Township of Puslinch

FEASIBILITY STUDY REPORT
FEASIBILITY STUDY FOR
MUNICIPAL WATER AND SEWAGE SERVICING
IN THE TOWNSHIP OF PUSLINCH

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1. Introduction

1.1 Background

The Township of Puslinch (Township) has undertaken a Feasibility Study to assess the viability of implementing municipal water and sewage services within key areas of the Township. Currently, water and sewage services in the Township consist of individual on-site wells and septic systems, as well as a few small and private communal water and sewage systems servicing individual developments.

The Township is surrounded by growing urban centres on all four sides with increasing demands for resources and land. The natural setting surrounding the Township and its accessibility to major markets and urban centres make this area an attractive place for development. Realizing this potential and the limitations on opportunities for growth resulting from lack of servicing, the need to assess the viability of implementing municipal water and sewage services for key areas within the Township was identified. CIMA+ was retained by the Township to complete the Feasibility Study.

1.2 Purpose of this Report

This Feasibility Study Report describes the key activities that have been undertaken as part of this assignment and the preliminary results of such activities, including:

+ A description of the project study area; including current land use designations, plans for future growth and development; and overview of existing key users;
+ Development of preliminary estimates of future water demands and sewage flows for the study area based on analysis of existing available information and general design criteria, as recommended by the Ministry of Environment and Climate Change (MOECC) for drinking water and sewage systems;
+ Development of high-level water and sewage servicing options, including major infrastructure requirements and estimates of probable cost associated with each option;
+ Results of high-level assessment of water and sewage servicing options, including key advantages and disadvantages for each servicing option considered in the study;
+ A review of potential cost recovery tools available to fund the capital works associated with the servicing options and a preliminary assessment of the upfront and annual costs of each option;
+ Identification of further studies required in order to establish a suitable cost recovery strategy; and,
+ Results of the public consultation activities including distribution of a Municipal Servicing Questionnaire and a Public Information Centre.

2. Project Study Area

2.1 Overview

The Township of Puslinch is located in south-central Ontario in Wellington County, generally southeast of the City of Guelph. The Township, along with six other lower tier municipalities, make up the County of Wellington.

A study area has been delineated to comprise key growth areas within the Township. The project Study Area is generally bounded by Maltby Road to the north, Victoria Road South to the east, Highway 401 to the south, and Highway 6 to the west, plus the settlement area of Morriston south of Highway 401, as shown below in Figure 1. Two major urban centres, Aberfoyle and Morriston, are found within the limits of the study area. The City of Guelph abuts the northern most limits of the study area.

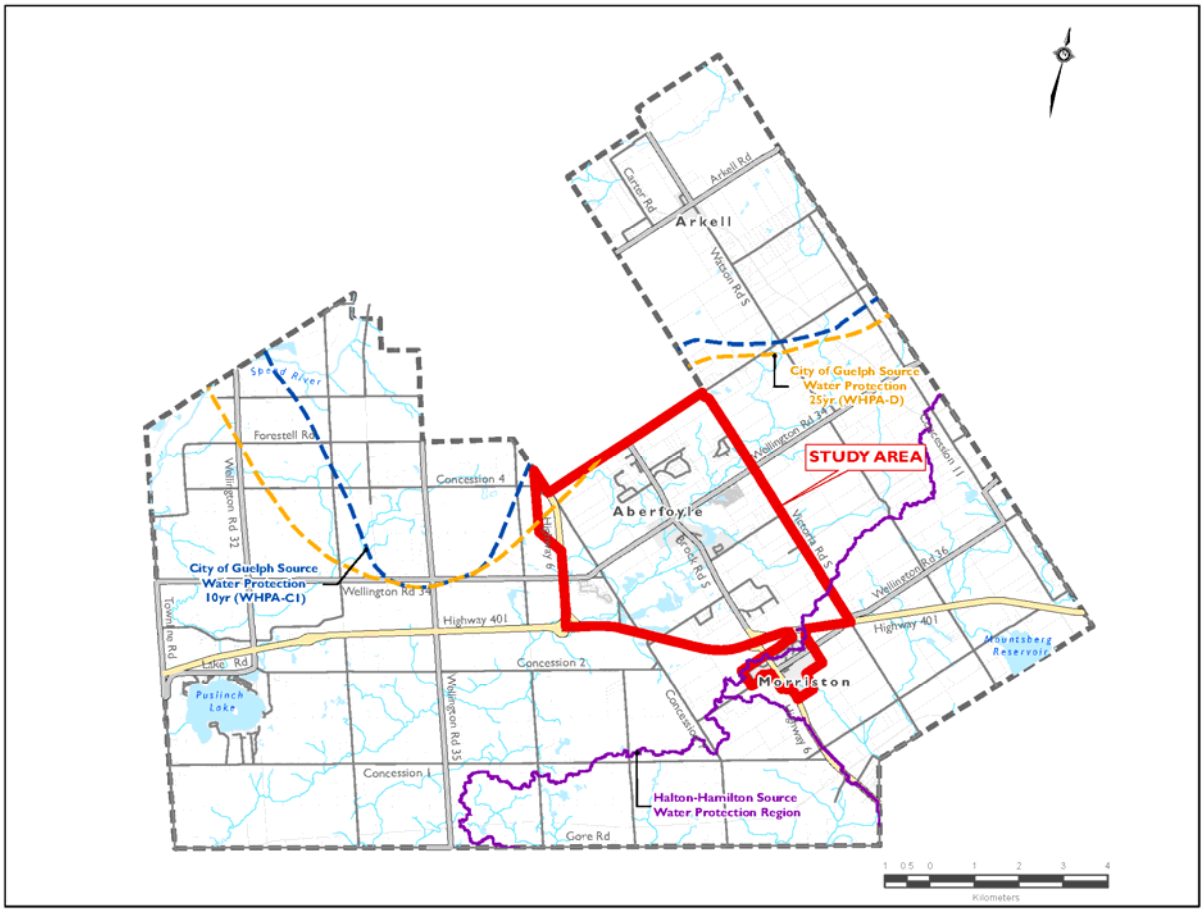

Figure 1 Study Area Map

2.2 Land Uses

The County of Wellington provides Planning Services for all growth and development related issues for the Township of Puslinch. The County, on behalf of the Township, has developed the Township's Official Plan (OP), which is used to guide all land use, growth strategies and servicing decisions for the Township. Existing land use designations within the study area are graphically presented in Figure 2.

The study area contains the highest concentrations of residential and employment lands in the Township. In general, the study area land uses are varied due to historic development patterns and influences of the nearby City of Guelph and major transportation corridors of Highway 401, Highway 6 north and south and Brock Road (the busiest County road in Wellington).

The two urban centres in Puslinch (Aberfoyle and Morriston) are located within the centre and south end of the study area. Aberfolyle's designated central business district is along Brock Road, with residential areas nearby. Community facilities such as the Township's Municipal Office and County Works Yard are within an industrial designation on the north side of Wellington Road 34. Other community uses are found within the recreational designation at the northwest corner of Brock Road South and Maple Leaf Lane, where the Puslinch Community Centre, Optimistic Recreation Centre, library and sports fields are located. Other land use designations in Aberfoyle include a highway commercial parcel north of Wellington Road 34 and future development lands across from the Municipal Office.

There are significant core greenlands areas in Aberfoyle which identify significant wetlands, significant woodlands, floodplain areas and other features. Special policy PA7-7 applies to the central area of Aberfoyle which is within the floodplain of Mill Creek and its tributary streams. Since Aberfoyle is recognized for the important role it plays as the Township's centre of residential, commercial and other community land uses, limited development is permitted within the PA7-7 floodplain lands.

The primary designation within the Morriston urban centre is residential. There is a central business district along Queen Street. The greenlands designation protects significant woodlands and core greenlands areas generally identify significant wetlands and floodplain.

Also of note in the study area, are the rural employment area and Puslinch economic development area (PA7-1) designations north of Highway 401 and east and west of Brock Road South. This is the predominant location for business and industry in the Township. A smaller and largely undeveloped rural employment area is also found on the east and west side of Highway 6 North (Hanlon Expressway) adjacent to Guelph.

Outside of Aberfoyle and Morriston, residential development takes the form of country residential subdivisions found north of Wellington Road 34 (on the west side of Victoria Road South, and on the east and west sides of Brock Road) and northeast of Highway 401 and Highway 6 North. East of Aberfoyle there are also the Mill Creek and Mini Lakes residential communities (Special Policy PA7-2 and PA7-6). The remaining rural land base is generally comprised of non-prime farmland and large natural areas and features.

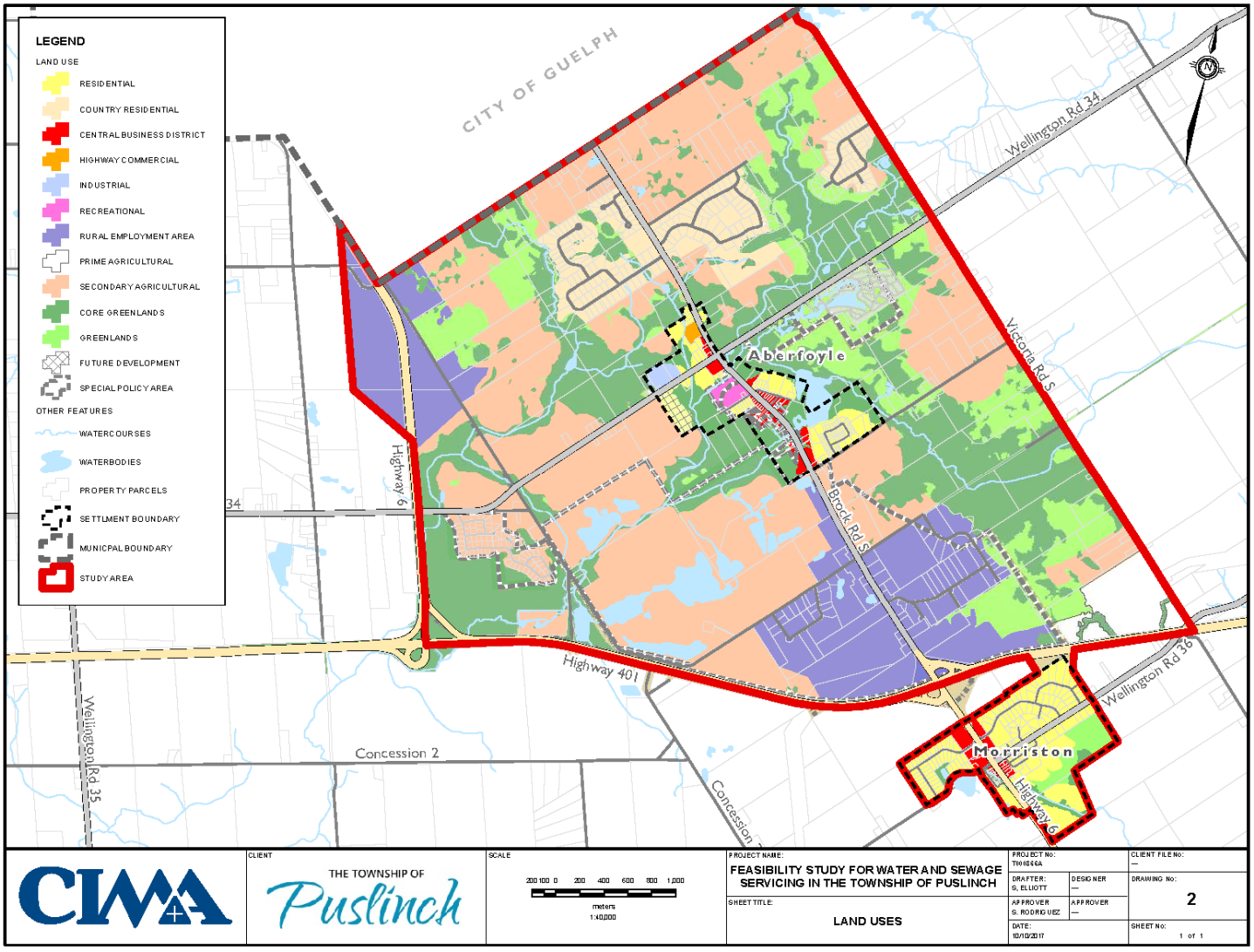

Figure 2 Existing Land Use Designations within Study Area

2.3 Source Water Protection Areas

The City of Guelph and Hamilton Region Source Protection Areas extend into the study area (see Figure 1). The City of Guelph Wellhead Protection Areas (WHPA), WHPA-D, corresponding to the 25 year time of travel, extend into the northwest portions of the study area. Enhanced development potential within source water protection areas could result from implementation of municipal servicing in the area

2.4 Population and Planning Projections

Projected growth within the study area has been set out in the County's Official Plan (OP). According to the OP, the majority of growth within the County will be directed to urban centres that offer municipal water and sewer servicing and, to a limited extent, to those urban centres and hamlets that offer partial, private communal, or individual on-site services. For the Study Area, the majority of the anticipated growth will be directed to the Aberfoyle and Morriston Urban Centres. Growth will also be directed, to a lesser extent, to secondary agricultural areas, provided that the planning policies for these areas can be met.

2.4.1 Residential Projections

Staff from the County of Wellington have indicated that the majority of the residential growth in the Township is expected to occur outside of the study area. Projected employment growth for the study area on the other hand, has been assumed to occur primarily within Aberfoyle and Morriston Urban Centres. The residential forecasts for these areas, as outlined in the County's OP, are summarized in Table 1, while the Employment Projections are summarized in Table 2.

Table 1 Projected Residential Growth – Aberfoyle and Morriston

Urban Centre	Projected Growth / Planning Period		
	2016	2036	2041
Aberfoyle[1]	325	345	335
Morriston[1]	480	590	620

Notes :

1. Projected Residential Growth as per Wellington County Official Plan May 6, 1999 (Last Revision September 1, 2016). Includes the net undercount adjustment which is estimated at approximately 4.1%.

The low projected residential growth established in the County's OP are based on the current lack of available water and wastewater servicing.

Table 2 Projected Employment Growth – Township of Puslinch

Urban Centre	Projected Growth / Planning Period		
	2016	2036	2041
Total Employment	4,017	5,161	5,632

Notes :

1. Projected Employment Growth as per Wellington County Official Plan May 6, 1999 (Last Revision September 1, 2016). Includes 'no fixed place of work' employment.

2.4.2 Residential Projections

Municipal infrastructure projects are normally planned for a 20-25 year planning horizon. Extended design periods are sometimes used for projects of difficult nature and high capital expenditures. For the purpose of this feasibility study, a 25 year design period corresponding to a design year 2041 has been considered adequate. As such, and consistent with the County's OP population projections, a residential population increase of 10 people in Aberfoyle and 140 people in Morriston has been used between 2016 and 2041.

2.4.3 Employment Projections

Based on the information provided by the County of Wellington, the 2016 employment population within the Study Area was estimated to be 2,224 persons, representing approximately 55% of the total employment population within the Township. For the purposes of this Feasibility Study, and based on discussions with staff from the County of Wellington, the following assumptions have been made:

+ The 2016 industrial employment within the study area of 2,224 persons were employed by the major water users known to exist in the study area. As such, water demands from the 2016 employment population, have been captured in the water demands provided by the large users.

+ The projected employment growth between 2016 and 2041 of approximately 1,610 jobs will all occur within the Study Area. For the purposes of this Study, it is assumed that there will be no employment growth elsewhere in the Township. This projected employment growth includes primary, work at home, industrial, commercial, institutional and no-fixed-place-of-work job types.

The assumptions noted above are considered conservative but adequate for the level of detail required in a feasibility study. Actual employment numbers within the existing large users need to be verified, should the project proceeds to the next stages (i.e., Class Environmental Assessment Study).

3. Existing Water and Sewage Services

Municipal servicing is currently not available in the Township. Water and sewage services in the study area currently consist of individual on-site wells, septic systems and a few on-site small and private communal water and sewage systems. The Township has an active role in monitoring the operation and efficiency of these private systems; however, all aspects of operation, monitoring, maintenance and repairs associated with private systems, are ultimately, the responsibility of the systems' owner.

Permits to Take Water (PTTW) issued by the Ontario Ministry of Environment and Climate Change (MOECC) require that each permit holder measure and record volumes and rates of water taken each day. Such records shall be submitted every year to the Ministry's Water Taking Reporting System (WTRS).

As part of this Study, all major users within the study area were contacted directly and requested to provide the most up-to-date water and sewage usage data, including the latest water volumes reported to the Ministry's WTRS. The following sections of this report present a summary of water usage/consumption for each of the major large users within the study area, as per available operating records and data provided to CIMA+ for 2015 and/or 2016. Large users are not required to monitor or measure sewage flows, and thus this information was not readily available. Sewage information that was provided to CIMA+, when measured and recorded by the user, has been included in the corresponding section for each major user.

3.1.1 Residential Uses

Existing residential properties within the study area are generally serviced by individual on-site well and septic systems. A few major community facilities have a dedicated on-site water system which includes the Puslinch Community Centre, Optimist Recreational Centre, and municipal offices. There are also a few residential development communities that operate their own private communal water and sewage systems, including:

+ Meadows of Aberfoyle,
+ Mini Lakes, and;
+ Millcreek Camping and Country Club.

Additional information for each of the above residential communities is provided as follows:

Meadows of Aberfoyle Communal Well Supply System

The Meadows of Aberfoyle is a single family residential development, located in the southeast area of Aberfoyle, north of Gilmour Road and east of Brock Road. It comprises 55 building lots and has been considered fully occupied since May 2011. This community is served by a communal water supply system, which consists of two wells serving the residents, as well as groundwater and surface water monitoring stations. Available water usage related data for this system is summarized in Table 3 below.

Table 3 Meadows of Aberfoyle – Water Servicing Data

Source ID	Usage Type	Max. Taking as per PTTW[1] (L/s)	Average Taking (L/s)[2]	Max. Taking (L/s)[3]	% of Permitted Max. Taking[4]
PW7	Water Supply	9.1	0.32	1.26	14%
PW6	Water Supply	9.1	0.28	1.92	21%
PW5[5]	Irrigation	0.78	-	-	-
PW2[5]	Irrigation	1.59	-	-	-
Total System Average Demand (L/s) =			**0.61**		
Unit per Capita Consumption Rate (L/cap/day)[6] =			**353**		

Notes :

1. Maximum taken as per existing PTWW #5626-7WLQ3W.
2. Two year average demands based on 2015 and 2016 data reported in the MOECC WTRS.
3. Two year average maximum demands based on 2015 and 2016 data reported in the MOECC WTRS.
4. % ratio between actual maximum taking and PTTW permitted max. taking
5. No water reported taken from well.
6. Unit per capita consumption rate calculated based on average system demands for PW7 and PW6 and a total service population of 149 people. Assumed a 2.7 PPU which is consistent with PPU for Aberfoyle for 2016 as per County's OP.

As per the 2016 Monitoring Report for this system, wells PW6 and PW7 were the only wells pumped. Wells PW5 and PW2 only serve as observation wells. In addition, water pumping and distribution system is controlled in a manner that wells PW6 and PW7 cannot be pumped simultaneously.

Meadows of Aberfoyle uses individual private septic systems for sewage treatment and disposal.

Mini Lakes Communal Well Supply System

The Mini Lakes Mobile Home Community is a private community located just outside of Aberfoyle off of Wellington County Road 34. The drinking water system is classified as a Non-Municipal Year Round Residential System under Ontario Regulation (O. Reg.) 170/03. There are approximately 260 service connections to the drinking water system servicing approximately 450 people. An additional 31 services are in place for the remaining development lots.

The drinking water system consists of three production wells and three corresponding pump houses, all connected to the distribution system that consists of 50 mm to 70 mm diameter polyethylene piping. Each pump house has a dedicated treatment system. Raw water is disinfected with sodium hypochlorite prior to entering the distribution system. Water is filtered using a multi-media filtration system and passed through a series of pressure retention tanks prior to being discharged into the distribution system. The water distribution system consists of three separate pressure zones, fully interconnected and isolated by valves. Available water usage related data for this system is summarized in Table 4 below.

Table 4 Mini Lakes – Water Servicing Data

Source ID	Usage Type	Max. Taking as per PTTW[1] (L/s)	Average Taking (L/s)[2]	Max. Taking (L/s)[3]	% of Permitted Max. Taking[4]
PW1	Water Supply	1.7	0.29	0.81	48%
PW2	Water Supply	2.3	0.43	0.94	41%
PW3	Water Supply	3.7	0.81	1.56	42%
PW4[5]	-	3.4	-	-	-
Total System Average Demand (L/s) =			**1.53**		
Unit per Capita Consumption Rate (L/cap/day)[6] =			**294**		

Notes :

1. Maximum taken as per existing PTWW #7137-AG7SV2.
2. Two year average demands based on 2015 and 2016 data reported in the MOECC WTRS.
3. Two year average maximum demands based on 2015 and 2016 data reported in the MOECC WTRS.
4. % ratio between actual maximum taking and PTTW permitted maximum taking.
5. No water reported taken from well. Well decommissioned in 2015.
6. Unit per capita consumption rate calculated based on average system demands for the 3 existing wells and a total service population of 450 people.

Available sewage flows related data for this system is summarized in Table 5 below.

Table 5 Mini Lakes – Sewage Servicing Data

Criteria	Value
Total Average Sewage Flows (L/s)[1] =	1.1
Total Average Sewage Flows (m^3/d) =	98.8
Unit per Capita Production Rate (L/cap/day)[2] =	219

Notes :

1. Two year sewage flows based on 2015 and 2016 data
2. Unit per capita consumption rate calculated based on average sewage flows and a total service population of 450 people.

Mini Lakes is allowed under the Amended Environmental Compliance Approval (ECA) #8154-AR4J2T to treat and dispose of 158 m^3/d of treated sewage from a maximum of 292 residential units. The sewage treatment system consists of three pumping stations that discharge to a sewage treatment plant. Treatment consists of a primary settling tank, rotating biological contactors, an intermediate clarifier, a denitrification tank, and a final clarifier. The effluent pump discharges the treated sewage for subsurface disposal to one of five shallow buried trench absorption cells.

Millcreek Camping and Country Club

Millcreek is a manufactured home community (also known as a land leased community). A PTTW is not required for the community since the water taking is less than 50 m^3/d. Available water usage related data for this system is summarized in Table 6 below.

Table 6 Millcreek Camping and Country Club – Water Servicing Data

Source ID	Usage Type	Max. Taking as per PTTW (L/s)	Average Taking (L/s)[1]	Max. Taking (L/s)	% of Permitted Max. Taking
N/A	N/A	N/A	0.36	-	N/A
Total System Average Demand (L/s) =			**0.36**		
Unit per Capita Consumption Rate (L/cap/day)[6] =			**N/A**		

Notes :

1. Two year average demands based on 2015 and 2016 data.
N/A = Not Applicable

Millcreek uses individual private septic systems for sewage treatment.

3.1.2 Industrial and Commercial Uses

The major industrial and commercial large water users within the study area, along with their permitted water takings, are listed below in Table 7. A brief overview of each of the large users and their reported water demands/consumptions are summarized in the following sections.

Table 7 Major Industrial and Commercial Users

ID	User Name	Usage Type	PTTW #	Max. Taking as per PTTW (L/s)	
				L/s	m^3/d
1	Royal Canin Canada Company	Food processing	3782-AB6MMX	2.8	240
2	Con-Cast Pipe Inc.	Concrete pipe manufacturer	8724-9GFPQE	5.2	450
3	Maple Leaf Foods – Morguard Brock McLean Limited	Distribution centre	7431-96LRQ6	7.6	654
4	Nestle Canada Inc.	Water Bottling	1381-95ATPY	41.7	3,600
5	Dufferin Aggregates – CRH Canada Group Inc.	Aggregate extraction	7510-A34KZH	94.7	8,183
6	Capital Paving Inc.	Aggregate producers	4373-8TXQK3	212.6	18,371
7	CBM Aggregates – St. Mary's Cement	Aggregate extraction	5550-9V7HXS	272.8	23,568
			7028-7LTNV9	272.8	23,568
	Total Industrial and Commercial Max. Permitted Taking =			**910**	**78,634**

Royal Canin Canada Company

Royal Canin is a pet food manufacturer located within the rural employment designated area, north of Highway 401 and east of Brock Road South. This facility uses water and generates both process and sanitary sewage. Their reported water usage is summarized in Table 8 below.

Table 8 Royal Canin Canada – Water Usage

Water Source	Reported Average Water Taking[1]		Max. PTTW Taking	Actual Taken / PTTW
	m^3/d	L/s	L/s	%
Well PW-1	93.8	1.1	2.8	39%

Notes :
1. Two year average usage based on reported 2015 and 2016 data.

Royal Canin uses separate sewage treatment systems for its process and domestic sewage. The amended ECA #1042-A3QQRY, allows a discharge of 30 m^3/d of treated process and domestic flows for subsurface disposal. The process sewage treatment system consists of a 40 m^3 equalization tank and a dissolved air flotation unit. A membrane bioreactor (rated treatment capacity of 75 m^3/d) is approved to be incorporated into the existing process sewage treatment system, as well as a UV disinfection unit and osmosis unit for reuse of water for operations. The domestic sewage treatment system consists of a pump station, a sequencing batch reactor (SBR) (rated treatment capacity of 30 m^3/d), and a sand filter (the filter is approved to be replaced with a drum filter). Both treated process and domestic sewage discharges to a shallow buried trench system that is laid out in two beds.

The average process and domestic sewage discharged for subsurface disposal by this facility are summarized in Table 9 below.

Table 9 Royal Canin Canada – Sewage Generation

Sewage Source	Reported Average Sewage Generation[1]		System Rated Capacity	Actual Generation / Rated Capacity
	m^3/d	L/s	m^3/d	%
Process and domestic sewage to buried trench	42	0.54	30	140%

Notes :
1. One year average sewage generation based on 2016 data.

Con-Cast Pipe Inc.

Con-Cast Pipe Inc. is a precast concrete products manufacturer. The manufacturing facility is located within the rural employment designated area, north of Highway 401 and west of Brock Road South. Their footprint comprises a dry cast facility of approximately 120,000 square foot and a wet cast facility of approximately 30,000 square foot. Their reported water usage is summarized in Table 10 below.

Table 10 Con-cast Pipe Inc. – Water Usage

Water Source	Reported Average Water Taking[1]		Max. PTTW Taking	Actual Taken / PTTW
	m^3/d	L/s	L/s	%
Well WSW 1	245.3	2.8	5.2	55%
Well WSW 2				

Notes :
1. Two year average usage based on reported 2015 and 2016 data.

Con-Cast Pipe Inc. is allowed under Amended ECA #3621-6HRKGC to treat and dispose of process sewage at an average flow of 5.66 m^3/d from its pre-cast concrete manufacturing facility. The treated process sewage is discharged to one of two on-site infiltration ponds. Based on information provided by Con-Cast Pipe Inc., process sewage flows are not monitored.

Maple Leaf Foods – Morguard Brock McLean Limited

Maple Leaf Foods has a distribution centre within the Township that distributes the company's prepared meats throughout central and eastern Ontario. Schenker Canada operates the distribution centre on behalf of Maple Leaf Foods. Based on information received from Schenker Canada, the water is used for the cooling tower/condenser and the sprinkler; however, their water use is restricted based on the capacity of their septic bed. Their reported water usage is summarized in Table 11 below.

Table 11 Maple Leaf Foods – Water Usage

Water Source	Reported Average Water Taking[1]		Max. PTTW Taking	Actual Taken / PTTW
	m^3/d	L/s	L/s	%
TW1 TW2	21.6	0.2	7.6	3%

Notes :
1. Two year average usage based on reported 2015 and 2016 data.

In terms of sewage generation, Maple Leaf Foods is allowed under Amended ECA #7567-94EK2F to treat and dispose of 17 m^3/d of treated domestic sewage. The sewage treatment system consists of two septic tanks (total capacity of 25 m^3), a tertiary treatment septic tank (rated treatment capacity of 17 m^3/d), and a polisher tank. The treated sewage is discharged to a raised stone and sand bed for subsurface disposal. The average domestic sewage generated by this facility are summarized in Table 12 below. Process sewage is not produced on-site as part of their operations.

Table 12 Maple Leaf Foods – Sewage Generation

Sewage Source	Reported Average Sewage Generation[1]		System Rated Capacity	Actual Generation / Rated Capacity
	m^3/d	L/s	m^3/d	%
Domestic sewage to septic system	14.3	0.17	17	90%

Notes :
1. Two year average sewage generation based on 2015 and 2016 data.

Nestle Canada Inc.

Nestle Canada Inc. operates a water bottling facility, located within the rural employment designated area, south of Aberfoyle. Their reported water usage is summarized in Table 13.

Table 13 Nestle Canada Inc. – Water Usage

Water Source	Reported Average Water Taking[1]		Max. PTTW Taking[2]	Actual Taken / PTTW
	m^3/d	L/s	L/s	%
TW3-80	2,117.7	24.5	41.7	59%
TW2-11[3]	-	-	-	-

Notes :
1. Two year average usage based on reported 2015 and 2016 data.
2. As per PTTW, the total taking of 3,600 m^3/d must not be exceeded for the combination of the water sources.
3. Well TW2-11 is to be used for miscellaneous purposes only (such as supplying water for firefighting purposes). As per information provided, no water was taken from Well TW2-11 in 2015 or 2016. Nestle Canada Inc. has recommended that the well be decommissioned.

Nestle Canada Inc. operates under two separate approvals for its process and domestic sewage. Amended ECA #2766-8Z6QHV allows Nestle Waters to treat and dispose process sewage and stormwater at an approximate peak flow of 1,444 m^3/week. The process sewage treatment system consists of a wet well/pump station, two aerated ponds, and six storage ponds. The treated process sewage discharges to Aberfoyle Creek, which is a tributary of Mill Creek and part of the Grand River watershed. Certificate of Approval (C of A) #3152-55LQ59 permits the treatment and disposal of 15.9m^3/d of domestic sewage. The approved domestic sewage treatment system consists of pumping chambers, three septic tanks (total capacity of 41 m^3), four tertiary treatment septic tanks (total rated treatment capacity of 20 m^3/d), and a dosing chamber. The treated domestic sewage is approved to discharge to a leaching bed and a shallow buried trench.

Based on information provided by Nestle Canada Inc., process and domestic sewage flows are not monitored.

Dufferin Aggregates – CRH Canada Group Inc.

Dufferin Aggregate (a division of CRH Canada Group Inc.) is an aggregate extraction business and operates three extraction pits within the Township of Puslinch. Out of the three pits, only one (Aberfoyle Pit No.1) is within the rural employment designated area, at 125 Brock Road. Their washing operation consists of a closed-loop washing system where the wash water from the wash plant is re-circulated through a settling pond system. Make-up water is periodically taken from the source pond to top-up the amount of water entering the wash plant to compensate from any loss water due to evaporation, infiltration or water adhering to aggregate products.

PTTW #5153-A49MT9 was also registered for this site as per MOECC online records. In communication with CRH Canada Group Inc., it was clarified that this PTTW was for a concrete plant that was on the same site; however, the plant is no longer onsite and water has not been taken from this source since 2010. Their reported water usage for the active wells is summarized in Table 14 below.

Table 14 Dufferin Aggregates – Water Usage

Water Source	Reported Average Water Taking[1]		Max. PTTW Taking[2]	Actual Taken / PTTW
	m^3/d	L/s	L/s	%
Pond 5	8.64	0.10	94.7	0.1%
Make Up Pond 6	126.1	1.46	94.7	2%
Total	134.8	1.56	94.7	2%

Notes :
1. Average usage based on reported 2016 data.
2. As per PTTW, the total taking amount may increase from 8,182 m^3/d (94.7 L/s) to 12,274 m^3/d (142 L/s) for any four months between April and November, and no water shall be taken in January and December. Water must also not be taken from one of the ponds for more than 10 consecutive days in February and March. At all times, water is not permitted to be taken from both ponds simultaneously.

Capital Paving

Capital Paving is a civil construction company specializing in transportation. The head office location in Puslinch has an asphalt and concrete plant, and an aggregate pit on-site. They have four sources for water taking to supply their plant operations, aggregate washing, and office use. According to communication with Capital Paving, there are plans to build a full wash plant on site in the near future, which will increase the water demands for aggregate washing. Their reported water usage is summarized in Table 15 below.

Table 15 Capital Paving – Water Usage

Water Source	Reported Average Water Taking[1]		Max. PTTW Taking[2]	Actual Taken / PTTW
	m^3/d	L/s	L/s	%
Pond B – Aggregate washing	166.1	1.92	196	1%
Well A – Office Use	2.4	0.03	1.3	2%
Well B – Asphalt Plant	51.7	0.60	6.0	10%
Well C – Concrete Plant	60.6	0.70	0.70	10%
Total	280.9	3.3	213	2%

Notes :
1. Average usage based on reported 2015 and 2016 data.

CBM Aggregates – St. Mary's Cement

CBM Aggregates (a division of St. Mary's Cement) is an aggregate extraction business and operates multiple extraction pits within the Township. The pits that have a wash plant on-site are the Aberfoyle and McNally pits, which operate under separate PTTWs to authorize aggregate washing in a closed loop system. Their reported water usage is summarized in Table 16 below.

Table 16 CBM Aggregates – Water Usage

Water Source	Reported Average Water Taking[1]		Max. PTTW Taking[2]	Actual Taken / PTTW
	m³/d	L/s	L/s	%
Aberfoyle Main (North) Pit Pond	14,411	166.8	272.8	61%
McNally Supply Pond	13,726	158.9	272.8	58%
Total	28,137	325.7	545.6	60%

Notes :
1. Average usage based on reported 2015 and 2016 data.

3.2 Summary of Large Users Demands and Flows

3.2.1 Existing Water Demands

A summary of the water demands/usage that have been established for the large users, based on available 2015-2016 operating / recorded data, is presented in Table 17. It is noted that water demands for all other single residential units/dwellings within the study area are not included in Table 17. These additional demands have been calculated separately and are presented in the following sections of this report.

Table 17 Summary of Existing Water Demands / Usage – Large Users

Large User Name	Average Water Taking[1]		Max. PTTW Taking	Actual Taken / PTTW
	m³/d	L/s	L/s	%
Residential Users				
Meadows of Aberfoyle	52.6	0.6	18.2	3%
Mini Lakes	132.5	1.5	7.7	19%
Millcreek Camping and Country Club	31.2	0.4	N/A	-
Total Large Residential Users =	**216.3**	**2.5**		
Large Industrial / Commercial Users				
Royal Canin Canada Company	93.8	1.1	2.8	39%
Con-Cast Pipe Inc.	245.3	2.8	5.2	55%
Maple Leaf Foods – Morguard Brock McLean Limited	21.6	0.2	7.6	3%
Nestle Canada Inc.	2,117.7	24.5	41.7	59%
Dufferin Aggregates – CRH Canada Group Inc.	134.8	1.56	94.7	2%
Capital Paving Inc.	280.9	3.3	213	2%
CBM Aggregates – St. Mary's Cement	28,137	325.7	545.6	60%
Total Large Industrial / Commercial Users =	**31,030**	**359.1**	**910.1**	**39%**

As shown in Table 17, the majority of all large users including residential and industrial and commercial, have current water demands in their systems below 60% of their permitted maximum water taking. A more representative assessment would involve a comparison between the maximum demands experienced by each system against the maximum permitted taking; however, in the absence of maximum day demand data, the average recorded flows have been compared relative to the maximum allowable water takings to provide a general indication of the current water demands for each user.

As per Table 17, Con-Cast Pipe Inc., Nestle Canada and CBM Aggregates – St. Mary's Cement, are the users with the largest volumes of water usage, relative to their existing permitted water taking capacity. Although Con-Cast Pipe Inc. uses in average approximately 55% of their permitted maximum taking capacity, the water demands for this system are very small compared to the amount of water used on an average daily basis by Nestle Canada Inc. and CBM Aggregates – St. Mary's Cement.

3.2.2 Existing Sewage Flows

Based on information received directly from the majority of the large users, tracking of sewage generation is not required and thus, this information is generally not available. Sewage flow data was received from two users within the study area, but considering the different nature of the activities that occur onsite, the data are considered specific to each user and is not deemed to be representative of the current sewage generation for the majority of the users in the Study Area. As such, these data have been omitted from further review.

For the purpose of the feasibility study, sewage flow generation has been calculated with consideration to the nature of the business and design guidelines provided by the MOECC. Calculated sewage flows for the study area are presented in Section 4 of this report.

4. Water Demand and Sewage Flow Analysis

Establishing water distribution, sewage collection, and supply and treatment capacity design flows are integral to capital planning and are key drivers for establishing future needs and timelines for project implementation. This section describes the proposed preliminary design parameters, in terms of water demands and sewage flows, for municipal water and sewage servicing in the Study Area and the rationale for its development.

4.1 Water System

There are two major components to development of a new Municipal Water System; namely, the Water Supply System and the Water Distribution System.

4.1.1 Water Supply Design Basis

Water treatment systems are generally designed on the basis of projected flows for a 20-year period. A larger design period may be selected for larger systems, in cases where construction cost is an overriding factor or to satisfy the ultimate requirements of the official plan.

The drinking water system, including water supply sources, water treatment plant and treated water storage are typically designed to satisfy the projected maximum day water demand of the service area. As such, establishing the design average and maximum day demands for the system is a critical step in the planning of water systems.

In order to establish the water demands for the study area, a 25-year planning period which corresponds to the year 2041, has been assumed. Projected water demands have been calculated assuming the residential projected growth in Aberfoyle and Morriston, as established in the County's Official Plan. In addition, it is presumed that no additional growth will occur within the existing residential communities currently serviced by private communal water systems, with the exception of the Mini Lakes Community, which has reported to have an additional 31 future service connections. In terms of industrial and commercial water demands, maximum day demands for the service area have been projected based on current water usages for each of the large users and a design maximum day factor representative of the mix of industrial and commercial users in the study area.

The basis for calculating the design average and maximum day water demands for the study area are tabulated in Table 18.

Table 18 Water Design Basis

Criteria	Value	Units	Comments
Unit per Capita Consumption Rate	360	L/cap/d	Assumed as the mid-point from MOECC range of 270-450 L/cap/day and marginally above the Meadows of Aberfoyle rate of 353 L/cap/d.
Residential Max. Day Factor	2.0	-	Based on MOECC Guidelines and expected future total residential and employment population of 7,900 for the study area.
Industrial/Commercial Max. Day Factor	3.0	-	Based on MOECC suggested range between 2 and 4 for industrial uses.

4.1.2 Water Distribution Design Basis

The Water Distribution system should be designed to meet the MOECC Design Guidelines. In particular, the system shall;

+ Be capable of maintaining system pressures between 350 to 480 kPa (50 to 70 psi) under normal operating conditions.
+ The maximum system pressure in the distribution system should not exceed 700 kPa (100 psi). Where local areas may experience higher system pressures, pressure reducing devices should be provided to avoid damage to household plumbing and unnecessary energy consumption.
+ System pressures shall not drop below 140 kPa (20 psi) under Maximum Day plus Fire Flow conditions.
+ Provision of Fire Protection through the municipal water distribution system is a municipal decision. If the Township decides to provide fire protection via the municipal water system, the minimum fire flows should be established with consideration given to the latest Fire Underwriter's Survey document "Water Supply for Public Fire Protection" and/or the MOECC's fire flows guidelines, whichever is judged more appropriate.

4.1.3 Preliminary Projected Water Demands

Preliminary projected water demands for the study area, based on the information available to-date, including residential, employment, and industrial and commercial uses are summarized in Tables 19, 20, and 21 respectively. Existing water demands for each user are also included in the tables, where available, for comparative purposes.

Table 19 Preliminary Projected Residential Water Demands

Residential Area	Population		2016 Existing Average Day Demands	2041 Future Average Day Demands[4]	2041 Future Max. Day Demands[5]
	2016	2041	L/s	L/s	L/s
Meadows of Aberfoyle	149	149	0.6	0.6	1.2
Mini Lakes[1]	450	504	1.5	2.1	4.2
Millcreek Camping and Country Club	87	87	0.4	0.4	0.7
Aberfoyle[2]	176	186	0.7	0.8	1.6
Morriston	480	620	2.0	2.6	5.2
Other Areas[3]	731	731	3.1	3.1	6.1
Total =	**2,073**	**2,277**	**8.3**	**9.5**	**19.0**

Notes :

1. Future population for Mini Lakes assumes 31 future service connections and a PPU of 1.7 (based on reported current population of 450 people and 260 service connections in 2016).
2. Aberfoyle existing population is calculated based on the reported 325 people in 2016 as per County's Official Plan minus existing population of 149 people currently serviced in the Meadows of Aberfoyle community which is located within the limits of Aberfoyle. Projected growth in Aberfoyle is consistent with the County's OP projections.
3. A total of 270 residential units/dwellings have been identified outside of Aberfoyle and Morriston but within the study area boundaries. A PPU of 2.7, as reported for Aberfoyle in the County's OP, has been used to calculate the total residential population for these additional units.
4. Future average day demands assume a unit consumption rate of 360 L/cap/day.
5. Future max. day demands assume a max. day factor of 2.0.

Table 20 Preliminary Projected Employment Water Demands[1]

Area	Employment[1]		2016 Existing Average Day Demands	2041 Future Average Day Demands[2]	2041 Future Max. Day Demands[3]
	2016	2041	L/s	L/s	L/s
Study Area	1,793	3,408	7.5	14.2	28.4

Notes :

1. Preliminary projected employment water demands shown in Table 20 reflect total employment count for the study area with the exception of industrial employment count records for 2016. Water demands for 2016 industrial employment have been captured and accounted for in the water demands received from the large users. For example; total 2016 employment as per OP is 4,017, out of which 2,224 corresponds to industrial employment. Since demands for industrial employment has been assumed under demands gathered from existing users, total 2016 employment numbers for study area is 1,793 (4,017 – 2,224). Total forecasted 2041 employment as per OP is 5,632, under the same assumption of industrial employment demands already captured, total 2041 employment numbers for study area is 3,408 (5,632 – 2,224).
2. Future average day demands assume a unit consumption rate of 360 L/employment/day.
3. Future max. day demands assume a max. day factor of 2.0.

Table 21 Preliminary Projected Industrial and Commercial Water Demands

Industrial / Commercial User	PTTW Capacity		2041 Future Average Day Demands[1]	2041 Future Max. Day Demands[2]
	m^3/d	L/s	L/s	L/s
Royal Canin Canada Company	240	2.8	1.1	2.8
Con-Cast Pipe Inc.	450	5.2	2.8	5.2
Maple Leaf Foods – Morguard Brock McLean Limited	654	7.6	0.2	0.7
Nestle Canada Inc.	3,600	41.7	24.5	41.7
Dufferin Aggregates – CRH Canada Group Inc.	8,183	94.7	1.6	4.7
Capital Paving Inc.	18,371	212.6	3.3	9.8
CBM Aggregates – St. Mary's Cement	47,136	545.6	325.7	545.6
Total Existing Large Users =	**78,634**	**910.1**	**359.1**	**610.4**
Total Large Users (excluding Nestle Canada Inc. and St. Mary's Cement) =	**27,898**	**323**	**9.0**	**23.2**

Notes :
1. Future average day demands for large users assume the current water usages reported for 2015 and 2016.
2. Future maximum day demands assume a maximum day factor of 3.0. However, if the calculated maximum day demands for a user would exceed their existing PTTW taking capacity, the current PTTW rate would prevail and is shown in the table.

4.1.4 Considerations

Considering the financial stability of the Township for the provision of municipal services and the implementation feasibility of a municipal water system for the study area, the following was considered:

+ Based on the nature and the character of their businesses, it would not be viable to provide municipal water services to Nestle Canada Inc. for bottling purposes, or to St. Mary's Cement for process and cooling water. It is assumed that these two large users will continue to use the sources that are currently permitted.

+ Provision of municipal water services should account for all projected residential, employment and most ICI uses within the study area. Municipal water servicing should also account for provision of municipal potable water to Nestle Canada Inc. and St. Mary's Cement for domestic purposes for the staff at these facilities.

+ All other existing large users, considered in this study, would connect to the municipal system. Existing average day water demands recorded for the period 2015-2016 from large users will be maintained to the 2041 planning period. Maximum day demands will increase based on the assumed max. day factor of 3.0, or to the current Permit to Take Water (PTTW) rate, whichever rate is lower.

Subject to the above noted considerations, the preliminary projected water demands for the study area are summarized in Table 22. Detailed calculations are provided in Appendix A for further reference.

Table 22 Preliminary Proposed System Water Demands

Service Type	Design Average Day Demand		Design Maximum Day Demand	
	m^3/d	L/s	m^3/d	L/s
Residential	820	9.5	1,639	19.0
Employment (outside of large users)	1,227	14.2	2,454	28.4
Industrial / Commercial / Recreational (large users excluding Nestle Canada Inc. and St. Mary's Cement)	776	9.0	2,001	23.2
Allowance for Domestic Use at Nestle Canada Inc. and St. Mary's Cement	51	0.6	152	1.8
Total Proposed System Demands =	**2,873**	**33.3**	**6,246**	**72.3**

Notes :
1. An allowance for domestic uses at Nestle Canada Inc. and St. Mary's Cement has been included in the calculations. The allowance is approximately 1% of their existing PTTW rate.

Key considerations for sizing the different water system components include:

+ Water supply may be from either a surface water or groundwater source. Given the lack of a significant surface water source within the Study Area, and given the evidence of significant groundwater resources in the area, it is anticipated that a groundwater supply system would be proposed for any water servicing solution within the Township.

+ The supply source for the new system should be able to meet the projected maximum design day demands. Multiple groundwater supply wells may be required to satisfy the projected maximum day demands.

+ Treatment processes should be able to meet the projected maximum design day demands, with Peak Hour Demands, with Emergency and/or Fire demands provided from storage.

+ Provision of Fire Protection through the Municipal water distribution system is a Municipal decision. Should the Township decide to provide fire protection via the municipal water system, the minimum fire flows should be established with consideration given to the latest Fire Underwriter's Survey document "Water Supply for Public Fire Protection" and/or the MOECC's fire flows guidelines, whichever is judged more appropriate.

+ The distribution system should be designed to maintain system pressures between 40 psi and 100 psi for a full range of demand scenarios. If the Township decides to provide Fire protection through the municipal system, the system should be sized to convey Maximum Day Demands plus Fire Flows while maintaining a minimum pressure of 20 psi throughout the system. The system should also be designed to minimize dead-end mains and excessive residence times which may lead to water quality issues. Watermain sizing would have a direct impact on the cost of the system, operation and maintenance requirements in addition to water quality considerations.

4.2 Sewage Design Basis

Sewage treatment facilities are typically designed for average day flows, while sewage conveyance systems are designed and rated to deliver peak sewage flows to the treatment facilities. Similar to the rationale used to develop the water design basis, a 25-year planning period which corresponds to the year 2041, has been assumed to calculate sewage generation in the study area.

The basis for calculating the design average and peak sewage flows for the study area are summarized in Table 23.

Table 23 Sewage Design Basis

Criteria	Value	Units	Comments
Unit per Capita Sewage Generation Rate	360	L/cap/day	Consistent with unit water consumption rate.
Peak Infiltration / Inflow Rate for Industrial / Commercial Areas	10,110	L/ha/day	Assumed based on the low end of MOECC Guidelines as new system should have low I&I contribution.
Peak Infiltration / Inflow Rate for Residential Areas	10,110	L/ha/day	Assumed based on the low end of MOECC Guidelines as new system should have low I&I contribution.
Population densities for Industrial / Commercial	85	person/ha	Assumed based on $30m^3$/ha/d (low end of MOECC Guideline) and 360 L/cap/d.
Peak Factor	varies	-	Calculated for each drainage area based on Harmon Formula

4.2.1 Preliminary Projected Sewage Flows

Preliminary projected sewage flows for the study area for all residential users as well as industrial and commercial users are summarized in Tables 24 and 25, respectively.

Table 24 Projected Residential Sewage Flows

Residential Area	2041 Population	2041 Future Average Day Flows[4] (for Treatment)	2041 Future Peak Day Flows[5] (for Sewer Capacity)
		L/s	L/s
Meadows of Aberfoyle	149	0.62	3.9
Mini Lakes[1]	504	2.10	12.3
Millcreek Camping and Country Club	87	0.36	2.4
Aberfoyle[2]	186	0.78	7.2
Morriston	620	2.58	23.5
Other Areas[3]	731	3.05	28.7
Total =	**2,277**	**9.5**	**78.1**

Notes :
1. Future population for Mini Lakes assumes 31 future service connections and a PPU of 1.7 (based on reported current population of 450 people and 260 service connections in 2016).
2. Aberfoyle existing population is calculated based on the reported 325 people in 2016 as per County's Official Plan minus existing population of 149 people currently serviced in the Meadows of Aberfoyle community which is located within the limits of Aberfoyle. Projected growth in Aberfoyle is consistent with the County's OP projections.
3. A total of 270 residential units/dwellings have been identified outside of Aberfoyle and Morriston but within the study area boundaries. A PPU of 2.7, as reported for Aberfoyle in the County's OP, has been used to calculate the total residential population for these additional units.
4. Future average day flows assume a unit generation rate of 360 L/cap/cay.
5. Peak day flows assume an I&I rate of 10,110 L/ha/d and peak factor calculated based on Harmon Formula.

Table 25 Projected Industrial and Commercial Sewage Flows

Industrial / Commercial Areas	Drainage Area	Equivalent ICI Population	2041 Future Average Day Flows[1] (for Treatment)	2041 Future Peak Day Flows[2] (for Sewer Capacity)
	ha	People	L/s	L/s
Within Aberfoyle	26	2,128	8.9	34.6
Within Morriston	9.7	809	3.4	14.1
Within other areas in Study Area	250.8	20,897	87.1	258.6
Total =	**286**	**23,835**	**99.3**	**307.4**

Notes :
1. Future average day flows for large users assume a unit generation rate of 360 L/cap/cay.
2. Future peak day flows assume an I&I rate of 10,110 L/ha/d and peak factor calculated based on Harmon Formula.

Sewage design flows for the study area are summarized in Table 26. The design flows noted in Table 26 do not account for process sewage generated by the large industries. Detailed calculations are provided in Appendix A for further reference.

Table 26 Proposed Sewage Design Flows

Servicing Category	Design Average Day Flow (for Treatment)		Design Peak Day Flow (for Sewer Capacity)	
	m^3/d	L/s	m^3/d	L/s
Residential	819.6	9.5	6,746.3	78.1
Industrial / Commercial / Recreational	8,580	99.3	26,557	307.4
Total Proposed System Flows =	**9,400**	**108.8**	**33,303**	**385.5**

4.3 Summary of Preliminary Projected Water Demands and Sewage Flows

The preliminary projected water demands and sewage flows for municipal servicing in the Study Area are summarized in Table 27.

Table 27 Summary of Preliminary Projected Water Demands and Sewage Flows

Water	Proposed Average Day Demands		Proposed Max. Day Demands	
	m^3/d	L/s	m^3/d	L/s
Preliminary System Water Demands	2,873	33.3	6,246	72.3

Sewage	Proposed Average Day Flows (for Treatment)		Proposed Peak Day Flows (for Sewer Capacity)	
	m^3/d	L/s	m^3/d	L/s
Preliminary System Sewage Flows	9,400	108.8	33,303	385.5

The results of the analysis of water demands and sewage flows for the Study Area are preliminary in nature and a summary of the information obtained to-date, as part of the Feasibility Study.

5. High-level Water Servicing Options – Development and Assessment

As part of the Feasibility Study, potential servicing options for water servicing were developed based on the general criteria established in Section 4. The Servicing Options were developed assuming that municipal water services were provided to all properties within the Study Area. Each option was then assessed on a high-level, in terms of key advantages, disadvantages and estimated probable costs.

This section provides a description of the high-level water servicing options considered in this study. Two alternative options have been reviewed to determine the potential cost implications of each. The options selected consist of Option 1 – Intra-Municipal Water Servicing, and Option 2 – Inter-Municipal Water Servicing. Major infrastructure / process requirements, general schematics and preliminary capital, operating and life cycle costs for each option are also presented.

5.1 General Description

5.1.1 Option 1 – Intra-Municipal Water Servicing

The Intra-Municipal Water Servicing alternative consists on providing the required water supply and treatment capacity through a new water supply system owned and operated by the Township. The new water supply system will be built within or in close proximity to one of the future well supply field identified in the City of Guelph Water and Wastewater Master Plan.

As part of Option 1, it is assumed that all existing individual on-site wells and existing small private communal water systems within the study area are expected to be decommissioned. Further consideration can be given to maintaining existing small private communal water systems during the Class EA stage; however, for the purpose of establishing high-level servicing options, it has been assumed that existing systems would no longer be in service. All small users and large users within the study area, with the exception of Nestle Canada Inc. and St. Mary's Cement, will be supplied by the new Municipal Water System. Nestle Canada Inc. and St. Mary's Cement will be provided with municipal water services for domestic uses only.

A hydrogeological investigation, including well drilling, well and aquifer testing, water quality characterization and groundwater modelling would be necessary to confirm the location and the production capacity of the new groundwater supply well(s) and any potential effects on existing natural heritage features within the area.

A new treatment facility would be required to provide the necessary treatment. A complete water quality characterization would be needed to confirm treatment requirements; however, for the purpose of option development and estimation of probable cost, it has been assumed that the water is of good quality, necessitating only treatment for disinfection.

A new storage facility will be provided as part of Option 1 in order to meet the required water storage requirements for equalization, emergency and fire flows. The storage facility may take the form of an

in-ground reservoir, an elevated tank, or a combination of the two. For the purposes of this Study, we have assumed that the necessary storage will be provided by a new elevated tank.

A description of the main infrastructure and process requirements for Option 1 – Intra-Municipal Water Servicing is provided in Table 28. A general schematic of the major components of Option 1 is shown in Figure 3.

Land acquisition would be anticipated for construction of the new treatment facility and the new elevated tank. All other linear infrastructure associated with Option 1 is expected to be constructed within existing road rights-of-way, with the exception of the Highway 401 crossing. Significant coordination with the MTO will be required to establish the alignment of the watermain connecting Morriston to the distribution system will be required to ensure that the new Highway 6 Morriston Bypass is not impacted by the construction of the municipal water works.

Table 28 Water Servicing Option 1 – Infrastructure / Process Requirements

Area	Option Requirements
Supply	• A new groundwater supply source will be developed to provide a maximum day demand of 72.3 L/s (6.25 MLD).
Treatment	• A new water treatment facility will be built to provide the required treatment requirements. It is assumed that the water is of good water quality and treatment will consist of only disinfection through chlorination. • The new treatment system would be designed to provide a treatment capacity of 6.25 MLD.
Pumping	• The new supply well(s) will be equipped with well pumps with enough capacity to overcome system pressure and pump to the new elevated tower.
Storage	• A new elevated water tank will be built to provide for required storage requirements. The new tank will have a minimum capacity of 3,500 m^3.
Distribution	• Approximately 5.1 km of 400 mm diameter watermain connecting the new supply wells/treatment facility to the new elevated water tank. • Approximately 27.1km of local distribution system consisting of watermains ranging in diameter from 150 to 300 mm.

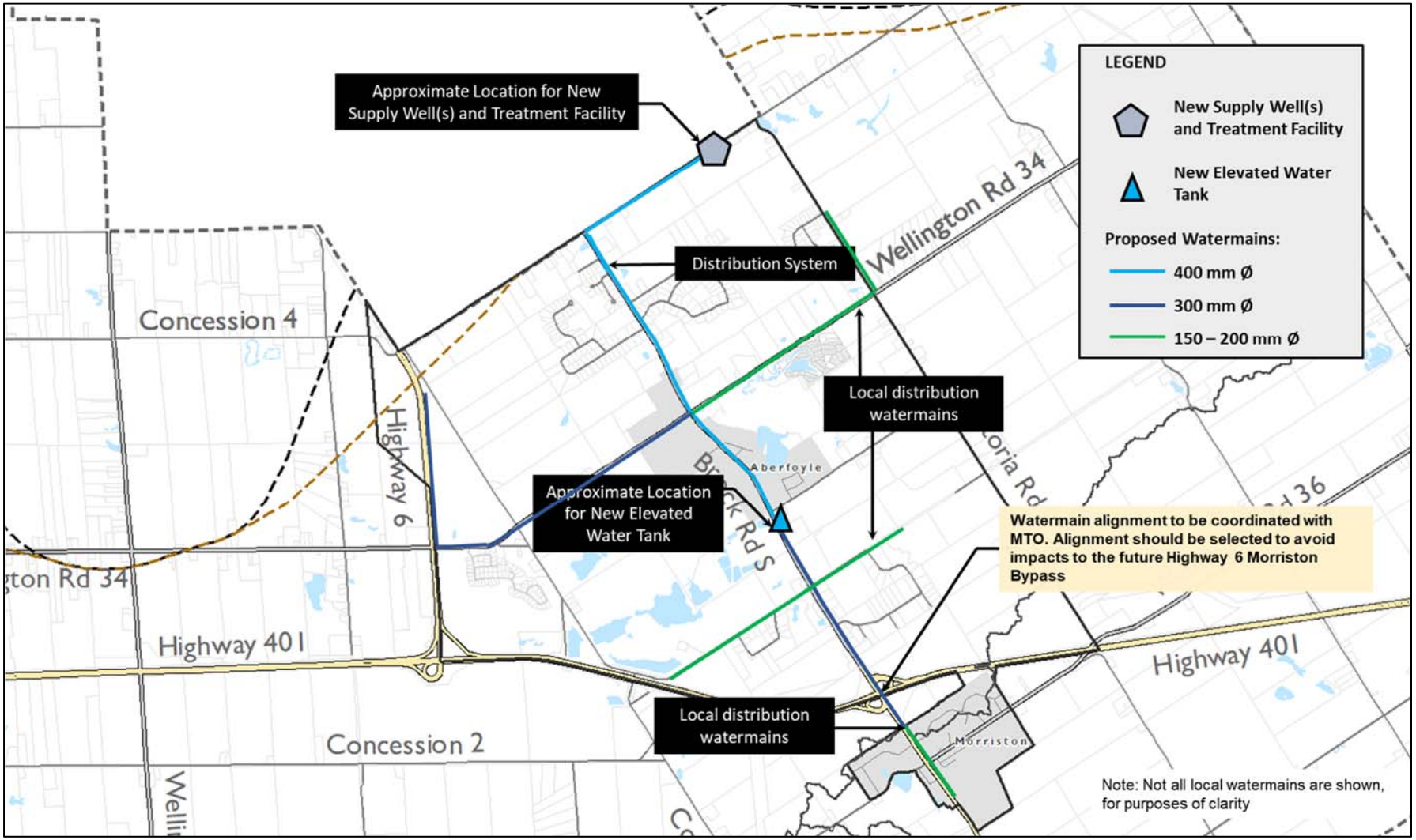

Figure 3 General Schematic – Option 1: Intra-Municipal Water Servicing

5.1.2 Option 2 – Inter-Municipal Water Servicing

The Inter-Municipal Water Servicing alternative consists of securing the required water supply and treatment capacity through the existing water supply system in the City of Guelph. Preliminary discussions with staff from the City of Guelph have indicated that the City would be open to negotiations for establishing an Inter-Municipal Servicing arrangement. Through further consultation with the City, the City indicated that they do not have excess water supply capacity to support external servicing requests. The Township acknowledged that the City may not have available capacity to allocate to the Township of Puslinch, and further recognized that if capacity was available, allocation of that capacity would not be without cost. Correspondence associated with preliminary consultation with the City of Guelph is included in Appendix B for further reference.

The Township Council would need to submit a formal request to the City of Guelph to initiate formal consideration of this Option. All water supply, treatment and distribution systems in the City of Guelph would remain under the City's ownership.

Similar to Option 1, all existing individual on-site wells and existing small and private communal water systems within the study area are expected to be decommissioned. All small users and large users within the study area, with the exception of Nestle Canada Inc. and St. Mary's Cement, will be supplied by the new Intra-Municipal Water System. Nestle Canada Inc. and St. Mary's Cement will be provided municipal water services for domestic uses only.

A new elevated water tank will be provided as part of Option 2 in order to meet the required water storage requirements for equalization, emergency and fire flows. A new metering facility will be required at the boundary between the City of Guelph System and the Township system. The metering facility may be combined with a pressure control station/re-chlorination system (either boosting or reduction) and may be required to control system pressures from the City of Guelph distribution system to meet the Township system requirements.

A description of the main infrastructure and process requirements for Option 2 – Inter-Municipal Water Servicing is provided in Table 29. A general schematic of the major components of Option 2 is shown in Figure 4.

Land acquisition would be anticipated for construction of the new pressure control station and the new elevated water tank. All other linear infrastructure associated with Option 2 is expected to occur with the existing road right-of-ways.

Table 29 Water Servicing Option 2 – Infrastructure / Process Requirements

Area	Option Requirements
Supply	• A direct connection to the City of Guelph distribution system, Pressure Zone 3. City of Guelph Water System should be able to provide a maximum day demand of 72.3 L/s (6,250 m^3/d).
Treatment	• Not required within the Township.
Facilities	• A new metering facility with a potential pressure control station will be required to accommodate maximum day flows of 72.3 L/s (6,250 m^3/d) to the new elevated tower in the Township. A new pressure control station may be required to control system pressures in the Township.
Storage	• A new elevated water tank will be built to provide for required storage requirements. The new tank will have a capacity of 3,500 m^3
Distribution	• Approximately 2.0 km of 400 mm diameter watermain extension in Guelph to the Puslinch border, and a metering facility at the municipal boundary. • Approximately 3.3 km of 400 mm diameter watermain from the metering facility to the new to the new elevated water tank. • Approximately 27.1 km of local distribution system consisting of watermains ranging in diameter from 150 to 300 mm.

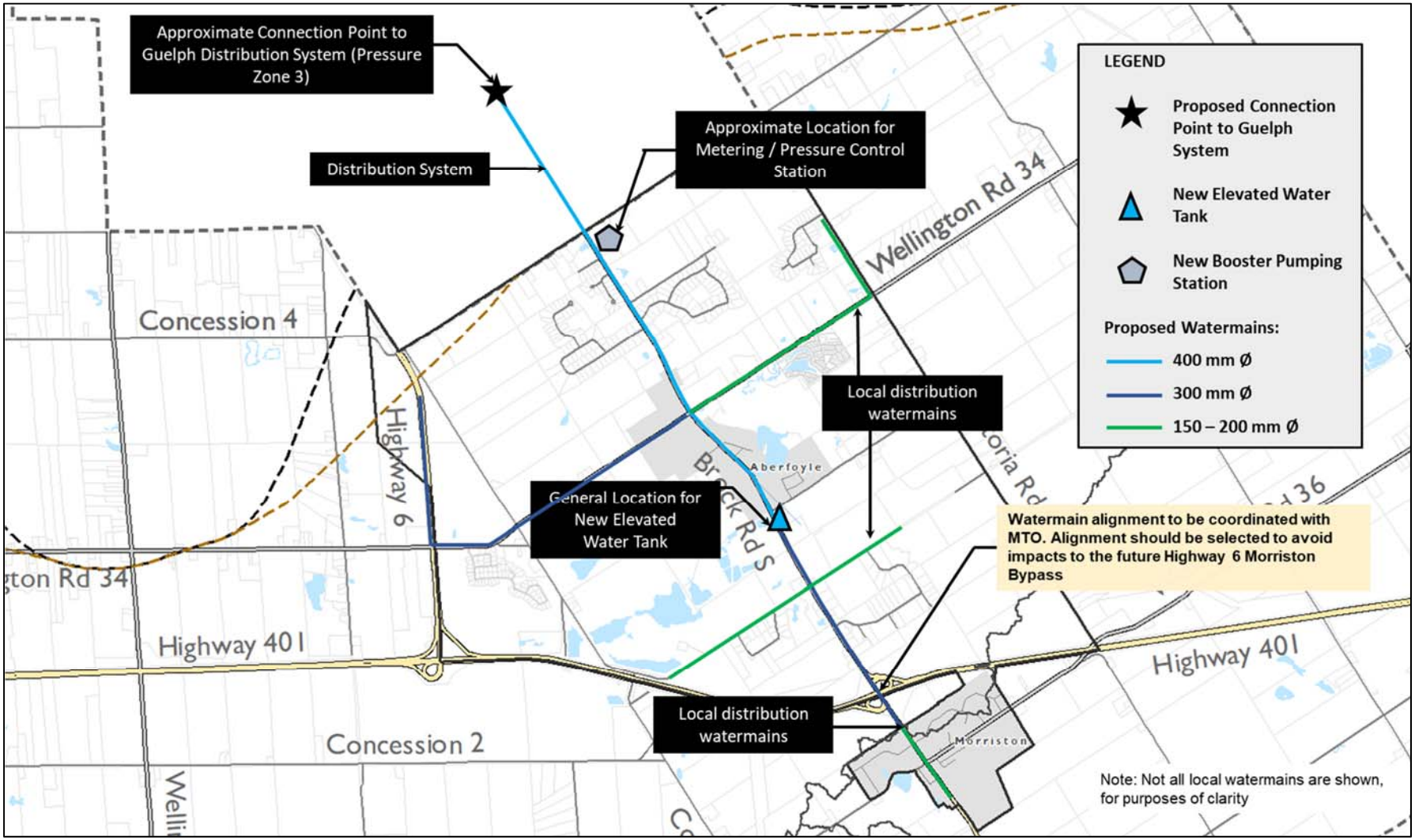

Figure 4 General Schematic – Option 2: Inter-Municipal Water Servicing

5.2 Estimates of Probable Cost – Water Servicing Options

Estimates of probable capital, operating and maintenance costs and life cycle costs have been developed. Capital costs include development of new supply, treatment and storage facilities, major process and treatment equipment such as pumps, piping and valves, instrumentation, treatment equipment, standby power supply and watermain installation. Operating and maintenance costs accounted for include power, chemical usage, regulatory requirements and other replacement and labour costs. Life cycle costs have been calculated based on a 20-year life expectancy.

The following general assumptions were made when developing the costs for the servicing options:

+ Cost estimates are based on 2018 construction costs. Inflation and escalation to account for actual expected prices at the time of construction cannot be accounted for at this time.

+ Estimates of probable capital costs have been developed on a conceptual level and based on prices and data in CIMA's possession, as well as previous experience from projects of similar nature and scope. The accuracy of conceptual estimates developed at this point, are assumed to be around +/- 30%.

+ There is capital expenditure associated with the replacement of major pumping and treatment equipment every 30 years for water facilities.

+ All taxes (including the 13% HST) have been excluded.

+ The cost to decommission existing private groundwater wells and small communal water systems within the study area has not been accounted for in Water Servicing Options 1 and 2. Should this project proceed to the next phases (i.e., completion of a Class Environmental Assessment Study), an inventory of existing groundwater wells within the study area should be completed and the cost for decommissioning existing wells and private communal water systems should be added to CIMA's preliminary estimates.

+ Capital costs associated with any required upgrades needed in the City of Guelph Water System to accommodate the inter-municipal connection and servicing, or any Capital Contributions to secure Supply capacity from Guelph are unknown at this point and have not been accounted for in the estimate for Option 2. The required capital costs would need to be identified through further negotiations between the Township and the City, as well as the mechanisms to pay for these upgrades. Similarly, a portion of the operation and maintenance (O&M) costs for Option 2 should be covered under a Bulk Water Rate that the Township would pay to the City, also to be established through further negotiations between the two parties.

+ Completion of Class Environmental Assessment (Class EA) studies as well as additional amendments to existing master plans, servicing studies, secondary plans, approved draft plans, etc., have not been accounted for and should be included in the Capital Upgrade Costs, through consultation and negotiations between the Township and the City.

Life cycle costs have been estimated based on:

+ A 20 year amortization period

+ An inflation rate of 2% and an interest rate of 6% to give a market/discount rate of 4%

Estimates for probable capital, operating and life cycle costs for the water servicing options are summarized Table 30. Detailed costs calculations are included in Appendix C.

Table 30 Water Servicing Options – Probable Cost Estimates

Servicing Alternative	Capital Cost ($ millions)	Annual Operating & Maintenance Cost	NPV 20-Year Life Cycle Cost [1] ($ millions)
Option 1 – Intra-Municipal Water Servicing	$ 34.3	$ 504,000	$ 39.4
Option 2 – Inter-Municipal Water Servicing	$ 29.6	$ 95,400	$ 29.3

Notes:
1. Net Present Value (NPV) represents the value of the project in today's dollars. Calculated NPV for Option 2 gets reduced over time as a result of the lower O&M costs which represent cash outflows. Higher cash outflows, as in Option 1, results in a higher NPV.

5.3 High-level Assessment

This section presents the results of the high-level assessment completed for the water servicing options considered in the Feasibility Study. Key advantages and disadvantages are summarized in Table 31.

Table 31 Water Servicing Options – High-Level Assessment Results

Servicing Option	Advantages	Disadvantages
Option 1 – Intra-Municipal Servicing	• Option provides the Township with complete control of the operation and maintenance of the water supply system. • Complete independent system from supply, to treatment and distribution. Township can provide desired level of robustness and flexibility to the system. • Provision of municipal water servicing (coupled with wastewater servicing) in the area will provide an invitation for developers to invest in the Township and promote growth in accordance with the County Official Plan – population and employment.	• Option results in highest capital, O&M and life cycle costs. • Option requires the largest amount of new infrastructure. • Majority of residents who currently rely on private groundwater wells and communal systems may object to a connection to a municipal system. • Residential connections to municipal systems to be born by residents.

Servicing Option	Advantages	Disadvantages
Option 2 – Inter-Municipal Servicing	• Option results in lower capital, O&M and life cycle costs when compared to Option 1. • Option provides the Township with some control of the operation and maintenance of the water supply system – through a servicing agreement between the Township and the City. • Option is able to optimize the use of some of the existing infrastructure (in City of Guelph) and reduces the need for new infrastructure. • Water supply is dependant on City of Guelph supply but provision of an elevated tower in the Township would provide adequate level of robustness and flexibility to the system. • City of Guelph has a proven track record of providing adequate level of water servicing to its residents, which create trust to potential future serviced areas in the Township. • Option supports affordable and sustainable development between two municipalities. • It may provide an opportunity for the two municipalities (City of Guelph and Township) to partner for funding opportunities and share existing resources. • This coordinated approach to service delivery can result in efficiencies in infrastructure costs, water conservation, and allow for additional funds to be allocated to improved treatment and program delivery. • Provision of municipal water servicing (coupled with wastewater servicing) will provide an invitation for developers to invest in the areas and promote growth in accordance with the County Official Plan – population and employment.	• Majority of residents who currently rely on private groundwater wells and communal systems may object to a connection to a municipal system. • It most likely require an amendment the City of Guelph Official Plan to allow the extension of the City's urban services for areas outside of the City's urban boundaries. This process may be long. • Amendments to existing Secondary Plans, and approve Draft Plans may be required. • City of Guelph Water Servicing Master Plan would need to integrate servicing to the area in Township. • Upgrades to existing water servicing infrastructure in Guelph Pressure Zone 3 may be required, directly or indirectly, to accommodate the inter-municipal transfer. • An inter-municipal agreement will be required to establish an inter-municipal services scheme. • The cost of any Capital Contribution and/or Capital Upgrades to secure supply from the City of Guelph is unknown at this time, and may represent a significant impact to the overall project cost.

6. High-level Sewage Servicing Options – Development and Assessment

Similar to the Water servicing options, potential servicing options for sewage servicing were developed based on the general criteria established in Section 4. The Servicing Options were developed assuming that municipal sewage services were provided to all properties within the Study Area. Each option was then assessed on a high-level, in terms of key advantages, disadvantages and estimated probable costs.

This section provides a description of the high-level sewage servicing options considered in this study. Two alternative options have been reviewed to determine the potential cost implications of each. The options selected consist of Option 1 – Intra-Municipal Sewage Servicing, and Option 2 – Inter-Municipal Sewage Servicing. Major infrastructure / process requirements, general schematics and preliminary capital, operating and life cycle costs for each option are also presented.

6.1 General Description

6.1.1 Option 1 – Intra-Municipal Sewage Servicing

The Intra-Municipal Sewage Servicing alternative considers the development of a stand-alone system for wastewater collection, treatment and disposal. The system would be owned and operated by the Township.

On a preliminary basis, the system would consist of a conventional gravity collection system with pumping stations and forcemains as required to accommodate ground elevation variations. A new treatment facility would be required, with discharge to a surface water course. For the purpose of this Study, a site in the vicinity of Mill Creek was selected; however, other discharge receivers should be explored in the next stages, including but not limited to the Speed River. Potential sensitivities and assimilative capacity of the receiving water body would need to be reviewed as part of a Class EA Study.

This system would allow a stand-alone collection and treatment for the study area operated and maintained by the Township. This option includes sanitary sewer installed at standard depths of three (3) metres to five (5) below existing ground surface. However, in order to service small pockets of residential, or mixed use land, pumping stations and forcemain would be required to convey the wastewater to the treatment facility.

As shown in Figure 5, a pumping station would be required to service Morriston, with a forcemain installed under the Ministry of Transportation (MTO) Highway 401. A small pumping station would be required to service the Audrey Meadows and the Mini Lakes communities which would pump by forcemain to a gravity sewer at Wellington Road 34 and Brock Road. An additional pumping station would be required for the collection and conveyance for Aberfoyle and surrounding area. The existing industrial/commercial lands north of Highway 401, and the areas east of Highway 6 could be serviced by gravity sewer to a waste water treatment facility generally located near Concession Road 7 and Mill

Creek area. The assimilative capacity of Mill Creek would need to be reviewed to ensure a suitable outfall location.

A description of the main infrastructure is summarized for Option 1 – Intra-Municipal Sewage Servicing in Table 32 below. A general schematic of the major components of Option 1 is shown in Figure 5.

Table 32 Sewage Servicing Option 1 – Infrastructure / Process Requirements

Area	Option Requirements
Collection	• A new conventional gravity collection system would be required throughout the Township in order to collect wastewater from the individual properties. The sewer system would range in size from 200 mm diameter up to 525 mm diameter.
Pumping	• Three pumping stations would be required to convey the wastewater from pockets that cannot, at this stage, be conveyed through a gravity system. The pumping stations would range in size from small (18 L/s) to medium sized (90 L/s) stations. • Provision of stand-by power and overflow storage would need to be considered during detailed design.
Treatment	• A wastewater treatment facility would need to be constructed to provide the required treatment capacity. It is anticipated that construction of the facility would be staged to accommodate current populations plus anticipated growth over the design period, with provisions for expansion beyond the current planning horizon. A new treatment plant would need to be designed for a capacity of 9,400 m^3/day.
Effluent Discharge	• For the purpose of this study, it has been assumed that treated effluent may be discharged to Mill Creek. An Assimilative Capacity Study will be required to determine if Mill Creek can be used for this disposal of treated effluent, and to establish design parameters and effluent criteria and loading limits from this facility.

As part of Option 1, all existing individual on-site septic tanks, communal wastewater systems within the study area are expected to be decommissioned, and costs for decommissioning will be the responsibility of the private property owners.

Land acquisition would be anticipated for construction of the new treatment facility and the pumping stations. All other linear infrastructure associated with Option 1 is expected to occur with existing road rights-of-way.

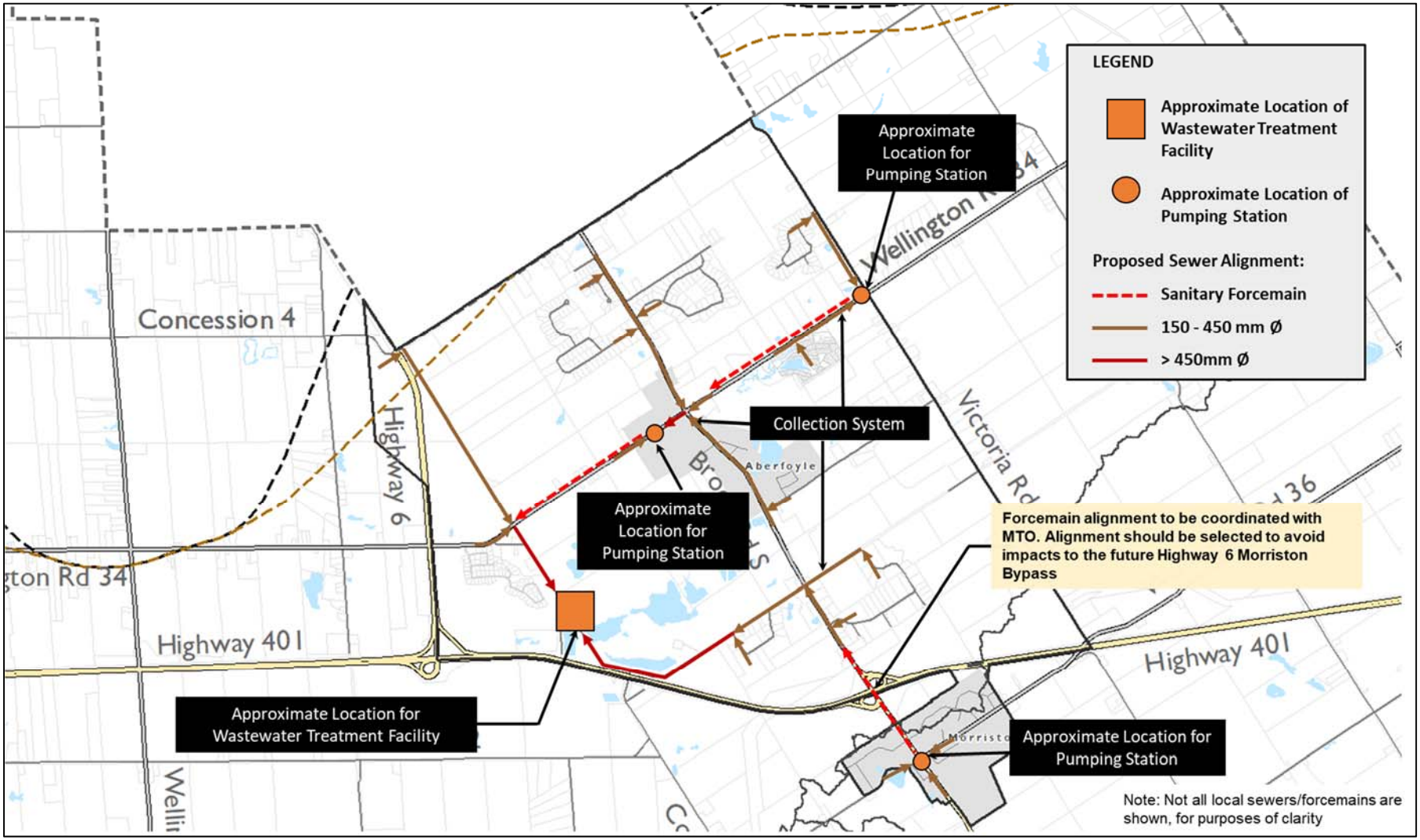

Figure 5 General Schematic – Option 1: Intra-Municipal Sewage Servicing

6.1.2 Option 2 – Inter-Municipal Sewage Servicing

The Inter-Municipal Sewage Servicing alternative consists of collection and conveyance of wastewater through a sanitary sewer network, pumping stations and forcemain, with an outlet to the Guelph collection system for ultimate treatment and disposal.

Option 2 will rely on the Guelph system for treatment, and therefore will require an inter-municipal servicing agreement. Preliminary discussions with staff from the City of Guelph have indicated that the City would be open to discussions necessary to establish an inter-municipal servicing agreement; however, no terms and/or conditions have been identified. Through further consultation with the City, the City indicated that they do not have excess sewage treatment capacity to support external servicing requests. The Township acknowledged that the City may not have available treatment capacity to allocate to the Township of Puslinch, and further recognized that if capacity was available, allocation of that capacity would not be without cost. Correspondence associated with preliminary consultation with the City of Guelph is included in Appendix B for further reference.

The Township Council would need to submit a formal request to the City of Guelph to initiate formal consideration of this Option.

The preliminary sewer alignment and location of pumping stations is similar to Option 1; however, an additional pumping station would be required to convey the wastewater generated from the lands east of Highway 6 to a larger pumping station that would convey the wastewater flows to the Guelph system. In addition, a flow monitoring facility would be required at the discharge location to measure flows for billing purposes.

As with Option 1, this system includes sanitary sewer installed at standard depths of three (3) to five (5) metres below existing surface. Figure 6 provides an approximate location for a pumping station to service Morriston, Audrey Meadows, the Mini Lakes communities, Aberfoyle and surrounding area. Each pumping station will have an associated forcemain which will discharge to the gravity system prior to being pumped into Guelph.

A description of the main infrastructure is summarized for Option 2 – Inter-Municipal Sewage Servicing in Table 33 below. A general schematic of the major components of Option 2 is shown in Figure 6.

Table 33 Sewage Servicing Option 2 – Infrastructure / Process Requirements

Area	Option Requirements
Collection	• A new gravity sewer system would be required throughout the Township in order to collect the wastewater. The sewer system would range in size from 150 mm diameter up to 525 mm diameter.
Pumping	• Four pumping stations would be required to convey the wastewater from pockets that cannot, at this stage, be conveyed through a gravity system. The pumping stations would range in size from small (18 L/s) to medium sized (385.5 L/s) stations.

As part of Option 2, all existing individual on-site septic tanks, and communal wastewater systems within the study area are expected to be decommissioned, and costs for decommissioning will be the direct responsibility of the private property owners.

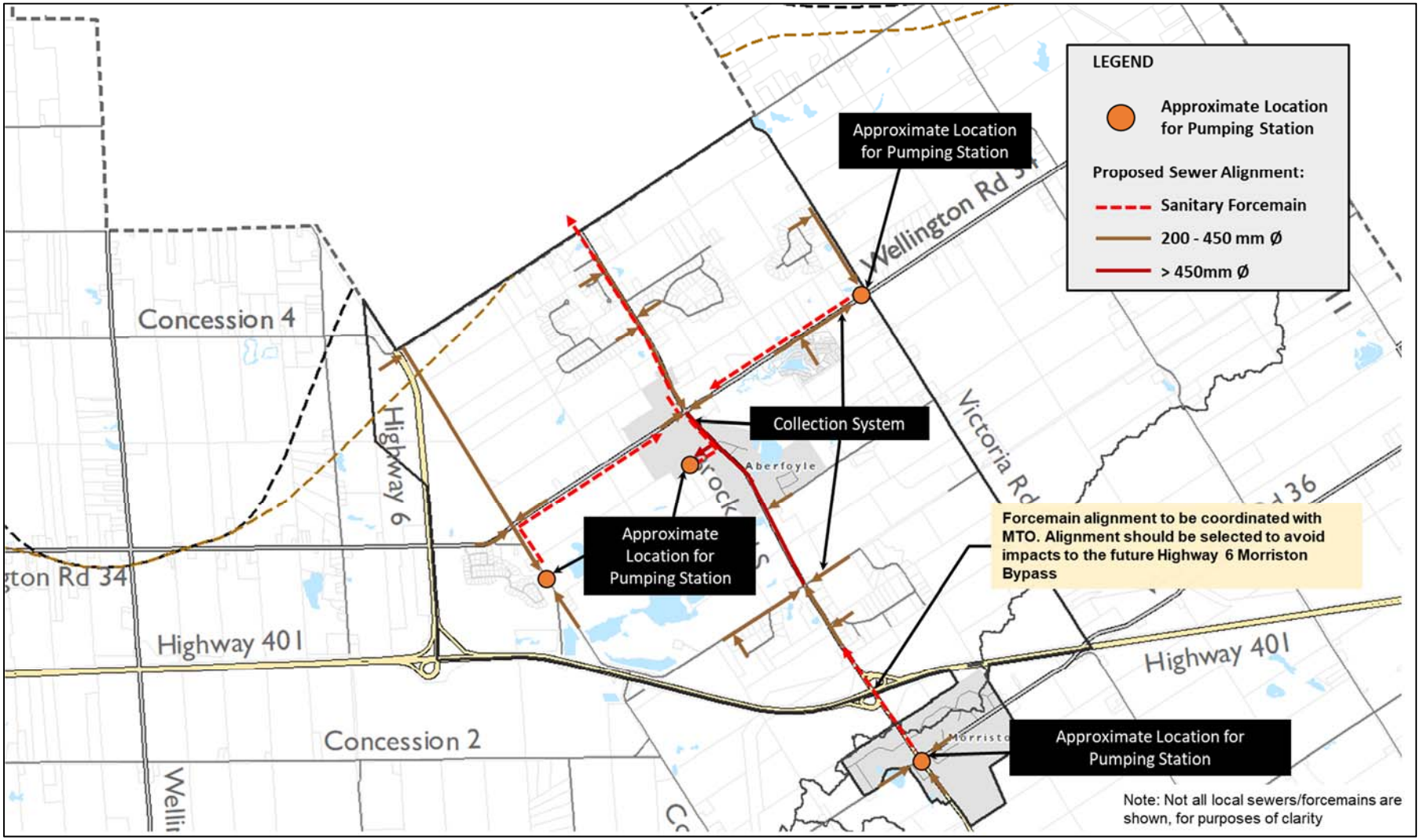

Figure 6 General Schematic – Option 2: Inter-Municipal Sewage Servicing

6.2 Estimates of Probable Cost – Sewage Servicing Options

Estimates of probable capital, operating and maintenance costs and life cycle costs have been developed. Capital costs include an allowance for property acquisition, for pumping stations and for Option 1, a treatment facility. Major process and treatment equipment such as pumps, piping and valves, instrumentation, treatment equipment, standby power supply are assumed to be included. Operating and maintenance costs accounted for include power, chemical usage, regulatory requirements and other replacement and labour costs. Life cycle costs have been calculated based on a 20-year life expectancy.

The following general assumptions were made when developing the costs for the servicing options:

+ Cost estimates are based on 2018 construction costs. Inflation and escalation to account for actual expected prices at the time of construction cannot be accounted for at this time.

+ Estimates of probable capital costs have been developed on a conceptual level and based on prices and data in CIMA's possession, as well as previous experience from projects of similar nature and scope. The accuracy of conceptual estimates developed at this point, are assumed to be +/- 30%.

+ There is capital expenditure associated with the replacement of major pumping and treatment equipment every 30 years for wastewater facilities.

+ The cost to decommission existing private septic systems within the study area has not been accounted for in Sewage Servicing Options 1 and 2.

+ Capital costs associated with any required upgrades needed in the City of Guelph collection and treatment system to accommodate the inter-municipal Option, are unknown at this point and have not been accounted for. The required capital costs would need to be identified through further negotiations between the Township and the City, as well as the mechanisms to pay for these upgrades. Similarly, a portion of the City of Guelph's operation and maintenance (O&M) costs would need to be reviewed and negotiated for Option 2.

+ Completion of a Class Environmental Assessment (Class EA) study as well as additional amendments to existing master plans, servicing studies, secondary plans, approved draft plans, etc., have not been accounted for and should be included in the Capital Upgrade Costs, through consultation and negotiation between the Township and the City.

Life cycle costs have been estimated based on:

+ A 20 year amortization period

+ An inflation rate of 2% and an interest rate of 6% to give a market/discount rate of 4%

Estimates for probable capital, operating and life cycle costs for the sewage servicing options are summarized Table 34.

Table 34 Sewage Servicing Options – Probable Cost Estimates

Servicing Alternative	Capital Cost ($ millions)	Annual Operating & Maintenance Cost	NPV - 20-Year Life Cycle Costs ($ millions)
Option 1 – Intra-Municipal Sewage Servicing	$ 66.6	$ 814,000	$ 73.0
Option 2 – Inter-Municipal Sewage Servicing	$ 43.5	$ 289,000	$ 44.5

Notes:

1. Net Present Value (NPV) represents the value of the project in today's dollars. Higher cash outflows, as in Option 1, results in a higher NPV.

6.3 High-level Assessment

This section presents the results of the high-level assessment completed for the sewage servicing options considered in the Feasibility. Key advantages and disadvantages are summarized in Table 35.

Table 35 Sewage Servicing Options – High-Level Assessment Results

Servicing Option	Advantages	Disadvantages
Option 1 – Intra-Municipal Servicing	• Provides the Township with complete control of the operation and maintenance of the wastewater collection and treatment system. • Complete independent system from collection, treatment and discharge/disposal. Township can provide desired level of robustness and flexibility to the system. • Provision of municipal sewage servicing (coupled with water servicing) in the area will provide an invitation for developers to invest in the Township and promote growth in accordance with the County Official Plan – population and employment.	• Results in highest capital, O&M and life cycle costs. • Option requires the largest amount of new infrastructure. • Majority of residents who currently rely on private septic systems and communal systems may object to connecting to a municipal system. • Residential connections to municipal systems to be borne by residents. • Assimilative capacity of Mill Creek may limit capacity of treatment plant. • An alternative effluent discharge location or method of disposal may be required.
Option 2 – Inter-Municipal Servicing	• Option results in lowest capital, O&M and life cycle costs. • Option provides the Township with control of the collection system and operation and maintenance, which is a lower complexity operations requirement.	• Majority of residents who currently rely on private septic and communal systems may object to a connection to a municipal system. • It most likely require an amendment the City of Guelph Official Plan to allow the

Servicing Option	Advantages	Disadvantages
	• Operations costs for wastewater treatment will be fixed by Agreement with the City of Guelph, and funded through rates established in the Agreement. • May be able to optimize the existing infrastructure (in City of Guelph) and reduce the need for new infrastructure. • It may provide an opportunity for the two municipalities (City of Guelph and Township) to partner for funding opportunities and share existing resources. • The coordinated approach to service delivery can result in efficiencies in infrastructure costs, water conservation, and allow for additional funds to be allocated to improved treatment and program delivery. • Provision of municipal sewage servicing (coupled with water servicing) will provide an invitation for developers to invest in the areas and promote growth in accordance with the County Official Plan – population and employment.	extension of the City's services for areas outside of the City's urban boundaries. • City of Guelph Wastewater Servicing Master Plan would need to integrate servicing to the area in Township. • Upgrades to existing wastewater infrastructure in Guelph may be required, directly or indirectly, to accommodate the inter-municipal servicing. • An inter-municipal agreement will be required to establish an inter-municipal services scheme. • The cost of any Capital Contribution and/or Capital Upgrades to secure treatment and disposal from the City of Guelph is unknown at this time, and may represent a significant impact to the overall project cost.

7. Overview of Cost Recovery and Funding Opportunities

As part of this Study, potential servicing options for provision of municipal water and sewage services in the Study Area have been explored, as described in Sections 5 and 6 of this report. However, affordability and issues such as how proposed servicing would be financed, and the potential cost burden on existing residents/business and potential development will need to be established.

A review of different approaches or tools, available to municipalities in Ontario to fund water and sewer servicing has been undertaken to identify 'order of magnitude' cost implications. This section provides a summary of the cost recovery tools that are available to fund the capital works considered under this Feasibility Study.

The estimates of probable costs identified in Sections 5.2 and 6.2 of this report are Preliminary and subject to refinement, should the Project proceed through to a Class EA Study and implementation. A detailed Financial Plan/Cost Recovery plan would be required as part of the Municipal Class EA Study.

7.1 Capital Connection Charges

Costs related to construction may be recovered through Capital Connection Charges, which can be levied under the *Municipal Act*, for existing residents and businesses benefiting from municipal servicing. Capital Connection Charges are one-time fees imposed on new customers connecting to the municipal system(s) as a condition of service, in addition to any actual cost incurred to physically connect to the system(s). Benefiting owners may be allowed to spread payments over a period of time, typically between 10 to 30 years, depending on the magnitude of the Project and the municipality's debt financing capacity.

Capital Connection Charges may be levied in different ways. Costs may be allocated based on property frontage, property area, or by the number of benefiting units. In addition, different rates may be applied based on land use (i.e. residential, industrial/commercial). These type of charges can be levied against all lands – developed and undeveloped. If Connection Charges are only imposed on developed lands, area-specific Development Charges should be enacted to recover monies from future benefitting lands.

Development Charges would be used to recover the cost of the growth related portion of the costs. A background study would need to be undertaken in accordance with the Municipal Act, in addition to completion of a public meeting process and passage of the appropriate by-law. Upon Council's direction, a separate background study and by-law will need to be prepared.

The Township does not currently use Capital Connection Charges to fund municipal servicing infrastructure, as existing services in the study area are provided through private and/or communal systems developed as part of the subdivision approval process. However, Capital Connection Charges is a tool commonly used by municipalities in Ontario to recover capital construction costs associated with the establishment or extension of municipal infrastructure to existing developed properties.

7.2 Development Charges

Development charges are fees levied against new development to help cover the initial capital cost of infrastructure required to service growth. Under the Development Charges Act, Municipalities in Ontario are able to recover certain costs associated with residential and non-residential growth. However, Development Charges cannot fund the portion of the costs that benefit existing residents.

Municipalities undertake a range of studies to identify servicing needs to accommodate growing populations within the municipalities' boundaries, and use this information to develop their Background Study, Development Charge Bylaw and Development Charge rates.

The Township's current Development Charge By-law (054/14) does not recover any costs associated with provision of municipal water and Wastewater servicing within the Township or within the study area subject to this Feasibility Study. Should the Township proceed with the provision of water and sewage servicing, the Township will need to update their Development Charge Background Study and consider adopting area-specific development charges for new development within the Study Area.

7.3 Water and Sewage User Rates

Water and sewer user rates fund the actual operating and routine maintenance costs for the water and wastewater systems, as well as provide funding for future maintenance and ultimate replacement of the infrastructure. Uniform utility rates per Class of users are levied against all users of the system.

In order to define the Water and Sewage Rates, the Township will need to undertake a Rate Study to identify annual operating and maintenance costs as well as the required contributions to the Township's Water and Wastewater reserves.

7.4 Federal and Provincial Grants

Grant funding from senior levels of government are available to assist municipalities in funding capital projects. The Government of Canada will invest more than $180 billion over 12 years in public transit projects, green infrastructure, social infrastructure, trade and transportation routes, and Canada's rural and northern communities. The Ontario Government is committed to making the largest infrastructure investment in the Province's history – about $190 billion over 13 years which started in 2014-2015.

Grant funding programs available to local governments for infrastructure projects have their own unique requirements, cost-sharing arrangements, eligibility requirements, and application procedures and deadlines.

Funding Opportunities on a Federal Level include:

+ Municipalities for Climate Innovation Program (MCIP): eligible for projects addressing Climate Change Mitigation or Adaption. Applications for the 5-year (2017-2022) funding program will be accepted on a continuous basis.

Funding Opportunities on a Federal / Provincial Bi-Lateral Level include:

+ Clean Water and Wastewater Fund (CWWF): Funding is available up to 75% of eligible costs per eligible project (50% federal; 25% provincial). The program targets projects that will contribute to the rehabilitation of both water treatment and distribution infrastructure and existing wastewater and storm water treatment systems; collection and conveyance infrastructure; and initiatives that improve asset management, system optimization, and planning for future upgrades to water and wastewater systems. Phase 1 Round is now closed (*Projects to be completed by March 2018*). Phase 2 Round is scheduled to be announced in spring 2018.

Funding Opportunities on a Provincial Level include:

+ Ontario Community Infrastructure Fund (OCIF) which provides steady, long-term funding for small, rural and northern communities to develop and renew their infrastructure. The total fund is increasing to $300 million per year by 2018-19. This funding includes a Formula-based and a Top-up Application Component. By 2019, the formula-based component will increase to a total allocation of $200 million annually. Communities will not need to apply for the funding but will need to provide planning and reporting documents to the government to receive the grants. Eligible communities with critical infrastructure projects may submit proposals to the new top-up component to bring their total OCIF funding up to $2 million over 2 years.

A clear and up-to-date understanding of grant funding available to local governments for infrastructure projects and the unique requirements and application process for each program is needed in order to take full advantage of the needed infrastructure dollars available from federal and provincial funds.

7.5 Preliminary Cost Recovery Estimates

To provide a rough order of magnitude for cost recovery estimates, it has been assumed that capital costs will be evenly distributed amongst the total number of benefiting units within the study area, including residential, commercial, industrial and institutional, on an equivalent basis. A total of 1,209 lots, or equivalent benefiting units, have been accounted for within the project study area. This preliminary assumption does not distinguish between the usage of the system amongst different users. A financing annual rate of 4.0% has also been used in the preliminary calculations.

Two cost recovery scenarios have been assumed to provide a preliminary cost estimate, which include:

7.5.1 Scenario A – No Funding:

This scenario assumes that all capital costs associated with the servicing options will be recovered entirely by all 1,209 benefiting units within the study area. A servicing cost per unit is calculated by dividing the capital cost of the option by the total number of units (1,209). Options are available for benefiting property owners to pay this amount upfront, or to finance the servicing costs over a period of time in an effort to reduce the annual costs. For preliminary calculation purposes, annual payments have been spread over 10, 15 and a 20-year time period.

Preliminary cost recovery estimates under Scenario A – No Funding, for the water and sewage servicing options, outlined in Sections 5.1 and 6.1, are summarized in Tables 36 and 37. Detailed calculations for cost recovery estimates are included in Appendix D.

Table 36 Cost Recovery Estimates for Water Servicing: Scenario A – No Funding

	Option 1 – Intra-Municipal Water Servicing	Option 2 – Inter-Municipal Water Servicing
Capital Cost ($ Millions)	$ 34.3 M	$ 29.6 M
Total Benefiting Units	1,209	1,209
Servicing Cost Per Unit (1,209 connections)	$ 28,371	$ 24,483
Annual Interest Rate	4.0%	4.0%
Estimated Annual Cost Per Unit :		
10-Year Period	$ 3,447	$ 2,975
15-Year Period	$ 2,518	$ 2,173
20-Year Period	$ 2,063	$ 1,780

Table 37 Cost Recovery Estimates for Sewage Servicing: Scenario A – No Funding

	Option 1 – Intra-Municipal Sewage Servicing	Option 2 – Inter-Municipal Sewage Servicing
Capital Cost ($ Millions)	$ 66.6 M	$ 43.5 M
Total Benefiting Units	1,209	1,209
Servicing Cost Per Unit (1,209 connections)	$ 55,087	$ 35,980
Annual Interest Rate	4.0%	4.0%
Estimated Annual Cost Per Unit :		
10-Year Period	$ 6,693	$ 4,371
15-Year Period	$ 4,890	$ 3,194
20-Year Period	$ 4,006	$ 2,616

7.5.2 Scenario B – Funding:

This scenario assumes that 2/3 of the capital costs associated with the servicing options will be funded through government funds, while the remaining 1/3 of the capital costs will be recovered through all 1,209 benefiting units within the study area. A servicing cost per unit is calculated by dividing the remaining 1/3 capital cost of the option by the total number of units (1,209). Annual payments have been spread over 10, 15 and a 20-year time period.

Preliminary cost recovery estimates under Scenario B – 2/3 Funding, for the water and sewage servicing options, outlined in Sections 5.1 and 6.1, are summarized in Tables 38 and 39. Detailed calculations for cost recovery estimates are included in Appendix D.

Table 38 Cost Recovery Estimates for Water Servicing: Scenario B – 2/3 Funding

	Option 1 – Intra-Municipal Water Servicing	Option 2 – Inter-Municipal Water Servicing
Capital Cost ($ Millions)	$ 34.3 M	$ 29.6 M
Subsidized Cost ($ Millions)	$ 11.4 M	$ 9.9 M
Total Benefiting Units	1,209	1,209
Servicing Cost Per Unit (1,209 connections)	$ 9,457	$ 8,161
Annual Interest Rate	4.0%	4.0%
Estimated Annual Cost Per Unit :		
10-Year Period	$ 1,149	$ 992
15-Year Period	$ 839	$ 724
20-Year Period	$ 688	$ 593

Table 39 Cost Recovery Estimates for Sewage Servicing: Scenario B – 2/3 Funding

	Option 1 – Intra-Municipal Sewage Servicing	Option 2 – Inter-Municipal Sewage Servicing
Capital Cost ($ Millions)	$ 66.6 M	$ 43.5 M
Subsidized Cost ($ Millions)	$ 22.2 M	$ 14.5 M
Total Benefiting Units	1,209	1,209
Servicing Cost Per Unit (1,209 connections)	$ 18,362	$ 11,993
Annual Interest Rate	4.0%	4.0%
Estimated Annual Cost Per Unit :		
10-Year Period	$ 1,980	$ 1,457
15-Year Period	$ 1,392	$ 1,065
20-Year Period	$ 1,104	$ 872

7.5.3 System Connection Costs

In addition to the above noted costs, homeowners and businesses would be required to construct private water services and sanitary building drains to connect to the municipal services on the road right-of-way.

Extension of water and wastewater services on private property is controlled under the Building Code Act. Each property connecting to the municipal system would need to obtain a plumbing permit prior to undertaking the work. This cost of extending provides water and sanitary services will vary based upon a number of factors, including:

+ Proximity of the connection from the building to the connection to the street
+ Restoration requirements (i.e. turf areas, driveways, walkway, landscaping, etc.)
+ Competitive pricing including the reputation, experience and quality of work of the contractor

+ Any other improvements, such as the removal of existing groundwater wells, septic systems, which may be made at the same time the work is being done.

+ Neighbours collectively retaining the same contractor to undertake the works at the same time.

For a typical residential property, completion of the private water service and sanitary service will typically cost in the order of $5,000 - $8,000 per property.

As noted earlier in this report, the Feasibility Study has assumed that all existing private groundwater wells within the Study Area will be decommissioned and disconnected from the house plumbing to prevent cross connections with the municipal system. Well decommissioning is regulated under the Ontario Water Resources Act, and must be completed in accordance with O. Reg. 903.

Consistent with the Act, private property owners that are required to decommission their well should use a licensed well contractor. The County of Wellington through its Rural Water Quality Program provides financial assistance to qualified landowners that apply best management practices that improve and protect ground and surface water quality; which include well decommissioning. The program is administered by the Grand River Conservation Authority. A formal application would need to be completed and is to be evaluated by a committee on the basis of the potential to improve and protect water quality. Grant rates for well decommissioning cover 100 per cent of the cost, up to a maximum of $2,500. More information is available at https://www.grandriver.ca/en/our-watershed/Wellington.aspx.

8. Public Communication and Consultation

Public communication and consultation initiatives were implemented in the Feasibility Study with the objective of gathering preliminary input from the users within the Study Area on the general intent of the study as well as the preliminary results of the key activities completed as part of the study. The outcome of these initiatives are described in the following sections.

8.1 Municipal Servicing Questionnaire

A Municipal Servicing Questionnaire was prepared by the Project Team, at the onset of the study, and distributed to all users within the project Study Area. The purpose of the questionnaire was to gauge the desire for existing private property and system owners to have municipal servicing.

The Township distributed approximately 1,000 copies of the questionnaire, which included residential, industrial, commercial and institutional (ICI) users within the study area. From the distributed copies, approximately 85 are considered to be ICI users.

A total of 361 completed questionnaires were received by the Township, which represent a response rate of approximately 36%. A breakdown of the completed questionnaires received is as follows (note that a few completed surveys are unaccounted for):

+ 260 questionnaires received from Aberfoyle, including 238 residential and 22 ICI
+ 80 questionnaires received from Morriston, including 74 residential and 6 ICI

Pie charts, depicting graphically the responses obtained, are included in Appendix E of this report. The following summarizes the questionnaire results:

+ Residential Users
  - 321 Questionnaires were received from residential users
  - 27% in favour of municipal water servicing
  - 33% in favour of municipal sewage servicing
+ ICI Users
  - 40 Questionnaires were received from ICI users
  - 63% in favour of municipal water servicing
  - 68% in favour of municipal sewage servicing
+ Total
  - 361 Questionnaires were received from residential and ICI users
  - 31% in favour of municipal water servicing
  - 36% in favour of municipal sewage servicing

Based on the responses obtained from existing users, particularly residential users, it is clear that current residents have a strong preference to remain on private well and sewage systems, due mainly to the high associated capital costs, and to some extent, to water quality considerations. ICI users on the other hand are in favour of municipal servicing.

8.2 Public Information Centre

A formal Public Information Centre (PIC) was held on March 22, 2018 at the Puslinch Community Centre, in Puslinch, from 6:30 p.m. to 8:30 p.m. Approximately, 120 members of the public signed in the PIC attendance sheet. Visitors were invited to arrive at 6:30 p.m. for an opportunity to see the display boards and to have informal conversations with the Project Team. A formal presentation by CIMA's Project Manager was scheduled for 7:00 p.m., followed by a Question and Answer (Q&A) session.

The primary purpose of the PIC was to share information with members of the public about the need and intent of the Feasibility Study, update everyone on the activities that have been taken to-date in association with the study and the preliminary results of such activities. As well, the PIC was an opportunity to get input from the public on the information shared.

The Mayor called order for the commencement of the presentation at 7:00 p.m. The Mayor initiated the meeting by describing how the need and scope of the feasibility study originated. He indicated that the Community Based Strategic Plan and the Business Retention and Expansion Study, completed for the Township, identified municipal servicing as one of the key drivers for businesses in the area to justify potential expansion of their businesses. The Township decided to look if there were any options on the table and identified the need to complete a Feasibility Study to look at potential options. The Mayor further indicated that no decisions have been made and that Council will look at the outcome of the Feasibility Study before making a decision. The Council's decision could be to revise the study area to include only commercial and industrial areas and exclude residential areas.

CIMA's Project Manager, provided the main presentation and covered the following topics:

+ Need for the Feasibility Study
+ Limits of the Study Area – the preliminary analysis includes servicing of the entire study area. However, final analysis may result in a smaller service area. (e.g. urban areas only)
+ Purpose of PIC
+ Preliminary growth projections
+ High-level water and sewage servicing options considered in the study
+ Results of a preliminary assessment of high-level water and sewage servicing options
+ Results obtained from the Municipal Servicing Questionnaire distributed within the study area
+ Next steps in the study.

Following the formal presentation, a Q&A session provided an opportunity for attendees to ask specific questions and to hear responses from the Project Team and the Mayor. Minutes documenting all participant questions and the responses provided by the Project Team were prepared and have been included in Appendix F. At 8:30 p.m., the Mayor concluded the Q&A session, thanking everyone for their participation and interest in the project. Residents were thanked for attending the PIC and providing input for the project.

In general, the message received from the PIC attendees was that current residents are not in favor of municipal servicing for residential areas, due to the associated high capital costs, for the most part, and to some extent, water quality considerations.

9. Summary and Recommendations

Population and employment growth within the study area have been established consistently with the projections set out in the County's Official Plan. The majority of growth will be directed to urban centres that offer municipal water and sewer servicing and, to a limited extent, to those urban centres and hamlets that offer partial, private communal or individual on-site services. For the Study Area, the majority of the anticipated growth will be directed to the Aberfoyle and Morriston Urban Centres. Growth will also be directed, to a lesser extent, to secondary agricultural areas, provided that the planning policies for these areas are met.

An analysis of the water demands was undertaken with a reasonable amount of background data for existing water demands within the Study Area. Reasonable water demand rates for existing users were then developed and used to estimate preliminary water use projections based on the population projections outlined within the County's Official Plan. MOECC Design Guidelines for Drinking Water Systems, 2008, were also used to validate and supplement any missing information.

For sewage flows, there was no background data available. As such, theoretical numbers based on MOECC Design Guidelines for Sewage Works, 2008, were assumed. Potential Industrial/Commercial/Institutional growth areas were identified and a theoretical population density (typical for many GTA and southwestern Ontario areas) was applied to such areas. Sewage flow projections also include an allowance for infiltration into the collection system. For the purpose of this study, we assumed full development of the potential Employment land areas within the 20 year horizon, as well as the projected residential growth.

Two potential high-level water and sewage servicing options for the study area were identified to include Option 1 – Intra-Municipal Water or Sewage Servicing, and Option 2 – Inter-Municipal Water or Sewage Servicing. Option 2 for water and sewage servicing, consists of reliance on the Guelph water and sewage system for treatment and disposal (in the case of sewage servicing), and therefore will require the appropriate inter-municipal servicing agreements. Preliminary discussions with staff from the City of Guelph have indicated that the City would be open to discussions necessary to establish an inter-municipal servicing agreement; however, no terms and/or conditions have been identified at this stage. The Township Council would need to submit a formal request to the City of Guelph to initiate formal consideration of this Option. There are more servicing design options that should be considered (i.e. alternative locations and routing for facilities); however, the basic options and assessments outlined in this report remain valid.

On a preliminary basis and from an economic impact perspective, it appears that the Inter-Municipal servicing options for both water and sewage servicing would be preferred. However, recent correspondence from the City of Guelph indicates that there is limited available capacity in the Guelph systems to provide servicing to the Township, and that significant Capital Upgrades would be required. The initial assessment would have to be re-visited once formal discussions and negotiations proceed with the City of Guelph, and once the impacts of any Capital Contributions, Capital Upgrades, and user rates are identified.

Preliminary cost recovery estimates have been calculated based on high-level estimates of probable capital costs for the servicing options and two different cost recovery scenarios explored as part of this Feasibility Study, which include no funding and a funding mechanism through government funds.

On a preliminary basis, it appears that implementation of any of the servicing options without any government funds would create a financial burden on the benefitting property owners. In addition, homeowners and businesses would be required to cover system connection costs as well, which are unknown at this point. In the end, the selected cost recovery option should be based on consultation between property owners and the municipality, and is influenced by the length of time required to fully fund the infrastructure works.

Various funding opportunities from both federal and provincial levels of government are available and should be explored in the future to provide a more accurate estimate of the costs.

It is recommended that further consideration be given to modifying the extent of municipal servicing to include only those areas within the Urban Hamlet areas of Aberfoyle and Morriston. The cost of extending municipal water and sewage systems to the more remote residential developments is disproportionately high, and would not represent good value for the investment considering the Township has no evidence of failing private systems. The reduced service area would provide a better opportunity for the Township to provide municipal services to those areas that have developed at a higher density, which would potentially result in a lower cost per connection.

The Township has the Mill Creek Monitoring Program which monitor historical groundwater elevations throughout the Township. It is suggested that a groundwater monitoring study be undertaken to assess groundwater quality within the study area. Given that on-site septic systems are a known point of potential groundwater contamination from bacteria, nitrates and other pollutants, combined with the presence of multiple private and communal septic systems in close proximity to groundwater wells in the area, monitoring of groundwater quality in the area can provide a better understanding of the existing groundwater quality conditions in the area. The results of this study can validate whether provision of municipal servicing to the entire study area is the best approach from a source protection perspective, and an option to be further explored through a completion of a separate Class Environmental Assessment Study.

APPENDIX A
Water Demand and Sewage Flow Analysis Detailed Calculations

Project Title:	**Puslinch Water and Sewage Feasibility Study**		
Client:	Township of Puslinch		
Project No.:	T000866A		
Task:	Criteria Development - Water Demands		
Prepared By:	Sandra Rodriguez	**Date:**	5-Oct-17
Reviewed by:	Stuart Winchester	**Date:**	6-Oct-17
Revision No. :	4	**Revision Date:**	3-Jan-18

ESTIMATE WATER DEMANDS FOR WHOLE STUDY AREA

Design Criteria

Description	Value	Units	Comments
MOECC Residential Unit Rate	270-450	L/cap/day	MOECC suggested range
Calculated for Ex. Communual Systems	353.0	L/cap/day	Calculated for Meadows of Aberfoyle
	294.4	L/cap/day	Calculated for Mini Lakes
Recommended Design Rate	360.0	L/cap/day	Assumed (mid point from MOECC range, marginally above Meadows of Aberfoyle rate)
Residential Max. Day Factor	2.00	-	Based on future residential and employment population of 7,909 as per adjacent numbers and MOECC Guidelines
Safety factor for ICI future conditions	1.00		Assumed
Industrial/Commercial Max. Day Factor	3.00	-	Assumed based on MOECC range between 2 and 4 for industrial uses.

Employment Forecast[1]

Employment Breakdown	2016	2041	Comments
Primary	116	114	
Work at Home	476	560	
Industrial	2224	3361	55% of the Total employment in 2016
Commercial / Population Related	651	867	
Institutional	138	182	
NFPOW	412	548	
Total =	**4017**	**5632**	Total employment projections consistent with County's OP numbers.

Notes:
1. As per breakwdown provided by County of Wellington. Source: Watson & Associates Economists Ltd. Wellington County 2014 Growth Analysis Final Report.

Residential Water Demands - Existing and Future

	Population Numbers		Existing (2016) Residential Water Demands		Future (2041) Residential Water Demands			
Residential Population within Study Area	Year		Ave.		Ave.		Max.	
	2016	2041	m^3/d	L/s	m^3/d	L/s	m^3/d	L/s
Meadows of Aberfoyle	149	149	52.6	0.61	53.6	0.62	107.3	1.24
Mini Lakes	450	504	132.5	1.53	181.3	2.10	362.6	4.20
Millcreek Camping and Country Club	87	87	31.2	0.4	31.2	0.4	62.4	0.7
Aberfoyle	176	186	63.4	0.73	67.0	0.78	134.0	1.55
Morriston	480	620	172.8	2.00	223.2	2.58	446.4	5.17
Other Areas	731	731	263.3	3.05	263.3	3.05	526.5	6.09
Total for Study Area =	**2,073**	**2,277**	**715.7**	**8.3**	**819.6**	**9.5**	**1,639**	**19.0**
Total Population Increase =	**204**							

Project Title:	**Puslinch Water and Sewage Feasibility Study**		
Client:	Township of Puslinch		
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Prepared By:	Sandra Rodriguez	**Date:**	5-Oct-17
Reviewed by:	Stuart Winchester	**Date:**	6-Oct-17
Revision No. :	4	**Revision Date:**	3-Jan-18

Employment Water Demands - Existing and Future (Assumes all employment except for industrial employment numbers)

			Existing (2016) Employment Water Demands		Future (2041) Employment Water Demands			
Employment Population within Study Area	**Year**		**Ave.**		**Ave.**		**Max.**	
	2016	**2041**	**m^3/d**	**L/s**	**m^3/d**	**L/s**	**m^3/d**	**L/s**
Employment[1]	1793	3408	645.5	7.47	1226.9	14.20	2453.8	28.40
Total for Study Area =	**1,793**	**3,408**	**645.5**	**7.5**	**1226.9**	**14.2**	**2,454**	**28.4**
Total Employment Population Increase =	**1,615**							

Notes:

1. It has been assumed that the existing 2224 employment numbers in 2016 have been captured within the water demands receieved from ex. large users.

Employment Water Demands - Existing and Future (Assumes all employment including industrial employment numbers)

			Existing (2016) Employment Water Demands		Future (2041) Employment Water Demands			
Employment Population within Study Area	**Year**		**Ave.**		**Ave.**		**Max.**	
	2016	**2041**	**m^3/d**	**L/s**	**m^3/d**	**L/s**	**m^3/d**	**L/s**
Employment[1]	4017	5632	1446.1	16.74	2027.5	23.47	4055.0	46.93
Total for Study Area =	**4,017**	**5,632**	**1446.1**	**16.7**	**2027.5**	**23.5**	**4,055**	**46.9**
Total Employment Population Increase =	**1,615**							

Notes:

1. Assumes all employment categories including industrial

Industrial and Commercial Water Demands - Existing and Future

				Existing (2016) ICI Water Demands[1]		Future (2041) ICI Water Demands[2]				Ex. Ave. Usage / PTTW
Large Industrial/Commercial Users	**PTTW Capacity**			**Ave.**		**Ave.**		**Max.**		
	L/d	**m^3/d**	**L/s**	**m^3/d**	**L/s**	**m^3/d**	**L/s**	**m^3/d**	**L/s**	**%**
Royal Canin Canada Company	240,000	240	2.8	93.8	1.1	93.8	1.1	240.0	2.8	39%
Con-Cast Pipe Inc.	450,000	450	5.2	245.3	2.8	245.3	2.8	450.0	5.2	55%
Morguard Brock McLean Limited - Maple Leaf Foods	653,760	654	7.6	21.6	0.2	21.6	0.2	64.8	0.7	3%
Nestle Canada Inc.	3,600,000	3,600	41.7	2,117.7	24.5	2,117.7	24.5	3,600.0	41.7	59%
CRH Canada Group Inc. - Dufferin Aggregates	8,182,800	8,183	94.7	134.6	1.6	134.6	1.6	403.8	4.7	2%
Capital Paving Inc.	18,371,400	18,371	212.6	280.9	3.3	280.9	3.3	842.6	9.8	2%
St. Marys Cement Inc. (Canada)	47,136,000	47,136	545.6	28,136.5	325.7	28,136.5	325.7	47,136.0	545.6	60%
Total for Study Area =	**78,633,960**	**78,634**	**910.1**	**31,030**	**359.1**	**31,030.3**	**359.1**	**52,737.1**	**610.4**	**39%**
Total Excluding Nestle & St. Marys	**27,897,960**	**27,898**	**323**			**776.1**	**9.0**	**2,001.1**	**23.2**	

Notes:

1. Calculated as the 2-year average between data provided from ex. large users for period between 2015 and 2016.
2. It has been assumed that future water demands from large users will remain consistent with actual demands.

Project Title:	**Puslinch Water and Sewage Feasibility Study**		
Client:	Township of Puslinch		
Project No.:	T000866A		
Task:	Criteria Development - Water Demands		
Prepared By:	Sandra Rodriguez	**Date:**	5-Oct-17
Reviewed by:	Stuart Winchester	**Date:**	6-Oct-17
Revision No. :	4	**Revision Date:**	3-Jan-18

RECOMMENDED SCENARIO:

Provide servicing to entire service area for domestic and ICI purposes. Nestle and St. Mary's Cement to be excluded; however, a 1% allocation of total PTTW flows have been assumed for domestic purposes in both Nestle and St. Marys.

Industry Name	PTTW Capacity		1% Allocation for Domestic	
	m3/d	L/s	m3/d	L/s
Nestle Canada Inc.	3,600	41.7	3.60	0.04
St. Marys Cement Inc. (Canada)	47,136	545.6	47.14	0.55

Service Type	**Scenario V (Domestic and Industrial Uses - Excluding Nestle and St. Marys Cement)**					
	Ave. Day Demands		**Max. Day Demands**		**Peak Hour Demands**	
	m^3/d	**L/s**	**m^3/d**	**L/s**	**m^3/d**	**L/s**
Residential	819.6	9.5	1,639.1	19.0	2,458.7	28.5
Industrial / Commercial / Recreational (outside large users)	1,226.9	14.2	2,453.8	28.4	3,680.6	42.6
Industrial / Commercial / Recreational (large users excluding Nestle and St. Marys)	776.1	9.0	2,001.1	23.2	2,328.3	26.9
Allowance for Domestic Use at Nestle and St. Marys	50.7	0.6	152.2	1.8	152.2	1.8
Total =	**2,873**	**33.3**	**6,246**	**72.3**	**8,620**	**99.8**

Project Title:	**Puslinch Water and Sewage Feasibility Study**		
Client:	Township of Puslinch		
Project No.:	T000866A		
Task:	Criteria Development - Wastewater Flows		
Prepared By:	Sandra Rodriguez	**Date:**	5-Oct-17
Reviewed by:	Stuart Winchester	**Date:**	6-Oct-17
Revision No. :	4	**Revision Date:**	3-Jan-18

ESTIMATE WASTEWATER FLOWS FOR WHOLE STUDY AREA

Design Criteria

Description	Value	Units	Comments
MOECC Residential Unit Rate	270-450	L/cap/day	MOECC suggested range
Calculated for Ex. Communual Systems	219.4	L/cap/day	Calculated for Mini Lakes
Water Unit Consumption Rate	360.0	L/cap/day	Assumed
Wastewater Flow Rate	360.0	L/cap/day	Assumed to be consistent with water consumption - Very conservative
Peak Infiltration / Inflow Rate for Industrial / Commercial Areas	10,110.0	L/ha/day	Low end of MOECC Guidelines, new system should have low I&I contribution
Peak Infiltration / Inflow Rate for Residential Areas	10,110.0	L/ha/day	Low end of MOECC Guidelines, new system should have low I&I contribution
Population densities for Industrial / Commercial	83	person/ha	Assuming 30 m3/ha/d (low end of MOECC Guideline) and 360 L/cap/d, this would equeate to approx. 83 ppha.
Peak Factor	varies	-	Calculated for each area based on Harmon Formula

Residential Wastewater Flows - Existing and Future

Residential Population within Study Area	Population Numbers		Drainage Area (ha)[1]		Existing (2016) Residential Wastewater Flows		Calculated Peak Factor for Future Population	Future (2041) Residential Wastewater Flows			
	Year				Ave.			Avg. (for Treatment)		Peak (for Sewer Capacity)	
	2016	2041	2016	2041	m^3/d	L/s		m^3/d	L/s	m^3/d	L/s
Meadows of Aberfoyle	149	149	10	10	53.6	0.6	4.41	53.6	0.62	337.3	3.9
Mini Lakes	450	504	24	27	98.8	1.1	4.36	181.3	2.10	1066.2	12.3
Millcreek Camping and Country Club	87	87	7	7	31.2	0.4	4.43	31.2	0.36	208.9	2.4
Aberfoyle	176	186	31	33	63.4	0.7	4.35	67.0	0.78	625.6	7.2
Morriston	480	620	83.2	107.5	172.8	2.0	4.23	223.2	2.58	2031.6	23.5
Other Areas	731	731	135	135	263.3	3.0	4.21	263.3	3.05	2476.7	28.7
Total for Study Area =	**2,073**	**2,277**	**291**	**320**	**683.0**	**7.9**		**819.6**	**9.5**	**6,746.3**	**78.1**
Total Population Increase =	**204**										

Notes:

1. Drainage Areas calculated in Google

Industrial and Commercial Wastewater Flows - Existing (2016)

Large Industrial/Commercial/Recreational Users	Drainage Areas	Equivalent ICI Population	Calculated Peak Factor	Existing ICI Wastewater Flows			
				Average Flow (for Treatment)		Peak Flows (for Sewer Capacity)	
	Ha	people		m^3/d	L/s	m^3/d	L/s
Aberfoyle	26	2,128	3.56	766.2	8.87	2,989.4	34.6
Morriston	9.7	809	3.86	291.3	3.37	1,221.8	14.1
Other areas within Study Area[1]	197.3	16,445	2.74	5,920.2	68.5	18,204.6	210.7
Total for Study Area =	**233**	**19,383**		**6,978**	**81**	**22,415.9**	**259.4**
		83					

Notes:

1. Drainage Areas calculated in Google. It represents the built up areas north of Highway 401 currently occupied by industries and around Highway 6 (concast). See adjacent figures

Project Title:	**Puslinch Water and Sewage Feasibility Study**		
Client:	Township of Puslinch		
Project No.:	T000866A		
Task:	Criteria Development - Wastewater Flows		
Prepared By:	Sandra Rodriguez	**Date:**	5-Oct-17
Reviewed by:	Stuart Winchester	**Date:**	6-Oct-17
Revision No. :	4	**Revision Date:**	3-Jan-18

Industrial and Commercial Wastewater Flows - Future (2041)

				Future ICI Wastewater Flows			
Large Industrial/Commercial/Recreational Users	**Drainage Areas**	**Equivalent ICI Population**	**Calculated Peak Factor**	**Average Flow (for Treatment)**		**Peak Flows (for Sewer Capacity)**	
	Ha	**people**		**m^3/d**	**L/s**	**m^3/d**	**L/s**
Aberfoyle	26	2,128	3.56	766.2	8.87	2,989.4	34.6
Morriston	9.7	809	3.86	291.3	3.37	1,221.8	14.1
Other areas within Study Area[1]	250.8	20,897	2.63	7,523.0	87.1	22,345.8	258.6
Total for Study Area =	**286**	**23,835**		**8,580**	**99.3**	**26,557.1**	**307.4**

Notes:

1. Includes existing developed ICI areas plus the rural employment area around Hwy 6. Assumes only 50% of the total area to be occupied by infrastructure.

DOMESTIC & ICI FLOWS SUMMARY - 2041

Service Area	**Average Flow (for Treatment)**		**Peak Flows (for Sewer Capacity)**	
	m^3/d	**L/s**	**m^3/d**	**L/s**
Residential	819.6	9.49	6,746.3	78.08
Industrial / Commercial / Recreational	8,580	99.31	26,557	307.37
Total =	**9,400.0**	**108.8**	**33,303.4**	**385.5**

Project Title:	**Puslinch Water and Sewage Feasibility Study**		
Client:	Township of Puslinch		
Project No.:	T000866A		
Task:	Water Demand Criteria Development - Water Usages		
Prepared By:	S. Rodriguez	**Date:**	5-Oct-17
Reviewed by:	S. Winchester	**Date:**	6-Oct-17
Revision No. :	0	**Revision Date:**	

ESTIMATE EXISTING RESIDENTIAL WATER DEMANDS FOR WHOLE STUDY AREA

Existing Residential Information

1. ABERFOYLE EXISTING & FUTURE

EXISTING (2016)

Criteria	Value	Units	Comments
Total 2016 Population	325	people	As per Wellington County OP, Revision September 2016. Table 8
2016 Households	120	units	
Calculated ex. PPU	2.7	person/unit	Calculated

FUTURE (2041)

Description	Value	Units	Comments
Total 2041 Population	335	people	As per Wellington County OP, Revision September 2016. Table 8
2016 Households	130	units	
Calculated ex. PPU	2.6	person/unit	Calculated

2. MORRISTON EXISTING & FUTURE

EXISTING (2016)

Description	Value	Units	Comments
Total 2016 Population	480	people	As per Wellington County OP, Revision September 2016. Table 8
2016 Households	185	units	
Calculated ex. PPU	2.6	person/unit	Calculated

FUTURE (2041)

Description	Value	Units	Comments
Total 2041 Population	620	people	As per Wellington County OP, Revision September 2016. Table 8
2016 Households	235	units	
Calculated ex. PPU	2.6	person/unit	Calculated

3. MEADOWS OF ABERFOYLE (Communal Water System)

EXISTING (2016)

Description	Value	Units	Comments
Total 2016 Population	149	people	As per Wellington County OP, Revision September 2016.
2016 Building Lots	55	units	As per 2016 Annual Monitoring Report provided by Greg Cook on Sept 13, 2017
Assumed ex. PPU	2.7	person/unit	Assumed based on 2016 numbers for Aberfoyle. Communal system is closer to Aberfoyle.
Ave. System Water Demands	0.6	L/s	2-year Average demands as per 2015 and 2016 reported flows in MOECC WTRS
	52.6	m3/d	
Max. Day Factor	137175.0	-	Calculated based on 2015 & 2016 data
Max. System Water Demands	83479.9	L/s	Calculated
	7212661.5	m3/d	
Calculated Unit Consumption Rate	353.0	L/cap/d	Calculated

4. MINI LAKES (Communal Water System)

EXISTING (2016)

Description	Value	Units	Comments
Total 2016 Population	450	people	As per 2016 O&M Report Mini Lakes, Burnside April 2017
2016 Service Connections	260	units	
Future Service Connections	31	units	
2016 Calculated PPU	1.7	person/unit	Calculated
Water			
Ave. System Water Demands	1.5	L/s	2-year Average demands as per 2015 and 2016 in Mini Lakes Report by American Water Canada
	132.5	m3/d	
Max. Day Factor	95166.7	-	Calculated based on 2015 & 2016 data
Max. System Water Demands	145946.5	L/s	Calculated
	12609778.9	m3/d	
Calculated Unit Consumption Rate	**294.4**	**L/cap/d**	**Calculated**
Wastewater			
Ave. Wastewater Flows	98.8	m3/d	2-year Average demands as per 2015 and 2016 in Mini Lakes Report by American Water Canada
	1.1	L/s	
Max. Wastewater Flows	177.4	m3/d	Max. Flows between 2015 and 2016 as per Mini Lakes Reports
	2.1	L/s	
Calculated Unit Production Rate	**219.4**	**L/cap/d**	**Calculated**

5. OTHER RESIDENTIAL AREAS (Within the Study Area)

EXISTING (2016)

Description	Value	Units	Comments
Total 2016 Population	731	people	Calculated
2016 Service Connections	270	units	Counted number of lots already developed within the study area - Google
2016 Assumed PPU	2.7	person/unit	Assumed based on 2016 numbers for Aberfoyle. Areas closer to Aberfoyle

APPENDIX B
Preliminary Consultation with City of Guelph

May 1, 2018

City of Guelph
1 Carden Street
Guelph, Ontario Canada
N1H 3A1

Attention: **Mr. Peter L. Busatto, General Manager, Environmental Services Department Infrastructure**

Dear Mr. Busatto,

RE: **Township of Puslinch Water and Sewage Feasibility Study – Response to City Comments to CIMA+ Draft TM-2: Servicing Options Memorandum**

The Township of Puslinch would like to thank you for providing comments to CIMA+'s Draft Technical Memorandum No.2 (TM-2) Servicing Options, prepared in association with the Feasibility Study for Municipal Water and Sewage Servicing in the Township of Puslinch. We have reviewed your comments to the above mentioned TM-2 and provide the following clarifications/answers to each of your comments in your correspondence, dated April 12, 2018.

Water Servicing City of Guelph Staff Comments

Page 3

- *Meadows of Aberfoyle is purely residential. Is this what was used to represent mixed ICI and residential in memo?*

Average water demands from Meadows of Aberfoyle were made available to CIMA+ and used accordingly to estimate the residential water demands in this specific system. A calculated unit consumption rate of 353 L/cap/day was obtained for Meadows of Aberfoyle. The design criterion of 360 L/cap/day assumed in the calculations was based on the mid value of the Ministry of Environment and Climate Change (MOECC) suggested range for residential users between 270 to 450 L/cap/day. The calculated unit consumption rate for Meadows of Aberfoyle was used for comparative purposes against the mid MOECC value of 360 L/cap/day.

Average and maximum water demands for ICI, used in CIMA+'s calculations, were based on actual 2015 and 2016 operational data and records obtained by CIMA+ directly from the existing large users within the study area.

- *Peaking factor is well above MOECC design standards and what the City of Guelph and other groundwater based communities have been able to achieve. MOECC will require that conservation be demonstrated through PTTW request. How is this being accomplished?*

101 Frederick St, Suite 900
Kitchener, ON N2H 6R2
Canada

Phone: **519.772.2299**
Fax: 519.772.2298
www.cima.ca

In the absence of actual data to calculate peak rate factors for existing systems, CIMA+ used the peaking factors recommended in the MOECC guidelines, Table 3-1, with consideration to projected residential and employment population for the study area. Based on a high conceptual level at which the Feasibility Study was undertaken, these preliminary assumptions in terms of design criteria were considered adequate. Minimum, maximum and peak rate factors will need to be refined at the Class Environmental Assessment study stages.

- *Will servicing include extension to areas that are already on communal systems - Mini-Lake, Meadows of Aberfoyle?*

The Feasibility Study assumed that existing private communal water systems, including Mini-Lake and Meadows of Aberfoyle, would also be serviced by the municipal system.

Page 4 – Table 2

- *At 360 L/cap/d this comes out to about 8000 people. County OP has population for all of Puslinch at about 8500 today and 9920 people in 2031. In the OP Aberfoyle has population of 320 today and 410 in 2031. What is population and business supporting demand/pop numbers used to support this forecast?*

Growth projections for the study area – which include Aberfoyle and Morriston – for 2041 were based on the residential and employment projections established in the Wellington County Official Plan, May 6, 1999 (Last Revision September 1, 2016). 2041 residential projections for the study area are in the order of 2,300 people, including Aberfoyle, Morriston as well as residential numbers from existing private communal water systems. 2041 employment projections for the Township, which are expected to happen in the urban areas of Aberfoyle and Morriston are 5,630 people. A combined projected residential and employment population of 7,930 people is estimated for the study area.

Page 5 – Section 3.1.1

- *Hydrological investigation would require completion of formal Class EA.*
- *Source Protection requirements also would be part of evaluation process (quality and quantity, land use constraints, etc.)*
- *Mill Creek impacts may be an environmental constraint.*
- *Groundwater quality may be GUDI and require treatment as necessary*

All four comments noted above are acknowledged. These will be considerations to be taken into account as part of a subsequent Class Environmental Assessment (Class EA) study process, should this be the route the Township decides to pursue in the future.

Page 7 Schematic

- *Proposed well location is top of the moraine - deep drilling will be required to get to the bedrock aquifers. This will add O&M costs to supply station that need to be accounted for through NPV calcs.*
- *Location of tower in low area of elevation?*

The estimates of probable capital and O&M costs calculated in the Feasibility Study have been based on general information of the study area and CIMA+'s previous experience with projects of similar

nature. These costs will need to be refined as additional information is obtained through supporting investigations that will need to be carried out during the Class EA study.

A preliminary location for a water storage facility was selected based on the proximity to major existing urban and ICI users in Aberfoyle and Morriston, and to ensure that the fire storage is in close proximity to the highest risk areas. For the purposes of establishing estimates of probable costs, it was assumed that an elevated tower would provide the necessary water storage requirements. However, a review of available water storage configuration options, (i.e. underground reservoirs or elevated tanks) as well as a Site Selection Study will need to be completed as part of the Class EA study, should the Township proceed with further review.

Page 8

- *City does not have excess water supply capacity to support external servicing requests.*
- *If preferred option, all costs to develop new supply and implement necessary distribution infrastructure to facilitate servicing of Puslinch would be the township's to cover.*

The Township acknowledges that the City may not have available capacity to allocate to the Township of Puslinch, and if capacity was available, allocation of that capacity would not be without cost. Table 8 on Page 13 of TM-1 indicates that "The cost of any Capital Contribution and/or Capital Upgrades to secure supply from the City of Guelph is unknown at this time, and may represent a significant impact to the overall project cost." These costs will need to be assessed and determined as part of the future Class EA Study.

Page 12

- *Important to note that source protection studies would also be required - delineation of WHPA, updates to the AR, development of policies, etc.*
- *Many customers may not be willing to pay municipal servicing costs (with small customer base to support system costs and cost per property to join system) and elect to stay on private services. Does the township have perspective of customers interest for communal servicing and what they feel would be "affordable" from their perspective?*

Acknowledged. Additional studies and investigations noted will need to be considered and carried out as part of the Class EA study process.

As part of the Feasibility Study, the Township distributed approximately 1,000 surveys within users in the study area to inquire about their desire for municipal servicing. A total of 361 completed questionnaires were received, which represent a response rate of 36%. A public meeting was also held on March 22, 2018 to review with members of the general public the background and intent of the feasibility study, preliminary results of activities completed to date, and the next steps in the study. Through the responses obtained from the completed surveys and the comments and questions received at the March Public Meeting, it is clear that existing residential users have a preference to remain on private water services and opposed to municipal servicing.

Wastewater Servicing Staff Comments

Page 15 – Table 9 (Treatment)

- *What is township's plan for biosolids treatment associated with this wastewater facility? Not mentioned in report or associated O&M costs.*

Establishing a Biosolids treatment plan was beyond the scope of the Feasibility Study. Consideration of the treatment and disposal of Biosolids would be considered as part of the required Class EA Study, should the Township decide to proceed with further consideration of municipal wastewater servicing in the Township.

Page 19

- *City does not have excess wastewater treatment capacity to support external servicing requests.*
- *If preferred option, all costs to develop, construct and implement necessary conveyance infrastructure to facilitate servicing of Puslinch would be the township's to cover.*

An additional statement will be added to CIMA+'s TM-2, Table 12 on Page 21 to note that "The cost of any Capital Contribution and/or Capital Upgrades to secure sewage treatment and disposal from the City of Guelph is unknown at this time, and may represent a significant impact to the overall project cost." This costs will need to be assessed and determined as part of the Class EA Study.

Page 20

- *Annual operating costs for option 2 very low based on other existing serving inter-municipal service agreements currently administered by the City. O&M costs to Puslinch would represent full cost causation to City associated with providing agreed upon level of servicing*

The operating cost for the Township's system was based on operating the Township system only. It was assumed that the City's operating costs would be covered by the bulk water rate for all water sold to the Township, or by the bulk wastewater flow into the City's collection system as monitored at the Township / City boundary. Once these rates are known, then the final assessment for the Preferred Decision could be made.

The memorandum also notes that Servicing Agreements would need to be negotiated between the City and the Township for water and/or wastewater servicing. These Agreements would outline the cost recovery mechanisms for the City to supply treated water to the Township boundary, or to collect raw wastewater at the City boundary and convey this wastewater to the City's facility for treatment and disposal. This Agreement would need be negotiated to the satisfaction of the Township and the City prior to proceeding with implementation of any inter-municipal water or wastewater system.

Engineering Staff Comments

Page 4 – Section 2.2 Wastewater System – Design Basis

- *Peak flows should be determined by modeling system hydraulic performance under the 1 in 25 year design storm event*

In the context of the Feasibility Study, preliminary peak flows have been estimated based on drainage areas and the Harmon Formula. Peak flows for the study area will need to be refined during the Class EA study.

Page 4 – Table 3 Wastewater Design Basis

- *The I/I rates should be related to what the system would experience during a 1 in 25 year design storm event.*

In the context of the Feasibility Study, preliminary I/I rates have been assumed to be consistent with the low end of the MOECC Design Guidelines for Sewage Works, as it was assumed that the new system should have low I&I contribution. I/I rates will need to be refined during the Class EA study.

Page 4 – Table 4 Preliminary Projected Wastewater flows

- *Do these values assume peak flows experienced during the 1 in 25 year design event?*

See answer above.

Page 5 / Table 5 – re: new storage facility

- *A new storage facility will be implemented as part of the servicing strategy for the Clair-Maltby Secondary Plan Area. This area will be serviced at a HGL of 400 m known as pressure zone 3. Any new planned servicing strategies should take Zone 3 infrastructure into consideration.*

Acknowledged. This is a future consideration for the Class EA study.

Given the general topography of the Township south of Maltby Road, we anticipated that system pressures in the Clair-Maltby area would be higher than desirable within the Township. As such, a metering / pressure reducing facility was proposed at the Township boundary to reduce system pressures within the Township. The exact HGL selected for the Township would need to be established through further study.

Page 6

- *Is Table 5 summarising Option 1 or describing Option 2 as the title suggests?*

Table 5 summarizes Water Servicing Option 1. Typo will be corrected in the final TM-2.

Page 8 – Section 3.1.2 Option 2 – Inter-Municipal Water Servicing

- *Figure 2 shows future distribution system in the Clair Maltby Secondary Plan Area with a Metering/pressure control station just south of the study area. At this point in time, the servicing strategy for the Clair Maltby Secondary Plan area will only include the lands within the City's municipal boundary (ie. the study area). The proposed infrastructure in this option will need to be integrated into servicing option for Clair Maltby if this Option were to advance.*

Acknowledged. This is a future consideration for the Class EA study.

Page 17 – Section 4.1.2 Option 2 – Inter-Municipal Sewage Servicing

- *Figure 4 shows future collection system outletting to the Clair Maltby Secondary Plan Area. At this point in time, the servicing strategy for the Clair Maltby Secondary Plan area will only include the lands within the City's municipal boundary (ie. the study area). The proposed infrastructure in this option will need to be integrated into servicing option for Clair Maltby if this Option were to advance. It should be noted that there are existing sanitary servicing capacity constraints in the vicinity of Clair Rd. and Gordon St. in the City of Guelph.*

Acknowledged. This is a future consideration for the Class EA study.

Planning Staff Comments

- *From a higher level planning perspective, please have the Township or County confirm that the growth assumptions they've made are consistent with the County Official Plan (and therefore Places to Grow). This is a few steps down the road, but much bigger planning concerns would arise if they needed the county to allocate significant additional growth to this area (population and/or employment) to support the financial feasibility of any servicing scheme.*

Population and employment projections used in the Feasibility Study are consistent with the projections established in the Wellington County Official Plan, May 6, 1999 (Last Revision September 1, 2016).

General Comments:

- *Table 1 Water Design Basis and Table 3 Wastewater Design Basis will need to be consistent with City of Guelph Design parameters if this option is advanced.*
- *The City of Guelph is undertaking the Clair Maltby Secondary Plan and Master Environmental Servicing Plan (MESP) in an effort to plan and service the last unplanned area in the City. It is expected that this study (in particular water/wastewater servicing and infrastructure recommendations) will be concluded in Q1 of 2019.*

Acknowledged. These are future considerations for the Class EA study.

We hope that the information enclosed in this letter addresses your comments adequately and clarifies any additional questions you may have in regards to the Township of Puslinch Feasibility Study for Municipal Water and Sewage Servicing. If you have any additional comments, please contact the undersigned.

Sincerely,

CIMA Canada Inc.

Stuart Winchester, P.Eng
Partner, Director, Municipal Infrastructure
Stuart.winchester@cima.ca

SR;vd
Encl.

cc: Karen Landry, Township of Puslinch
James Su, Ontario Clean Water Agency

City of Guelph Staff Comments on CIMA's Puslinch Water/Wastewater Servicing Study, April 12, 2018

Water Servicing Staff Comments

Page 3
-Meadows of Aberfoyle is purely residential. Is this what was use to represent mixed ICI and residential in memo?
-Peaking factor is well above MOECC design standards and what the City of Guelph and other groundwater based communities have been able to achieve. MOECC will require that conservation be demonstrated through PTTW request. How is this being accomplished?
-Will servicing include extension to areas that are already on communal systems - Mini-Lake, Meadows of Aberfoyle?

Page 4 – Table 2
- At 360 L/cap/d this comes out to about 8000 people. County OP has population for all of Puslinch at about 8500 today and 9920 people in 2031. In the OP Aberfoyle has pop of 320 today and 410 in 2031. What is population and business supporting demand/pop numbers used to support this forecast ?

Page 5 – Section 3.1.1
-Hydrological investigation would require completion of formal Class EA.
-Source Protection requirements also we be part of evaluation process (quality and quantity, land use constraints, etc.)
-Mill Creek impacts may be an environmental constraint.
-Groundwater quality may be GUDI and require treatment as necessary

Page 7 Schematic
-proposed well location is top of the moraine - deep drilling will be required to get to the bedrock aquifers. This will add O&M costs to supply station that need to be accounted for through NPV calcs
-location of tower in low area of elevation??

Page 8
-City does not have excess water supply capacity to support external servicing requests.
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-If preferred option, all costs to develop, construct and implement necessary conveyance infrastructure to facilitate servicing of Puslinch would be the township's to cover.

Page 20
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Engineering Staff Comments
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- Peak flows should be determined by modeling system hydraulic performance under the 1 in 25 year design storm event

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- The I/I rates should be related to what the system would experience during a 1 in 25 year design storm event.

Page 4 – Table 4 Preliminary Projected Wastewater flows
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Page 17 – Section 4.1.2 Option 2 – Inter-Municipal Sewage Servicing
-Figure 4 shows future collection system outletting to the Clair Maltby Secondary Plan Area. At this point in time, the servicing strategy for the Clair Maltby Secondary Plan area will only include the lands within the City's municipal boundary (ie. the study area). The proposed infrastructure in this option will need to be integrated into servicing option for Clair Maltby if this Option were to advance. It should be noted that there are existing sanitary servicing capacity constraints in the vicinity of Clair Rd. and Gordon St. in the City of Guelph.

Planning Staff Comments
From a higher level planning perspective, please have the Township or County confirm that the growth assumptions they've made are consistent with the County Official Plan (and therefore Places to Grow). This is a few steps down the road, but much bigger planning concerns would arise if they needed the county to allocate significant additional growth to this area (population and/or employment) to support the financial feasibility of any servicing scheme.

General Comments:
-Table 1 Water Design Basis and Table 3 Wastewater Design Basis will need to be consistent with City of Guelph Design parameters if this option is advanced.

-The City of Guelph is undertaking the Clair Maltby Secondary Plan and Master Environmental Servicing Plan (MESP) in an effort to plan and service the last unplanned area in the City. It is expected that this study (in particular water/wastewater servicing and infrastructure recommendations) will be concluded in Q1 of 2019.

APPENDIX C
Probable Costs Estimates
Detailed Calculations

Project Title:	**Puslinch Water and Sewage Feasibility Study**		
Client:	Township of Puslinch		
Project No.:	T000866A		
Task:	Option Development - Water		
Prepared By:	Sandra Rodriguez	**Date:**	9-Jan-18
Reviewed by:	Stuart Winchester	**Date:**	
Revision No. :		**Revision Date:**	

SOURCE: WATER DEMANDS HAVE BEEN CALCULATED PREVIOUSLY IN A SEPARATE SPREADSHEET. THIS IS A COPY OF THE WATER DEMANDS CALCULATIONS. PROVIDED HERE FOR REFERENCE AND USED IN THE DEVELEOPMENT OF OPTIONS.

ESTIMATE WATER DEMANDS FOR WHOLE STUDY AREA

Design Criteria

Description	Value	Units	Comments
MOECC Residential Unit Rate	270-450	L/cap/day	MOECC suggested range
Calculated for Ex. Communual Systems	353.0	L/cap/day	Calculated for Meadows of Aberfoyle
	294.4	L/cap/day	Calculated for Mini Lakes
Recommended Design Rate	360.0	L/cap/day	Assumed (mid point from MOECC range, marginally above Meadows of Aberfoyle rate)
Residential Max. Day Factor	2.00	-	Based on future residential and employment population of 7,909 as per adjacent numbers and MOECC Guidelines
Safety factor for ICI future conditions	1.00		Assumed
Industrial/Commercial Max. Day Factor	3.00	-	Assumed based on MOECC range between 2 and 4 for industrial uses.

RECOMMENDED SCENARIO:

Provide servicing to entire service area for domestic and ICI purposes. Nestle and St. Mary's Cement to be excluded; however, a 1% allocation of total PTTW flows have been assumed for domestic purposes in both Nestle and St. Marys.

Industry Name	PTTW Capacity		1% Allocation for Domestic	
	m3/d	L/s	m3/d	L/s
Nestle Canada Inc.	3,600	41.7	3.60	0.04
St. Marys Cement Inc. (Canada)	47,136	545.6	47.14	0.55

Service Type	Scenario V (Domestic and Industrial Uses - Excluding Nestle and St. Marys Cement)					
	Ave. Day Demands		Max. Day Demands		Peak Hour Demands	
	m^3/d	L/s	m^3/d	L/s	m^3/d	L/s
Residential	819.6	9.5	1,639.1	19.0	2,458.7	28.5
Industrial / Commercial / Recreational (outside large users)	1,226.9	14.2	2,453.8	28.4	3,680.6	42.6
Industrial / Commercial / Recreational (large users excluding Nestle and St. Marys)	776.1	9.0	2,001.1	23.2	2,328.3	26.9
Allowance for Domestic Use at Nestle and St. Marys	50.7	0.6	152.2	1.8	152.2	1.8
Total =	**2,873**	**33.3**	**6,246**	**72.3**	**8,620**	**99.8**

Project Title:	**Puslinch Water and Sewage Feasibility Study**		
Client:	Township of Puslinch		
Project No.:	T000866A		
Task:	Option Development - Water Option 1A - Intra-Municipal Servicing		
Prepared By:	Sandra Rodriguez	**Date:**	30-Jan-18
Reviewed by:	Stuart Winchester	**Date:**	27-Feb-18
Revision No. :		**Revision Date:**	

Option 1A - Intra-Municipal Servicing

Key Components:

Water supply - Assumes one new groundwater well

One common treatment facility providing treatment for well water. Assume good water quality requiring treament for disinfection only.

Storage facility - assumes one elevated water tower. To be located south of Aberfoyle and close to ex. industrial/employment area.

Distribution system - Assumes connection to Guelph distribution system around southern boundary for pressure Zone 3.

1. System Design Demands

Design Demands	Units		Comments
	m3/d	L/s	
Average Day Demands	2,873.3	33.3	
Max. Day Demands	6,246.2	72.3	
Peak Hour Demands	8,619.9	99.8	
Calculated Max. Day Factor	2.2		
Peak Hour Factor	3.0		

2. Well Supply

Criteria	Value	Units	Comments
Required Supply Demand (System Max. Day Demands)	72.3	L/s	
No. wells (assumed)	1.0		Assumes two wells, based on capacity
Well Capacity (each)	72.3	L/s	
No. of well pumps	1.0		
Capacity of well pump (each)	72.3	L/s	

2. Treatment Facility - Provision of disinfection only assumed

Criteria	Value	Units	Comments
Required Treatment Demand (System Max. Day Demands)	72.3	L/s	
No. chlorine contact chambers (assumed)	1.0		Assumes only one contact chamber providing full treatment capacity
Tratment capacity of contact chamber	72.3	L/s	

3. Storage Facility - Storage through an Elevated Water Tower

3.a Storage Calculations based on Risk Analysis for Emergency Storage (no fire protection)

Criteria	Value	Units	Comments
Emergency Storage Volume			Emergency storage volume equivalent to 2 x full day's demand
System Ave. Day Demands	33	L/s	
	2,873	m3/d	
Calculated Emergency Volume	5,747	m3	

3.b Storage Calculations based on MOECC Guidelines (fire protection provided)

Criteria	Value	Units	Comments
Minimum Required Storage Volume			Fire Storage + Equalization Storage (25% of Max. Day) + Emergency Storage (25% of Fire + Equalization Storage)
System Max . Day Demands	6,246	m3/d	
Fire Storage	1,253	m3	Fire storage based on ultimate euiqvalent population of 7700 people. Based on fire flow of 174 L/s for 3 hours as per MOE guidelines Table 8-1 (value interpolated)
Equalization Storage	1,562	m3	
Emergency Storage	703.6	m3	
Minimum Required Storage Volume as per MOECC	3,518	m3	Separate chlorine contact chambers will provide the required disinfection requirements
	3.5	ML	

4. Distribution System					
From Guelph/treatment facility to New Elevated Tower in Aberfyole					
Criteria	**Value**		**Units**		**Comments**
Set watermain diameter of	mm	400	300	200	Note that future watermains in south Guelph expected to be 400 mm diameter
	m	0.40	0.30	0.20	
Length of distribution watermain	m	5,500	5,500	5,500	Approx. distance from current upper boundary of Guelph Zone 3 @ Clair Road West to proposed location of new tower in Aberfoyle.
Pipeline Area	m2	0.126	0.071	0.031	
Pipeline Volume	m3	691.2	388.8	172.8	
System Ultimate Average Daily Flow	L/s	33.3	33.3	33.3	
System Ultimate Max. Daily Flow	L/s	72.3	72.3	72.3	
System Ultimate Peak Hour Flow	L/s	99.8	99.8	99.8	
System Max. day + Fire Flow	L/s	246.3	246.3	246.3	
Velocity under Average Flows	m/s	0.3	0.5	1.1	
Velocity under Max. Flows	m/s	0.6	1.0	2.3	Chose 400 mm mainly to be consistent with future watermains in Guelph
Velocity under Peak Hour Flows	m/s	0.8	1.4	3.2	
Velocity under Max. day + Fire flows	m/s	1.96	3.48	7.84	
Retention Time under Ultimate Average Flows	hrs	5.8	3.2	1.4	
Retention Time under Max. Flows	hrs	2.7	1.5	0.7	
From New Elevated Tower in Aberfyole to Industrial and Commercial areas					
Criteria	**Value**	**Units**			**Comments**
Set watermain diameter of	mm	500	400	300	
	m	0.50	0.40	0.30	
Length of distribution watermain	m	1,800	1,800	1,800	Approx. length for major industrial/employment area south of Aberfoyle
Pipeline Area	m2	0.196	0.126	0.071	
Pipeline Volume	m3	353.4	226.2	127.2	
System Ultimate Average Daily Flow	L/s	33.3	33.3	33.3	
System Ultimate Max. Daily Flow	L/s	72.3	72.3	72.3	
System Ultimate Peak Hour Flow	L/s	99.8	99.8	99.8	
System Max. day + Fire Flow	L/s	246.3	246.3	246.3	
Velocity under Average Flows	m/s	0.17	0.26	0.47	
Velocity under Max. Flows	m/s	0.37	0.58	1.02	
Velocity under Peak Hour Flows	m/s	0.51	0.79	1.41	
Velocity under Max. day + Fire flows	m/s	1.3	2.0	3.5	Chose 400 mm to satisfy max. day + fire flow conditions in major industrial/employment area
Retention Time under Ultimate Average Flows	hrs	3.0	1.9	1.1	
Retention Time under Max. Flows	hrs	1.4	0.9	0.5	
From New Elevated Tower in Aberfyole to Morriston					
Criteria	**Value**	**Units**			**Comments**
Set watermain diameter of	mm	300	200	150	
	m	0.30	0.20	0.15	
Length of distribution watermain	m	1,500	1,500	1,500	Approx. length for major industrial/employment area to Morriston
Pipeline Area	m2	0.071	0.031	0.018	
Pipeline Volume	m3	106.0	47.1	26.5	
System Ultimate Average Daily Flow for MORRISTON only	L/s	2.6	2.6	2.6	
System Ultimate Max. Daily Flow for MORRISTON only	L/s	5.2	5.2	5.2	
System Ultimate Peak Hour Flow for MORRISTON only	L/s	7.8	7.8	7.8	
System Max. day + Fire Flow	L/s	43.2	43.2	43.2	2041 Projected population for Morriston is 620 people. As per MOE Guidelines suggested fireflows for this population is 38 L/s for 2 hours
Velocity under Average Flows	m/s	0.04	0.08	0.15	
Velocity under Max. Flows	m/s	0.07	0.16	0.29	
Velocity under Peak Hour Flows	m/s	0.11	0.25	0.44	
Velocity under Max. day + Fire flows	m/s	0.6	1.4	2.4	Chose 200 mm to satisfy max. day + fire flow conditions
Retention Time under Ultimate Average Flows	hrs	11.4	5.1	2.9	
Retention Time under Max. Flows	hrs	5.7	2.5	1.4	

Project Title:	**Puslinch Water and Sewage Feasibility Study**		
Client:	Township of Puslinch		
Project No.:	T000866A		
Task:	Water Servcing Option Development - Option 1 Probable Cost		
Prepared By:	Sandra Rodriguez	**Date:**	30-Jan-18
Reviewed by:	S. Winchester	**Date:**	27-Feb-18
Revision No. :	1	**Revision Date:**	27-Feb-18

CAPITAL AND OPERATION & MAINTENANCE COST

Option 1A - Intra-Municipal System

System Description	Quantity	Unit	Material		Labour		Total Material & Labour	Sub Total Cost	Comments
			Unit Cost	Total Material Cost	% of Material	Total Labour Cost			
Supply and Treatment									
Preliminary Studies and Approvals - hydrogeological study and testing	1	LS	$ 500,000	$ 500,000	50%	$ 250,000	$ 750,000		
Construction of new production wells (assumed 2), equipped with well pumps	1	LS	$ 150,000	$ 150,000	50%	$ 75,000	$ 225,000		
New treatment facility (assumes 15mx10m footprint)	150	m2	$ 2,000	$ 300,000	50%	$ 150,000	$ 450,000		
Piping, valves and fittings	1	LS	$ 50,000	$ 50,000	50%	$ 25,000	$ 75,000		
Instrumentation	1	LS	$ 35,000	$ 35,000	30%	$ 10,500	$ 45,500		
Sodium Hypoclorite System - disinfection	1	each	$ 50,000	$ 50,000	30%	$ 15,000	$ 65,000		
Electrical (standby diesel generator, service entrance, control panels motor starters, controls and automation)	1	LS	$ 450,000	$ 450,000	50%	$ 225,000	$ 675,000		
Mechanical (HVAC system, lighting)	1	LS	$ 75,000	$ 75,000	50%	$ 37,500	$ 112,500		
Site Works (includes site grading, excavation, trenching, backfilling)	1	LS	$ 250,000	$ 250,000	50%	$ 125,000	$ 375,000		
Contact Chambers for disinfection	1	LS	$ 250,000	$ 250,000	50%	$ 125,000	$ 375,000		
Other site works (watermains, driveway, fences, gates, sodding, etc.)	1	LS	$ 100,000	$ 100,000	50%	$ 50,000	$ 150,000		
Power upgrades to 3 phase	1	LS	$ 75,000	$ 75,000	50%	$ 37,500	$ 112,500		
Property acquisition - treatment facility	1.0	acres	$ 300,000	$ 300,000		$ -	$ 300,000		*Assumed $300,000/acre as per info provide by real state agent in Puslinch.*
Property acquisition - storage facility	1.00	acres	$ 300,000	$ 300,000		$ -	$ 300,000		*Assumed $300,000/acre as per info provide by real state agent in Puslinch.*
Sub-total Capital Cost for New Well Pump =								**$ 4,010,500**	
Storage and Distribution System									
New Elevated water tower (3,500 m3)	1	LS	$ 4,000,000	$ 4,000,000	incl		$ 4,000,000		*Provided by M. Elliott*
400 mm diameter watermain	5,100	m	$ 870	$ 4,437,000	incl		$ 4,437,000		*Assumes installation in shoulder of road*
300 mm diameter watermain	7,700	m	$ 520	$ 4,004,000	incl		$ 4,004,000		*Assumes installation in shoulder of road*
200 mm diameter watermain	20,100	m	$ 360	$ 7,236,000	incl		$ 7,236,000		*Assumes installation in shoulder of road*
Sub-total Capital Cost for Connecting Watermain =								**$ 19,677,000**	
SUB-TOTAL CAPITAL COST IN CURRENT YEAR (2018) =								**$ 23,687,500**	
Contingency (20%) =								**$ 4,737,500**	
Engineering and Construction (15%) =								**$ 3,553,200**	
Contractor Overhead (10%) =								**$ 2,368,800**	
TOTAL CAPITAL COST IN CURRENT YEAR (2018) =								**$ 34,347,000**	

OPERATION AND MAINTENANCE COST

Area	Item	QTY	Unit	Unit Cost ($)	Annual Cost	Subtotal	Comments
Pumping Cost	Well Pumps Annual Electrical Cost	$ 1	LS	$ 15,000	$ 10,000		
	Sub-Total Well Pumps =					**$ 10,000**	
Chemical Systems	NaOCl at new well pump facility for primary disinfection	$ 1	LS	$ 5,000	$ 5,000		
	Sub-Total Chemical Systems =					**$ 5,000**	
Miscellaneous O&M	Equipment maintenance, contracts and agreements	1	LS	$ 30,000	$ 30,000		
	Pumps parts and replacement, materials, for new facility	1	LS	$ 15,000	$ 15,000		
	Sub-Total Regulatory Requirements =					**$ 45,000**	
Labour	Labour	1	LS	$ 350,000	$ 350,000		Assumed that Town will retain an Operating Agency to operate the system on their behalf. High-level cost provided by OCWA in email on February 20, 2018.
	Sub-Total Regulatory Requirements =					**$ 350,000**	
Regulatory Requirements	Lab and reporting	1	LS	$ 10,000	$ 10,000		
	Sub-Total Regulatory Requirements =					**$ 10,000**	
TOTAL O&M COST IN CURRENT YEAR (2018) =						**$ 420,000**	
Contingency (20%) =						**$ 84,000**	
TOTAL O&M COST IN CURRENT YEAR (2018) =						**$ 504,000**	

Project Title:	**Puslinch Water and Sewage Feasibility Study**		
Client:	Township of Puslinch		
Project No.:	T000866A		
Task:	Water Servcing Option Development - Option 1 Probable Cost		
Prepared By:	Sandra Rodriguez	**Date:**	8-Feb-18
Reviewed by:	S. Winchester	**Date:**	27-Feb-18
Revision No. :	2	**Revision Date:**	28-Feb-18

LIFE CYCLE COST

Option 1A - Intra-Municipal System

Economic Factors

Interest rate (%)	6%
Inflation rate (%)	2.0%
Project Start Year (Year n)	2020
Planning Period (yrs)	20

Cost in Year n = Cost in Current Year x (1+inflation Rate)^(Year n - Current Year)

Present Value = Cost /((1+Interest Rate)^(Year n - Current Year))

20-Year NPV

Year	Capital Cost	NPV Capital Cost	Operating Cost	NPV Operating Cost	Capital and Operating NPV
2018	$34,347,000		$504,000		
2019	$0		$0		
2020	$35,734,619	$31,803,684	$524,362	$466,680	$32,270,363
2021	$0	$0	$534,849	$449,069	$449,069
2022	$0	$0	$545,546	$432,123	$432,123
2023	$0	$0	$556,457	$415,817	$415,817
2024	$0	$0	$567,586	$400,126	$400,126
2025	$0	$0	$578,938	$385,027	$385,027
2026	$0	$0	$590,516	$370,497	$370,497
2027	$0	$0	$602,327	$356,516	$356,516
2028	$0	$0	$614,373	$343,063	$343,063
2029	$0	$0	$626,661	$330,117	$330,117
2030	$862,404	$428,589	$639,194	$317,660	$746,248
2031	$0	$0	$651,978	$305,673	$305,673
2032	$0	$0	$665,017	$294,138	$294,138
2033	$0	$0	$678,318	$283,038	$283,038
2034	$0	$0	$691,884	$272,358	$272,358
2035	$0	$0	$705,722	$262,080	$262,080
2036	$0	$0	$719,836	$252,190	$252,190
2037	$0	$0	$734,233	$242,674	$242,674
2038	$0	$0	$748,917	$233,516	$233,516
2039	$0	$0	$763,896	$224,704	$224,704
2040	$1,051,266	$291,732	$779,174	$216,225	$507,956
	Sub-Total NPV value =	$32,524,004		$6,853,289	
	Total NPV value (20 years) =	**$39,377,300**			**$39,377,300**

Capital Cost Breakdown Every 10 Years :

Well Pump House	Cost every 10 years	Comments
Building envelope, disinfection system, media regeneration, equipment =	$100,000	Assumed
Well rehabilitation (2 wells) =	$80,000	Assumed
Elevated Tank (inspection, coating, etc.) =	$500,000	
Total Capital Cost New Well Pump House / 10 years	**$680,000**	

Total Additional Capital Cost / 10 years = $680,000

Project Title:	**Puslinch Water and Sewage Feasibility Study**		
Client:	Township of Puslinch		
Project No.:	T000866A		
Task:	Water Servcing Option Development - Option 2 Probable Cost		
Prepared By:	Sandra Rodriguez	**Date:**	30-Jan-18
Reviewed by:	S. Winchester	**Date:**	27-Feb-18
Revision No. :	1	**Revision Date:**	27-Feb-18

CAPITAL AND OPERATION & MAINTENANCE COST

Option 1B - Inter-Municipal System

System Description	Quantity	Unit	Material		Labour		Total Material & Labour	Sub Total Cost	Comments
			Unit Cost	Total Material Cost	% of Material	Total Labour Cost			
Supply									
Connection to ex. Guelph distribution system, including metering facility	1	LS	$ 250,000	$ 250,000	50%	$ 125,000	$ 375,000		
Pressure Control Station	1	LS	$ 1,000,000	$ 1,000,000	50%	$ 500,000	$ 1,500,000		*Assumed by S.Rodriguez*
Property acquisition - Pressure Control station	0.5	acres	$ 300,000	$ 150,000		$ -	$ 150,000		*Assumed $300,000/acre as per info provide by real state agent in Puslinch.*
Property acquisition - storage facility	1.0	acres	$ 300,000	$ 300,000		$ -	$ 300,000		*Assumed $300,000/acre as per info provide by real state agent in Puslinch.*
Sub-total Capital Cost for New Well Pump =								**$ 2,325,000**	
Storage and Distribution									
New Elevated water tower (3,500 m3)	1	LS	$ 4,000,000	$ 4,000,000	incl		$ 4,000,000		*Provided by M. Elliott*
400 mm diameter watermain	3,300	m	$ 870	$ 2,871,000	incl		$ 2,871,000		*Assumes installation in shoulder of road*
300 mm diameter watermain	7,700	m	$ 520	$ 4,004,000	incl		$ 4,004,000		*Assumes installation in shoulder of road*
150mm - 200 mm diameter watermain	20,100	m	$ 360	$ 7,236,000	incl		$ 7,236,000		*Assumes installation in shoulder of road*
Sub-total Capital Cost for Connecting Watermain =								**$ 18,111,000**	
SUB-TOTAL CAPITAL COST IN CURRENT YEAR (2018) = $ 20,436,000									
Contingency (20%) = $ 4,087,200									
Engineering and Construction (15%) = $ 3,065,400									
Contractor Overhead (10%) = $ 2,043,600									
TOTAL CAPITAL COST IN CURRENT YEAR (2018) = $ 29,632,200									

OPERATION AND MAINTENANCE COST

Area	Item	QTY	Unit	Unit Cost ($)	Annual Cost	Subtotal	Comments
Pumping Cost	Well Pumps Annual Electrical Cost	$ 1	LS	$ 15,000	$ 10,000		
	Sub-Total Well Pumps =					**$ 10,000**	
Chemical Systems	NaOCl at new well pump facility for primary disinfection	$ 1	LS	$ 2,000	$ 2,000		In case they want to do re-chlorination at the storage facility
	Sub-Total Chemical Systems =					**$ 2,000**	
Miscellaneous O&M	Equipment maintenance, contracts and agreements	1	LS	$ 10,000	$ 10,000		
	Pumps parts and replacement, materials, for new facility	1	LS	$ 5,000	$ 5,000		
	Sub-Total Regulatory Requirements =					**$ 15,000**	
Labour	Labour	1	LS		$ 50,000		Assumed
	Sub-Total Regulatory Requirements =					**$ 50,000**	
Regulatory Requirements	Lab and reporting	1	LS	$ 2,500	$ 2,500		
	Sub-Total Regulatory Requirements =					**$ 2,500**	
TOTAL O&M COST IN CURRENT YEAR (2018) = $						**79,500**	
Contingency (20%) = $						**15,900**	
TOTAL O&M COST IN CURRENT YEAR (2018) = $						**95,400**	

Project Title:	**Puslinch Water and Sewage Feasibility Study**		
Client:	Township of Puslinch		
Project No.:	T000866A		
Task:	Water Servcing Option Development - Option 2 Probable Cost		
Prepared By:	Sandra Rodriguez	**Date:**	8-Feb-18
Reviewed by:	S. Winchester	**Date:**	27-Feb-18
Revision No. :	2	**Revision Date:**	28-Feb-18

LIFE CYCLE COST

Option 1B - Inter-Municipal System

Economic Factors

Interest rate (%)	6%
Inflation rate (%)	2.0%
Project Start Year (Year n)	2020
Planning Period (yrs)	20

Cost in Year n = Cost in Current Year x (1+inflation Rate)^(Year n - Current Year)

Present Value = Cost /((1+Interest Rate)^(Year n - Current Year))

20-Year NPV

Year	Capital Cost	NPV Capital Cost	Operating Cost	NPV Operating Cost	Capital and Operating NPV
2018	$29,632,200		$95,400		
2019	$0		$0		
2020	$30,829,341	$27,438,004	$99,254	$88,336	$27,526,339
2021	$0	$0	$101,239	$85,002	$85,002
2022	$0	$0	$103,264	$81,795	$81,795
2023	$0	$0	$105,329	$78,708	$78,708
2024	$0	$0	$107,436	$75,738	$75,738
2025	$0	$0	$109,585	$72,880	$72,880
2026	$0	$0	$111,776	$70,130	$70,130
2027	$0	$0	$114,012	$67,483	$67,483
2028	$0	$0	$116,292	$64,937	$64,937
2029	$0	$0	$118,618	$62,486	$62,486
2030	$697,533	$346,653	$120,990	$60,128	$406,781
2031	$0	$0	$123,410	$57,859	$57,859
2032	$0	$0	$125,878	$55,676	$55,676
2033	$0	$0	$128,396	$53,575	$53,575
2034	$0	$0	$130,964	$51,553	$51,553
2035	$0	$0	$133,583	$49,608	$49,608
2036	$0	$0	$136,255	$47,736	$47,736
2037	$0	$0	$138,980	$45,935	$45,935
2038	$0	$0	$141,759	$44,201	$44,201
2039	$0	$0	$144,595	$42,533	$42,533
2040	$850,289	$235,959	$147,486	$40,928	$276,888
	Sub-Total NPV value =	$28,020,616		$1,297,230	
	Total NPV value (20 years) =	**$29,317,900**			**$29,317,900**

Capital Cost Breakdown Every 10 Years :		
Well Pump House	Cost every 10 years	Comments
PS building envelope, equipment =	$50,000	Assumed
Elevated Tank (inspection, coating, etc.) =	$500,000	
Total Capital Cost New Well Pump House / 10 years	**$550,000**	

Total Additional Capital Cost / 10 years = $550,000

WATER SERVICING INFRASTRUCTURE AVERAGE UNIT PRICES (2018 - Southwestern Region)

A) Watermain Installation with Minimum Restoration (Top Soil and Seed only) (FOR INSTALLATION IN DITCHES)

	Nom. Pipe Size	Outer Diameter	Depth to Invert	Minimum Trench Width	Excavation		Bedding		Pipe		Backfill		Restoration Allowance	**Subtotal Unit Cost**	Appurtenance Allowance	**Subtotal Unit Cost**	Dewatering Allowance	**Subtotal Unit Cost**	Conting @20%	Eng. @15%	**TOTAL (excl. HST)**
					Vol.	Cost	Vol.	Cost	Cost	Installation	Vol.	Cost									
	(mm)	(m)	(m)	(m)	(m^3)	($/m)	(m^3)	($/m)	($/m)	($/m)	(m^3)	($/m)	($/m)	**($/m)**	($/m)	**($/m)**	($/m)	**($/m)**	($/m)	($/m)	**($/m)**
PVC	100	0.14	2.4	0.74	2.8	16.80	0.44	19.70	24.80	2.48	2.80	14.00	40.00	**117.78**	59.00	**176.78**	10	**186.78**	37.40	33.60	**260.00**
	150	0.20	2.4	0.80	3.10	18.60	0.52	23.40	38.25	3.83	2.85	14.30	40.00	**138.38**	59.00	**197.38**	10	**207.38**	41.50	31.11	**280.00**
	200	0.26	2.4	0.86	3.4	20.40	0.61	27.50	63.00	6.30	2.90	14.50	40.00	**171.70**	64.00	**235.70**	10	**245.70**	49.10	36.86	**340.00**
	250	0.33	2.4	0.93	3.7	22.20	0.73	32.70	91.00	9.10	2.95	14.80	40.00	**209.80**	67.00	**276.80**	10	**286.80**	57.40	43.02	**390.00**
	300	0.38	2.4	0.98	4.0	24.00	0.81	36.70	124.50	12.45	3.00	15.00	40.00	**252.65**	80.00	**332.65**	15	**347.65**	69.50	52.15	**470.00**
	350	0.45	2.4	1.05	4.4	26.40	0.94	42.60	279.00	27.90	3.00	15.00	40.00	**430.90**	85.00	**515.90**	15	**530.90**	106.20	79.64	**720.00**
	400	0.50	2.4	1.10	4.5	27.00	1.04	47.10	312.00	31.20	3.05	15.30	40.00	**472.60**	103.00	**575.60**	15	**590.60**	118.10	88.59	**800.00**
	450	0.55	2.4	1.15	4.6	27.60	1.15	51.80	385.00	38.50	3.05	15.30	40.00	**558.20**	123.00	**681.20**	15	**696.20**	139.20	104.43	**940.00**
	500	0.60	2.4	1.20	4.9	29.40	1.26	56.70	450.00	45.00	3.05	15.30	40.00	**636.40**	134.00	**770.40**	20	**790.40**	158.10	118.56	**1,070.00**
	600	0.73	2.4	1.33	5.8	34.80	1.57	70.70	719.00	71.90	3.05	15.30	40.00	**951.70**	174.00	**1,125.70**	20	**1,145.70**	229.10	171.86	**1,550.00**
CPP	750	0.90	2.4	1.50	7.0	42.00	2.02	91.20	850.00	85.00	3.00	15.00	40.00	**1,123.20**	150.00	**1,273.20**	20	**1,293.20**	258.60	193.98	**1,750.00**
	900	1.10	3.0	1.70	8.7	52.20	2.63	118.60	1,000.00	100.00	3.35	16.80	40.00	**1,327.60**	180.00	**1,507.60**	20	**1,527.60**	305.50	229.14	**2,070.00**

B) Watermain Installation with Granular Road Restoration

	Nom. Pipe Size	Outer Diameter	Depth to Invert	Minimum Trench Width	Excavation		Bedding		Pipe		Backfill		Restoration Allowance	**Subtotal Unit Cost**	Appurtenance Allowance	**Subtotal Unit Cost**	Dewatering Allowance	**Subtotal Unit Cost**	Conting @20%	Eng. @15%	**TOTAL (excl. HST)**
					Vol.	Cost	Vol.	Cost	Cost	Installation	Vol.	Cost									
	(mm)	(m)	(m)	(m)	(m^3)	($/m)	(m^3)	($/m)	($/m)	($/m)	(m^3)	($/m)	($/m)	**($/m)**	($/m)	**($/m)**	($/m)	**($/m)**	($/m)	($/m)	**($/m)**
PVC	100	0.14	2.4	0.74	2.8	16.80	0.44	19.70	24.80	2.48	2.80	14.00	72.00	**149.78**	59.00	**208.78**	10	**218.78**	43.80	39.40	**310.00**
	150	0.20	2.4	0.80	3.10	18.60	0.52	23.40	38.25	3.83	2.85	14.30	72.00	**170.38**	59.00	**229.38**	10	**239.38**	47.90	35.91	**330.00**
	200	0.26	2.4	0.86	3.4	20.40	0.61	27.50	63.00	6.30	2.90	14.50	72.00	**203.70**	64.00	**267.70**	10	**277.70**	55.50	41.66	**380.00**
	250	0.33	2.4	0.93	3.7	22.20	0.73	32.70	91.00	9.10	2.95	14.80	72.00	**241.80**	67.00	**308.80**	10	**318.80**	63.80	47.82	**440.00**
	300	0.38	2.4	0.98	4.0	24.00	0.81	36.70	124.50	12.45	3.00	15.00	72.00	**284.65**	80.00	**364.65**	15	**379.65**	75.90	56.95	**520.00**
	350	0.45	2.4	1.05	4.4	26.40	0.94	42.60	279.00	27.90	3.00	15.00	72.00	**462.90**	105.00	**567.90**	15	**582.90**	116.60	87.44	**790.00**
	400	0.50	2.4	1.10	4.5	27.00	1.04	47.10	312.00	31.20	3.05	15.30	72.00	**504.60**	123.00	**627.60**	15	**642.60**	128.50	96.39	**870.00**
	450	0.55	2.4	1.15	4.6	27.60	1.15	51.80	385.00	38.50	3.05	15.30	72.00	**590.20**	153.00	**743.20**	15	**758.20**	151.60	113.73	**1,030.00**
	500	0.60	2.4	1.20	4.9	29.40	1.26	56.70	450.00	45.00	3.05	15.30	72.00	**668.40**	164.00	**832.40**	20	**852.40**	170.50	127.86	**1,160.00**
	600	0.73	2.4	1.33	5.8	34.80	1.57	70.70	719.00	71.90	3.05	15.30	72.00	**983.70**	194.00	**1,177.70**	20	**1,197.70**	239.50	179.66	**1,620.00**
CPP	750	0.90	2.4	1.50	7.0	42.00	2.02	91.20	850.00	85.00	3.00	15.00	72.00	**1,155.20**	150.00	**1,305.20**	20	**1,325.20**	265.00	198.78	**1,790.00**
	900	1.10	3.0	1.70	8.7	52.20	2.63	118.60	1,000.00	100.00	3.35	16.80	72.00	**1,359.60**	180.00	**1,539.60**	20	**1,559.60**	311.90	233.94	**2,110.00**

C) Watermain Installation with with Road Restoration (Assumes 1 Lane restored, along with Curb & Gutter, and Sidewalk one side)

	Nom. Pipe Size	Outer Diameter	Depth to Invert	Minimum Trench Width	Excavation		Bedding		Pipe		Backfill		Restoration Allowance	**Subtotal Unit Cost**	Appurtenance Allowance	**Subtotal Unit Cost**	Dewatering Allowance	**Subtotal Unit Cost**	Conting @20%	Eng. @15%	**TOTAL (excl. HST)**
					Vol.	Cost	Vol.	Cost	Cost	Installation	Vol.	Cost									
	(mm)	(m)	(m)	(m)	(m^3)	($/m)	(m^3)	($/m)	($/m)	($/m)	(m^3)	($/m)	($/m)	**($/m)**	($/m)	**($/m)**	($/m)	**($/m)**	($/m)	($/m)	**($/m)**
PVC	100	0.14	2.4	0.74	2.8	16.80	0.44	19.70	24.80	2.48	2.80	14.00	214.12	**291.90**	59.00	**350.90**	10	**360.90**	72.20	65.00	**500.00**
	150	0.20	2.4	0.80	3.1	18.60	0.52	23.40	38.25	3.83	2.85	14.30	214.12	**312.50**	59.00	**371.50**	10	**381.50**	76.30	57.22	**520.00**
	200	0.26	2.4	0.86	3.4	20.40	0.61	27.50	63.00	6.30	2.90	14.50	214.12	**345.82**	64.00	**409.82**	10	**419.82**	84.00	62.97	**570.00**
	250	0.33	2.4	0.93	3.7	22.20	0.73	32.70	91.00	9.10	2.95	14.80	214.12	**383.92**	67.00	**450.92**	10	**460.92**	92.20	69.14	**630.00**
	300	0.38	2.4	0.98	4.0	24.00	0.81	36.70	124.50	12.45	3.00	15.00	214.12	**426.77**	80.00	**506.77**	15	**521.77**	104.40	78.27	**710.00**
	350	0.45	2.4	1.05	4.4	26.40	0.94	42.60	279.00	27.90	3.00	15.00	214.12	**605.02**	105.00	**710.02**	15	**725.02**	145.00	108.75	**980.00**
	400	0.50	2.4	1.10	4.5	27.00	1.04	47.10	312.00	31.20	3.05	15.30	214.12	**646.72**	123.00	**769.72**	15	**784.72**	156.90	117.71	**1,060.00**
	450	0.55	2.4	1.15	4.6	27.60	1.15	51.80	385.00	38.50	3.05	15.30	214.12	**732.32**	153.00	**885.32**	15	**900.32**	180.10	135.05	**1,220.00**
	500	0.60	2.4	1.20	4.9	29.40	1.26	56.70	450.00	45.00	3.05	15.30	214.12	**810.52**	164.00	**974.52**	20	**994.52**	198.90	149.18	**1,350.00**
	600	0.73	2.4	1.33	5.8	34.80	1.57	70.70	719.00	71.90	3.05	15.30	214.12	**1,125.82**	194.00	**1,319.82**	20	**1,339.82**	268.00	200.97	**1,810.00**
CPP	750	0.90	2.4	1.50	7	42.00	2.02	91.20	850.00	85.00	3.00	15.00	214.12	**1,297.32**	150.00	**1,447.32**	20	**1,467.32**	293.50	220.10	**1,990.00**
	900	1.10	3.0	1.70	8.7	52.20	2.63	118.60	1,000.00	100.00	3.35	16.80	214.12	**1,501.72**	180.00	**1,681.72**	20	**1,701.72**	340.30	255.26	**2,300.00**

Notes

1) Cost of excavation: $6/m3
2) Cost of bedding/pipe surrounding: $45/m3 includes supply and place
3) PVC Pipe (up to 600 mm) Cost provided by IPEX on 30 Oct 17
4) Pipe Installation Allowance based on 10% of pipe cost
5) Backfill trench $5/m3 based on replacement of native material and compaction
6) Includes costs for mainline valves and hydrant sets. No hydrants connected to 750mm and larger mains. Service connections and special appurtenances excluded
7) Restoration for route along existing road allowance (Cost varies with type of restoration). Minimum 4.0m width of restoration (2.0m trench plus 1.0 m each side)
8) Includes allowance for dewatering
9) PVC DR18 (100mm to 600mm)

Prepared By: D. Prashad Date:
Checked By: S. Winchester Date: 30-Nov-17

CIMA
Partners in excellence

WASTEWATER SERVICING INFRASTRUCTURE - Average Unit Prices (Southwestern Ontarion Region) for 2018

Nom. Pipe Size	Depth to Invert	Shoring System Cost	Outer pipe Diameter	Excavation		Granular Bed. Surr.		Backfill		Pipe		MH Allowance	**Subtotal**	Dewatering Allowance	**TOTAL (excluding restoration)**	Road Restoration	**TOTAL (including restoration)**
				Vol.	Cost	Vol.	Cost	Vol.	Cost	Cost	Installation Allowance						
(mm)	(m)	($/m)	(m)	(m3)	($/m)	(m3)	($/m)	(m3)	($/m)	($/m)	($/m)	($/m)	**($/m)**	($/m)	**($/m)**	($/m)	**($/m)**
200	5	10.00	0.213	6.2	37.20	0.6	27.00	5.6	28.00	55.65	5.57	94.00	**257.42**	20.00	**280**	214	**494**
250	5	10.00	0.267	6.2	37.2	0.7	31.5	5.5	27.5	85.30	8.53	94.00	**294.03**	20.00	**320**	214	**534**
300	5	10.00	0.318	6.2	37.20	0.8	36.00	5.4	27.00	120.25	12.03	94.00	**336.48**	20.00	**360**	214	**574**
375	5	10.00	0.389	6.2	37.20	0.9	40.50	5.3	26.50	162.45	16.25	94.00	**386.90**	20.00	**410**	214	**624**
450	5	10.00	0.622	7.3	43.80	1.2	54.00	6.1	30.50	101.30	30.39	94.00	**363.99**	20.00	**390**	214	**604**
525	5	10.00	0.711	7.8	46.80	1.4	63.00	6.4	32.00	129.00	38.70	135.00	**454.50**	20.00	**480**	214	**694**
600	5	10.00	0.800	8.2	49.20	1.5	67.50	6.7	33.50	170.90	51.27	135.00	**517.37**	20.00	**540**	214	**754**
675	5	15.00	0.889	8.7	52.20	1.6	72.00	7.1	35.50	259.60	77.88	135.00	**647.18**	20.00	**670**	271	**941**
750	5	15.00	0.978	9.2	55.20	1.8	81.00	7.4	37.00	343.50	103.05	135.00	**769.75**	20.00	**790**	271	**1,061**
825	5	15.00	1.067	9.6	57.60	1.9	85.50	7.7	38.50	443.40	133.02	172.00	**945.02**	20.00	**970**	271	**1,241**
900	5	15.00	1.156	10.4	62.40	2.1	94.50	8.3	41.50	478.40	143.52	172.00	**1,007.32**	20.00	**1,030**	271	**1,301**
975	5	20.00	1.245	10.8	64.80	2.2	99.00	8.6	43.00	549.70	164.91	172.00	**1,113.41**	20.00	**1,140**	271	**1,411**
1050	5	20.00	1.334	11.3	67.80	2.4	108.00	8.9	44.50	632.00	189.60	303.00	**1,364.90**	20.00	**1,390**	271	**1,661**
1200	5	20.00	1.511	12.2	73.20	2.7	121.50	9.5	47.50	791.50	237.45	303.00	**1,594.15**	20.00	**1,620**	271	**1,891**
200	7	10.00	0.213	8.6	51.60	0.6	27.00	8.0	40.00	55.65	5.57	150.00	**339.82**	20.00	**360**	214	**574**
250	7	10.00	0.267	8.6	51.60	0.7	31.5	7.9	39.50	85.30	8.53	150.00	**376.43**	20.00	**400.00**	214	614
300	7	15.00	0.318	8.6	51.60	0.8	36.00	7.8	39.00	120.25	12.03	150.00	**423.88**	20.00	**450**	214	**664**
375	7	15.00	0.389	8.6	51.60	0.9	40.50	7.7	38.50	162.45	16.25	150.00	**474.30**	20.00	**500**	214	**714**
450	7	15.00	0.622	10.2	61.20	1.2	54.00	9.0	45.00	101.30	30.39	150.00	**456.89**	20.00	**480**	214	**694**
525	7	15.00	0.711	10.8	64.80	1.4	63.00	9.4	47.00	129.00	38.70	189.00	**546.50**	20.00	**570**	214	**784**
600	7	20.00	0.800	11.4	68.40	1.5	67.50	9.9	49.50	170.90	51.27	189.00	**616.57**	20.00	**640**	214	**854**
675	7	20.00	0.889	12.1	72.60	1.6	72.00	10.5	52.50	259.60	77.88	189.00	**743.58**	20.00	**770**	271	**1,041**
750	7	20.00	0.978	12.7	76.20	1.8	81.00	10.9	54.50	343.50	103.05	189.00	**867.25**	20.00	**890**	271	**1,161**
825	7	20.00	1.067	13.3	79.80	1.9	85.50	11.4	57.00	443.40	133.02	226.00	**1,044.72**	20.00	**1,070**	271	**1,341**
900	7	30.00	1.156	14.3	85.80	2.1	94.50	12.2	61.00	478.40	143.52	226.00	**1,119.22**	20.00	**1,140**	271	**1,411**
975	7	30.00	1.245	14.9	89.40	2.2	99.00	12.7	63.50	549.70	164.91	226.00	**1,222.51**	20.00	**1,250**	271	**1,521**
1050	7	40.00	1.334	15.6	93.60	2.4	108.00	13.2	66.00	632.00	189.60	356.00	**1,485.20**	20.00	**1,510**	271	**1,781**
1200	7	40.00	1.511	16.9	101.40	2.7	121.50	14.2	71.00	791.50	237.45	356.00	**1,718.85**	20.00	**1,740**	271	**2,011**

Notes

1) Cost of excavation $6/m^3
2) For 200mm to 375 mm sewer pipe, supply cost taken from Royal Pipe Products (PVC) 2018 Price Installation Cost 10% of pipe supply cost
3) For sewer pipe 450mm dia and larger, supply cost taken from M-Con Products 2017 Price list for Installation Cost 30% of pipe cost for concrete pipe
4) Backfill trench $5/m3 based on replacement of native material and compaction
5) Cost of granular bedding $45/m^3
6) Manhole Spacing 100 m
7) Service Laterals excluded from this estimate,
8) Restoration cost for sewers 600mm dia and smaller includes 300mm subbase, 150mm base, 60mm binder, and 40mm binder
9) Restoration cost for sewers larger than 600mm dia includes 450mm subbase, 150mm base, 100mm binder, and 40mm surface
10) Engineering and HST not included

Prepared By: S. Mayirou Date: 9/1/2018
Checked By: S. Winchester Date: 15/01/18

MH	Dia	Depth	List Price[1]	Additional Items[2]	Sub-Total _ Supply Cost	Installation @ 100%	Total Cost per Installed	Cost per m
	1200	5	$3,834.00	$862.80	$4,696.80	$4,696.80	$9,400.00	$94.00
	1500	5	$5,630.00	$1,112.80	$6,742.80	$6,742.80	$13,500.00	$135.00
	1800	5	$7,128.00	$1,462.80	$8,590.80	$8,590.80	$17,200.00	$172.00
	2400	5	$13,265.00	$1,862.80	$15,127.80	$15,127.80	$30,300.00	$303.00
	1200	7	$6,593.00	$862.80	$7,455.80	$7,455.80	$15,000.00	$150.00
	1500	7	$8,293.00	$1,112.80	$9,405.80	$9,405.80	$18,900.00	$189.00
	1800	7	$9,791.00	$1,462.80	$11,253.80	$11,253.80	$22,600.00	$226.00
	2400	7	$15,927.00	$1,862.80	$17,789.80	$17,789.80	$35,600.00	$356.00

Note:

1 Based on 2017 List Price from M-Con Products. Safety Landing included for MH depths > 5.0 m

2 Allowance for castings, grade rings, benching, flexible connectors

Flexible Connectors

300	$312.30
375	$375.30
450	$474.80
525	$560.50
600	$664.40
675	Not listed
750	Not listed
825	Not listed
900	Not listed
975	Not listed
1050	Not listed
1200	Not listed

Excavation Quantities for Sewers laid at Different Depths

For Depth to Invert = 5.0 m

Nom. Pipe Size	Outer Pipe Dia.	Depth To Invert	Bottom Trench			Middle Trench			Top Trench				Total Area
			Width	Depth	Area	Width	Depth	Area	Bottom Width	Top Width	Depth	Area	
mm	m	m	m	m	m2	m	m	m2	m	m	m	m2	m2
200	0.260	5	1.010	1	1.0	1.510	3	4.5	1.510	3.510	1	2.5	**8.1**
250	0.318	5	1.068	1	1.1	1.568	3	4.7	1.568	3.568	1	2.6	**8.3**
300	0.445	5	1.195	1	1.2	1.695	3	5.1	1.695	3.695	1	2.7	**9.0**
375	0.520	5	1.270	1	1.3	1.770	3	5.3	1.770	3.770	1	2.8	**9.4**
450	0.580	5	1.330	1	1.3	1.830	3	5.5	1.830	3.830	1	2.8	**9.7**
525	0.665	5	1.415	1	1.4	1.915	3	5.7	1.915	3.915	1	2.9	**10.1**
600	0.755	5	1.505	1	1.5	2.005	3	6.0	2.005	4.005	1	3.0	**10.5**
675	0.880	5	1.630	1	1.6	2.130	3	6.4	2.130	4.130	1	3.1	**11.2**
750	0.970	5	1.720	1	1.7	2.220	3	6.7	2.220	4.220	1	3.2	**11.6**
825	1.055	5	1.805	1	1.8	2.305	3	6.9	2.305	4.305	1	3.3	**12.0**

For Depth to Invert = 7.0 m

Nom. Pipe Size	Outer Pipe Dia.	Depth To Invert	Bottom Trench			Middle Trench			Top Trench				Total Area
			Width	Depth	Area	Width	Depth	Area	Bottom Width	Top Width	Depth	Area	
mm	m	m	m	m	m2	m	m	m2	m	m	m	m2	m2
250	0.318	7	1.068	1	1.1	1.568	5	7.8	1.568	3.568	1	2.6	**11.5**
300	0.445	7	1.195	1	1.2	1.695	5	8.5	1.695	3.695	1	2.7	**12.4**
375	0.520	7	1.270	1	1.3	1.770	5	8.9	1.770	3.770	1	2.8	**12.9**
450	0.580	7	1.330	1	1.3	1.830	5	9.2	1.830	3.830	1	2.8	**13.3**
525	0.665	7	1.415	1	1.4	1.915	5	9.6	1.915	3.915	1	2.9	**13.9**
600	0.755	7	1.505	1	1.5	2.005	5	10.0	2.005	4.005	1	3.0	**14.5**
675	0.880	7	1.630	1	1.6	2.130	5	10.7	2.130	4.130	1	3.1	**15.4**
750	0.970	7	1.720	1	1.7	2.220	5	11.1	2.220	4.220	1	3.2	**16.0**
825	1.055	7	1.805	1	1.8	2.305	5	11.5	2.305	4.305	1	3.3	**16.6**

For Depth to Invert = 9.0 m

Nom. Pipe Size	Outer Pipe Dia.	Depth To Invert	Bottom Trench			Middle Trench			Top Trench				Total Area
			Width	Depth	Area	Width	Depth	Area	Bottom Width	Top Width	Depth	Area	
mm	m	m	m	m	m2	m	m	m2	m	m	m	m2	m2
250	0.318	9	1.068	1	1.1	1.568	6	9.4	1.568	5.568	2	7.1	**17.6**
300	0.445	9	1.195	1	1.2	1.695	6	10.2	1.695	5.695	2	7.4	**18.8**
375	0.520	9	1.270	1	1.3	1.770	6	10.6	1.770	5.770	2	7.5	**19.4**
450	0.580	9	1.330	1	1.3	1.830	6	11.0	1.830	5.830	2	7.7	**20.0**
525	0.665	9	1.415	1	1.4	1.915	6	11.5	1.915	5.915	2	7.8	**20.7**
600	0.755	9	1.505	1	1.5	2.005	6	12.0	2.005	6.005	2	8.0	**21.5**
675	0.880	9	1.630	1	1.6	2.130	6	12.8	2.130	6.130	2	8.3	**22.7**
750	0.970	9	1.720	1	1.7	2.220	6	13.3	2.220	6.220	2	8.4	**23.5**
825	1.055	9	1.805	1	1.8	2.305	6	13.8	2.305	6.305	2	8.6	**24.2**

RESTORATION UNIT COST FOR SEWERS

Nom. Pipe Size	Outer Pipe Dia.	Depth To Invert	Surface Area of Trench	Topsoil+ Seed Cost @ $7.5/m^2	Topsoil+ Sod Cost @ $10.00/m^2	Granular Restoration Base & Sub-base		Asphalt including Granular Base	
						Local Street @ $18.0/m^2	Collector Street @ $23.4/m^2	Local Street @ $41.0/m^2	Collector Street @ $55.3/m^2
mm	m	m	m^2/m	$/m	$/m	$/m	$/m	$/m	$/m
300	0.445	5	4.0	30.2	40.0	72.0	93.6	214.1	271.0
375	0.533	5	4.0	30.2	40.0	72.0	93.6	214.1	271.0
450	0.622	5	4.0	30.2	40.0	72.0	93.6	214.1	271.0
525	0.711	5	4.0	30.2	40.0	72.0	93.6	214.1	271.0
600	0.800	5	4.0	30.2	40.0	72.0	93.6	214.1	271.0
675	0.889	5	4.0	30.2	40.0	72.0	93.6	214.1	271.0
750	0.978	5	4.0	30.2	40.0	72.0	93.6	214.1	271.0
825	1.067	5	4.0	30.2	40.0	72.0	93.6	214.1	271.0
900	1.156	5	4.0	30.2	40.0	72.0	93.6	214.1	271.0
975	1.245	5	4.0	30.2	40.0	72.0	93.6	214.1	271.0
105	1.334	5	4.0	30.2	40.0	72.0	93.6	214.1	271.0
1200	1.511	5	4.0	30.2	40.0	72.0	93.6	214.1	271.0

UNIT COST FOR DIFFERENT LAYERS

Item	Local Street		Collector Street		Remarks	
		$/m^2		$/m^2		
Subbase	300 mm "B"	10.8	450 mm "B"	16.2	"B" @ $15/tonne (2.4 t/m^3)	
Base	150 mm "A"	7.2	150 mm "A"	7.2	"A" @ $20/tonne (2.4 t/m^3)	
Subtotal		**18.0**		**23.4**		
Binder	60 HL4	13.2	100 HL4	22.1	"HL4" @ $90/tonne (2.45 t/m^3)	
Surface	40 HL3	9.8	40 HL3	9.8	"HL3" @ $100/tonne (2.45 t/m^3)	
Total		**41.0**		**55.3**		
Curb (one side)		50.0		50.0		

APPENDIX D
Preliminary Cost Recovery Estimates
Detailed Calculations

Project Title:	**Water and Sewage Feasibility Study**
Client:	Township of Puslinch
Project No.:	T000866A
Task:	Cost Recovery Calculations
Prepared By:	S. Rodriguez **Date:** 16-Apr-18
Reviewed by:	S. Winchester **Date:** 19-Apr-18
Revision No. :	**Revision Date:**

	PRELIMINARY COST RECOVERY OPTIONS							
	WATER SERVICING				WASTEWATER SERVICING			
	OPTION 1		OPTION 2		OPTION 1		OPTION 2	
ASSUME NO FUNDING								
CAPITAL COST	$34,300,000		$29,600,000		$66,600,000		$43,500,000	
Servicing Cost Per Unit (1,209 connections)	$28,371		$24,483		$55,087		$35,980	
	Monthly Cost	Annual Cost	Monthly Cost	Annual Cost	Monthly Cost	Annual Cost	Monthly Cost	Annual Cost
Estimated Cost - 10 Year Payback (4.0%)	$287	$3,447	$248	$2,975	$558	$6,693	$364	$4,371
Estimated Cost - 15 Year Payback (4.0%)	$210	$2,518	$181	$2,173	$407	$4,890	$266	$3,194
Estimated Cost - 20 Year Payback (4.0%)	$172	$2,063	$148	$1,780	$334	$4,006	$218	$2,616
ASSUME 2/3 FUNDING								
CAPITAL COST	$34,300,000		$29,600,000		$66,600,000		$43,500,000	
SUBSIDIZED COST	$11,433,333		$9,866,667		$22,200,000		$14,500,000	
Servicing Cost Per Unit (1,209 connections)	$9,457		$8,161		$18,362		$11,993	
	Monthly Cost	Annual Cost	Monthly Cost	Annual Cost	Monthly Cost	Annual Cost	Monthly Cost	Annual Cost
Estimated Cost - 10 Year Payback (4.0%)	$96	$1,149	$83	$992	$165	$1,980	$121	$1,457
Estimated Cost - 15 Year Payback (4.0%)	$70	$839	$60	$724	$116	$1,392	$89	$1,065
Estimated Cost - 20 Year Payback (4.0%)	$57	$688	$49	$593	$92	$1,104	$73	$872

Note: Payback amouts exclude Administration Fees (if any) charged by the Township to administer the loans

TOWNSHIP OF PUSLINCH
Water Servicing - Option W1

Estimated Capital Cost: $34,300,000
Number of Benefitting Properties: 1,209
Cost per Connection: $28,370.55

Capital Cost Recovery Factor - A = 0.010124514
Monthly Cost -P = $287.24

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$28,371.00	4.00%	10	**$287.24**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
1	$28,371.00	$94.57	$192.67	$28,178.33	$94.57
2	$28,178.33	$93.93	$193.31	$27,985.01	$188.50
3	$27,985.01	$93.28	$193.96	$27,791.05	$281.78
4	$27,791.05	$92.64	$194.61	$27,596.45	$374.42
5	$27,596.45	$91.99	$195.25	$27,401.19	$466.41
6	$27,401.19	$91.34	$195.91	$27,205.29	$557.74
7	$27,205.29	$90.68	$196.56	$27,008.73	$648.43
8	$27,008.73	$90.03	$197.21	$26,811.52	$738.46
9	$26,811.52	$89.37	$197.87	$26,613.65	$827.83
10	$26,613.65	$88.71	$198.53	$26,415.11	$916.54
11	$26,415.11	$88.05	$199.19	$26,215.92	$1,004.59
12	$26,215.92	$87.39	$199.86	$26,016.07	$1,091.98
13	$26,016.07	$86.72	$200.52	$25,815.54	$1,178.70
14	$25,815.54	$86.05	$201.19	$25,614.35	$1,264.75
15	$25,614.35	$85.38	$201.86	$25,412.49	$1,350.13
16	$25,412.49	$84.71	$202.53	$25,209.96	$1,434.84
17	$25,209.96	$84.03	$203.21	$25,006.75	$1,518.87
18	$25,006.75	$83.36	$203.89	$24,802.86	$1,602.23
19	$24,802.86	$82.68	$204.57	$24,598.30	$1,684.90
20	$24,598.30	$81.99	$205.25	$24,393.05	$1,766.90
21	$24,393.05	$81.31	$205.93	$24,187.11	$1,848.21
22	$24,187.11	$80.62	$206.62	$23,980.50	$1,928.83
23	$23,980.50	$79.93	$207.31	$23,773.19	$2,008.77
24	$23,773.19	$79.24	$208.00	$23,565.19	$2,088.01
25	$23,565.19	$78.55	$208.69	$23,356.50	$2,166.56
26	$23,356.50	$77.85	$209.39	$23,147.11	$2,244.42
27	$23,147.11	$77.16	$210.09	$22,937.02	$2,321.57
28	$22,937.02	$76.46	$210.79	$22,726.24	$2,398.03
29	$22,726.24	$75.75	$211.49	$22,514.75	$2,473.78
30	$22,514.75	$75.05	$212.19	$22,302.56	$2,548.83
31	$22,302.56	$74.34	$212.90	$22,089.66	$2,623.18
32	$22,089.66	$73.63	$213.61	$21,876.05	$2,696.81
33	$21,876.05	$72.92	$214.32	$21,661.72	$2,769.73
34	$21,661.72	$72.21	$215.04	$21,446.69	$2,841.93
35	$21,446.69	$71.49	$215.75	$21,230.93	$2,913.42
36	$21,230.93	$70.77	$216.47	$21,014.46	$2,984.19
37	$21,014.46	$70.05	$217.19	$20,797.27	$3,054.24
38	$20,797.27	$69.32	$217.92	$20,579.35	$3,123.57
39	$20,579.35	$68.60	$218.64	$20,360.70	$3,192.16
40	$20,360.70	$67.87	$219.37	$20,141.33	$3,260.03
41	$20,141.33	$67.14	$220.10	$19,921.22	$3,327.17
42	$19,921.22	$66.40	$220.84	$19,700.39	$3,393.57
43	$19,700.39	$65.67	$221.57	$19,478.81	$3,459.24
44	$19,478.81	$64.93	$222.31	$19,256.50	$3,524.17
45	$19,256.50	$64.19	$223.05	$19,033.44	$3,588.36
46	$19,033.44	$63.44	$223.80	$18,809.65	$3,651.80
47	$18,809.65	$62.70	$224.54	$18,585.10	$3,714.50
48	$18,585.10	$61.95	$225.29	$18,359.81	$3,776.45
49	$18,359.81	$61.20	$226.04	$18,133.77	$3,837.65
50	$18,133.77	$60.45	$226.80	$17,906.97	$3,898.10
51	$17,906.97	$59.69	$227.55	$17,679.42	$3,957.79
52	$17,679.42	$58.93	$228.31	$17,451.11	$4,016.72
53	$17,451.11	$58.17	$229.07	$17,222.03	$4,074.89
54	$17,222.03	$57.41	$229.84	$16,992.20	$4,132.30
55	$16,992.20	$56.64	$230.60	$16,761.60	$4,188.94
56	$16,761.60	$55.87	$231.37	$16,530.23	$4,244.81
57	$16,530.23	$55.10	$232.14	$16,298.08	$4,299.91
58	$16,298.08	$54.33	$232.92	$16,065.17	$4,354.24
59	$16,065.17	$53.55	$233.69	$15,831.48	$4,407.79
60	$15,831.48	$52.77	$234.47	$15,597.00	$4,460.56
61	$15,597.00	$51.99	$235.25	$15,361.75	$4,512.55

TOWNSHIP OF PUSLINCH
Water Servicing - Option W1

Estimated Capital Cost: $34,300,000
Number of Benefitting Properties: 1,209
Cost per Connection: $28,370.55

Capital Cost Recovery Factor - A = 0.010124514
Monthly Cost -P = $287.24

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$28,371.00	4.00%	10	**$287.24**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
62	$15,361.75	$51.21	$236.04	$15,125.72	$4,563.76
63	$15,125.72	$50.42	$236.82	$14,888.89	$4,614.17
64	$14,888.89	$49.63	$237.61	$14,651.28	$4,663.80
65	$14,651.28	$48.84	$238.40	$14,412.87	$4,712.64
66	$14,412.87	$48.04	$239.20	$14,173.67	$4,760.68
67	$14,173.67	$47.25	$240.00	$13,933.68	$4,807.93
68	$13,933.68	$46.45	$240.80	$13,692.88	$4,854.38
69	$13,692.88	$45.64	$241.60	$13,451.28	$4,900.02
70	$13,451.28	$44.84	$242.40	$13,208.88	$4,944.86
71	$13,208.88	$44.03	$243.21	$12,965.66	$4,988.89
72	$12,965.66	$43.22	$244.02	$12,721.64	$5,032.10
73	$12,721.64	$42.41	$244.84	$12,476.80	$5,074.51
74	$12,476.80	$41.59	$245.65	$12,231.15	$5,116.10
75	$12,231.15	$40.77	$246.47	$11,984.68	$5,156.87
76	$11,984.68	$39.95	$247.29	$11,737.38	$5,196.82
77	$11,737.38	$39.12	$248.12	$11,489.26	$5,235.94
78	$11,489.26	$38.30	$248.95	$11,240.32	$5,274.24
79	$11,240.32	$37.47	$249.77	$10,990.55	$5,311.71
80	$10,990.55	$36.64	$250.61	$10,739.94	$5,348.34
81	$10,739.94	$35.80	$251.44	$10,488.49	$5,384.14
82	$10,488.49	$34.96	$252.28	$10,236.21	$5,419.11
83	$10,236.21	$34.12	$253.12	$9,983.09	$5,453.23
84	$9,983.09	$33.28	$253.97	$9,729.13	$5,486.50
85	$9,729.13	$32.43	$254.81	$9,474.31	$5,518.93
86	$9,474.31	$31.58	$255.66	$9,218.65	$5,550.51
87	$9,218.65	$30.73	$256.51	$8,962.14	$5,581.24
88	$8,962.14	$29.87	$257.37	$8,704.77	$5,611.12
89	$8,704.77	$29.02	$258.23	$8,446.54	$5,640.13
90	$8,446.54	$28.16	$259.09	$8,187.46	$5,668.29
91	$8,187.46	$27.29	$259.95	$7,927.50	$5,695.58
92	$7,927.50	$26.43	$260.82	$7,666.69	$5,722.00
93	$7,666.69	$25.56	$261.69	$7,405.00	$5,747.56
94	$7,405.00	$24.68	$262.56	$7,142.44	$5,772.24
95	$7,142.44	$23.81	$263.43	$6,879.01	$5,796.05
96	$6,879.01	$22.93	$264.31	$6,614.69	$5,818.98
97	$6,614.69	$22.05	$265.19	$6,349.50	$5,841.03
98	$6,349.50	$21.17	$266.08	$6,083.42	$5,862.20
99	$6,083.42	$20.28	$266.96	$5,816.46	$5,882.47
100	$5,816.46	$19.39	$267.85	$5,548.60	$5,901.86
101	$5,548.60	$18.50	$268.75	$5,279.86	$5,920.36
102	$5,279.86	$17.60	$269.64	$5,010.21	$5,937.96
103	$5,010.21	$16.70	$270.54	$4,739.67	$5,954.66
104	$4,739.67	$15.80	$271.44	$4,468.23	$5,970.46
105	$4,468.23	$14.89	$272.35	$4,195.88	$5,985.35
106	$4,195.88	$13.99	$273.26	$3,922.62	$5,999.34
107	$3,922.62	$13.08	$274.17	$3,648.46	$6,012.41
108	$3,648.46	$12.16	$275.08	$3,373.38	$6,024.57
109	$3,373.38	$11.24	$276.00	$3,097.38	$6,035.82
110	$3,097.38	$10.32	$276.92	$2,820.46	$6,046.14
111	$2,820.46	$9.40	$277.84	$2,542.62	$6,055.54
112	$2,542.62	$8.48	$278.77	$2,263.85	$6,064.02
113	$2,263.85	$7.55	$279.70	$1,984.15	$6,071.57
114	$1,984.15	$6.61	$280.63	$1,703.53	$6,078.18
115	$1,703.53	$5.68	$281.56	$1,421.96	$6,083.86
116	$1,421.96	$4.74	$282.50	$1,139.46	$6,088.60
117	$1,139.46	$3.80	$283.44	$856.01	$6,092.40
118	$856.01	$2.85	$284.39	$571.63	$6,095.25
119	$571.63	$1.91	$285.34	$286.29	$6,097.16
120	$286.29	$0.95	$286.29	$0.00	$6,098.11

TOWNSHIP OF PUSLINCH
Water Servicing - Option W1

Estimated Capital Cost: $34,300,000
Number of Benefitting Properties: 1,209
Cost per Connection: $28,370.55

Capital Cost Recovery Factor - A = 0.007396879
Monthly Cost -P = $209.86

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$28,371.00	4.00%	15	**$209.86**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
1	$28,371.00	$94.57	$115.29	$28,255.71	$94.57
2	$28,255.71	$94.19	$115.67	$28,140.04	$188.76
3	$28,140.04	$93.80	$116.06	$28,023.99	$282.56
4	$28,023.99	$93.41	$116.44	$27,907.54	$375.97
5	$27,907.54	$93.03	$116.83	$27,790.71	$468.99
6	$27,790.71	$92.64	$117.22	$27,673.49	$561.63
7	$27,673.49	$92.24	$117.61	$27,555.88	$653.87
8	$27,555.88	$91.85	$118.00	$27,437.87	$745.73
9	$27,437.87	$91.46	$118.40	$27,319.48	$837.19
10	$27,319.48	$91.06	$118.79	$27,200.68	$928.25
11	$27,200.68	$90.67	$119.19	$27,081.50	$1,018.92
12	$27,081.50	$90.27	$119.59	$26,961.91	$1,109.19
13	$26,961.91	$89.87	$119.98	$26,841.93	$1,199.07
14	$26,841.93	$89.47	$120.38	$26,721.54	$1,288.54
15	$26,721.54	$89.07	$120.79	$26,600.76	$1,377.61
16	$26,600.76	$88.67	$121.19	$26,479.57	$1,466.28
17	$26,479.57	$88.27	$121.59	$26,357.98	$1,554.55
18	$26,357.98	$87.86	$122.00	$26,235.98	$1,642.41
19	$26,235.98	$87.45	$122.40	$26,113.58	$1,729.86
20	$26,113.58	$87.05	$122.81	$25,990.77	$1,816.90
21	$25,990.77	$86.64	$123.22	$25,867.55	$1,903.54
22	$25,867.55	$86.23	$123.63	$25,743.91	$1,989.76
23	$25,743.91	$85.81	$124.04	$25,619.87	$2,075.58
24	$25,619.87	$85.40	$124.46	$25,495.41	$2,160.98
25	$25,495.41	$84.98	$124.87	$25,370.54	$2,245.96
26	$25,370.54	$84.57	$125.29	$25,245.25	$2,330.53
27	$25,245.25	$84.15	$125.71	$25,119.55	$2,414.68
28	$25,119.55	$83.73	$126.13	$24,993.42	$2,498.41
29	$24,993.42	$83.31	$126.55	$24,866.88	$2,581.72
30	$24,866.88	$82.89	$126.97	$24,739.91	$2,664.61
31	$24,739.91	$82.47	$127.39	$24,612.52	$2,747.08
32	$24,612.52	$82.04	$127.82	$24,484.70	$2,829.12
33	$24,484.70	$81.62	$128.24	$24,356.46	$2,910.74
34	$24,356.46	$81.19	$128.67	$24,227.79	$2,991.93
35	$24,227.79	$80.76	$129.10	$24,098.70	$3,072.69
36	$24,098.70	$80.33	$129.53	$23,969.17	$3,153.01
37	$23,969.17	$79.90	$129.96	$23,839.21	$3,232.91
38	$23,839.21	$79.46	$130.39	$23,708.82	$3,312.38
39	$23,708.82	$79.03	$130.83	$23,577.99	$3,391.41
40	$23,577.99	$78.59	$131.26	$23,446.72	$3,470.00
41	$23,446.72	$78.16	$131.70	$23,315.02	$3,548.15
42	$23,315.02	$77.72	$132.14	$23,182.88	$3,625.87
43	$23,182.88	$77.28	$132.58	$23,050.30	$3,703.15
44	$23,050.30	$76.83	$133.02	$22,917.28	$3,779.98
45	$22,917.28	$76.39	$133.47	$22,783.81	$3,856.37
46	$22,783.81	$75.95	$133.91	$22,649.90	$3,932.32
47	$22,649.90	$75.50	$134.36	$22,515.55	$4,007.82
48	$22,515.55	$75.05	$134.81	$22,380.74	$4,082.87
49	$22,380.74	$74.60	$135.25	$22,245.49	$4,157.47
50	$22,245.49	$74.15	$135.71	$22,109.78	$4,231.62
51	$22,109.78	$73.70	$136.16	$21,973.62	$4,305.32
52	$21,973.62	$73.25	$136.61	$21,837.01	$4,378.57
53	$21,837.01	$72.79	$137.07	$21,699.95	$4,451.36
54	$21,699.95	$72.33	$137.52	$21,562.42	$4,523.69
55	$21,562.42	$71.87	$137.98	$21,424.44	$4,595.57
56	$21,424.44	$71.41	$138.44	$21,286.00	$4,666.98
57	$21,286.00	$70.95	$138.90	$21,147.09	$4,737.93
58	$21,147.09	$70.49	$139.37	$21,007.73	$4,808.43
59	$21,007.73	$70.03	$139.83	$20,867.90	$4,878.45
60	$20,867.90	$69.56	$140.30	$20,727.60	$4,948.01
61	$20,727.60	$69.09	$140.76	$20,586.83	$5,017.10

TOWNSHIP OF PUSLINCH
Water Servicing - Option W1

Estimated Capital Cost:	$34,300,000
Number of Benefitting Properties:	1,209
Cost per Connection:	$28,370.55

Capital Cost Recovery Factor - A = 0.007396879
Monthly Cost -P = $209.86

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$28,371.00	4.00%	15	**$209.86**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
62	$20,586.83	$68.62	$141.23	$20,445.60	$5,085.73
63	$20,445.60	$68.15	$141.70	$20,303.90	$5,153.88
64	$20,303.90	$67.68	$142.18	$20,161.72	$5,221.56
65	$20,161.72	$67.21	$142.65	$20,019.07	$5,288.76
66	$20,019.07	$66.73	$143.13	$19,875.94	$5,355.49
67	$19,875.94	$66.25	$143.60	$19,732.34	$5,421.75
68	$19,732.34	$65.77	$144.08	$19,588.25	$5,487.52
69	$19,588.25	$65.29	$144.56	$19,443.69	$5,552.81
70	$19,443.69	$64.81	$145.04	$19,298.65	$5,617.63
71	$19,298.65	$64.33	$145.53	$19,153.12	$5,681.96
72	$19,153.12	$63.84	$146.01	$19,007.11	$5,745.80
73	$19,007.11	$63.36	$146.50	$18,860.61	$5,809.16
74	$18,860.61	$62.87	$146.99	$18,713.62	$5,872.03
75	$18,713.62	$62.38	$147.48	$18,566.14	$5,934.40
76	$18,566.14	$61.89	$147.97	$18,418.17	$5,996.29
77	$18,418.17	$61.39	$148.46	$18,269.71	$6,057.69
78	$18,269.71	$60.90	$148.96	$18,120.75	$6,118.58
79	$18,120.75	$60.40	$149.45	$17,971.29	$6,178.99
80	$17,971.29	$59.90	$149.95	$17,821.34	$6,238.89
81	$17,821.34	$59.40	$150.45	$17,670.89	$6,298.30
82	$17,670.89	$58.90	$150.95	$17,519.94	$6,357.20
83	$17,519.94	$58.40	$151.46	$17,368.48	$6,415.60
84	$17,368.48	$57.89	$151.96	$17,216.52	$6,473.49
85	$17,216.52	$57.39	$152.47	$17,064.05	$6,530.88
86	$17,064.05	$56.88	$152.98	$16,911.07	$6,587.76
87	$16,911.07	$56.37	$153.49	$16,757.58	$6,644.13
88	$16,757.58	$55.86	$154.00	$16,603.59	$6,699.99
89	$16,603.59	$55.35	$154.51	$16,449.08	$6,755.34
90	$16,449.08	$54.83	$155.03	$16,294.05	$6,810.17
91	$16,294.05	$54.31	$155.54	$16,138.51	$6,864.48
92	$16,138.51	$53.80	$156.06	$15,982.44	$6,918.27
93	$15,982.44	$53.27	$156.58	$15,825.86	$6,971.55
94	$15,825.86	$52.75	$157.10	$15,668.76	$7,024.30
95	$15,668.76	$52.23	$157.63	$15,511.13	$7,076.53
96	$15,511.13	$51.70	$158.15	$15,352.98	$7,128.24
97	$15,352.98	$51.18	$158.68	$15,194.30	$7,179.41
98	$15,194.30	$50.65	$159.21	$15,035.09	$7,230.06
99	$15,035.09	$50.12	$159.74	$14,875.35	$7,280.18
100	$14,875.35	$49.58	$160.27	$14,715.07	$7,329.76
101	$14,715.07	$49.05	$160.81	$14,554.27	$7,378.81
102	$14,554.27	$48.51	$161.34	$14,392.93	$7,427.33
103	$14,392.93	$47.98	$161.88	$14,231.04	$7,475.30
104	$14,231.04	$47.44	$162.42	$14,068.62	$7,522.74
105	$14,068.62	$46.90	$162.96	$13,905.66	$7,569.63
106	$13,905.66	$46.35	$163.50	$13,742.16	$7,615.99
107	$13,742.16	$45.81	$164.05	$13,578.11	$7,661.79
108	$13,578.11	$45.26	$164.60	$13,413.51	$7,707.05
109	$13,413.51	$44.71	$165.15	$13,248.37	$7,751.77
110	$13,248.37	$44.16	$165.70	$13,082.67	$7,795.93
111	$13,082.67	$43.61	$166.25	$12,916.42	$7,839.54
112	$12,916.42	$43.05	$166.80	$12,749.62	$7,882.59
113	$12,749.62	$42.50	$167.36	$12,582.26	$7,925.09
114	$12,582.26	$41.94	$167.92	$12,414.35	$7,967.03
115	$12,414.35	$41.38	$168.48	$12,245.87	$8,008.41
116	$12,245.87	$40.82	$169.04	$12,076.83	$8,049.23
117	$12,076.83	$40.26	$169.60	$11,907.23	$8,089.49
118	$11,907.23	$39.69	$170.17	$11,737.07	$8,129.18
119	$11,737.07	$39.12	$170.73	$11,566.33	$8,168.30
120	$11,566.33	$38.55	$171.30	$11,395.03	$8,206.86
121	$11,395.03	$37.98	$171.87	$11,223.16	$8,244.84
122	$11,223.16	$37.41	$172.45	$11,050.71	$8,282.25

TOWNSHIP OF PUSLINCH
Water Servicing - Option W1

Estimated Capital Cost:	$34,300,000
Number of Benefitting Properties:	1,209
Cost per Connection:	$28,370.55

Capital Cost Recovery Factor - A = 0.007396879
Monthly Cost -P = $209.86

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$28,371.00	4.00%	15	**$209.86**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
123	$11,050.71	$36.84	$173.02	$10,877.69	$8,319.09
124	$10,877.69	$36.26	$173.60	$10,704.09	$8,355.34
125	$10,704.09	$35.68	$174.18	$10,529.92	$8,391.02
126	$10,529.92	$35.10	$174.76	$10,355.16	$8,426.12
127	$10,355.16	$34.52	$175.34	$10,179.82	$8,460.64
128	$10,179.82	$33.93	$175.92	$10,003.90	$8,494.57
129	$10,003.90	$33.35	$176.51	$9,827.39	$8,527.92
130	$9,827.39	$32.76	$177.10	$9,650.29	$8,560.68
131	$9,650.29	$32.17	$177.69	$9,472.60	$8,592.85
132	$9,472.60	$31.58	$178.28	$9,294.32	$8,624.42
133	$9,294.32	$30.98	$178.88	$9,115.44	$8,655.40
134	$9,115.44	$30.38	$179.47	$8,935.97	$8,685.79
135	$8,935.97	$29.79	$180.07	$8,755.90	$8,715.57
136	$8,755.90	$29.19	$180.67	$8,575.23	$8,744.76
137	$8,575.23	$28.58	$181.27	$8,393.95	$8,773.34
138	$8,393.95	$27.98	$181.88	$8,212.08	$8,801.32
139	$8,212.08	$27.37	$182.48	$8,029.59	$8,828.70
140	$8,029.59	$26.77	$183.09	$7,846.50	$8,855.46
141	$7,846.50	$26.16	$183.70	$7,662.80	$8,881.62
142	$7,662.80	$25.54	$184.31	$7,478.49	$8,907.16
143	$7,478.49	$24.93	$184.93	$7,293.56	$8,932.09
144	$7,293.56	$24.31	$185.55	$7,108.01	$8,956.40
145	$7,108.01	$23.69	$186.16	$6,921.85	$8,980.09
146	$6,921.85	$23.07	$186.78	$6,735.07	$9,003.17
147	$6,735.07	$22.45	$187.41	$6,547.66	$9,025.62
148	$6,547.66	$21.83	$188.03	$6,359.63	$9,047.44
149	$6,359.63	$21.20	$188.66	$6,170.97	$9,068.64
150	$6,170.97	$20.57	$189.29	$5,981.68	$9,089.21
151	$5,981.68	$19.94	$189.92	$5,791.76	$9,109.15
152	$5,791.76	$19.31	$190.55	$5,601.21	$9,128.46
153	$5,601.21	$18.67	$191.19	$5,410.03	$9,147.13
154	$5,410.03	$18.03	$191.82	$5,218.20	$9,165.16
155	$5,218.20	$17.39	$192.46	$5,025.74	$9,182.55
156	$5,025.74	$16.75	$193.10	$4,832.64	$9,199.31
157	$4,832.64	$16.11	$193.75	$4,638.89	$9,215.42
158	$4,638.89	$15.46	$194.39	$4,444.49	$9,230.88
159	$4,444.49	$14.81	$195.04	$4,249.45	$9,245.69
160	$4,249.45	$14.16	$195.69	$4,053.76	$9,259.86
161	$4,053.76	$13.51	$196.34	$3,857.42	$9,273.37
162	$3,857.42	$12.86	$197.00	$3,660.42	$9,286.23
163	$3,660.42	$12.20	$197.66	$3,462.76	$9,298.43
164	$3,462.76	$11.54	$198.31	$3,264.45	$9,309.97
165	$3,264.45	$10.88	$198.98	$3,065.47	$9,320.85
166	$3,065.47	$10.22	$199.64	$2,865.83	$9,331.07
167	$2,865.83	$9.55	$200.30	$2,665.53	$9,340.63
168	$2,665.53	$8.89	$200.97	$2,464.56	$9,349.51
169	$2,464.56	$8.22	$201.64	$2,262.92	$9,357.73
170	$2,262.92	$7.54	$202.31	$2,060.60	$9,365.27
171	$2,060.60	$6.87	$202.99	$1,857.61	$9,372.14
172	$1,857.61	$6.19	$203.66	$1,653.95	$9,378.33
173	$1,653.95	$5.51	$204.34	$1,449.61	$9,383.84
174	$1,449.61	$4.83	$205.02	$1,244.58	$9,388.67
175	$1,244.58	$4.15	$205.71	$1,038.87	$9,392.82
176	$1,038.87	$3.46	$206.39	$832.48	$9,396.29
177	$832.48	$2.77	$207.08	$625.40	$9,399.06
178	$625.40	$2.08	$207.77	$417.62	$9,401.15
179	$417.62	$1.39	$208.46	$209.16	$9,402.54
180	$209.16	$0.70	$209.16	$0.00	$9,403.24

TOWNSHIP OF PUSLINCH
Water Servicing - Option W1

Estimated Capital Cost: $34,300,000
Number of Benefitting Properties: 1,209
Cost per Connection: $28,370.55

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $171.92

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$28,371.00	4.00%	20	**$171.92**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
1	$28,371.00	$94.57	$77.35	$28,293.65	$94.57
2	$28,293.65	$94.31	$77.61	$28,216.04	$188.88
3	$28,216.04	$94.05	$77.87	$28,138.17	$282.94
4	$28,138.17	$93.79	$78.13	$28,060.04	$376.73
5	$28,060.04	$93.53	$78.39	$27,981.65	$470.26
6	$27,981.65	$93.27	$78.65	$27,903.00	$563.54
7	$27,903.00	$93.01	$78.91	$27,824.09	$656.55
8	$27,824.09	$92.75	$79.18	$27,744.91	$749.29
9	$27,744.91	$92.48	$79.44	$27,665.47	$841.78
10	$27,665.47	$92.22	$79.70	$27,585.77	$933.99
11	$27,585.77	$91.95	$79.97	$27,505.80	$1,025.95
12	$27,505.80	$91.69	$80.24	$27,425.56	$1,117.63
13	$27,425.56	$91.42	$80.50	$27,345.06	$1,209.05
14	$27,345.06	$91.15	$80.77	$27,264.28	$1,300.20
15	$27,264.28	$90.88	$81.04	$27,183.24	$1,391.08
16	$27,183.24	$90.61	$81.31	$27,101.93	$1,481.69
17	$27,101.93	$90.34	$81.58	$27,020.35	$1,572.03
18	$27,020.35	$90.07	$81.85	$26,938.49	$1,662.10
19	$26,938.49	$89.79	$82.13	$26,856.36	$1,751.89
20	$26,856.36	$89.52	$82.40	$26,773.96	$1,841.42
21	$26,773.96	$89.25	$82.68	$26,691.29	$1,930.66
22	$26,691.29	$88.97	$82.95	$26,608.33	$2,019.63
23	$26,608.33	$88.69	$83.23	$26,525.11	$2,108.33
24	$26,525.11	$88.42	$83.51	$26,441.60	$2,196.75
25	$26,441.60	$88.14	$83.78	$26,357.82	$2,284.88
26	$26,357.82	$87.86	$84.06	$26,273.75	$2,372.74
27	$26,273.75	$87.58	$84.34	$26,189.41	$2,460.32
28	$26,189.41	$87.30	$84.62	$26,104.79	$2,547.62
29	$26,104.79	$87.02	$84.91	$26,019.88	$2,634.64
30	$26,019.88	$86.73	$85.19	$25,934.69	$2,721.37
31	$25,934.69	$86.45	$85.47	$25,849.22	$2,807.82
32	$25,849.22	$86.16	$85.76	$25,763.46	$2,893.98
33	$25,763.46	$85.88	$86.04	$25,677.41	$2,979.86
34	$25,677.41	$85.59	$86.33	$25,591.08	$3,065.45
35	$25,591.08	$85.30	$86.62	$25,504.46	$3,150.76
36	$25,504.46	$85.01	$86.91	$25,417.55	$3,235.77
37	$25,417.55	$84.73	$87.20	$25,330.36	$3,320.50
38	$25,330.36	$84.43	$87.49	$25,242.87	$3,404.93
39	$25,242.87	$84.14	$87.78	$25,155.09	$3,489.07
40	$25,155.09	$83.85	$88.07	$25,067.02	$3,572.92
41	$25,067.02	$83.56	$88.37	$24,978.65	$3,656.48
42	$24,978.65	$83.26	$88.66	$24,889.99	$3,739.74
43	$24,889.99	$82.97	$88.96	$24,801.03	$3,822.71
44	$24,801.03	$82.67	$89.25	$24,711.78	$3,905.38
45	$24,711.78	$82.37	$89.55	$24,622.23	$3,987.75
46	$24,622.23	$82.07	$89.85	$24,532.38	$4,069.83
47	$24,532.38	$81.77	$90.15	$24,442.23	$4,151.60
48	$24,442.23	$81.47	$90.45	$24,351.79	$4,233.07
49	$24,351.79	$81.17	$90.75	$24,261.04	$4,314.25
50	$24,261.04	$80.87	$91.05	$24,169.98	$4,395.12
51	$24,169.98	$80.57	$91.36	$24,078.63	$4,475.68
52	$24,078.63	$80.26	$91.66	$23,986.97	$4,555.95
53	$23,986.97	$79.96	$91.97	$23,895.00	$4,635.90
54	$23,895.00	$79.65	$92.27	$23,802.73	$4,715.55
55	$23,802.73	$79.34	$92.58	$23,710.15	$4,794.89
56	$23,710.15	$79.03	$92.89	$23,617.26	$4,873.93
57	$23,617.26	$78.72	$93.20	$23,524.06	$4,952.65
58	$23,524.06	$78.41	$93.51	$23,430.55	$5,031.07
59	$23,430.55	$78.10	$93.82	$23,336.73	$5,109.17
60	$23,336.73	$77.79	$94.13	$23,242.60	$5,186.96
61	$23,242.60	$77.48	$94.45	$23,148.15	$5,264.43

TOWNSHIP OF PUSLINCH
Water Servicing - Option W1

Estimated Capital Cost:	$34,300,000
Number of Benefitting Properties:	1,209
Cost per Connection:	$28,370.55

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $171.92

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$28,371.00	4.00%	20	**$171.92**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
62	$23,148.15	$77.16	$94.76	$23,053.39	$5,341.59
63	$23,053.39	$76.84	$95.08	$22,958.31	$5,418.44
64	$22,958.31	$76.53	$95.39	$22,862.91	$5,494.97
65	$22,862.91	$76.21	$95.71	$22,767.20	$5,571.18
66	$22,767.20	$75.89	$96.03	$22,671.17	$5,647.07
67	$22,671.17	$75.57	$96.35	$22,574.82	$5,722.64
68	$22,574.82	$75.25	$96.67	$22,478.14	$5,797.89
69	$22,478.14	$74.93	$97.00	$22,381.15	$5,872.81
70	$22,381.15	$74.60	$97.32	$22,283.83	$5,947.42
71	$22,283.83	$74.28	$97.64	$22,186.19	$6,021.70
72	$22,186.19	$73.95	$97.97	$22,088.22	$6,095.65
73	$22,088.22	$73.63	$98.30	$21,989.92	$6,169.28
74	$21,989.92	$73.30	$98.62	$21,891.30	$6,242.58
75	$21,891.30	$72.97	$98.95	$21,792.35	$6,315.55
76	$21,792.35	$72.64	$99.28	$21,693.07	$6,388.19
77	$21,693.07	$72.31	$99.61	$21,593.45	$6,460.50
78	$21,593.45	$71.98	$99.94	$21,493.51	$6,532.48
79	$21,493.51	$71.65	$100.28	$21,393.23	$6,604.12
80	$21,393.23	$71.31	$100.61	$21,292.62	$6,675.43
81	$21,292.62	$70.98	$100.95	$21,191.67	$6,746.41
82	$21,191.67	$70.64	$101.28	$21,090.39	$6,817.05
83	$21,090.39	$70.30	$101.62	$20,988.77	$6,887.35
84	$20,988.77	$69.96	$101.96	$20,886.81	$6,957.31
85	$20,886.81	$69.62	$102.30	$20,784.51	$7,026.93
86	$20,784.51	$69.28	$102.64	$20,681.87	$7,096.22
87	$20,681.87	$68.94	$102.98	$20,578.88	$7,165.16
88	$20,578.88	$68.60	$103.33	$20,475.56	$7,233.75
89	$20,475.56	$68.25	$103.67	$20,371.89	$7,302.00
90	$20,371.89	$67.91	$104.02	$20,267.87	$7,369.91
91	$20,267.87	$67.56	$104.36	$20,163.51	$7,437.47
92	$20,163.51	$67.21	$104.71	$20,058.79	$7,504.68
93	$20,058.79	$66.86	$105.06	$19,953.73	$7,571.54
94	$19,953.73	$66.51	$105.41	$19,848.32	$7,638.06
95	$19,848.32	$66.16	$105.76	$19,742.56	$7,704.22
96	$19,742.56	$65.81	$106.11	$19,636.45	$7,770.03
97	$19,636.45	$65.45	$106.47	$19,529.98	$7,835.48
98	$19,529.98	$65.10	$106.82	$19,423.16	$7,900.58
99	$19,423.16	$64.74	$107.18	$19,315.98	$7,965.32
100	$19,315.98	$64.39	$107.54	$19,208.44	$8,029.71
101	$19,208.44	$64.03	$107.89	$19,100.55	$8,093.74
102	$19,100.55	$63.67	$108.25	$18,992.29	$8,157.41
103	$18,992.29	$63.31	$108.62	$18,883.68	$8,220.72
104	$18,883.68	$62.95	$108.98	$18,774.70	$8,283.66
105	$18,774.70	$62.58	$109.34	$18,665.36	$8,346.24
106	$18,665.36	$62.22	$109.70	$18,555.66	$8,408.46
107	$18,555.66	$61.85	$110.07	$18,445.59	$8,470.31
108	$18,445.59	$61.49	$110.44	$18,335.15	$8,531.80
109	$18,335.15	$61.12	$110.81	$18,224.34	$8,592.92
110	$18,224.34	$60.75	$111.17	$18,113.17	$8,653.66
111	$18,113.17	$60.38	$111.55	$18,001.62	$8,714.04
112	$18,001.62	$60.01	$111.92	$17,889.71	$8,774.05
113	$17,889.71	$59.63	$112.29	$17,777.42	$8,833.68
114	$17,777.42	$59.26	$112.66	$17,664.75	$8,892.94
115	$17,664.75	$58.88	$113.04	$17,551.71	$8,951.82
116	$17,551.71	$58.51	$113.42	$17,438.29	$9,010.32
117	$17,438.29	$58.13	$113.80	$17,324.50	$9,068.45
118	$17,324.50	$57.75	$114.17	$17,210.32	$9,126.20
119	$17,210.32	$57.37	$114.55	$17,095.77	$9,183.57
120	$17,095.77	$56.99	$114.94	$16,980.83	$9,240.55
121	$16,980.83	$56.60	$115.32	$16,865.51	$9,297.16
122	$16,865.51	$56.22	$115.70	$16,749.81	$9,353.38

TOWNSHIP OF PUSLINCH
Water Servicing - Option W1

Estimated Capital Cost: $34,300,000
Number of Benefitting Properties: 1,209
Cost per Connection: $28,370.55

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $171.92

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$28,371.00	4.00%	20	**$171.92**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
123	$16,749.81	$55.83	$116.09	$16,633.72	$9,409.21
124	$16,633.72	$55.45	$116.48	$16,517.24	$9,464.65
125	$16,517.24	$55.06	$116.87	$16,400.38	$9,519.71
126	$16,400.38	$54.67	$117.25	$16,283.12	$9,574.38
127	$16,283.12	$54.28	$117.65	$16,165.48	$9,628.66
128	$16,165.48	$53.88	$118.04	$16,047.44	$9,682.54
129	$16,047.44	$53.49	$118.43	$15,929.01	$9,736.03
130	$15,929.01	$53.10	$118.83	$15,810.18	$9,789.13
131	$15,810.18	$52.70	$119.22	$15,690.96	$9,841.83
132	$15,690.96	$52.30	$119.62	$15,571.34	$9,894.13
133	$15,571.34	$51.90	$120.02	$15,451.32	$9,946.04
134	$15,451.32	$51.50	$120.42	$15,330.90	$9,997.54
135	$15,330.90	$51.10	$120.82	$15,210.08	$10,048.65
136	$15,210.08	$50.70	$121.22	$15,088.86	$10,099.35
137	$15,088.86	$50.30	$121.63	$14,967.23	$10,149.64
138	$14,967.23	$49.89	$122.03	$14,845.20	$10,199.53
139	$14,845.20	$49.48	$122.44	$14,722.76	$10,249.02
140	$14,722.76	$49.08	$122.85	$14,599.92	$10,298.09
141	$14,599.92	$48.67	$123.26	$14,476.66	$10,346.76
142	$14,476.66	$48.26	$123.67	$14,352.99	$10,395.01
143	$14,352.99	$47.84	$124.08	$14,228.91	$10,442.86
144	$14,228.91	$47.43	$124.49	$14,104.42	$10,490.29
145	$14,104.42	$47.01	$124.91	$13,979.51	$10,537.30
146	$13,979.51	$46.60	$125.32	$13,854.19	$10,583.90
147	$13,854.19	$46.18	$125.74	$13,728.45	$10,630.08
148	$13,728.45	$45.76	$126.16	$13,602.29	$10,675.84
149	$13,602.29	$45.34	$126.58	$13,475.70	$10,721.18
150	$13,475.70	$44.92	$127.00	$13,348.70	$10,766.10
151	$13,348.70	$44.50	$127.43	$13,221.27	$10,810.60
152	$13,221.27	$44.07	$127.85	$13,093.42	$10,854.67
153	$13,093.42	$43.64	$128.28	$12,965.14	$10,898.31
154	$12,965.14	$43.22	$128.71	$12,836.44	$10,941.53
155	$12,836.44	$42.79	$129.13	$12,707.30	$10,984.32
156	$12,707.30	$42.36	$129.56	$12,577.74	$11,026.68
157	$12,577.74	$41.93	$130.00	$12,447.74	$11,068.60
158	$12,447.74	$41.49	$130.43	$12,317.31	$11,110.10
159	$12,317.31	$41.06	$130.86	$12,186.45	$11,151.15
160	$12,186.45	$40.62	$131.30	$12,055.15	$11,191.77
161	$12,055.15	$40.18	$131.74	$11,923.41	$11,231.96
162	$11,923.41	$39.74	$132.18	$11,791.23	$11,271.70
163	$11,791.23	$39.30	$132.62	$11,658.61	$11,311.01
164	$11,658.61	$38.86	$133.06	$11,525.55	$11,349.87
165	$11,525.55	$38.42	$133.50	$11,392.05	$11,388.29
166	$11,392.05	$37.97	$133.95	$11,258.10	$11,426.26
167	$11,258.10	$37.53	$134.40	$11,123.70	$11,463.79
168	$11,123.70	$37.08	$134.84	$10,988.86	$11,500.87
169	$10,988.86	$36.63	$135.29	$10,853.56	$11,537.50
170	$10,853.56	$36.18	$135.74	$10,717.82	$11,573.68
171	$10,717.82	$35.73	$136.20	$10,581.62	$11,609.40
172	$10,581.62	$35.27	$136.65	$10,444.97	$11,644.67
173	$10,444.97	$34.82	$137.11	$10,307.87	$11,679.49
174	$10,307.87	$34.36	$137.56	$10,170.30	$11,713.85
175	$10,170.30	$33.90	$138.02	$10,032.28	$11,747.75
176	$10,032.28	$33.44	$138.48	$9,893.80	$11,781.19
177	$9,893.80	$32.98	$138.94	$9,754.86	$11,814.17
178	$9,754.86	$32.52	$139.41	$9,615.45	$11,846.69
179	$9,615.45	$32.05	$139.87	$9,475.58	$11,878.74
180	$9,475.58	$31.59	$140.34	$9,335.24	$11,910.32
181	$9,335.24	$31.12	$140.81	$9,194.44	$11,941.44
182	$9,194.44	$30.65	$141.27	$9,053.16	$11,972.09
183	$9,053.16	$30.18	$141.75	$8,911.42	$12,002.27

TOWNSHIP OF PUSLINCH
Water Servicing - Option W1

Estimated Capital Cost:	$34,300,000
Number of Benefitting Properties:	1,209
Cost per Connection:	$28,370.55

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $171.92

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$28,371.00	4.00%	20	**$171.92**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
184	$8,911.42	$29.70	$142.22	$8,769.20	$12,031.97
185	$8,769.20	$29.23	$142.69	$8,626.51	$12,061.20
186	$8,626.51	$28.76	$143.17	$8,483.34	$12,089.96
187	$8,483.34	$28.28	$143.64	$8,339.69	$12,118.23
188	$8,339.69	$27.80	$144.12	$8,195.57	$12,146.03
189	$8,195.57	$27.32	$144.60	$8,050.97	$12,173.35
190	$8,050.97	$26.84	$145.09	$7,905.88	$12,200.19
191	$7,905.88	$26.35	$145.57	$7,760.31	$12,226.54
192	$7,760.31	$25.87	$146.05	$7,614.25	$12,252.41
193	$7,614.25	$25.38	$146.54	$7,467.71	$12,277.79
194	$7,467.71	$24.89	$147.03	$7,320.68	$12,302.68
195	$7,320.68	$24.40	$147.52	$7,173.16	$12,327.08
196	$7,173.16	$23.91	$148.01	$7,025.15	$12,351.00
197	$7,025.15	$23.42	$148.51	$6,876.64	$12,374.41
198	$6,876.64	$22.92	$149.00	$6,727.64	$12,397.33
199	$6,727.64	$22.43	$149.50	$6,578.15	$12,419.76
200	$6,578.15	$21.93	$150.00	$6,428.15	$12,441.69
201	$6,428.15	$21.43	$150.50	$6,277.66	$12,463.11
202	$6,277.66	$20.93	$151.00	$6,126.66	$12,484.04
203	$6,126.66	$20.42	$151.50	$5,975.16	$12,504.46
204	$5,975.16	$19.92	$152.01	$5,823.15	$12,524.38
205	$5,823.15	$19.41	$152.51	$5,670.64	$12,543.79
206	$5,670.64	$18.90	$153.02	$5,517.62	$12,562.69
207	$5,517.62	$18.39	$153.53	$5,364.09	$12,581.08
208	$5,364.09	$17.88	$154.04	$5,210.05	$12,598.96
209	$5,210.05	$17.37	$154.56	$5,055.49	$12,616.33
210	$5,055.49	$16.85	$155.07	$4,900.42	$12,633.18
211	$4,900.42	$16.33	$155.59	$4,744.83	$12,649.52
212	$4,744.83	$15.82	$156.11	$4,588.73	$12,665.33
213	$4,588.73	$15.30	$156.63	$4,432.10	$12,680.63
214	$4,432.10	$14.77	$157.15	$4,274.95	$12,695.40
215	$4,274.95	$14.25	$157.67	$4,117.28	$12,709.65
216	$4,117.28	$13.72	$158.20	$3,959.08	$12,723.38
217	$3,959.08	$13.20	$158.73	$3,800.35	$12,736.57
218	$3,800.35	$12.67	$159.25	$3,641.10	$12,749.24
219	$3,641.10	$12.14	$159.79	$3,481.31	$12,761.38
220	$3,481.31	$11.60	$160.32	$3,320.99	$12,772.98
221	$3,320.99	$11.07	$160.85	$3,160.14	$12,784.05
222	$3,160.14	$10.53	$161.39	$2,998.75	$12,794.59
223	$2,998.75	$10.00	$161.93	$2,836.83	$12,804.58
224	$2,836.83	$9.46	$162.47	$2,674.36	$12,814.04
225	$2,674.36	$8.91	$163.01	$2,511.35	$12,822.95
226	$2,511.35	$8.37	$163.55	$2,347.80	$12,831.32
227	$2,347.80	$7.83	$164.10	$2,183.70	$12,839.15
228	$2,183.70	$7.28	$164.64	$2,019.06	$12,846.43
229	$2,019.06	$6.73	$165.19	$1,853.87	$12,853.16
230	$1,853.87	$6.18	$165.74	$1,688.12	$12,859.34
231	$1,688.12	$5.63	$166.30	$1,521.83	$12,864.97
232	$1,521.83	$5.07	$166.85	$1,354.98	$12,870.04
233	$1,354.98	$4.52	$167.41	$1,187.57	$12,874.56
234	$1,187.57	$3.96	$167.96	$1,019.61	$12,878.51
235	$1,019.61	$3.40	$168.52	$851.08	$12,881.91
236	$851.08	$2.84	$169.09	$682.00	$12,884.75
237	$682.00	$2.27	$169.65	$512.35	$12,887.02
238	$512.35	$1.71	$170.21	$342.13	$12,888.73
239	$342.13	$1.14	$170.78	$171.35	$12,889.87
240	$171.35	$0.57	$171.35	$0.00	$12,890.44

TOWNSHIP OF PUSLINCH
Water Servicing - Option W2

Estimated Capital Cost: $29,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $24,483.04

Capital Cost Recovery Factor - A = 0.010124514
Monthly Cost -P = $247.88

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$24,483.00	4.00%	10	**$247.88**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
1	$24,483.00	$81.61	$166.27	$24,316.73	$81.61
2	$24,316.73	$81.06	$166.82	$24,149.91	$162.67
3	$24,149.91	$80.50	$167.38	$23,982.53	$243.17
4	$23,982.53	$79.94	$167.94	$23,814.59	$323.11
5	$23,814.59	$79.38	$168.50	$23,646.10	$402.49
6	$23,646.10	$78.82	$169.06	$23,477.04	$481.31
7	$23,477.04	$78.26	$169.62	$23,307.42	$559.57
8	$23,307.42	$77.69	$170.19	$23,137.23	$637.26
9	$23,137.23	$77.12	$170.75	$22,966.48	$714.38
10	$22,966.48	$76.55	$171.32	$22,795.15	$790.94
11	$22,795.15	$75.98	$171.89	$22,623.26	$866.92
12	$22,623.26	$75.41	$172.47	$22,450.79	$942.33
13	$22,450.79	$74.84	$173.04	$22,277.75	$1,017.17
14	$22,277.75	$74.26	$173.62	$22,104.13	$1,091.43
15	$22,104.13	$73.68	$174.20	$21,929.93	$1,165.11
16	$21,929.93	$73.10	$174.78	$21,755.15	$1,238.21
17	$21,755.15	$72.52	$175.36	$21,579.79	$1,310.72
18	$21,579.79	$71.93	$175.95	$21,403.84	$1,382.66
19	$21,403.84	$71.35	$176.53	$21,227.31	$1,454.00
20	$21,227.31	$70.76	$177.12	$21,050.19	$1,524.76
21	$21,050.19	$70.17	$177.71	$20,872.48	$1,594.93
22	$20,872.48	$69.57	$178.30	$20,694.18	$1,664.50
23	$20,694.18	$68.98	$178.90	$20,515.28	$1,733.48
24	$20,515.28	$68.38	$179.49	$20,335.78	$1,801.87
25	$20,335.78	$67.79	$180.09	$20,155.69	$1,869.65
26	$20,155.69	$67.19	$180.69	$19,975.00	$1,936.84
27	$19,975.00	$66.58	$181.30	$19,793.70	$2,003.42
28	$19,793.70	$65.98	$181.90	$19,611.80	$2,069.40
29	$19,611.80	$65.37	$182.51	$19,429.30	$2,134.77
30	$19,429.30	$64.76	$183.11	$19,246.18	$2,199.54
31	$19,246.18	$64.15	$183.72	$19,062.46	$2,263.69
32	$19,062.46	$63.54	$184.34	$18,878.12	$2,327.23
33	$18,878.12	$62.93	$184.95	$18,693.17	$2,390.16
34	$18,693.17	$62.31	$185.57	$18,507.60	$2,452.47
35	$18,507.60	$61.69	$186.19	$18,321.42	$2,514.16
36	$18,321.42	$61.07	$186.81	$18,134.61	$2,575.23
37	$18,134.61	$60.45	$187.43	$17,947.18	$2,635.68
38	$17,947.18	$59.82	$188.05	$17,759.13	$2,695.51
39	$17,759.13	$59.20	$188.68	$17,570.44	$2,754.70
40	$17,570.44	$58.57	$189.31	$17,381.13	$2,813.27
41	$17,381.13	$57.94	$189.94	$17,191.19	$2,871.21
42	$17,191.19	$57.30	$190.57	$17,000.62	$2,928.51
43	$17,000.62	$56.67	$191.21	$16,809.41	$2,985.18
44	$16,809.41	$56.03	$191.85	$16,617.56	$3,041.21
45	$16,617.56	$55.39	$192.49	$16,425.07	$3,096.61
46	$16,425.07	$54.75	$193.13	$16,231.95	$3,151.36
47	$16,231.95	$54.11	$193.77	$16,038.17	$3,205.46
48	$16,038.17	$53.46	$194.42	$15,843.76	$3,258.92
49	$15,843.76	$52.81	$195.07	$15,648.69	$3,311.74
50	$15,648.69	$52.16	$195.72	$15,452.97	$3,363.90
51	$15,452.97	$51.51	$196.37	$15,256.61	$3,415.41
52	$15,256.61	$50.86	$197.02	$15,059.58	$3,466.26
53	$15,059.58	$50.20	$197.68	$14,861.90	$3,516.46
54	$14,861.90	$49.54	$198.34	$14,663.56	$3,566.00
55	$14,663.56	$48.88	$199.00	$14,464.56	$3,614.88
56	$14,464.56	$48.22	$199.66	$14,264.90	$3,663.10
57	$14,264.90	$47.55	$200.33	$14,064.57	$3,710.65
58	$14,064.57	$46.88	$201.00	$13,863.58	$3,757.53
59	$13,863.58	$46.21	$201.67	$13,661.91	$3,803.74
60	$13,661.91	$45.54	$202.34	$13,459.57	$3,849.28

TOWNSHIP OF PUSLINCH
Water Servicing - Option W2

Estimated Capital Cost: $29,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $24,483.04

Capital Cost Recovery Factor - A = 0.010124514
Monthly Cost -P = $247.88

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$24,483.00	4.00%	10	**$247.88**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
61	$13,459.57	$44.87	$203.01	$13,256.56	$3,894.14
62	$13,256.56	$44.19	$203.69	$13,052.87	$3,938.33
63	$13,052.87	$43.51	$204.37	$12,848.50	$3,981.84
64	$12,848.50	$42.83	$205.05	$12,643.45	$4,024.67
65	$12,643.45	$42.14	$205.73	$12,437.71	$4,066.81
66	$12,437.71	$41.46	$206.42	$12,231.29	$4,108.27
67	$12,231.29	$40.77	$207.11	$12,024.19	$4,149.05
68	$12,024.19	$40.08	$207.80	$11,816.39	$4,189.13
69	$11,816.39	$39.39	$208.49	$11,607.90	$4,228.51
70	$11,607.90	$38.69	$209.19	$11,398.71	$4,267.21
71	$11,398.71	$38.00	$209.88	$11,188.83	$4,305.20
72	$11,188.83	$37.30	$210.58	$10,978.25	$4,342.50
73	$10,978.25	$36.59	$211.28	$10,766.96	$4,379.09
74	$10,766.96	$35.89	$211.99	$10,554.98	$4,414.98
75	$10,554.98	$35.18	$212.70	$10,342.28	$4,450.17
76	$10,342.28	$34.47	$213.40	$10,128.88	$4,484.64
77	$10,128.88	$33.76	$214.12	$9,914.76	$4,518.40
78	$9,914.76	$33.05	$214.83	$9,699.93	$4,551.45
79	$9,699.93	$32.33	$215.55	$9,484.39	$4,583.79
80	$9,484.39	$31.61	$216.26	$9,268.12	$4,615.40
81	$9,268.12	$30.89	$216.98	$9,051.14	$4,646.29
82	$9,051.14	$30.17	$217.71	$8,833.43	$4,676.46
83	$8,833.43	$29.44	$218.43	$8,615.00	$4,705.91
84	$8,615.00	$28.72	$219.16	$8,395.83	$4,734.63
85	$8,395.83	$27.99	$219.89	$8,175.94	$4,762.61
86	$8,175.94	$27.25	$220.63	$7,955.32	$4,789.86
87	$7,955.32	$26.52	$221.36	$7,733.96	$4,816.38
88	$7,733.96	$25.78	$222.10	$7,511.86	$4,842.16
89	$7,511.86	$25.04	$222.84	$7,289.02	$4,867.20
90	$7,289.02	$24.30	$223.58	$7,065.44	$4,891.50
91	$7,065.44	$23.55	$224.33	$6,841.11	$4,915.05
92	$6,841.11	$22.80	$225.07	$6,616.03	$4,937.85
93	$6,616.03	$22.05	$225.83	$6,390.21	$4,959.91
94	$6,390.21	$21.30	$226.58	$6,163.63	$4,981.21
95	$6,163.63	$20.55	$227.33	$5,936.30	$5,001.75
96	$5,936.30	$19.79	$228.09	$5,708.21	$5,021.54
97	$5,708.21	$19.03	$228.85	$5,479.36	$5,040.57
98	$5,479.36	$18.26	$229.61	$5,249.74	$5,058.83
99	$5,249.74	$17.50	$230.38	$5,019.36	$5,076.33
100	$5,019.36	$16.73	$231.15	$4,788.22	$5,093.06
101	$4,788.22	$15.96	$231.92	$4,556.30	$5,109.02
102	$4,556.30	$15.19	$232.69	$4,323.61	$5,124.21
103	$4,323.61	$14.41	$233.47	$4,090.14	$5,138.62
104	$4,090.14	$13.63	$234.24	$3,855.90	$5,152.26
105	$3,855.90	$12.85	$235.03	$3,620.87	$5,165.11
106	$3,620.87	$12.07	$235.81	$3,385.06	$5,177.18
107	$3,385.06	$11.28	$236.59	$3,148.47	$5,188.46
108	$3,148.47	$10.49	$237.38	$2,911.08	$5,198.96
109	$2,911.08	$9.70	$238.17	$2,672.91	$5,208.66
110	$2,672.91	$8.91	$238.97	$2,433.94	$5,217.57
111	$2,433.94	$8.11	$239.77	$2,194.17	$5,225.68
112	$2,194.17	$7.31	$240.56	$1,953.61	$5,233.00
113	$1,953.61	$6.51	$241.37	$1,712.24	$5,239.51
114	$1,712.24	$5.71	$242.17	$1,470.07	$5,245.22
115	$1,470.07	$4.90	$242.98	$1,227.09	$5,250.12
116	$1,227.09	$4.09	$243.79	$983.31	$5,254.21
117	$983.31	$3.28	$244.60	$738.71	$5,257.49
118	$738.71	$2.46	$245.42	$493.29	$5,259.95
119	$493.29	$1.64	$246.23	$247.05	$5,261.59
120	$247.05	$0.82	$247.05	$0.00	$5,262.42

TOWNSHIP OF PUSLINCH
Water Servicing - Option W2

Estimated Capital Cost: $29,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $24,483.04

Capital Cost Recovery Factor - A = 0.007396879
Monthly Cost -P = $181.10

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$24,483.00	4.00%	15	**$181.10**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
1	$24,483.00	$81.61	$99.49	$24,383.51	$81.61
2	$24,383.51	$81.28	$99.82	$24,283.69	$162.89
3	$24,283.69	$80.95	$100.15	$24,183.54	$243.83
4	$24,183.54	$80.61	$100.49	$24,083.05	$324.45
5	$24,083.05	$80.28	$100.82	$23,982.23	$404.72
6	$23,982.23	$79.94	$101.16	$23,881.08	$484.66
7	$23,881.08	$79.60	$101.49	$23,779.58	$564.27
8	$23,779.58	$79.27	$101.83	$23,677.75	$643.53
9	$23,677.75	$78.93	$102.17	$23,575.58	$722.46
10	$23,575.58	$78.59	$102.51	$23,473.07	$801.04
11	$23,473.07	$78.24	$102.85	$23,370.21	$879.29
12	$23,370.21	$77.90	$103.20	$23,267.01	$957.19
13	$23,267.01	$77.56	$103.54	$23,163.47	$1,034.74
14	$23,163.47	$77.21	$103.89	$23,059.59	$1,111.96
15	$23,059.59	$76.87	$104.23	$22,955.35	$1,188.82
16	$22,955.35	$76.52	$104.58	$22,850.77	$1,265.34
17	$22,850.77	$76.17	$104.93	$22,745.85	$1,341.51
18	$22,745.85	$75.82	$105.28	$22,640.57	$1,417.33
19	$22,640.57	$75.47	$105.63	$22,534.94	$1,492.80
20	$22,534.94	$75.12	$105.98	$22,428.96	$1,567.91
21	$22,428.96	$74.76	$106.33	$22,322.62	$1,642.68
22	$22,322.62	$74.41	$106.69	$22,215.93	$1,717.08
23	$22,215.93	$74.05	$107.04	$22,108.89	$1,791.14
24	$22,108.89	$73.70	$107.40	$22,001.49	$1,864.83
25	$22,001.49	$73.34	$107.76	$21,893.73	$1,938.17
26	$21,893.73	$72.98	$108.12	$21,785.61	$2,011.15
27	$21,785.61	$72.62	$108.48	$21,677.13	$2,083.77
28	$21,677.13	$72.26	$108.84	$21,568.29	$2,156.03
29	$21,568.29	$71.89	$109.20	$21,459.09	$2,227.92
30	$21,459.09	$71.53	$109.57	$21,349.52	$2,299.45
31	$21,349.52	$71.17	$109.93	$21,239.59	$2,370.62
32	$21,239.59	$70.80	$110.30	$21,129.29	$2,441.42
33	$21,129.29	$70.43	$110.67	$21,018.62	$2,511.85
34	$21,018.62	$70.06	$111.04	$20,907.58	$2,581.91
35	$20,907.58	$69.69	$111.41	$20,796.18	$2,651.60
36	$20,796.18	$69.32	$111.78	$20,684.40	$2,720.92
37	$20,684.40	$68.95	$112.15	$20,572.25	$2,789.87
38	$20,572.25	$68.57	$112.52	$20,459.73	$2,858.44
39	$20,459.73	$68.20	$112.90	$20,346.83	$2,926.64
40	$20,346.83	$67.82	$113.28	$20,233.55	$2,994.47
41	$20,233.55	$67.45	$113.65	$20,119.90	$3,061.91
42	$20,119.90	$67.07	$114.03	$20,005.87	$3,128.98
43	$20,005.87	$66.69	$114.41	$19,891.46	$3,195.66
44	$19,891.46	$66.30	$114.79	$19,776.66	$3,261.97
45	$19,776.66	$65.92	$115.18	$19,661.49	$3,327.89
46	$19,661.49	$65.54	$115.56	$19,545.93	$3,393.43
47	$19,545.93	$65.15	$115.94	$19,429.99	$3,458.58
48	$19,429.99	$64.77	$116.33	$19,313.65	$3,523.35
49	$19,313.65	$64.38	$116.72	$19,196.93	$3,587.73
50	$19,196.93	$63.99	$117.11	$19,079.83	$3,651.72
51	$19,079.83	$63.60	$117.50	$18,962.33	$3,715.32
52	$18,962.33	$63.21	$117.89	$18,844.44	$3,778.52
53	$18,844.44	$62.81	$118.28	$18,726.16	$3,841.34
54	$18,726.16	$62.42	$118.68	$18,607.48	$3,903.76
55	$18,607.48	$62.02	$119.07	$18,488.41	$3,965.78
56	$18,488.41	$61.63	$119.47	$18,368.94	$4,027.41
57	$18,368.94	$61.23	$119.87	$18,249.07	$4,088.64
58	$18,249.07	$60.83	$120.27	$18,128.80	$4,149.47
59	$18,128.80	$60.43	$120.67	$18,008.13	$4,209.90
60	$18,008.13	$60.03	$121.07	$17,887.06	$4,269.93
61	$17,887.06	$59.62	$121.47	$17,765.59	$4,329.55

TOWNSHIP OF PUSLINCH
Water Servicing - Option W2

Estimated Capital Cost: $29,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $24,483.04

Capital Cost Recovery Factor - A = 0.007396879
Monthly Cost -P = $181.10

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$24,483.00	4.00%	15	**$181.10**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
62	$17,765.59	$59.22	$121.88	$17,643.71	$4,388.77
63	$17,643.71	$58.81	$122.29	$17,521.42	$4,447.58
64	$17,521.42	$58.40	$122.69	$17,398.73	$4,505.99
65	$17,398.73	$58.00	$123.10	$17,275.63	$4,563.98
66	$17,275.63	$57.59	$123.51	$17,152.11	$4,621.57
67	$17,152.11	$57.17	$123.92	$17,028.19	$4,678.74
68	$17,028.19	$56.76	$124.34	$16,903.85	$4,735.50
69	$16,903.85	$56.35	$124.75	$16,779.10	$4,791.85
70	$16,779.10	$55.93	$125.17	$16,653.93	$4,847.78
71	$16,653.93	$55.51	$125.58	$16,528.35	$4,903.29
72	$16,528.35	$55.09	$126.00	$16,402.35	$4,958.39
73	$16,402.35	$54.67	$126.42	$16,275.92	$5,013.06
74	$16,275.92	$54.25	$126.84	$16,149.08	$5,067.32
75	$16,149.08	$53.83	$127.27	$16,021.81	$5,121.15
76	$16,021.81	$53.41	$127.69	$15,894.12	$5,174.55
77	$15,894.12	$52.98	$128.12	$15,766.00	$5,227.53
78	$15,766.00	$52.55	$128.54	$15,637.46	$5,280.09
79	$15,637.46	$52.12	$128.97	$15,508.48	$5,332.21
80	$15,508.48	$51.69	$129.40	$15,379.08	$5,383.90
81	$15,379.08	$51.26	$129.83	$15,249.25	$5,435.17
82	$15,249.25	$50.83	$130.27	$15,118.98	$5,486.00
83	$15,118.98	$50.40	$130.70	$14,988.28	$5,536.40
84	$14,988.28	$49.96	$131.14	$14,857.14	$5,586.36
85	$14,857.14	$49.52	$131.57	$14,725.57	$5,635.88
86	$14,725.57	$49.09	$132.01	$14,593.56	$5,684.97
87	$14,593.56	$48.65	$132.45	$14,461.10	$5,733.61
88	$14,461.10	$48.20	$132.89	$14,328.21	$5,781.81
89	$14,328.21	$47.76	$133.34	$14,194.87	$5,829.58
90	$14,194.87	$47.32	$133.78	$14,061.09	$5,876.89
91	$14,061.09	$46.87	$134.23	$13,926.86	$5,923.76
92	$13,926.86	$46.42	$134.67	$13,792.19	$5,970.18
93	$13,792.19	$45.97	$135.12	$13,657.06	$6,016.16
94	$13,657.06	$45.52	$135.57	$13,521.49	$6,061.68
95	$13,521.49	$45.07	$136.03	$13,385.46	$6,106.75
96	$13,385.46	$44.62	$136.48	$13,248.98	$6,151.37
97	$13,248.98	$44.16	$136.93	$13,112.05	$6,195.54
98	$13,112.05	$43.71	$137.39	$12,974.66	$6,239.24
99	$12,974.66	$43.25	$137.85	$12,836.81	$6,282.49
100	$12,836.81	$42.79	$138.31	$12,698.50	$6,325.28
101	$12,698.50	$42.33	$138.77	$12,559.73	$6,367.61
102	$12,559.73	$41.87	$139.23	$12,420.50	$6,409.47
103	$12,420.50	$41.40	$139.70	$12,280.80	$6,450.88
104	$12,280.80	$40.94	$140.16	$12,140.64	$6,491.81
105	$12,140.64	$40.47	$140.63	$12,000.01	$6,532.28
106	$12,000.01	$40.00	$141.10	$11,858.91	$6,572.28
107	$11,858.91	$39.53	$141.57	$11,717.35	$6,611.81
108	$11,717.35	$39.06	$142.04	$11,575.31	$6,650.87
109	$11,575.31	$38.58	$142.51	$11,432.79	$6,689.45
110	$11,432.79	$38.11	$142.99	$11,289.80	$6,727.56
111	$11,289.80	$37.63	$143.47	$11,146.34	$6,765.20
112	$11,146.34	$37.15	$143.94	$11,002.40	$6,802.35
113	$11,002.40	$36.67	$144.42	$10,857.97	$6,839.02
114	$10,857.97	$36.19	$144.90	$10,713.07	$6,875.22
115	$10,713.07	$35.71	$145.39	$10,567.68	$6,910.93
116	$10,567.68	$35.23	$145.87	$10,421.81	$6,946.15
117	$10,421.81	$34.74	$146.36	$10,275.45	$6,980.89
118	$10,275.45	$34.25	$146.85	$10,128.60	$7,015.14
119	$10,128.60	$33.76	$147.34	$9,981.27	$7,048.91
120	$9,981.27	$33.27	$147.83	$9,833.44	$7,082.18
121	$9,833.44	$32.78	$148.32	$9,685.12	$7,114.96
122	$9,685.12	$32.28	$148.81	$9,536.31	$7,147.24

TOWNSHIP OF PUSLINCH
Water Servicing - Option W2

Estimated Capital Cost:	$29,600,000
Number of Benefitting Properties:	1,209
Cost per Connection:	$24,483.04

Capital Cost Recovery Factor - A = 0.007396879
Monthly Cost -P = $181.10

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$24,483.00	4.00%	15	**$181.10**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
123	$9,536.31	$31.79	$149.31	$9,387.00	$7,179.03
124	$9,387.00	$31.29	$149.81	$9,237.19	$7,210.32
125	$9,237.19	$30.79	$150.31	$9,086.88	$7,241.11
126	$9,086.88	$30.29	$150.81	$8,936.07	$7,271.40
127	$8,936.07	$29.79	$151.31	$8,784.76	$7,301.18
128	$8,784.76	$29.28	$151.82	$8,632.95	$7,330.47
129	$8,632.95	$28.78	$152.32	$8,480.63	$7,359.24
130	$8,480.63	$28.27	$152.83	$8,327.80	$7,387.51
131	$8,327.80	$27.76	$153.34	$8,174.46	$7,415.27
132	$8,174.46	$27.25	$153.85	$8,020.61	$7,442.52
133	$8,020.61	$26.74	$154.36	$7,866.25	$7,469.25
134	$7,866.25	$26.22	$154.88	$7,711.37	$7,495.48
135	$7,711.37	$25.70	$155.39	$7,555.98	$7,521.18
136	$7,555.98	$25.19	$155.91	$7,400.07	$7,546.37
137	$7,400.07	$24.67	$156.43	$7,243.64	$7,571.03
138	$7,243.64	$24.15	$156.95	$7,086.68	$7,595.18
139	$7,086.68	$23.62	$157.48	$6,929.21	$7,618.80
140	$6,929.21	$23.10	$158.00	$6,771.21	$7,641.90
141	$6,771.21	$22.57	$158.53	$6,612.68	$7,664.47
142	$6,612.68	$22.04	$159.06	$6,453.62	$7,686.51
143	$6,453.62	$21.51	$159.59	$6,294.04	$7,708.02
144	$6,294.04	$20.98	$160.12	$6,133.92	$7,729.00
145	$6,133.92	$20.45	$160.65	$5,973.27	$7,749.45
146	$5,973.27	$19.91	$161.19	$5,812.08	$7,769.36
147	$5,812.08	$19.37	$161.72	$5,650.36	$7,788.73
148	$5,650.36	$18.83	$162.26	$5,488.10	$7,807.57
149	$5,488.10	$18.29	$162.80	$5,325.29	$7,825.86
150	$5,325.29	$17.75	$163.35	$5,161.94	$7,843.61
151	$5,161.94	$17.21	$163.89	$4,998.05	$7,860.82
152	$4,998.05	$16.66	$164.44	$4,833.62	$7,877.48
153	$4,833.62	$16.11	$164.99	$4,668.63	$7,893.59
154	$4,668.63	$15.56	$165.54	$4,503.09	$7,909.15
155	$4,503.09	$15.01	$166.09	$4,337.01	$7,924.16
156	$4,337.01	$14.46	$166.64	$4,170.37	$7,938.62
157	$4,170.37	$13.90	$167.20	$4,003.17	$7,952.52
158	$4,003.17	$13.34	$167.75	$3,835.41	$7,965.87
159	$3,835.41	$12.78	$168.31	$3,667.10	$7,978.65
160	$3,667.10	$12.22	$168.87	$3,498.23	$7,990.87
161	$3,498.23	$11.66	$169.44	$3,328.79	$8,002.54
162	$3,328.79	$11.10	$170.00	$3,158.79	$8,013.63
163	$3,158.79	$10.53	$170.57	$2,988.22	$8,024.16
164	$2,988.22	$9.96	$171.14	$2,817.08	$8,034.12
165	$2,817.08	$9.39	$171.71	$2,645.38	$8,043.51
166	$2,645.38	$8.82	$172.28	$2,473.10	$8,052.33
167	$2,473.10	$8.24	$172.85	$2,300.24	$8,060.57
168	$2,300.24	$7.67	$173.43	$2,126.81	$8,068.24
169	$2,126.81	$7.09	$174.01	$1,952.80	$8,075.33
170	$1,952.80	$6.51	$174.59	$1,778.21	$8,081.84
171	$1,778.21	$5.93	$175.17	$1,603.04	$8,087.77
172	$1,603.04	$5.34	$175.75	$1,427.29	$8,093.11
173	$1,427.29	$4.76	$176.34	$1,250.95	$8,097.87
174	$1,250.95	$4.17	$176.93	$1,074.02	$8,102.04
175	$1,074.02	$3.58	$177.52	$896.50	$8,105.62
176	$896.50	$2.99	$178.11	$718.39	$8,108.61
177	$718.39	$2.39	$178.70	$539.69	$8,111.00
178	$539.69	$1.80	$179.30	$360.39	$8,112.80
179	$360.39	$1.20	$179.90	$180.50	$8,114.00
180	$180.50	$0.60	$180.50	$0.00	$8,114.60

TOWNSHIP OF PUSLINCH
Water Servicing - Option W2

Estimated Capital Cost:	$29,600,000
Number of Benefitting Properties:	1,209
Cost per Connection:	$24,483.04

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $148.36

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$24,483.00	4.00%	20	**$148.36**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
1	$24,483.00	$81.61	$66.75	$24,416.25	$81.61
2	$24,416.25	$81.39	$66.97	$24,349.27	$163.00
3	$24,349.27	$81.16	$67.20	$24,282.08	$244.16
4	$24,282.08	$80.94	$67.42	$24,214.65	$325.10
5	$24,214.65	$80.72	$67.65	$24,147.01	$405.82
6	$24,147.01	$80.49	$67.87	$24,079.13	$486.31
7	$24,079.13	$80.26	$68.10	$24,011.04	$566.57
8	$24,011.04	$80.04	$68.33	$23,942.71	$646.61
9	$23,942.71	$79.81	$68.55	$23,874.16	$726.42
10	$23,874.16	$79.58	$68.78	$23,805.38	$806.00
11	$23,805.38	$79.35	$69.01	$23,736.37	$885.35
12	$23,736.37	$79.12	$69.24	$23,667.12	$964.47
13	$23,667.12	$78.89	$69.47	$23,597.65	$1,043.36
14	$23,597.65	$78.66	$69.70	$23,527.95	$1,122.02
15	$23,527.95	$78.43	$69.94	$23,458.01	$1,200.45
16	$23,458.01	$78.19	$70.17	$23,387.84	$1,278.64
17	$23,387.84	$77.96	$70.40	$23,317.44	$1,356.60
18	$23,317.44	$77.72	$70.64	$23,246.80	$1,434.32
19	$23,246.80	$77.49	$70.87	$23,175.93	$1,511.81
20	$23,175.93	$77.25	$71.11	$23,104.82	$1,589.07
21	$23,104.82	$77.02	$71.35	$23,033.48	$1,666.08
22	$23,033.48	$76.78	$71.58	$22,961.89	$1,742.86
23	$22,961.89	$76.54	$71.82	$22,890.07	$1,819.40
24	$22,890.07	$76.30	$72.06	$22,818.01	$1,895.70
25	$22,818.01	$76.06	$72.30	$22,745.71	$1,971.76
26	$22,745.71	$75.82	$72.54	$22,673.16	$2,047.58
27	$22,673.16	$75.58	$72.78	$22,600.38	$2,123.16
28	$22,600.38	$75.33	$73.03	$22,527.35	$2,198.49
29	$22,527.35	$75.09	$73.27	$22,454.08	$2,273.58
30	$22,454.08	$74.85	$73.52	$22,380.56	$2,348.43
31	$22,380.56	$74.60	$73.76	$22,306.80	$2,423.03
32	$22,306.80	$74.36	$74.01	$22,232.80	$2,497.39
33	$22,232.80	$74.11	$74.25	$22,158.54	$2,571.50
34	$22,158.54	$73.86	$74.50	$22,084.04	$2,645.36
35	$22,084.04	$73.61	$74.75	$22,009.30	$2,718.97
36	$22,009.30	$73.36	$75.00	$21,934.30	$2,792.34
37	$21,934.30	$73.11	$75.25	$21,859.05	$2,865.45
38	$21,859.05	$72.86	$75.50	$21,783.55	$2,938.31
39	$21,783.55	$72.61	$75.75	$21,707.80	$3,010.93
40	$21,707.80	$72.36	$76.00	$21,631.80	$3,083.28
41	$21,631.80	$72.11	$76.26	$21,555.54	$3,155.39
42	$21,555.54	$71.85	$76.51	$21,479.03	$3,227.24
43	$21,479.03	$71.60	$76.77	$21,402.27	$3,298.84
44	$21,402.27	$71.34	$77.02	$21,325.25	$3,370.18
45	$21,325.25	$71.08	$77.28	$21,247.97	$3,441.26
46	$21,247.97	$70.83	$77.54	$21,170.43	$3,512.09
47	$21,170.43	$70.57	$77.79	$21,092.64	$3,582.66
48	$21,092.64	$70.31	$78.05	$21,014.58	$3,652.97
49	$21,014.58	$70.05	$78.31	$20,936.27	$3,723.02
50	$20,936.27	$69.79	$78.57	$20,857.70	$3,792.80
51	$20,857.70	$69.53	$78.84	$20,778.86	$3,862.33
52	$20,778.86	$69.26	$79.10	$20,699.76	$3,931.59
53	$20,699.76	$69.00	$79.36	$20,620.40	$4,000.59
54	$20,620.40	$68.73	$79.63	$20,540.77	$4,069.33
55	$20,540.77	$68.47	$79.89	$20,460.88	$4,137.80
56	$20,460.88	$68.20	$80.16	$20,380.72	$4,206.00
57	$20,380.72	$67.94	$80.43	$20,300.29	$4,273.93
58	$20,300.29	$67.67	$80.69	$20,219.60	$4,341.60
59	$20,219.60	$67.40	$80.96	$20,138.63	$4,409.00
60	$20,138.63	$67.13	$81.23	$20,057.40	$4,476.13
61	$20,057.40	$66.86	$81.50	$19,975.90	$4,542.99

TOWNSHIP OF PUSLINCH
Water Servicing - Option W2

Estimated Capital Cost: $29,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $24,483.04

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $148.36

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$24,483.00	4.00%	20	**$148.36**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
62	$19,975.90	$66.59	$81.78	$19,894.12	$4,609.57
63	$19,894.12	$66.31	$82.05	$19,812.07	$4,675.89
64	$19,812.07	$66.04	$82.32	$19,729.75	$4,741.93
65	$19,729.75	$65.77	$82.60	$19,647.15	$4,807.69
66	$19,647.15	$65.49	$82.87	$19,564.28	$4,873.18
67	$19,564.28	$65.21	$83.15	$19,481.13	$4,938.40
68	$19,481.13	$64.94	$83.43	$19,397.71	$5,003.34
69	$19,397.71	$64.66	$83.70	$19,314.01	$5,067.99
70	$19,314.01	$64.38	$83.98	$19,230.02	$5,132.37
71	$19,230.02	$64.10	$84.26	$19,145.76	$5,196.47
72	$19,145.76	$63.82	$84.54	$19,061.22	$5,260.29
73	$19,061.22	$63.54	$84.82	$18,976.39	$5,323.83
74	$18,976.39	$63.25	$85.11	$18,891.29	$5,387.09
75	$18,891.29	$62.97	$85.39	$18,805.89	$5,450.06
76	$18,805.89	$62.69	$85.68	$18,720.22	$5,512.74
77	$18,720.22	$62.40	$85.96	$18,634.26	$5,575.14
78	$18,634.26	$62.11	$86.25	$18,548.01	$5,637.26
79	$18,548.01	$61.83	$86.54	$18,461.47	$5,699.08
80	$18,461.47	$61.54	$86.82	$18,374.65	$5,760.62
81	$18,374.65	$61.25	$87.11	$18,287.54	$5,821.87
82	$18,287.54	$60.96	$87.40	$18,200.13	$5,882.83
83	$18,200.13	$60.67	$87.70	$18,112.44	$5,943.50
84	$18,112.44	$60.37	$87.99	$18,024.45	$6,003.87
85	$18,024.45	$60.08	$88.28	$17,936.17	$6,063.95
86	$17,936.17	$59.79	$88.57	$17,847.59	$6,123.74
87	$17,847.59	$59.49	$88.87	$17,758.72	$6,183.23
88	$17,758.72	$59.20	$89.17	$17,669.56	$6,242.43
89	$17,669.56	$58.90	$89.46	$17,580.09	$6,301.33
90	$17,580.09	$58.60	$89.76	$17,490.33	$6,359.93
91	$17,490.33	$58.30	$90.06	$17,400.27	$6,418.23
92	$17,400.27	$58.00	$90.36	$17,309.91	$6,476.23
93	$17,309.91	$57.70	$90.66	$17,219.25	$6,533.93
94	$17,219.25	$57.40	$90.96	$17,128.28	$6,591.33
95	$17,128.28	$57.09	$91.27	$17,037.02	$6,648.42
96	$17,037.02	$56.79	$91.57	$16,945.44	$6,705.21
97	$16,945.44	$56.48	$91.88	$16,853.57	$6,761.70
98	$16,853.57	$56.18	$92.18	$16,761.38	$6,817.87
99	$16,761.38	$55.87	$92.49	$16,668.89	$6,873.75
100	$16,668.89	$55.56	$92.80	$16,576.09	$6,929.31
101	$16,576.09	$55.25	$93.11	$16,482.98	$6,984.56
102	$16,482.98	$54.94	$93.42	$16,389.56	$7,039.51
103	$16,389.56	$54.63	$93.73	$16,295.83	$7,094.14
104	$16,295.83	$54.32	$94.04	$16,201.79	$7,148.46
105	$16,201.79	$54.01	$94.36	$16,107.44	$7,202.46
106	$16,107.44	$53.69	$94.67	$16,012.77	$7,256.15
107	$16,012.77	$53.38	$94.99	$15,917.78	$7,309.53
108	$15,917.78	$53.06	$95.30	$15,822.48	$7,362.59
109	$15,822.48	$52.74	$95.62	$15,726.86	$7,415.33
110	$15,726.86	$52.42	$95.94	$15,630.92	$7,467.75
111	$15,630.92	$52.10	$96.26	$15,534.66	$7,519.86
112	$15,534.66	$51.78	$96.58	$15,438.08	$7,571.64
113	$15,438.08	$51.46	$96.90	$15,341.17	$7,623.10
114	$15,341.17	$51.14	$97.22	$15,243.95	$7,674.24
115	$15,243.95	$50.81	$97.55	$15,146.40	$7,725.05
116	$15,146.40	$50.49	$97.87	$15,048.53	$7,775.54
117	$15,048.53	$50.16	$98.20	$14,950.33	$7,825.70
118	$14,950.33	$49.83	$98.53	$14,851.80	$7,875.53
119	$14,851.80	$49.51	$98.86	$14,752.94	$7,925.04
120	$14,752.94	$49.18	$99.19	$14,653.76	$7,974.22
121	$14,653.76	$48.85	$99.52	$14,554.24	$8,023.06
122	$14,554.24	$48.51	$99.85	$14,454.39	$8,071.58

TOWNSHIP OF PUSLINCH
Water Servicing - Option W2

Estimated Capital Cost: $29,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $24,483.04

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $148.36

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$24,483.00	4.00%	20	**$148.36**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
123	$14,454.39	$48.18	$100.18	$14,354.21	$8,119.76
124	$14,354.21	$47.85	$100.51	$14,253.70	$8,167.61
125	$14,253.70	$47.51	$100.85	$14,152.85	$8,215.12
126	$14,152.85	$47.18	$101.19	$14,051.66	$8,262.29
127	$14,051.66	$46.84	$101.52	$13,950.14	$8,309.13
128	$13,950.14	$46.50	$101.86	$13,848.28	$8,355.63
129	$13,848.28	$46.16	$102.20	$13,746.07	$8,401.79
130	$13,746.07	$45.82	$102.54	$13,643.53	$8,447.61
131	$13,643.53	$45.48	$102.88	$13,540.65	$8,493.09
132	$13,540.65	$45.14	$103.23	$13,437.42	$8,538.23
133	$13,437.42	$44.79	$103.57	$13,333.85	$8,583.02
134	$13,333.85	$44.45	$103.92	$13,229.94	$8,627.47
135	$13,229.94	$44.10	$104.26	$13,125.67	$8,671.57
136	$13,125.67	$43.75	$104.61	$13,021.06	$8,715.32
137	$13,021.06	$43.40	$104.96	$12,916.10	$8,758.72
138	$12,916.10	$43.05	$105.31	$12,810.80	$8,801.77
139	$12,810.80	$42.70	$105.66	$12,705.14	$8,844.48
140	$12,705.14	$42.35	$106.01	$12,599.13	$8,886.83
141	$12,599.13	$42.00	$106.37	$12,492.76	$8,928.83
142	$12,492.76	$41.64	$106.72	$12,386.04	$8,970.47
143	$12,386.04	$41.29	$107.08	$12,278.97	$9,011.75
144	$12,278.97	$40.93	$107.43	$12,171.53	$9,052.68
145	$12,171.53	$40.57	$107.79	$12,063.74	$9,093.26
146	$12,063.74	$40.21	$108.15	$11,955.59	$9,133.47
147	$11,955.59	$39.85	$108.51	$11,847.08	$9,173.32
148	$11,847.08	$39.49	$108.87	$11,738.21	$9,212.81
149	$11,738.21	$39.13	$109.23	$11,628.98	$9,251.94
150	$11,628.98	$38.76	$109.60	$11,519.38	$9,290.70
151	$11,519.38	$38.40	$109.96	$11,409.41	$9,329.10
152	$11,409.41	$38.03	$110.33	$11,299.08	$9,367.13
153	$11,299.08	$37.66	$110.70	$11,188.38	$9,404.79
154	$11,188.38	$37.29	$111.07	$11,077.32	$9,442.09
155	$11,077.32	$36.92	$111.44	$10,965.88	$9,479.01
156	$10,965.88	$36.55	$111.81	$10,854.07	$9,515.57
157	$10,854.07	$36.18	$112.18	$10,741.89	$9,551.75
158	$10,741.89	$35.81	$112.56	$10,629.33	$9,587.55
159	$10,629.33	$35.43	$112.93	$10,516.40	$9,622.98
160	$10,516.40	$35.05	$113.31	$10,403.09	$9,658.04
161	$10,403.09	$34.68	$113.69	$10,289.41	$9,692.72
162	$10,289.41	$34.30	$114.06	$10,175.34	$9,727.01
163	$10,175.34	$33.92	$114.44	$10,060.90	$9,760.93
164	$10,060.90	$33.54	$114.83	$9,946.07	$9,794.47
165	$9,946.07	$33.15	$115.21	$9,830.86	$9,827.62
166	$9,830.86	$32.77	$115.59	$9,715.27	$9,860.39
167	$9,715.27	$32.38	$115.98	$9,599.29	$9,892.78
168	$9,599.29	$32.00	$116.36	$9,482.93	$9,924.77
169	$9,482.93	$31.61	$116.75	$9,366.18	$9,956.38
170	$9,366.18	$31.22	$117.14	$9,249.04	$9,987.60
171	$9,249.04	$30.83	$117.53	$9,131.50	$10,018.43
172	$9,131.50	$30.44	$117.92	$9,013.58	$10,048.87
173	$9,013.58	$30.05	$118.32	$8,895.26	$10,078.92
174	$8,895.26	$29.65	$118.71	$8,776.55	$10,108.57
175	$8,776.55	$29.26	$119.11	$8,657.44	$10,137.82
176	$8,657.44	$28.86	$119.50	$8,537.94	$10,166.68
177	$8,537.94	$28.46	$119.90	$8,418.04	$10,195.14
178	$8,418.04	$28.06	$120.30	$8,297.74	$10,223.20
179	$8,297.74	$27.66	$120.70	$8,177.03	$10,250.86
180	$8,177.03	$27.26	$121.11	$8,055.93	$10,278.12
181	$8,055.93	$26.85	$121.51	$7,934.42	$10,304.97
182	$7,934.42	$26.45	$121.91	$7,812.50	$10,331.42
183	$7,812.50	$26.04	$122.32	$7,690.18	$10,357.46

TOWNSHIP OF PUSLINCH
Water Servicing - Option W2

Estimated Capital Cost:	$29,600,000
Number of Benefitting Properties:	1,209
Cost per Connection:	$24,483.04

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $148.36

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$24,483.00	4.00%	20	**$148.36**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
184	$7,690.18	$25.63	$122.73	$7,567.46	$10,383.09
185	$7,567.46	$25.22	$123.14	$7,444.32	$10,408.32
186	$7,444.32	$24.81	$123.55	$7,320.77	$10,433.13
187	$7,320.77	$24.40	$123.96	$7,196.81	$10,457.54
188	$7,196.81	$23.99	$124.37	$7,072.44	$10,481.52
189	$7,072.44	$23.57	$124.79	$6,947.65	$10,505.10
190	$6,947.65	$23.16	$125.20	$6,822.45	$10,528.26
191	$6,822.45	$22.74	$125.62	$6,696.83	$10,551.00
192	$6,696.83	$22.32	$126.04	$6,570.79	$10,573.32
193	$6,570.79	$21.90	$126.46	$6,444.33	$10,595.23
194	$6,444.33	$21.48	$126.88	$6,317.45	$10,616.71
195	$6,317.45	$21.06	$127.30	$6,190.14	$10,637.76
196	$6,190.14	$20.63	$127.73	$6,062.41	$10,658.40
197	$6,062.41	$20.21	$128.15	$5,934.26	$10,678.61
198	$5,934.26	$19.78	$128.58	$5,805.68	$10,698.39
199	$5,805.68	$19.35	$129.01	$5,676.67	$10,717.74
200	$5,676.67	$18.92	$129.44	$5,547.23	$10,736.66
201	$5,547.23	$18.49	$129.87	$5,417.36	$10,755.15
202	$5,417.36	$18.06	$130.30	$5,287.05	$10,773.21
203	$5,287.05	$17.62	$130.74	$5,156.31	$10,790.83
204	$5,156.31	$17.19	$131.17	$5,025.14	$10,808.02
205	$5,025.14	$16.75	$131.61	$4,893.53	$10,824.77
206	$4,893.53	$16.31	$132.05	$4,761.48	$10,841.08
207	$4,761.48	$15.87	$132.49	$4,628.99	$10,856.96
208	$4,628.99	$15.43	$132.93	$4,496.06	$10,872.39
209	$4,496.06	$14.99	$133.38	$4,362.68	$10,887.37
210	$4,362.68	$14.54	$133.82	$4,228.86	$10,901.91
211	$4,228.86	$14.10	$134.27	$4,094.59	$10,916.01
212	$4,094.59	$13.65	$134.71	$3,959.88	$10,929.66
213	$3,959.88	$13.20	$135.16	$3,824.72	$10,942.86
214	$3,824.72	$12.75	$135.61	$3,689.10	$10,955.61
215	$3,689.10	$12.30	$136.07	$3,553.04	$10,967.91
216	$3,553.04	$11.84	$136.52	$3,416.52	$10,979.75
217	$3,416.52	$11.39	$136.97	$3,279.55	$10,991.14
218	$3,279.55	$10.93	$137.43	$3,142.12	$11,002.07
219	$3,142.12	$10.47	$137.89	$3,004.23	$11,012.54
220	$3,004.23	$10.01	$138.35	$2,865.88	$11,022.56
221	$2,865.88	$9.55	$138.81	$2,727.07	$11,032.11
222	$2,727.07	$9.09	$139.27	$2,587.80	$11,041.20
223	$2,587.80	$8.63	$139.74	$2,448.06	$11,049.83
224	$2,448.06	$8.16	$140.20	$2,307.86	$11,057.99
225	$2,307.86	$7.69	$140.67	$2,167.19	$11,065.68
226	$2,167.19	$7.22	$141.14	$2,026.05	$11,072.90
227	$2,026.05	$6.75	$141.61	$1,884.45	$11,079.66
228	$1,884.45	$6.28	$142.08	$1,742.36	$11,085.94
229	$1,742.36	$5.81	$142.55	$1,599.81	$11,091.75
230	$1,599.81	$5.33	$143.03	$1,456.78	$11,097.08
231	$1,456.78	$4.86	$143.51	$1,313.27	$11,101.93
232	$1,313.27	$4.38	$143.98	$1,169.29	$11,106.31
233	$1,169.29	$3.90	$144.46	$1,024.83	$11,110.21
234	$1,024.83	$3.42	$144.95	$879.88	$11,113.63
235	$879.88	$2.93	$145.43	$734.45	$11,116.56
236	$734.45	$2.45	$145.91	$588.54	$11,119.01
237	$588.54	$1.96	$146.40	$442.14	$11,120.97
238	$442.14	$1.47	$146.89	$295.25	$11,122.44
239	$295.25	$0.98	$147.38	$147.87	$11,123.43
240	$147.87	$0.49	$147.87	$0.00	$11,123.92

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW1

Estimated Capital Cost:	$66,600,000
Number of Benefitting Properties:	1,209
Cost per Connection:	$55,086.85

Capital Cost Recovery Factor - A = 0.010124514
Monthly Cost -P = $557.73

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$55,087.00	4.00%	10	**$557.73**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
1	$55,087.00	$183.62	$374.11	$54,712.89	$183.62
2	$54,712.89	$182.38	$375.35	$54,337.54	$366.00
3	$54,337.54	$181.13	$376.60	$53,960.94	$547.12
4	$53,960.94	$179.87	$377.86	$53,583.08	$726.99
5	$53,583.08	$178.61	$379.12	$53,203.96	$905.60
6	$53,203.96	$177.35	$380.38	$52,823.58	$1,082.95
7	$52,823.58	$176.08	$381.65	$52,441.93	$1,259.03
8	$52,441.93	$174.81	$382.92	$52,059.00	$1,433.84
9	$52,059.00	$173.53	$384.20	$51,674.80	$1,607.37
10	$51,674.80	$172.25	$385.48	$51,289.32	$1,779.62
11	$51,289.32	$170.96	$386.76	$50,902.56	$1,950.58
12	$50,902.56	$169.68	$388.05	$50,514.51	$2,120.26
13	$50,514.51	$168.38	$389.35	$50,125.16	$2,288.64
14	$50,125.16	$167.08	$390.65	$49,734.51	$2,455.72
15	$49,734.51	$165.78	$391.95	$49,342.57	$2,621.50
16	$49,342.57	$164.48	$393.25	$48,949.31	$2,785.98
17	$48,949.31	$163.16	$394.56	$48,554.75	$2,949.14
18	$48,554.75	$161.85	$395.88	$48,158.87	$3,110.99
19	$48,158.87	$160.53	$397.20	$47,761.67	$3,271.52
20	$47,761.67	$159.21	$398.52	$47,363.14	$3,430.73
21	$47,363.14	$157.88	$399.85	$46,963.29	$3,588.60
22	$46,963.29	$156.54	$401.18	$46,562.11	$3,745.15
23	$46,562.11	$155.21	$402.52	$46,159.59	$3,900.35
24	$46,159.59	$153.87	$403.86	$45,755.72	$4,054.22
25	$45,755.72	$152.52	$405.21	$45,350.51	$4,206.74
26	$45,350.51	$151.17	$406.56	$44,943.95	$4,357.91
27	$44,943.95	$149.81	$407.92	$44,536.04	$4,507.72
28	$44,536.04	$148.45	$409.28	$44,126.76	$4,656.17
29	$44,126.76	$147.09	$410.64	$43,716.12	$4,803.26
30	$43,716.12	$145.72	$412.01	$43,304.11	$4,948.98
31	$43,304.11	$144.35	$413.38	$42,890.73	$5,093.33
32	$42,890.73	$142.97	$414.76	$42,475.97	$5,236.30
33	$42,475.97	$141.59	$416.14	$42,059.83	$5,377.89
34	$42,059.83	$140.20	$417.53	$41,642.30	$5,518.09
35	$41,642.30	$138.81	$418.92	$41,223.38	$5,656.89
36	$41,223.38	$137.41	$420.32	$40,803.06	$5,794.30
37	$40,803.06	$136.01	$421.72	$40,381.34	$5,930.32
38	$40,381.34	$134.60	$423.12	$39,958.21	$6,064.92
39	$39,958.21	$133.19	$424.54	$39,533.68	$6,198.11
40	$39,533.68	$131.78	$425.95	$39,107.73	$6,329.89
41	$39,107.73	$130.36	$427.37	$38,680.36	$6,460.25
42	$38,680.36	$128.93	$428.79	$38,251.56	$6,589.19
43	$38,251.56	$127.51	$430.22	$37,821.34	$6,716.69
44	$37,821.34	$126.07	$431.66	$37,389.68	$6,842.76
45	$37,389.68	$124.63	$433.10	$36,956.59	$6,967.39
46	$36,956.59	$123.19	$434.54	$36,522.05	$7,090.58
47	$36,522.05	$121.74	$435.99	$36,086.06	$7,212.32
48	$36,086.06	$120.29	$437.44	$35,648.61	$7,332.61
49	$35,648.61	$118.83	$438.90	$35,209.71	$7,451.44
50	$35,209.71	$117.37	$440.36	$34,769.35	$7,568.80
51	$34,769.35	$115.90	$441.83	$34,327.52	$7,684.70
52	$34,327.52	$114.43	$443.30	$33,884.21	$7,799.13
53	$33,884.21	$112.95	$444.78	$33,439.43	$7,912.08
54	$33,439.43	$111.46	$446.26	$32,993.17	$8,023.54
55	$32,993.17	$109.98	$447.75	$32,545.42	$8,133.52
56	$32,545.42	$108.48	$449.24	$32,096.17	$8,242.00
57	$32,096.17	$106.99	$450.74	$31,645.43	$8,348.99
58	$31,645.43	$105.48	$452.24	$31,193.19	$8,454.47
59	$31,193.19	$103.98	$453.75	$30,739.43	$8,558.45
60	$30,739.43	$102.46	$455.26	$30,284.17	$8,660.92
61	$30,284.17	$100.95	$456.78	$29,827.39	$8,761.86

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW1

Estimated Capital Cost: $66,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $55,086.85

Capital Cost Recovery Factor - A = 0.010124514
Monthly Cost -P = $557.73

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$55,087.00	4.00%	10	**$557.73**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
62	$29,827.39	$99.42	$458.30	$29,369.08	$8,861.29
63	$29,369.08	$97.90	$459.83	$28,909.25	$8,959.18
64	$28,909.25	$96.36	$461.36	$28,447.89	$9,055.55
65	$28,447.89	$94.83	$462.90	$27,984.98	$9,150.38
66	$27,984.98	$93.28	$464.45	$27,520.54	$9,243.66
67	$27,520.54	$91.74	$465.99	$27,054.54	$9,335.39
68	$27,054.54	$90.18	$467.55	$26,587.00	$9,425.58
69	$26,587.00	$88.62	$469.11	$26,117.89	$9,514.20
70	$26,117.89	$87.06	$470.67	$25,647.22	$9,601.26
71	$25,647.22	$85.49	$472.24	$25,174.98	$9,686.75
72	$25,174.98	$83.92	$473.81	$24,701.17	$9,770.67
73	$24,701.17	$82.34	$475.39	$24,225.78	$9,853.00
74	$24,225.78	$80.75	$476.98	$23,748.80	$9,933.76
75	$23,748.80	$79.16	$478.57	$23,270.24	$10,012.92
76	$23,270.24	$77.57	$480.16	$22,790.07	$10,090.49
77	$22,790.07	$75.97	$481.76	$22,308.31	$10,166.45
78	$22,308.31	$74.36	$483.37	$21,824.94	$10,240.81
79	$21,824.94	$72.75	$484.98	$21,339.97	$10,313.56
80	$21,339.97	$71.13	$486.60	$20,853.37	$10,384.70
81	$20,853.37	$69.51	$488.22	$20,365.15	$10,454.21
82	$20,365.15	$67.88	$489.85	$19,875.31	$10,522.09
83	$19,875.31	$66.25	$491.48	$19,383.83	$10,588.34
84	$19,383.83	$64.61	$493.12	$18,890.71	$10,652.96
85	$18,890.71	$62.97	$494.76	$18,395.95	$10,715.92
86	$18,395.95	$61.32	$496.41	$17,899.54	$10,777.24
87	$17,899.54	$59.67	$498.06	$17,401.48	$10,836.91
88	$17,401.48	$58.00	$499.72	$16,901.75	$10,894.91
89	$16,901.75	$56.34	$501.39	$16,400.36	$10,951.25
90	$16,400.36	$54.67	$503.06	$15,897.30	$11,005.92
91	$15,897.30	$52.99	$504.74	$15,392.57	$11,058.91
92	$15,392.57	$51.31	$506.42	$14,886.14	$11,110.22
93	$14,886.14	$49.62	$508.11	$14,378.04	$11,159.84
94	$14,378.04	$47.93	$509.80	$13,868.23	$11,207.77
95	$13,868.23	$46.23	$511.50	$13,356.73	$11,254.00
96	$13,356.73	$44.52	$513.21	$12,843.53	$11,298.52
97	$12,843.53	$42.81	$514.92	$12,328.61	$11,341.33
98	$12,328.61	$41.10	$516.63	$11,811.97	$11,382.43
99	$11,811.97	$39.37	$518.36	$11,293.62	$11,421.80
100	$11,293.62	$37.65	$520.08	$10,773.53	$11,459.44
101	$10,773.53	$35.91	$521.82	$10,251.72	$11,495.36
102	$10,251.72	$34.17	$523.56	$9,728.16	$11,529.53
103	$9,728.16	$32.43	$525.30	$9,202.86	$11,561.96
104	$9,202.86	$30.68	$527.05	$8,675.81	$11,592.63
105	$8,675.81	$28.92	$528.81	$8,147.00	$11,621.55
106	$8,147.00	$27.16	$530.57	$7,616.42	$11,648.71
107	$7,616.42	$25.39	$532.34	$7,084.08	$11,674.10
108	$7,084.08	$23.61	$534.12	$6,549.97	$11,697.71
109	$6,549.97	$21.83	$535.90	$6,014.07	$11,719.54
110	$6,014.07	$20.05	$537.68	$5,476.39	$11,739.59
111	$5,476.39	$18.25	$539.47	$4,936.91	$11,757.84
112	$4,936.91	$16.46	$541.27	$4,395.64	$11,774.30
113	$4,395.64	$14.65	$543.08	$3,852.57	$11,788.95
114	$3,852.57	$12.84	$544.89	$3,307.68	$11,801.79
115	$3,307.68	$11.03	$546.70	$2,760.97	$11,812.82
116	$2,760.97	$9.20	$548.53	$2,212.45	$11,822.02
117	$2,212.45	$7.37	$550.35	$1,662.09	$11,829.40
118	$1,662.09	$5.54	$552.19	$1,109.91	$11,834.94
119	$1,109.91	$3.70	$554.03	$555.88	$11,838.64
120	$555.88	$1.85	$555.88	$0.00	$11,840.49

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW1

Estimated Capital Cost: $66,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $55,086.85

Capital Cost Recovery Factor - A = 0.007396879
Monthly Cost -P = $407.47

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$55,087.00	4.00%	15	**$407.47**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
1	$55,087.00	$183.62	$223.85	$54,863.15	$183.62
2	$54,863.15	$182.88	$224.59	$54,638.56	$366.50
3	$54,638.56	$182.13	$225.34	$54,413.21	$548.63
4	$54,413.21	$181.38	$226.09	$54,187.12	$730.01
5	$54,187.12	$180.62	$226.85	$53,960.27	$910.63
6	$53,960.27	$179.87	$227.60	$53,732.67	$1,090.50
7	$53,732.67	$179.11	$228.36	$53,504.30	$1,269.61
8	$53,504.30	$178.35	$229.12	$53,275.18	$1,447.95
9	$53,275.18	$177.58	$229.89	$53,045.29	$1,625.54
10	$53,045.29	$176.82	$230.65	$52,814.64	$1,802.36
11	$52,814.64	$176.05	$231.42	$52,583.21	$1,978.40
12	$52,583.21	$175.28	$232.19	$52,351.02	$2,153.68
13	$52,351.02	$174.50	$232.97	$52,118.05	$2,328.19
14	$52,118.05	$173.73	$233.75	$51,884.31	$2,501.91
15	$51,884.31	$172.95	$234.52	$51,649.78	$2,674.86
16	$51,649.78	$172.17	$235.31	$51,414.48	$2,847.03
17	$51,414.48	$171.38	$236.09	$51,178.39	$3,018.41
18	$51,178.39	$170.59	$236.88	$50,941.51	$3,189.00
19	$50,941.51	$169.81	$237.67	$50,703.84	$3,358.81
20	$50,703.84	$169.01	$238.46	$50,465.38	$3,527.82
21	$50,465.38	$168.22	$239.25	$50,226.13	$3,696.04
22	$50,226.13	$167.42	$240.05	$49,986.08	$3,863.46
23	$49,986.08	$166.62	$240.85	$49,745.23	$4,030.08
24	$49,745.23	$165.82	$241.65	$49,503.57	$4,195.90
25	$49,503.57	$165.01	$242.46	$49,261.11	$4,360.91
26	$49,261.11	$164.20	$243.27	$49,017.84	$4,525.11
27	$49,017.84	$163.39	$244.08	$48,773.76	$4,688.50
28	$48,773.76	$162.58	$244.89	$48,528.87	$4,851.08
29	$48,528.87	$161.76	$245.71	$48,283.16	$5,012.85
30	$48,283.16	$160.94	$246.53	$48,036.63	$5,173.79
31	$48,036.63	$160.12	$247.35	$47,789.28	$5,333.91
32	$47,789.28	$159.30	$248.17	$47,541.11	$5,493.21
33	$47,541.11	$158.47	$249.00	$47,292.11	$5,651.68
34	$47,292.11	$157.64	$249.83	$47,042.28	$5,809.32
35	$47,042.28	$156.81	$250.66	$46,791.61	$5,966.13
36	$46,791.61	$155.97	$251.50	$46,540.11	$6,122.10
37	$46,540.11	$155.13	$252.34	$46,287.77	$6,277.23
38	$46,287.77	$154.29	$253.18	$46,034.59	$6,431.53
39	$46,034.59	$153.45	$254.02	$45,780.57	$6,584.98
40	$45,780.57	$152.60	$254.87	$45,525.70	$6,737.58
41	$45,525.70	$151.75	$255.72	$45,269.98	$6,889.33
42	$45,269.98	$150.90	$256.57	$45,013.41	$7,040.23
43	$45,013.41	$150.04	$257.43	$44,755.98	$7,190.27
44	$44,755.98	$149.19	$258.29	$44,497.70	$7,339.46
45	$44,497.70	$148.33	$259.15	$44,238.55	$7,487.79
46	$44,238.55	$147.46	$260.01	$43,978.54	$7,635.25
47	$43,978.54	$146.60	$260.88	$43,717.66	$7,781.84
48	$43,717.66	$145.73	$261.75	$43,455.92	$7,927.57
49	$43,455.92	$144.85	$262.62	$43,193.30	$8,072.42
50	$43,193.30	$143.98	$263.49	$42,929.81	$8,216.40
51	$42,929.81	$143.10	$264.37	$42,665.43	$8,359.50
52	$42,665.43	$142.22	$265.25	$42,400.18	$8,501.72
53	$42,400.18	$141.33	$266.14	$42,134.04	$8,643.05
54	$42,134.04	$140.45	$267.03	$41,867.02	$8,783.50
55	$41,867.02	$139.56	$267.92	$41,599.10	$8,923.05
56	$41,599.10	$138.66	$268.81	$41,330.29	$9,061.72
57	$41,330.29	$137.77	$269.70	$41,060.59	$9,199.49
58	$41,060.59	$136.87	$270.60	$40,789.99	$9,336.35
59	$40,789.99	$135.97	$271.51	$40,518.48	$9,472.32
60	$40,518.48	$135.06	$272.41	$40,246.07	$9,607.38
61	$40,246.07	$134.15	$273.32	$39,972.75	$9,741.54

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW1

Estimated Capital Cost: $66,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $55,086.85

Capital Cost Recovery Factor - A = 0.007396879
Monthly Cost -P = $407.47

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$55,087.00	4.00%	15	**$407.47**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
62	$39,972.75	$133.24	$274.23	$39,698.52	$9,874.78
63	$39,698.52	$132.33	$275.14	$39,423.38	$10,007.11
64	$39,423.38	$131.41	$276.06	$39,147.32	$10,138.52
65	$39,147.32	$130.49	$276.98	$38,870.34	$10,269.01
66	$38,870.34	$129.57	$277.90	$38,592.43	$10,398.58
67	$38,592.43	$128.64	$278.83	$38,313.60	$10,527.22
68	$38,313.60	$127.71	$279.76	$38,033.84	$10,654.93
69	$38,033.84	$126.78	$280.69	$37,753.15	$10,781.71
70	$37,753.15	$125.84	$281.63	$37,471.52	$10,907.55
71	$37,471.52	$124.91	$282.57	$37,188.96	$11,032.46
72	$37,188.96	$123.96	$283.51	$36,905.45	$11,156.42
73	$36,905.45	$123.02	$284.45	$36,620.99	$11,279.44
74	$36,620.99	$122.07	$285.40	$36,335.59	$11,401.51
75	$36,335.59	$121.12	$286.35	$36,049.24	$11,522.63
76	$36,049.24	$120.16	$287.31	$35,761.93	$11,642.79
77	$35,761.93	$119.21	$288.27	$35,473.66	$11,762.00
78	$35,473.66	$118.25	$289.23	$35,184.44	$11,880.25
79	$35,184.44	$117.28	$290.19	$34,894.25	$11,997.53
80	$34,894.25	$116.31	$291.16	$34,603.09	$12,113.84
81	$34,603.09	$115.34	$292.13	$34,310.96	$12,229.18
82	$34,310.96	$114.37	$293.10	$34,017.86	$12,343.55
83	$34,017.86	$113.39	$294.08	$33,723.78	$12,456.95
84	$33,723.78	$112.41	$295.06	$33,428.72	$12,569.36
85	$33,428.72	$111.43	$296.04	$33,132.68	$12,680.79
86	$33,132.68	$110.44	$297.03	$32,835.65	$12,791.23
87	$32,835.65	$109.45	$298.02	$32,537.63	$12,900.68
88	$32,537.63	$108.46	$299.01	$32,238.62	$13,009.14
89	$32,238.62	$107.46	$300.01	$31,938.61	$13,116.60
90	$31,938.61	$106.46	$301.01	$31,637.60	$13,223.07
91	$31,637.60	$105.46	$302.01	$31,335.58	$13,328.52
92	$31,335.58	$104.45	$303.02	$31,032.56	$13,432.98
93	$31,032.56	$103.44	$304.03	$30,728.53	$13,536.42
94	$30,728.53	$102.43	$305.04	$30,423.49	$13,638.85
95	$30,423.49	$101.41	$306.06	$30,117.43	$13,740.26
96	$30,117.43	$100.39	$307.08	$29,810.35	$13,840.65
97	$29,810.35	$99.37	$308.10	$29,502.24	$13,940.02
98	$29,502.24	$98.34	$309.13	$29,193.11	$14,038.36
99	$29,193.11	$97.31	$310.16	$28,882.95	$14,135.67
100	$28,882.95	$96.28	$311.20	$28,571.76	$14,231.95
101	$28,571.76	$95.24	$312.23	$28,259.52	$14,327.18
102	$28,259.52	$94.20	$313.27	$27,946.25	$14,421.38
103	$27,946.25	$93.15	$314.32	$27,631.93	$14,514.54
104	$27,631.93	$92.11	$315.37	$27,316.57	$14,606.64
105	$27,316.57	$91.06	$316.42	$27,000.15	$14,697.70
106	$27,000.15	$90.00	$317.47	$26,682.68	$14,787.70
107	$26,682.68	$88.94	$318.53	$26,364.15	$14,876.64
108	$26,364.15	$87.88	$319.59	$26,044.56	$14,964.52
109	$26,044.56	$86.82	$320.66	$25,723.90	$15,051.34
110	$25,723.90	$85.75	$321.73	$25,402.18	$15,137.08
111	$25,402.18	$84.67	$322.80	$25,079.38	$15,221.76
112	$25,079.38	$83.60	$323.87	$24,755.50	$15,305.36
113	$24,755.50	$82.52	$324.95	$24,430.55	$15,387.87
114	$24,430.55	$81.44	$326.04	$24,104.51	$15,469.31
115	$24,104.51	$80.35	$327.12	$23,777.39	$15,549.66
116	$23,777.39	$79.26	$328.21	$23,449.18	$15,628.92
117	$23,449.18	$78.16	$329.31	$23,119.87	$15,707.08
118	$23,119.87	$77.07	$330.41	$22,789.46	$15,784.15
119	$22,789.46	$75.96	$331.51	$22,457.96	$15,860.11
120	$22,457.96	$74.86	$332.61	$22,125.34	$15,934.97
121	$22,125.34	$73.75	$333.72	$21,791.62	$16,008.72
122	$21,791.62	$72.64	$334.83	$21,456.79	$16,081.36

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW1

Estimated Capital Cost: $66,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $55,086.85

Capital Cost Recovery Factor - A = 0.007396879
Monthly Cost -P = $407.47

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$55,087.00	4.00%	15	**$407.47**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
123	$21,456.79	$71.52	$335.95	$21,120.84	$16,152.88
124	$21,120.84	$70.40	$337.07	$20,783.77	$16,223.29
125	$20,783.77	$69.28	$338.19	$20,445.58	$16,292.57
126	$20,445.58	$68.15	$339.32	$20,106.26	$16,360.72
127	$20,106.26	$67.02	$340.45	$19,765.81	$16,427.74
128	$19,765.81	$65.89	$341.59	$19,424.22	$16,493.62
129	$19,424.22	$64.75	$342.72	$19,081.50	$16,558.37
130	$19,081.50	$63.60	$343.87	$18,737.63	$16,621.98
131	$18,737.63	$62.46	$345.01	$18,392.62	$16,684.44
132	$18,392.62	$61.31	$346.16	$18,046.45	$16,745.74
133	$18,046.45	$60.15	$347.32	$17,699.14	$16,805.90
134	$17,699.14	$59.00	$348.47	$17,350.66	$16,864.90
135	$17,350.66	$57.84	$349.64	$17,001.03	$16,922.73
136	$17,001.03	$56.67	$350.80	$16,650.22	$16,979.40
137	$16,650.22	$55.50	$351.97	$16,298.25	$17,034.90
138	$16,298.25	$54.33	$353.14	$15,945.11	$17,089.23
139	$15,945.11	$53.15	$354.32	$15,590.79	$17,142.38
140	$15,590.79	$51.97	$355.50	$15,235.29	$17,194.35
141	$15,235.29	$50.78	$356.69	$14,878.60	$17,245.13
142	$14,878.60	$49.60	$357.88	$14,520.72	$17,294.73
143	$14,520.72	$48.40	$359.07	$14,161.65	$17,343.13
144	$14,161.65	$47.21	$360.27	$13,801.39	$17,390.34
145	$13,801.39	$46.00	$361.47	$13,439.92	$17,436.34
146	$13,439.92	$44.80	$362.67	$13,077.25	$17,481.14
147	$13,077.25	$43.59	$363.88	$12,713.36	$17,524.73
148	$12,713.36	$42.38	$365.09	$12,348.27	$17,567.11
149	$12,348.27	$41.16	$366.31	$11,981.96	$17,608.27
150	$11,981.96	$39.94	$367.53	$11,614.43	$17,648.21
151	$11,614.43	$38.71	$368.76	$11,245.67	$17,686.93
152	$11,245.67	$37.49	$369.99	$10,875.68	$17,724.41
153	$10,875.68	$36.25	$371.22	$10,504.46	$17,760.66
154	$10,504.46	$35.01	$372.46	$10,132.01	$17,795.68
155	$10,132.01	$33.77	$373.70	$9,758.31	$17,829.45
156	$9,758.31	$32.53	$374.94	$9,383.36	$17,861.98
157	$9,383.36	$31.28	$376.19	$9,007.17	$17,893.26
158	$9,007.17	$30.02	$377.45	$8,629.72	$17,923.28
159	$8,629.72	$28.77	$378.71	$8,251.02	$17,952.05
160	$8,251.02	$27.50	$379.97	$7,871.05	$17,979.55
161	$7,871.05	$26.24	$381.24	$7,489.81	$18,005.79
162	$7,489.81	$24.97	$382.51	$7,107.31	$18,030.75
163	$7,107.31	$23.69	$383.78	$6,723.53	$18,054.44
164	$6,723.53	$22.41	$385.06	$6,338.47	$18,076.86
165	$6,338.47	$21.13	$386.34	$5,952.12	$18,097.98
166	$5,952.12	$19.84	$387.63	$5,564.49	$18,117.82
167	$5,564.49	$18.55	$388.92	$5,175.57	$18,136.37
168	$5,175.57	$17.25	$390.22	$4,785.35	$18,153.62
169	$4,785.35	$15.95	$391.52	$4,393.83	$18,169.58
170	$4,393.83	$14.65	$392.83	$4,001.00	$18,184.22
171	$4,001.00	$13.34	$394.14	$3,606.87	$18,197.56
172	$3,606.87	$12.02	$395.45	$3,211.42	$18,209.58
173	$3,211.42	$10.70	$396.77	$2,814.65	$18,220.29
174	$2,814.65	$9.38	$398.09	$2,416.56	$18,229.67
175	$2,416.56	$8.06	$399.42	$2,017.14	$18,237.72
176	$2,017.14	$6.72	$400.75	$1,616.40	$18,244.45
177	$1,616.40	$5.39	$402.08	$1,214.31	$18,249.84
178	$1,214.31	$4.05	$403.42	$810.89	$18,253.88
179	$810.89	$2.70	$404.77	$406.12	$18,256.59
180	$406.12	$1.35	$406.12	$0.00	$18,257.94

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW1

Estimated Capital Cost: $66,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $55,086.85

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $333.82

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$55,087.00	4.00%	20	**$333.82**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
1	$55,087.00	$183.62	$150.19	$54,936.81	$183.62
2	$54,936.81	$183.12	$150.69	$54,786.11	$366.75
3	$54,786.11	$182.62	$151.20	$54,634.92	$549.37
4	$54,634.92	$182.12	$151.70	$54,483.22	$731.48
5	$54,483.22	$181.61	$152.21	$54,331.01	$913.09
6	$54,331.01	$181.10	$152.71	$54,178.30	$1,094.20
7	$54,178.30	$180.59	$153.22	$54,025.08	$1,274.79
8	$54,025.08	$180.08	$153.73	$53,871.34	$1,454.87
9	$53,871.34	$179.57	$154.25	$53,717.10	$1,634.45
10	$53,717.10	$179.06	$154.76	$53,562.34	$1,813.50
11	$53,562.34	$178.54	$155.28	$53,407.06	$1,992.04
12	$53,407.06	$178.02	$155.79	$53,251.27	$2,170.07
13	$53,251.27	$177.50	$156.31	$53,094.96	$2,347.57
14	$53,094.96	$176.98	$156.83	$52,938.13	$2,524.56
15	$52,938.13	$176.46	$157.36	$52,780.77	$2,701.02
16	$52,780.77	$175.94	$157.88	$52,622.89	$2,876.95
17	$52,622.89	$175.41	$158.41	$52,464.48	$3,052.36
18	$52,464.48	$174.88	$158.93	$52,305.55	$3,227.24
19	$52,305.55	$174.35	$159.46	$52,146.08	$3,401.59
20	$52,146.08	$173.82	$160.00	$51,986.09	$3,575.41
21	$51,986.09	$173.29	$160.53	$51,825.56	$3,748.70
22	$51,825.56	$172.75	$161.06	$51,664.49	$3,921.45
23	$51,664.49	$172.21	$161.60	$51,502.89	$4,093.67
24	$51,502.89	$171.68	$162.14	$51,340.75	$4,265.34
25	$51,340.75	$171.14	$162.68	$51,178.07	$4,436.48
26	$51,178.07	$170.59	$163.22	$51,014.85	$4,607.07
27	$51,014.85	$170.05	$163.77	$50,851.08	$4,777.12
28	$50,851.08	$169.50	$164.31	$50,686.77	$4,946.63
29	$50,686.77	$168.96	$164.86	$50,521.91	$5,115.58
30	$50,521.91	$168.41	$165.41	$50,356.50	$5,283.99
31	$50,356.50	$167.85	$165.96	$50,190.54	$5,451.84
32	$50,190.54	$167.30	$166.51	$50,024.02	$5,619.15
33	$50,024.02	$166.75	$167.07	$49,856.95	$5,785.89
34	$49,856.95	$166.19	$167.63	$49,689.33	$5,952.08
35	$49,689.33	$165.63	$168.19	$49,521.14	$6,117.71
36	$49,521.14	$165.07	$168.75	$49,352.39	$6,282.78
37	$49,352.39	$164.51	$169.31	$49,183.09	$6,447.29
38	$49,183.09	$163.94	$169.87	$49,013.21	$6,611.24
39	$49,013.21	$163.38	$170.44	$48,842.77	$6,774.61
40	$48,842.77	$162.81	$171.01	$48,671.77	$6,937.42
41	$48,671.77	$162.24	$171.58	$48,500.19	$7,099.66
42	$48,500.19	$161.67	$172.15	$48,328.04	$7,261.33
43	$48,328.04	$161.09	$172.72	$48,155.32	$7,422.42
44	$48,155.32	$160.52	$173.30	$47,982.02	$7,582.94
45	$47,982.02	$159.94	$173.88	$47,808.14	$7,742.88
46	$47,808.14	$159.36	$174.46	$47,633.69	$7,902.24
47	$47,633.69	$158.78	$175.04	$47,458.65	$8,061.02
48	$47,458.65	$158.20	$175.62	$47,283.03	$8,219.22
49	$47,283.03	$157.61	$176.21	$47,106.82	$8,376.83
50	$47,106.82	$157.02	$176.79	$46,930.03	$8,533.85
51	$46,930.03	$156.43	$177.38	$46,752.65	$8,690.28
52	$46,752.65	$155.84	$177.97	$46,574.67	$8,846.12
53	$46,574.67	$155.25	$178.57	$46,396.10	$9,001.37
54	$46,396.10	$154.65	$179.16	$46,216.94	$9,156.03
55	$46,216.94	$154.06	$179.76	$46,037.18	$9,310.08
56	$46,037.18	$153.46	$180.36	$45,856.82	$9,463.54
57	$45,856.82	$152.86	$180.96	$45,675.86	$9,616.40
58	$45,675.86	$152.25	$181.56	$45,494.30	$9,768.65
59	$45,494.30	$151.65	$182.17	$45,312.13	$9,920.30
60	$45,312.13	$151.04	$182.78	$45,129.35	$10,071.34
61	$45,129.35	$150.43	$183.39	$44,945.97	$10,221.77

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW1

Estimated Capital Cost:	$66,600,000
Number of Benefitting Properties:	1,209
Cost per Connection:	$55,086.85

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $333.82

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$55,087.00	4.00%	20	**$333.82**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
62	$44,945.97	$149.82	$184.00	$44,761.97	$10,371.59
63	$44,761.97	$149.21	$184.61	$44,577.36	$10,520.79
64	$44,577.36	$148.59	$185.23	$44,392.14	$10,669.39
65	$44,392.14	$147.97	$185.84	$44,206.29	$10,817.36
66	$44,206.29	$147.35	$186.46	$44,019.83	$10,964.71
67	$44,019.83	$146.73	$187.08	$43,832.75	$11,111.45
68	$43,832.75	$146.11	$187.71	$43,645.04	$11,257.56
69	$43,645.04	$145.48	$188.33	$43,456.71	$11,403.04
70	$43,456.71	$144.86	$188.96	$43,267.75	$11,547.90
71	$43,267.75	$144.23	$189.59	$43,078.16	$11,692.12
72	$43,078.16	$143.59	$190.22	$42,887.94	$11,835.72
73	$42,887.94	$142.96	$190.86	$42,697.08	$11,978.67
74	$42,697.08	$142.32	$191.49	$42,505.59	$12,121.00
75	$42,505.59	$141.69	$192.13	$42,313.45	$12,262.68
76	$42,313.45	$141.04	$192.77	$42,120.68	$12,403.73
77	$42,120.68	$140.40	$193.41	$41,927.27	$12,544.13
78	$41,927.27	$139.76	$194.06	$41,733.21	$12,683.89
79	$41,733.21	$139.11	$194.71	$41,538.50	$12,823.00
80	$41,538.50	$138.46	$195.35	$41,343.15	$12,961.46
81	$41,343.15	$137.81	$196.01	$41,147.14	$13,099.27
82	$41,147.14	$137.16	$196.66	$40,950.48	$13,236.43
83	$40,950.48	$136.50	$197.31	$40,753.17	$13,372.93
84	$40,753.17	$135.84	$197.97	$40,555.20	$13,508.77
85	$40,555.20	$135.18	$198.63	$40,356.57	$13,643.96
86	$40,356.57	$134.52	$199.29	$40,157.27	$13,778.48
87	$40,157.27	$133.86	$199.96	$39,957.31	$13,912.34
88	$39,957.31	$133.19	$200.63	$39,756.69	$14,045.53
89	$39,756.69	$132.52	$201.29	$39,555.39	$14,178.05
90	$39,555.39	$131.85	$201.97	$39,353.43	$14,309.90
91	$39,353.43	$131.18	$202.64	$39,150.79	$14,441.08
92	$39,150.79	$130.50	$203.31	$38,947.48	$14,571.58
93	$38,947.48	$129.82	$203.99	$38,743.48	$14,701.41
94	$38,743.48	$129.14	$204.67	$38,538.81	$14,830.55
95	$38,538.81	$128.46	$205.35	$38,333.46	$14,959.02
96	$38,333.46	$127.78	$206.04	$38,127.42	$15,086.79
97	$38,127.42	$127.09	$206.72	$37,920.70	$15,213.88
98	$37,920.70	$126.40	$207.41	$37,713.28	$15,340.29
99	$37,713.28	$125.71	$208.11	$37,505.18	$15,466.00
100	$37,505.18	$125.02	$208.80	$37,296.38	$15,591.02
101	$37,296.38	$124.32	$209.50	$37,086.88	$15,715.34
102	$37,086.88	$123.62	$210.19	$36,876.69	$15,838.96
103	$36,876.69	$122.92	$210.89	$36,665.79	$15,961.88
104	$36,665.79	$122.22	$211.60	$36,454.20	$16,084.10
105	$36,454.20	$121.51	$212.30	$36,241.89	$16,205.62
106	$36,241.89	$120.81	$213.01	$36,028.88	$16,326.42
107	$36,028.88	$120.10	$213.72	$35,815.16	$16,446.52
108	$35,815.16	$119.38	$214.43	$35,600.73	$16,565.90
109	$35,600.73	$118.67	$215.15	$35,385.58	$16,684.57
110	$35,385.58	$117.95	$215.86	$35,169.72	$16,802.52
111	$35,169.72	$117.23	$216.58	$34,953.14	$16,919.76
112	$34,953.14	$116.51	$217.31	$34,735.83	$17,036.27
113	$34,735.83	$115.79	$218.03	$34,517.80	$17,152.05
114	$34,517.80	$115.06	$218.76	$34,299.04	$17,267.11
115	$34,299.04	$114.33	$219.49	$34,079.56	$17,381.44
116	$34,079.56	$113.60	$220.22	$33,859.34	$17,495.04
117	$33,859.34	$112.86	$220.95	$33,638.39	$17,607.90
118	$33,638.39	$112.13	$221.69	$33,416.70	$17,720.03
119	$33,416.70	$111.39	$222.43	$33,194.27	$17,831.42
120	$33,194.27	$110.65	$223.17	$32,971.10	$17,942.07
121	$32,971.10	$109.90	$223.91	$32,747.19	$18,051.97
122	$32,747.19	$109.16	$224.66	$32,522.53	$18,161.13

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW1

Estimated Capital Cost: $66,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $55,086.85

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $333.82

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$55,087.00	4.00%	20	**$333.82**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
123	$32,522.53	$108.41	$225.41	$32,297.12	$18,269.54
124	$32,297.12	$107.66	$226.16	$32,070.96	$18,377.20
125	$32,070.96	$106.90	$226.91	$31,844.05	$18,484.10
126	$31,844.05	$106.15	$227.67	$31,616.38	$18,590.25
127	$31,616.38	$105.39	$228.43	$31,387.95	$18,695.63
128	$31,387.95	$104.63	$229.19	$31,158.76	$18,800.26
129	$31,158.76	$103.86	$229.95	$30,928.81	$18,904.12
130	$30,928.81	$103.10	$230.72	$30,698.09	$19,007.22
131	$30,698.09	$102.33	$231.49	$30,466.60	$19,109.55
132	$30,466.60	$101.56	$232.26	$30,234.34	$19,211.10
133	$30,234.34	$100.78	$233.04	$30,001.30	$19,311.88
134	$30,001.30	$100.00	$233.81	$29,767.49	$19,411.89
135	$29,767.49	$99.22	$234.59	$29,532.90	$19,511.11
136	$29,532.90	$98.44	$235.37	$29,297.53	$19,609.55
137	$29,297.53	$97.66	$236.16	$29,061.37	$19,707.21
138	$29,061.37	$96.87	$236.95	$28,824.42	$19,804.08
139	$28,824.42	$96.08	$237.73	$28,586.69	$19,900.17
140	$28,586.69	$95.29	$238.53	$28,348.16	$19,995.45
141	$28,348.16	$94.49	$239.32	$28,108.84	$20,089.95
142	$28,108.84	$93.70	$240.12	$27,868.72	$20,183.64
143	$27,868.72	$92.90	$240.92	$27,627.80	$20,276.54
144	$27,627.80	$92.09	$241.72	$27,386.07	$20,368.63
145	$27,386.07	$91.29	$242.53	$27,143.54	$20,459.92
146	$27,143.54	$90.48	$243.34	$26,900.21	$20,550.40
147	$26,900.21	$89.67	$244.15	$26,656.06	$20,640.07
148	$26,656.06	$88.85	$244.96	$26,411.09	$20,728.92
149	$26,411.09	$88.04	$245.78	$26,165.31	$20,816.96
150	$26,165.31	$87.22	$246.60	$25,918.72	$20,904.17
151	$25,918.72	$86.40	$247.42	$25,671.30	$20,990.57
152	$25,671.30	$85.57	$248.25	$25,423.05	$21,076.14
153	$25,423.05	$84.74	$249.07	$25,173.98	$21,160.88
154	$25,173.98	$83.91	$249.90	$24,924.07	$21,244.80
155	$24,924.07	$83.08	$250.74	$24,673.34	$21,327.88
156	$24,673.34	$82.24	$251.57	$24,421.77	$21,410.12
157	$24,421.77	$81.41	$252.41	$24,169.36	$21,491.53
158	$24,169.36	$80.56	$253.25	$23,916.10	$21,572.09
159	$23,916.10	$79.72	$254.10	$23,662.01	$21,651.81
160	$23,662.01	$78.87	$254.94	$23,407.06	$21,730.69
161	$23,407.06	$78.02	$255.79	$23,151.27	$21,808.71
162	$23,151.27	$77.17	$256.65	$22,894.63	$21,885.88
163	$22,894.63	$76.32	$257.50	$22,637.12	$21,962.20
164	$22,637.12	$75.46	$258.36	$22,378.77	$22,037.65
165	$22,378.77	$74.60	$259.22	$22,119.55	$22,112.25
166	$22,119.55	$73.73	$260.08	$21,859.46	$22,185.98
167	$21,859.46	$72.86	$260.95	$21,598.51	$22,258.85
168	$21,598.51	$72.00	$261.82	$21,336.69	$22,330.84
169	$21,336.69	$71.12	$262.69	$21,073.99	$22,401.96
170	$21,073.99	$70.25	$263.57	$20,810.42	$22,472.21
171	$20,810.42	$69.37	$264.45	$20,545.98	$22,541.58
172	$20,545.98	$68.49	$265.33	$20,280.65	$22,610.06
173	$20,280.65	$67.60	$266.21	$20,014.43	$22,677.67
174	$20,014.43	$66.71	$267.10	$19,747.33	$22,744.38
175	$19,747.33	$65.82	$267.99	$19,479.34	$22,810.21
176	$19,479.34	$64.93	$268.89	$19,210.45	$22,875.14
177	$19,210.45	$64.03	$269.78	$18,940.67	$22,939.17
178	$18,940.67	$63.14	$270.68	$18,669.99	$23,002.31
179	$18,669.99	$62.23	$271.58	$18,398.41	$23,064.54
180	$18,398.41	$61.33	$272.49	$18,125.92	$23,125.87
181	$18,125.92	$60.42	$273.40	$17,852.52	$23,186.29
182	$17,852.52	$59.51	$274.31	$17,578.21	$23,245.80
183	$17,578.21	$58.59	$275.22	$17,302.99	$23,304.39

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW1

Estimated Capital Cost: $66,600,000
Number of Benefitting Properties: 1,209
Cost per Connection: $55,086.85

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $333.82

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$55,087.00	4.00%	20	**$333.82**

Month	StartingBalance	Interest	Principal	EndingBalance	TotalInterest
184	$17,302.99	$57.68	$276.14	$17,026.85	$23,362.07
185	$17,026.85	$56.76	$277.06	$16,749.79	$23,418.82
186	$16,749.79	$55.83	$277.98	$16,471.81	$23,474.66
187	$16,471.81	$54.91	$278.91	$16,192.90	$23,529.56
188	$16,192.90	$53.98	$279.84	$15,913.06	$23,583.54
189	$15,913.06	$53.04	$280.77	$15,632.28	$23,636.58
190	$15,632.28	$52.11	$281.71	$15,350.58	$23,688.69
191	$15,350.58	$51.17	$282.65	$15,067.93	$23,739.86
192	$15,067.93	$50.23	$283.59	$14,784.34	$23,790.08
193	$14,784.34	$49.28	$284.54	$14,499.80	$23,839.37
194	$14,499.80	$48.33	$285.48	$14,214.32	$23,887.70
195	$14,214.32	$47.38	$286.44	$13,927.88	$23,935.08
196	$13,927.88	$46.43	$287.39	$13,640.49	$23,981.51
197	$13,640.49	$45.47	$288.35	$13,352.15	$24,026.97
198	$13,352.15	$44.51	$289.31	$13,062.84	$24,071.48
199	$13,062.84	$43.54	$290.27	$12,772.56	$24,115.02
200	$12,772.56	$42.58	$291.24	$12,481.32	$24,157.60
201	$12,481.32	$41.60	$292.21	$12,189.11	$24,199.20
202	$12,189.11	$40.63	$293.19	$11,895.92	$24,239.83
203	$11,895.92	$39.65	$294.16	$11,601.76	$24,279.49
204	$11,601.76	$38.67	$295.14	$11,306.62	$24,318.16
205	$11,306.62	$37.69	$296.13	$11,010.49	$24,355.85
206	$11,010.49	$36.70	$297.11	$10,713.37	$24,392.55
207	$10,713.37	$35.71	$298.11	$10,415.27	$24,428.26
208	$10,415.27	$34.72	$299.10	$10,116.17	$24,462.98
209	$10,116.17	$33.72	$300.10	$9,816.07	$24,496.70
210	$9,816.07	$32.72	$301.10	$9,514.98	$24,529.42
211	$9,514.98	$31.72	$302.10	$9,212.88	$24,561.14
212	$9,212.88	$30.71	$303.11	$8,909.77	$24,591.85
213	$8,909.77	$29.70	$304.12	$8,605.65	$24,621.54
214	$8,605.65	$28.69	$305.13	$8,300.52	$24,650.23
215	$8,300.52	$27.67	$306.15	$7,994.38	$24,677.90
216	$7,994.38	$26.65	$307.17	$7,687.21	$24,704.55
217	$7,687.21	$25.62	$308.19	$7,379.02	$24,730.17
218	$7,379.02	$24.60	$309.22	$7,069.80	$24,754.77
219	$7,069.80	$23.57	$310.25	$6,759.54	$24,778.33
220	$6,759.54	$22.53	$311.28	$6,448.26	$24,800.86
221	$6,448.26	$21.49	$312.32	$6,135.94	$24,822.36
222	$6,135.94	$20.45	$313.36	$5,822.57	$24,842.81
223	$5,822.57	$19.41	$314.41	$5,508.17	$24,862.22
224	$5,508.17	$18.36	$315.46	$5,192.71	$24,880.58
225	$5,192.71	$17.31	$316.51	$4,876.20	$24,897.89
226	$4,876.20	$16.25	$317.56	$4,558.64	$24,914.14
227	$4,558.64	$15.20	$318.62	$4,240.02	$24,929.34
228	$4,240.02	$14.13	$319.68	$3,920.34	$24,943.47
229	$3,920.34	$13.07	$320.75	$3,599.59	$24,956.54
230	$3,599.59	$12.00	$321.82	$3,277.77	$24,968.54
231	$3,277.77	$10.93	$322.89	$2,954.88	$24,979.47
232	$2,954.88	$9.85	$323.97	$2,630.91	$24,989.32
233	$2,630.91	$8.77	$325.05	$2,305.87	$24,998.08
234	$2,305.87	$7.69	$326.13	$1,979.74	$25,005.77
235	$1,979.74	$6.60	$327.22	$1,652.52	$25,012.37
236	$1,652.52	$5.51	$328.31	$1,324.21	$25,017.88
237	$1,324.21	$4.41	$329.40	$994.81	$25,022.29
238	$994.81	$3.32	$330.50	$664.31	$25,025.61
239	$664.31	$2.21	$331.60	$332.71	$25,027.82
240	$332.71	$1.11	$332.71	$0.00	$25,028.93

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW2

Estimated Capital Cost: $43,500,000
Number of Benefitting Properties: 1,209
Cost per Connection: $35,980.15

Capital Cost Recovery Factor - A = 0.010124514
Monthly Cost -P = $364.28

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$35,980.00	4.00%	10	**$364.28**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
1	$35,980.00	$119.93	$244.35	$35,735.65	$119.93
2	$35,735.65	$119.12	$245.16	$35,490.49	$239.05
3	$35,490.49	$118.30	$245.98	$35,244.51	$357.35
4	$35,244.51	$117.48	$246.80	$34,997.72	$474.84
5	$34,997.72	$116.66	$247.62	$34,750.09	$591.49
6	$34,750.09	$115.83	$248.45	$34,501.65	$707.33
7	$34,501.65	$115.01	$249.27	$34,252.37	$822.33
8	$34,252.37	$114.17	$250.11	$34,002.27	$936.51
9	$34,002.27	$113.34	$250.94	$33,751.33	$1,049.85
10	$33,751.33	$112.50	$251.78	$33,499.55	$1,162.35
11	$33,499.55	$111.67	$252.61	$33,246.94	$1,274.02
12	$33,246.94	$110.82	$253.46	$32,993.48	$1,384.84
13	$32,993.48	$109.98	$254.30	$32,739.18	$1,494.82
14	$32,739.18	$109.13	$255.15	$32,484.03	$1,603.95
15	$32,484.03	$108.28	$256.00	$32,228.03	$1,712.23
16	$32,228.03	$107.43	$256.85	$31,971.18	$1,819.66
17	$31,971.18	$106.57	$257.71	$31,713.47	$1,926.23
18	$31,713.47	$105.71	$258.57	$31,454.90	$2,031.94
19	$31,454.90	$104.85	$259.43	$31,195.47	$2,136.79
20	$31,195.47	$103.98	$260.30	$30,935.17	$2,240.77
21	$30,935.17	$103.12	$261.16	$30,674.01	$2,343.89
22	$30,674.01	$102.25	$262.03	$30,411.98	$2,446.14
23	$30,411.98	$101.37	$262.91	$30,149.07	$2,547.51
24	$30,149.07	$100.50	$263.78	$29,885.29	$2,648.01
25	$29,885.29	$99.62	$264.66	$29,620.63	$2,747.63
26	$29,620.63	$98.74	$265.54	$29,355.08	$2,846.36
27	$29,355.08	$97.85	$266.43	$29,088.65	$2,944.21
28	$29,088.65	$96.96	$267.32	$28,821.33	$3,041.17
29	$28,821.33	$96.07	$268.21	$28,553.12	$3,137.25
30	$28,553.12	$95.18	$269.10	$28,284.02	$3,232.42
31	$28,284.02	$94.28	$270.00	$28,014.02	$3,326.70
32	$28,014.02	$93.38	$270.90	$27,743.12	$3,420.08
33	$27,743.12	$92.48	$271.80	$27,471.32	$3,512.56
34	$27,471.32	$91.57	$272.71	$27,198.61	$3,604.13
35	$27,198.61	$90.66	$273.62	$26,924.99	$3,694.79
36	$26,924.99	$89.75	$274.53	$26,650.46	$3,784.54
37	$26,650.46	$88.83	$275.45	$26,375.02	$3,873.38
38	$26,375.02	$87.92	$276.36	$26,098.65	$3,961.29
39	$26,098.65	$87.00	$277.28	$25,821.37	$4,048.29
40	$25,821.37	$86.07	$278.21	$25,543.16	$4,134.36
41	$25,543.16	$85.14	$279.14	$25,264.02	$4,219.50
42	$25,264.02	$84.21	$280.07	$24,983.96	$4,303.72
43	$24,983.96	$83.28	$281.00	$24,702.96	$4,387.00
44	$24,702.96	$82.34	$281.94	$24,421.02	$4,469.34
45	$24,421.02	$81.40	$282.88	$24,138.14	$4,550.74
46	$24,138.14	$80.46	$283.82	$23,854.32	$4,631.21
47	$23,854.32	$79.51	$284.77	$23,569.56	$4,710.72
48	$23,569.56	$78.57	$285.71	$23,283.84	$4,789.28
49	$23,283.84	$77.61	$286.67	$22,997.18	$4,866.90
50	$22,997.18	$76.66	$287.62	$22,709.55	$4,943.55
51	$22,709.55	$75.70	$288.58	$22,420.97	$5,019.25
52	$22,420.97	$74.74	$289.54	$22,131.43	$5,093.99
53	$22,131.43	$73.77	$290.51	$21,840.92	$5,167.76
54	$21,840.92	$72.80	$291.48	$21,549.44	$5,240.56
55	$21,549.44	$71.83	$292.45	$21,257.00	$5,312.40
56	$21,257.00	$70.86	$293.42	$20,963.57	$5,383.25
57	$20,963.57	$69.88	$294.40	$20,669.17	$5,453.13
58	$20,669.17	$68.90	$295.38	$20,373.79	$5,522.03
59	$20,373.79	$67.91	$296.37	$20,077.42	$5,589.94
60	$20,077.42	$66.92	$297.36	$19,780.07	$5,656.87
61	$19,780.07	$65.93	$298.35	$19,481.72	$5,722.80

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW2

Estimated Capital Cost: $43,500,000
Number of Benefitting Properties: 1,209
Cost per Connection: $35,980.15

Capital Cost Recovery Factor - A = 0.010124514
Monthly Cost -P = $364.28

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$35,980.00	4.00%	10	**$364.28**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
62	$19,481.72	$64.94	$299.34	$19,182.38	$5,787.74
63	$19,182.38	$63.94	$300.34	$18,882.04	$5,851.68
64	$18,882.04	$62.94	$301.34	$18,580.70	$5,914.62
65	$18,580.70	$61.94	$302.34	$18,278.35	$5,976.56
66	$18,278.35	$60.93	$303.35	$17,975.00	$6,037.48
67	$17,975.00	$59.92	$304.36	$17,670.64	$6,097.40
68	$17,670.64	$58.90	$305.38	$17,365.26	$6,156.30
69	$17,365.26	$57.88	$306.40	$17,058.87	$6,214.19
70	$17,058.87	$56.86	$307.42	$16,751.45	$6,271.05
71	$16,751.45	$55.84	$308.44	$16,443.01	$6,326.89
72	$16,443.01	$54.81	$309.47	$16,133.54	$6,381.70
73	$16,133.54	$53.78	$310.50	$15,823.04	$6,435.48
74	$15,823.04	$52.74	$311.54	$15,511.50	$6,488.22
75	$15,511.50	$51.70	$312.58	$15,198.92	$6,539.92
76	$15,198.92	$50.66	$313.62	$14,885.31	$6,590.59
77	$14,885.31	$49.62	$314.66	$14,570.64	$6,640.20
78	$14,570.64	$48.57	$315.71	$14,254.93	$6,688.77
79	$14,254.93	$47.52	$316.76	$13,938.17	$6,736.29
80	$13,938.17	$46.46	$317.82	$13,620.35	$6,782.75
81	$13,620.35	$45.40	$318.88	$13,301.47	$6,828.15
82	$13,301.47	$44.34	$319.94	$12,981.53	$6,872.49
83	$12,981.53	$43.27	$321.01	$12,660.52	$6,915.76
84	$12,660.52	$42.20	$322.08	$12,338.44	$6,957.96
85	$12,338.44	$41.13	$323.15	$12,015.29	$6,999.09
86	$12,015.29	$40.05	$324.23	$11,691.06	$7,039.14
87	$11,691.06	$38.97	$325.31	$11,365.75	$7,078.11
88	$11,365.75	$37.89	$326.39	$11,039.36	$7,116.00
89	$11,039.36	$36.80	$327.48	$10,711.88	$7,152.80
90	$10,711.88	$35.71	$328.57	$10,383.30	$7,188.50
91	$10,383.30	$34.61	$329.67	$10,053.63	$7,223.11
92	$10,053.63	$33.51	$330.77	$9,722.87	$7,256.63
93	$9,722.87	$32.41	$331.87	$9,390.99	$7,289.04
94	$9,390.99	$31.30	$332.98	$9,058.02	$7,320.34
95	$9,058.02	$30.19	$334.09	$8,723.93	$7,350.53
96	$8,723.93	$29.08	$335.20	$8,388.73	$7,379.61
97	$8,388.73	$27.96	$336.32	$8,052.41	$7,407.57
98	$8,052.41	$26.84	$337.44	$7,714.98	$7,434.42
99	$7,714.98	$25.72	$338.56	$7,376.41	$7,460.13
100	$7,376.41	$24.59	$339.69	$7,036.72	$7,484.72
101	$7,036.72	$23.46	$340.82	$6,695.90	$7,508.18
102	$6,695.90	$22.32	$341.96	$6,353.94	$7,530.50
103	$6,353.94	$21.18	$343.10	$6,010.83	$7,551.68
104	$6,010.83	$20.04	$344.24	$5,666.59	$7,571.71
105	$5,666.59	$18.89	$345.39	$5,321.20	$7,590.60
106	$5,321.20	$17.74	$346.54	$4,974.66	$7,608.34
107	$4,974.66	$16.58	$347.70	$4,626.96	$7,624.92
108	$4,626.96	$15.42	$348.86	$4,278.10	$7,640.34
109	$4,278.10	$14.26	$350.02	$3,928.08	$7,654.60
110	$3,928.08	$13.09	$351.19	$3,576.90	$7,667.70
111	$3,576.90	$11.92	$352.36	$3,224.54	$7,679.62
112	$3,224.54	$10.75	$353.53	$2,871.01	$7,690.37
113	$2,871.01	$9.57	$354.71	$2,516.30	$7,699.94
114	$2,516.30	$8.39	$355.89	$2,160.41	$7,708.33
115	$2,160.41	$7.20	$357.08	$1,803.33	$7,715.53
116	$1,803.33	$6.01	$358.27	$1,445.06	$7,721.54
117	$1,445.06	$4.82	$359.46	$1,085.59	$7,726.36
118	$1,085.59	$3.62	$360.66	$724.93	$7,729.97
119	$724.93	$2.42	$361.86	$363.07	$7,732.39
120	$363.07	$1.21	$363.07	$0.00	$7,733.60

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW2

Estimated Capital Cost: $43,500,000
Number of Benefitting Properties: 1,209
Cost per Connection: $35,980.15

Capital Cost Recovery Factor - A = 0.007396879
Monthly Cost -P = $266.14

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$35,980.00	4.00%	15	**$266.14**

Month	StartingBalance	Interest	Principal	EndingBalance	Total Interest
1	$35,980.00	$119.93	$146.21	$35,833.79	$119.93
2	$35,833.79	$119.45	$146.69	$35,687.10	$239.38
3	$35,687.10	$118.96	$147.18	$35,539.92	$358.34
4	$35,539.92	$118.47	$147.67	$35,392.24	$476.80
5	$35,392.24	$117.97	$148.17	$35,244.08	$594.78
6	$35,244.08	$117.48	$148.66	$35,095.42	$712.26
7	$35,095.42	$116.98	$149.15	$34,946.26	$829.24
8	$34,946.26	$116.49	$149.65	$34,796.61	$945.73
9	$34,796.61	$115.99	$150.15	$34,646.46	$1,061.72
10	$34,646.46	$115.49	$150.65	$34,495.81	$1,177.21
11	$34,495.81	$114.99	$151.15	$34,344.66	$1,292.19
12	$34,344.66	$114.48	$151.66	$34,193.00	$1,406.67
13	$34,193.00	$113.98	$152.16	$34,040.83	$1,520.65
14	$34,040.83	$113.47	$152.67	$33,888.16	$1,634.12
15	$33,888.16	$112.96	$153.18	$33,734.99	$1,747.08
16	$33,734.99	$112.45	$153.69	$33,581.30	$1,859.53
17	$33,581.30	$111.94	$154.20	$33,427.09	$1,971.47
18	$33,427.09	$111.42	$154.72	$33,272.38	$2,082.89
19	$33,272.38	$110.91	$155.23	$33,117.15	$2,193.80
20	$33,117.15	$110.39	$155.75	$32,961.40	$2,304.19
21	$32,961.40	$109.87	$156.27	$32,805.13	$2,414.06
22	$32,805.13	$109.35	$156.79	$32,648.34	$2,523.41
23	$32,648.34	$108.83	$157.31	$32,491.03	$2,632.24
24	$32,491.03	$108.30	$157.84	$32,333.19	$2,740.54
25	$32,333.19	$107.78	$158.36	$32,174.83	$2,848.32
26	$32,174.83	$107.25	$158.89	$32,015.94	$2,955.57
27	$32,015.94	$106.72	$159.42	$31,856.52	$3,062.29
28	$31,856.52	$106.19	$159.95	$31,696.57	$3,168.48
29	$31,696.57	$105.66	$160.48	$31,536.08	$3,274.13
30	$31,536.08	$105.12	$161.02	$31,375.06	$3,379.25
31	$31,375.06	$104.58	$161.56	$31,213.51	$3,483.84
32	$31,213.51	$104.05	$162.09	$31,051.41	$3,587.88
33	$31,051.41	$103.50	$162.64	$30,888.78	$3,691.39
34	$30,888.78	$102.96	$163.18	$30,725.60	$3,794.35
35	$30,725.60	$102.42	$163.72	$30,561.88	$3,896.77
36	$30,561.88	$101.87	$164.27	$30,397.61	$3,998.64
37	$30,397.61	$101.33	$164.81	$30,232.80	$4,099.97
38	$30,232.80	$100.78	$165.36	$30,067.43	$4,200.74
39	$30,067.43	$100.22	$165.91	$29,901.52	$4,300.97
40	$29,901.52	$99.67	$166.47	$29,735.05	$4,400.64
41	$29,735.05	$99.12	$167.02	$29,568.03	$4,499.76
42	$29,568.03	$98.56	$167.58	$29,400.45	$4,598.32
43	$29,400.45	$98.00	$168.14	$29,232.31	$4,696.32
44	$29,232.31	$97.44	$168.70	$29,063.61	$4,793.76
45	$29,063.61	$96.88	$169.26	$28,894.35	$4,890.64
46	$28,894.35	$96.31	$169.83	$28,724.53	$4,986.95
47	$28,724.53	$95.75	$170.39	$28,554.13	$5,082.70
48	$28,554.13	$95.18	$170.96	$28,383.17	$5,177.88
49	$28,383.17	$94.61	$171.53	$28,211.65	$5,272.49
50	$28,211.65	$94.04	$172.10	$28,039.54	$5,366.53
51	$28,039.54	$93.47	$172.67	$27,866.87	$5,460.00
52	$27,866.87	$92.89	$173.25	$27,693.62	$5,552.89
53	$27,693.62	$92.31	$173.83	$27,519.79	$5,645.20
54	$27,519.79	$91.73	$174.41	$27,345.39	$5,736.93
55	$27,345.39	$91.15	$174.99	$27,170.40	$5,828.08
56	$27,170.40	$90.57	$175.57	$26,994.83	$5,918.65
57	$26,994.83	$89.98	$176.16	$26,818.67	$6,008.63
58	$26,818.67	$89.40	$176.74	$26,641.92	$6,098.03
59	$26,641.92	$88.81	$177.33	$26,464.59	$6,186.83
60	$26,464.59	$88.22	$177.92	$26,286.67	$6,275.05
61	$26,286.67	$87.62	$178.52	$26,108.15	$6,362.67

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW2

Estimated Capital Cost: $43,500,000
Number of Benefitting Properties: 1,209
Cost per Connection: $35,980.15

Capital Cost Recovery Factor - A = 0.007396879
Monthly Cost -P = $266.14

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$35,980.00	4.00%	15	**$266.14**

Month	StartingBalance	Interest	Principal	EndingBalance	Total Interest
62	$26,108.15	$87.03	$179.11	$25,929.04	$6,449.70
63	$25,929.04	$86.43	$179.71	$25,749.33	$6,536.13
64	$25,749.33	$85.83	$180.31	$25,569.02	$6,621.96
65	$25,569.02	$85.23	$180.91	$25,388.11	$6,707.19
66	$25,388.11	$84.63	$181.51	$25,206.60	$6,791.82
67	$25,206.60	$84.02	$182.12	$25,024.48	$6,875.84
68	$25,024.48	$83.41	$182.72	$24,841.75	$6,959.25
69	$24,841.75	$82.81	$183.33	$24,658.42	$7,042.06
70	$24,658.42	$82.19	$183.94	$24,474.47	$7,124.25
71	$24,474.47	$81.58	$184.56	$24,289.92	$7,205.84
72	$24,289.92	$80.97	$185.17	$24,104.74	$7,286.80
73	$24,104.74	$80.35	$185.79	$23,918.95	$7,367.15
74	$23,918.95	$79.73	$186.41	$23,732.54	$7,446.88
75	$23,732.54	$79.11	$187.03	$23,545.51	$7,525.99
76	$23,545.51	$78.49	$187.65	$23,357.86	$7,604.47
77	$23,357.86	$77.86	$188.28	$23,169.58	$7,682.33
78	$23,169.58	$77.23	$188.91	$22,980.67	$7,759.57
79	$22,980.67	$76.60	$189.54	$22,791.13	$7,836.17
80	$22,791.13	$75.97	$190.17	$22,600.96	$7,912.14
81	$22,600.96	$75.34	$190.80	$22,410.16	$7,987.48
82	$22,410.16	$74.70	$191.44	$22,218.72	$8,062.18
83	$22,218.72	$74.06	$192.08	$22,026.64	$8,136.24
84	$22,026.64	$73.42	$192.72	$21,833.92	$8,209.66
85	$21,833.92	$72.78	$193.36	$21,640.56	$8,282.44
86	$21,640.56	$72.14	$194.00	$21,446.56	$8,354.58
87	$21,446.56	$71.49	$194.65	$21,251.91	$8,426.06
88	$21,251.91	$70.84	$195.30	$21,056.61	$8,496.90
89	$21,056.61	$70.19	$195.95	$20,860.66	$8,567.09
90	$20,860.66	$69.54	$196.60	$20,664.05	$8,636.63
91	$20,664.05	$68.88	$197.26	$20,466.79	$8,705.51
92	$20,466.79	$68.22	$197.92	$20,268.88	$8,773.73
93	$20,268.88	$67.56	$198.58	$20,070.30	$8,841.29
94	$20,070.30	$66.90	$199.24	$19,871.06	$8,908.19
95	$19,871.06	$66.24	$199.90	$19,671.16	$8,974.43
96	$19,671.16	$65.57	$200.57	$19,470.59	$9,040.00
97	$19,470.59	$64.90	$201.24	$19,269.35	$9,104.90
98	$19,269.35	$64.23	$201.91	$19,067.44	$9,169.14
99	$19,067.44	$63.56	$202.58	$18,864.86	$9,232.69
100	$18,864.86	$62.88	$203.26	$18,661.60	$9,295.58
101	$18,661.60	$62.21	$203.93	$18,457.67	$9,357.78
102	$18,457.67	$61.53	$204.61	$18,253.06	$9,419.31
103	$18,253.06	$60.84	$205.30	$18,047.76	$9,480.15
104	$18,047.76	$60.16	$205.98	$17,841.78	$9,540.31
105	$17,841.78	$59.47	$206.67	$17,635.11	$9,599.78
106	$17,635.11	$58.78	$207.36	$17,427.76	$9,658.57
107	$17,427.76	$58.09	$208.05	$17,219.71	$9,716.66
108	$17,219.71	$57.40	$208.74	$17,010.97	$9,774.06
109	$17,010.97	$56.70	$209.44	$16,801.53	$9,830.76
110	$16,801.53	$56.01	$210.13	$16,591.40	$9,886.77
111	$16,591.40	$55.30	$210.84	$16,380.56	$9,942.07
112	$16,380.56	$54.60	$211.54	$16,169.02	$9,996.67
113	$16,169.02	$53.90	$212.24	$15,956.78	$10,050.57
114	$15,956.78	$53.19	$212.95	$15,743.83	$10,103.76
115	$15,743.83	$52.48	$213.66	$15,530.17	$10,156.24
116	$15,530.17	$51.77	$214.37	$15,315.80	$10,208.01
117	$15,315.80	$51.05	$215.09	$15,100.71	$10,259.06
118	$15,100.71	$50.34	$215.80	$14,884.91	$10,309.39
119	$14,884.91	$49.62	$216.52	$14,668.38	$10,359.01
120	$14,668.38	$48.89	$217.25	$14,451.14	$10,407.90
121	$14,451.14	$48.17	$217.97	$14,233.17	$10,456.08
122	$14,233.17	$47.44	$218.70	$14,014.47	$10,503.52

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW2

Estimated Capital Cost: $43,500,000
Number of Benefitting Properties: 1,209
Cost per Connection: $35,980.15

Capital Cost Recovery Factor - A = 0.007396879
Monthly Cost -P = $266.14

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$35,980.00	4.00%	15	**$266.14**

Month	StartingBalance	Interest	Principal	EndingBalance	Total Interest
123	$14,014.47	$46.71	$219.42	$13,795.05	$10,550.23
124	$13,795.05	$45.98	$220.16	$13,574.89	$10,596.22
125	$13,574.89	$45.25	$220.89	$13,354.00	$10,641.47
126	$13,354.00	$44.51	$221.63	$13,132.38	$10,685.98
127	$13,132.38	$43.77	$222.37	$12,910.01	$10,729.75
128	$12,910.01	$43.03	$223.11	$12,686.90	$10,772.79
129	$12,686.90	$42.29	$223.85	$12,463.05	$10,815.08
130	$12,463.05	$41.54	$224.60	$12,238.46	$10,856.62
131	$12,238.46	$40.79	$225.34	$12,013.11	$10,897.42
132	$12,013.11	$40.04	$226.10	$11,787.02	$10,937.46
133	$11,787.02	$39.29	$226.85	$11,560.17	$10,976.75
134	$11,560.17	$38.53	$227.61	$11,332.56	$11,015.28
135	$11,332.56	$37.78	$228.36	$11,104.20	$11,053.06
136	$11,104.20	$37.01	$229.13	$10,875.07	$11,090.07
137	$10,875.07	$36.25	$229.89	$10,645.18	$11,126.32
138	$10,645.18	$35.48	$230.66	$10,414.53	$11,161.81
139	$10,414.53	$34.72	$231.42	$10,183.10	$11,196.52
140	$10,183.10	$33.94	$232.20	$9,950.91	$11,230.47
141	$9,950.91	$33.17	$232.97	$9,717.94	$11,263.64
142	$9,717.94	$32.39	$233.75	$9,484.19	$11,296.03
143	$9,484.19	$31.61	$234.53	$9,249.66	$11,327.64
144	$9,249.66	$30.83	$235.31	$9,014.36	$11,358.48
145	$9,014.36	$30.05	$236.09	$8,778.26	$11,388.52
146	$8,778.26	$29.26	$236.88	$8,541.39	$11,417.78
147	$8,541.39	$28.47	$237.67	$8,303.72	$11,446.26
148	$8,303.72	$27.68	$238.46	$8,065.26	$11,473.93
149	$8,065.26	$26.88	$239.26	$7,826.00	$11,500.82
150	$7,826.00	$26.09	$240.05	$7,585.95	$11,526.91
151	$7,585.95	$25.29	$240.85	$7,345.09	$11,552.19
152	$7,345.09	$24.48	$241.66	$7,103.44	$11,576.68
153	$7,103.44	$23.68	$242.46	$6,860.98	$11,600.35
154	$6,860.98	$22.87	$243.27	$6,617.71	$11,623.22
155	$6,617.71	$22.06	$244.08	$6,373.63	$11,645.28
156	$6,373.63	$21.25	$244.89	$6,128.73	$11,666.53
157	$6,128.73	$20.43	$245.71	$5,883.02	$11,686.96
158	$5,883.02	$19.61	$246.53	$5,636.49	$11,706.57
159	$5,636.49	$18.79	$247.35	$5,389.14	$11,725.36
160	$5,389.14	$17.96	$248.18	$5,140.96	$11,743.32
161	$5,140.96	$17.14	$249.00	$4,891.96	$11,760.46
162	$4,891.96	$16.31	$249.83	$4,642.13	$11,776.76
163	$4,642.13	$15.47	$250.67	$4,391.46	$11,792.24
164	$4,391.46	$14.64	$251.50	$4,139.96	$11,806.87
165	$4,139.96	$13.80	$252.34	$3,887.62	$11,820.67
166	$3,887.62	$12.96	$253.18	$3,634.44	$11,833.63
167	$3,634.44	$12.11	$254.02	$3,380.42	$11,845.75
168	$3,380.42	$11.27	$254.87	$3,125.54	$11,857.02
169	$3,125.54	$10.42	$255.72	$2,869.82	$11,867.43
170	$2,869.82	$9.57	$256.57	$2,613.25	$11,877.00
171	$2,613.25	$8.71	$257.43	$2,355.82	$11,885.71
172	$2,355.82	$7.85	$258.29	$2,097.53	$11,893.56
173	$2,097.53	$6.99	$259.15	$1,838.38	$11,900.56
174	$1,838.38	$6.13	$260.01	$1,578.37	$11,906.68
175	$1,578.37	$5.26	$260.88	$1,317.49	$11,911.94
176	$1,317.49	$4.39	$261.75	$1,055.75	$11,916.34
177	$1,055.75	$3.52	$262.62	$793.13	$11,919.86
178	$793.13	$2.64	$263.50	$529.63	$11,922.50
179	$529.63	$1.77	$264.37	$265.26	$11,924.26
180	$265.26	$0.88	$265.26	$0.00	$11,925.15

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW2

Estimated Capital Cost: $43,500,000
Number of Benefitting Properties: 1,209
Cost per Connection: $35,980.15

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $218.03

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$35,980.00	4.00%	20	**$218.03**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
1	$35,980.00	$119.93	$98.10	$35,881.90	$119.93
2	$35,881.90	$119.61	$98.43	$35,783.48	$239.54
3	$35,783.48	$119.28	$98.75	$35,684.72	$358.82
4	$35,684.72	$118.95	$99.08	$35,585.64	$477.77
5	$35,585.64	$118.62	$99.41	$35,486.23	$596.39
6	$35,486.23	$118.29	$99.74	$35,386.48	$714.67
7	$35,386.48	$117.95	$100.08	$35,286.41	$832.63
8	$35,286.41	$117.62	$100.41	$35,186.00	$950.25
9	$35,186.00	$117.29	$100.75	$35,085.25	$1,067.54
10	$35,085.25	$116.95	$101.08	$34,984.17	$1,184.49
11	$34,984.17	$116.61	$101.42	$34,882.75	$1,301.10
12	$34,882.75	$116.28	$101.76	$34,781.00	$1,417.38
13	$34,781.00	$115.94	$102.10	$34,678.90	$1,533.31
14	$34,678.90	$115.60	$102.44	$34,576.47	$1,648.91
15	$34,576.47	$115.25	$102.78	$34,473.69	$1,764.16
16	$34,473.69	$114.91	$103.12	$34,370.57	$1,879.08
17	$34,370.57	$114.57	$103.46	$34,267.11	$1,993.65
18	$34,267.11	$114.22	$103.81	$34,163.30	$2,107.87
19	$34,163.30	$113.88	$104.15	$34,059.14	$2,221.75
20	$34,059.14	$113.53	$104.50	$33,954.64	$2,335.28
21	$33,954.64	$113.18	$104.85	$33,849.79	$2,448.46
22	$33,849.79	$112.83	$105.20	$33,744.59	$2,561.29
23	$33,744.59	$112.48	$105.55	$33,639.04	$2,673.77
24	$33,639.04	$112.13	$105.90	$33,533.14	$2,785.90
25	$33,533.14	$111.78	$106.25	$33,426.89	$2,897.68
26	$33,426.89	$111.42	$106.61	$33,320.28	$3,009.10
27	$33,320.28	$111.07	$106.96	$33,213.32	$3,120.17
28	$33,213.32	$110.71	$107.32	$33,105.99	$3,230.88
29	$33,105.99	$110.35	$107.68	$32,998.32	$3,341.24
30	$32,998.32	$109.99	$108.04	$32,890.28	$3,451.23
31	$32,890.28	$109.63	$108.40	$32,781.88	$3,560.86
32	$32,781.88	$109.27	$108.76	$32,673.12	$3,670.14
33	$32,673.12	$108.91	$109.12	$32,564.00	$3,779.05
34	$32,564.00	$108.55	$109.49	$32,454.52	$3,887.59
35	$32,454.52	$108.18	$109.85	$32,344.67	$3,995.78
36	$32,344.67	$107.82	$110.22	$32,234.45	$4,103.59
37	$32,234.45	$107.45	$110.58	$32,123.87	$4,211.04
38	$32,123.87	$107.08	$110.95	$32,012.91	$4,318.12
39	$32,012.91	$106.71	$111.32	$31,901.59	$4,424.83
40	$31,901.59	$106.34	$111.69	$31,789.90	$4,531.17
41	$31,789.90	$105.97	$112.07	$31,677.83	$4,637.13
42	$31,677.83	$105.59	$112.44	$31,565.40	$4,742.73
43	$31,565.40	$105.22	$112.81	$31,452.58	$4,847.95
44	$31,452.58	$104.84	$113.19	$31,339.39	$4,952.79
45	$31,339.39	$104.46	$113.57	$31,225.82	$5,057.25
46	$31,225.82	$104.09	$113.95	$31,111.88	$5,161.34
47	$31,111.88	$103.71	$114.33	$30,997.55	$5,265.04
48	$30,997.55	$103.33	$114.71	$30,882.85	$5,368.37
49	$30,882.85	$102.94	$115.09	$30,767.76	$5,471.31
50	$30,767.76	$102.56	$115.47	$30,652.29	$5,573.87
51	$30,652.29	$102.17	$115.86	$30,536.43	$5,676.05
52	$30,536.43	$101.79	$116.24	$30,420.18	$5,777.83
53	$30,420.18	$101.40	$116.63	$30,303.55	$5,879.23
54	$30,303.55	$101.01	$117.02	$30,186.53	$5,980.25
55	$30,186.53	$100.62	$117.41	$30,069.12	$6,080.87
56	$30,069.12	$100.23	$117.80	$29,951.32	$6,181.10
57	$29,951.32	$99.84	$118.19	$29,833.13	$6,280.94
58	$29,833.13	$99.44	$118.59	$29,714.54	$6,380.38
59	$29,714.54	$99.05	$118.98	$29,595.56	$6,479.43
60	$29,595.56	$98.65	$119.38	$29,476.18	$6,578.08
61	$29,476.18	$98.25	$119.78	$29,356.40	$6,676.33

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW2

Estimated Capital Cost: $43,500,000
Number of Benefitting Properties: 1,209
Cost per Connection: $35,980.15

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $218.03

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$35,980.00	4.00%	20	**$218.03**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
62	$29,356.40	$97.85	$120.18	$29,236.22	$6,774.19
63	$29,236.22	$97.45	$120.58	$29,115.64	$6,871.64
64	$29,115.64	$97.05	$120.98	$28,994.66	$6,968.70
65	$28,994.66	$96.65	$121.38	$28,873.28	$7,065.34
66	$28,873.28	$96.24	$121.79	$28,751.49	$7,161.59
67	$28,751.49	$95.84	$122.19	$28,629.30	$7,257.43
68	$28,629.30	$95.43	$122.60	$28,506.70	$7,352.86
69	$28,506.70	$95.02	$123.01	$28,383.69	$7,447.88
70	$28,383.69	$94.61	$123.42	$28,260.27	$7,542.49
71	$28,260.27	$94.20	$123.83	$28,136.44	$7,636.69
72	$28,136.44	$93.79	$124.24	$28,012.20	$7,730.48
73	$28,012.20	$93.37	$124.66	$27,887.54	$7,823.86
74	$27,887.54	$92.96	$125.07	$27,762.47	$7,916.81
75	$27,762.47	$92.54	$125.49	$27,636.98	$8,009.36
76	$27,636.98	$92.12	$125.91	$27,511.07	$8,101.48
77	$27,511.07	$91.70	$126.33	$27,384.74	$8,193.18
78	$27,384.74	$91.28	$126.75	$27,257.99	$8,284.46
79	$27,257.99	$90.86	$127.17	$27,130.82	$8,375.32
80	$27,130.82	$90.44	$127.60	$27,003.22	$8,465.76
81	$27,003.22	$90.01	$128.02	$26,875.20	$8,555.77
82	$26,875.20	$89.58	$128.45	$26,746.75	$8,645.36
83	$26,746.75	$89.16	$128.88	$26,617.88	$8,734.51
84	$26,617.88	$88.73	$129.31	$26,488.57	$8,823.24
85	$26,488.57	$88.30	$129.74	$26,358.84	$8,911.53
86	$26,358.84	$87.86	$130.17	$26,228.67	$8,999.40
87	$26,228.67	$87.43	$130.60	$26,098.06	$9,086.82
88	$26,098.06	$86.99	$131.04	$25,967.03	$9,173.82
89	$25,967.03	$86.56	$131.47	$25,835.55	$9,260.37
90	$25,835.55	$86.12	$131.91	$25,703.64	$9,346.49
91	$25,703.64	$85.68	$132.35	$25,571.29	$9,432.17
92	$25,571.29	$85.24	$132.79	$25,438.49	$9,517.41
93	$25,438.49	$84.79	$133.24	$25,305.25	$9,602.20
94	$25,305.25	$84.35	$133.68	$25,171.57	$9,686.56
95	$25,171.57	$83.91	$134.13	$25,037.45	$9,770.46
96	$25,037.45	$83.46	$134.57	$24,902.87	$9,853.92
97	$24,902.87	$83.01	$135.02	$24,767.85	$9,936.93
98	$24,767.85	$82.56	$135.47	$24,632.38	$10,019.49
99	$24,632.38	$82.11	$135.92	$24,496.46	$10,101.60
100	$24,496.46	$81.65	$136.38	$24,360.08	$10,183.25
101	$24,360.08	$81.20	$136.83	$24,223.25	$10,264.45
102	$24,223.25	$80.74	$137.29	$24,085.96	$10,345.20
103	$24,085.96	$80.29	$137.75	$23,948.21	$10,425.48
104	$23,948.21	$79.83	$138.20	$23,810.01	$10,505.31
105	$23,810.01	$79.37	$138.67	$23,671.34	$10,584.68
106	$23,671.34	$78.90	$139.13	$23,532.22	$10,663.58
107	$23,532.22	$78.44	$139.59	$23,392.63	$10,742.02
108	$23,392.63	$77.98	$140.06	$23,252.57	$10,820.00
109	$23,252.57	$77.51	$140.52	$23,112.05	$10,897.50
110	$23,112.05	$77.04	$140.99	$22,971.06	$10,974.55
111	$22,971.06	$76.57	$141.46	$22,829.59	$11,051.12
112	$22,829.59	$76.10	$141.93	$22,687.66	$11,127.21
113	$22,687.66	$75.63	$142.41	$22,545.25	$11,202.84
114	$22,545.25	$75.15	$142.88	$22,402.37	$11,277.99
115	$22,402.37	$74.67	$143.36	$22,259.02	$11,352.66
116	$22,259.02	$74.20	$143.83	$22,115.18	$11,426.86
117	$22,115.18	$73.72	$144.31	$21,970.87	$11,500.58
118	$21,970.87	$73.24	$144.80	$21,826.07	$11,573.82
119	$21,826.07	$72.75	$145.28	$21,680.79	$11,646.57
120	$21,680.79	$72.27	$145.76	$21,535.03	$11,718.84
121	$21,535.03	$71.78	$146.25	$21,388.78	$11,790.62
122	$21,388.78	$71.30	$146.74	$21,242.05	$11,861.92

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW2

Estimated Capital Cost: $43,500,000
Number of Benefitting Properties: 1,209
Cost per Connection: $35,980.15

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $218.03

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$35,980.00	4.00%	20	**$218.03**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
123	$21,242.05	$70.81	$147.22	$21,094.82	$11,932.72
124	$21,094.82	$70.32	$147.72	$20,947.11	$12,003.04
125	$20,947.11	$69.82	$148.21	$20,798.90	$12,072.86
126	$20,798.90	$69.33	$148.70	$20,650.20	$12,142.19
127	$20,650.20	$68.83	$149.20	$20,501.00	$12,211.03
128	$20,501.00	$68.34	$149.70	$20,351.30	$12,279.36
129	$20,351.30	$67.84	$150.19	$20,201.11	$12,347.20
130	$20,201.11	$67.34	$150.69	$20,050.42	$12,414.54
131	$20,050.42	$66.83	$151.20	$19,899.22	$12,481.37
132	$19,899.22	$66.33	$151.70	$19,747.52	$12,547.70
133	$19,747.52	$65.83	$152.21	$19,595.31	$12,613.53
134	$19,595.31	$65.32	$152.71	$19,442.60	$12,678.85
135	$19,442.60	$64.81	$153.22	$19,289.37	$12,743.66
136	$19,289.37	$64.30	$153.73	$19,135.64	$12,807.95
137	$19,135.64	$63.79	$154.25	$18,981.39	$12,871.74
138	$18,981.39	$63.27	$154.76	$18,826.63	$12,935.01
139	$18,826.63	$62.76	$155.28	$18,671.36	$12,997.77
140	$18,671.36	$62.24	$155.79	$18,515.56	$13,060.00
141	$18,515.56	$61.72	$156.31	$18,359.25	$13,121.72
142	$18,359.25	$61.20	$156.83	$18,202.42	$13,182.92
143	$18,202.42	$60.67	$157.36	$18,045.06	$13,243.59
144	$18,045.06	$60.15	$157.88	$17,887.18	$13,303.74
145	$17,887.18	$59.62	$158.41	$17,728.77	$13,363.37
146	$17,728.77	$59.10	$158.94	$17,569.83	$13,422.46
147	$17,569.83	$58.57	$159.47	$17,410.37	$13,481.03
148	$17,410.37	$58.03	$160.00	$17,250.37	$13,539.07
149	$17,250.37	$57.50	$160.53	$17,089.84	$13,596.57
150	$17,089.84	$56.97	$161.07	$16,928.77	$13,653.53
151	$16,928.77	$56.43	$161.60	$16,767.17	$13,709.96
152	$16,767.17	$55.89	$162.14	$16,605.03	$13,765.85
153	$16,605.03	$55.35	$162.68	$16,442.35	$13,821.20
154	$16,442.35	$54.81	$163.22	$16,279.13	$13,876.01
155	$16,279.13	$54.26	$163.77	$16,115.36	$13,930.27
156	$16,115.36	$53.72	$164.31	$15,951.04	$13,983.99
157	$15,951.04	$53.17	$164.86	$15,786.18	$14,037.16
158	$15,786.18	$52.62	$165.41	$15,620.77	$14,089.78
159	$15,620.77	$52.07	$165.96	$15,454.81	$14,141.85
160	$15,454.81	$51.52	$166.52	$15,288.29	$14,193.37
161	$15,288.29	$50.96	$167.07	$15,121.22	$14,244.33
162	$15,121.22	$50.40	$167.63	$14,953.59	$14,294.73
163	$14,953.59	$49.85	$168.19	$14,785.41	$14,344.58
164	$14,785.41	$49.28	$168.75	$14,616.66	$14,393.86
165	$14,616.66	$48.72	$169.31	$14,447.35	$14,442.59
166	$14,447.35	$48.16	$169.87	$14,277.48	$14,490.74
167	$14,277.48	$47.59	$170.44	$14,107.04	$14,538.33
168	$14,107.04	$47.02	$171.01	$13,936.03	$14,585.36
169	$13,936.03	$46.45	$171.58	$13,764.45	$14,631.81
170	$13,764.45	$45.88	$172.15	$13,592.30	$14,677.69
171	$13,592.30	$45.31	$172.72	$13,419.58	$14,723.00
172	$13,419.58	$44.73	$173.30	$13,246.28	$14,767.73
173	$13,246.28	$44.15	$173.88	$13,072.40	$14,811.89
174	$13,072.40	$43.57	$174.46	$12,897.94	$14,855.46
175	$12,897.94	$42.99	$175.04	$12,722.90	$14,898.45
176	$12,722.90	$42.41	$175.62	$12,547.28	$14,940.86
177	$12,547.28	$41.82	$176.21	$12,371.07	$14,982.69
178	$12,371.07	$41.24	$176.79	$12,194.28	$15,023.93
179	$12,194.28	$40.65	$177.38	$12,016.89	$15,064.57
180	$12,016.89	$40.06	$177.98	$11,838.92	$15,104.63
181	$11,838.92	$39.46	$178.57	$11,660.35	$15,144.09
182	$11,660.35	$38.87	$179.16	$11,481.19	$15,182.96
183	$11,481.19	$38.27	$179.76	$11,301.43	$15,221.23

TOWNSHIP OF PUSLINCH
Wastewater Servicing - Option WW2

Estimated Capital Cost: $43,500,000
Number of Benefitting Properties: 1,209
Cost per Connection: $35,980.15

Capital Cost Recovery Factor - A = 0.006059803
Monthly Cost -P = $218.03

Loan Amount	Interest Rate	Term in Years	Monthly Payment
$35,980.00	4.00%	20	**$218.03**

Month	Starting Balance	Interest	Principal	Ending Balance	Total Interest
184	$11,301.43	$37.67	$180.36	$11,121.07	$15,258.90
185	$11,121.07	$37.07	$180.96	$10,940.10	$15,295.97
186	$10,940.10	$36.47	$181.56	$10,758.54	$15,332.44
187	$10,758.54	$35.86	$182.17	$10,576.37	$15,368.30
188	$10,576.37	$35.25	$182.78	$10,393.59	$15,403.56
189	$10,393.59	$34.65	$183.39	$10,210.21	$15,438.20
190	$10,210.21	$34.03	$184.00	$10,026.21	$15,472.24
191	$10,026.21	$33.42	$184.61	$9,841.60	$15,505.66
192	$9,841.60	$32.81	$185.23	$9,656.37	$15,538.46
193	$9,656.37	$32.19	$185.84	$9,470.53	$15,570.65
194	$9,470.53	$31.57	$186.46	$9,284.06	$15,602.22
195	$9,284.06	$30.95	$187.08	$9,096.98	$15,633.16
196	$9,096.98	$30.32	$187.71	$8,909.27	$15,663.49
197	$8,909.27	$29.70	$188.33	$8,720.94	$15,693.19
198	$8,720.94	$29.07	$188.96	$8,531.97	$15,722.26
199	$8,531.97	$28.44	$189.59	$8,342.38	$15,750.70
200	$8,342.38	$27.81	$190.22	$8,152.16	$15,778.50
201	$8,152.16	$27.17	$190.86	$7,961.30	$15,805.68
202	$7,961.30	$26.54	$191.49	$7,769.81	$15,832.21
203	$7,769.81	$25.90	$192.13	$7,577.67	$15,858.11
204	$7,577.67	$25.26	$192.77	$7,384.90	$15,883.37
205	$7,384.90	$24.62	$193.42	$7,191.49	$15,907.99
206	$7,191.49	$23.97	$194.06	$6,997.43	$15,931.96
207	$6,997.43	$23.32	$194.71	$6,802.72	$15,955.29
208	$6,802.72	$22.68	$195.36	$6,607.36	$15,977.96
209	$6,607.36	$22.02	$196.01	$6,411.36	$15,999.99
210	$6,411.36	$21.37	$196.66	$6,214.70	$16,021.36
211	$6,214.70	$20.72	$197.32	$6,017.38	$16,042.07
212	$6,017.38	$20.06	$197.97	$5,819.41	$16,062.13
213	$5,819.41	$19.40	$198.63	$5,620.77	$16,081.53
214	$5,620.77	$18.74	$199.30	$5,421.48	$16,100.26
215	$5,421.48	$18.07	$199.96	$5,221.52	$16,118.34
216	$5,221.52	$17.41	$200.63	$5,020.89	$16,135.74
217	$5,020.89	$16.74	$201.30	$4,819.59	$16,152.48
218	$4,819.59	$16.07	$201.97	$4,617.63	$16,168.54
219	$4,617.63	$15.39	$202.64	$4,414.99	$16,183.93
220	$4,414.99	$14.72	$203.32	$4,211.67	$16,198.65
221	$4,211.67	$14.04	$203.99	$4,007.68	$16,212.69
222	$4,007.68	$13.36	$204.67	$3,803.01	$16,226.05
223	$3,803.01	$12.68	$205.36	$3,597.65	$16,238.73
224	$3,597.65	$11.99	$206.04	$3,391.61	$16,250.72
225	$3,391.61	$11.31	$206.73	$3,184.89	$16,262.02
226	$3,184.89	$10.62	$207.42	$2,977.47	$16,272.64
227	$2,977.47	$9.92	$208.11	$2,769.36	$16,282.56
228	$2,769.36	$9.23	$208.80	$2,560.56	$16,291.80
229	$2,560.56	$8.54	$209.50	$2,351.07	$16,300.33
230	$2,351.07	$7.84	$210.19	$2,140.87	$16,308.17
231	$2,140.87	$7.14	$210.90	$1,929.98	$16,315.30
232	$1,929.98	$6.43	$211.60	$1,718.38	$16,321.74
233	$1,718.38	$5.73	$212.30	$1,506.07	$16,327.47
234	$1,506.07	$5.02	$213.01	$1,293.06	$16,332.49
235	$1,293.06	$4.31	$213.72	$1,079.34	$16,336.80
236	$1,079.34	$3.60	$214.43	$864.91	$16,340.39
237	$864.91	$2.88	$215.15	$649.76	$16,343.28
238	$649.76	$2.17	$215.87	$433.89	$16,345.44
239	$433.89	$1.45	$216.59	$217.31	$16,346.89
240	$217.31	$0.72	$217.31	$0.00	$16,347.61

APPENDIX E
Municipal Servicing Questionnaire Results Memorandum, CIMA+

Memorandum

To:	Karen Landry, Township of Puslinch
cc:	James Su, Ontario Clean Water Agency
From:	Sandra Rodriguez, CIMA+ Stuart Winchester, CIMA+
Subject:	**Municipal Servicing Questionnaire Results**
Project Name:	Feasibility Study for Municipal Water and Sewage Servicing in the Township of Puslinch
Date:	March 1, 2018

1. Introduction

The Township of Puslinch (Township) is undertaking a Feasibility Study to assess the viability of implementing municipal water and sewage services within key areas of the Township. As part of the Feasibility Study, a Municipal Servicing Questionnaire was prepared and distributed to all residents/property owners within the limits of the project Study Area. The purpose of the questionnaire was to gauge public interest for a municipal water and sewage system. A copy of the Municipal Servicing Questionnaire is attached to this memorandum.

2. Municipal Servicing Questionnaire – Summary Results

In total, the Township distributed approximately 1,000 copies of the questionnaire, which included residential, industrial, commercial and institutional (ICI) users within the study area.

A total of 361 completed questionnaires were received, which represent a response rate of 36%. Pie charts, depicting graphically the responses obtained, are attached to this memorandum for reference. The following summarizes the questionnaire results:

- Residential Users
  - 321 Questionnaires were received from residential users
  - 27% in favour of municipal water servicing
  - 33% in favour of municipal sewage servicing
- ICI Users
  - 40 Questionnaires were received from residential users
  - 63% in favour of municipal water servicing
  - 68% in favour of municipal sewage servicing

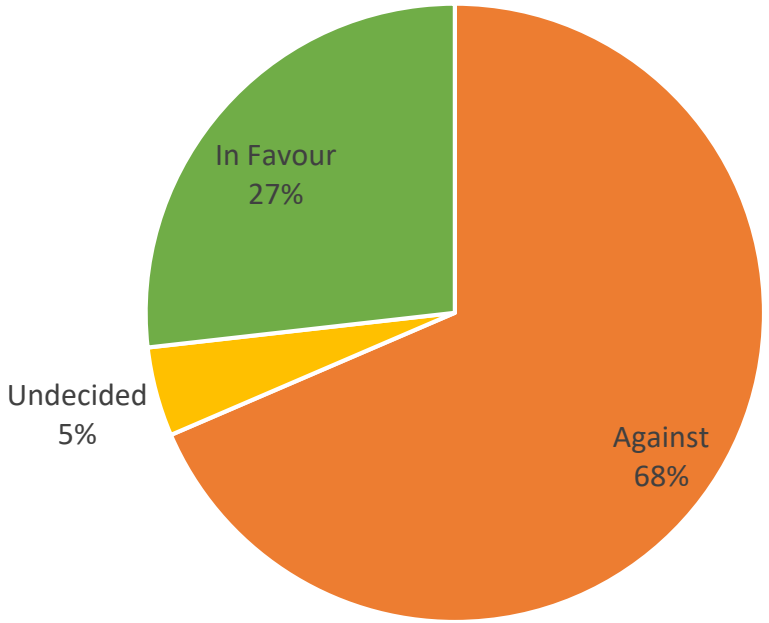
5935 Airport Road, Suite 500
Mississauga, ON L4V 1W5
Canada

Phone: (905) 695-1005
Fax : (905) 695-0525
www.cima.ca

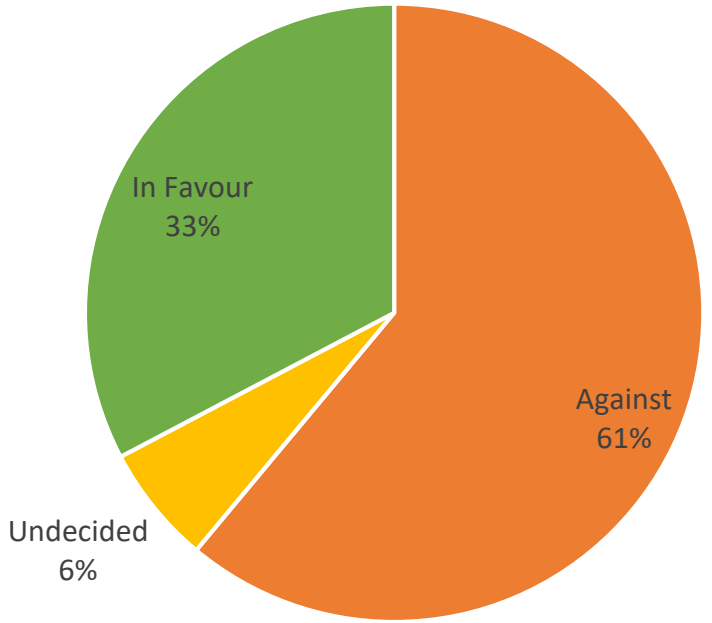
- Total
  - 361 Questionnaires were received from residential and ICI users
  - 31% in favour of municipal water servicing
  - 36% in favour of municipal sewage servicing

Township of Puslinch Municipal Water and Sewage Feasibility Study – Residential Interest

Municipal Water Servicing



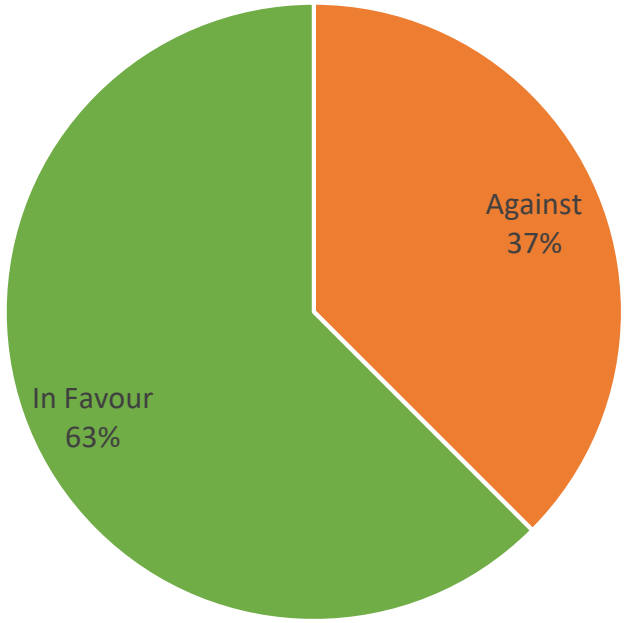
Municipal Sewage Servicing



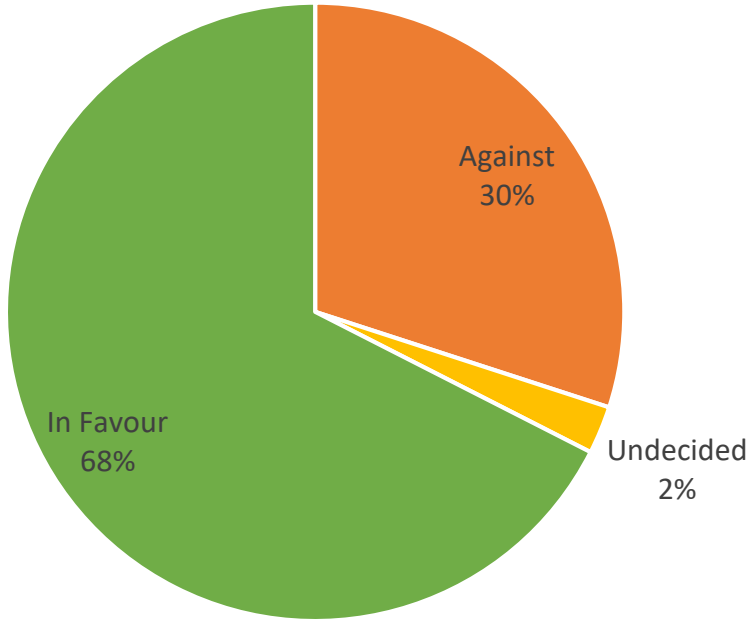
Number of Surveys: 321

Township of Puslinch Municipal Water and Sewage Feasibility Study – ICI Interest

Municipal Water Servicing



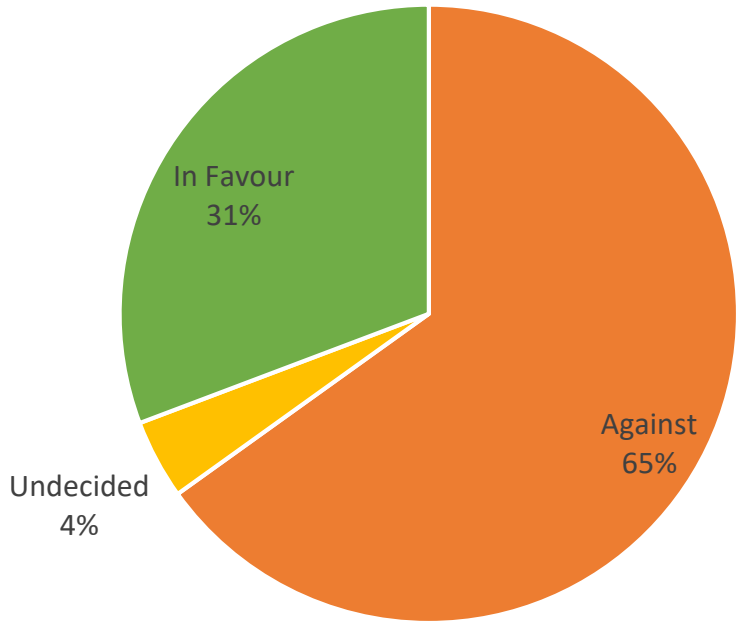
Municipal Sewage Servicing



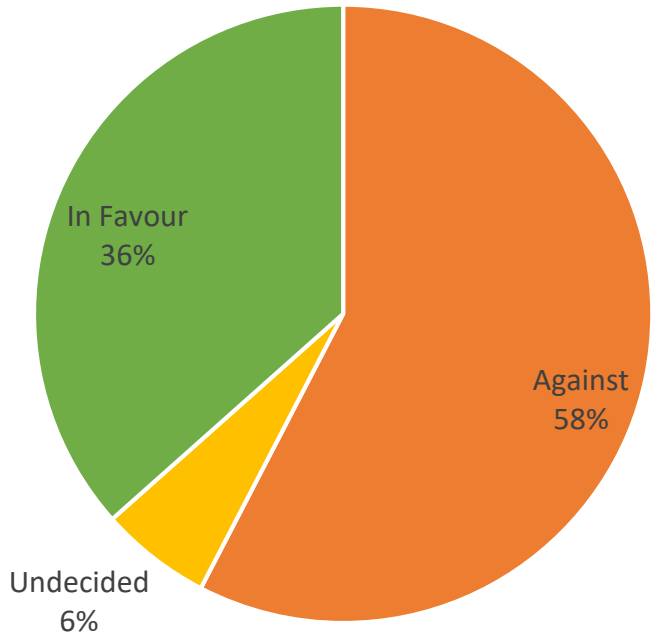
Number of Surveys: 40

Township of Puslinch Municipal Water and Sewage Feasibility Study – Combined Interest (Residential + ICI)

Municipal Water Servicing



Municipal Sewage Servicing



Total Number of Surveys: 361

THE TOWNSHIP OF Puslinch

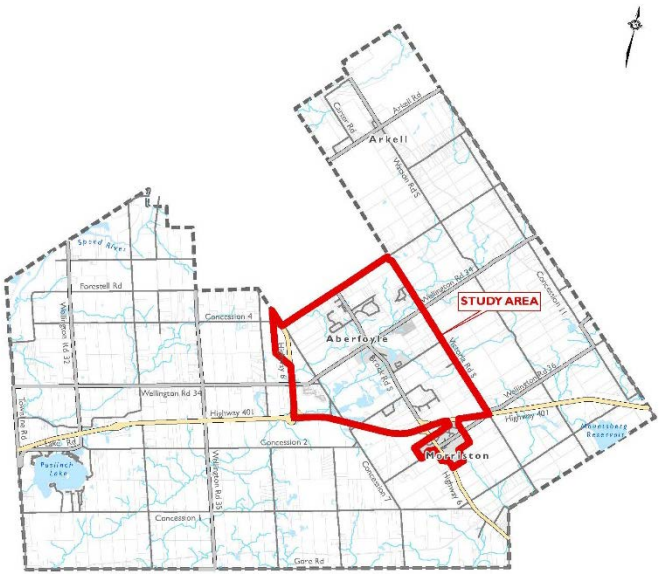
Municipal Servicing Questionnaire
For
Feasibility Study for Municipal Water and Sewage Servicing in the Township of Puslinch

Why are you getting this Questionnaire?

The Township of Puslinch is initiating a ***Feasibility Study*** to assess the viability of implementing municipal water and sewage services within key areas of the Township.

The adjacent map shows the Study Area for this project, which encompasses the key areas to be considered in the Feasibility Study for municipal servicing.

As a resident/property owner within the limits of project Study Area, the Township is interested in gauging your feedback and desire to potentially connect your property to a municipal water and sewage system, should they become available in the area.



Why are we doing a Feasibility Study?

The Township of Puslinch is surrounded by growing urban centres on all four sides with increasing demands for resources and land. The Township has been fiscally responsible on all fronts and has been operated in a very lean fashion, while keeping its rural character, protecting the agricultural land base and supporting local economic growth. The strong and established commercial and industrial base in the Township provides an opportunity to better support commercial activities and expansion through focused economic development.

Water and sewage services in Puslinch currently consist of individual on-site wells, septic systems and a few on-site small and private communal water and sewage systems. The Township has an active role in monitoring the operation and efficiency of these private systems; however, all aspects of operation, monitoring, maintenance and repairs associated with private systems, are ultimately, the responsibility of the systems' owner.

To balance commercial and residential growth and considering the importance of adequate infrastructure to economic well-being, public health and water quality protection, the Township has identified the need to conduct a ***Feasibility Study*** to investigate servicing alternatives for the provision of water and sewage services in key areas of the Township, and to explore available financial tools in preparation for the future.

THE TOWNSHIP OF Puslinch

Municipal Servicing Questionnaire
For
Feasibility Study for Municipal Water and Sewage Servicing in the Township of Puslinch

What is a Feasibility Study?

A Feasibility Study is an assessment of the viability of a proposed project or idea. The purpose of this Feasibility Study is to complete a planning level assessment of the potential for providing municipal water and sewage servicing for key areas within the Township of Puslinch. The assessment of servicing strategies will consider existing servicing schemes, current and future servicing needs, financial implications of water and sewage servicing alternatives and public interest in municipal servicing.

A Public Information Centre (PIC) will be held as part of this study to discuss the servicing alternatives under consideration and gather your feedback. The PIC is planned for Fall 2017. A separate invitation to the PIC will be sent out ahead of the meeting with details on date, time and location of the meeting.

Please be aware that if the Feasibility Study determines that municipal water and sewage servicing is feasible, a ***Municipal Class Environmental Assessment (Class EA) Study*** will need to be completed before the Township can proceed with implementation of any works. Additional public communication and consultation will be carried out during the Class EA study to inform the public and provide additional opportunities for public participation in the study.

Why is your opinion important?

The Township appreciates that not everyone may want to connect to municipal systems. To confirm future servicing needs for the study area, the Township would like to get a sense of how many private property/system owners desire to be provided with municipal servicing. Your opinion will also allow the project team to evaluate the potential for project support and assess the implications of the servicing alternatives from a socio-cultural and economic perspective.

Your response to the enclosed questionnaire is very valuable to the project team undertaking the Feasibility Study. Your response to the questionnaire does not commit you in any way for or against municipal water and sewage services. The information collected will be used solely for the purposes of this study. All personal information will remain confidential.

Contact Information

Please contact either of the project team members if you have any questions about the enclosed '***Municipal Water and Sewage Servicing Questionnaire***' or wish to obtain more information on the project:

Karen M. Landry
CAO/Clerk
Township of Puslinch
7404 Wellington Rd 34
Puslinch, ON N0B 2J0
P: 519.763.1226 ext. 214
Email: klandry@puslinch.ca

Stuart Winchester, P.Eng.
Project Manager
CIMA+
101 Frederick Street, Suite 900
Kitchener, ON N2H 6R2
P: 519.772.2299 ext. 6202
Email: stuart.winchester@cima.ca

THE TOWNSHIP OF Puslinch

Municipal Servicing Questionnaire

For

Feasibility Study for Municipal Water and Sewage Servicing in the Township of Puslinch

Please take a moment to complete the enclosed questionnaire and return it in the enclosed envelope to the attention of the Township's CAO/Clerk, Karen M. Landry, by September 22, 2017. Alternatively, you can complete the Questionnaire online at www.puslinch.ca.

Even if you are not interested in a future connection to the municipal system, your information and comments are valuable to the Township.

THE TOWNSHIP OF Puslinch

Municipal Servicing Questionnaire
For
Feasibility Study for Municipal Water and Sewage Servicing in the Township of Puslinch

Property Address: _____

Property Owner: _____ Phone: _____

Contact Person: _____ Phone: _____

Billing Address: _____

General

1. What is Your Property Type?

Residential ☐ Commercial ☐ Industrial ☐

Water Services

2. What is your ***Existing Drinking Water Source***?

Private Well ☐ Communal System ☐ Other ☐

Explain if **Other**: _____

3. If you have a private well, has the well ever gone dry or provided insufficient ***Water Quantity***?

Yes: ☐ No: ☐

Explain if **Yes**: _____

4. Has there ever been a problem with the ***Water Quality*** from your well or water service?

Yes: ☐ No:

Explain if **Yes**: _____

5. Will you be interested in a future ***Municipal Water Service Connection***?

Yes: ☐ No: ☐

Explain if **No**: _____

THE TOWNSHIP OF Puslinch

Municipal Servicing Questionnaire
For
Feasibility Study for Municipal Water and Sewage Servicing in the Township of Puslinch

Wastewater Services

6. What is your ***Existing Sewage System***?

Septic Tank / Leaching Bed ☐ Holding Tank / Hauled Sewage ☐ Other ☐

Explain if **Other**: _____

7. Have you had any problems with your septic system in the past?

Yes: ☐ No: ☐ N/A ☐

Explain if **YES**: _____

8. Has your septic tank/holding tank undergone inspection on a regular basis?

Yes: ☐ No: ☐ N/A ☐

Explain if either **YES or NO**: _____

9. If you have a leaching bed, are there any shrubs and/or trees planted over this area?

Yes: ☐ No: ☐

Explain if **YES**: _____

10. Will you be interested in a future ***Municipal Sewage Service Connection***?

Yes: ☐ No: ☐

Explain if **No**: _____

Additional Comments:

_____

_____

_____

_____

_____

THE TOWNSHIP OF Puslinch

Municipal Servicing Questionnaire
For
Feasibility Study for Municipal Water and Sewage Servicing in the Township of Puslinch

Please return your complete Questionnaire by September 22, 2017 in the enclosed envelope or complete it on-line at www.puslinch.ca.

Personal information on this form is collected under the authority of the Municipal Act. The information is used for the purpose of conducting a feasibility study for municipal water and sewage servicing and is maintained in accordance with the Municipal Freedom of Information and Protection of Privacy Act. Questions regarding the collection of this information may be directed to the Township Clerk's office.

The Township of Puslinch is committed to providing accessible formats and communication supports for people with a disability. If another format would work better for you, please contact the Township Clerk's office for assistance.

APPENDIX F
Public Information Centre Presentation and Minutes

Township of Puslinch

Feasibility Study for Municipal Water and Sewage Servicing

Public Information Centre

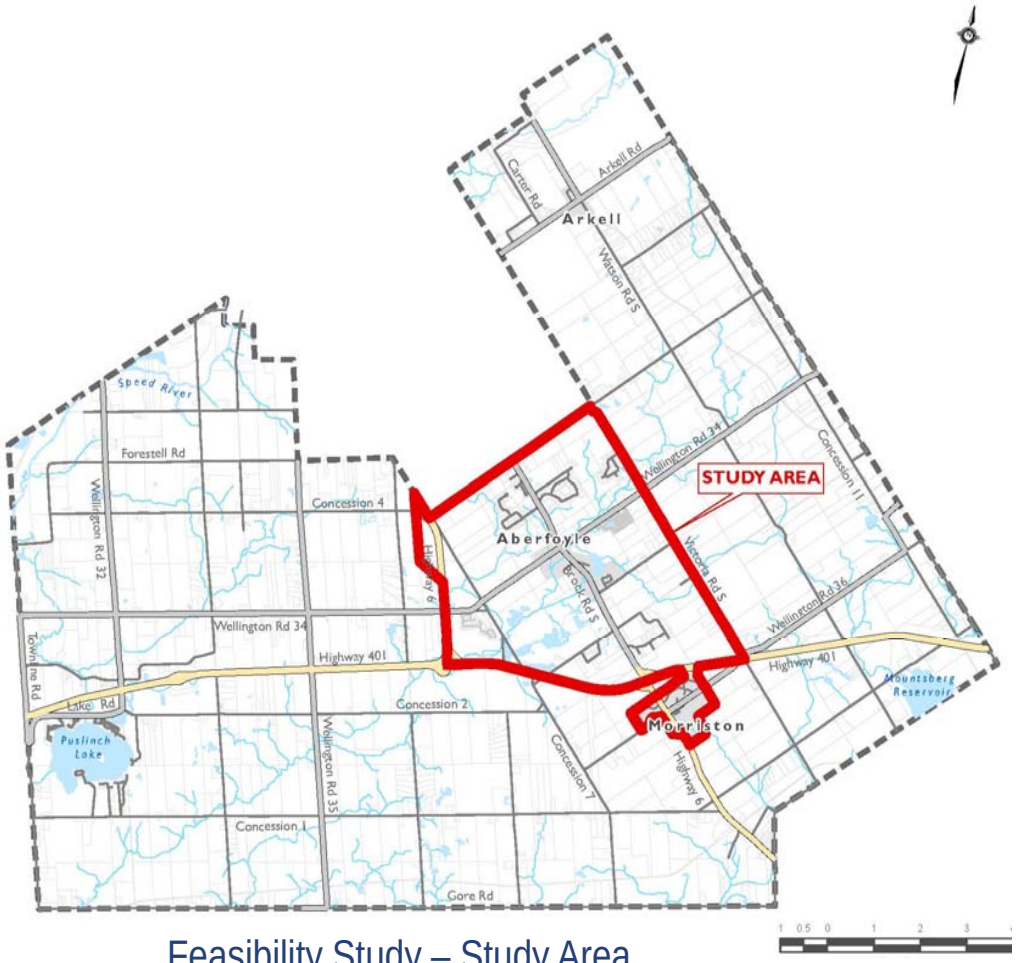
Location: Puslinch Community Centre
23 Brock Road South, Puslinch
6:30 p.m. to 8:30 p.m.

March 22, 2018

CIMA
Partners in excellence

Why are we here?

- The Township is undertaking a Feasibility Study to assess the viability of implementing municipal water and sewage servicing within key areas (see map).
  - Preliminary analysis includes servicing of entire study area. However, final analysis may result in a smaller service area (e.g., urban areas only)
- The Township is an attractive place for development; however, lack of municipal servicing limits opportunities for growth.
- The Feasibility Study will provide the basis for proceeding (or not proceeding) with any further Studies and Public Consultation that will be necessary before implementing ANY municipal water or sewage servicing solution.



Feasibility Study – Study Area

What is the Purpose of this Meeting?

- This meeting provides the public with the opportunity to:
  - Understand why the Township is undertaking this study and the scope of the study
  - Review the high-level water and sewage servicing options being considered
  - Review the key advantages and disadvantages identified for each servicing option
  - Learn about the results obtained from the Municipal Servicing Questionnaire distributed within the study area
  - Review and discuss the study with Township staff and their consultants, and any questions you may have related to the study

Preliminary Residential and Employment Projections

Projected Residential Growth – Aberfoyle and Morriston:

Urban Centre	Projected Growth / Planning Period		
	2016	2036	2041
Aberfoyle[1]	325	345	335
Morriston[1]	480	590	620

Notes:

1. Projected Residential Growth as per Wellington County Official Plan May 6, 1999 (Last Revision September 1, 2016). Includes the net undercount adjustment which is estimated at approximately 4.1%.

Projected Employment Growth – Township of Puslinch:

Urban Centre	Projected Growth / Planning Period		
	2016	2036	2041
Puslinch – Total Employment[1]	4,017	5,161	5,632

Notes:

1. Projected Employment Growth as per Wellington County Official Plan May 6, 1999 (Last Revision September 1, 2016). Includes 'no fixed place of work' employment.

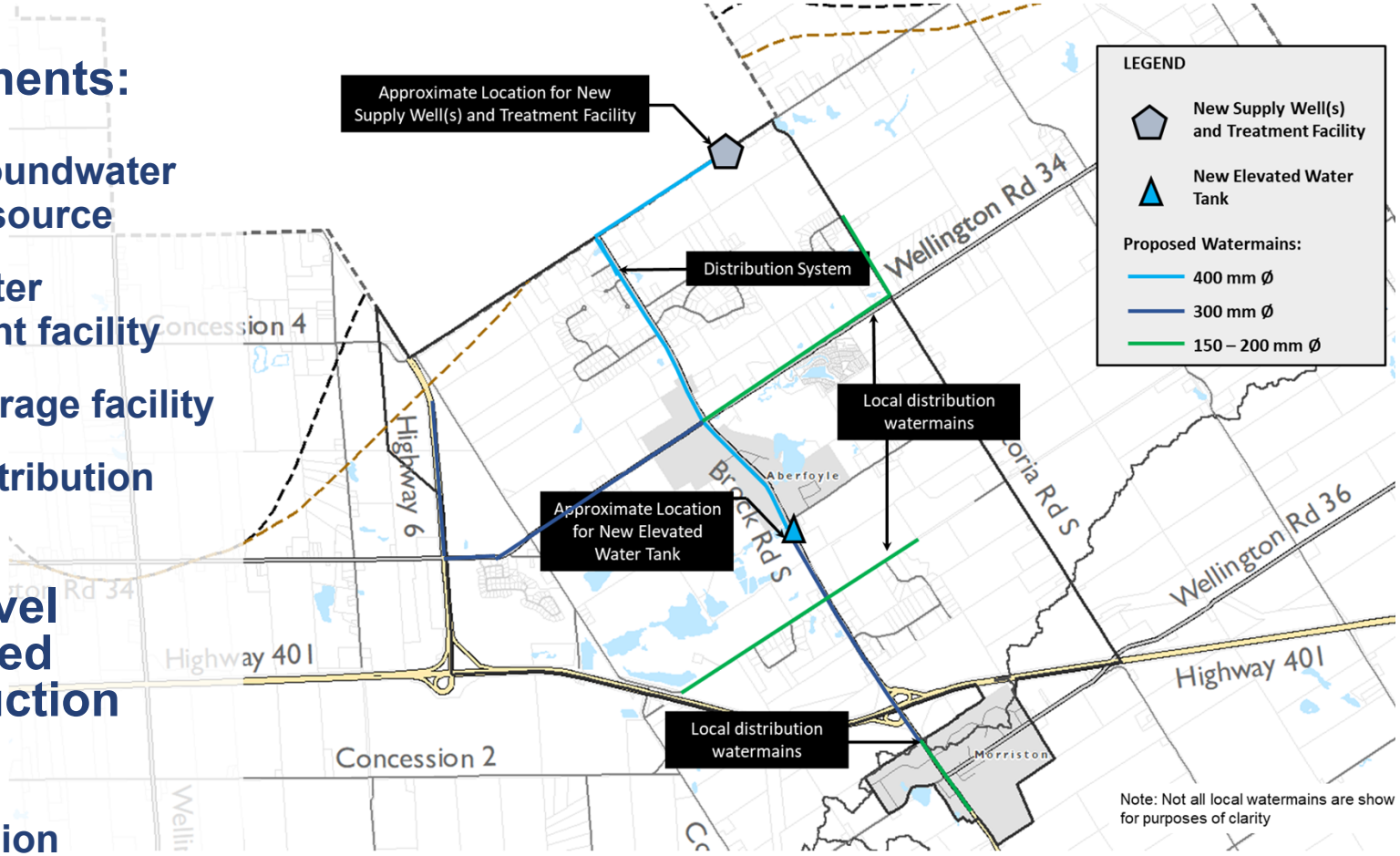
What Servicing Options have been Considered?

High-level servicing options developed for consideration in the Feasibility Study include:

- **Intra-Municipal Servicing – Servicing to be provided solely by the Township**
  - New municipal water system consisting of new well(s), treatment facility, storage, pumping and distribution
  - New municipal sewage system consisting of new pumping station(s), treatment and conveyance system
- **Inter-Municipal Servicing – Servicing to be provided jointly by Township and neighbouring municipality (i.e., City of Guelph)**
  - Connection to City of Guelph water supply and distribution system
  - Connection to City of Guelph sewage collection and treatment system

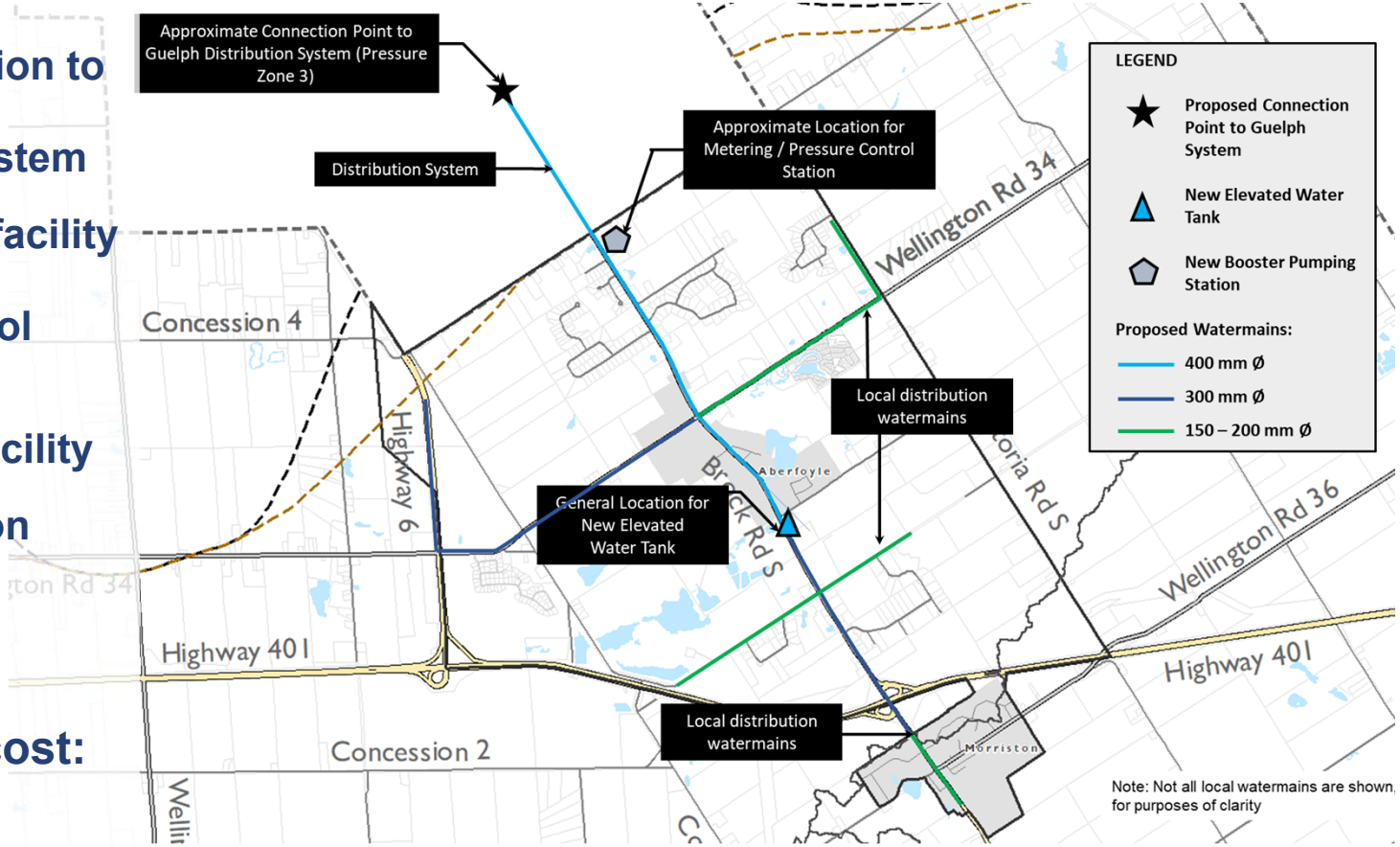
Option 1: Intra-Municipal Servicing

+ **Major components:**
  - New groundwater supply source
  - New water treatment facility
  - New storage facility
  - New distribution system
+ **High-level estimated construction cost:**
  - 34.3 Million



Option 2: Inter-Municipal Servicing

+ **Major components:**
  - Direct connection to City of Guelph distribution system
  - New metering facility and potential pressure control station
  - New storage facility
  - New distribution system
+ **High-level estimated construction cost:**
  - 29.6 Million

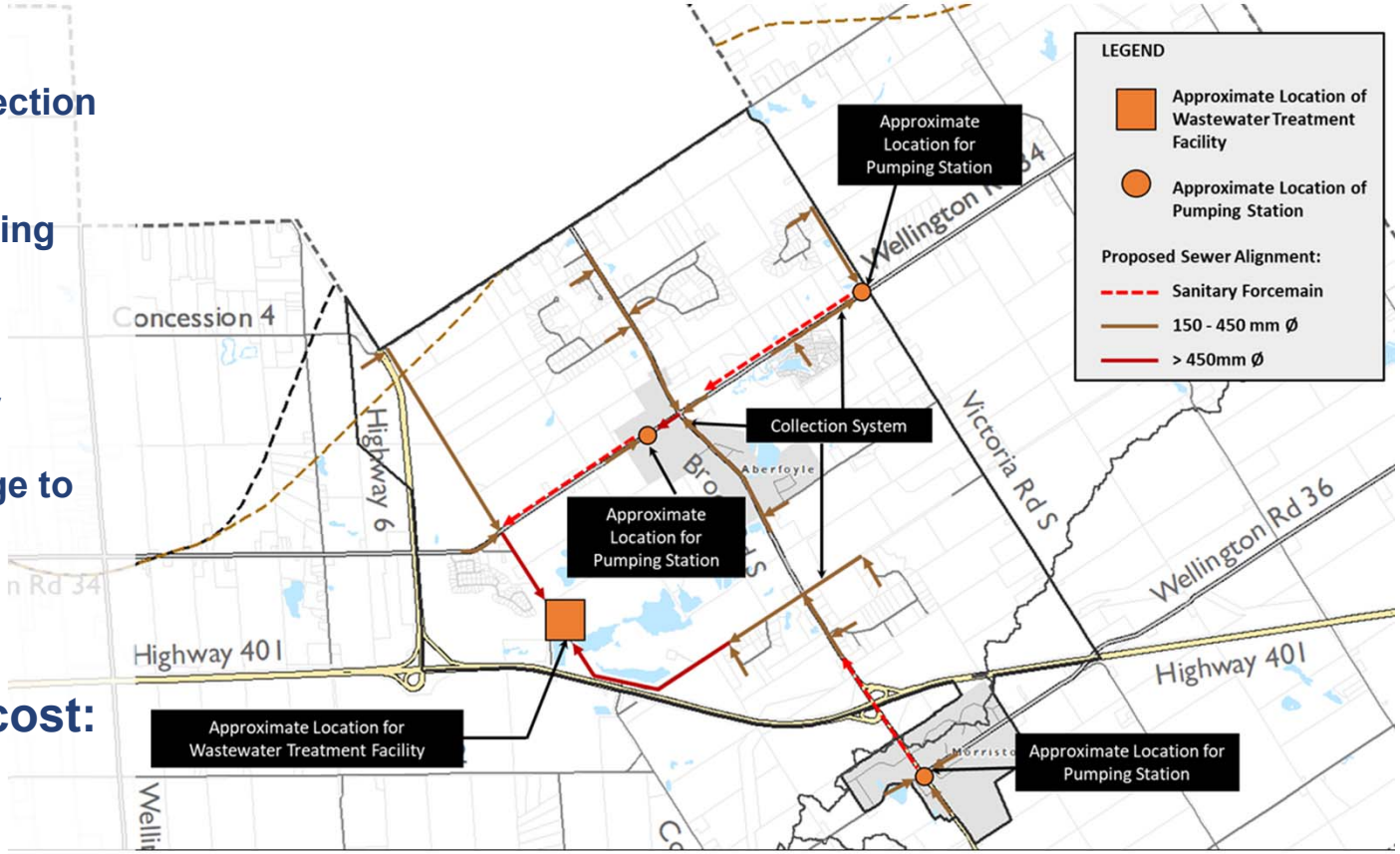


Preliminary Assessment of High-Level Water Servicing Options

Option	Key Advantages	Key Disadvantages
Option 1: Intra-Municipal Water Servicing	• Completely independent system – greater local control	• Higher capital, O&M and Life Cycle Cost • Requires larger amount of new infrastructure
Option 2: Inter-Municipal Water Servicing (through City of Guelph)	• Lower capital, O&M and Life Cycle Cost • Optimizes use of existing infrastructure (within Guelph) • Guelph has a proven track record of providing high quality drinking water • Economy of scale may be realized with Joint Supply system • May improve opportunities for funding assistance with joint Projects • Bulk water rates may be set, thereby establishing more predictable O&M costs	• Upgrades to infrastructure in the City may be required – cost unknown at this time and may be significant • Bulk water supply rates are unknown at this time • Need for an inter-municipal servicing agreement (Guelph & Puslinch)
Common to both Options	• Municipal water and sewage servicing encourages developers to invest and promote growth in the Township • Amendments to Official Plan and Secondary Plans may be required • Existing private and communal wells to be decommissioned • Cost of extending private water service and connection to existing plumbing is in addition to the estimated costs	

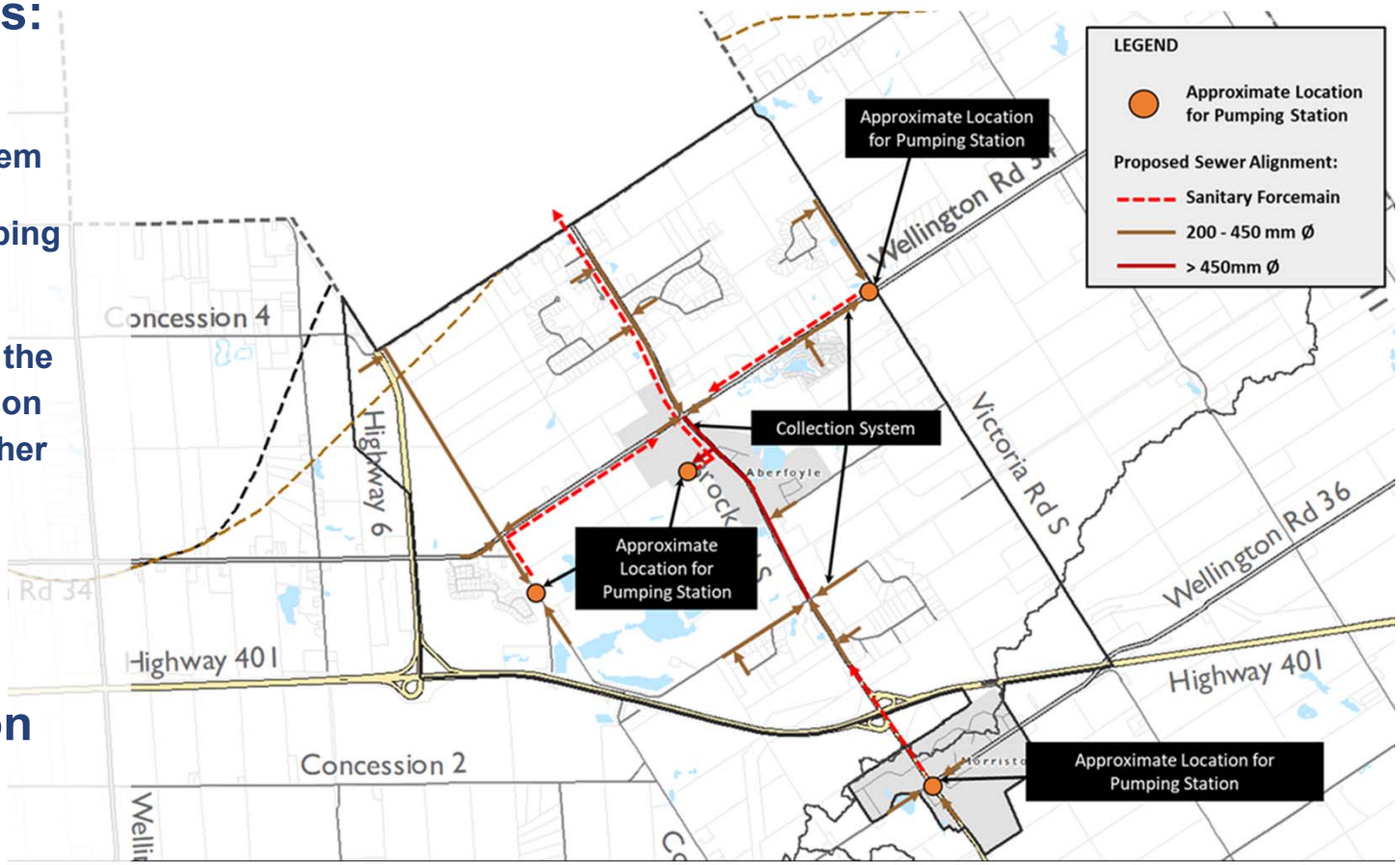
Option 1: Intra-Municipal Servicing

+ **Major components:**
  - New gravity collection system
  - Three new pumping facilities
  - New wastewater treatment facility
  - Effluent discharge to Mill Creek
+ **High-level estimated construction cost:**
  - 66.6 Million



Option 2: Inter-Municipal Servicing

+ **Major components:**
  - New gravity collection system
  - Four new pumping facilities
  - Discharge into the Guelph collection system for further treatment and disposal
+ **High-level estimated construction cost:**
  - 43.5 Million



Preliminary Assessment of High-Level Sewage Servicing Options

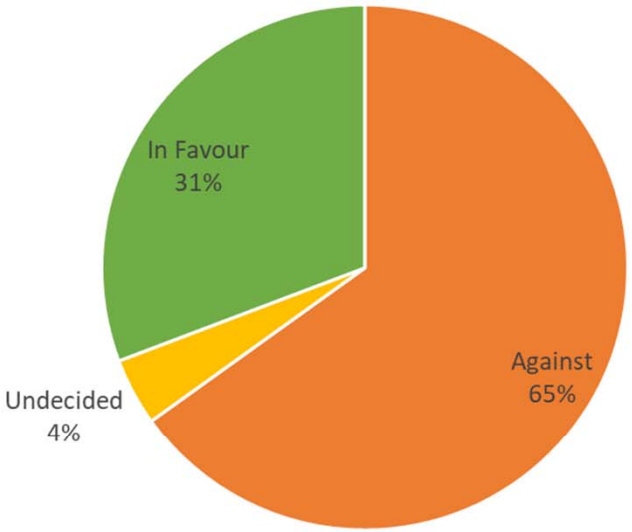
Option	Key Advantages	Key Disadvantages
Option 1: Intra-Municipal Sewage Servicing	• Completely independent system – greater local control for Puslinch residents	• Highest capital, O&M and Life Cycle Cost • Requires larger amount of new infrastructure in Puslinch • Assimilative capacity of receiving stream may be a limiting factor – alternate discharge location or higher quality effluent may be needed – cost implication
Option 2: Inter-Municipal Sewage Servicing (through City of Guelph)	• Lower capital, O&M and Life Cycle Costs • Lower operational requirements for the collection system • Economy of scale may be realized with Joint Wastewater Treatment system • Provides an opportunity for Joint Funding applications • Known wastewater rates will assist in establishing predictable O&M budgets	• Upgrades to infrastructure in the City may be required – cost unknown at this time and may be significant • Need for an inter-municipal Servicing Agreement (Guelph & Puslinch)
Common to Both Options	• Municipal water and sewage servicing encourages developers to invest and promote growth in Township • Amendments to Official Plan and Secondary Plans may be required • Existing private and communal waste disposal systems to be decommissioned • Cost of Private building drain construction is in addition to the estimated costs	

Municipal Questionnaire – Survey Results

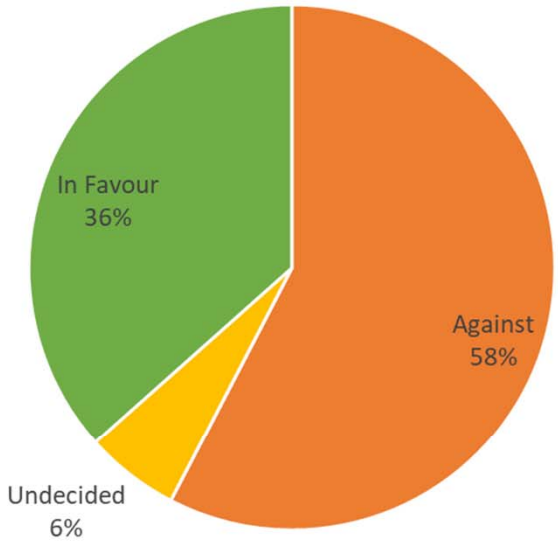
CIMA
Partners in excellence

Questionnaire – Combined Results (Residential & ICI)

Municipal Water Servicing



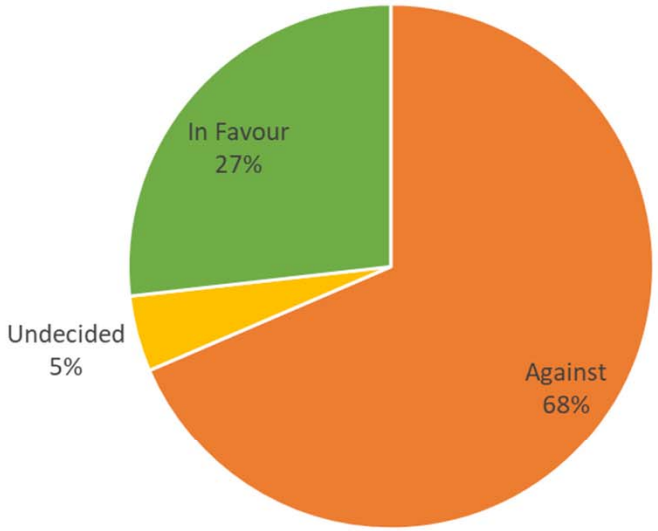
Municipal Sewage Servicing



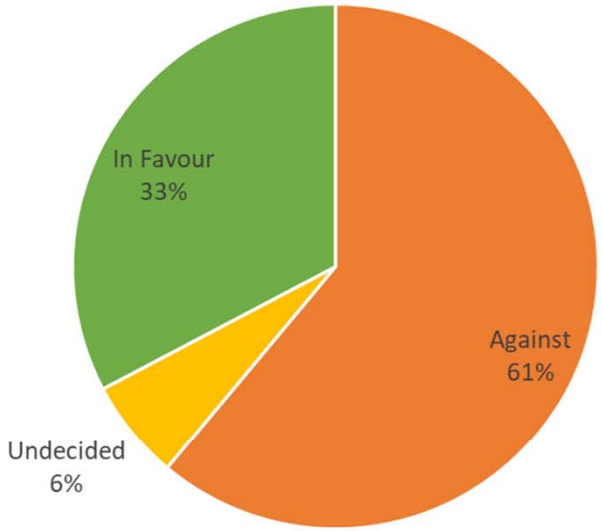
Total Number of Surveys Received: 361

Questionnaire – Residential Results

Municipal Water Servicing



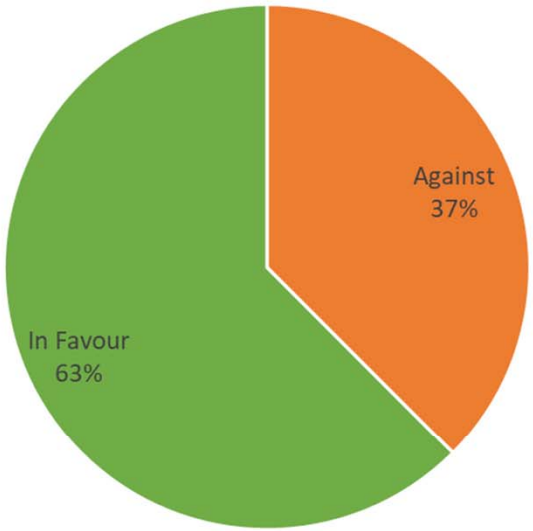
Municipal Sewage Servicing



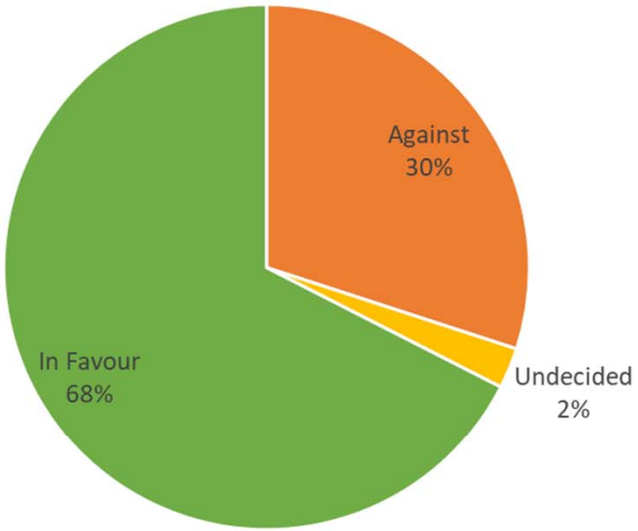
Number of Residential Surveys Received: 321

Questionnaire – ICI Results

Municipal Water Servicing



Municipal Sewage Servicing



Number of ICI Surveys Received: 40

Next Steps

April 2018	– Received comments from this Public Meeting – Finalize Feasibility Study Report
Spring / Summer 2018	– Council Approval of Decision (i.e., to proceed with further Study or not to proceed with further Study)
2019 – 2021	– Class EA Study Completion (subject to Council approval and budget allocation)

* Dates are preliminary and subject to change

Project Contacts

- For more information about this project, or to view the Public Information Centre displays online, please visit our website:

  http://www.puslinch.ca/en/living-here/feasibility-study-for-municipal-water-and-sewage-servicing-.asp

- Should you have any questions or concerns about this study, please contact:

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THE CORPORATION OF THE TOWNSHIP OF PUSLINCH
PUBLIC INFORMATION CENTRE MINUTES

DATE:	**Thursday, March 22, 2018**
TIME:	**6:30 p.m. to 8:30 p.m. – Presentation at 7:00 p.m.**
PLACE:	**Archie MacRobbie – Puslinch Community Centre Chambers**
FILE NUMBER:	**Feasibility Study – Water and Wastewater Services**
MEMBERS:	**Mayor Dennis Lever** **Councillor John Sepulis** **Councillor Matthew Bulmer** **Councillor Susan Fielding, regrets** **Councillor Ken Roth, regrets**

The Mayor called order for the commencement of the presentation at 7:00 p.m.
The Mayor initiated the meeting by describing how the need and scope of the feasibility study originated. He indicated that the Community Based Strategic Plan and the Business Retention and Expansion Study, completed for the Township, identified municipal servicing as one of the key drivers for businesses in the area to justify potential expansion of their businesses. The Township decided to look if there were any options on the table and identified the need to complete a Feasibility Study to look at potential options. The Mayor further indicated that no decisions have been made and that Council will look at the outcome of tonight's' Public Information Centre before making a decision. Council's decision could be to revise the study area to include only commercial and industrial areas and exclude residential areas. The purpose of the public information centre was to bring everyone up-to-date.

Presentations:

Stuart Winchester, CIMA, consultant for the Township presented the following information:

- The Township is undertaking a Feasibility Study to assess the viability of implementing municipal water and sewage servicing within key areas as identified in the Study Area map
- The preliminary analysis includes servicing of the entire study area. However, final analysis may result in a smaller service area. (e.g. urban areas only)
- The Township is an attractive place for development; however, lack of municipal servicing limits opportunities for growth
- The Feasibility Study will provide the basis for proceeding (or not proceeding) with any further Studies and Public Consultation that will be necessary before implementing any municipal water or sewage servicing solution
- This meeting provides the public with the opportunity to:
    - Understand why the Township is undertaking this study and the scope of the study
    - Review the high-level water and sewage servicing options being considered
    - Review the key advantages and disadvantages identified for each servicing option
    - Learn about the results obtained from the Municipal Servicing Questionnaire distributed within the study area
    - Review and discuss the study with Township staff and their consultants, and any questions you may have related to the study
- Projected Residential Growth – Aberfoyle and Morriston
- Projected Employment Growth – Township of Puslinch
- High-level servicing options developed for consideration in the Feasibility Study include:

  - Intra-Municipal Servicing – Servicing to be provided solely by the Township
  - Inter-Municipal Servicing – Servicing to be provided jointly by the Township and neighbouring municipality (e.g City of Guelph)
- Results of the questionnaire – combined results (Residential & ICI)
- Next Steps
  - Receive comments from this meeting
  - Finalize Feasibility Study Report
  - Spring/Summer 2018 – Council approval of decision to proceed or not to proceed with further study
  - 2019 – 2021 – If Council decides to proceed with a Class EA Study it is subject to budget allocation

Questions/Comments:

The following inquiries, comments and responses were made regarding the Township's Water and Wastewater Feasibility Study:

Q/C – Question or Comment R – Response

Q/C - What is the cost of the feasibility study and how is it funded?

R - Mayor Lever noted the cost of the feasibility study is approximately $75,000.00 with funding from other levels of government.

Q/C - How was the boundary of the study area determined?

R - The consultants together with Township staff determined the study area boundary. It was noted that Morriston was not included initially however upon review it was determined that the hamlet should be included as part of the study.

Q/C - Has the City of Guelph been contacted to determine whether they would consider or have the capacity to provide services to the Township?

R - City of Guelph staff were consulted to inquire whether they would consider providing services to the Township. City of Guelph staff advised they are open to initiate discussions and would consider a request by the Township. It was noted that Township Council would need to make a formal request to Guelph City Council to formally consider a request for services.

Q/C - Is development restricted to industrial and commercial growth? Can services be provided for the industrial and commercial sector only?

R - Residential subdivision development cannot occur outside the Township's urban boundaries. The scope of this study can be reduced to narrow consideration to providing services to the industrial and commercial area within the study boundary. This is part of the future discussions for Council.

Q/C - Does the province print their own money to fund these type of studies?

R - The province provides funding for studies supporting water and wastewater and the design and construction of infrastructure.

Q/C - The City of Guelph is challenged with supplying water for its own municipality. It has to impose water bans and restrictions. The costs to have Guelph upgrade its infrastructure to supply services to the Township could be high.

R - If the Township were to decide to request Guelph to consider providing services to the Township the costs including any upgrades to Guelph's infrastructure would need to be considered.

Q/C - Does a property owner incur costs to connect? What are the costs to connect?

R – There would be costs to a property owner to connect to the service. A cost to connect is not available at this time, as the feasibility study does not include detailed costing estimates. Detailed costing estimates and recovery options such as development charges and other funding sources are examined through the Class Environmental Assessment process.

Q/C - If the capital costs are not known we cannot provide an opinion on whether we support it or not. What will be our capital cost?

R – The Mayor reiterated that capital costs for connections are unknown at this point. Initial studies indicated future concerns for the Township for water and wastewater servicing and they thought that an analysis of the options was needed through a Feasibility Study.

Q/C – We have been affected by a well that was installed and I am worried about my water. Aquifer depletion is a problem for the Township. All of sudden we will have development and be under pressure to grow. I like living in a rural place.

Q/C – Is it legally possible to require a property owner to decommission a private system? What will Nestle do? Will you drive them away if they are forced to connect?

R – The Township has the ability to obligate a property owner to connect to its system, if desired so. The Province has a mandate where properties fronting municipal infrastructure are required to connect to the system. The Township does not know what Nestle will elect to do.

Q/C – The Town of Erin is going through the same thing right now and it is estimated to cost a property owner $20,000 to $30,000 to connect. By looking at the survey results, who created the Questionnaire?

R –The Questionnaire was produced, by the Project Team, early on in the study before the servicing options were developed. The intent of the questionnaire was to philosophically know whether there was an interest or not within the study area. If the Township decides to proceed with a Municipal Class Environmental Assessment Study, more detailed capital cost estimates and recovery plan can be developed as well as the costs per connection.

Q/C – How many questionnaires were circulated and what was the response rate?

R – Approximately 969 questionnaires were circulated including residential, industrial, institutional and commercial users.

Q/C – Is growth the reason for doing this? Has the growth between Trafalgar and Guelph Line been taken into consideration as part of this study?

R – The growth between Trafalgar and Guelph Line was not considered as part of this study.

Q/C – The cost of 80 to 100 million dollars will be borne by the residents in the area. How is cost recovery determined and how is funding assistance from other levels of government obtained?

R – It was noted that capital cost recovery options would be established during the Class Environmental Assessment process. Should the Township proceed with a Class Environmental Assessment Study, available funding opportunities, including potential for development charges and funding systems from senior levels of federal and provincial governments will be investigated. It was also noted that water and waste water systems are segregated and treated separately from the Township's tax levy budget.

Q/C – I don't get it. Everyone has a well and septic system and I have not heard any complaints about what we currently have. Morriston will only grow by about 140 homes, so who is this for? Is it new huge development that requires municipal servicing?

R – The Mayor reiterated that, as explained at the beginning of the meeting, there was a general concern raised by residents at large within the Township, about water and wastewater servicing, which came through completion of the Township's Community Based Strategic Plan and the Business Retention and Expansion studies. The general concern supported the need to undertake the feasibility study for municipal services, but the goal is not to encourage massive development. The Province establishes limits on growth for every municipality. It was further noted that the Township is having this public information centre to bring everyone up-to-date.

It was stated that out of $2.2 Billion in weighted assessment the commercial/industrial sector contributes approximately $500 million which has a significant positive impact by shifting the burden away from the residential tax-payers.

Q/C – A petition was put together after receiving the questionnaire and it will be presented to Council in the next month or so. Concerns were expressed with respect to creating urban sprawl. Over 95% of people in the Morriston area are in opposition and the majority are happy with the Status Quo. It was stated that the questionnaire was loaded and leading.

Q/C – It was stated that today is International Water Day. Is Nestle going to be on a water meter?

R – It has not been decided whether there is going to be a system and who will be connecting to it. Nestle has their own wells; however, they have expressed an interest in water supply for domestic purposes.

Q/C – The price to connect in Guelph was approximately $20,000 seven years ago for properties located approximately 50 feet away from the road. The cost to connect now would not be any less than that.

Q/C – Are the estimates based on future dollar values?

R – The estimates are in 2018 dollars.

Q/C – I am new to the community and I am not in favour of connecting. I would like to thank Council for providing stewardship and doing its job by exploring options as they have an obligation to look to the future. Even if we disagree, we need to thank them.

Q/C – Since 1987 I have been jaded by the tendering process and typically these numbers mean nothing. The tendering process worked well until about 15 years ago.

Q/C – Guelph has a major intensification program and wants to get to the 401, Aberfoyle gets in the way. Guelph water has to be filtered and smells. My well water is clear and pure and I do not have the money to connect. I would need to leave my house if I am obligated to decommission and connect.

Q/C – How much commercial/industrial vacant land is left? What are the lands in the area of the Hanlon zoned as?

R – The Township does not have very much industrial/commercial land left for development. The lands in the immediate area of the Hanlon are designated Rural Employment under the County's Official Plan.

Q/C – Inquired as to how Mill Creek could even receive discharge. What is the projected flow of sewage?

R – A site selection process has not been completed. At this time for the purposes of the feasibility study a general site location in the study area was selected. Mill Creek may be a potential discharge location but other receivers may be utilized, whether it is feasible or not would have to be established in future studies. A site selection process would be evaluated through the completion of a Class Environmental Assessment.

Q/C – The Feasibility Study lacks a major point – What is Guelph going to ask? Are we going to take our water back from Guelph? As a former resident of Guelph, they currently lack water resources and struggle to provide their own residents.

R – The City of Guelph has completed a Water Supply Master Plan which identified potential for new wells regarding the future supply of water for the City and its development. It was noted that 50 percent of Guelph's water supply is sourced through the Arkell springs area.

The Township could consider as part of a Class Environmental Assessment supplying water to Guelph.

It was stated that the undertaking of a Class Environmental Assessment costs hundreds of thousands of dollars. The Township would seek grant funding from other sources of government if it decides to proceed with a Class Environmental Assessment.

Q/C – Other than the costs for completing the feasibility study, what other advantage is your firm receiving?

R – No other advantage is given. If the Township decides to proceed with a Class Environmental Assessment it would issue a "Request for Proposal" for completion of the work.

Q/C – I am opposed to municipal services, there is so much that is unknown. What are the next steps for Council?

R – The consultant will complete the feasibility study and it will be presented to Council in the Spring/early Summer of 2018 for consideration. Council will review the outcome of the meeting and decide if it will go any further and how it will pay for any additional work/studies.

Q/C – Was the questionnaire the same for commercial lands and residential lands? I think there was a misunderstanding of the questionnaire.

R – The questionnaire was the same for all land owners in the study area.

Q/C – I noticed a theme in the questionnaire and explanatory material to promote an opportunity for growth. Can you clarify the position of growth?

R – Current legislation does not permit residential (subdivision) growth outside an urban boundary.

The Township as part of this study is considering the impacts on industrial and commercial growth within the study area which includes lands in the area of the Hanlon. This is being considered because of the impact on jobs and on the tax ratio between residential and commercial. The Township has industrial lands and they will encourage industrial and commercial development because of the tax ratio. Industrial and commercial users have a much higher tax rate than residential users and thus, they make up a bigger part of the taxes. Industrial and commercial users make up a significant part of the tax base. Any increase in expenses in the future will need to be absorbed by residents if the Township doesn't encourage industrial/commercial growth.

Q/C – Would it be logical to accommodate growth for the commercial and industrial sector but not at the expense of the residential tax payer?

Q/C – Are you going to include water services for fire hydrants.

R – A decision has not been made. If the Township decides to proceed with a Class Environmental Assessment, a Municipal decision with respect to provision for fire protection would need to be made, as well as the level of service and what areas will get it.

Q/C – How would growth be allocated if services were in place? How is growth allocated?

R – The province advises the County of the projected growth to be allocated to the County. The County then distributes growth to the local municipalities in the County. For example, Centre Wellington has been assigned to receive most of the projected growth.

Q/C – The Township should pursue servicing only for industrial and commercial development. The Township should utilize the 401 corridor for industrial and commercial development.

Q/C – The Township is in a good location to support distribution and warehouse development. The Township has a difficult job with the recent changes regarding the natural heritage system, greenbelt and prime agricultural land.

Q/C – Do we know how many people reside and also work in the Township?

R – The Township does not have this information.

Q/C – If the Township was to provide services just to the industrial and commercial lands in the 401 area and services run along Brock Road would residential properties that front on Brock Road pay the same connection cost as an industrial/commercial property?

R – As part of a Class Environmental Assessment the Township would determine what properties would be required to connect and costs. A Capital Cost Recovery Plan would be established and will determine the cost per connection for industrial only and for industrial and residential. A range of cost recovery options will need to be established because the demands would be different for different users. However, whether you connect or not, there is value gained from municipal services.

Q/C – Why did Maple Leaf Foods choose to locate in Puslinch over Guelph?

R – The land in Guelph was more expensive. Maple Leaf had other site selection criteria to consider including proximity to a highway for long combination vehicles.

Q/C – If residential water and wastewater services are installed I am going to have to sell. Who is then going to want to buy my home?

Q/C – The Township needs to consider whether this area can support more water taking. If the City of Guelph is suffering with growth, how are we going to be able to support waste management with a fraction of Mill Creek. The Township needs to consider the physical environment.