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Bayshore Village Sewage Works Effluent Spray Irrigation

CLASS ENVIRONMENTAL ASSESSMENT PROJECT FILE UPDATE

DRAFT REPORT

Township of Ramara

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Issue	Date	Description
0	August 7, 2024	Draft Report
1	October 8, 2024	Final Draft Report

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1 Introduction

A Class Environmental Assessment (Class EA) (Schedule B) was completed in 2017 to consider alternatives for the Bayshore Village effluent spray irrigation system. The Class EA was documented in the *Bayshore Village Sewage Works Effluent Spray Irrigation Class Environmental Assessment Phases 1 and 2 Project File* (Tatham, September 2017), referred herein as the 2017 Class EA report.

The Township of Ramara (Township) requested that Tatham Engineering Limited (Tatham) update the Class EA to address the Ministry of the Environment, Conservation and Parks (MECP) comments and consider current conditions and concerns.

This report for the Class EA Update presents relevant information from the 2017 Class EA report, additional studies and consultation, an updated evaluation of alternative solutions, and updated recommendations for addressing the issues with the Bayshore Village effluent disposal system. This report is intended to be a stand-alone report, not an addendum to the 2017 Class EA report.

1.1 BACKGROUND

Bayshore Village is a residential community located on the east shore of Lake Simcoe. It was built by a developer and assumed by the Township in 1991. Figure 1 presents the study area.

The community is almost fully built-out. In 2023, there were 342 built lots of the 343 available lots. At the Township's average occupancy of 2.6 people per dwelling, the total estimated population currently connected to the municipal sewer system is 889 residents.

The Bayshore Village Sewage Works consist of a gravity sanitary sewer system with a satellite sewage pumping station and a main sewage pumping station, a two-cell waste stabilization pond, referred to as lagoons in this report, and an effluent spray irrigation system on two fields referred to as the South Field and the North Field that are located adjacent to the lagoons near the Lake Simcoe shoreline.

Figure 1: Study Area

1.2 STUDY OBJECTIVES AND PROBLEM STATEMENT

1.2.1 Project History

The Class EA was originally initiated in October 2010 to consider the expansion of the effluent spray irrigation fields serving the Bayshore Village Sewage Works. Over the years, it had been observed that the soils of the spray fields had become compacted, and their infiltrative capacity had deteriorated. Spare spray irrigation capacity was needed to provide operational flexibility to take spray fields out of service for aeration and/or tilling as needed to maintain their capacity for the disposal of the lagoons content.

Following the first Public Information Centre (PIC) in February 2011 and consultation with the Ministry of the Environment and Climate Change (now MECP), the project evolved, and the Township decided to widen the scope of the Class EA to consider alternatives to effluent spray irrigation. The problem statement was revised to:

Bayshore Village effluent spray irrigation fields have been in continuous operation for 25 to 38 years. Soils have become compacted and have reduced absorption capacity. A longer spray irrigation period is often required. There is no spare capacity in the spray irrigation system to temporarily take spray irrigation fields out of service for aerating and/or tilling the soils as needed to restore and maintain their original effluent absorption capacity. The effluent disposal system must have sufficient capacity to adequately dispose of the effluent from the Bayshore Village lagoons. The effluent disposal system should minimize impacts on the environment and on adjacent residents and farms, meet current regulatory requirements, satisfy the Township's operational needs, and be affordable.

Following public and agency consultation, which included numerous meetings and a second PIC in November 2016, the Class EA report and the Notice of Completion were issued in September 2017. The Class EA report recommended that in the short term the Township establish an additional spray field to provide spare capacity, and concurrently advance the preferred long-term solution of abandoning spray irrigation and constructing a new tertiary treatment facility with effluent discharge to Lake Simcoe.

The Ministry of the Environment (now MECP) main comment on the 2017 Class EA Report was that the preferred solution had to fit within the current policy and regulatory requirements, mainly the Lake Simcoe Protection Plan (LSPP) policies, which do not allow a new municipal sewage treatment plant discharging to Lake Simcoe.

The Township pursued their request for the Ministry of the Environment (now MECP) to review the wording of the LSPP policies as part of the 10-year review, and to consider the Bayshore Village sewage works as an existing municipal system that discharge, albeit indirectly, to Lake

Simcoe. This would eliminate the regulatory constraint to establishing the long-term preferred solution.

In 2022, considering the urgent need to address concerns with the effluent spray irrigation system and the unsuccessful discussions with the MECP, the Township resolved to abandon the preferred long-term solution of establishing a tertiary sewage treatment plant with direct discharge to Lake Simcoe, and requested that Tatham update the Class EA to identify an alternate preferred solution for the long term.

1.2.2 Class EA Update Problem Statement

For this Class EA Update, the problem statement is essentially unchanged, as follows:

The Bayshore Village effluent is spray irrigated on fields that have been in continuous operation since the 1980s. Soils have become compacted and have reduced infiltration capacity. It is increasingly difficult to dispose of the effluent from May to October. There are concerns by the adjacent residents about runoff from the spray irrigation operation and potential impacts on humans and farm animals, as well as aerosols and drainage. There is a need to find the most appropriate solution for the disposal of lagoon effluent.

The preferred solution needs to:

- *Provide the required effluent disposal capacity without runoff to adjacent properties, ditches and Wainman Creek/Lake Simcoe.*
- *Provide some spare capacity for operational flexibility.*
- *Involve reasonable level of effort for operation and maintenance.*
- *Address adjacent residents' concerns.*
- *Have reasonable capital costs for construction, equipment and land.*
- *Be acceptable to the MECP so that approval can be obtained.*

1.3 REPORT ORGANIZATION

This Class EA Update report summarizes the Class EA from its inception in 2010. It presents the relevant information from the 2017 Class EA report and the analysis and consultation completed for the Class EA Update. The report is organized as follows:

- Section 2 presents the existing environmental conditions in the study area that could be impacted by the alternative solutions.
- Section 3 describes the sewage works and effluent spray irrigation system.
- Section 4 outlines the regulatory context in which the Class EA study was completed.

- Section 5 presents the alternative solutions that were considered during the 2017 Class EA and Class EA Update, and their assessment.
- Section 6 summarizes the public and review agency consultation and the comments that were received.
- Section 7 presents the final evaluation and recommendations.

1.4 REFERENCES

The following documents were referred to in the preparation of the Class EA Update report:

- Preliminary Report for the Proposed Bayshore Village Waste Water Spray Irrigation Site, Beak Consultants Limited, November 1988.
- Hydrogeological and Spray Lands Operation Report for the Proposed Bayshore Village Waste Water Spray Irrigation Site, Beak Consultants Limited (undated).
- Bayshore Village Sewage Treatment System Spray Irrigation Pilot Study, Totten Sims Hubicki Associates, March 1996.
- Subsurface Investigation, Proposed Expansion Areas, Bayshore Village Sewage Treatment Works, Concession 7, Lot 22 and Concession 7 Lot 20, Township of Ramara, Ontario, Terraprobe Inc., May 3, 2010.
- Approved Assessment Report: Lake Simcoe and Couchiching-Black River Source Protection Area, Part 1: Lake Simcoe Watershed, South Georgian Bay - Lake Simcoe Source Protection Committee, January 2015.
- Bayshore Village Sewage Works Annual Performance Reports.
- Township of Ramara Staff Reports.

2 Environmental Conditions

The Bayshore Village effluent spray fields are located at the intersection of Concession Road 8 and Sideroad 20, north of Bayshore Village, as shown on Figure 1.

2.1 NATURAL ENVIRONMENT

The Bayshore Village lagoon and effluent spray fields are surrounded by the Barnstable Bay wetland, which is a Class 2 Provincially Significant Wetland on the shore of Lake Simcoe. Barnstable Bay is noted to have significant fisheries.

There is also a regionally significant Area of Natural and Scientific Interest (McGinnis Point ANSI) to the south and west of the spray fields. The ANSI is a 200-ha shoreline swamp; no specific species occurrences are noted for this area.

The Bayshore Village spray irrigation fields are approximately 1.2 km to 1.6 km east of the Lake Simcoe shoreline. They are located on both sides of Wainman's Creek, which flows from upstream wetlands and agricultural areas to Barnstable Bay in Lake Simcoe. Wainman's Creek crosses Concession Rd. 8 between the South Field and the North Field. Stream flows have not been measured. Stream water quality upstream and downstream of the Bayshore Village spray irrigation fields has been monitored since 1994.

A small ditch drains the northern portion of the North Field to a central wooded and low-lying area. Two small ditches drain this central area: one flows south to the Concession Rd. 8 ditch, which drains to Wainman's Creek, and one flows east to another low-lying area connected to Wainman's Creek. The South Field drains towards the northwest to Wainman's Creek and to the east into the Sideroad 20 ditch.

Ground elevations on the spray irrigation lands range from 220 m to 222 m in the North Field and from 220 m to 224 m in the South Field (TSH, 1993, 1995). The areas around the spray fields are similarly flat with lower areas in proximity to Wainman's Creek. The spray fields are located on lands that have slopes that are less than 3%.

2.2 ADJACENT LAND USES

As per the Township of Ramara zoning map, the Bayshore Village Sewage Works site is designated Rural. It is surrounded by Natural Areas and other lands designated Rural. Lands outside of the wetlands to the east, north and west of the spray irrigation lands are mostly in active agricultural use, except for some low-lying areas covered in bush or small trees.

There are residences and farm operations in proximity to the spray irrigation fields on Concession Rd. 8: one residence is immediately north of the South Field; the other residences are west of the North Field.

2.3 GEOLOGY AND HYDROGEOLOGY

2.3.1 1988 Investigations

Boreholes drilled for the design of the Bayshore Village spray fields (Beak, 1988) indicated the soils on the existing site are varved and compact glacio-lacustrine clays overlying glacial till, which in turn lies on bedrock. The soils in the North Field are slightly heavier than in the South Field. The clay type soils are moderately well to poorly drained. Depth to the groundwater table is low in the spring in both the South and North Fields but increases in the summer. Upward vertical gradients were greater than horizontal gradients; as such, water moving from the site is not expected to enter the deep groundwater.

The soil's saturated hydraulic conductivities were measured in May 1988 using a Guelph Permeameter. In the South Field, they ranged between 2.1×10^{-6} cm/s and 2.1×10^{-4} cm/s at 15 cm depth and were lower at 50 cm depth (1.3×10^{-6} to 8.6×10^{-6} cm/s). In the North Field, the saturated hydraulic conductivities ranged between 1.9×10^{-6} to 5.4×10^{-5} cm/s at shallow depth and were lower at 50 cm depth (8.6×10^{-7} to 2.5×10^{-5} cm/s).

2.3.2 2009 Subsurface Investigation

Terraprobe conducted in 2009 a subsurface investigation of two areas adjacent to the Bayshore Village lagoons and spray fields: the area immediately to the west of the lagoons, and the area east of the South Field.

Drilled boreholes showed the presence of sandy or clayey silt over sandy silty gravel. Depth to bedrock ranged from 2.5 m to 7.9 m below ground surface. The soil's hydraulic conductivity was estimated based on the grain size distribution to range between 1×10^{-7} to 2×10^{-5} cm/s. Static groundwater level in the west area was 0.3 m to 1.4 m below ground, and in the east area, was 0.2 m to 0.8 m below ground, in November.

2.3.3 2023 Infiltration Testing

Tatham conducted a field investigation of the South Field and of the area immediately west of the lagoons in December 2023 to determine if the hydraulic conductivity of the soils in the South Field had changed since 1988 and to determine the hydraulic conductivity of the soils in the area west of the lagoons, where a future effluent disposal system could potentially be established.

In situ Guelph Permeameter testing was carried out in hand-augured holes, 0.4 m to 0.6 m below surface. The field saturated hydraulic conductivities in the South Field were found to range

between 9.5 x 10^{-5} to 5.7 x 10^{-4} cm/s, indicating the near surface infiltration capacity of the soils has not changed significantly since 1988. The west area's saturated hydraulic conductivities ranged between 1.9 x 10^{-4} and 3.8 x 10^{-4} cm/s, slightly higher than in the South Field.

2.4 ARCHAEOLOGY AND HERITAGE RESOURCES

An archaeological assessment of the field immediately west of the Bayshore Village sewage lagoons and spray irrigation fields was conducted to evaluate its archaeological potential and determine if further archaeological assessment is required.

The Stage 1 Archaeological Assessment (Archeoworks Inc, January 2024) attached in Appendix A indicated that the background research on the area's geography and history identified features in proximity to the study area that contribute to establishing the site's archaeological potential, including water sources, i.e., wetlands associated with creeks draining to Lake Simcoe, and 19th century settlement. Review of mapping and aerial imagery from the 20th and 21st centuries revealed observable changes in the study area, but the depth and extent of these alterations could not be confirmed to fully classify the study area as being fully disturbed.

Accordingly, a Stage 2 archaeological assessment, in the form of a pedestrian survey of the field immediately west of the sewage lagoons, was conducted on August 2, 2024, after the field had been plowed and disced multiple times. During the survey, a collection of 174 historic artifacts was encountered that suggest a mid-19th century habitation. The material recovered is likely associated with a Euro-Canadian domestic structure built in the 1850s and utilized through the 1860s into the 1870s. As the site has further cultural heritage value and interest, a Stage 3 archaeological assessment is required to determine the full extent and characteristics of the site, and a Stage 4 mitigation may be required prior to construction activity.

There is low potential for built heritage resources and cultural heritage landscapes in the study area, based on a screening completed in accordance with the Ministry of Tourism, Culture and Sport Form, attached in Appendix A.

3 Existing Sewage Works

3.1 APPROVALS

The Bayshore Village Sewage Works were originally constructed under Certificate of Approval (C of A) No. 3-0304-77-006, dated June 1, 1977. They were upgraded under C of A No. 3-1337-81-827, dated November 25, 1982, and amended by notices dated June 6, 1985, July 7, 1992, April 18, 1994, and November 1, 1995. The system currently operates under C of A No. 3-1337-81-968 issued July 17, 1996. The C of A is attached in Appendix B.

The C of A provides a description of the sewage works as it was designed, lists the monitoring requirements and the conditions under which the system must operate, including the maximum effluent application rate (55 m^3/ha/day averaged over the number of spray days each season), the allowed spray period (May 18 to September 28), and that it should preclude ponding, runoff and aerosol drift beyond the property.

3.2 SYSTEM DESCRIPTION

3.2.1 Wastewater Collection and Pumping

Two pumping stations collect the wastewater generated in Bayshore Village: the West Sewage Pumping Station (SPS), which serves approximately 30% of the development, and the East SPS, which serves the entire development. Two 16.7 L/s submersible pumps (one duty, one stand-by) in the East SPS convey wastewater via a 150 mm forcemain to the lagoons. Raw wastewater flows to the lagoons are measured at the East SPS.

3.2.2 Wastewater Treatment

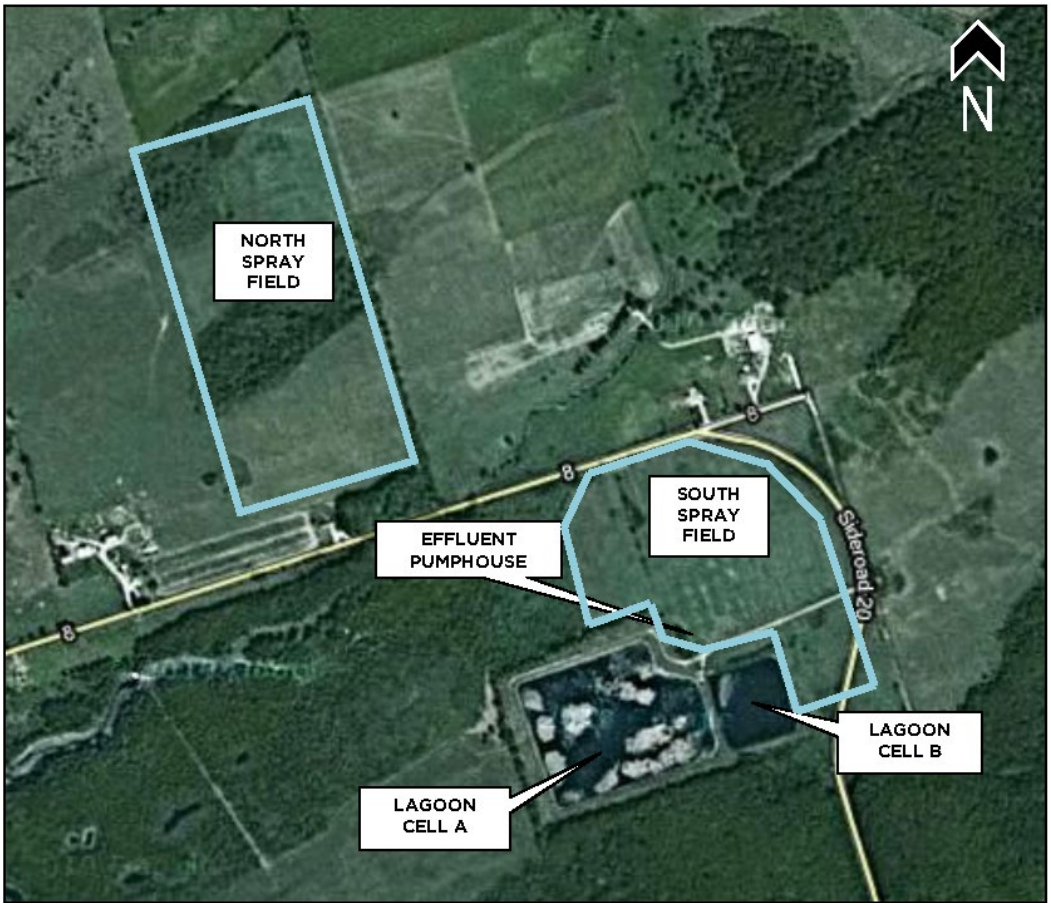
The wastewater treatment system consists of a two-cell facultative waste stabilization pond, located 2.5 km north of Bayshore Village on Sideroad 20, on Lot 21, Concession 7.

The average daily flow rated capacity of the wastewater treatment system is 399 m^3/day.

Raw wastewater is pumped from the East SPS to Cell B (small lagoon) from where it flows by gravity to Cell A (large lagoon). The lagoons provide biological treatment of the wastewater, and storage during the winter months when the effluent spray irrigation system is not in operation.

An aerial view of the existing sewage works is shown on Figure 2.

Figure 2: Existing Sewage Works



One lagoon cell was constructed in 1977 and the second lagoon cell was constructed in 1982. Cell A was relined with imported clay in 1995 (TSH, 1996).

The effective volume (excluding freeboard and sludge storage) of Cell B was estimated at 30,000 m^3 in 2014. The effective volume of Cell A was estimated at 110,000 m^3 in 1995. A hydrographic acoustic sonar survey of the two lagoon cells conducted in April 2022 indicated the average depth of sludge was 150 mm in both cells.

3.2.3 Effluent Disposal

During the spray irrigation season, effluent from Cell A is drawn from a concrete sump via a 250 mm diameter pipe to the effluent pump house. The pipe is equipped with a rotating self-cleaning strainer.

The effluent pump house consists of a 3 m by 3.6 m wood frame building that houses a 132 L/s effluent pump with variable speed drive, a pressure reducing valve, and a magnetic flow meter on a 150 mm diameter discharge line.

The lagoon effluent is spray irrigated on the South Field and the North Field, adjacent to the lagoons. The fields are equipped with above-ground irrigation piping and sprinklers.

From the late 1980s to 1993, the Township utilized the South Field only for effluent spray irrigation. A two-year pilot testing program on the North Field was conducted in 1994 and 1995. As of 2024, the South Field has been in operation for approximately 35 years, and the North Field has been in operation for 30 years.

The South Field covers an area of approximately 23 ha immediately north of the lagoons on Lot 21, Concession 7. The North Field has an approximate area of 18 ha and is north of Concession Rd. 8 on Lot 22, Concession 8. Not all the land on these fields is used for spray irrigation.

The original design (Beak, TSH) determined that a total of 26 ha could be used for spray irrigation (14 ha on the South Field and 12 ha on the North Field), as described in the C of A. The 2017 Class EA and the Class EA Update have been based on the Township utilizing 25 ha for spray irrigation (13.6 ha in the South Field and 11.4 ha in the North Field), based on aerial photography. The Township determined in April 2024 (Staff Report ID-25-24) that the current spray areas covered 10.5 ha on the South Field and 10 ha on the North Field, and that piping to a 3.7 ha area in the South Field had been disconnected in 2020. Therefore, the total available spray irrigation area is 24.2 ha. However, the adjacent residents who have lived beside the spray fields since their installation have noted that the spray irrigation piping and spigot layout has been altered numerous times over the years, and the actual area that is sprayed is less than the total available spray area. Confirmation of the current area used for spray irrigation is required to verify that the volume of effluent applied meets the C of A requirements.

3.3 SPRAY IRRIGATION SYSTEM DESIGN AND PILOT TESTING

The effluent spray irrigation system was designed in 1988, following a hydrogeological study by Beak Consultants Limited (1988). Beak recommended that the South and North spray fields be divided into four management zones for the purposes of designing and operating the spray irrigation system. These zones were established based on the soil's ability to accommodate the application of effluent and on the depth to the water table. Beak suggested a schedule of application rates as a starting point for the design, subject to further pilot testing and soil moisture measurements. The application rates, which included precipitation, ranged between 3.75 mm to 9.4 mm per application period. The suggested total volume of effluent applied per year over 100 spray days was 157,800 m^3.

In 1994, Totten Sims Hubicki (TSH) conducted a spray irrigation pilot study as requested by the MOE (now MECP) prior to the use of the North Field. Their pilot study report (TSH, 1996), relying extensively on Beak's hydrogeological investigation, established maximum hourly effluent application rates based on the soils' unsaturated hydraulic conductivities. These maximum hourly application rates ranged from 0.072 mm/hr to 3.6 mm/hr. The pilot study concluded a volume of 132,000 m^3 could be disposed of on the available 26 ha of spray lands over 98 spray days at the suggested spray irrigation rates. TSH recommended that the effluent be sprayed at the design maximum rates for a short period of time, ranging from 1.5 hour to 4.1 hour, on each of these 98 days, so as not to exceed the maximum allowable rate of 55 m^3/ha/day specified in the C of A.

With 134 available days between the May 18 to September 28 spray season, this approach included 36 days for drying up the soil between applications and for rainy and/or windy days when spraying is not permitted.

During the 1994-1995 pilot study, instances of aerosol drift, ponding and runoff to the ditches along Sideroad 20 were observed and recorded. The Township addressed these issues by hiring a full-time inspector, whose responsibilities were to monitor and control the spray irrigation program closely. If ponding was observed, the area was allowed to dry up before spraying was resumed.

The TSH pilot study report also recommended annual aeration of the spray fields to improve the absorption capacity of the surficial soils and prevent consolidation with time, which would promote runoff.

3.4 SPRAY IRRIGATION SYSTEM OPERATION

At the time, Township staff found the TSH-recommended part-time operation of the Bayshore spray irrigation system difficult to implement. Spraying for short periods of time daily and varying the spraying duration between the various spray areas was difficult because of the labour involved and the pumping/piping design. Operators found that shutting off sprinklers in some areas caused excessive pressure in the piping in other areas resulting in breaks. The operating practice evolved to a system whereby the operators typically spray irrigated for 7 or 8-hour days over most of the available spraying land but allowed longer drying and recuperation periods between spray days.

The typical method of operation of the spray irrigation system is as follows:

- Spray irrigation piping, including the piping across Wainman's Creek, and the spray nozzles are installed and pressure-tested in May.

- Spray irrigation fields are inspected daily to determine whether conditions are favourable for spray irrigation. Spray irrigation is carried out when there is good weather (i.e., no rain and wind velocity less than 15 km/hr), no ponding of surface water on site, and sufficiently dry soils.
- If spraying is possible, the operator starts the effluent pump. A further inspection of the field is made to verify that sprinkler heads are operational. If problems are found such as broken pipes, clogged sprinkler heads, surface ponding, and aerosol drift, then the spray operation is modified, discontinued or repairs are completed as needed.
- Operation staff maintain a daily log of the spray irrigation operation.

During periods when the fields are left to dry, the grass is cut to promote evapotranspiration. The grass is not removed from the fields.

The typical spray irrigation season is from May 18 to September 28 each year.

It has become increasingly difficult for Township operators to spray irrigate the entire content of lagoon Cell A within the allowed 4.5-month spray irrigation period while meeting the operational guidelines to minimize runoff and the average effluent application rate specified in the C of A. Requests to extend the spray period to the end of October or early November to dispose of the lagoon content were approved by MECP six times in the past 10 years. Runoff from less permeable areas occurs more frequently. During rainy summers when there is a limited opportunity to let the fields dry up between spray irrigation days, the effluent has been sprayed when the soils were still wet and saturated, which reduces significantly their infiltration capacity, and when the weather conditions were unfavourable, resulting in runoff to adjacent properties, drainage ditches and Wainman's Creek, and/or aerosols.

In the past 10 years, the number of favourable days for spray irrigation appears to have diminished: the spray fields were used 65 days per season on average, compared with the design basis of 98 days.

The spray fields were not aerated in many years. In 2016, deep aeration was completed on the South Field. No significant improvement in the soil's ability to infiltrate the effluent applied was noted.

During the 2023 winter, 55,000 m^3 of effluent was removed from Cell A and hauled to the Lagoon City STP for final treatment and disposal because the lagoon liquid level had not been sufficiently lowered through the 2023 spray season to ensure there would be sufficient volume to store the effluent over the winter and spring months before the start of the 2024 spray season.

3.5 PERFORMANCE MONITORING

3.5.1 Influent Wastewater Flows and I/I Control

The Bayshore Village lagoons received on average 345 m^3/day of wastewater in the 10-year period of 2014 to 2023. This represents 86% of the system's rated capacity of 399 m^3/day. Wastewater flows have decreased in 2022 and 2023, with a 2-year average of 261 m^3/day because of reductions in inflow and infiltration into the sanitary sewer system.

The Township developed and implemented an inflow and infiltration control program for the Bayshore Village sewage collection system. Video inspections of the sewers and lateral pipes, maintenance hole inspections, and property inspections, were completed in 2022. Findings included active infiltration in some sewer sections, laterals and maintenance holes, as well as evidence, and potential sources, of infiltration at joints and in laterals. Sump pumps connected to the sanitary sewers were also found. To date, the Township has repaired the laterals and disconnected the sump pumps. Repairs on the main sewer lines are planned to be completed concurrently with road replacement work.

3.5.2 Raw Wastewater and Lagoon Effluent Quality

The raw (influent) wastewater quality, the Cell B (small lagoon) quality, and the Cell A (effluent) quality for the past 10 years (2014 to 2023) are summarized in Table 1. The data shows that the Bayshore Village lagoons produce effluent typical of secondary treatment facilities.

Table 1: Raw Wastewater and Effluent Characteristics (2014-2023 Averages)

PARAMETER	QUALITY (mg/L)			REMOVAL (%)
	Raw Wastewater	Cell B (Small Lagoon)	Cell A (Large Lagoon)	
BOD_5	138	26	14	90%
Total Suspended Solids	147	27	26	82%
Total Phosphorus	2.3	2.1	0.8	65%
Total Kjeldahl Nitrogen	27	14	3	89%
Total Ammonia		11	2	

3.5.3 Groundwater, Surface Water and Soil Quality

The impact of the effluent disposal on groundwater quality, surface water quality and soil characteristics is monitored by the following sampling program, which has been in place since 1995, in accordance with the C of A:

- groundwater samples taken in six boreholes in and around the North and South fields;
- water samples taken in Wainman's Creek upstream and downstream of the spray fields; and,
- soil samples taken in the North and South fields.

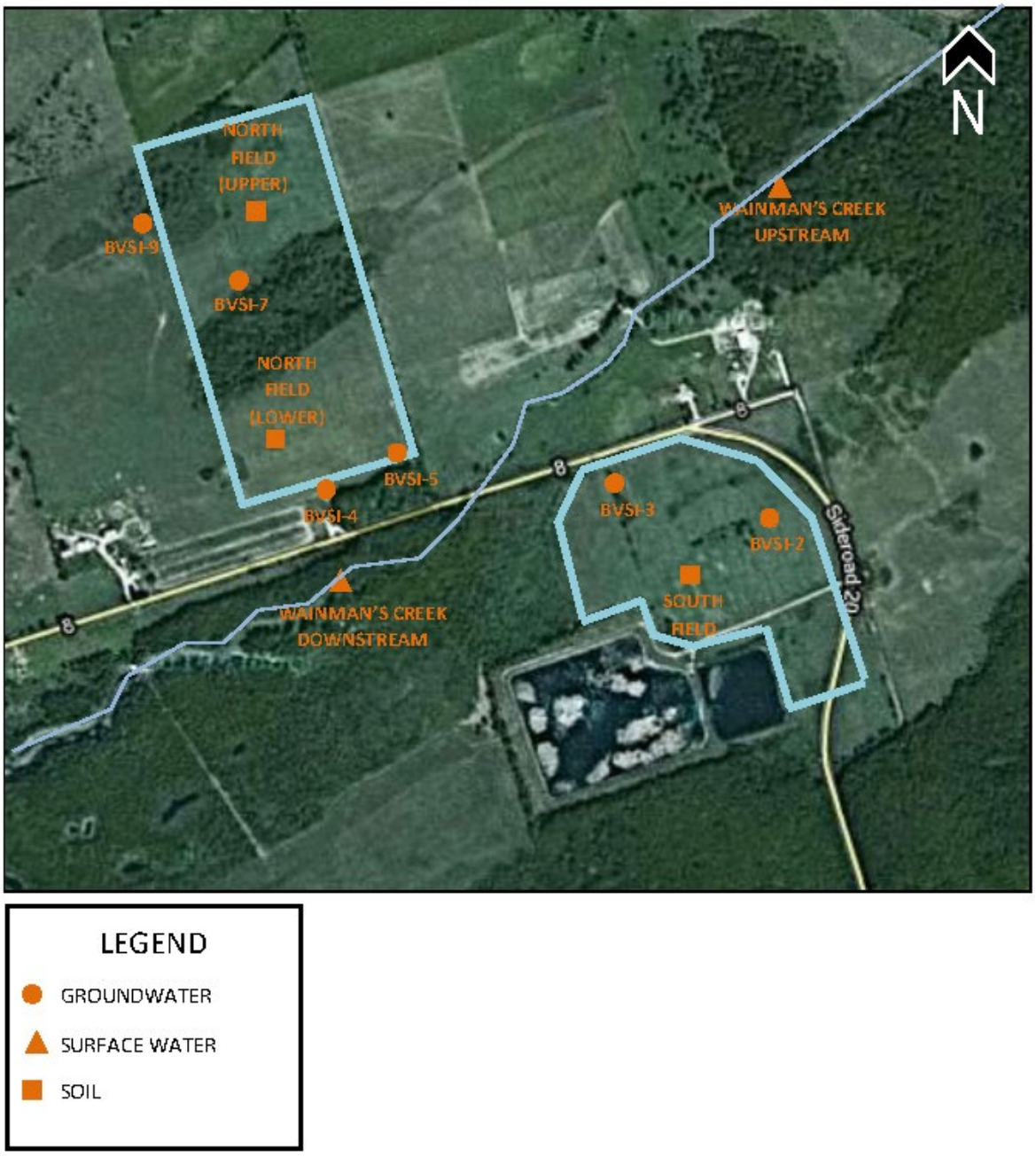
Samples are taken:

- In May, before the start of the spray irrigation season;
- In August, during spraying; and,
- In October, after spraying is completed.

The locations of the sampling points are shown on Figure 3. All laboratory results from the monitoring program are tabulated and presented in graphs attached in Appendix C.

Groundwater quality is compared annually with the Ontario Drinking Water Standards, Objectives and Guidelines (ODWS) and with previous monitoring data to assess potential impacts and trends. High chloride levels have been noted, particularly at locations close to the road in the South Field. Concentrations of nitrogen, including TKN and TAN, are mostly undetectable during and after the spray irrigation season. Nitrate levels are very low. Effluent spray irrigation during the growing season does not add nitrogen because of the plants' nitrogen uptake. The overall average Total Phosphorus concentration in groundwater is 0.2 mg/L.

Figure 3: Spray Irrigation System Monitoring Locations



Wainman's Creek water quality has frequently exceeded the phosphorus Provincial Water Quality Objective (PWQO) for streams of 0.03 mg/L. The data shows very consistent water quality between the upstream and downstream sampling locations, indicating no measurable impact from the spray irrigation operation. Using the ammonia results obtained from the upstream and downstream samples, unionized ammonia concentrations in Wainman's Creek are below the PWQO. Surface water quality does not appear to have been impacted by the spray irrigation operation.

Soil core samples show localized increases in the concentration of some contaminants during the spray irrigation season. However, the concentration levels are consistent with levels recorded in previous years, and therefore do not show increases over the years. Higher concentrations of phosphorus are measured in the South Field than in the North Field.

4 Regulatory Context

4.1 LAKE SIMCOE PROTECTION PLAN

The construction and operation of sewage treatment facilities in Ontario are regulated under the *Ontario Water Resources Act*, 1990 (OWRA). Further, O. Reg. 60/08 (amended under O. Reg. 130/09) Lake Simcoe Protection, governs point source discharges of phosphorus to Lake Simcoe.

The *Lake Simcoe Protection Act*, 2008 (LSPA) provides the framework for the development of the Lake Simcoe Protection Plan (LSPP). The LSPP, issued in June 2009, establishes objectives to protect and enhance the Lake Simcoe water quality, including reducing loadings of phosphorus and other nutrients of concern to Lake Simcoe and its tributaries.

The LSPP sets out policy 4.3-DP to prohibit the establishment of new municipal sewage treatment plants in the Lake Simcoe watershed unless: the new plant replaces an existing municipal sewage treatment plant, or it services a development where one or more subsurface sewage systems are failing.

The Bayshore Village Sewage Works is not listed in O. Reg. 60/08, amended by O. Reg. 130/09, as one of the existing municipal sewage treatment plants in the Lake Simcoe watershed. This is because the facility does not have a direct effluent discharge to the lake.

However, the LSPP objectives and policies to protect the lake's water quality and reduce phosphorus loadings, apply to the Bayshore Village sewage system as it is located within the watershed and near the lake.

4.2 SOURCE WATER PROTECTION

Under the *Clean Water Act*, 2006, source water protection plans were developed to protect municipal water supplies from various threats including sewage works. The Source Protection Plan for the South Georgian Bay Lake Simcoe Protection Region has defined the Well Head Protection Areas (WHPA) for the Bayshore Village municipal wells.

The groundwater vulnerability for the Bayshore Village water supply was delineated, and the areas determined to contribute groundwater to the wells within the 25-year capture zone were defined as WHPA. The Bayshore Village municipal sanitary sewer system was identified as a potential Significant Drinking Water Threat. The existing sewage lagoons and part of the South Field are within the WHPA-C 5-year capture zone. The North Field and the area west of the lagoons are outside of the WHPA.

5 Alternative Solutions

This section lists the alternative solutions previously considered in the 2017 Class EA Report. For the Class EA Update, these alternative solutions were updated and screened, and the updated short list of alternative solutions were evaluated. The updated alternative solutions are described and assessed in the following sections.

5.1 2017 CLASS EA LIST OF ALTERNATIVE SOLUTIONS CONSIDERED

At the first PIC in February 2011, two alternative solutions were presented to address the original Problem Statement:

- Do Nothing
- Acquire additional land for effluent spray irrigation

Following the receipt of comments and concerns with the operation of the spray fields (see Chapter 6), the Problem Statement was expanded and as a result, new alternative solutions were considered, and alternatives were modified. The long list of all alternatives considered during the 2017 Class EA study was as follows:

- Alt. 1 Do nothing
- Alt. 2 Alter spray irrigation practices
- Alt. 3A Establish one new spray irrigation field
- Alt. 3B Establish two new spray irrigation fields and abandon the North Field
- Alt. 4 Build an effluent disposal bed and abandon the North Field only
- Alt. 5 Discontinue spray irrigation and build an effluent disposal bed
- Alt. 6 Discontinue spray irrigation, upgrade sewage treatment and discharge to Wainman's Creek
- Alt. 7 Pump sewage or effluent to the Lagoon City STP
- Alt. 8 Plant trees on the spray fields

5.2 CLASS EA UPDATE LONG LIST OF ALTERNATIVE SOLUTIONS

For this Class EA Update, the following long list of alternative solutions was considered, then screened:

- Do Nothing

- Alt. 1: Reduce Inflow and Infiltration in Bayshore Village sewers
- Alt. 2: Increase spray irrigation rate on existing spray fields, and add effluent UV disinfection
- Alt. 3: Establish 1 new spray irrigation field (West), and add effluent UV disinfection
- Alt. 4: Establish 1 new spray irrigation field (West), decommission North Field, and add effluent UV disinfection
- Alt. 5: Establish 2 new spray irrigation fields (West and other), decommission North Field, and add effluent UV disinfection
- Alt. 6: Build effluent disposal bed on West field, continue spray irrigation on South Field, decommission North Field and add effluent UV disinfection
- Alt. 7: Build effluent disposal bed on the South Field, establish spray irrigation on West field, decommission North Field and add effluent UV disinfection
- Alt. 8: Discontinue spray irrigation, and build effluent disposal bed on the West field
- Alt. 9: Discontinue spray irrigation, pump lagoon effluent to Lagoon City STP, and expand Lagoon City STP
- Alt. 10: Discontinue spray irrigation, upgrade lagoons with tertiary sewage treatment plant with effluent discharged to Wainman's Creek to Lake Simcoe

A brief description of each of the above alternative solutions is provided below.

Only one alternative from the 2017 Class EA was not carried forth in this Class EA Update: planting trees on the spray fields. Although trees can uptake nutrients, it was determined that the evapotranspiration rate achieved with a willow or poplar plantation only results in a small increase in effluent disposal capacity. Further, the trees do not grow well in clay soils, and there is no market for the wood once it is harvested.

5.2.1 Do Nothing

Do Nothing is considered for comparison purposes. Do Nothing at the Bayshore Village Sewage Works would involve continuing with the current spray irrigation operation with the existing equipment on the existing spray fields. The issues and concerns with the capacity and operation of the spray irrigation system would continue and likely worsen over time as the system ages. The Township would need to haul lagoon effluent to the Lagoon City STP if the weather during the spray season does not provide sufficient favourable spray days. Do Nothing would incur additional operating costs for hauling, as well as ongoing maintenance and replacement costs.

5.2.2 Alternative 1: Reduce Inflow and Infiltration

This alternative consists of continuing with the ongoing efforts to monitor and control inflow and infiltration (I/I) into the Bayshore Village sanitary sewers. Measurable reductions in wastewater flows have been noted in the past two years, however, are not sufficient to consistently address the concerns with the spray irrigation system capacity. Monitoring and controlling I/I requires annual budgets for sewer system inspections, repairs and rehabilitation.

5.2.3 Alternative 2: Increase Spray Irrigation Rate and Add UV Disinfection

Alternative 2 involves increasing the spray irrigation application rate on the existing spray fields such that all the annual effluent volume could be disposed on the typically available number of good spray days within the allowed May to October spray season. All existing spray fields and equipment would be maintained. The spray irrigation scheduling would be modified to provide more time between spray irrigation events to allow the soils to dry up between applications to maximize infiltration. Lagoon effluent UV disinfection would be implemented at the spray irrigation pumping station to mitigate concerns with the health impacts of aerosols from the spraying of effluent.

Assuming the number of available spray days per season is 65 days, the application rate would need to be 90 m^3/ha/day over 25 ha, to dispose of the annual volume of effluent. This application rate is 60% higher than the currently allowed rate of 55 m^3/ha/day and would likely result in more runoff from the spray fields. The estimated project cost to upgrade the effluent pumping station to implement UV disinfection is $500,000.

5.2.4 Alternative 3: Establish One New Spray Irrigation Field (West) and Add UV Disinfection

This alternative involves establishing one additional spray irrigation area of 16 ha on the field west of the sewage lagoons, which the Township owns. With the existing South and North Fields, a total of 41 ha would be available for effluent spray irrigation. The entire annual effluent volume could be disposed by spray irrigation over this area assuming there are 65 favourable spray days per season. With an extended season, which on average provides 75 spray days, there could be a 15% buffer that would allow part of a field to be taken out of service on a rotational basis for a year, to till it and rebuild its infiltration capacity. UV disinfection of the lagoon effluent prior to spray irrigation would be provided, and tree buffers would be planted along Concession Road 8 and Sideroad 20 to mitigate aerosols from the spray irrigation operation.

This alternative would maintain and expand the current effluent disposal approach in a manner that provides some spare capacity and reduces runoff to adjacent properties and Wainman's Creek. However, if the weather conditions during a spray season are not favourable for infiltration and evapotranspiration, and fields cannot dry sufficiently between spray applications,

surface runoff may still occur and hauling of effluent from the lagoons to the Lagoon City STP would still be needed. The estimated project cost of this alternative is $1.6 million.

5.2.5 Alternative 4: Establish One New Spray Irrigation Field (West), Decommission North Field, and Add Effluent UV Disinfection

Alternative 4 is like Alternative 3, with the exception that the North Field is taken out of operation due to the immediately adjacent residents' concerns with the impacts on their properties. The existing South field (13.6 ha) plus a new 16 ha spray field would provide 29.6 ha of available irrigation area. At the maximum allowable application rate of 55 m^3/ha/day, it would take 89 spray days per season to dispose of the total annual effluent volume. Historically, considering the past 10 years, the number of favourable spray days per season has been much lower. This alternative would not provide adequate effluent disposal capacity at the MECP-allowed spray irrigation rate.

5.2.6 Alternative 5: Establish Two New Spray Irrigation Fields (West and Other), Decommission North Field, and Add Effluent UV Disinfection

With Alternative 5, spray irrigation would continue on the South Field and be discontinued on the North Field, and two additional spray fields would be established, 16 ha on the West field and one other field at a location to be determined. The second additional field would need to have a spray area of at least 13 ha to provide the required disposal capacity at the MECP-allowed application rate. The closest agricultural lands that are not environmentally protected (wetland areas) and that could potentially be used for spray irrigation are 3 to 4 km from the Bayshore Village lagoons via existing roads. The project would include expanding the effluent pumping station to provide the capacity to pump to the remote field and a 3 to 4 km long forcemain. The effluent would be UV-disinfected before spraying and tree buffers would be planted where required. The estimated project cost is $11.3 million, excluding land acquisition costs.

5.2.7 Alternative 6: Build Effluent Disposal Bed on West Field, Maintain South Spray Field, Decommission North Field, and Add Effluent UV Disinfection

This alternative involves utilizing two effluent disposal approaches: spray irrigation and subsurface disposal. Spray irrigation would continue on the South Field. The spray irrigation equipment on the North Field would be removed. A fully raised effluent disposal bed would be constructed on the Township-owned field west of the sewage lagoons.

During the summer months, lagoon effluent, disinfected by UV, would be sprayed on the South Field at a reduced spray irrigation frequency that provides a drying period between spray irrigation events. Tree buffers would be planted along Concession Road 8 and Sideroad 20.

The effluent disposal bed, with a capacity of 292 m^3/day, would receive pumped lagoon effluent, after the required minimum lagoon retention time (30 days), year-round. Due to the clay soils and high groundwater table, the bed would be raised and have a large sand mantle, covering a total area of about 4 ha.

This approach would be designed to provide approximately 20% spare spray irrigation capacity so that spray irrigation areas could be rotated. As this alternative would reduce the volume of effluent that is spray irrigated, the potential for effluent runoff and negative impacts on the adjacent residents would be reduced. However, there would remain the potential for effluent breakout from a fully raised bed built on relatively impermeable soils. As the life of a disposal bed is limited, the bed may need to be rehabilitated or replaced in 30 to 40 years. The estimated project cost of this alternative is $6.2 million.

5.2.8 Alternative 7: Build Effluent Disposal Bed on South Field, Establish Spray Irrigation on West Field, Decommission North Field, and Add Effluent UV Disinfection

Alternative 7 is like Alternative 6 in that it combines two effluent disposal approaches, and the North spray field is decommissioned. In this alternative however, the new effluent disposal bed would be constructed on the South Field, and new spray irrigation equipment would be installed on the new West field. As the West field is larger, more of the effluent could be disposed by spray irrigation, and the effluent disposal bed could be slightly smaller than in Alternative 6. The disposal bed would have a capacity of 274 m^3/day and a total loading area of 4.4 ha.

Alternative 7 would take longer to be implemented than Alternative 6 as the project would need to be phased: spray irrigation equipment on the West field would need to be installed and commissioned before the new effluent disposal bed could be constructed on the South Field. The estimated project cost of this alternative is $8.3 million.

5.2.9 Alternative 8: Discontinue Spray Irrigation and Build Effluent Disposal Bed on the West Field

Alternative 8 involves abandoning spray irrigation for the disposal of the effluent and replacing it with a large (400 m^3/day) raised disposal bed built on the Township-owned West field. The treated lagoon effluent would be pumped year-round to the disposal bed, which would have a total loading area of 6 ha. All spray irrigation equipment would be removed from the South and North Fields.

This approach would eliminate the restriction of weather on effluent disposal capacity and the runoff and negative impacts of spray irrigation on the adjacent residents. However, there would remain the potential for effluent breakout from a fully raised bed built on relatively impermeable soils. As the life of a disposal bed is limited, the bed may need to be rehabilitated or replaced in 30 to 40 years. The estimated project cost of Alternative 8 is $7.3 million.

5.2.10 Alternative 9: Discontinue Spray Irrigation and Discharge Effluent to the Lagoon City STP

Alternative 9 involves abandoning spray irrigation as the effluent disposal method and pumping all the treated lagoon effluent to the Lagoon City STP for tertiary treatment and discharge to Lake Simcoe. This alternative would require the construction of an effluent pumping station, the installation of a 150 mm diameter forcemain, and a 400 m^3/day expansion of the Lagoon City STP. Although there is currently available capacity at the STP, this capacity is allocated for growth in Brechin.

Two effluent forcemain routes were assessed from the Bayshore Village lagoons to the Lagoon City STP, as follows:

- Route follows Concession Road 7 and the abandoned railway line to the STP site. The approximate length of forcemain is 7,300 m.
- Route follows Concession Road 7, Highway 12, Simcoe Road, and Laguna Parkway to the STP site. The approximate length of forcemain is 15,000 m.

This alternative would eliminate the restriction of weather on effluent disposal capacity and the runoff and negative impacts of spray irrigation on the adjacent residents, but would require extensive construction, either through a wetland area, or through existing roads. The estimated project cost if the effluent forcemain is constructed along the short route is $21 million. The estimated project cost for the long forcemain route is $36 million.

5.2.11 Alternative 10: Discontinue Spray Irrigation and Upgrade Lagoons with STP with Effluent Discharged to Wainman's Creek to Lake Simcoe

This alternative involves abandoning effluent spray irrigation and replacing it with the discharge of tertiary treated effluent to Wainman's Creek, which drains to Lake Simcoe. It would require upgrading the Bayshore Village lagoon system to a 400 m^3/day tertiary sewage treatment facility. LSPP Policy 4.3DP prohibits new municipal sewage treatment plants in the Lake Simcoe watershed, unless it replaces an existing plant, or it services a development where one or more subsurface sewage systems are failing. Further, the phosphorus load to Lake Simcoe from the new effluent discharge would need to be less than from the spray irrigation effluent disposal system. Consultation with MECP confirmed that a surface effluent discharge from the Bayshore Village sewage system would not be approved because of the LSPP policies. The project cost of this alternative was estimated at $10.2 million in 2022.

5.3 SCREENING OF ALTERNATIVE SOLUTIONS

5.3.1 Screening Assessment

The alternatives were screened to identify the ones that meet the following criteria:

- Must meet the Problem Statement.
- Must conform to current MECP guidelines and policies.
- Must be financially feasible, which was considered for this screening as having an estimated project cost less than $10 million.

As shown in Table 2, seven alternatives and Do Nothing were screened out. Four alternatives were short-listed for further assessment.

Table 2: Alternative Screening Summary

ALTERNATIVES	MEETS PROBLEM STATEMENT	COULD BE APPROVED BY MECP	FINANCIALLY VIABLE	SCREENED OUT
Do Nothing	No	No	Yes	X
1 Reduce I/I only	No	Yes	Yes	X
2 Increase Spray Irrigation Rate	No	No	Yes	X
3 Add West Spray Field	Yes	Yes	Yes	
4 Add West Spray Field & Decommission North Field	No	No	Yes	X
5 Add West Spray Field & Additional Field, and Decommission North Field	Yes	Yes	No	X
6 Build Bed on West Field, Keep South Field & Decommission North Field	Yes	Yes	Yes	
7 Build Bed on South Field, Add West Field & Decommission North Field	Yes	Yes	Yes	
8 Build Bed on West Field & Decommission All Spray Fields	Yes	Yes	Yes	
9 Decommission Spray Fields & Pump Effluent to Lagoon City STP	Yes	Yes	No	X
10 Decommission Spray Fields & Treat Effluent at Tertiary STP to Lake	Yes	No	No	X

The main rationales for screening out seven of the 10 alternatives are summarized as follows:

- Do Nothing: It does not meet the Problem Statement because it does not provide a solution for the disposal of the annual volume of effluent within the typically available number of favourable spray days at the allowed spray irrigation rate and does not address issues with the existing spray irrigation system.
- Alternative 1: Reduce I/I. On its own, I/I reduction in the sanitary sewers cannot reduce the wastewater flows to the point that the effluent spray irrigation capacity issues are resolved. However, measures to monitor and control I/I must continue and be part of the recommended solution.
- Alternative 2: Increase the spray irrigation rate of application. This option is expected to exacerbate the existing issues with the spray irrigation operation.
- Alternative 4: Use the South Field, add a West spray field and abandon the North Field. This option does not provide sufficient spray irrigation area to dispose of the effluent volume within the typically available number of good spray days and at the allowed spray irrigation rate and does not address issues with the existing spray irrigation system.
- Alternative 5: Establish two new spray irrigation fields, one at a remote location. This alternative was screened out because potentially suitable land for spray irrigation is distant from the lagoons, resulting in a high project cost, and because of the uncertainty in finding available and suitable land.
- Alternative 9: Pump the effluent to Lagoon City STP. This option has a very high project cost mainly due to the length and construction of the forcemain and the need to expand the Lagoon City STP.
- Alternative 10: Build a tertiary STP and discharge to Lake Simcoe. This alternative cannot be implemented under the LSPP policies and would not be approved by the MECP.

5.4 ASSESSMENT OF SHORT LIST OF ALTERNATIVE SOLUTIONS

Following the screening, four alternatives were considered for further comparative assessment:

- Alternative 3: Establish an additional spray irrigation area in the West field and maintain the existing South and North Fields.
- Alternative 6: Build an effluent disposal bed on the West field, maintain the South Field, and decommission the North Field.
- Alternative 7: Build an effluent disposal bed on the South Field, establish a new spray irrigation area on the West field, and decommission the North Field.

- Alternative 8. Discontinue spray irrigation and build an effluent disposal bed on the West field.

5.4.1 Comparative Assessment

The alternative solutions on the short list were assessed against the evaluation criteria listed in Table 3.

Table 3: Alternative Solutions Evaluation Criteria

EVALUATION CRITERIA	
Technical	**Socio-Economic Environment Impacts**
▪ Provides Required Effluent Disposal Capacity? ▪ Provides Operational Flexibility? ▪ Operation and Maintenance Requirements ▪ Construction Timeline ▪ Permits and Approval Requirements	▪ Public Health ▪ Adjacent Land Uses and Property Values ▪ Air Quality Impacts ▪ Aesthetic Impacts (Noise, Visual, Odour) ▪ Temporary Construction Impacts ▪ Estimated Capital Costs ▪ Land Acquisition ▪ Estimated Operating and Maintenance Costs
Natural Environment and Cultural/Heritage Impacts	
▪ Surface Water Quality ▪ Groundwater Quality ▪ Woodlands, Wetlands and Vegetation ▪ Wildlife and Habitat ▪ Archaeological and Heritage Resources	

Air quality impacts of Alternative 3 and Alternative 6, were determined by air quality modelling and compared with Do Nothing. This analysis is presented in Appendix D. Under existing conditions (Do Nothing), the spray irrigation operation's modelled emissions for ammonia, hydrogen sulphide and suspended solids are all below the MECP criteria at the property limits. The emissions of all three parameters for Alternatives 3 and 6 are lower than for Do Nothing.

Project construction cost estimates for the short list of alternative solutions are enclosed in Appendix E.

Table 4 overleaf presents the comparative assessment of the alternative solutions. The Do Nothing alternative is included in this table for comparative purposes. The following summarizes the conclusions of the assessment of alternative solutions:

- Alternative 3, which involves continuing with effluent spray irrigation by expanding the spray irrigation area, is the lowest capital cost alternative, however it offers the least protection

against the risk that all the lagoon effluent cannot be disposed of every year due to unfavourable weather conditions for spray irrigation. The additional land would allow a reduction in the spray application rate and/or the application frequency, however, there remains the potential for runoff from the spray fields if the spray operation is not very closely monitored to ensure it meets all the MECP approval conditions. This runoff is a significant issue for the adjacent residents and as a potential source of pollutants to the environment.

- Alternatives 6 and 7, which involve utilizing one spray irrigation field seasonally, as well as an effluent disposal bed year-round, have significantly higher capital costs than Alternative 3. However, they result in a much lower risk of insufficient disposal capacity if the weather is unfavourable for spray irrigation, and of runoff from the spray field, because the spray irrigation rate and the application frequency would be reduced. The disadvantage of these alternatives includes the increase in the operation and maintenance requirements associated with running two effluent disposal systems, which translates into the highest total costs over 20 years.
- Alternative 6 offers the advantage over Alterative 7 of potentially phasing the project, such that over time, the South Field could be abandoned, and the new disposal bed could be expanded.
- Alternative 7 offers the advantage over Alternative 6 of moving the spray irrigation operation further from adjacent residents and in a new area where adequate buffers could be provided. However, as this alternative involves establishing a new spray field with new equipment, it has the highest capital costs and would have a longer implementation period.
- Alternative 8, which consists of replacing seasonal spray irrigation with year-round effluent disposal in a large bed, provides a solution with the required capacity without being affected by weather conditions. It addresses the issues with effluent runoff to adjacent properties and Wainman's Creek. The capital costs are high, due to the large amount of imported sand that will be required to build the raised bed, however, the annual operating costs will be less than for a spray irrigation system. Over a 20-year period, the total costs are estimated to be lower than for Alternatives 6 and 7.

Table 4: Assessment of Alternative Solutions

	Do Nothing	Alternative 3 Establish One New Spray Irrigation Field (West) and Maintain North and South Fields	Alternative 6 Build Effluent Disposal Bed on West Field, Keep South Spray Field only	Alternative 7 Build Effluent Disposal Bed on South Field, Establish Spray on West Field only	Alternative 8 Build Effluent Disposal Bed and Discontinue Spray Irrigation
Description	Continue with current spray irrigation operations on existing fields.	Maintain existing spray fields. Establish 16 ha spray field (West). Add effluent UV disinfection and tree buffers.	Decommission North spray field. Maintain South spray field. Build raised effluent disposal bed on West field. Add UV disinfection and tree buffers.	Decommission North and South spray fields. Establish spray field (West). Build raised effluent disposal bed on South field. Add UV disinfection.	Discontinue spray irrigation. Build raised effluent disposal bed on West field.
TECHNICAL CRITERIA					
Provides Required Effluent Disposal Capacity?	Insufficient spray area considering typical available spray days.	Total spray area is sufficient if the effluent can be irrigated over 65 days or more.	Effluent disposal bed + spray field would be designed to meet total effluent disposal capacity	Effluent disposal bed + spray field would be designed to meet total effluent disposal capacity.	Effluent disposal bed would be designed to meet total effluent disposal capacity.
	No	Improved	Yes	Yes	Yes
Provides Operational Flexibility?	Does not improve operational flexibility.	If 75 spray irrigation days are available, could provide 16% spare capacity to take areas out of service for aerating or tilling.	System would be designed to provide spare capacity to take out of service spray areas for aerating or tilling, or disposal bed cells for a rest.	System would be designed to provide spare capacity to take out of service spray areas for aerating or tilling, or disposal bed cells for a rest.	System would be designed to provide spare capacity to take disposal bed cells out of service for a rest.
	No	Improved	Yes	Yes	Yes
Operation and Maintenance Requirements	O&M to set-up and maintain existing piping/nozzles and pump station, supervise spray days, and harvest hay.	O&M to set-up and maintain existing piping/nozzles, pump station, and new irrigation system, supervise spray days. O&M for UV system.	Less O&M of existing irrigation system (smaller). O&M for UV system and new pump station to disposal bed, and inspection of bed.	Less O&M of irrigation system (new). O&M for UV system and new pump station to disposal bed, and inspection of bed.	O&M for new pump station to disposal bed, and inspection of bed.
	High	Higher	Highest	Highest	Less
Construction Timeline	Not applicable	Short timeline to install new spray irrigation equipment	Longer timeline to construct new pumping station and disposal bed.	Adds one year to construction timeline for new bed then installation of new equipment on South Field.	Longer timeline to construct new pumping station and disposal bed.
	Not applicable	Short	Longer	Longest	Longer
Permits and Approval Requirements	Continue with existing C of A.	Amended ECA required for additional field and UV equipment.	Amended ECA required for UV equipment, new pumping station and disposal bed.	Amended ECA required for new spray field, UV equipment, new pumping station and disposal bed.	ECA required for new pumping station and disposal bed.
	None	Obtainable	Obtainable	Obtainable	Obtainable
NATURAL ENVIRONMENT AND CULTURAL/HERITAGE IMPACTS					
Surface Water Quality	Potential contamination of ditches, Wainman's Creek and Lake if runoff occurs during spray irrigation.	Lower spray application rate and/or frequency would reduce potential for surface water contamination from spray field runoff.	Lower spray application rate and/or frequency would reduce potential for surface water contamination from spray field runoff. Low potential for effluent breakout from disposal bed.	Lower spray application rate and/or frequency would reduce potential for surface water contamination from spray field runoff. Low potential for effluent breakout from disposal bed.	Eliminates potential for surface water contamination from spray field runoff. Low potential for effluent breakout from disposal bed.
	Potential Negative Impact	Less Potential Negative Impact	Lower Potential Negative Impact	Lower Potential Negative Impact	Least Potential Negative Impact

	Do Nothing	Alternative 3 Establish One New Spray Irrigation Field (West) and Maintain North and South Fields	Alternative 6 Build Effluent Disposal Bed on West Field, Keep South Spray Field only	Alternative 7 Build Effluent Disposal Bed on South Field, Establish Spray on West Field only	Alternative 8 Build Effluent Disposal Bed and Discontinue Spray Irrigation
Groundwater Quality	Spray irrigation of treated effluent has low potential for contamination of groundwater.	Spray irrigation of treated effluent has low potential for contamination of groundwater.	Spray irrigation and in-bed disposal of treated effluent has low potential for contamination of groundwater.	Spray irrigation and in-bed disposal of treated effluent has low potential for contamination of groundwater.	In-bed disposal of treated effluent has low potential for contamination of groundwater.
	Low Potential Negative Impact	Low Potential Negative Impact	Low Potential Negative Impact	Low Potential Negative Impact	Low Potential Negative Impact
Woodlands, Wetlands and Vegetation	Existing spray fields are near but outside a wetland area.	West field is near but outside wetland area and has no significant woodlands or vegetation.	West field is near but outside wetland area and has no significant woodlands or vegetation.	West field is near but outside wetland area and has no significant woodlands or vegetation.	West field is near but outside wetland area and has no significant woodlands or vegetation.
	Low Potential Negative Impact	Low Potential Negative Impact	Low Potential Negative Impact	Low Potential Negative Impact	Low Potential Negative Impact
Wildlife and Habitat	Existing spray fields are near but outside potential wildlife habitat of wetland and Barnstable Bay ANSI.	West field is near but outside potential wildlife habitat of wetland and Barnstable Bay ANSI.	West field is near but outside potential wildlife habitat of wetland and Barnstable Bay ANSI.	West field is near but outside potential wildlife habitat of wetland and Barnstable Bay ANSI.	West field is near but outside potential wildlife habitat of wetland and Barnstable Bay ANSI.
	Low Potential Negative Impact	Low Potential Negative Impact	Low Potential Negative Impact	Low Potential Negative Impact	Low Potential Negative Impact
Archaeological and Heritage Resources	No proposed change.	Stage 2 archaeological assessment found artifacts from an early pioneer site on west field. Full mitigation will be completed. No built heritage resources.	Stage 2 archaeological assessment found artifacts from an early pioneer site on west field. Full mitigation will be completed. No built heritage resources.	Stage 2 archaeological assessment found artifacts from an early pioneer site on west field. Full mitigation will be completed. No built heritage resources.	Stage 2 archaeological assessment found artifacts from an early pioneer site on west field. Full mitigation will be completed. No built heritage resources.
	No Potential Impact	Low Potential Negative Impact	Low Potential Negative Impact	Low Potential Negative Impact	Low Potential Negative Impact
SOCIO-ECONOMIC ENVIRONMENT IMPACTS					
Public Health	Runoff causes localized bacterial contamination of adjacent wells, ditches, creek and lake. Potential wind dispersion of microbiological aerosols.	Lower public health risk because reduced potential for ponding and runoff, and effluent disinfection.	Lower public health risk because significantly reduced potential for ponding and runoff, and effluent disinfection.	Lower public health risk because significantly reduced potential for ponding and runoff, and effluent disinfection. Spray field further from residences and road.	Minimal public health risk as potential for ponding, runoff off site and aerosols is eliminated.
	Potential Negative Impact	Low Potential Negative Impact	Low Risk	Low Risk	No Risk
Adjacent Land Uses and Property Values	Potential negative impact to existing farming operations. Adjacent property values affected by effluent spray operation.	Minor reduction in impacts to adjacent properties from improved effluent spray operation.	Change to existing land use on West field: used for effluent disposal bed. Reduction in impact to adjacent properties from reduced effluent spray operation.	Change to existing land use on West field: used for effluent spray irrigation. More reduction in impact to adjacent properties because of reduced and further effluent spray operation.	Change to existing land use on West field: used for effluent disposal bed. Adjacent property values not expected to be affected by effluent disposal bed.
	Potential Negative Impact	Potential Negative Impact	Less Potential Negative Impact	Low Potential Negative Impact	Improvement
Air Quality Impacts	No change to air quality impacts. Dispersion modelling shows levels of contaminants in aerosols are below MECP limits at property line.	Improvements to air quality. Dispersion modelling shows lower levels of contaminants, all below MECP limits at property line.	Further improvements to air quality. Dispersion modelling shows lower levels of contaminants, all below MECP limits at property line.	Improvements to air quality. Dispersion modelling shows lower levels of contaminants, all below MECP limits at property line.	No aerosols associated with an effluent disposal bed.
	Low Potential Negative Impact	Low Potential Negative Impact	Lower Potential Negative Impact	Lower Potential Negative Impact	Improvement

	Do Nothing	Alternative 3 Establish One New Spray Irrigation Field (West) and Maintain North and South Fields	Alternative 6 Build Effluent Disposal Bed on West Field, Keep South Spray Field only	Alternative 7 Build Effluent Disposal Bed on South Field, Establish Spray on West Field only	Alternative 8 Build Effluent Disposal Bed and Discontinue Spray Irrigation
Aesthetic Impacts (Noise, Visual, Odour)	Odours associated with lagoons or effluent spray irrigation operation noted by adjacent residents. Sprinklers visible from road & adjacent properties.	Visual impacts from sprinklers minimized by proposed tree buffers. New West field less visible to adjacent residents. No change to potential for odours.	Visual impacts from sprinklers minimized by tree buffer. Reduced extent of spray area would decrease potential for odours and visual impacts. Disposal bed doesn't cause noise or have odours. Bed on West field less visible to adjacent residents.	Spraying on West field less visible to adjacent residents. Reduced extent of spray area would decrease potential for odours. Disposal bed doesn't cause noise or have odours. Bed on South field would be visible to adjacent residents.	Disposal bed doesn't cause noise or have odours. Bed on West field less visible to neighbouring residents.
	Potential Negative Impact	Potential Negative Impact	Less Potential Negative Impact	Low Potential Negative Impact	Improvement
Temporary Construction Impacts	No construction required.	Installation of piping and equipment for West spray field would cause very minor disruption to residents or traffic.	Construction of disposal bed, incl. hauling of septic sand, would cause some temporary disruption to residents or traffic along the haul route.	Construction of disposal bed, incl. hauling of septic sand, would cause some temporary disruption to residents or traffic along the haul route.	Construction of disposal bed, incl. hauling of septic sand, would cause some temporary disruption to residents and traffic along the haul route. More impact due to longer construction period.
	No Potential Impact	Very Minor Potential Impact	Less Temporary Impact	Less Temporary Impact	Most Potential Temporary Impact
Estimated Capital Costs	None.	Irrigation equipment, piping and UV equipment in pump house expansion. Estimated capital cost: $1.6 M	Disposal bed, piping and pumps to bed, plus UV equipment in pump house expansion. Estimated capital cost: $6.2 M	Disposal bed, piping and pumps to bed, plus new irrigation equipment & piping, Estimated capital cost: $8.3 M	Disposal bed, and piping and pumps to bed. Estimated capital cost: $7.3 M
	None	Lower Cost	High Cost	Highest Capital Cost	High Cost
Land Acquisition	None	None	None	None	None
	None	None	None	None	None
Estimated Operating and Maintenance Costs	Approx. $150k/year + haulage costs ($700k in 2023)	Costs to pump to new field. Labour costs to operate and maintain additional irrigation field and equipment. Approx. $230k/year + potential haulage costs	Costs to pump to new bed. Labour costs for additional dosing equipment and for cutting grass. Less labour for O&M of spray irrigation equipment and fields. Approx. $150k/year	Costs to pump to new bed. Labour costs for additional dosing equipment and for cutting grass. Less labour for O&M of spray irrigation equipment and fields. Approx. $150k/year	Costs to pump to new bed. Labour costs for additional dosing equipment, bed maintenance and inspection, and grass cutting. Eliminates O&M of spray irrigation equipment and fields. Approx. $80k/year
	No Change	Increase	Net Decrease	Net Decrease	Most Decrease
Total Estimated Costs over 20 years (Capital + O&M)	$3M, plus equipment replacement and haulage	$6.2 M, plus equipment replacement	$9.2 M, plus equipment replacement	$11.3 M	$8.9 M
	No Change	Lower Cost	High Cost	Highest Total Cost	High Cost

5.4.2 Preliminary Preferred Solution

Following the comparative assessment described above, **Alternative 8 - Replace effluent spray irrigation with an effluent disposal bed operated year-round**, was identified as the preliminary preferred solution, and presented at the PIC.

Continuing to monitor and control extraneous flows from inflow and infiltration into the sanitary sewers, was also recommended to maintain the incoming wastewater flows well within the capacity of the treatment and disposal system.

6 Public and Agency Consultation

6.1 SUMMARY OF CONSULTATION PROCESS UP TO 2017 CLASS EA REPORT

The public and agency consultation process that was completed for the 2017 Class EA is presented in detail in the 2017 Class EA Report. It is summarized below:

- A Notice of Study Commencement was mailed on October 1, 2010, and published in the Orillia Packet and Times on October 14, 2010.
- A Notice of PIC and Comments Invited was mailed on February 10, 2011, and published in the Orillia Packet and Times on February 10 and 17, 2011.
- A PIC was held on February 24, 2011 at the Joyland Beach Community Centre in the Township of Ramara. The PIC open house was attended by 18 residents and Township councillors.
- Comments were received from residents indicating concerns with the spray irrigation capacity and operation, runoff to Wainman's Creek, flooding, odours, aerosols during spraying, proximity to Wainman's Creek, and impact on the water quality in Wainman's Creek and Lake Simcoe.
- A meeting was held on March 25, 2011, with Township staff, three residents and Tatham (then CCTA), to obtain clarifications on the adjacent residents' concerns and discuss how these could be addressed. Concerns with observed surface runoff and the quality of the effluent sprayed onto the fields, and property values, were discussed.
- The Township authorized a topographic survey and assessment of the overall drainage in the area, and the remedial of the municipal drainage ditches and culverts and some private drainage channels. This work was completed in 2011 and 2012.
- The Township asked Tatham (then CCTA) to develop a list of alternatives to effluent spray irrigation and assess their feasibility.
- Meetings were held with MOECC (now MECP) and the Lake Simcoe Region Conservation Authority (LSRCA) to discuss potential alternatives for effluent disposal and establish their feasibility, and presentations were made to Township Council to provide updates on the Class EA study, as follows:
    - Meeting with MOECC on May 9, 2013, to discuss the alternative solution of building a wastewater treatment plant with a direct discharge to Lake Simcoe. MOECC stated the policies of the Lake Simcoe Protection Plan prohibit new municipal STPs discharging to Lake Simcoe.

- Deputation to Ramara Council on September 15, 2014, to provide an update on the Class EA; present the revised Problem Statement, the new list of alternative solutions and their assessment and identify the preliminary preferred solution; and obtain the Township's concurrence on the next steps.
- Meeting with LSRCA on November 25, 2014, to present the issues at the Bayshore Village spray irrigation fields and the alternatives under consideration. Specific input was requested on the alternative of a direct effluent discharge to Lake Simcoe. The LSRCA considered a direct effluent discharge to the lake a viable and preferable option to the status quo.
- Conference call with MOECC and LSRCA on July 29, 2015, to present the alternatives under consideration and discuss the legal status of the Bayshore Village Sewage Works. MOECC indicated that amendments to the LSPP and/or O. Reg.130/09 would be required to obtain approval for a new discharge to Lake Simcoe and it would need to be demonstrated that the phosphorus load will not increase.
- Meeting with the MOECC Barrie District Office on November 27, 2015, to discuss potential other alternatives to improve or replace the effluent spray irrigation system. MOECC suggested consideration of planting hydrophilic plants such as poplars, and of short-term measures such as adding organic material. MOECC confirmed that sub-drains were not allowed.
- Meeting on February 26, 2016 between the Township's Mayor and Deputy Mayor with MOECC Minister, Assistant Deputy Minister and Senior Policy Advisor, to discuss the Bayshore Village STP effluent disposal Class EA and request changes to the LSPP and/or O. Reg. 60/08 as amended by O. Reg. 130/09. MOECC expressed the importance of the LSPP, and indicated a long-term solution needs to be resolved through the Class EA in consultation with MOECC. A benefit to Lake Simcoe must be firmly realized to rationalize and justify a new point source discharge to Lake Simcoe.
- Presentation to Ramara Council on September 19, 2016, to provide an update on the Class EA and the consultation meetings to date, and to present the preliminary preferred long-term solution and the recommended short-term solution. Township authorized CCTA to proceed with a second PIC to obtain public comments.
- Letter submitted by the Township of Ramara to the MOECC Minister on October 24, 2016 to respond to questions from the February 2016 delegation; express their concern with the difficulty in finding a solution that is acceptable to MOECC; present a resolution of Ramara Council to request amendments to LSPP policies and regulations; and invite the Minister to visit the Bayshore Village spray irrigation site. The MOECC responded

on April 5, 2017 that the preferred solution must fit within existing policy and regulatory requirements.

- A Notice of PIC and Comments Invited for PIC No. 2 was mailed to the updated mailing list on October 27, 2016, and published in the Packet and Times on October 27, November 3, and November 10, 2016.
- PIC No. 2 was held on November 15, 2016 at the Township Council Chambers. The PIC was attended by 36 residents, Township councillors and staff. A summary of the questions and answers at the PIC was posted on the Township's website. The PIC presentation material was sent to the Bayshore Village Association for distribution to members.
- The questions and comments expressed by the PIC attendees reflected a wide range of opinions on the preferred approach to resolving the effluent spray irrigation issue, from preferring a STP with direct discharge to Lake Simcoe to total opposition to any effluent discharge to Wainman's Creek and Lake Simcoe due to concerns with water quality, and from strong concerns with the operation of the existing spray fields to preferring the status quo. Overall, residents expressed the need to protect the lake's water quality.
- A presentation was made to the Township of Ramara Committee of Council on September 18, 2017, to present the conclusions of the Class EA.
- The Notice of Completion of the Class EA Study was issued on October 11, 2017. It was posted on the Township of Ramara website, in the Packet and Times, and mailed to all on the updated mailing list, as well as to the Regional MOECC EA Coordinator.

6.2 COMMENTS ON 2017 CLASS EA REPORT

Comments were received from the LSRCA and the MECP following the issue of the Notice of Completion in October 2017. These comments are summarized in Table 5. Correspondence is attached in Appendix F.

Table 5: Comments Received Following 2017 Class EA Report

DATE	FROM	COMMENT	RESPONSE
Oct. 23, 2017	Jim and June Newlands	Agree with report recommendation to build a STP. It is unfortunate that considerable sum of taxpayers' money needs to be spent on a temporary fix. Noted water in pasture east of North Field and across from South Field from spray irrigation activity. Looking to Township to address runoff issue through ditch improvements.	No letter response required.
Nov. 9, 2017	Mike Wilson, LSRCA	A portion of the South Field is within the WHPA for the Bayshore Village Well Supply. The policies of the South Georgian Bay Lake Simcoe Source Protection Plan and the circumstances and vulnerability score for the effluent discharge to be considered a significant drinking water threat should be reviewed to ensure the proposed activity will be permitted.	Letter response on Oct. 3, 2018
Nov. 28, 2017	Paul Martin, MOE	As it is impossible to determine if or when the preferred long-term solution could be implemented, MOE recommends that a solution that fits within the existing policy and regulatory requirements be identified as the long-term solution. The costs of implementing a new STP and outfall need to be reviewed. Capital and operating costs of pumping sewage to the Lagoon City STP should be reconsidered. MOE does not have any objection in principle to the proposed short-term solution but will require a hydrogeological study to confirm spray irrigation meets the MOECC Reasonable Use policy. Recommends an air quality impact assessment to ensure the short-term solution will not result in odour impacts off-site, and to identify mitigating measures. Anticipates that adding spray fields will alleviate problems with the many requests for extending the spray season, and with other concerns. Recommends an evaluation of the spray irrigation system and operations to ensure integrity and that established procedures are followed. MOE comments should be addressed, and studies completed before completion of the Class EA.	Letter response on October 3, 2018
Nov. 21, 2018	Paul Martin, MECP	As the additional West spray field is no longer available, the preferred option must be revised to include lands that will be identified for use as spray fields. Without this info, the EA process is not complete. Impacts from the proposed solution must be evaluated and a hydrogeological study must be completed at the EA stage. A contingency plan is required to address potential exceedance of the system's rated capacity.	No response letter submitted

6.3 PUBLIC AND AGENCY CONSULTATION DURING CLASS EA UPDATE

Following a deputation to Township Council on December 11, 2023, the public and agency consultation for the Class EA Update was initiated, as described below.

6.3.1 Deputation to Council – December 2023

Tatham made a deputation to Township Council on December 11, 2023 to provide an update on the Class EA. Following this deputation, the residents adjacent to the spray irrigation fields sent Tatham correspondence (emails and letters) that had been previously submitted to the MECP, to the Township Mayor and Councilors, and to OCWA. The letter sent to the Minister of the MECP in January 2024 expressed their significant concerns with the operation of the spray irrigation fields and to indicate their support for abandoning effluent spray irrigation, particularly on the North Field, and replacing it with an effluent disposal bed. All correspondence received from the adjacent residents is attached in Appendix H.

In summary, their concerns, expressed to Township Council and to Tatham during the 2017 Class EA and the Class EA Update, are:

- Recurrent and frequent effluent spills onto their properties, which they attribute to runoff from over spraying, spraying in a manner that does not follow the conditions of the Certificate of Approval, and to problems with inefficient and faulty equipment.
- The actual spray application rate is higher than the calculated and reported rate because the actual spray irrigation area is less than the original area due to changes in the piping and sprinkler layout and numbers.
- Effluent runoff flows through their properties and to ditches that drain to Lake Simcoe.
- One drinking water well has high bacteriological counts during the spray season.
- Spray irrigation near the property lines has caused spraying of effluent onto their properties.
- Effluent spraying, ponding and runoff on their properties has caused the loss of useable farmland.
- The spray irrigation system has been operated without due consideration and concern for their health, the health of the animals, and the farms, which are their livelihood.
- The lagoon effluent is not disinfected or adequately treated before spraying. Also, concern with bypassing of flow from the small lagoon into the large lagoon in 2023, as this may cause untreated sewage to be sprayed.
- Odours from the lagoons and spray irrigation.

6.3.2 Public Information Centre for Class EA Update

A Notice of Public Information Centre was posted on May 6, 2024 on the Township of Ramara website as well as in the on line newspaper Orillia Matters from May 8 to May 22, 2024, and mailed and e-mailed to an updated mailing list on May 6, 2024. The Notice and the PIC mailing list are attached in Appendix G.

The PIC was held on May 22, 2024, at the Township Council Chambers and was also available via a Zoom link. The PIC consisted of a PowerPoint presentation, followed by a question-and-answer period from in-person and virtual attendees. There were 57 residents at the PIC. The presentation and the sign-in sheets are attached in Appendix G. The presentation as well as the recording of the presentation are available on the Township website.

6.3.3 Comments Received

Comments from Public

Comments were received verbally and in writing at the PIC, in letters to the Township, and by email during the two-week review period. All received comments supported the preliminary preferred solution of abandoning spray irrigation and implementing an effluent disposal bed (Alternative 8). In summary, the main points made in the comments received were:

- Spray irrigation should not be considered as a viable option because of past and current issues and impacts on adjacent families and properties.
- Spray irrigation system should be decommissioned to address the adjacent residents' concerns and their witnessing of ponding, runoff and other problems.
- Concern that MECP may shut down the spray irrigation system.
- Urgency to address the issues with effluent disposal.
- Township needs to seek grants to assist with construction costs.

The adjacent residents to the Bayshore Village spray irrigation fields provided numerous and extensive letters and emails, with photos, videos and other documents, to express their concerns with the spray irrigation operation, and dissatisfaction that spray irrigation was considered as an alternative solution considering the harm it has caused.

From June 1 to June 5, 2024, similar emails were received from 41 Bayshore Village households, all stating their support for Alternative 8 and requesting that the Township seek provincial and federal grants to assist with construction costs and that the project move rapidly so that it is shovel-ready by the end of the current term of Council.

Table 6 summarizes the comments received from the public. All correspondence received and responses are attached in Appendix H.

Table 6: Class EA Update PIC – Summary of Public Comments Received

DATE	FROM	COMMENT	RESPONSE
May 11, 2024	Jim and June Newlands	Asking Tatham opinion re operation, management and effectiveness of spray irrigation system and request that options that include spray irrigation be screened out. Over spraying has resulted in effluent flooding on their beef farm, causing lost productivity and undue stress and concern. They reported spills to MECP. Referring to deputation to Council of Dec 11, 2023: concerns are real not just potential. Spray area is much less than 26 ha. How important is the 55 m3/ha/day? Could Tatham recommend a safe and effective amount that could be sprayed until a permanent solution can be implemented? Only viable option is #8. Concern that sewage is not adequately treated and of bypass of flow from small lagoon to large lagoon. Concern that effluent sprayed when windy, rainy and when there is ponding. Concern that lagoons are in WHPA for Bayshore municipal wells. Spray system has always been operated from an economically efficient priority without considering the safety and concerns of the two adjacent families. Spray spigots are very close to the property lines. Continuing with spray irrigation would require minimum setbacks. Extremely concerned that spray irrigation will continue to cause harm to their farms, their health, their animals' heath, and their livelihood.	Letter response on Sept. 5, 2024
May 13, 2024	Greg McIsaac	Witnessed ponding on land surrounding the ponds and creating its path to lower ground. Will be watching with care how the Township handles this.	Thank you email
May 16, 2024	Anna Bourgeois (Concerned Citizens of Ramara), Margaret Prophet (Simcoe County Greenbelt Coalition), Claire Malcomson (Rescue Lake Simcoe Coalition)	Recommend that Ramara Council pursue Option 8. Spray fields should not be an option. Can't afford to ship wastewater.	
May 19, 2024	Mark Wainman	If operators had met operating conditions 3.1, 3.2 and 3.3 of C of A and reported spills when they occurred to ditches and surrounding properties, there would have been fewer days than the number of spray days used in the calculations.	Letter response on Sept. 5, 2024

DATE	FROM	COMMENT	RESPONSE
May 20, 2024	Jamie Wainman	Lives on property that borders the spray fields and has seen the damage they are causing. Constant overspray and broken pipes result in property being flooded from 4 sides. Concerned when unable to walk through our fields due to large amounts of ponding effluent from the spray fields. It makes parts of our property and field completely unusable for farming. Extremely concerned about the safety of our well. The spray fields do not operate safely. Fears they have caused irreversible damage to our property.	
May 20, 2024	Michael Douglas	The most viable long-term solution is Alt. 8. All spray fields must be decommissioned.	
May 21, 2024	Neil Wainman	Cell B (small lagoon) was bypassed for at least April 5 to June 22, 2023, meaning that untreated sewage was pumped into Cell A (large lagoon), which was then pumped out to the spray fields. Cell B was also bypassed recently to Cell A. Please explain.	Letter response on Sept. 5, 2024
May 22, 2024	Michael Douglas	No more spraying. Build effluent disposal bed on west field. Advantages: used year-round, can dispose of annual volume of effluent, eliminates current constant runoff contaminating local properties and Lake Simcoe, out of sight, out of mind, minimizes potential impacts on groundwater quality. Township has had opportunity to find funding. Alt. 8 finally attempts to address surrounding area residents' concerns. Township residents must not continue to be subjected to substandard method of handling effluent. Alt. 8 is the most cost effective. Spray fields and Township adherence to approved management practices cannot be trusted.	
May 22, 2024	Anna Bourgeois	Timeline for archaeology study? Will materials for the construction of a disposal bed need to be brought in? Timeline for MECP approval? Why consider spray field alternatives if apparent that climate is unreliable factor in success of dealing with effluent?	
May 24, 2024	Kathy Guillemette and J. Tom Hamilton	Effluent disposal bed and discontinue spray irrigation appears to solve disposal problem and address concerns of persons living near the fields. Question re potential for effluent breakout, O&M for dosing system. Township missed out on grant opportunities.	
May 24, 2024	Ross Fidler	Agree with Alt. 8. Concern that if spray fields become more ineffective, MECP will shut it down. Need a decision this June.	

DATE	FROM	COMMENT	RESPONSE
May 25, 2024	Jamie Wainman	Lives on property that borders North field. Overspray constantly floods our property. Has witnessed things, including broken pipes spraying up in the air that go unfixed for days, and lawn mower stuck that required backhoe to assist. Supports option 8. Additional action must be taken in mean time to address concerns with spray irrigation system.	
May 25, 2024	Mark Wainman	Disappointed that spray irrigation still presented as a viable option, which shows a total disregard for all the problems the systems has experienced in the past 30 years. Answers to questions were weak or inaccurate, including about treatment, bypass, future trucking of effluent.	Letter response on Sept. 5, 2024
May 26, 2024	Konrad Brenner	Alternative of disposal in a tile field and abandoning spray irrigation is reasonable, if accepted that a STP will not be approved by the Province.	Thank you email
June 1, 2024	Jim and June Newlands	Disappointed and angry that their comments expressed in the May 11 letter not addressed in the PIC. PIC refers to treated effluent, ignoring the bypasses of the small lagoon that occur regularly. How could the sewage be partially treated? Soils are compacted. They cannot absorb 55 m^3/ha/day. Land area used for spray irrigation is overstated. Considers that the spray alternatives should have been screened out because of their lack of capacity and that MECP would not approve them based on past poor performance. Spray irrigation area calculation by Township is not accurate. Do not believe in Township commitment to operate system in compliance with approval, based on past and on May 31 when conditions were not favourable.	Letter response on Sept. 5, 2024
June 1 to June 5, 2024	41 households in Bayshore Village	Support Alt. 8. Request that Township seek provincial and federal grants to support construction costs. Hopeful that project be shovel ready by end of current term of this Council.	Thank you emails
June 3, 2024	Ken Szijarto	Township should abandon any option that would invest in expanding the use of the spray field technology. The best option is one that prevents effluent runoff, can be expanded, and minimizes O&M costs.	Thank you email
June 3, 2024	Jim and June Newlands	Although 55 m^3/ha/day (5.5 mm/day) is a small amount, soils cannot absorb it because they are compacted. Also, the spray area is much less than used in calculations. Township, in Staff Report ID24-25, calculates 20 ha, but that is land area available, not	Letter response on Sept. 5, 2024

DATE	FROM	COMMENT	RESPONSE
		area sprayed on, which he calculates at 10 ha, based on number of spray heads used. This results in a much higher volume of effluent sprayed per ha.	
June 4, 2024	Joseph and Laura Lee	Only Alt 8 is viable. Spray irrigation options are not. They should have been screened out. Land area is incorrect. Would not meet C of A. Need to address the concerns of the adjacent farm owners. Timeline is unacceptable. Need to fast track the project.	Email on Aug. 20, 2024
June 4, 2024	Margaret Sharpe	Suggest that wastewater system be moved across Sideroad 8 and utilize a tertiary treatment plant.	by Dyana Marks, Township of Ramara
June 5, 2024	Pat and Linda Richardson	Why has this problem not been corrected years ago? Concerns about impacts on two neighbouring farms and on wildlife, health of the lake. Concern about bypasses between the lagoons caused untreated sewage to be sprayed. Alt 8 is the only option. Alt 3,6 and 7 should be removed from consideration. Object to proposed timeline.	Email on Aug. 20, 2024
June 5, 2024	Jim and June Newlands	Email from veterinarian about health and environmental risks associated with effluent from Bayshore Village spray fields. Have previously been forced to take pasture and cropland out of production for safety of cattle and ourselves, reduce the size of herd., and buy hay from other farmers.	
June 5, 2024	Geraldine Toebes	Totally opposed to expanding effluent spray irrigation. Concerns with depending on weather, clay soils, risk of lagoons overwhelmed by sewage, Wainman Creek water quality, more building permits in Bayshore Village, impacts on adjacent property owners, costs to taxpayers. In favour of Alt. 8.	Thank you email
June 5, 2024	Rick Matthews	It is time to replace the spray irrigation fields. Supports Alt. 8. The effluent disposal bed should be Council's priority and this issue be resolved before the term of this council. Urges Township to lobby for funds for construction. A task force of Council, engineer and support staff should be formed, and a project plan should be developed. A single individual should be responsible to make this project happen.	
June 6, 2024	Drew Fulford	If phosphorus from private septic systems is more concentrated than in treated effluent, wouldn't it be best for Lake Simcoe to implement the most environmentally beneficial solution to reduce phosphorus loading? Could the chosen solution	Email on Aug. 20, 2024

DATE	FROM	COMMENT	RESPONSE
		include capacity for additional connections and reduce the financial burden?	
June 6, 2024	Neil Wainman	Request clarification of bypass of small lagoon. Was raw sewage being pumped directly into the large lagoon?	Township responded verbally
June 7, 2024	Mark Wainman	Concern with recent operation of spray irrigation system: spills from North field occur daily across his property when spraying, then to ditches, creek and lake. 2023 Annual Report mentions many non-compliance items. 2023 MECP inspection report presents more issues, including 2 spills that were not reported and that caused effluent to enter creek. Requests that Township not spray in the North field.	Letter response on Sept. 5, 2024
June 7, 2024	Jim and June Newlands	Sent letter to MECP Barrie District Office regarding inspection report of March 4, 2024. The Bayshore system had not been inspected since 2018. Concern that spills had not been reported. Requested that no further exemptions be issued. Spray irrigation should not continue in any form.	
June 7, 2024	Jim and June Newlands	Re Staff Report ID-25-24: Area of South and North Fields were estimated at 20 ha plus 3.7 ha at south end of South Field that has not been used in many years. Challenges these calculations. Estimates it is 10 ha. If pipes had been evenly spaced, it would not change the volume sprayed but it would reduce over spraying on the North Field and would show runoff at SR 20for all to see. Township is spraying directly on half the available land, therefore over spraying, operating over the design capacity, out of compliance with C of A and spraying on their property. Request that MECP or a third-party survey the spray fields currently in use to determine actual acreage used not just available for use.	
June 7, 2024	Jim and June Newlands	Township calculations of spray area in Staff Report ID24-25 include portions of the fields that do not have pipes so can't be receiving effluent. There is also overlap between the spray circles, which compounds the amount of effluent applied in some areas. Would the spray irrigation option operate effectively as built? Would the new area have a similar layout? As spray irrigation will have to continue for foreseeable future, the area used for spray irrigation is paramount to determine the safe application rate. Rows of pipes have been added in the North Field even though the soils have less capacity. Changing the piping distribution between the North Field and the South Field would help distribute the spraying more evenly	

DATE	FROM	COMMENT	RESPONSE
		and reduce the effluent load near the property lines and drinking water well. Alternatives that include spray irrigation are not acceptable. Do nothing is not an option. Waiting 3 years for implementing a proper solution is not acceptable.	
July 1, 2024	Jim and June Newlands	As of July 1, there has been minimal spraying on South Field and none on North Field. Concerned there will be excessive spraying at the end of the season. Township has been digging a ditch on east side, during which drainage pipe has been found. This ditch may lessen spills on their property but will not solve overspraying, mismanagement, and non-compliance. Waiting for response on calculations of spray areas.	
July 9, 2024	Jim and June Newlands	Email to MECP re OCWA presentation of Staff Report ID-33-24 to Council and request clarification about exemptions in 2024. Staff Report states the content of the sewage lagoons will need to be hauled to Lagoon City STP because levels are high. Challenges in trying to use the spray fields this year support the position that the spray fields are not a feasible, economical or efficient system to lawfully dispose of Bayshore Village sewage. Wants to know if applications for exemptions or relief have been requested, as there is concern they may exacerbate the problems.	

Comments from Agencies

The agencies listed on the mailing list in Appendix G were invited to attend the PIC and submit comments on the Class EA Update. Comments received to date are summarized in Table 7.

Table 7: Class EA Update – Summary of Agency Comments Received

DATE	FROM	COMMENT	RESPONSE
May 14, 2024	Georgia Lumley, Historic Saugeen Metis	The project is well beyond the boundaries of the traditional harvesting territory of ye Historic Saugeen Metis and cannot comment.	
May 21, 2024	Krish Selvakumar, MECP	Acknowledged receipt of Notice of PIC	
June 5, 2024	Liam Smythe, Ministry of Citizenship and Multiculturalism	Acknowledges receipt of Stage 1 archaeological assessment report and that Stage 2 assessment has been recommended. Requests confirmation that study area has been screened for built heritage resources or cultural heritage landscapes. Include screening check list in EA report.	
June 7, 2024	Dave Ritchie, Simcoe County Federation of Agriculture	Effluent spray irrigation is causing significant negative impacts on neighbouring farmers and this cannot be permitted to continue. The most environmentally sound long-term solution is to process the sewage in an appropriate wastewater treatment plant with a tertiary level or greater treatment system. The system must include assurances that oversight and monitoring will be critical components. Request that hydrogeological studies be completed. Time is of the essence.	
June 7, 2024	Thomas Brandstetter, Beef Farmers of Ontario	Our members with farms neighbouring the effluent spray fields have communicated their serious concerns and the negative impacts. Continuing with current effluent spray process is unacceptable. The most environmentally sound long-term solution is to process the sewage in an appropriate wastewater treatment plant with a tertiary level or greater treatment system. The chosen solution must ensure long term protection from pollution to neighbouring properties, ground and surface water and the environment.	
June 13, 2024	Chief Taynar Simpson, Alderville First Nation	Study area is within the Traditional Territory of Alderville First Nation, within the Williams Treaties Territory. The First Nations within this Territory have had their harvesting rights legally reaffirmed. Provide a Notice of Request to Consult with relevant information to assist in preparing a meaningful response. There may be burial or archaeological sites in the study area. An Archaeological Liaison must be involved in any Stages2-4 assessments.	Township communications for involvement during Stage 2 AA

6.3.4 Deputation to Council – August 12, 2024

At a presentation to Council on August 12, 2024, Tatham summarized the comments received at and following the PIC, and presented the preferred and recommended solutions (as described in the following Section 7) and a preliminary schedule to implementation.

Council concurred with the findings of the Class EA Update.

7 Conclusions and Recommendations

7.1 FINAL ASSESSMENT

The comments received during the Class EA Update consultation were reviewed and considered in the final assessment of the alternative solutions to identify the preferred solution that is recommended to be advanced to design, approvals, and implementation.

The responses from the residents of the properties adjacent to the spray irrigation fields, Bayshore Village, and neighbouring areas, indicate their strong support for abandoning seasonal spray irrigation as the means of effluent disposal and transitioning to a subsurface effluent disposal system utilized year-round (Alternative 8).

The technical evaluation and impact assessment also lead to the same conclusion to ensure the Bayshore Village effluent disposal system has sufficient capacity and can be operated in a manner that has acceptable impacts on adjacent residents and properties and on the natural environment.

The estimated costs for the implementation of a large subsurface disposal system are significant. However, considering the spray irrigation system's operational difficulties and impacts on adjacent residents over the past 35-40 years, and the expected ongoing costs to haul excess effluent to the Lagoon City STP for further treatment and discharge, the benefits outweigh the costs. Further, there is no other viable alternative for effluent disposal considering the site location and the policies of the LSPP.

In summary, the preferred solution is:

- Alternative 8, Discontinue Spray Irrigation and Build Effluent Disposal Bed on the West Field.

In conjunction, continuing efforts to reduce inflow and infiltration into the Bayshore Village sanitary sewers is essential to minimize the flows to the sewage lagoons and thus reduce the volume of effluent that needs to be disposed.

7.2 DESCRIPTION OF THE PREFERRED SOLUTION

7.2.1 Effluent Disposal Bed

The design concept for the recommended effluent disposal bed consists of the following:

- Retain Cell B (small lagoon) for secondary treatment of sewage from Bayshore Village. With an operating volume of 30,000 m^3, and at the design flow of 399 m^3/day, Cell B provides 75 days of retention, which exceeds the minimum treatment requirement of 30 days for facultative stabilization ponds. As summarized in Table 1, sewage treatment through Cell B

provides an effluent quality that meets the pre-treatment criterion ($cBOD_5$: 30 mg/L) of the Design Guidelines for Sewage Works (MOE, 2008) for applying higher loading rates in the design of large subsurface disposal systems.

- Abandon, remove sludge and fill in Cell A, as effluent storage and polishing will no longer be required.
- Construct a new effluent pumping station with duty/stand-by pumps and outdoor diesel emergency generator, to dose the lagoon effluent to the new disposal bed.
- Construct a fully-raised Type A dispersal bed on the field west of the lagoons. The bed design criteria are:
  - Design flow: 400 m^3/day
  - Native soil T-time: 50 min/cm
  - Imported sand fill T-time of 8 min/cm
  - Maximum hydraulic loading rate: 8 L/m^2/day
- Conceptual design:
  - 2 dispersal beds, divided into 9 zones, each with 6 cells of 6, 28m long runs.
  - Effluent distribution to cells in bed through multiple automatic distribution valves.
  - Imported sand fill height of approximately 1.7 m to maintain a minimum of 600 mm unsaturated soil above calculated mounding.
  - Stone and tile layer: 300 mm, plus 300 mm soil cover.
  - Total bed loading area, including 15 m mantle: 52,000 m^2 minimum.
  - Total bed footprint: 6 ha.
- Decommission and remove all spray irrigation equipment and piping from the South and North Fields.
- Decommission the effluent irrigation pumping station.

7.2.2 Inflow and Infiltration Control

The recent reduction in wastewater flows from Bayshore Village needs to be maintained or improved to reduce to the extent possible the loading on the treatment and disposal system to extend its life. It is recommended that the Township:

- Repair the main sewers, maintenance holes and laterals to remove known and potential sources of inflow and infiltration.

- Continue annual monitoring and disconnecting illegal sump pump discharges to the sanitary sewer system.
- Set up a regular schedule of video inspections of the sewer system to identify any new potential sources of inflow and infiltration.
- Maintain an annual sanitary sewer system repair budget.

7.3 INTERIM OPERATION AND MITIGATING MEASURES FOR SPRAY IRRIGATION SYSTEM

7.3.1 Interim Operation

Until the effluent disposal bed is designed, approved and constructed, the Township must continue to operate the spray fields in a manner that meets all conditions of the C of A. This includes:

- inspection prior to starting a spray day to verify that the conditions are favourable for spray irrigation (no ponding indicating the soils are saturated, and no rain or high wind); and
- supervision of the spray irrigation operation so that if ponding and/or runoff is observed, the spray irrigation in the affected area is shut-off to allow the area to dry.

To prepare for the 2025 spray season, the following measures are recommended to mitigate issues and concerns with the past operation of the spray irrigation system:

- Thorough inspection of the spray area piping to identify required repairs.
- Confirmation/survey of the piping and spigot layout, preparation of a plan of the existing layout, and determination of the existing spray area.
- Relocate spigots that are close to adjacent properties and adjust the location of piping as required and feasible to optimize the spray area and minimize the potential for runoff.
- Determine the revised actual spray area, which should be used to calculate and verify that the actual average spray irrigation rate meets the C of A allowed rate.
- Update the O&M manual to include as a minimum:
  - clear description of the conditions and measures to be taken for spray irrigation;
  - spill reporting and management instructions; and
  - triggers for initiating the contingency plan.
- Enter a contract for provisional hauling of effluent to Lagoon City.

7.4 CONFIRMATION OF CLASS EA SCHEDULE

The construction of a large subsurface disposal system is considered a Schedule B undertaking under the MEA Class EA process. No further Class EA activity is required.

7.5 NEXT STEPS AND SCHEDULE

Upon completion of the Class EA Update, advancing the design and implementation of the preferred solution will involve the following steps:

- Detailed topographic survey of the proposed bed area.
- Stages 3 archaeological assessment of the early pioneer site and excavation and removal of artifacts if required.
- Detailed geotechnical and hydrogeological investigation for design purposes.
- Preliminary design and preliminary construction cost estimate.
- Pre-consultation with MECP.
- Detailed design.
- Application for MECP approval and request for accelerated review.
- Applications for government funding.
- Preparation of drawings for tendering.
- Tendering and construction.

A preliminary schedule up to construction of the new effluent disposal bed is presented in Table 8, starting from the issuing of the Notice of Completion of the Class EA. The schedule is contingent on the timelines to obtain an ECA for the wastewater system and to complete the Stage 3 and Stage 4 archaeological assessments.

Table 8: Preliminary Implementation Schedule

	COMPLETED BY END OF
Final Report and Notice of Completion of Class EA	November 2024
30-day Public Review	December 2024
Topographic survey, geotechnical investigation	December 2024
Preliminary design and consultation with MECP	February 2025
Detailed design and application for MECP approval	April 2025
Tendering	June 2025
Stage 3 archaeological assessment and report	August 2025
Stage 4 archaeological assessment and report (if required)	May 2026
Construction period (contingent on receipt of ECA and completion of Stage 4 archaeological field work)	Fall 2025 to Fall 2026