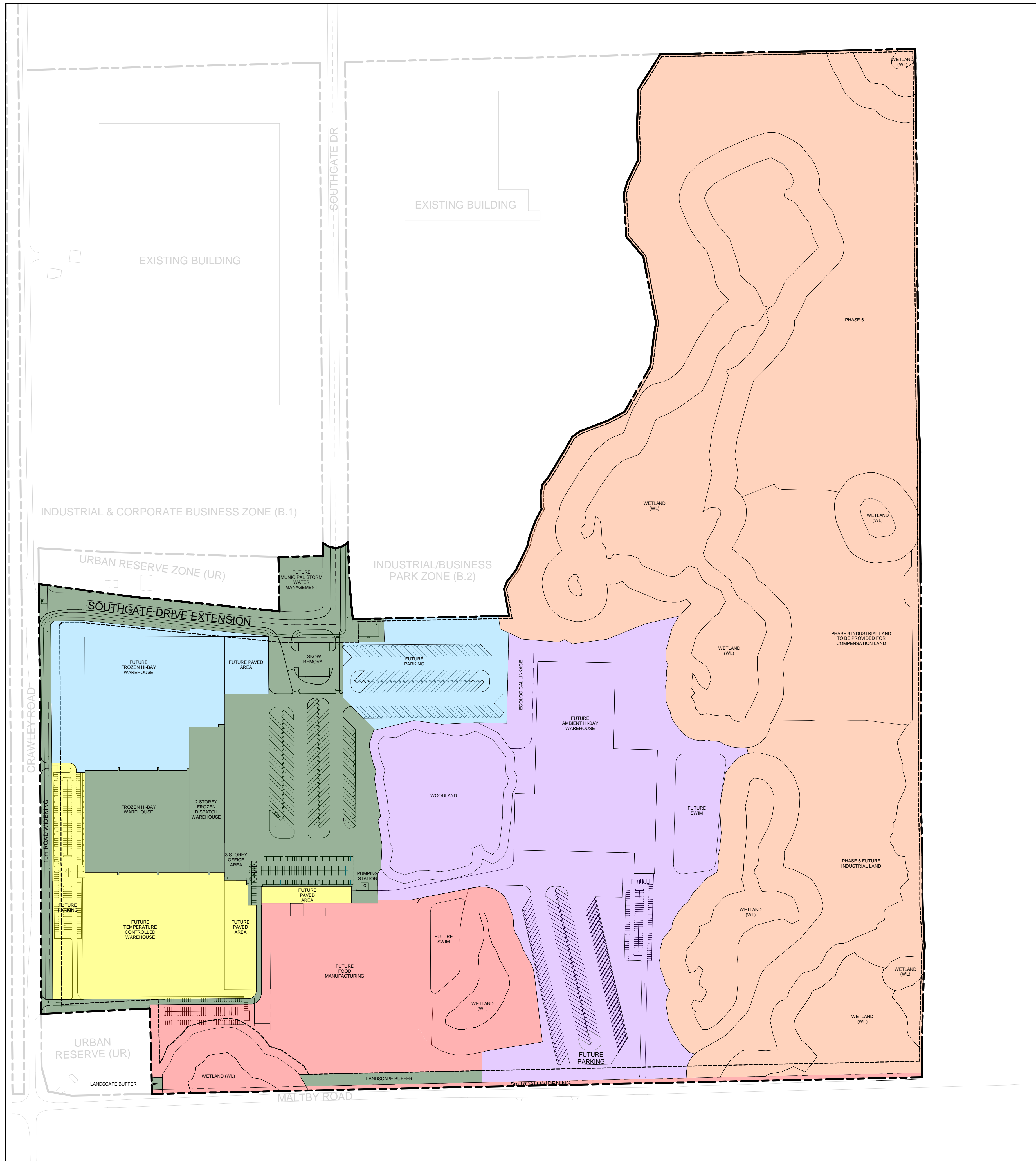
9. Conclusions

AECOM was retained by NewCold to prepare a Feasibility Noise Study for their project located at 384 Crawley Road, Guelph. The current modelled noise sources represent Phase 1 of the Project. The acoustic modelling results of the noise emissions at identified PORs indicated that Phase 1 of the Project will operate in compliance with the applicable MECP sound level limits and further noise mitigation is not expected. A noise assessment analysis for the east-west extension of the Southgate Road is developed and included in an independent noise analysis report.

10. References

1. ISO (International Organization for Standardization). 1996. Standard 9613-2, Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation. Geneva, Switzerland.
2. Ontario Ministry of Environment, Conservation and Parks (MECP), Publication NPC-300: Stationary and Transportation Sources – Approval and Planning, October 1995.
3. Ontario Ministry of Environment, Conservation and Parks (MECP), Publication NPC-233: Information to be Submitted for Approval of Stationary Sources of Sound, August 2013.
4. David A. Bies and Colin H. Hansen. 2009. Engineering Noise Control Theory and Practice – Fourth Edition. Chippenham, Wiltshire.
5. Guelph Noise Control Guidelines, Version 1.0, City of Guelph, November 2018 – In effect as of January 1, 2019
6. The City of Guelph Official Plan, March 2018 Consolidation.
7. Guidelines for the Preparation of Environmental Impact Studies, City of Guelph, Version 2, April 2020.
8. Bylaw Number (2000) – 16366, The Corporation of the City of Guelph.

Figures



SITE LEGEND			
---	EXISTING PROPERTY LINE	---	SETBACK LINE
---	FUTURE PROPERTY LINE		

PHASING LEGEND					
[Green Box]	PHASE 1	[Red Box]	PHASE 3	[Purple Box]	PHASE 5
[Yellow Box]	PHASE 2	[Blue Box]	PHASE 4	[Orange Box]	PHASE 6



PROJECT
NEWCOLD COLD STORAGE FACILITY
384 CRAWLEY ROAD,
GUELPH, ON L1L 1G5

CLIENT
NEWCOLD ADVANCED COLD LOGISTICS

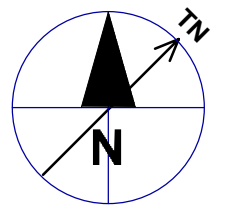
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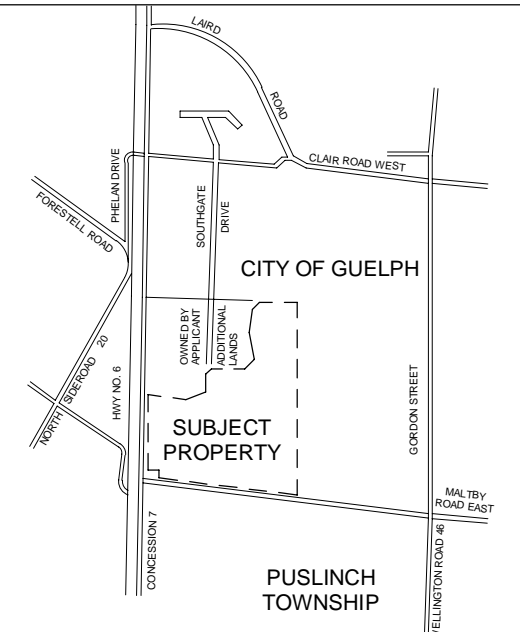


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NO.	DATE	ISSUED FOR SPA PHASE 1
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KEY PLAN



PROJECT NUMBER
60682143
SHEET TITLE
PHASING PLAN

SHEET NUMBER
A-101

Figure 1: Project Site Plan Map

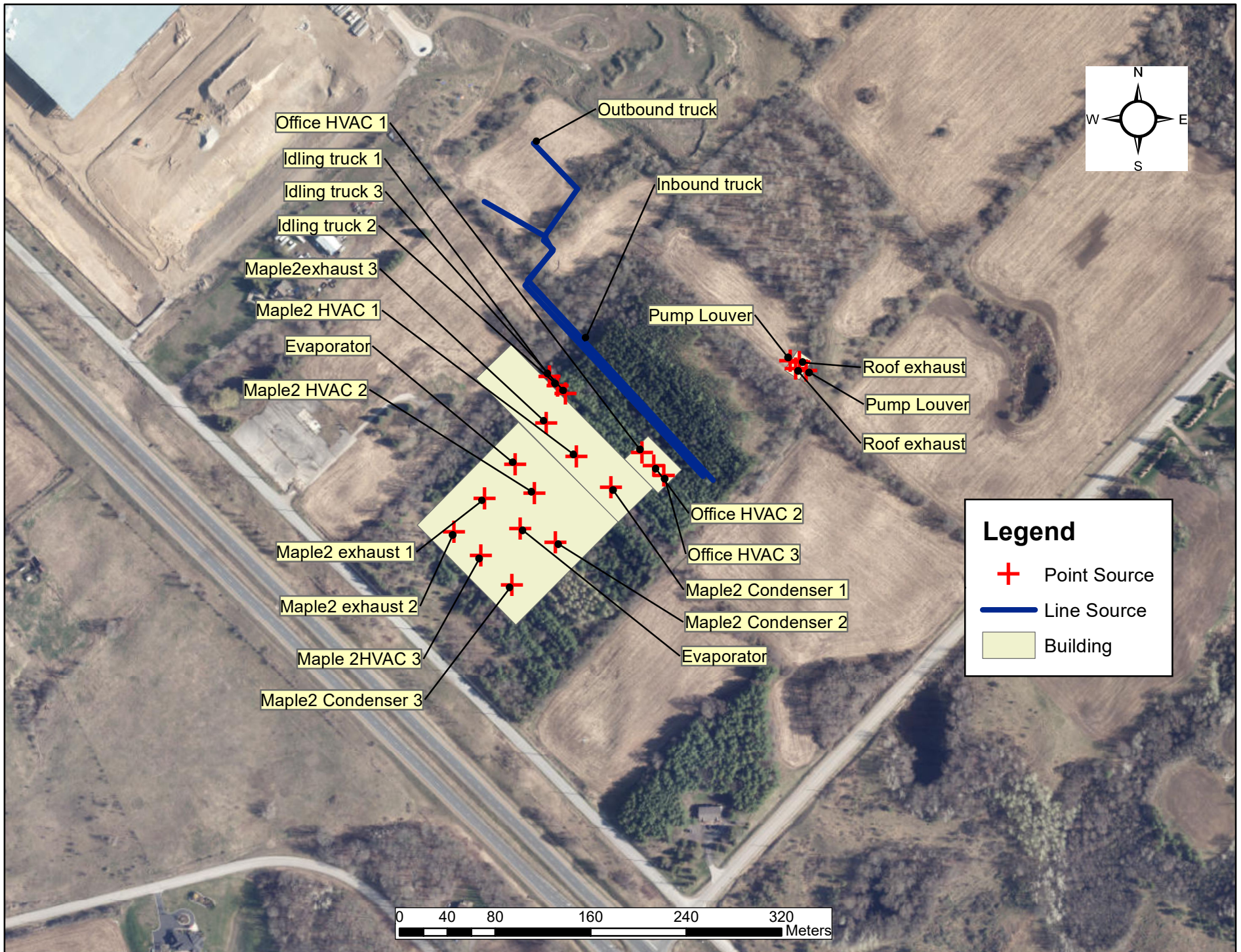


Figure 2: Project Noise Sources



Figure 3: Project Points of Reception

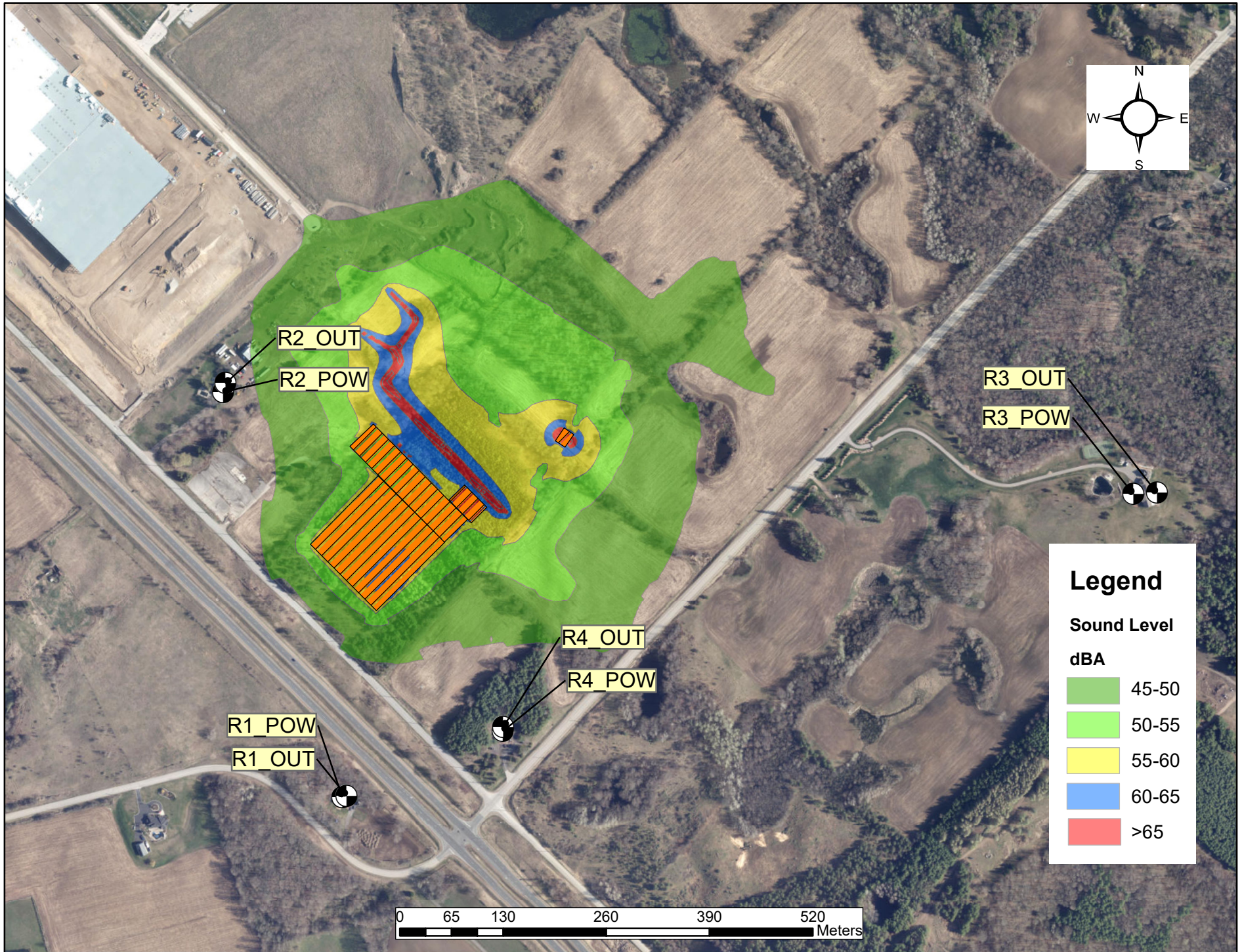


Figure 4: 1.5 m Height Noise Contour Prediction Results

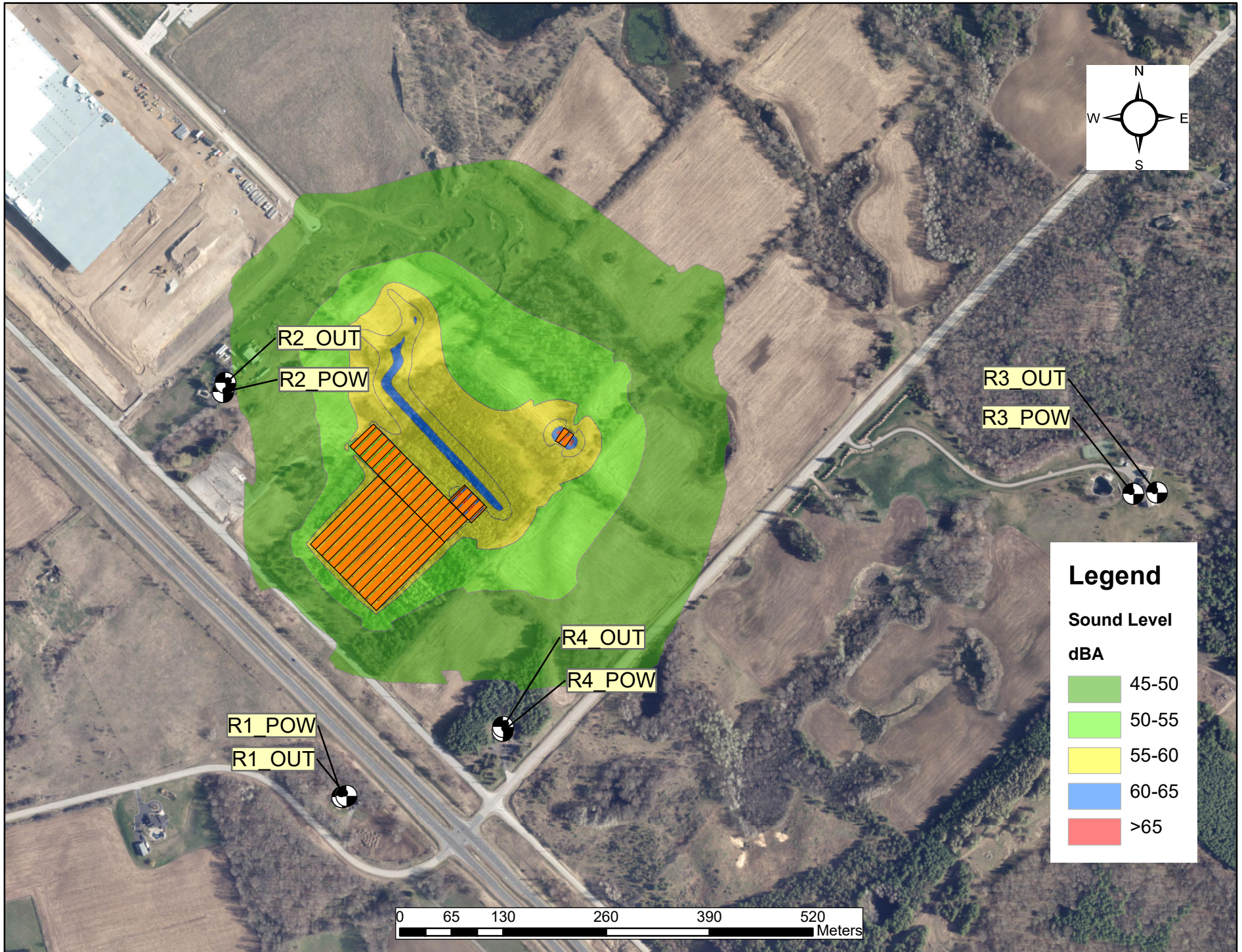
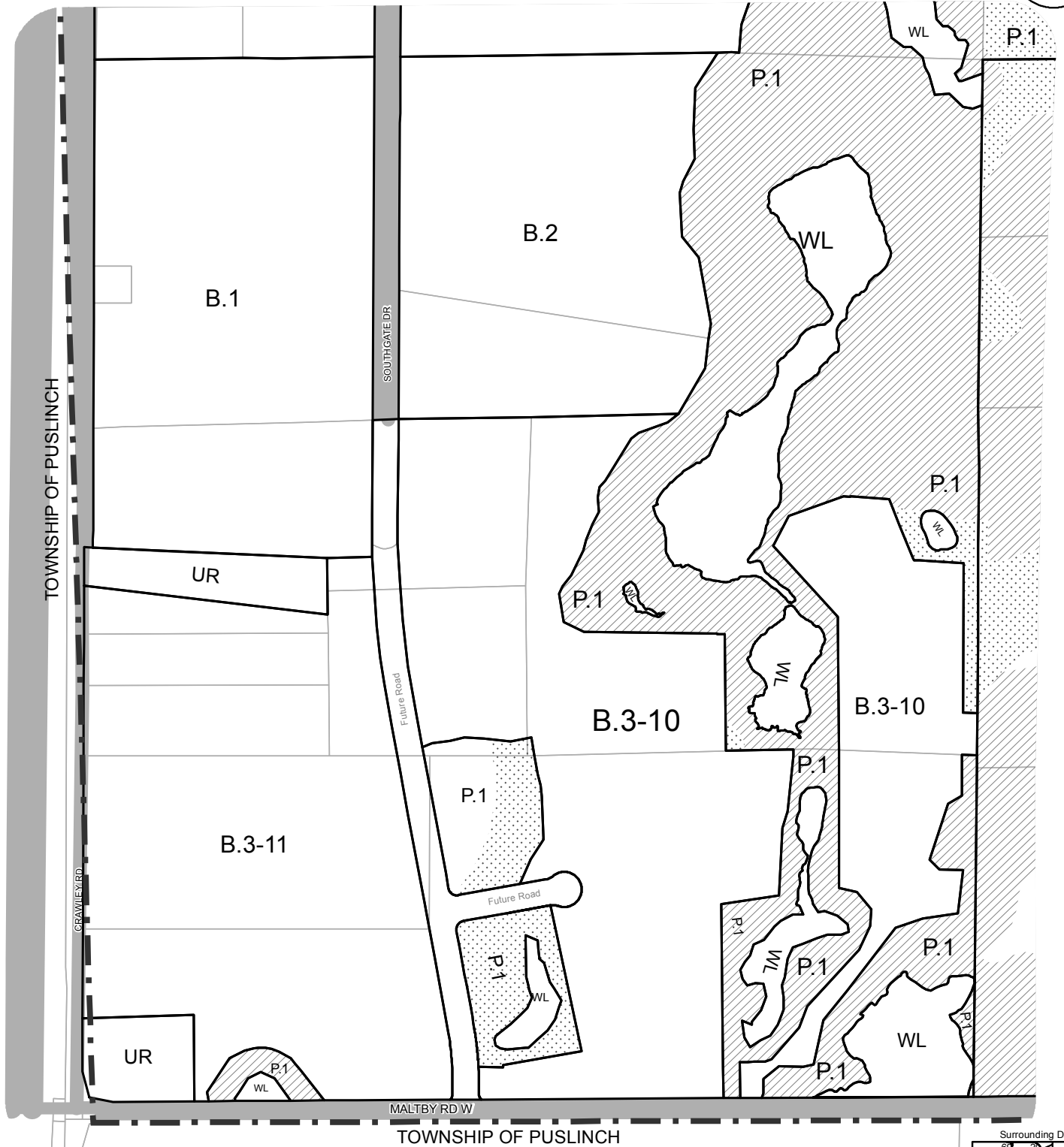


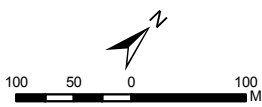
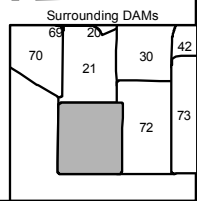
Figure 5: 4.5 m Height Noise Contour Prediction Results

Appendix A Land Use Zoning Maps



LANDS ADJACENT TO PROVINCIALLY SIGNIFICANT WETLANDS (See Section 13.3)
 LANDS WITH ONE OF THE FOLLOWING: LOCALLY SIGNIFICANT WETLANDS, SIGNIFICANT WOODLOTS, NATURAL CORRIDOR, OR LINKAGE (See Section 13.4)

LANDS WITHIN THE SPECIAL POLICY AREA (See Section 12.4)
 LANDS WITHIN THE FLOOD FRINGE (See Section 12.3)



CITY OF GUELPH BY-LAW (1995) - 14864
As last amended by By-law (2010) - 19063

SCHEDULE 'A'



Appendix B Noise Impact Table

Table B- 1

Source ID	R1_POW				R1_OUT			R2_POW				R2_OUT			R3_POW				R3_OUT			R4_POW				R4_OUT				
	Src-POR Distance (m)	Day Leq (dBA)	Eve Leq (dBA)	Night Leq (dBA)	Src-POR Distance (m)	Day Leq (dBA)	Eve Leq (dBA)	Src-POR Distance (m)	Day Leq (dBA)	Eve Leq (dBA)	Night Leq (dBA)	Src-POR Distance (m)	Day Leq (dBA)	Eve Leq (dBA)	Src-POR Distance (m)	Day Leq (dBA)	Eve Leq (dBA)	Night Leq (dBA)	Src-POR Distance (m)	Day Leq (dBA)	Eve Leq (dBA)	Src-POR Distance (m)	Day Leq (dBA)	Eve Leq (dBA)	Night Leq (dBA)	Src-POR Distance (m)	Day Leq (dBA)	Eve Leq (dBA)	Src-POR Distance (m)	Day Leq (dBA)
Mp2cond_1	271	35	35	35	269	34	34	307	29	29	29	314	28	28	964	24	24	24	993	23	23	246	36	36	36	243	35	35		
Mp2cond_2	314	33	33	33	311	32	32	306	29	29	29	312	28	28	923	24	24	24	953	24	24	254	36	36	36	250	35	35		
Mp2cond_3	371	32	32	32	368	32	32	316	29	29	29	319	28	28	874	30	30	30	904	24	24	279	35	35	35	274	34	34		
Mp2hvac_1	293	27	27	27	292	26	26	272	24	24	24	279	23	23	987	16	16	16	1016	15	15	282	23	23	23	279	22	22		
Mp2hvac_2	293	27	27	27	292	26	26	272	24	24	24	279	23	23	987	16	16	16	1016	15	15	282	23	23	23	279	22	22		
Mp2hvac_3	293	27	27	27	292	26	26	272	24	24	24	279	23	23	987	16	16	16	1016	15	15	282	23	23	23	279	22	22		
Mp2ex_1	313	23	23	23	312	22	22	243	22	22	22	250	21	21	1008	11	11	11	1037	10	10	312	16	16	16	308	15	15		
Mp2ex_2	313	23	23	23	312	22	22	243	22	22	22	250	21	21	1008	11	11	11	1037	10	10	312	16	16	16	308	15	15		
Mp2ex_3	313	23	23	23	312	22	22	243	22	22	22	250	21	21	1008	11	11	11	1037	10	10	312	16	16	16	308	15	15		
ldletrk_1	449	-9	-9	-9	447	-9	-9	232	3	3	3	232	4	4	927	9	9	9	957	8	8	383	-7	-7	-7	379	-7	-7		
ldletrk_2	443	-9	-9	-9	440	-9	-9	240	2	2	2	241	3	3	920	9	9	9	949	8	8	374	-6	-6	-6	369	-6	-6		
ldletrk_3	438	-9	-9	-9	435	-9	-9	249	1	1	1	249	2	2	913	9	9	9	942	8	8	365	-6	-6	-6	361	-6	-6		
pump_ex1_ph1	529	24	24	24	525	23	23	432	27	27	27	431	26	26	722	20	20	20	751	19	19	375	28	28	28	369	27	27		
pump_ex2_ph1	535	24	24	24	531	23	23	435	27	27	27	433	26	26	720	20	20	20	749	19	19	380	27	27	27	375	27	27		
pump_lv1_ph1	533	22	22	22	529	20	20	427	29	29	29	425	28	28	727	5	5	5	756	3	3	380	17	17	17	375	15	15		
pump_lv2_ph1	532	27	27	27	528	25	25	441	11	11	11	440	10	10	713	23	23	23	742	20	20	375	30	30	30	369	28	28		
ohvac_1	408	9	9	9	405	8	8	327	11	11	11	328	10	10	848	23	23	23	877	21	21	301	23	23	23	296	21	21		
ohvac_2	401	15	15	15	398	13	13	340	10	10	10	342	9	9	838	23	23	23	867	21	21	288	33	33	33	283	32	32		
ohvac_3	397	30	30	30	394	28	28	351	10	10	10	353	9	9	830	23	23	23	859	21	21	279	34	34	34	274	32	32		
Evaporator_1	320	16	16	16	317	14	14	277	16	16	16	282	15	15	952	10	10	10	982	9	9	280	17	17	17	276	15	15		
Evaporator_2	372	13	13	13	370	12	12	239	21	21	21	243	20	20	954	10	10	10	984	9	9	327	14	14	14	323	13	13		
Inbound_truck_oph1	-	23	23	23	-	22	22	-	37	37	37	-	37	37	-	26	26	26	-	23	23	-	28	28	28	-	27	27		
Outbound_truck_oph1	-	23	23	23	-	22	22	-	40	40	40	-	39	39	-	28	28	28	-	26	26	-	29	29	29	-	28	28		
Pump_rooftop_ph1	-	8	8	8	-	8	8	-	10	10	10	-	10	10	-	5	5	5	-	5	5	-	11	11	11	-	11	11		
rooftop_ph1	-	-13	-13	-13	-	-13	-13	-	-12	-12	-12	-	-12	-12	-	-20	-20	-20	-	-20	-20	-	-12	-12	-12	-	-13	-13		
Pump_wall_ph1	-	25	25	25	-	24	24	-	27	27	27	-	26	26	-	22	22	22	-	20	20	-	28	28	28	-	27	27		
Warehouse Wall_oPh1	-	24	24	24	-	22	22	-	26	26	26	-	24	24	-	15	15	15	-	12	12	-	24	24	24	-	22	22		

