Cookstown Water Pollution Control Plant
Class Environmental Assessment

Environmental Study Report

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Volume 1 of 3

Environmental Study Report

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Executive Summary

InnServices Utilities Inc. (InnServices) has completed a Schedule C Class Environmental Assessment (Class EA) for the Cookstown Water Pollution Control Plant (WPCP). The Cookstown WPCP currently provides wastewater servicing to lots within the Cookstown settlement boundary. The WPCP is an extended aeration plant with effluent storage lagoons and seasonal effluent discharge to Innisfil Creek. The Highway 400 & Highway 89 area is serviced by private systems. The Study Area includes both areas within the current settlement boundary for Cookstown as well as the Highway 400 & 89 Employment Lands.

The objective of the Class EA study was to develop the most cost effective, environmentally sound, and sustainable approach to meet future wastewater servicing requirements in the community of Cookstown and the Highway 400 & 89 Employment Lands. The projected 2051 average day flow (ADF) of 1,864 m^3/d exceeds the existing Cookstown WPCP ADF capacity of 825 m^3/d. As a result, additional wastewater servicing capacity must be provided to accommodate planned growth in the Study Area.

The Cookstown WPCP is located on the south side of Victoria Ave at the south end of the community of Cookstown. Land use to the south, east and west of the WPCP site is agricultural, with a mix of existing residential and future potential residential development to the north. Land designated Open Space (OS) is located at the northwest corner of the site, consisting of the Cookstown Trans Canada Trail. The outfall route, located along road rights-of-way as shown in Figure ES.1, is bounded by residential, rural residential and agricultural land, with environmental protection areas in the vicinity of Innisfil Creek.

Public and stakeholder consultation was conducted throughout this study. A Notice of Commencement was issued in December 2023, Public Information Centre (PIC) No. 1 held in November 2024 and PIC No. 2 held in June 2025. Comments received from review agencies, the general public, and Indigenous communities have been documented and addressed throughout this Class EA Study.

Alternative wastewater servicing solutions and design concepts were developed and evaluated based on their natural, social / cultural / community, economic and technical impacts. Alternative solutions considered included optimizing the existing WPCP, conveying flows to the Lakeshore WPCP, constructing a new WPCP, and upgrading and expanding the existing WPCP. In addition, alternative effluent receivers were also considered, namely: Innisfil Creek, the existing receiver; Nottawasaga River; and, Lake Simcoe. The preferred solution was to upgrade and expand the Cookstown WPCP with effluent discharge to Innisfil Creek.

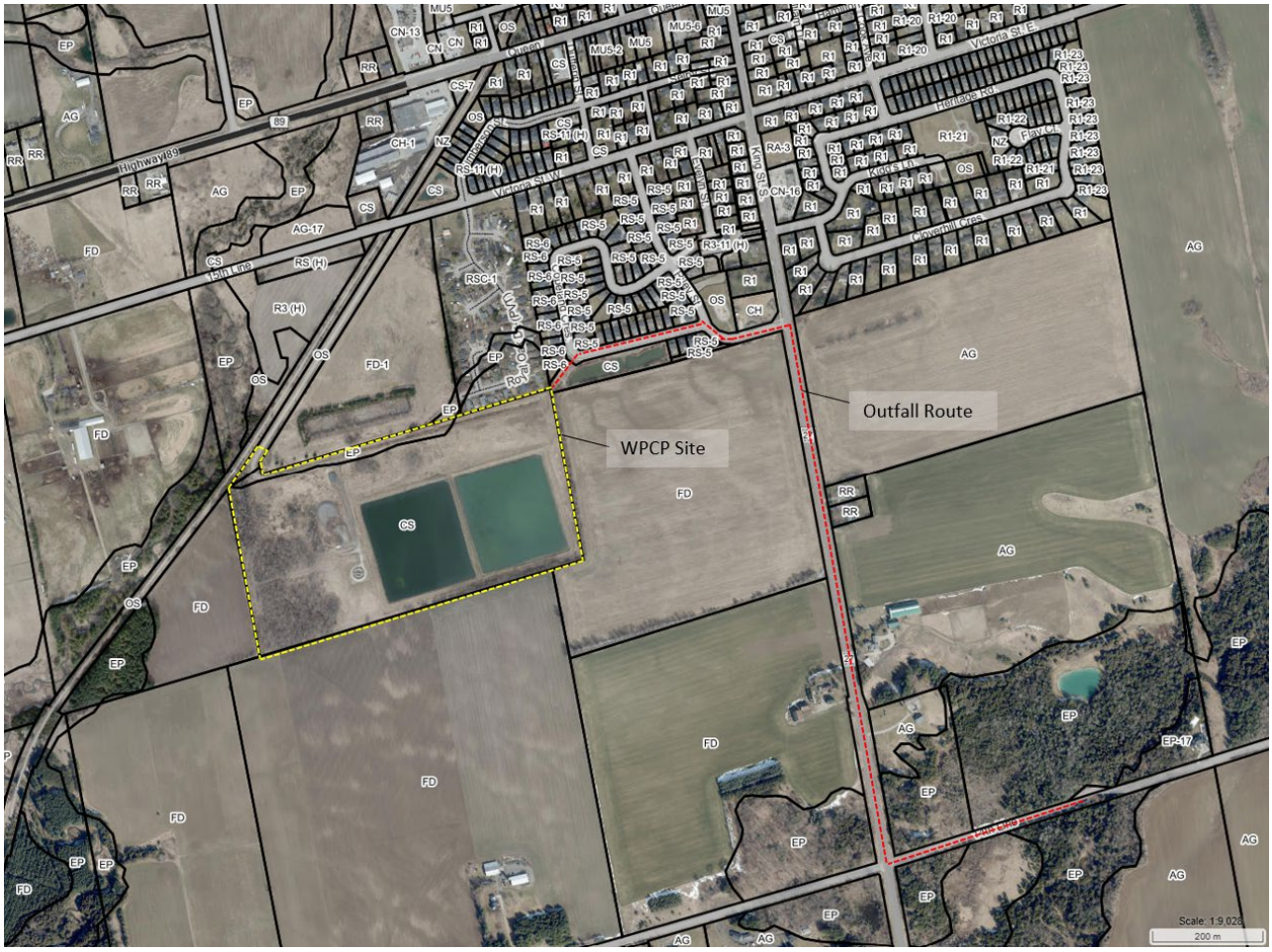

Figure ES.1 – Land Uses Adjacent to the Existing WPCP Site and Effluent Outfall Route

An analysis of the assimilative capacity of Innisfil Creek was undertaken to determine appropriate effluent discharge requirements for an upgraded and expanded Cookstown WPCP. This involved a combination of desk-top and field studies, as well as consultation with both the Ministry of the Environment, Conservation and Parks (MECP) and the Nottawasaga Valley Conservation Authority (NVCA). Proposed effluent requirements considered extensive analysis of water quality and flows in Innisfil Creek. Proposed effluent discharge rates were based on maintaining adequate dilution ratios at all times, while also ensuring sufficient base flow available in the receiver to accommodate the increased capacity of the Cookstown WPCP. MECP approved the proposed effluent requirements for an upgraded and expanded Cookstown WPCP.

Alternative design concepts for the upgrade and expansion of the Cookstown WPCP were developed. Technologies considered included: extended aeration with tertiary filtration; moving bed biofilm reactor (MBBR) with tertiary filtration; membrane bioreactor (MBR); and, conventional activated sludge (CAS) with tertiary filtration. The short-listed design concepts were evaluated based on their natural, social / cultural / community, economic

and technical impacts. The preferred solution was extended aeration with tertiary treatment, with the selection of tertiary treatment and biosolids storage technologies to be made during preliminary design. The preferred design concept includes:

- Upgrades to the on-site sewage pumping station (SPS);
- A new headworks providing screening and grit removal, as well as an odour control system with a minimum 80% odour reduction efficiency;
- Two new bioreactors, operating in parallel and equipped with a new diffused aeration system, to provide biological oxidation;
- Two new secondary clarifiers, operating in parallel, to provide solids separation;
- A new tertiary filtration system, such as shallow bed granular media filters or deep-bed granular media filters, and sized to accommodate the projected design peak flow capacity to provide tertiary level solids removal;
- Maintaining the existing lagoons for effluent storage;
- A new diversion tank and effluent pumping system to allow effluent to be directed to and pumped from the effluent storage lagoons;
- A new UV disinfection system;
- Upgraded effluent outfall piping to Innisfil Creek along the existing outfall path;
- Converting the existing bioreactor and secondary clarifier tankage into a two-stage aerobic digester for sludge digestion;
- A new biosolids storage system, such as aerated liquid biosolids storage tanks or a geotextile dewatering and storage system, to provide on-site biosolids storage capacity;
- New building(s) to house the headworks equipment, blowers, tertiary treatment, and chemical feed systems; and,
- Upgrades to the standby power system as required, including replacing the existing diesel generator with a new, larger unit or providing an additional diesel generator; and,
- Other upgrades necessary, including but not limited to electrical and/or access road modifications or improvements.

Figure ES.2 presents the preferred alternative design concept layout for upgrades to the Cookstown WPCP. The site layout will be finalized during the preliminary and detailed design stages. The existing outfall route is shown in Figure ES.1.

Figure ES.2 – Conceptual Level Upgrades to the Cookstown WPCP

Based on the conceptual level layout of the preferred design concept (Figure ES.2), it is anticipated that all of the upgrades can be accommodated on the previously disturbed area of the Cookstown WPCP site. As such, a Stage 2 Archaeological Assessment is not required at this time. Potential impacts during construction and proposed mitigation measures were identified, and air quality impact assessment completed.

To accommodate the approved flow weighted effluent discharge approach for the expanded Cookstown WPCP, a permanent flow monitoring station in the vicinity of the outfall is required. Two potential locations for a permanent flow monitoring were evaluated: at the 14th Line bridge crossing; and, the at the 15th Line bridge crossing. Selection of the preferred monitoring location will be completed during preliminary design.

Finally, the feasibility of conveying wastewater from the Highway 400 and 89 area was assessed. A feasible conceptual level conveyance option was developed, consisting of the following:

- Two new SPSs (“East SPS” and “West SPS”) located to the east Highway 400 (within the projection of the 15th Line right-of-way) and to the west of Highway 400 (within the 15th Line right-of-way).
- A force main from the West SPS travelling west along 15th Line to the crest of the hill on Victoria Street East. The force main will cross a bridge over Innisfil Creek and a major natural gas pipeline to the east of Cookstown.

- Gravity sewer on Victoria Street to the Cookstown Trans Canada Trail, and south on the Cookstown Trans Canada Trail to the main SPS at the Cookstown WPCP.

Figure ES.3 presents the feasible conceptual level conveyance option. While an evaluation of local collection system needs in the Highway 400&89 Employment Lands was beyond the scope of the feasibility assessment, selection of a specific technology will not impact the feasibility of the conveyance option, nor will it impact the preferred servicing solution for the Cookstown WPCP.

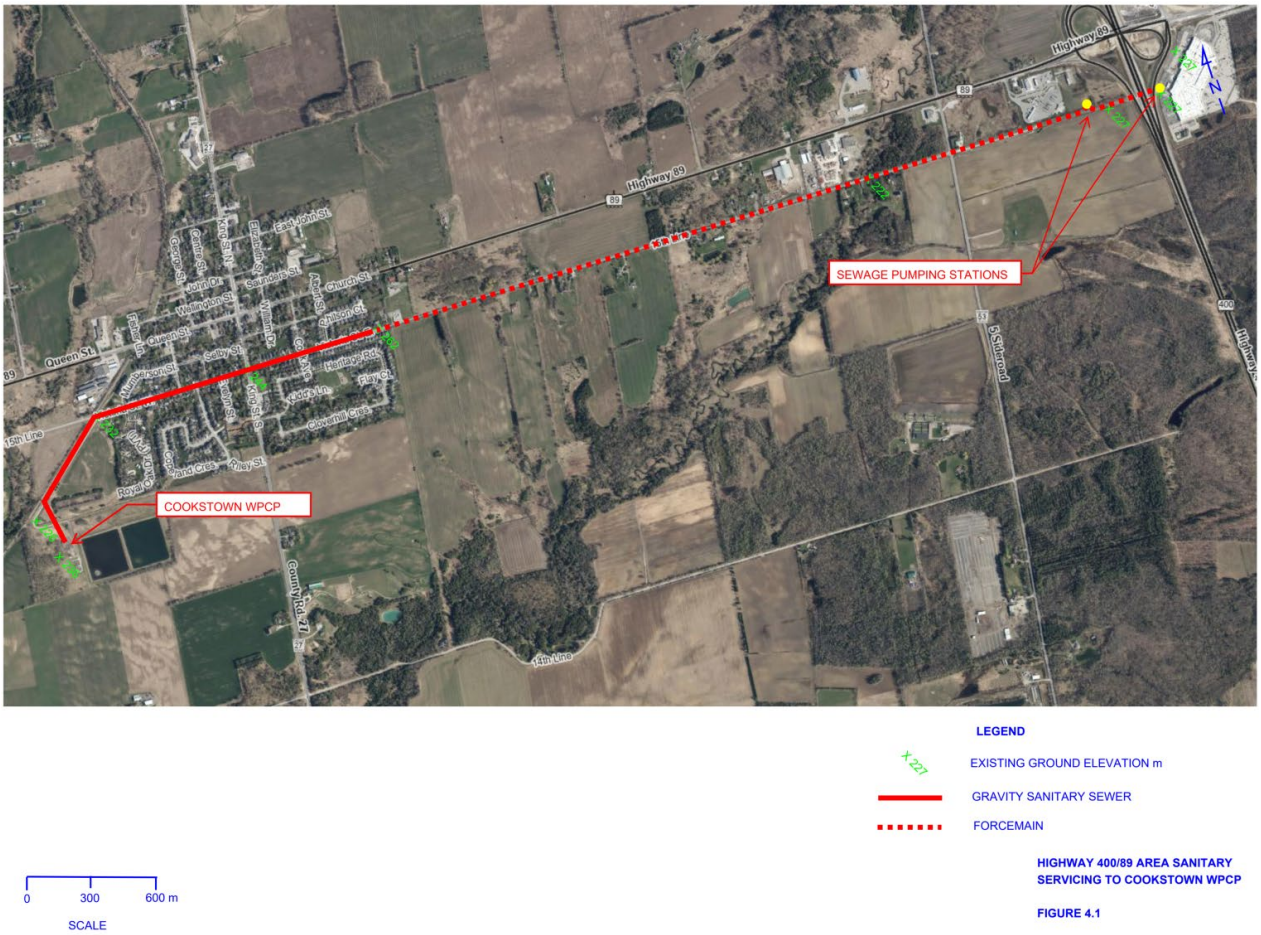

Figure ES.3 – Conceptual Level Wastewater Conveyance Option for the 400&89 Employment Lands

Although a feasibility assessment was completed, the analysis does not satisfy the Class EA requirements associated with new main SPSs and force mains / gravity sewers. Therefore, extending servicing to the Highway 400&89 Employment Lands will require future studies.

The estimated conceptual level capital, annual O&M and life cycle cost of the proposed upgrades to the Cookstown WPCP are presented in Table ES.1. Further studies are needed to confirm the upgrades and upsizing required for the Cookstown sanitary sewer system to meet future Cookstown growth within the settlement boundary.

Table ES.1 – Conceptual Level Capital, O&M and Life Cycle Costs Associated with Upgrading and Expanding the Cookstown WPCP

Cost Item	Conceptual Level Cost Estimate
Estimated Capital Cost	$45.2M
Estimated Annual O&M Cost	$1,051K
Estimated Net Present Value of O&M Costs to 2051	$34.4M
Estimated Life Cycle Cost to 2051	**$79.6M**

Notes:

All costs in 2025 Canadian dollars excluding HST.

Costs do not include improvements to the existing Cookstown sanitary collection system.

Additional details provided in Appendix N.

The estimated capital costs associated with both the proposed upgrades to the Cookstown WPCP and conveyance of wastewater from the Highway 400&89 Employment Lands are provided in Table ES.2. The costs associated with conveyance from the Highway 400&89 Employment Lands are considered preliminary and will be updated as part of studies required to meet the Class EA requirements associated with these works. Further studies are also required to confirm the requirements for a new sanitary collection system for the Highway 400&89 Employment Lands.

Table ES.2 – Conceptual Level Capital Costs Associated with Upgrading and Expanding the Cookstown WPCP and Wastewater Conveyance from Highway 400&89 Employment Lands

Cost Item	Conceptual Level Capital Cost Estimate
Estimated Capital Cost – WPCP Upgrades	$45.2M
Estimated Capital Cost – Conveyance from Highway 400&89	$40.7M (1)
Estimated Life Cycle Cost to 2051	**$85.9M**

Notes:

All costs in 2025 Canadian dollars excluding HST.

Costs do not include improvements to the existing Cookstown sanitary collection system or those associated with a new collection system in the 400&89 Employment Lands area.

1. Costs associated with additional studies required to support the design and approval of the East and West SPSs, forcemains and/or gravity sewer are not included in the above estimate.

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1. Introduction

The Cookstown Water Pollution Control Plant (WPCP) services the community of Cookstown in the Town of Innisfil (the Town). The WPCP is an extended aeration plant with effluent storage lagoons and seasonal effluent discharge to Innisfil Creek. The rated average day flow (ADF) capacity of the WPCP is 825 m^3/d. A copy of the WPCP's current Environmental Compliance Approval (ECA) is included in Appendix A, while a review of existing conditions is provided in Technical Memorandum No. 1 – Existing Conditions (see Appendix B).

The Cookstown WPCP is currently operating at approximately 75% of its rated ADF capacity. To meet the servicing requirements of future growth in the service area, as well as to provide wastewater servicing for the employment area at Highway 400 and Highway 89, the Cookstown WPCP will have to be expanded beyond its existing rated capacity. As such, this project is a "Schedule C" activity under the Municipal Class Environmental Assessment (Class EA) process.

Blue Sky Energy Engineering & Consulting Inc. (Blue Sky) and R.J. Burnside & Associates Ltd. (RJB) were retained by InnServices Utilities Inc. (InnServices) to provide engineering services for the Cookstown WPCP Class EA.

1.1 Study Area

The Cookstown WPCP is located at 59 Victoria Street in the community of Cookstown in the Town of Innisfil. Effluent from the WPCP is pumped to Innisfil Creek along Copeland Crescent, Riley Street, County Road 27 and 14th Line.

The Study Area has been defined as the Cookstown WPCP site, the outfall force main and gravity sewer route to Innisfil Creek, the area within the settlement boundary of the community of Cookstown, and the employment area at Highway 400 and Highway 89.

The Study Area is shown in Figure 1.1.

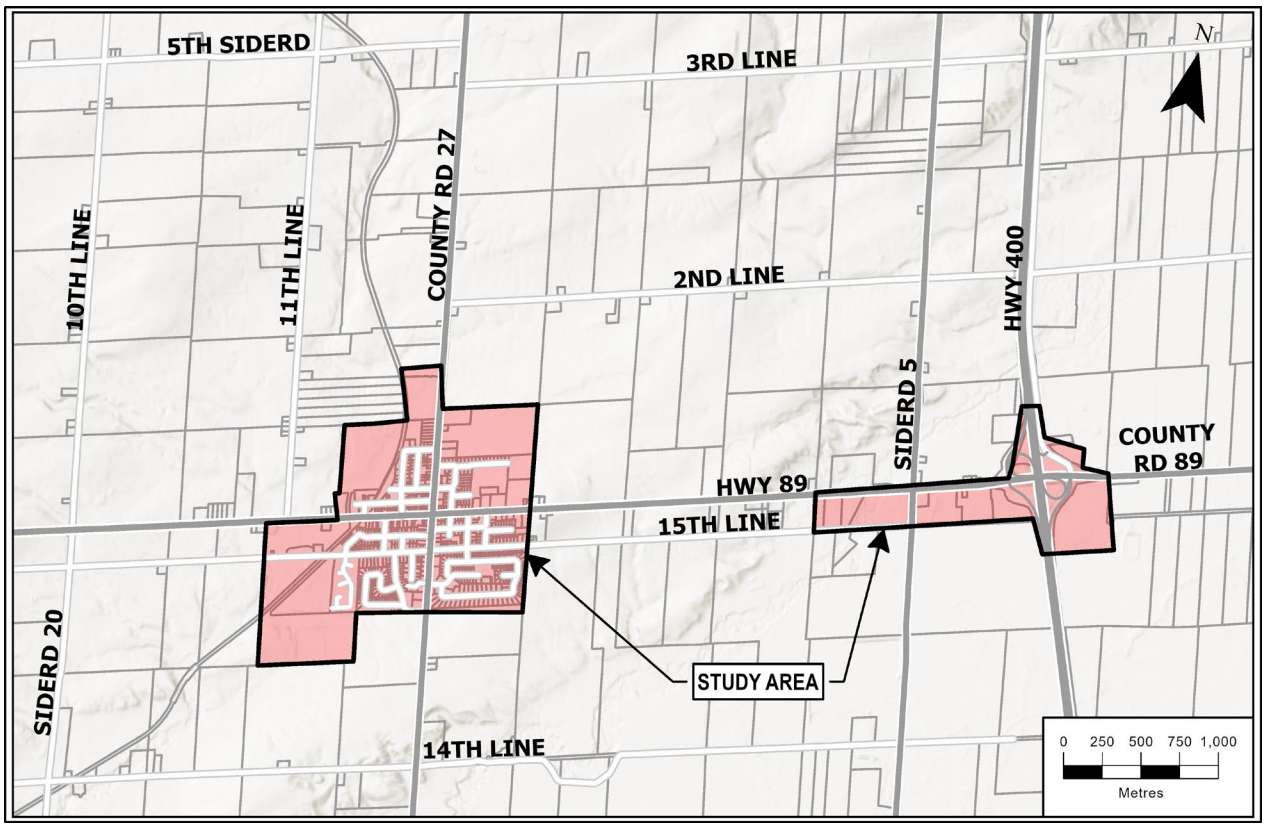

Figure 1.1 – Study Area

1.2 Class Environmental Assessment Process

The Class EA process identifies and assesses possible adverse effects to the environment caused by infrastructure projects. The Municipal Class EA process, illustrated in Figure 1.2, has five phases, namely:

- Phase 1: Identify the problem and/or opportunity to be addressed by the study.
- Phase 2: Identify and evaluate potential solutions to the address the problem statement (identified in Phase 1).
- Phase 3: Examine and evaluate design concepts associated with the preferred solution (identified in Phase 2) that can be used to resolve the problem statement.
- Phase 4: Summarize the work completed in Phases 1 to 3 in an Environmental Study Report (ESR).
- Phase 5: Implement the project.

There are different types of projects defined within the Class EA framework based on the potential for adverse environmental effects as described below:

- Exempt: Limited in scale and having minimal adverse impacts on the environment.
- Schedule B: Have the potential for some adverse environmental impacts and must complete the first two phases of the Class EA process.
- Schedule C: Potential for significant environmental effects and must complete all phases of the Class EA process.

This project was undertaken as a “Schedule C” project under the Class EA framework.

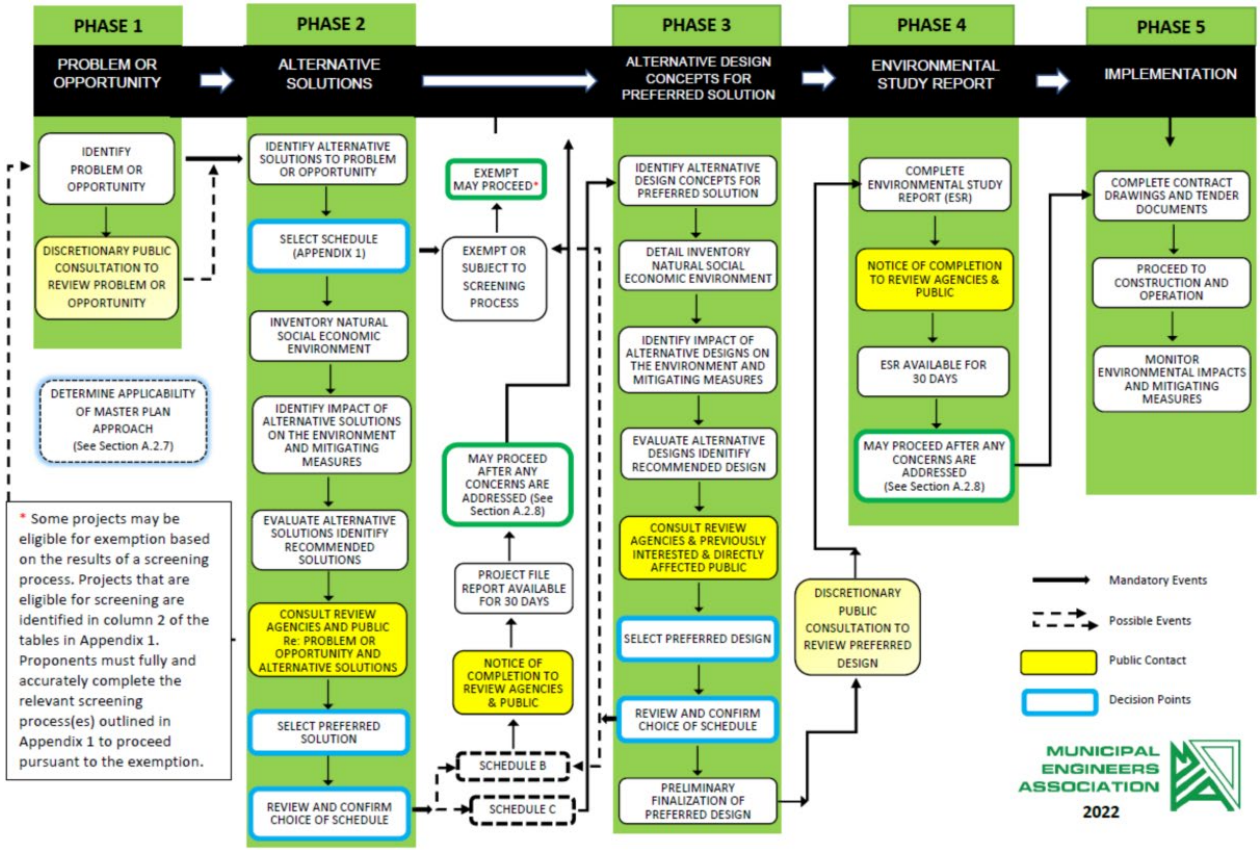

Figure 1.2 – Overview of the Municipal Class EA Process (from MEA, 2023)

The publication of this ESR represents the conclusion of Phase 4 of the Class EA process. The Environmental Study Report will be placed on the public record by issuing a Notice of Completion and interested individuals will have 30 days to provide comments.

2. Problem Statement

2.1 Study Objective

The objective of this study is to develop the most cost effective, environmentally sound, and sustainable approach to meet future wastewater servicing requirements in the Study Area.

2.2 Justification and Need for the Project

The future ADF associated with projected growth in the Study Area to 2051 was developed, and is presented in Table 2.1. Details are provided in Technical Memorandum No. 2 – Future Flows and Loadings (see Appendix C).

Table 2.1 – Overall Projected Equivalent Service Population and Raw Wastewater ADF for the Study Area to 2051

Parameter	Equivalent Service Population	Projected Raw Wastewater ADF
Existing (base)	2,000 persons	586 m^3/d
Approved Growth	853 persons	276 m^3/d
Future Growth - Residential	1,204 persons	389 m^3/d
Future Growth – Commercial	153 equiv. persons	49 m^3/d
Highway 400 & 89 Employment Lands	1,747 equiv. persons	564 m^3/d
Total	5,957 equiv. persons	1,864 m^3/d

Notes:

See Technical Memorandum No. 2 – Future Flows and Loadings (Appendix C of this ESR) for details.

The projected 2051 ADF of 1,864 m^3/d exceeds the existing Cookstown WPCP ADF capacity of 825 m^3/d. As a result, additional wastewater servicing capacity must be provided to accommodate planned growth in the Study Area.

2.3 Flow and Loading Projections

Table 2.2 presents the design wastewater flows and loadings for the Study Area, based on growth projections and a design period to 2051. This design basis, in terms of flows and raw wastewater quality, was used to develop conceptual level upgrade requirements for the alternatives considered as part of this study.

Table 2.2 – Projected Raw Wastewater Flows and Characteristics to the Design Year 2051

Parameter	Raw Wastewater
Flows	
ADF	1,864 m^3/d
MDF	4,818 m^3/d
PIF	7,122 m^3/d
Loadings	
BOD_5	473 kg/d
TSS	514 kg/d
TKN	101 kg/d
TP	11.8 kg/d
Concentrations	
BOD_5	254 mg/L
TSS	276 mg/L
TKN	54.2 mg/L
TP	6.3 mg/L

3. Existing Conditions

This section describes the existing natural and socio-economic environment in the Study Area and provides detailed information regarding the configuration, performance and capacity of the existing Cookstown WPCP.

3.1 Natural Environment

The following section provides a summary of the physiological, biophysical, watercourses, woodlots, wetland, and terrestrial features located within the Study Area.

3.1.1 Physiography

According to Map 2556 entitled “Quaternary Geology of Ontario – Southern Sheet” (Barnett et al., 1991), the Study Area is located on an area of Newmarket Till, with deposits consisting of a sandy silt to silt matrix, moderate to high in carbonate content, and moderate to high in clast content. According to Map 2544 entitled “Bedrock Geology of Ontario – Southern Sheet” (Ontario Geological Survey, 1991), the bedrock in the area generally consists of limestone, dolostone, shale arkose, and sandstone of the Ottawa Grouping, Simcoe Grouping, and the Shadow Lake Formation. According to Map 2715 entitled “Physiography of Southern Ontario”, the Study Area is located in the physiographic area of a till plain.

3.1.2 Biophysical Environment

A natural environment assessment was completed to support the Class EA Study. Detailed findings are provided in a Natural Environment Report (see Appendix D). The study involved a combination of background study and information review along with field investigations undertaken in the Summer and Fall of 2024.

No significant natural heritage features were identified in the study area. Nottawasaga Valley Conservation Authority (NVCA) regulated areas overlap the study area in both the northwest corner of the WPCP property as well as along the outfall route near Innisfil Creek.

Various vegetation communities were present with the study area including meadow, forest, treed swamp, marsh and agricultural lands. In the vicinity of the WPCP, the vegetation communities consist of deciduous forest, graminoid meadow, hedgerow row and tallgrass prairie. The lagoons are classified as open water. Northwest of the site a cultural woodland and swamp border Cookstown Creek and northwest a graminoid meadow and an open water pond are surrounded by a coniferous plantation. East of the WPCP, the lands are primarily agricultural. A stormwater management pond surround by meadow is located at the south end of the residential subdivision. A deciduous swamp is present east of Innisfil Creek in the vicinity of the outfall. The study area may also provide Candidate Special Wildlife Habitat (SWH) for Special Concern and Rare Wildlife Species.

Several Species at Ris (SAR) were observed during the site assessments including one provincially Threatened Eastern Meadowlark and two species of Special Concern: Barn Swallow; and, Snapping Turtle. With respect to trees, one Endangered Butternut was observed and several Endangered Black Ash were identified near Innisfil Creek.

3.1.3 Watercourses

The outfall for the Cookstown WPCP discharges to Innisfil Creek at 14th Line. Innisfil Creek is a tributary of the Nottawasaga River, and is located to the east and south of the Cookstown WPCP site. Cookstown Creek is located to the northwest of the Cookstown WPCP site.

3.2 Socio-Economic Environment

The following sections provide summary information on existing and planned land uses within the Study Area as well as existing heritage and archaeological resources.

3.2.1 Existing Land Uses

The Cookstown WPCP is located on the south side of Victoria Ave at the south end of the community of Cookstown. Land use to the south, east and west of the WPCP site is agricultural, with a mix of existing residential and future potential residential development to the north. Land designated Open Space (OS) is located at the northwest corner of the site, consisting of the Cookstown Trans Canada Trail.

The outfall route, located along road rights-of-way as shown in Figure 3.1, is bounded by residential, rural residential and agricultural land, with environmental protection areas in the vicinity of Innisfil Creek.

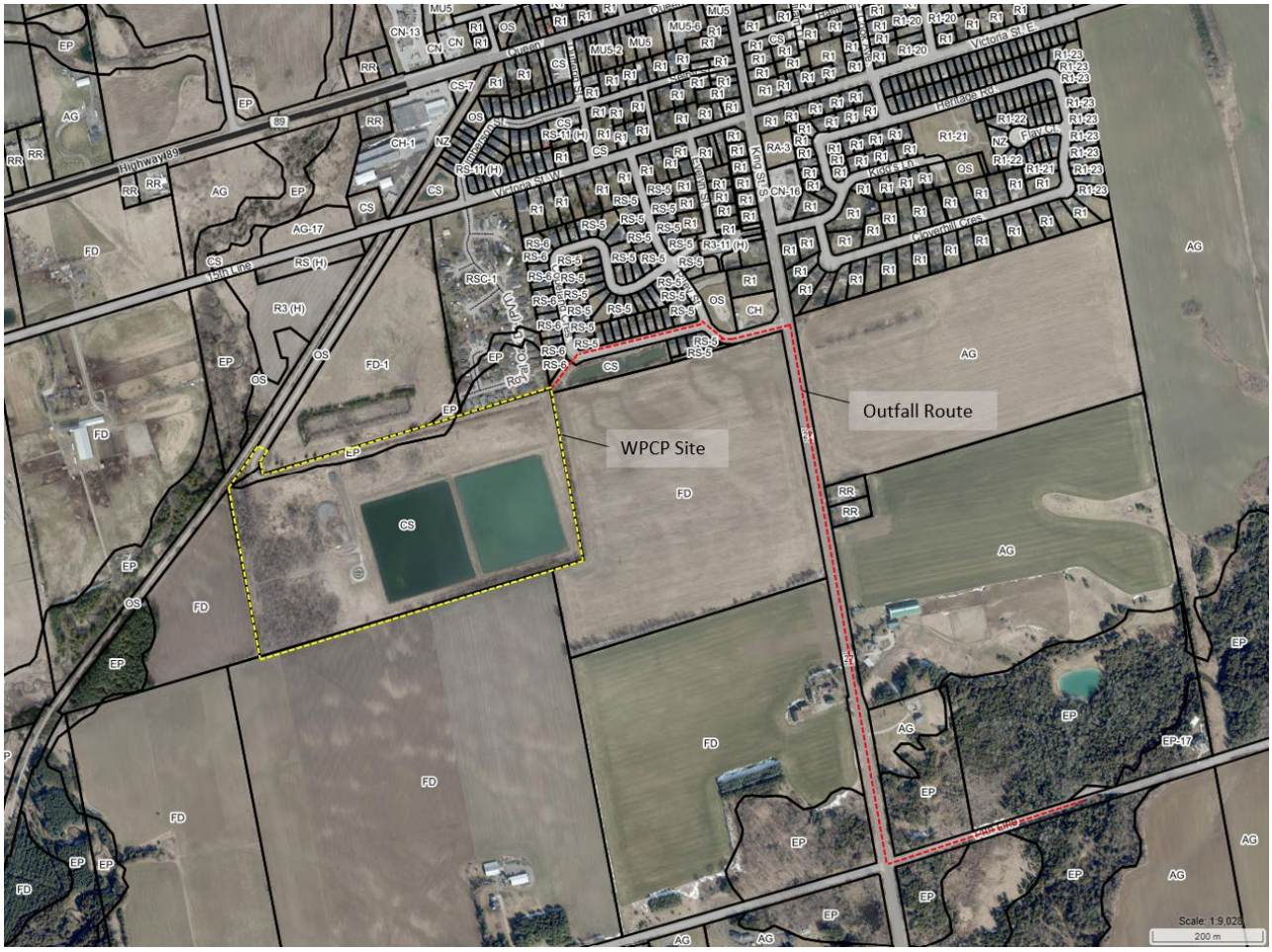

Figure 3.1 – Land Uses Adjacent to the WPCP Site and Effluent Outfall Route

3.2.2 Heritage and Archaeological Resources

A cultural heritage inventory of the Study Area was completed to support this Class EA Study. Detailed findings are provided in the Cultural Heritage Report (see Appendix E). The assessment was based on background historical research and a review of secondary source material, including historical mapping.

Results indicate a study area with an Indigenous history spanning several millennia, a rural agricultural Euro-Canadian history dating back to the early nineteenth century, and a residential and water treatment history dating to the mid twentieth century. A review of federal, provincial, and municipal registers, inventories, and databases revealed one commemorative feature (C.F.), one potential built heritage resource (B.H.R.), and two potential cultural heritage landscapes (C.H.L.s) identified within the study area, namely:

- C.F.: A commemorative bridge on the Cookstown Trans Canada Trail over Cookstown Creek.
- B.H.R.: A wood beam bridge on 14th Line between King Street South (County Road 27) and 5th Sideroad.
- C.H.L.s: A farmstead at 4930 King Street South (County Road 27); and, a farmstead at 5203 King Street South (County Road 27).

A Stage 1 Archaeological Assessment of the Study Area was completed to support this Class EA Study. Detailed findings are provided in the Stage 1 Archaeological Assessment Report (see Appendix F).

A large portion of the existing Cookstown WPCP site was identified as previously disturbed and, therefore, does not retain archaeological potential. These areas do not require future assessment. Other areas, specifically the wooded area at the west end of the WPCP site, was identified as exhibiting archaeological potential.

3.3 Technical Environment

This section presents a detailed description of the existing Cookstown WPCP. Details can be found in Technical Memorandum No. 1 – Existing Conditions (see Appendix B).

3.3.1 Existing Wastewater Servicing

The Cookstown WPCP currently provides wastewater servicing to lots within the Cookstown settlement boundary. The Highway 400 & Highway 89 area is serviced by private systems.

Wastewater from the existing service area is currently conveyed to the Cookstown WPCP treatment process via the on-site sewage pumping station (SPS). The SPS is equipped with two submersible pumps discharging into an influent force main. The 200 mm diameter pipe is split into two twinned 200 mm force mains near the headworks allowing the raw sewage to be discharged into either of two grit channels for grit removal. Following the grit channels, the wastewater is combined and conveyed to the treatment package plant. Prior to secondary treatment, the de-gritted wastewater passes through an influent box equipped with a 150 mm comminutor and a bar screen.

Following preliminary treatment, the wastewater enters the aeration basin of the secondary treatment package plant where it undergoes biological treatment. Wastewater from the aeration tank flows over a weir where it is dosed with alum and flows via a 250 mm pipe into the clarifier influent well. Effluent from the clarifier flows over a weir into a 300 mm pipe to the effluent pond which consists of two cells. Effluent from the storage lagoons is discharged into Innisfil Creek seasonally from October to May, inclusive, via an effluent pumping system.

Activated sludge from the clarifier is removed and directed to the sludge pumping station. A portion of the sludge from the pumping station is returned to the aeration basin near the influent box via two return activated sludge (RAS) pumps. The remaining sludge is pumped to the first cell of the effluent lagoon via the waste activated sludge (WAS) pump. Thickened sludge from the Cookstown WPCP is occasionally dredged and hauled off-site.

An assessment of the sanitary sewer system was beyond the scope of this study. According to InnServices, the existing sanitary sewer system has capacity to meet current demands. Additional studies will be required to determine if upgrades and upsizing of collection system infrastructure is required to meet future growth demands in the settlement boundary.

Details regarding tank and equipment sizing can be found in Appendix B. A process flow diagram (PFD) of the existing treatment process is provided in Figure 3.2, and a layout of the existing site is presented in Figure 3.3.

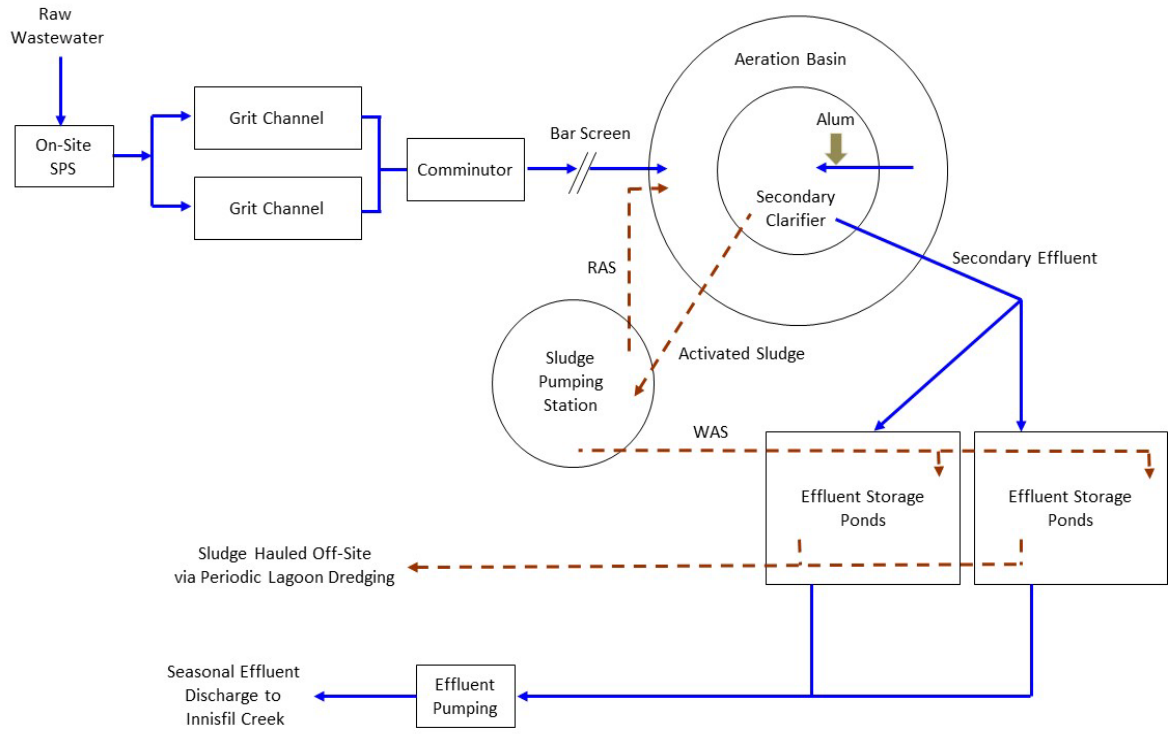

Figure 3.2 – Process Flow Diagram of the Existing Cookstown WPCP

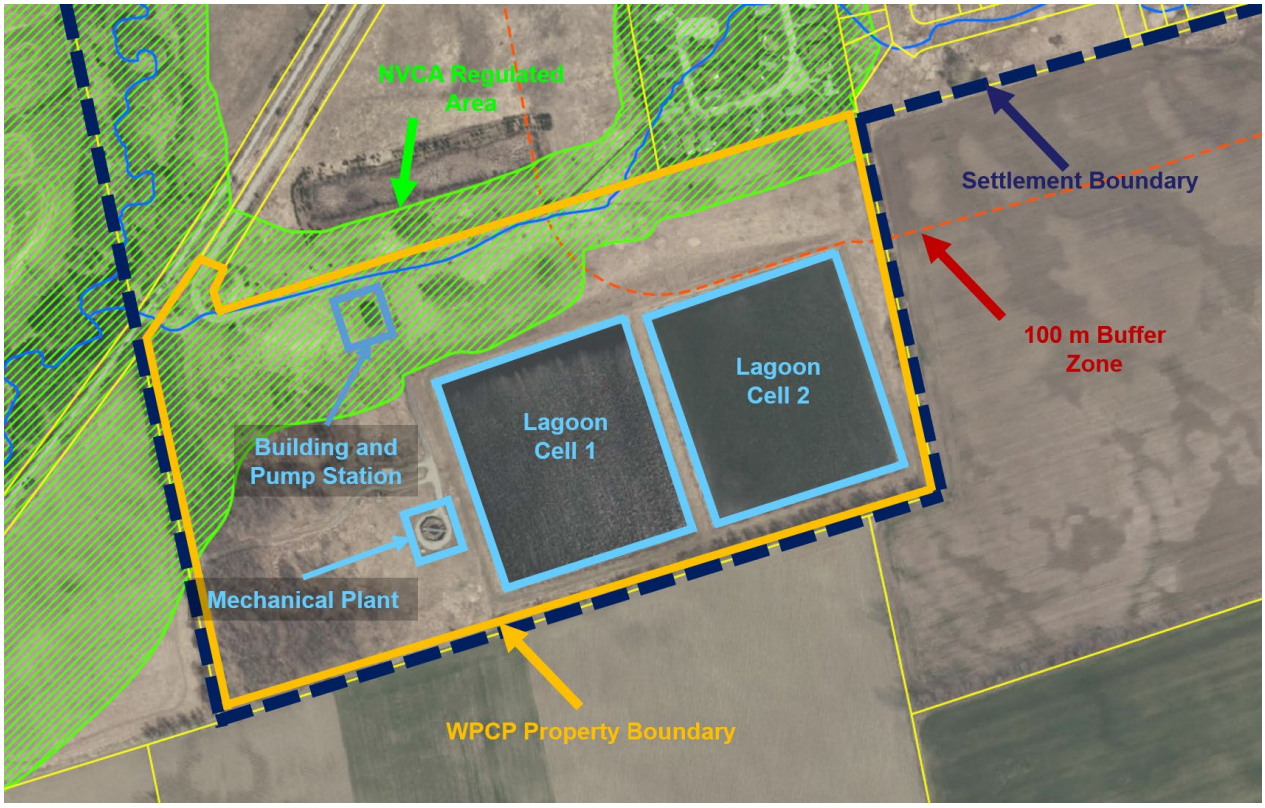

Figure 3.3 – Site Layout of the Existing Cookstown WPCP

3.3.2 Current Cookstown WPCP Effluent Objectives and Compliance Limits

The Cookstown WPCP operates under Amended ECA No. 9741-B4GRWZ dated May 29, 2019 (see Appendix A), and has a rated ADF capacity of 825 m^3/d. The ECA identifies periods during which the Cookstown WPCP is not permitted to discharge effluent due to low flows in Innisfil Creek (June 1 to September 30). During these periods, secondary effluent is pumped to the effluent holding pond for storage. During the period from October 1 to May 31, effluent may be discharged to Innisfil Creek. Table 3.1 presents the ECA effluent discharge restrictions for the Cookstown WPCP.

Table 3.1 – ECA Effluent Discharge Restrictions

Discharge Period	Maximum Discharge to Innisfil Creek
January 1 – March 31	10 L/s
April 1 – April 30	60 L/s
May 1 – May 31	10 L/s
June 1 – September 30	No discharge
October 1 – December 31	10 L/s

The ECA specifies maximum effluent concentration compliance limits for carbonaceous biochemical oxygen demand ($cBOD_5$), total suspended solids (TSS), total ammonia nitrogen (TAN), and total phosphorus (TP). An annual loading compliance limit is also specified for TP. Table 3.2 presents the ECA effluent quality requirements for the Cookstown WPCP.

Table 3.2 – ECA Effluent Compliance Objectives and Limits

Parameter	Concentration Objective (1)	Concentration Limit (1)	Loading Limit(1)
$cBOD_5$	15 mg/L	25 mg/L	-
TSS	15 mg/L	25 mg/L	-
TAN (2)	-	4.0 mg/L	-
TP	1.0 mg/L	1.0 mg/L	300 kg/yr

Notes:

1. Based on annual average values.
2. In addition to annual average values, compliance is based on monthly average values during the months of April, October, and November.

3.3.3 Historical Plant Influent Flows and Quality

Table 3.3 summarizes the historical raw wastewater ADF and maximum day flows (MDF) to the Cookstown WPCP.

Table 3.3 – Historical Annual Average and Maximum Day Flows to the Cookstown WPCP (2020 – 2023)

Year	Annual Average Day Flow	Maximum Daily Flow
2020	586 m^3/d	2,543 m^3/d
2021	616 m^3/d	1,957 m^3/d
2022	569 m^3/d	1,223 m^3/d
2023	646 m^3/d	1,473 m^3/d
Overall (2020 – 2023)	604 m^3/d	2,543 m^3/d
ECA Rated Capacity	825 m^3/d	–

The historical raw wastewater ADF to the Cookstown WPCP was 604 m^3/d between 2020 and 2023, which is equivalent to 73 percent of the ECA rated ADF capacity of 825 m^3/d. The MDF experienced over the review period was 2,543 m^3/d, occurring in January 2020.

The existing Cookstown WPCP service area consists primarily of residential customers with some commercial and institutional use. Typically, raw sewage samples are collected on a monthly basis. A summary of the historical raw wastewater concentrations is shown in Table 3.4, with the maximum concentration value of the monthly samples collected shown in parentheses. For months when more than one sample was collected, the average of the sample results were calculated. The average concentrations of BOD_5, TSS, total Kjeldahl nitrogen (TKN), and total phosphorus (TP) are based on the monthly samples collected over the historical review period from 2020 to 2023.

Table 3.4 – Raw Wastewater Characteristics (2020 – 2023)

Year	$cBOD_5$ (mg/L)	TSS (mg/L)	TAN (mg/L)	TP (mg/L)
2020	248	236	51.6	4.87
2021	233	261	53.4	5.53
2022	284	306	65.2	6.74
2023	271	244	53.8	5.74
Overall	259	262	56.0	5.72
Typical (1)				
High Strength	400	389	69	11.0
Medium Strength	200	195	35	5.6
Low Strength	133	130	23	3.7

Notes:

1. The “low”, “medium” and “high” refer to low, medium and high strength domestic wastewaters. Low strength wastewater based on an approximate flowrate of 570 L/cap/d, medium strength on 380 L/cap/d, and high strength on 190 L/cap/d. From Metcalf & Eddy (2014).

Overall, the raw wastewater to the Cookstown WPCP can be characterized as medium to high strength with respect to BOD_5, TSS and TKN, and medium strength with respect to TP.

Additional details regarding raw wastewater flows and characteristics can be found in Appendix B.

3.3.4 Historical Effluent Quality

Table 3.5 presents historical final effluent concentrations from the Cookstown WPCP, with maximum values shown in parentheses.

Table 3.5 – Final Effluent Quality (2020 – 2023)

Year	$cBOD_5$ (mg/L)	TSS (mg/L)	TAN (mg/L)	TP (mg/L)
2020	3.0 (4.0)	3.8 (7.0)	5.1 (6.7)	0.06 (0.12)
2021	3.9 (6.3)	4.3 (7.3)	3.3 (5.8)	0.09 (0.17)
2022	3.0 (6.0)	3.2 (4.5)	2.0 (4.2)	0.04 (0.07)
2023	2.8 (4.0)	3.8 (6.0)	1.4 (2.6)	0.04 (0.06)
ECA Requirements Objective Limit	 15 25	 15 25	 - 4.0	 0.8 1.0

Notes:
Values in parentheses represent maximum reported concentrations. In some cases, this represents a single sample result.

Over the review period (2020 - 2023), effluent concentrations significantly below the compliance limits were consistently achieved with respect to $cBOD_5$, TSS, and TP. Excluding 2020, TAN annual average concentrations have historically been below the annual compliance limit of 4.0 mg/L, however monthly results have been above the compliance limit of 4.0 mg/L for April, October and November. An upgraded aeration system was installed in the Summer of 2021, which appears to have improved effluent TAN concentrations. The effluent TAN concentration was well below 4.0 mg/L from October 2022 to the end of the review period (December 2023).

Additional details regarding effluent quality can be found in Appendix B.

3.3.5 Capacity of the Existing Cookstown WPCP

A capacity assessment of the existing Cookstown WPCP was completed as part of the analysis of existing conditions. The assessment was performed using traditional desktop analytical methods, historical plant operational data, plant design criteria, results of secondary clarifier stress testing, approved ECA capacities, and typical design guidelines.

Details are provided in Technical Memorandum No. 1 – Existing Conditions (see Appendix B). In summary, the capacity assessment concluded:

- On-site SPS: The existing on-site SPS's firm capacity (2,634 m^3/d) cannot accommodate the projected peak flow associated with growth to 2051 (7,122 m^3/d; see Table 2.2).
- Grit Removal: The existing grit channels have a combined peak flow capacity of 5,268 m^3/d which is less than the peak flow associated with growth to 2051 (7,122 m^3/d; see Table 2.2).
- Bioreactor: Assuming typical operating parameter values for an extended aeration process providing year-round nitrification, the existing bioreactor has an estimated ADF capacity of 720 m^3/d, which is less than the projected 2051 ADF of 1,864 m^3/d.
- Secondary Clarifier: Based on the results of stress testing, the existing clarifier has an estimated equivalent ADF capacity of 969 m^3/d, which is less than the projected 2051 ADF of 1,864 m^3/d.
- Effluent Storage: The lagoon system is comprised of two cells operated in series. Each effluent lagoon cell has a volume of 53,040 m^3 at an operating depth of 1.8 m, for a total available lagoon storage volume of 106,080 m^3. Depending on future effluent discharge limitations, this may or may not provide sufficient effluent storage for the projected 2051 ADF of 1,864 m^3/d.
- Effluent Pumping: In addition, the existing effluent pumping system and associated outfall (comprised of both a forcemain and gravity sewer) is currently configured to pump a maximum flow of 60 L/s, which is sufficient to meet current approved peak discharge rates (in the month of April). Depending on the required future effluent discharge rates, upgrades may be required to the effluent pumps and/or outfall.
- Sludge Handling: From the sludge pumping station, WAS is pumped by a WAS pump with a capacity of 10 L/s (864 m^3/d) to the first cell of the effluent lagoon system for thickening and storage. Should the preferred solution require an upgrade and/or expansion to the existing WPCP, an alternative method of WAS storage/treatment will need to be evaluated to meet potentially stringent effluent requirements. As such, a capacity assessment of sludge storage was not conducted.

4. Development and Evaluation of Alternative Solutions

4.1 Overview of Alternative Solutions

A number of alternatives to meet the wastewater servicing needs of the Study Area were considered, including:

1. **"Do Nothing"**

   Under this alternative, no increase in wastewater servicing capacity would be provided. The Cookstown WPCP would maintain its rated capacity of 825 m^3/d.

2. **Reduce wastewater flows through water conservation programs and sewer rehabilitation**

   This alternative would include the implementation of programs to reduce wastewater flows through water efficiency and sewer rehabilitation. Although it is possible that a reduction in wastewater flows could be achieved through water efficiency and sewer rehabilitation programs, at this stage of the evaluation the flow reduction cannot be quantified.

   However, given the current rated capacity of the Cookstown WPCP (825 m3/d) and the magnitude of the projected 2051 ADF (1,864 m3/d), it can be concluded that this alternative would not be able to accommodate the projected growth for the Study Area as a stand-alone solution. Wastewater reduction strategies should, however, be pursued as part of the preferred solution.

3. **Optimization and Re-rating of the Cookstown WPCP**

   This alternative would involve modifying and optimizing operational practices at the existing treatment system, including minor upgrades to existing unit process equipment and/or tankage to accommodate future flows and loadings.

   The results of a capacity assessment of the existing Cookstown WPCP indicates that many of the existing unit processes have capacities well below the projected 2051 design ADF of 1,864 m3/d (see Section 3.3.5). While optimization could increase the rated ADF capacity of the existing Cookstown WPCP, experience at other Ontario facilities suggests that optimization is generally capable of yielding capacity increases of 10% to 25%. Therefore, it can be concluded that this alternative would not be able to accommodate the projected growth for the Study Area as a stand-alone option. Optimizing the re-use of existing infrastructure should, however, be considered as part of other alternative solutions as appropriate.

4. **Expansion and upgrading of the existing Cookstown WPCP to treat future flows and loadings with effluent discharge to the current receiver, Innisfil Creek**

   This alternative would expand the existing WPCP to provide capacity for the existing

community and any forecasted growth. The expanded WPCP would be sized to accommodate the increased wastewater flows associated with growth in the Study Area, and would utilize an activated sludge process providing year-round nitrification, tertiary level treatment for phosphorus removal, non-toxic disinfection and effluent storage. Existing plant infrastructure would be re-used and/or repurposed where possible, and the existing outfall would be retained and upgraded as necessary.

5. **Expansion and upgrading of the existing Cookstown WPCP to treat future flows and loadings with effluent discharge to the Nottawasaga River**

   This alternative would expand the existing WPCP to provide capacity for the existing community and any forecasted growth. The expanded WPCP would be sized to accommodate the increased wastewater flows associated with growth in the Study Area, and would utilize an activated sludge process providing year-round nitrification, tertiary level treatment for phosphorus removal, non-toxic disinfection and effluent equalization storage. Existing plant infrastructure would be re-used and/or repurposed where possible. New effluent pumping station(s), forcemain and gravity sewer would be required to convey effluent to the Nottawasaga River, approximately 8 km to the west of the WPCP site.

6. **Maintain the existing Cookstown WPCP facility at its current rated capacity and construct a new WWTP in Cookstown to treat additional flows**

   This alternative would involve maintaining the existing Cookstown WPCP, with upgrades as required to restore all unit processes to an equivalent rated ADF capacity of 825 m^3/d, and constructing a new WWTP to service the balance of the wastewater servicing need, or an ADF capacity of 1,039 m^3/d.

   A site for the new tertiary treatment facility would need to be identified and acquired, and effluent storage would need to be provided, by either pumping effluent to the existing Cookstown WPCP's storage lagoons or constructing new lagoon cells at the new site.

7. **Expansion and upgrading of the existing Cookstown WPCP to treat growth in the Community of Cookstown, and construct a new wastewater treatment plant (WWTP) to service the Highway 400 & 89 area**

   Under this alternative, separate treatment facilities would be provided to service the community of Cookstown and the 400 & 89 Employment Area, respectively.

   Based on growth projections, the existing Cookstown WPCP would need to be expanded to 1,300 m^3/d to meet future servicing needs. A new continuous discharge WWTP with a rated capacity of 564 m^3/d would be constructed in the 400 & 89 area to service growth in this employment area with effluent discharge to Innisfil Creek.

8. Decommission the existing Cookstown WPCP and convey all flows to the Lakeshore WPCP

This alternative would consist of decommissioning the existing Cookstown WPCP, constructing sewer infrastructure to convey wastewater from the Cookstown WPCP service area to the Lakeshore WPCP, and treating all wastewater at the Lakeshore WPCP. The sewer forcemain would be sized to accommodate the increased wastewater flows associated with growth in the community. The existing effluent storage lagoons could be retained and utilized as equalization during periods of high influent flow and/or as emergency storage in the event of a broken forcemain. Other existing plant infrastructure would be decommissioned, including the existing outfall to Innisfil Creek

Based on the alternative solutions presented above, there are three potential effluent receivers that were4. considered, namely:

- **Innisfil Creek**

  Innisfil Creek is the current effluent receiver for the Cookstown WPCP. The existing effluent outfall is located approximately 1.5 km southeast of the Cookstown WPCP. Effluent is conveyed to the receiver via an effluent pumping station, forcemain and gravity sewer.

  Constraints include periods of very low base flows, particularly during the Summer and Fall, providing limited capacity for dilution. In addition, the receiver is Policy 2 for TP. Opportunities include its status as the existing receiver for the Cookstown WPCP, and potential expansion of the discharge window to include the period June 1 to September 30 helping to maintain flows in a creek subject to water taking for agricultural purposes.

  To accommodate the increased effluent discharge volume while maintaining minimum dilution ratios at all times, it would be necessary to maintain the existing lagoons for effluent storage as well vary effluent discharge rates based on season and measured flows in Innisfil Creek. Using this type of discharge control, it was determined that the ultimate assimilative capacity of Innisfil Creek at the current outfall location is approximately 3,000 m^3/d. A detailed ACS was completed, and the MECP has approved effluent targets and discharge rates for the projected 2051 ADF capacity of 1,864 m^3/d. Details of the ACS are provided in Section 5.

- **Nottawasaga River**

  The Nottawasaga River is a large river located approximately 8 km to the west of the Cookstown WPCP. Its tributaries include Innisfil Creek. Utilizing the Nottawasaga River as an effluent receiver for a WPCP in Cookstown would require an effluent discharge system consisting of two pumping stations, two force mains and gravity sewers from the WPCP to the Nottawasaga River.

Constraints include the receiver being located outside the boundary of the Town of Innisfil, its Policy 2 status with respect to TP, limited available assimilative capacity due to other dischargers in the vicinity, and a number of sensitive uses of the Nottawasaga River including recreation, swimming and fishing. Opportunities include higher base flows than Innisfil Creek, improving dilution and reducing or eliminating the need for effluent storage.

- **Lake Simcoe**

  Lake Simcoe is a large body of water located approximately 15 km to the east of the Cookstown WPCP. The Lakeshore WPCP, which currently services the community of Alcona in the Town of Innisfil, has an existing outfall to Lake Simcoe. Utilizing Lake Simcoe as an effluent receiver for wastewater generated in Cookstown and the Highway 400 & 89 area would require conveying the wastewater to the Lakeshore WPCP, located approximately 19 km to the northeast of the Cookstown WPCP (see Alternative 8).

  Constraints include the Lake Simcoe Protection Act, which defines a legislated cap on TP loadings to Lake Simcoe. Due to current technological limitations associated with consistently achievable effluent TP concentrations, there is a limit to the total effluent volume that can be discharged by the Town to Lake Simcoe while remaining within the available TP loading limit cap. As a result, the servicing capacity currently possible at the Lakeshore WPCP is limited. By extension, any capacity that is used for servicing the community of Cookstown and the Highway 400 & 89 Employment Lands would reduce the wastewater servicing capacity available for Alcona and other nearby communities. Opportunities include more effluent dilution potential than a discharge to Innisfil Creek, and allow for the conversion of the Cookstown WPCP into a continuous discharge facility, reducing or eliminating the need to store effluent.

The location of each is presented in Figure 4.1.

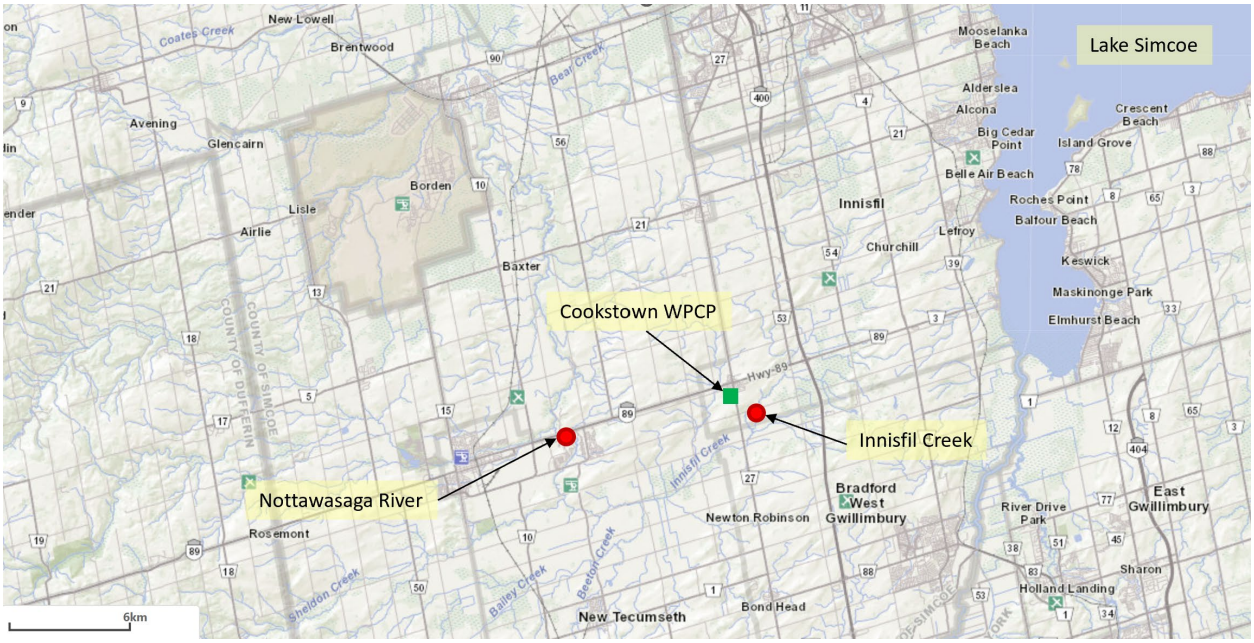

Figure 4.1 – Potential Effluent Receivers

Technical Memorandum 3 – Alternative Solutions was prepared to provide details regarding the development and evaluation of the alternative solutions, and is provided in Appendix G.

4.2 Identification of Feasible Alternative Solutions

An evaluation was conducted to determine which of the alternative solutions presented in Section 4.1 are capable of meeting the study objectives. Only those alternative solutions that satisfy the project objectives were considered for further evaluation. Two criteria were used to assess the feasibility of the alternatives, namely:

- Ability to meet servicing requirements associated with projected growth to 2051; and,
- Ability for the receiving water body and/or WWTP to accommodate the projected wastewater flows to 2051.

Alternative 1 (Do Nothing) would not provide servicing capacity for planned growth in the Study Area. As a result, this alternative does not satisfy the study objectives and was not considered further.

Alternative 2 (Reduce Wastewater Flows through Water Efficiency and Sewer Rehabilitation) would possibly be able to achieve a reduction in wastewater flows; however, given the current rated capacity of the Cookstown WPCP (825 m^3/d) and the magnitude of the projected 2051 ADF (1,864 m^3/d), it can be concluded that this alternative would not be able to accommodate the projected growth for the Study Area as a stand-alone solution. Water efficiency and extraneous flow reduction should be considered for implementation in conjunction with the preferred alternative.

Alternative 3 (Optimization and Re-rating of the Cookstown WPCP) may provide additional servicing capacity for a portion of the planned growth in the Study Area. Despite this, optimization and re-rating alone would not be sufficient to provide servicing capacity to accommodate all planned growth in the Study Area as a stand-alone solution. Optimizing the reuse of existing infrastructure should, however, be considered as part of other alternative solutions as appropriate.

Alternative 4 (Upgrade and Expand the Existing Cookstown WPCP with Effluent Discharge to Innisfil Creek), Alternative 5 (Upgrade and Expand the Existing Cookstown WPCP with Effluent Discharge to Nottawasaga River), Alternative 6 (Maintain Existing Cookstown WPCP and Construct a New WWTP in Cookstown) and Alternative 7 (Expand Cookstown WPCP and Construct a New WWTP to Service 400 & 89) would all provide sufficient wastewater treatment capacity (at one or more wastewater treatment facilities) to meet growth demands.

As noted in Section 5, it has been confirmed that Innisfil Creek can accommodate an ADF of 1,864 m^3/d with an expanded effluent discharge window. Despite this, discharge restrictions over the summer months will still be required. As such, some means of

providing effluent storage for any facilities discharging to Innisfil Creek will need to be provided. Base flows in Nottawasaga River are sufficient to accommodate year-round effluent discharge.

Based on the above, Alternative 4 (Upgrade and Expand the Existing Cookstown WPCP with Effluent Discharge to Innisfil Creek), Alternative 5 (Upgrade and Expand the Existing Cookstown WPCP with Effluent Discharge to Nottawasaga River) and Alternative 6 (Maintain Existing Cookstown WPCP and Construct a New WWTP in Cookstown), which incorporate effluent discharge to Innisfil Creek with effluent storage or year-round discharge to the Nottawasaga River, are also compatible with receiver limitations.

Alternative 7 (Expand Cookstown WPCP and Construct a New WWTP to Service 400 & 89) would provide an upgraded Cookstown WPCP with a rated capacity of 1,300 m^3/d. The available on-site effluent storage would allow the facility to limit volumetric flow rates to Innisfil Creek over the summer months. However, a new continuous-discharge WWTP to service the Highway 400 & 89 area with a rated capacity of 564 m^3/d could not be accommodated by Innisfil Creek, particularly over the Summer period. Therefore, Alternative 7 is not compatible with receiver limitations.

Alternative 8 (Decommission the Cookstown WPCP and Convey Flows to the Lakeshore WPCP) does not satisfy the Study objectives. Based the ongoing 2023 Master Servicing Plan Update, planned growth within the planned service area of the Lakeshore WPCP, along with stringent TP loading limits for wastewater treatment plant discharges to Lake Simcoe, mean that the Lakeshore WPCP cannot accommodate the servicing needs of the community of Cookstown and the 400 & 89 Employment Lands. As a result, this option can not satisfy either the growth requirements or receiver limitations.

A summary of the screening of alternative servicing solutions is presented in Table 4.1. The three short-listed feasible alternatives carried forward for additional evaluation are:

- Alternative 4 – Upgrade and Expand the Existing Cookstown WPCP with Effluent Discharge to Innisfil Creek;
- Alternative 5 – Upgrade and Expand the Existing Cookstown WPCP with Effluent Discharge to Nottawasaga River; and,
- Alternative 6 – Maintain Existing Cookstown WPCP and Construct a New WWTP in Cookstown.

Table 4.1 – Screening of Alternative Solutions

Alternative Solution	Meets Growth Requirements?	Compatible with Receiver Limitations?	Feasible Solution?
1 – Do Nothing	No	Yes	No
2 – Reduce Flows	No	Yes	No
3 – Optimize and Re-Rate Cookstown WPCP	No	Yes	No
4 – Upgrade / Expand Cookstown WPCP with Effluent to Innisfil Creek	Yes	Yes	Yes
5 – Upgrade / Expand Cookstown WPCP with Effluent to Nottawasaga River	Yes	Yes	Yes
6 – Maintain the Existing Cookstown WPCP and Construct a New WWTP in Cookstown	Yes	Yes	Yes
7 – Expand the Cookstown WPCP and Construct a New WWTP to Service Highway 400 & 89	Yes	No	No
8 – Decommission Cookstown WPCP and Convey Flows to Lakeshore WPCP	No	No	No

4.3 Evaluation of Feasible Alternative Solutions

4.3.1 Development of Alternative Solutions

Additional conceptual level design details were developed for each of the short-listed feasible alternative solutions identified. The following assumptions were made when developing the conceptual level designs:

- Any upgrades to the Cookstown WPCP would be accommodated on the existing site, and no new lagoon cells would be constructed.
- For Alternative 6, which involves constructing a new WWTP in Cookstown, it was assumed that effluent from this new facility would be stored in the lagoons and discharged via the outfall at the existing Cookstown WPCP.
- It was assumed that effluent would need to meet Limit of Technology (LoT) targets for TP and year-round, stringent effluent TAN limits.
- WAS storage in the effluent storage lagoons would be discontinued, and new WAS handling and/or storage would be provided at the Cookstown WPCP.

Additional details are provided in Appendix G.

All three short-listed alternatives would ultimately require a collection system, SPSs and force main / gravity sewer from the Highway 400 & 89 Employment Lands to convey wastewater to the Cookstown collection system and/or WPCP. Since these collection and conveyance options are similar for all of the short-listed alternatives, this was not considered as a factor in the analysis of the alternative solutions. Additional analysis of conveyance requirements is provided in Section 7.

4.3.2 Evaluation Criteria

Evaluation criteria were developed to evaluate the short-listed alternatives based on their impacts on the natural environment, social environment and economic environment during both the design / construction phase and operations phase.

4.3.3 Comparison of Relative Costs

A conceptual level cost evaluation was conducted to determine relative costs of the feasible alternatives. The estimated relative capital costs and operation and maintenance (O&M) costs area compared on a relative basis in Table 4.2.

Table 4.2 – Comparative Capital and O&M Costs

Alternative Solution	Capital Cost	Annual O&M Cost
Alternative 4 – Upgrade and Expand the Existing Cookstown WPCP with Effluent Discharge to Innisfil Creek	○	○
Alternative 5 – Upgrade and Expand the Existing Cookstown WPCP with Effluent Discharge to Nottawasaga River	◕	◔
Alternative 6 – Maintain Existing Cookstown WPCP and Construct a New WWTP in Cookstown	●	●

Notes:

○ ◔ ◑ ◕ ●

Lowest cost → Highest cost

4.3.4 Comparison of the Alternative Solutions

A comparison of the advantages and disadvantages of the feasible alternatives is provided in Table 4.3. A completed evaluation scoring matrix is provided in Table 4.4.

Table 4.3 – Comparison of Advantages and Disadvantages of Feasible Servicing Solutions

Servicing Alternative	Advantages	Disadvantages
4 – Upgrade and Expand Cookstown WPCP with Effluent Discharge to Innisfil Creek	• Maximizes reuse of existing infrastructure • Construction limited to existing WPCP site and outfall route • Along with Alternative 5, the least complex operational requirements from a treatment perspective	• Future expansion options limited by assimilative capacity of Innisfil Creek • Requires construction staging • Complex discharge requirements and a need for permanent flow monitoring in Innisfil Creek
5 – Upgrade and Expand Cookstown WPCP with Effluent Discharged to Nottawasaga River	• Maximizes reuse of existing infrastructure at the existing WPCP • Lower operating complexity than Alternative 6 • Receiver most capable of accommodating future expansions • Could eliminate one or both effluent storage lagoon cells • Along with Alternative 4, the least complex operational requirements from a treatment perspective	• Approval and construction of new outfall required – high capital cost • Outfall route and effluent discharge location outside Town boundary • Outfall route along a provincial highway • Does not reuse existing outfall infrastructure • Results in reduced flows in Innisfil Creek • Requires construction staging for upgrades to the WPCP
6 – Maintain the Existing Cookstown WPCP and Construct a New WWTP in Cookstown to Service Growth	• Reuses existing WPCP and outfall infrastructure	• Future expansion options limited by assimilative capacity of Innisfil Creek • Requires upgrades to the existing WPCP in addition to construction of a new WWTP • Would require additional land acquisition • Most complex operational requirements from a treatment perspective • High costs associated with operating and maintaining two separate plants • Complex discharge requirements and a need for permanent flow monitoring in Innisfil Creek

Table 4.4 – Evaluation Matrix – Feasible Alternative Solutions

Group	Criteria	Proposed Weighting	Alt 4	Alt 5	Alt 6
Design / Construction Phase					
Natural Environment	Effect on surface waters	3	4	3	4
	Disruption of terrestrial features	3	4	2	1
Social / Cultural / Community Environment	Disruption of adjacent residential, community and recreational features (noise, dust, odour, traffic)	4	3	1	2
	Impact on heritage resources	2	4	3	4
Economic Environment	Capital costs of construction	5	4	2	1
Technical Environment	Constructability	3	4	2	3
	Compatibility with existing infrastructure	3	4	3	2
Town Growth	Flexibility for future expansion	4	2	4	2
	Total Weighted Score – Design/Construction Phase	**-**	**96**	**66**	**59**
Operations Phase					
Natural Environment	Effect on surface waters	3	4	3	4
Social / Cultural / Community Environment	Disruption of adjacent residential, community and recreational features (noise, dust, odour, traffic)	4	4	2	3
Economic Environment	Operation and maintenance costs	5	4	3	1
Technical Environment	Ability to consistently meet effluent criteria	3	4	3	4
	Operating requirements / complexity	3	3	2	1
	Total Weighted Score – Operations Phase	**-**	**69**	**47**	**44**
	Total Overall Weighted Score	**-**	**165**	**113**	**103**

4.3 Selection of the Preferred Solution

The preferred solution is Alternative 4 – Upgrade and Expand the Cookstown WPCP with Effluent Discharge to Innisfil Creek.

In addition to having the lowest capital and O&M costs, Alternative 4 offers the following advantages relative to the other options:

Expanding and Upgrading the Existing Plant vs. Operating Two Treatment Facilities

- No land acquisition is required to expand and upgrade the existing plant, resulting in capital cost savings. Constructing a new treatment facility would require the identification and acquisition of a new site.
- Expanding and upgrading the existing plant will result in less impact on the environment during construction as only one site will be disturbed. In addition, the existing site was previously disturbed around existing WPCP infrastructure, reducing or eliminating the need to disturb previously undisturbed land.
- Expanding and upgrading the existing facility allows for the optimal reuse of existing infrastructure. Having two treatment facilities would incur costs associated with upgrades to the existing WPCP to address deficiencies in addition to the costs associated with the construction of a new treatment plant.
- Expanding and upgrading the existing plant avoids the operational complexity, additional flow monitoring, additional operator effort and additional O&M costs associated with running two separate treatment facilities.

Maintaining the Existing Effluent Receiver vs. a New Outfall to the Nottawasaga

- The existing outfall route is approximately 2 km in length, while the outfall route to the Nottawasaga River would be approximately 11 km. Maintaining the existing outfall route will result in less impact on the environment and community during construction.
- A single pumping station, located at the Cookstown WWTP site, is required to pump effluent to Innisfil Creek. Pumping effluent to the Nottawasaga River would require the construction of a least one additional, intermediate pumping station along the new outfall route, increasing operations and maintenance requirements.
- Maintaining the effluent outfall to Innisfil Creek will help to maintain and increase base flows in the creek. Diverting effluent to the Nottawasaga River would reduce the already low flows in Innisfil Creek and potentially impact downstream water taking.
- Pumping treated effluent to the Nottawasaga River results in increased energy requirements. By maintaining the existing outfall route to Innisfil Creek, energy savings can be realized.

5. Effluent Requirements for an Expanded and Upgraded WPCP

5.1 Location of Cookstown WPCP Outfall

Effluent from the Cookstown WPCP is stored in effluent storage lagoons located on the WPCP site and is pumped seasonally via an effluent pumping system to Innisfil Creek, discharging just south of 14th Line. The preferred solution (Alternative 4 – Upgrade and Expand the Cookstown WPCP with Effluent Discharge to Innisfil Creek) will maintain the existing outfall route and discharge location.

5.2 Assimilative Capacity Study

An analysis of the assimilative capacity of Innisfil Creek was undertaken to determine appropriate effluent discharge requirements for an upgraded and expanded Cookstown WPCP. This involved a combination of desk-top and field studies, as well as consultation with both MECP and NVCA. The methodology, field program results, consultation activity documentation and the development of the proposed effluent requirements are presented in detail in Appendix H.

Proposed effluent requirements considered extensive analysis of water quality and flows in Innisfil Creek. Proposed effluent discharge rates were based on maintaining adequate dilution ratios at all times, while also ensuring sufficient base flow available in the receiver to accommodate the increased capacity of the Cookstown WPCP. Effluent limits were based on the assimilative capacity available in Innisfil Creek as well as Provincial Water Quality Objectives (PWQOs), Canadian Water Quality Guidelines (CWQGs) and MECP Guideline F-5-1.

An Assimilative Capacity Study (ACS) was submitted on February 15, 2023. MECP reviewed the ACS and provided comments on March 30, 2023. Additional information was provided to MECP on March 31, 2023, and MECP approved the proposed effluent requirements in an email dated April 14, 2023. A copy of the ACS report and associated follow-up correspondence is provided in Appendix H.

5.3 Future Effluent Requirements

Effluent concentration and loading targets for the upgraded an expanded Cookstown WPCP are presented in Table 5.1.

Table 5.1 – Effluent Objectives and Limits for the Cookstown WPCP Operating and an ADF of 1,864 m^3/d

Parameter	Averaging Period	Objective (mg/L unless noted otherwise)	Limit (mg/L unless noted otherwise)
$cBOD_5$	Monthly	5.0	7.0
TSS	Monthly	5.0	7.0
TAN			
Winter (Nov to Apr)	Monthly	3.0	4.0
Spring (May to Jun)	Monthly	1.5	2.0
Summer (Jul to Sep)	Monthly	0.4	0.5
Fall (Oct)	Monthly	1.5	2.0
TP (concentration)	Monthly	0.08	0.10
TP (loading)	Annual	-	54.4 kg/yr (equivalent to 0.08 mg/L)
E. coli	Monthly (1)	100 cfu/100 mL	200 cfu/100 mL
pH	Single Sample	6.5 to 8.5	6.0 to 9.0

Notes:

1. Geometric mean.

Maximum effluent discharge rates for the upgraded and expanded Cookstown WPCP are presented in Table 5.2. The effluent discharge rates are a function of both season and flows in the receiver, Innisfil Creek.

Table 5.2 –Maximum Effluent Discharge Rates as a Function of Stream Flow in Innisfil Creek at the Outfall for the Cookstown WPCP Operating at an ADF of 1,864 m^3/d

Receiver Flow at Outfall (m^3/s)	Maximum Effluent Discharge Rate (L/s)				
	Dec 1 to Apr 30	May 1 to Jun 30	Jul 1 to Sep 1	Oct 1 to 31	Nov 1 to 30
≤0.02	0	0	0	0	0
>0.02 to 0.05	3	0	0	3	0
>0.05 to 0.10	8	0	6	7	4
>0.10 to 0.50	16	4	13	10	8
>0.50 to 1.00	80	24	64	75	39
>1.00 to 1.50	160	49	127	150	78
>1.50	240	74	191	220	117

In their correspondence dated April 14, 2023, MECP noted that due to the challenge posed by the limited capacity of Innisfil Creek, they “are supportive of the proposal to use a flow weighted discharge approach on the condition that a permanent flow monitoring station is established in the vicinity of the outfall since accurate real time flow is crucial to this approach.” Options for permanent flow monitoring in Innisfil Creek are discussed in more detail in Section 9.1.1.

6. Development and Evaluation of Alternative Design Concepts

6.1 Overview of Alternative Design Concepts

Alternative design concepts were developed to meet the wastewater servicing needs of the Study Area. Several upgrades would be common to all design concepts, including:

- New on-site raw wastewater SPS;
- New headworks;
- New tertiary effluent diversion chamber and effluent pumping system;
- New UV disinfection; and,
- New outfall force main and gravity sewers to Innisfil Creek.

The alternative design concepts vary in the following key areas:

- Secondary and tertiary treatment; and,
- Sludge digestion and storage.

Four alternative design concepts were considered, namely:

1. **Extended aeration with tertiary filtration**

   Implementation of the extended aeration process for the upgraded and expanded Cookstown WPCP would include providing new bioreactors and secondary clarifiers. New tertiary filtration would also be required. The existing extended aeration process tankage would be repurposed to provide the required aerobic digester capacity, and new biosolids storage tanks would be provided.

2. **Moving bed biofilm reactor (MBBR) with tertiary filtration**

   Implementation of the MBBR process for the upgraded and expanded Cookstown WPCP would include providing new MBBR tanks and downstream solids separation (e.g. DAF or Actiflo). New tertiary filtration would also be required. The existing extended aeration process tankage would be repurposed to provide the required aerobic digester capacity, and new biosolids storage tanks would be provided.

3. **Membrane bioreactor (MBR)**

   Implementation of the MBR process for the upgraded and expanded Cookstown WPCP would include providing new bioreactors, a new equalization tank, membrane tanks, ultrafiltration membrane units and associated chemical feed systems. The existing extended aeration process tankage would be repurposed to provide the required aerobic digester capacity, and new biosolids storage tanks would be provided.

4. Conventional activated sludge (CAS) with tertiary filtration

Implementation of the CAS process for the upgraded and expanded Cookstown WPCP would include providing new bioreactors and new secondary clarifiers. New tertiary filtration would also be required. The existing extended aeration process tankage would be repurposed to provide primary clarifier capacity. Because the CAS process generates both raw sludge and WAS, the new solids treatment train would need to be able to handle, stabilize and store these sludges. This could be accomplished by providing a new anaerobic digester and new biosolids storage tanks, or other sludge stabilization and storage options.

Technical Memorandum 4 – Alternative Design Concepts was prepared to provide details regarding the development and evaluation of the alternative solutions, and is provided in Appendix I.

6.2 Evaluation of Alternative Design Concepts

6.2.1 Design Concepts Short-List

An evaluation was conducted to determine which of the alternative design concepts presented in Section 6.1 are capable of meeting the study objectives. Only those alternative design concepts that satisfy the project objectives and are technically feasible were considered for further evaluation.

Option 1 (Extended aeration with tertiary filtration) is a common configuration of small and medium sized facilities in Ontario that are required to meet stringent effluent TSS and TP concentrations. The biological treatment process can be designed to consistently meet stringent effluent TAN targets and works well in cold weather. It can also be paired with a variety of tertiary filtration options, including but not limited to granular media filters, tertiary membrane filtration, and disc filters. Finally, operations staff are familiar with the extended aeration process since it is the existing secondary treatment process at the Cookstown WPCP. Therefore, Option 1 is a feasible option for the upgraded and expanded Cookstown WPCP.

Option 2 (MBBR with tertiary filtration) is a newer treatment technology than extended aeration and, as a result, there are not as many municipal treatment plants equipped with this process. Because a mixed liquor concentration is not maintained in the MBBR tanks, the solids that require removal tend to be smaller (less flocculated). In addition, without a sustained mixed liquor concentration, operations staff have less operational flexibility and control. Based on input received from a supplier of the MBBR technology, this option is not recommended for an upgraded and expanded Cookstown WPCP as it would be difficult to consistently achieve the required effluent targets, specifically in terms of TP and TSS. Providing additional polishing steps to further reduce the effluent TP and TSS concentrations would add complexity and cost. Therefore, Option 2 is not recommended

for the upgraded and expanded Cookstown WPCP.

Option 3 (MBR) is not as common as extended aeration with tertiary filtration; however, MBR systems have been implemented successfully at small and medium sized facilities in Ontario that are required to meet stringent effluent TSS and TP concentrations. The biological treatment process can be designed to consistently meet stringent effluent TAN targets and works well in cold weather. The ultrafiltration membranes provide excellent solids removal, allowing MBR systems to consistently achieve high quality effluent in terms of TSS and TP. While the hydraulic throughput capacity of the membranes decreases in cold liquid temperatures, potential hydraulic bottlenecks can be addressed by designing the membrane filtration system for combined peak flow / cold weather events. Finally, the MBR system typically has a smaller footprint than the extended aeration process with tertiary filtration. Therefore, Option 3 is a feasible option for the upgraded and expanded Cookstown WPCP.

Option 4 (CAS with tertiary filtration) is used by numerous municipal wastewater treatment facilities in Ontario; however, these are typically larger treatment systems where the addition of primary clarification can significantly reduce the required volume of downstream bioreactors. Compared to the extended aeration process (Option 1), the CAS process involves additional operational complexity, including the need for an additional liquid treatment train step (primary clarification) and the more complex anaerobic digestion process. The CAS process also has higher potential for odours and generates high-strength return streams that could impact liquid treatment train performance. Therefore, Option 4 is not recommended for the upgraded and expanded Cookstown WPCP.

The two short-listed feasible alternative design concepts carried forward for additional evaluation are:

- Option 1 – Extended aeration with tertiary filtration; and,
- Option 3 – MBR.

Both short-listed design concepts would ultimately require a collection system, SPSs and force main / gravity sewer from the Highway 400 & 89 Employment Lands to convey wastewater to the Cookstown collection system and/or WPCP. Since these collection and conveyance options are similar for both of the short-listed design concepts, this was not considered as a factor in the analysis of the alternative design concepts. Additional analysis of conveyance requirements from the Highway 400 & 89 Employment Lands is provided in Section 7.

6.2.2 Development of Short-Listed Design Concepts

Option 1 – Extended Aeration with Tertiary Filtration

Implementation of Option 1 would consist of:

- Upgrades to the on-site SPS;
- A new headworks providing screening and grit removal;
- Two new bioreactors each with a volume of approximately 1,200 m^3, operating in parallel and equipped with a new diffused aeration system, to provide biological oxidation;
- Two new secondary clarifiers each with a surface area of approximately 100 m^2, operating in parallel, to provide solids separation;
- A new tertiary filtration system, such as shallow bed granular media filters or deep-bed granular media filters, and sized to accommodate the projected design peak flow capacity (operating at N-1 conditions) to provide tertiary level solids removal;
- A new diversion tank and effluent pumping system to allow effluent to be directed to and pumped from the effluent storage lagoons;
- A new UV disinfection system;
- Upgraded effluent outfall piping to Innisfil Creek;
- Converting the existing bioreactor and secondary clarifier tankage into a two-stage aerobic digester for sludge digestion;
- A new biosolids storage system, such as aerated liquid biosolids storage tanks or a geotextile dewatering and storage system, to provide on-site biosolids storage capacity;
- New building(s) to house the headworks equipment, blowers, tertiary treatment, and chemical feed systems.

For the purposes of developing a conceptual site layout for Option 1, it was assumed that deep-bed granular media filters would be provided, along with liquid biosolids storage tanks.

A conceptual level site layout for Option 1 – Extended Aeration with Tertiary Filtration is provided in Figure 6.1. Based on the site layout, all new infrastructure can be accommodated on the portion of the existing WPCP site that has been previously disturbed.

Option 3 - MBR

Implementation of Option 3 would consist of:

- Upgrades to the on-site SPS;
- A new headworks providing fine screening and grit removal;
- Two new bioreactors, operating in parallel and equipped with a new diffused aeration system, to provide biological oxidation. Each bioreactor having an approximate volume of 625 m^3, with 175 m^3 operating in anoxic mode and 450 m^3 operating in aerobic mode (see Appendix A);
- Three new membrane tanks housed in a new membrane building, each with an approximate volume of 80 m^3;
- A new raw wastewater equalization tank to provide peak flow attenuation, assumed to have an approximate volume of 625 m^3 (consistent with each of the new bioreactors);
- An ultra-filtration membrane system, including membrane units, permeate pumping, backpulse system, air scouring system, clean-in-place capability with associated chemical feed systems and associated instrumentation and controls sized to accommodate projected peak flows at design minimum temperatures and N-1 operating conditions and housed in a new membrane building;
- A new diversion tank and effluent pumping system to allow effluent to be directed to and pumped from the effluent storage lagoons;
- A new UV disinfection system;
- Upgraded effluent outfall piping to Innisfil Creek;
- Converting the existing bioreactor and secondary clarifier tankage into a two-stage aerobic digester for sludge digestion;
- A new biosolids storage system, such as aerated liquid biosolids storage tanks or a geotextile dewatering and storage system, to provide on-site biosolids storage capacity;
- New building(s) to house the headworks equipment, blowers, membrane tanks, associated membrane system equipment, and chemical feed systems

For the purposes of developing a conceptual site layout for Option 3, supplier recommended bioreactor and membrane tank dimensions were assumed (see Appendix I for details). It was also assumed that liquid biosolids storage tanks would be provided.

A conceptual level site layout for Option 3 – MBR is provided in Figure 6.2. Based on the site layout, all new infrastructure can be accommodated on the portion of the existing WPCP site that has been previously disturbed.

Figure 6.1 – Conceptual Layout for Design Concept Option 1 – Extended Aeration with Tertiary Filtration

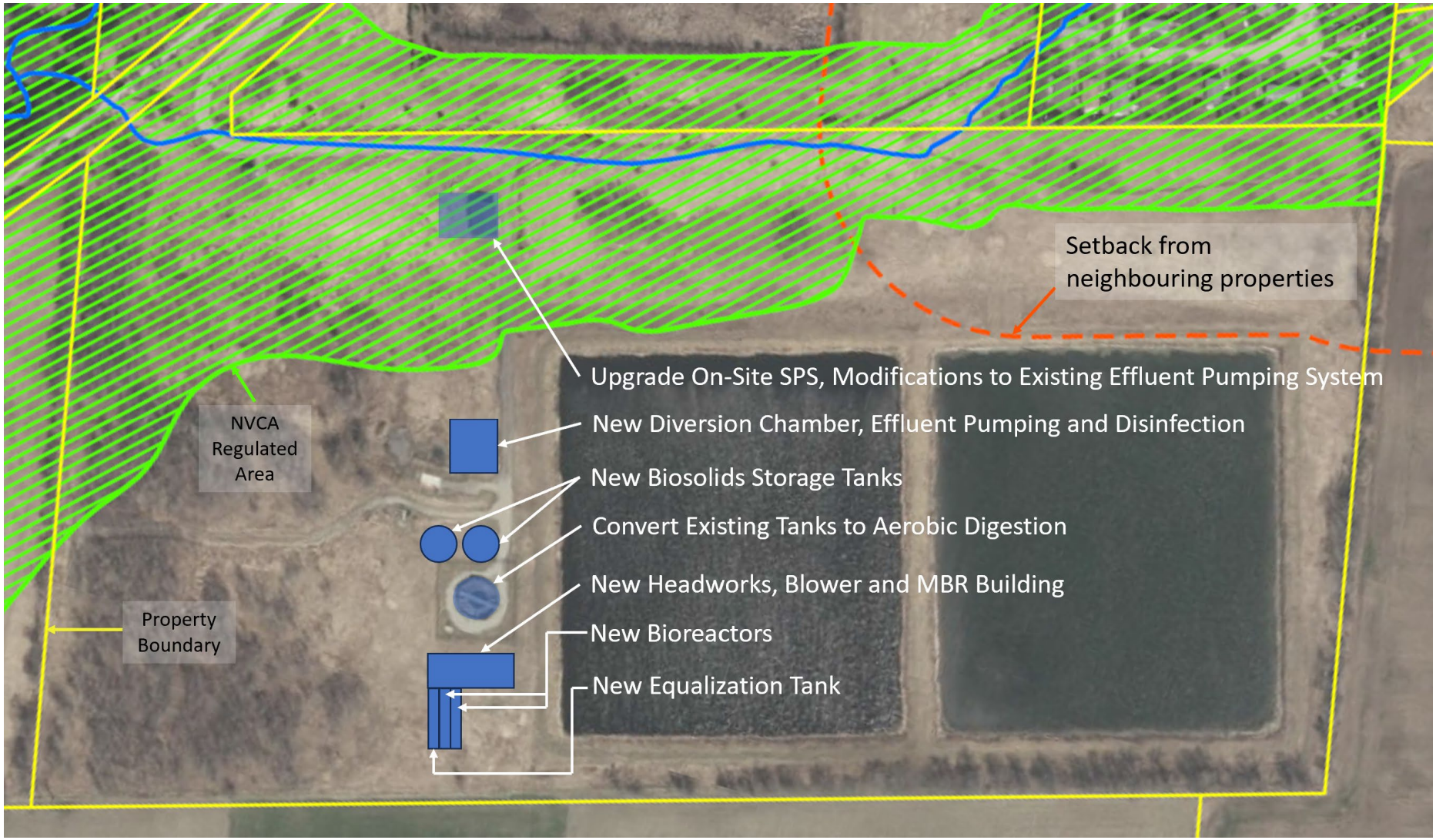

Figure 6.2 – Conceptual Layout for Design Concept Option 3 – MBR

6.2.3 Evaluation Criteria

Evaluation criteria were developed to evaluate the short-listed alternatives based on their impacts on the natural environment, social environment and economic environment during both the design / construction phase and operations phase.

6.2.4 Cost Estimates

A life cycle cost analysis was completed for the two short-listed alternative design concepts based on an inflation rate of 5% and an interest rate of 3.5% and is presented in Table 6.1. Details regarding the capital cost and operation and maintenance (O&M) cost estimates are provided in Appendix I.

Table 6.1 – Comparison of Estimated Capital Costs, Annual O&M Costs and Net Present Value for the Short-Listed Design Concepts

Cost Item	Option 1 – EA with Tertiary Filtration	Option 3 - MBR
Estimated Capital Cost	$45.2M	$44.9M
Estimated Annual O&M Cost	$1,051K	$1,315K
Estimated Net Present Value of O&M Costs to 2051	$34.4M	$43.1M
Estimated Life Cycle Cost to 2051	**$79.6M**	**$88.0M**

Notes:

All costs in 2025 Canadian dollars excluding HST.

Costs do not include improvements to the existing Cookstown sanitary collection system.

6.2.5 Comparison of the Short-Listed Concepts

A comparison of the advantages and disadvantages of the feasible alternatives is provided in Tables 6.2 and 6.3. A completed evaluation scoring matrix is provided in Table 6.4.

Table 6.2 – Preliminary Evaluation of Alternative Design Concepts During the Construction Phase

Evaluation Criterion	Option 1 – Extended Aeration with Tertiary Filtration	Option 3 – MBR
Natural Environment		
Effect on surface waters	• All construction impacts can be mitigated through good construction techniques.	• All construction impacts can be mitigated through good construction techniques
Disruption of terrestrial features	• Larger footprint than Option 3.	• Smaller construction footprint than Option 1.
Social / Cultural / Community Environment		
Disruption of adjacent residential, community and recreational features (noise, dust, odour, traffic)	• Minor noise and dust on adjacent land owners and residents during construction activities.	• Minor noise and dust on adjacent land owners and residents during construction activities
Economic Environment		
Capital Costs of Construction	• Similar capital cost as Option 3.	• Similar capital cost as Option 1.
Technical Environment		
Constructability	• Construction of the new headworks, bioreactors, clarifiers, tertiary filters, effluent diversion / pumping and disinfection systems could be accommodated by keeping the existing extended aeration system in service. • Once the new liquid treatment train has been constructed, the existing tankage could be retrofitted to operate as the two-stage aerobic digester.	• Construction of the new headworks, bioreactors, clarifiers, tertiary filters, effluent diversion / pumping and disinfection systems could be accommodated by keeping the existing extended aeration system in service. • Once the new liquid treatment train has been constructed, the existing tankage could be retrofitted to operate as the two-stage aerobic digester.
Compatibility with existing infrastructure	• Can utilize the existing bioreactor / secondary clarifier tankage, as well as the existing effluent storage lagoons.	• Can utilize the existing bioreactor / secondary clarifier tankage, as well as the existing effluent storage lagoons.

Table 6.3 – Preliminary Evaluation of Alternative Design Concepts During the Operations Phase

Evaluation Criterion	Option 1 – Extended Aeration with Tertiary Filtration	Option 3 – MBR
Natural Environment		
Effect on surface waters	• Negligible impacts as future design effluent targets and necessary effluent flow rate control can be met.	• Negligible impacts as future design effluent targets and necessary effluent flow rate control can be met.
Social / Cultural / Community Environment		
Disruption of adjacent residential, community and recreational features (noise, dust, odour, traffic)	• Low disruption anticipated. • Potential for odours from aerobic digestion process, particularly during decanting activities.	• Low disruption anticipated. • Potential for odours from aerobic digestion process, particularly during decanting activities.
Economic Environment		
O&M Costs	• Lower annual O&M costs relative to Option 3.	• Higher annual O&M costs relative to Option 1.
Technical Environment		
Ability to consistently meet effluent criteria	• Able to consistently meet effluent criteria.	• Able to consistently meet effluent criteria. • Reduced risk for washout of nitrifying bacteria during cold / wet weather events. • Potential for improved effluent quality, especially in terms of TSS and TP, over Option 1.
Performance and experience in similar climates and size	• Very good experience / performance. • Proven treatment process with long history of application in similar climates.	• Not as many installations in Ontario or other colder climates. • Throughput capacity can be reduced during cold weather events.
Operational complexity / familiarity of operations staff with process	• Low complexity. • Operations staff familiar with processes involved in treatment by extended aeration. • InnServices has granular media filters at the Lakeshore WPCP.	• High complexity. • Membranes represent a barrier to flow through the plant, requiring complex control of permeate pump operation. • Membranes have intensive maintenance requirements. • Operations staff are not familiar with this technology.
Operating requirements / operation time usage	• Lower requirements than Option 3.	• Higher requirements than Option 1.

Table 6.4 – Evaluation Matrix – Short-Listed Alternative Design Concepts

Group	Criteria	Weighting	Option 1	Option 3
Design/Construction Phase				
Natural Environment	Effect on surface waters	3	4	4
	Disruption of terrestrial features	3	3	4
Social / Cultural / Community Environment	Disruption of adjacent residential, community and recreational features (noise, dust, odour, traffic)	4	4	4
Economic Environment	Capital costs of construction	5	4	4
Technical Environment	Constructability	3	4	4
	Compatibility with existing infrastructure	3	4	4
	Total Weighted Score – Design / Construction Phase	**-**	**81**	**84**
Operations Phase				
Natural Environment	Effect on surface waters	3	4	4
Social / Cultural / Community Environment	Disruption of adjacent residential, community and recreational features (noise, dust, odour, traffic)	4	4	4
Economic Environment	Operation and maintenance costs	5	4	3
Technical Environment	Ability to consistently meet effluent criteria	5	3	4
	Performance / experience in similar climates / size	4	4	2
	Operating complexity / familiarity	4	4	2
	Operating requirements / operation time usage	3	4	2
	Total Weighted Score – Operations Phase	**-**	**107**	**85**
	Total Overall Weighted Score	**-**	**188**	**169**

6.3 Selection of the Preferred Design Concept

The preferred solution is Option 1 – Extended Aeration with Tertiary Treatment.

The selection of tertiary treatment and biosolids storage technologies will be made during preliminary design. Final tank sizing and building footprints will also be confirmed during preliminary design.

7. Assessment of Wastewater Conveyance from Highways 400 and 89

7.1 Overview of Design Options

Conceptual level design options for the key components of a wastewater collection and conveyance system to service the 400&89 Employment Lands were developed. Technical Memorandum 5 – Wastewater Conveyance from Highway 400 & Highway 89 Employment Lands – Feasibility Assessment was prepared to provide details regarding the development and feasibility analysis of the alternatives, and is provided in Appendix J.

Key components of a wastewater collection system would include:

- **Local Collection System**

  A local collection system, to which the serviced lots can connect, would be required. Options could include gravity sewers, septic tank effluent gravity (STEG) systems and/or septic tank effluent pumping (STEG) systems with SPSs as required. Evaluation of local collection system options was beyond the scope of the feasibility assessment; however, selection of a specific technology (or combination of technologies) will not impact the feasibility of constructing main sewage pumping stations or force main and gravity sewers to the Cookstown WPCP.

- **Main Sewage Pumping Stations**

  The main SPSs are the stations that would convey the wastewater from the 400/89 Employment Lands to the Cookstown collection system and/or the Cookstown WPCP. The local collection system would connect to the main SPSs. Due to the 400&89 Employment Lands spanning both sides of Highway 400, a minimum of two main SPSs would be required: one on the east side of Highway 400 (“East SPS”), and one on the west side of Highway 400 (“West SPS”).

- **Force Main and Gravity Sewers to the Cookstown WPCP**

  New force mains and gravity sewers are required to convey the wastewater from the 400&89 Employment Lands to the Cookstown collection system and/or Cookstown WPCP. At a minimum, it will be necessary to connect the East SPS to the West SPS via a force main that crosses Highway 400, as well as provide a mixture of force mains / gravity sewers to connect the West SPS to the Cookstown collection system and/or Cookstown WPCP. A bridge crossing over Innisfil Creek will also be required.

7.2 Conceptual Level Conveyance Option

7.2.1 Overview

A conceptual level conveyance option was developed that consists of the following:

- Two new main SPSs (“East SPS” and “West SPS”). Each would include precast concrete wet wells housing duplex submersible pumps each sized for peak flow, a

below grade precast concrete valve chamber, and an outdoor weatherproof enclosure for pump starters and controls. Each SPS would also be equipped with a self-contained outdoor generator for standby power.

- The “East SPS” would be located in the Cookstown Outlet Mall parking lot on the east side of Highway 400 within the projection of the 15th Line right-of-way. The discharge force main would be microtunnelled under Highway 400 to the “West SPS”.
- The “West SPS” would be located just off 15th Line, approximately 250 m west of Highway 400. The force main from the West SPS would travel west along 15th Line approximately 3500 m to the crest of the hill on Victoria Street East. A bridge crossing over Innisfil Creek will also be required.
- Gravity sewer would be installed on Victoria Street to the Cookstown Trans Canada Trail and south on the Cookstown Trans Canada Trail to the main SPS at the Cookstown WPCP.

This option is presented visually in Figure 7.1.

7.2.2 Feasibility Assessment

Overall, the conceptual level option presented in Section 7.2.1 was determined to be feasible. The following items would require additional consideration during preliminary and detailed design:

- Obtaining land for both the “East SPS” and “West SPS”.
- Techniques (e.g. microtunnelling) and other considerations (e.g. alignment) associated with the force main from the “East SPS” crossing under Highway 400 and the force main from the “West SPS” crossing Innisfil Creek as well as a major natural gas pipeline located to the east of Cookstown.
- Alternative routes for the force main and gravity sewers from the “West SPS” to the Cookstown collection system and/or Cookstown WPCP.
- Dewatering needs during construction.

Additional details are provided in Appendix J.

7.2.3 Future Studies and Approvals Required

Although methods to convey wastewater from the 400&89 Employment Lands to the WPCP were considered as part of the feasibility assessment, the analysis completed did not satisfy the Class EA requirements associated with new main SPSs and force mains / gravity sewers. Therefore, extending servicing to the 400&89 Employment Lands will require future studies:

- Studies to meet Class EA requirements, if identified as necessary via the Class EA screening process, for the main SPSs, force mains and gravity sewers to convey

wastewater from the 400&89 Employment Lands to the WPCP.

- Studies required to support the Class EA study and/or screening process which may include, but not be limited to, the following:
  - Natural Environment Inventory;
  - Geotechnical and Hydrogeological Investigation;
  - Stage 1 Archaeological Study.

In addition, permits and/or approvals will be required from, but not limited to, the following:

- MTO
- NVCA
- TransCanada PipeLines Limited
- County of Simcoe
- MECP

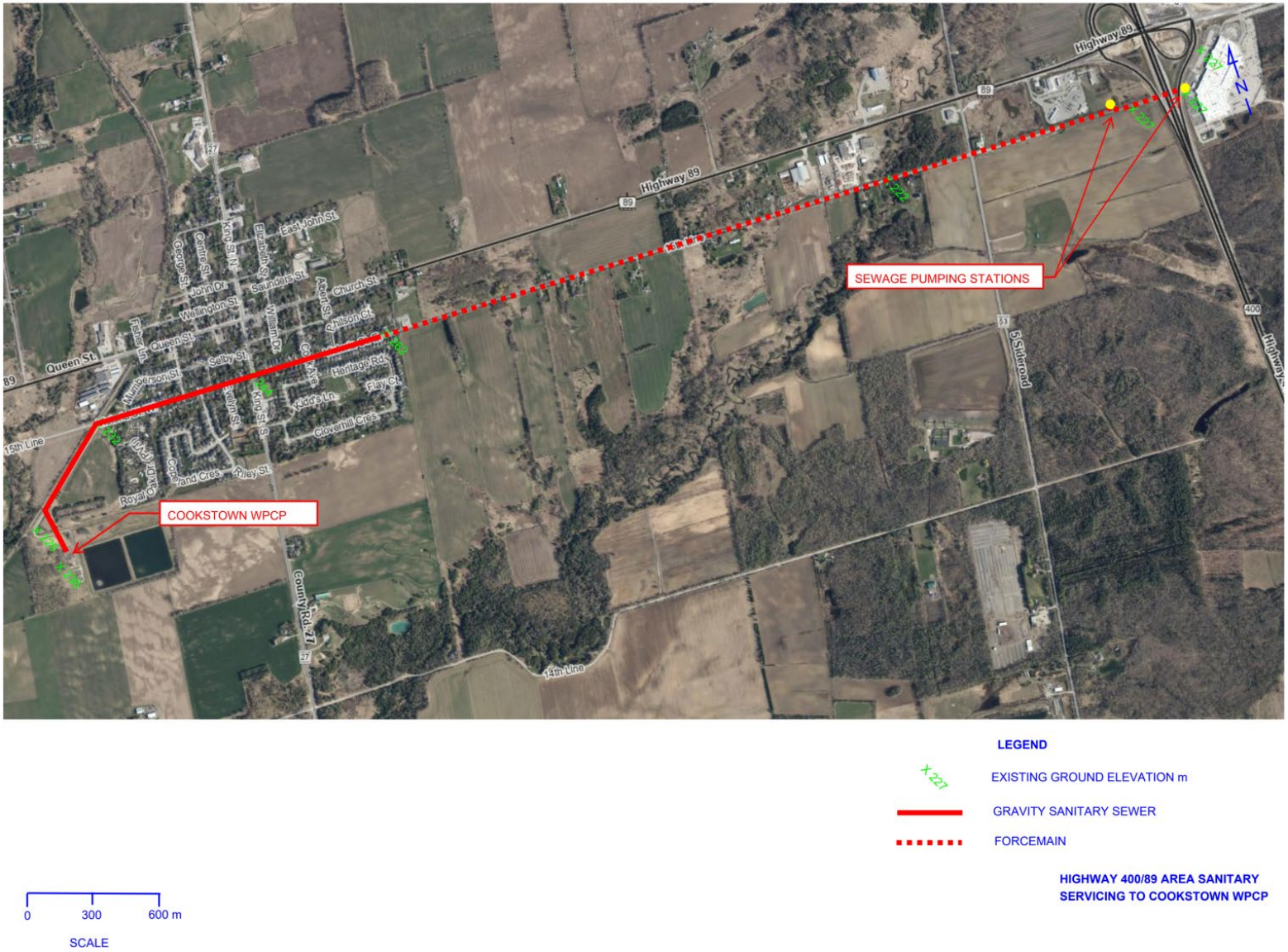

Figure 7.1 – Conceptual Level Wastewater Conveyance Option for the 400&89 Employment Lands

8. Consultation Process Summary

Consultation in an important part of the MCEA process, ensuring that stakeholders and other members of the public with an interest in the project have an opportunity to provide input into the study. Comments received during the Class EA Study are incorporated into the development and evaluation of alternative solutions and design concepts.

At a minimum, consultation activities must be sufficient to fulfill the requirements of a Schedule C project. Schedule C project requirements include four mandatory public points of contact curing the MECA process (see Figure 1.2). The mandatory points of public contact for this project included a Notice of Commencement, two Public Information Centers (PICs) held during Phase 2 and Phase 3 of the Class EA process, and a Notice of Completion.

A project webpage on InnServices' website [1] was established to provide project information, including project notices, PIC materials and information on how to ask questions or provide comment, including contact information for the project team members.

A Project Contact List was developed as a mailing list to distribute project notices. The Project Contact List consisted of technical and Provincial agencies, utilities, and Indigenous communities that may have an interest in the project, as well as stakeholders within the Study Area that indicated an interest in the project. Throughout the MCEA process, the Project Contact List was used to maintain contact information for those interested in the project, as well as to summarize comments received about the project and responses from the study team. A copy of the Project Contact List is provided in Appendix K. Copies of Correspondence are also provided in Appendix K.

8.1 Project Notices

Project Notices (Notice of Commencement, Notice of PIC No. 1, Notice of PIC No. 2) were published online at InnServices' Cookstown WPCP Class EA website, the Town of Innisfil's website, and a local news website (Simcoe.com), as well as posted on the InnServices Utilities Inc.'s social media accounts. Project Notices were also emailed or mailed directly to regulatory agencies, municipalities, Indigenous communities and others on the Project Contact List.

The Notice of Commencement was issued on December 4, 2023. It was published online, posted to social media and circulated to the Project Contact List on the same day.

The Notice of PIC No. 1 was issued on October 7, 2024. It was published online, posted

[1] Project URL: https://innservices.co/infrastructure-upgrades/environmental-assessments/cookstown-water-pollution-control-plant

to social media and circulated to the Project Contact List on the same day.

The Notice of PIC No. 2 was issued on May 27, 2025. It was published online, posted to social media and circulated to the Project Contact List on the same day.

Copies of the Project Notices are provided in Appendix K.

8.2 Public Information Centers

Two in-person PICs were held as part of the Class EA Study to allow the opportunity for the public to provide input into the planning and design of the project.

Summaries of each of the PICs are provided below. Copies of the PIC Notes, presentation materials and associated correspondence are provided in Appendix K.

8.2.1 Public Information Center No. 1

PIC No. 1 was held in the Meeting Hall at the Cookstown Library on November 6, 2024 as an in-person, drop-in style format with project information displayed around the room. Members of the project team were present to discuss the project with interested members of the public and answer questions. Attendees were greeted upon arrival, encouraged to sign in, and made aware of the opportunity to provide comments using a printed comment form available at PIC No. 1, a digital comment form available on InnServices' project webpage, or by contacting the project team directly with written comments.

Presentation material provided background information on the existing environment of the Study Area, an overview of the Class EA process, alternative receivers under consideration, alternative solutions, the recommended preferred alternative solution, and next steps.

Following PIC No. 1, the presentation materials and comment sheet were posted to InnServices' project webpage for the public to view or download. A deadline of December 6, 2024 to submit comments was identified on the presentation materials and comment sheet.

A total of 41 people attended PIC No. 1 (excluding members of the project team), with 34 attendees signing the sign-in sheet. Comments received during the PIC and/or within the comment period included the following themes:

- Concerns with respect to the potential for an expansion of the plant overflowing the capacity of the existing lagoons.
- Questions regarding anticipated timeline for completion of the Class EA Study, construction activities, and availability of additional servicing capacity.
- Concerns regarding the potential for inter-basin transfers from the Nottawasaga River

/ Georgian Bay watershed to the Lake Simcoe watershed.

- Concerns with respect to maintaining Innisfil Creek as the effluent receiver given its limited assimilative capacity.
- Questions regarding the need and cost associated with including the Highway 400&89 Employment Lands within the Study Area.

Details of PIC No. 1, copies of the comments received and the project team's responses are available in Appendix K.

8.2.2 Public Information Center No. 2

PIC No. 2 was held in the Meeting Hall at the Cookstown Library on June 26, 2025 as an in-person, drop-in style format with project information displayed around the room. Members of the project team were present to discuss the project with interested members of the public and answer questions. Attendees were greeted upon arrival, encouraged to sign in, and made aware of the opportunity to provide comments using a printed comment form available at PIC No. 2, a digital comment form available on InnServices' project webpage, or by contacting the project team directly with written comments.

Presentation material described the project, confirmed selection of the preferred servicing solution, provided information regarding alternative design concepts under consideration, identified the recommended preferred design concept, and outlined next steps.

Following PIC No. 2, the presentation materials and comment sheet were posted to InnServices' project webpage for the public to view or download. A deadline of July 26, 2025 to submit comments was identified on the presentation materials and comment sheet.

A total of 12 people attended PIC No. 2 (excluding members of the project team), with 10 attendees signing the sign-in sheet. Comments received during the PIC and/or within the comment period included the following themes:

- Questions regarding the future design ADF anticipated for the upgraded and expanded Cookstown WPCP and the development included in the growth projection.
- Concerns with respect to the including servicing of the Highway 400&89 Employment Lands in the preferred alternative.
- Questions regarding the potential to modify the effluent discharge location into Innisfil Creek to a point further downstream.

Details of PIC No. 2, copies of the comments received and the project team's responses are available in Appendix K.

8.3 Consultation with Indigenous Communities

The MECP has developed guidance on the steps to rights-based consultation with Indigenous Communities. Indigenous Communities with a potential interest in the project were identified through correspondence and direction provided by the MECP (correspondence: Chunmei Liu, Regional Environmental Planner, MECP, dated December 7, 2023). A copy of the correspondence with MECP is provided in Appendix K.

Individual correspondence with Project Notices was sent by email / mail to Indigenous communities. Follow-up phone calls were made to Indigenous Communities that may have an interest in the Study to confirm receipt of the notices and to inquire about their level of interest in the Project and/or to determine if the communities had any concerns or questions about the Project.

Additional correspondence was sent by email / mail to Indigenous communities for notification of the coordination for Stage 1 Archaeological Assessment and ask for any comments or interest in participating in the Stage 1 Assessment. The Stage 1 Assessment Report was circulated to Indigenous Communities on July 2, 2025. In the accompanying email it was noted that, based on the conceptual level layout of the preferred design concept and the results of the Stage 1 Archaeological Assessment, a Stage 2 Archaeological Assessment was not required as part of this Class EA Study.

Hiawatha First Nation responded to the notification of Stage 1 Archaeological Assessment to circulate the information to the archaeology coordinator. A follow-up email was sent by the project team to inform Hiawatha First Nation of the date and time planned for the Stage 1 Archaeological Assessment. A copy of the draft Stage 1 Archaeological Assessment Report was circulated to Hiawatha First Nation on July 2, 2025. No further correspondence was received from Hiawatha First Nation following circulation of the draft Stage 1 Archaeological Assessment Report.

Huron-Wendat Nation expressed interest to participate in all archaeological fieldwork for this project, as well as receiving copies of the draft reports for review and comments. A copy of the draft Stage 1 Archaeological Assessment Report was circulated to Huron-Wendat Nation on July 2, 2025. A response to the draft Stage 1 Archaeological Assessment Report circulation provided thanks for the report and noted that the Wendat Nation is interested in participating in all archaeological fieldwork for this project, as well as receiving copies of the draft reports for review and comments.

Mississaugas of the Credit First Nation expressed interest to review the Stage 1 Archaeological Assessment once the report was completed. A copy of the draft Stage 1 Archaeological Assessment Report was circulated to Mississaugas of the Credit First Nation on July 2, 2025. The Mississaugas of the Credit First Nation responded to the circulation of the Stage 1 Archaeological Assessment Report noting the project falls

outside the Traditional and Treaty Lands; therefore, the Mississaugas of the Credit First Nation cannot provide any comments.

A summary of communications and comments received from Indigenous Communities throughout the project is provided in the Project Contact List in Appendix K and summarized below in Table 8.1.

Table 8.1 – Indigenous Communities Correspondence Summary

Community	Notices Sent	Comments Received	Correspondence Sent
Alderville First Nation	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement	231213_Phone call from Julie: project is in Treaty 18 area; therefore, Beausoleil, Georgina Island, and Rama First Nation should be taking the lead on the project. Alderville will not really be involved; however, if there are archeology studies associated with the project, Alderville would like to be involved with liaisons to participate.	241022_Phone call. Follow up to confirm receipt of NOPIC. No answer left voicemail with details and contact info. 240801_Phone call. Follow up to confirm receipt of Stage 1AA. No answer, left voicemail with study details and contact info. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. No answer, left voicemail with study details and contact info. 231212_call. Follow up Notice of Commencement. No answer. Left voicemail with study and call back info
Beausoleil First Nation	250702_Draft Stage 1AA report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement	240712_Phone call. Follow up to confirm receipt of Stage 1AA. Reception informed Lua is no longer in position, currently vacant continue to send notices to consultations email (BFNConsultation@chimnissing.ca). Anthony Lewis, Lands Manager email address was provided as interim contact (ALewis@chimnissing.ca)	241017_Phone call. Follow up to confirm receipt of Notice of PIC. No answer. Left voicemail for Adam Lewis with study details and contact info. 240801_Phone call. Follow up to confirm receipt of Stage 1AA. No answer. Voicemail full, unable to leave message. 240724_Email. Notice Stage 1AA forwarded to Anthony Lewis, Lands Manager. 240712_Phone call. Follow up to confirm receipt of Stage 1AA. Reception informed Lua is no longer in position and is currently vacant. Anthony Lewis Lands Manager email address was provided as interim contact (ALewis@chimnissing.ca), Anthony Lewis not in office today. 231214_Phone call. Follow up to confirm receipt of Notice of Commencement. Lua Mandor confirmed receipt of Notice, will review and respond to email with comments 231212_Phone call. Follow up to confirm receipt of Notice of Commencement. No answer. Left voicemail with study details and contact info.

Community	Notices Sent	Comments Received	Correspondence Sent
Chippewas of Georgina Island	250702_Draft Stage 1AA report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement	241018_Email. J.L. Porte responded to Notice of PIC, confirmed receipt. Inquired what the study is looking for from GIFN at this time. 240724_Phone call. JL Porte confirmed receipt of Notice Stage 1AA. GIFN does not have capacity to participate in Stage 1AA. GIFN would like to be circulated the Stage 1AA report when available. GIFN expressed interest in participating in any Stage 2AA works.	241024_Email. Project team provided PIC information to keep GIFN informed of study progress. The project team is happy to meet or discuss any questions or comments on the project. Provided link to study website to access information about the project. 241017_Phone call. Follow up to confirm receipt of NOPIC. No answer, Left study details and contact info. 231214_Phone call. Confirmed receipt of notice and will respond to email with comments. 231212_Phone call. Follow up to confirm receipt of Notice of Commencement. No answer. Left study details and call back info.
Chippewas of Mnjikaning First Nation (Rama)	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement	231213_Email. Ben Benson responded to Notice of Commencement. RFN interest in the project is rather low but would like to review the document before final submission, Ben Benson is transitioning out of role, email address will remain active and new contact will be Sam until replacement is found.	241017_Phone call. Follow up to confirm receipt of Notice of PIC. No answer, left study details and contact info. 240801_Phone call. Follow up to confirm receipt of Notice Stage 1AA. No answer. Left study details and contact info. 240724_Phone call. Follow up to confirm receipt Notice Stage 1AA. Reception informed consultations position is vacant. Transferred call to Ben Cousineau, no answer. Left voicemail with study details and contact info. 231212_Phone call. Follow up to confirm receipt of Notice of Commencement. Ben Benson confirmed receipt of notice, will review and respond to email with level of interest.

Community	Notices Sent	Comments Received	Correspondence Sent
Curve Lake First Nation	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement		241017_Phone call. Follow up to confirm receipt of NOPIC. No answer. Left voicemail with study details and contact info. 240801_Phone call. Follow up to confirm receipt of Stage 1AA. No answer, voicemail full, unable to leave message 240724_Phone call. Follow up to confirm receipt of Stage 1AA. No answer, voicemail full, unable to leave message 231214_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info. 231212_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info.
Hiawatha First Nation	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement	240724_Email. Sean Davison confirmed receipt of Notice and voicemail. Cc'd Mandy McGonigle Archaeology coordinator and requested Mandy respond.	241022_Phone call. Follow up to confirm receipt of NOPIC. No answer left voicemail with details and contact info. 240801_Email. Follow up email sent to Sean Davison and Mandy McGonigle inquiring about level of interest in Stage 1AA participation. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. No answer, left voicemail with study details and contact info. 231214_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info. 231212_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info.

Community	Notices Sent	Comments Received	Correspondence Sent
Kawartha Nishnawbe First Nation	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement	240725_Hard copy mail. Returned to sender.	241022_Phone call. Follow up to confirm receipt of NOPIC. No answer left voicemail with details and contact info. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. No answer, left voicemail with study details and contact info. 240729_Hard copy mail resent. Updated mailing address (Notice Stage 1AA mail RTS) and phone #. General email contact added, email Notice Stage 1AA also sent to email contact. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. Call not completed, number not in service.
Kitigan Zibi Anishinabeg	240712_Notice of Stage 1AA 231205_Notice of Commencement	240724_Phone call. New Chief Dylan Whiteduck did not receive notice; it was delivered to previous chief Jean Guy Whiteduck. Noted the community does not have any interest in participating in the study. Requested to be removed from contact list.	240724_Phone call. Follow up to confirm receipt of Notice Stage 1AA. Removed from contact list per phone call response received.

Community	Notices Sent	Comments Received	Correspondence Sent
Long Point First Nations	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement		241022_Phone call. Follow up to confirm receipt of NOPIC. No answer, unable to leave voicemail. 240801_Phone call. Follow up to confirm receipt of Stage 1AA. Reception informed Chief was on vacation, returning August 6 and no other staff to speak to regarding consultation or archaeology. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. Reception informed Chief was on vacation, did not know return date and assistant was unavailable. Left voicemail for Chief Rodgers with study details and contact info. 231214_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info. 231212_Follow up phone call to confirm receipt of Notice of Commencement, reception informed Chief Henry Rodgers unavailable, not in the office and please call back.
M'Chigeeng First Nation	250702_Draft Stage 1AA report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1 AA 231205_Notice of Commencement		241022_Phone call. Follow up to confirm receipt of NOPIC. No answer left voicemail with details and contact info. 240801_Phone call. Follow up to confirm receipt of Stage 1AA. No answer. Left voicemail with study details and contact info. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. No answer. Left voicemail with study details and contact info. 231214_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info. 231212_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info.

Community	Notices Sent	Comments Received	Correspondence Sent
Métis Nation of Ontario	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement	240801_Phone call. Mary MacDougall confirmed receipt of Notice, it has been sent to internal consultation committee, Mary is waiting to hear from committee on direction regarding the study. Mary noted if Métis Nation does not respond by August 6, then they do not have an interest to participate in Stage 1AA. Métis Nation Would like to be kept informed on when the Stage 1AA Report is available and will respond at that time if they have interest in reviewing the report. 240202_Updated contact information. Jesse Fieldwebster is in new position, no longer looking after consultations, continue to send all Notices to Consultations@metisnation.org, do not send notices to Regional Manager directly.; follow up calls only with Regional Manager. 231212_Jesse Fieldwebster returned call and left voicemail. Confirmed receipt of message about the study.	241017_Phone call. Follow up to confirm receipt of NOPIC. No answer. Left voicemail with study details and contact info. 240801_Phone call. Mary MacDougall confirmed receipt of notice, it has been sent to internal consultation committee, Mary is waiting to hear from committee on direction regarding the study. Mary noted if Métis Nation does not respond by August 6 ,then they do not have an interest to participate in Stage 1AA. Métis Nation Would like to be kept informed on when the Stage 1AA Report is available and will respond at that time if they have interest in reviewing the report. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. No answer. Left voicemail with study details and contact info. 240202_Updated contact information. Jesse Fieldwebster is in new position, no longer looking after consultations, continue to send all notices to Consultations@metisnation.org, do not send notices to Regional Manager directly.; follow up calls only with Regional Manager. 231212_Jesse Fieldwebster returned call and left voicemail. Confirmed receipt of message about the study. 231212_Phone call. Follow up to confirm receipt of Notice of Commencement. No answer. Left voicemail with study details and contact info.

Community	Notices Sent	Comments Received	Correspondence Sent
Mississaugas of the Credit First Nation	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement	240730_Email. MCFN would like to review the draft Stage 1AA Report once available. If Stage 2 fieldwork is required, MCFN would like to have a Field Liaison Representative ("FLR") on location, who can ensure that the Nation's special interests and concerns are respected and considered during the fieldwork.	241023_Phone call. Follow up to confirm receipt of NOPIC. No answer. Left voicemail with details and contact info. 240730_Email. Innisfil sent email to Adam LaForme (cc'd Abby LaForme). InnServices is committed to fostering strong relationships with First Nation groups and are open to future engagement to assist MCFN in review of the project. At this time, InnServices does not have an established First Nations consultation policy and will not be able to provide payment for fees including but not limited to capacity funding, review, and file fees. MCFN is still welcome to attend the Stage 1AA on-site. Alternatively, the Stage 1AA Report may be circulated for review once complete. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. No answer. Left voicemail with study details and contact info. 231214_Phone call. Follow up Notice of Commencement. Reception answered, Abby LaForme not in office, left message with reception with study details and contact info. 231212_Phone call. Follow up Notice of Commencement. No Answer. No voicemail.
Mississaugas of Scugog Island First Nation	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement		241022_Phone call. Follow up to confirm receipt of NOPIC. No answer left voicemail with details and contact info. 240801_Phone call. Follow up to confirm receipt of Stage 1AA. No answer, left voicemail with study details and contact info. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. No answer, left voicemail with study details and contact info. 231214_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info. 231212_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info.

Community	Notices Sent	Comments Received	Correspondence Sent
Mohawks Council of Akwesasne	231205_Notice of Commencement	231214_Email. Response to Notice of Commencement, Akwesasne has no comments to provide, and given the distance of this project from Akwesasne, the community will not participate in any consultation.	231214_Contact removed from list per response to Notice of Commencement.
Mohawks of the Bay of Quinte	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement		241023_Phone call. Follow up to confirm receipt of NOPIC. No answer. Left voicemail with details and contact info. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. Contact voicemail is out of office until August 6. Left voicemail with study details and contact info. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. No answer. Left voicemail with study details and contact info. 231214_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info. 231212_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info.
Moose Deer Point First Nation	240712_Notice of Stage 1AA 231205_Notice of Commencement	240724_Phone call. Marie Martinez Diaz is no longer with MDPFN, new administrator Aaron St. Pierre, confirmed receipt of Notice. MDPFN is not interested in participating in this study and can be removed for the contact list of further communications from this study.	240724_Phone Call. Follow up to confirm receipt of Notice Stage 1AA. Contact removed per response to Notice of Commencement. 231214_Phone call. Follow up Notice of Commencement. Reception informed out of office, left voicemail with study details and contact info. 231212_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info.

Community	Notices Sent	Comments Received	Correspondence Sent
Munsee-Delaware Nation	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement	240724_Phone call. Follow up to confirm receipt of Stage 1AA. Reception confirmed receipt of email, could not speak to communities level of interest in participation. Reception will request the Chief to respond to email notice with level of interest in the study.	241023_Phone call. Follow up to confirm receipt of NOPIC. Reception confirmed receipt of Notice and informed the Notice was forwarded to Chief Thomas. 231214_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info. 231212_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info.

Community	Notices Sent	Comments Received	Correspondence Sent
Nation Huronne-Wendat	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement	241025_Email. Benjamin Labbe responded to NOPIC. Thanked for update on the project. HW requested to realize a peer review of the AA Report to ensure that HW archaeological heritage is protected. Included attachment with cost estimate to support the review. HW requested to return cost estimate signed if the fees are accepted. 240719_Email. Marie-Sophie Gendron responded to Notice Stage 1AA. Huron-Wendat is interested in participating in all archaeological fieldwork for this project. Attached PDF of quote for participation, cc'd Dominique in charge of coordinating the presence of HW field liaison. Once fieldwork is available please send directly to Dominique (Dominique.Lesage@wendake.ca)	241028_Email. Bluesky responded to HW. Thank you for contacting us in response to the NOPIC 1. The Notice was sent as part of the outreach program to all stakeholders to keep apprised of the study status. If HW would like to attend the November 6 PIC, Bluesky would be happy to meet and answer any questions. If HW is unable to attend, HW will still have the opportunity to review the PIC presentation materials, which will be posted online at the study's website (https://innservices.co/infrastructure-upgrades/environmental-assessments/cookstown-water-pollution-control-plant). This will allow HW to review the materials and follow-up via email with any comments or questions that you may have. Regarding the Stage 1AA, field work was completed in August 2024 and report preparation is underway. Once finalized, we will provide Huron-Wendat Nation with a copy of the Stage 1AA Report. The existing plant site has been mostly disturbed due to the previous construction of the existing plant, so the Site has minimal archaeological value. Regarding review fees, included attachment to email of InnServices' response that was previously sent to Marie-Sophie Gendron of Huron-Wendat Nation in July 2024. 240725_Email. Innisfil sent email to Marie-Sophie Gendron (cc'd Dominique Lesage). InnServices is committed to fostering strong relationships with First Nation groups and are open to future engagement to assist HW in review of the project. Please note at this time, InnServices does not have an established First Nations consultation policy and will not be able to provide payment for fees including but not limited to capacity funding, review, and file fees. The Huron-Wendat Nation is still welcome to attend the Stage 1AA on-site. Alternatively, the Stage 1AA Report may be circulated for review once complete. 231214_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info. 231212_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info.

Community	Notices Sent	Comments Received	Correspondence Sent
Nation Anishnabe du Lac-Simon	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement		240801_Phone call. Follow up to confirm receipt of Stage 1AA. Reception speaks only French. Unable to communicate request in English. Unable to be directed to any other English speaking contacts. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. No answer, left voicemail with study details and contact info.
Ogemawahj Tribal Council	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement	250527_Email. NOPIC2 autoreply. OOO until May 30.	241022_Phone call. Follow up to confirm receipt of NOPIC. No answer left voicemail with details and contact info. 231212_Phone call. No answer. Left study details and call back info, will call back.
Oneida of the Thames First Nation	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement		241022_Phone call. Follow up to confirm receipt of NOPIC. No answer left voicemail with details and contact info. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. Janelle Cornelius confirmed receipt of notice, could not speak to level of interest at this time, will respond to notice with the community level of interest in participation. 231214_Phone call. Follow up Notice of Commencement. Reception informed Janelle Cornelius out of office and took message, left study details and contact info. 231212_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info.

Community	Notices Sent	Comments Received	Correspondence Sent
Saugeen Ojibway Nation (SON) Environment Office	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement		241017_Phone call. Follow up to confirm receipt of NOPIC. No answer. Left voicemail with study details and contact info. 240801_Phone call. Follow up to confirm receipt of Stage 1AA. No answer, left voicemail with study details and contact info. 240724_Phone call. Follow up to confirm receipt of Stage 1AA. No answer, left voicemail with study details and contact info. 231214_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info. 231212_Phone call. Follow up Notice of Commencement. No answer. Left voicemail with study details and contact info.
Union of Ontario Indians	231205_Notice of Commencement	231213_Email. Allan Dokis responded to Notice of Commencement, Anishinabek Nation is not a consultative entity for any of the 39 Anishinabek First Nations that are part of our organization unless explicitly mandated. General emails sent to the Anishinabek Nation do not constitute a consultative process with any of our 39 Anishinabek First Nations, as each of the communities are the rights holders and need to be contacted directly.	Contact removed following response to Notice of Commencement.
Williams Treaties Communities Coordinator	250702_Draft Stage 1AA Report 250527_Notice of PIC2 241007_Notice of PIC1 240712_Notice of Stage 1AA 231205_Notice of Commencement		231212_Phone call. Follow up Notice of Commencement. number not in service.

8.5 Notice of Study Completion

A Notice of Completion will be published online InnServices' Cookstown WPCP Class EA website, Simcoe.com, posted on the Town of Innisfil's and InnServices Utilities Inc.'s social media accounts and emailed or mailed to those on the Project Contact List. The Notice of Completion will provide members of the public with the dates and locations where the Environmental Study Report can be reviewed as well as the names and addresses of people to whom they can send their comments during the 30-day public comment period.

9. Overview of Preferred Design Concept

9.1 Upgrade and Expand the Cookstown WPCP

9.1.1 Description of Upgrades

The preferred alternative for wastewater servicing for the Study Area is to upgrade and expand the existing Cookstown WPCP.

Phase 3 of the Class EA process evaluated alternative design concepts to implement the preferred alternative solution. Based on the evaluation undertaken and documents in this ESR, the preferred design concept includes:

- Upgrades to the on-site SPS;
- A new headworks providing screening and grit removal, as well as an odour control system with a minimum 80% odour reduction efficiency;
- Two new bioreactors each with a volume of approximately 1,200 m^3, operating in parallel and equipped with a new diffused aeration system, to provide biological oxidation;
- Two new secondary clarifiers each with a surface area of approximately 100 m^2, operating in parallel, to provide solids separation;
- A new tertiary filtration system, such as shallow bed granular media filters or deep-bed granular media filters, and sized to accommodate the projected design peak flow capacity (operating at N-1 conditions) to provide tertiary level solids removal;
- Maintaining the existing lagoons for effluent storage;
- A new diversion tank and effluent pumping system to allow effluent to be directed to and pumped from the effluent storage lagoons;
- A new UV disinfection system;
- Upgraded effluent outfall piping to Innisfil Creek along the existing outfall path;
- Converting the existing bioreactor and secondary clarifier tankage into a two-stage aerobic digester for sludge digestion;
- A new biosolids storage system, such as aerated liquid biosolids storage tanks or a geotextile dewatering and storage system, to provide on-site biosolids storage capacity;
- New building(s) to house the headworks equipment, blowers, tertiary treatment, and chemical feed systems; and,
- Upgrades to the standby power system as required, including replacing the existing

diesel generator with a new, larger unit or providing an additional diesel generator; and,

- Other upgrades necessary, including but not limited to electrical and/or access road modifications or improvements.

Figure 9.1 presents the preferred alternative design concept layout for upgrades to the Cookstown WPCP. The site layout will be finalized during the preliminary and detailed design stages. The existing outfall route is shown in Figure 3.1 (see Section 3.2.1).

Figure 9.1 – Conceptual Level Upgrades to the Cookstown WPCP

Finally, to accommodate the flow weighted effluent discharge approach approved as part of the Assimilative Capacity Study (see Section 5.3), a permanent flow monitoring station in the vicinity of the outfall is required. Two potential locations for a permanent flow monitoring were evaluated: at the 14th Line bridge crossing; and, the at the 15th Line bridge crossing. Details of the evaluation are provided in Appendix L. Selection of the preferred monitoring location will be completed during preliminary design. Implementing continuous flow monitoring at the preferred location would consist of the following:

- Selecting an appropriate cross-section;
- Installing a staff gauge;
- Flow measurements at the monitoring location;

- Developing a stage-discharge relationship; and,
- Installing continuous flow monitoring equipment and periodic assessments to ensure continued validity of the stage-discharge relationship.

9.1.2 Confirmation of Class EA Schedule

The proposed project will increase the rated capacity of the Cookstown WPCP from 825 m^3/d to 1,864 m^3/d; hence, it is a Schedule C undertaking under the Municipal Class EA framework.

9.1.3 Additional Approval Requirements

Prior to construction of the preferred design, the following additional approvals will be required:

- NVCA permit for construction works in regulated areas;
- Building permit;
- Environmental Compliance Approval, issued by MECP under the Ontario Water Resources Act;
- Permit-to-Take-Water, if required, for site dewatering;
- Excess soils permit
- MTO
- County of Simcoe
- Environmental Compliance Approval (Air) for any new or modified air emissions.

9.1.4 Potential Impacts During Construction and Proposed Mitigation Measures

Construction will occur in two areas, namely:

- The existing Cookstown WPCP site. Based on the conceptual level layout of the preferred design concept (Figure 9.1), it is anticipated that all of the upgrades can be accommodated on the previously disturbed area of the Cookstown WPCP site. As such, a Stage 2 Archaeological Assessment is not required at this time.
- The existing outfall route. The existing outfall is located within existing easements and road rights-of-way. No change is proposed to the existing outfall route.

Construction will have potential short-term environmental and social impacts including noise, vibration, dust and traffic. During construction, mitigating measures will be employed wherever possible to minimize impacts, some of which may include:

- Preparing a sediment and erosion control plan;

- Limiting construction activities to normal working hours, Monday to Friday;
- Maintaining muffling devices on construction vehicles and heavy equipment;
- Developing and adhering to an approved traffic management plan which minimizes local traffic disruptions during the construction period; and,
- Performance excavation in an orderly and efficient manner to minimize disturbances from noise, vibration and dust.

Based on the results of a natural environment assessment, the following mitigation measures are recommended to minimize or avoid negative impacts on natural features and their ecological functions:

- If possible, any activities that could disturb breeding birds (clearing of vegetation, loud noise emissions, high intensity operations) should be scheduled outside the period early April to late August.
- If possible, construction activities close to or within wetlands, ditches, and upland meadow and woodland habitats should be scheduled outside the period March to October to minimize impacts on amphibian and reptile populations.
- If construction activities are required during sensitive wildlife periods, approaches should be followed to minimize disturbance, such as exclusion fencing for amphibian species and inspections of potential breeding bird habitat by a qualified avian biologist prior to the commencement of construction activities.
- Avoid lighting construction areas at night during spring (March-June) and fall (August-October) bird migration periods. If not possible, implement steps to minimize the impact on migratory birds.
- Conduct daily wildlife inspections during construction.
- Minimize disruption of natural vegetation, and avoid the introduction and spread of additional invasive plant species.
- Finally, no in-water work associated with upgrades to the outfall will be permitted from March 15 to July 15.

In terms of potential impacts on local heritage resources, no direct or indirect adverse impacts anticipated to any identified heritage resource as a result of the project works; however, vibration planning/monitoring is recommended to ensure that there are no unintended impacts due to construction-related vibrations on several sites within 50 m of the proposed works.

A pre-construction notice will be provided to inform the public of the scale of the proposed construction, and schedule.

9.1.5 Potential Impacts from Operation and Proposed Mitigation Measures

The effluent limits and discharge rates proposed for the expanded and upgraded Cookstown WPCP were developed in consultation with NVCA and MECP and are intended to be protective of water quality and the receiving water environment.

InnServices has not received any odour complaints regarding the WPCP. The existing significant noise sources at the Cookstown WPCP include the diesel generator and mechanical aerators. The proposed upgrades involve modifications to the treatment process and additional potential sources of noise and odours.

A background noise study should be completed to assess baseline noise levels associated with the existing WPCP and works incorporated into the design of the upgrades to the WPCP to mitigate noise levels to regulated levels.

With respect to odours, the results of a detailed air quality impact assessment are presented in Section 9.1.6.

9.1.6 Air Quality Impact Assessment

An air quality impact assessment (AQIA) was completed to evaluate the impact of the current operation at the Cookstown WPCP and the future preferred alternative for plant expansion. A copy of the AQIA report is provided in Appendix M.

Seven existing and future potential residential dwellings located in the vicinity of the Cookstown WPCP were included in the assessment together with the receptor grid surrounding the property in all directions. Air dispersion modelling was performed for the representative contaminants for existing and the future preferred alternative scenarios. The impacts were assessed on 10-minute, 0.5-hour, 1-hour, 24-hour and annual bases. Predicted ground level concentrations were added to the 90th percentile local background measurements for both scenarios, and total cumulative effects were compared to the Ontario Ambient Air Quality Criteria (AAQC).

The assessment of existing and future preferred scenario confirms that the concentrations of all contaminants currently are, and are expected to remain in the future, below acceptable levels. Odour concentrations at the existing receptors are expected to be reduced for the future scenario as compared to the existing scenario.

Based on the preferred design concept, the upgraded and expanded Cookstown WPCP is not expected to pose a human health concern to the nearby residences; however, at times odour might be a nuisance to the residential area to the north of the Cookstown WPCP site. Future development will need to maintain, at a minimum, a 150 m separation distance between existing and future major facility infrastructure and new sensitive receivers.

Odour control will be required at the new headworks. It is recommended that an odour impact assessment be conducted once an odour control unit is installed to ensure 80% odour control efficiency is adequate. It is also recommended that an Odour Management Plan be developed during design and included with the future ECA application for MECP review.

9.1.7 Monitoring Program

The monitoring program specified in the ECA for the upgraded and expanded Cookstown WPCP will confirm that the effluent limits are being met and that the receiving water is protected. In addition, daily flows in Innisfil Creek at 15th Line will be monitored and recorded as part of the upgraded wastewater treatment system.

9.1.8 Accidents and Malfunctions

Potential malfunctions and accidental events related to project construction and operations activities were considered during the course of the assessment. The events considered include hazardous material spills, breaks in outfall, failures of the effluent treatment or odour control systems, transportation accidents, fires and explosions. It has been determined that such events are unlikely to occur due to project pre-planning, system redundancy, emergency response planning and the on-going implementation of monitoring and maintenance procedures. Contingency measures are in place at the facilities to address accidents or malfunctions. Nonetheless, should accidents or malfunctions occur, the effects would generally be temporary while corrective action is taken.

9.2 Wastewater Conveyance from the Highways 400 and 89 Area

9.2.1 Description of Potential Design Concept

A feasible conceptual level conveyance option was developed, consisting of the following:

- Two new SPSs (“East SPS” and “West SPS”) located to the east Highway 400 (within the projection of the 15th Line right-of-way) and to the west of Highway 400 (within the 15th Line right-of-way).
- A force main from the West SPS travelling west along 15th Line to the crest of the hill on Victoria Street East. The force main will cross a bridge over Innisfil Creek and a major natural gas pipeline to the east of Cookstown.
- Gravity sewer on Victoria Street to the Cookstown Trans Canada Trail, and south on the Cookstown Trans Canada Trail to the main SPS at the Cookstown WPCP.

Figure 9.2 presents the feasible conceptual level conveyance option. While an evaluation of local collection system needs in the Highway 400&89 Employment Lands was beyond the scope of the feasibility assessment, selection of a specific technology will not impact

the feasibility of the conveyance option, nor will it impact the preferred servicing solution for the Cookstown WPCP.

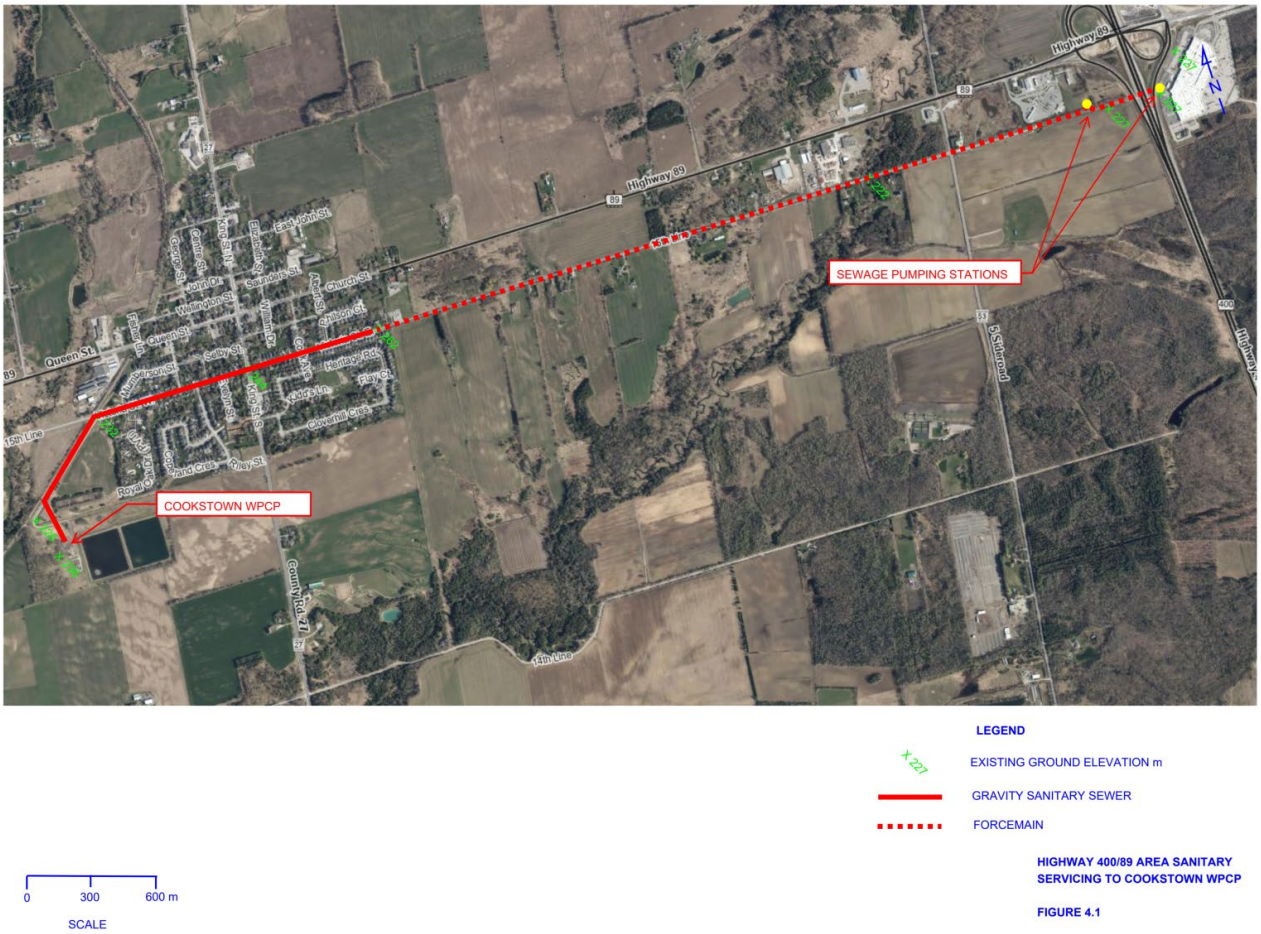

Figure 9.2 – Conceptual Level Wastewater Conveyance Option for the 400&89 Employment Lands

9.2.2 Additional Study and Approval Requirements

Although a feasibility assessment was completed, the analysis does not satisfy the Class EA requirements associated with new main SPSs and force mains / gravity sewers. Therefore, extending servicing to the Highway 400&89 Employment Lands will require future studies:

- Studies to meet Class EA requirements, if identified as necessary via the Class EA screening process, for the main SPSs, force mains and gravity sewers to convey wastewater from the 400&89 Employment Lands to the WPCP.
- Studies required to support the Class EA study and/or screening process which may include, but not be limited to, the following:
  - Natural Environment Inventory;

- Geotechnical and Hydrogeological Investigation;
- Stage 1 Archaeological Study.

In addition, permits and/or approvals will be required from, but not limited to, the following:

- MTO
- NVCA
- TransCanada PipeLines Limited
- County of Simcoe
- MECP

9.3 Opinion of Probable Costs

The estimated conceptual level capital, annual O&M and life cycle cost of the proposed upgrades to the Cookstown WPCP are presented in Table 9.1. Further studies are needed to confirm the upgrades and upsizing required for the Cookstown sanitary sewer system to meet future Cookstown growth within the settlement boundary.

Table 9.1 – Conceptual Level Capital, O&M and Life Cycle Costs Associated with Upgrading and Expanding the Cookstown WPCP

Cost Item	Conceptual Level Cost Estimate
Estimated Capital Cost	$45.2M
Estimated Annual O&M Cost	$1,051K
Estimated Net Present Value of O&M Costs to 2051	$34.4M
Estimated Life Cycle Cost to 2051	**$79.6M**

Notes:

All costs in 2025 Canadian dollars excluding HST.
Costs do not include improvements to the existing Cookstown sanitary collection system.
Additional details provided in Appendix N.

The estimated capital costs associated with both the proposed upgrades to the Cookstown WPCP and conveyance of wastewater from the Highway 400&89 Employment Lands are provided in Table 9.2. The costs associated with conveyance from the Highway 400&89 Employment Lands are considered preliminary and will be updated as part of studies required to meet the Class EA requirements associated with these works. Further studies are also required to confirm the requirements for a new sanitary collection system for the Highway 400&89 Employment Lands.

Table 9.2 – Conceptual Level Capital Costs Associated with Upgrading and Expanding the Cookstown WPCP and Wastewater Conveyance from Highway 400&89 Employment Lands

Cost Item	Conceptual Level Capital Cost Estimate
Estimated Capital Cost – WPCP Upgrades	$45.2M
Estimated Capital Cost – Conveyance from Highway 400&89	$40.7M (1)
Estimated Life Cycle Cost to 2051	**$85.9M**

Notes:

All costs in 2025 Canadian dollars excluding HST.

Costs do not include improvements to the existing Cookstown sanitary collection system or those associated with a new collection system in the 400&89 Employment Lands area.

Additional details provided in Appendix N.

1. Costs associated with additional studies required to support the design and approval of the East and West SPSs, forcemains and/or gravity sewer are not included in the above estimate.

Details regarding the development of the above cost estimates are provided in Appendix N.

10. References

Barnett, P.J., Cowan, W.R. and Henry, A.P. 1991. Quaternary geology of Ontario, southern sheet; Ontario Geological Survey, Map 2556.

MEA, 2023. Municipal Class Environmental Assessment.

Ontario Geological Survey 1991. Bedrock geology of Ontario, southern sheet; Ontario Geological Survey, Map 2544.