MUNICIPALITY OF BLUEWATER

CLASS ENVIRONMENTAL ASSESSMENT FOR EXPANSION AND UPGRADING OF THE BAYFIELD SEWAGE TREATMENT FACILITY

ENVIRONMENTAL STUDY REPORT

BMROSS
engineering better communities

MUNICIPALITY OF BLUEWATER

CLASS ENVIRONMENTAL ASSESSMENT

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ENVIRONMENTAL STUDY REPORT

March 10, 2021

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street
Goderich, Ontario
N7A 2T4

File No. 09051

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B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 www.bmross.net

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MUNICIPALITY OF BLUEWATER

CLASS ENVIRONMENTAL ASSESSMENT FOR EXPANSION AND UPGRADING OF THE BAYFIELD WASTEWATER TREATMENT FACILITY ENVIRONMENTAL STUDY REPORT

1.0 INTRODUCTION

1.1 Purpose of Report

The Municipality of Bluewater initiated a Class Environmental Assessment in September 2011 to identify the best strategy for expanding and upgrading the Wastewater Treatment Facility (WWTF) servicing the community of Bayfield. The study process followed the procedures set out in the Municipal Class Environmental Assessment (Class EA) (Municipal Engineers Association, 2000) document, dated June 2000, as amended in 2007, 2011 & 2015. B.M. Ross and Associates Limited (BMROSS) was engaged to conduct the Class EA investigation on behalf of the Municipality of Bluewater.

The purpose of this report is to document the planning and design process followed during Phases 1 to 4 of the Class EA investigation. The report includes a summary of the defined problems regarding sanitary sewage treatment in Bayfield, as well as a description of the alternative solutions considered to resolve the identified problems. The decision-making process leading to the selection of a preferred alternative is documented.

1.2 Environmental Assessment Process

Municipalities must adhere to the Environmental Assessment Act of Ontario when completing road, sewer or waterworks activities. The Act allows the use of Class Environmental Assessments for most municipal projects. A Class EA is an approved planning document which describes the process that proponents must follow in order to meet the requirements of the EA Act. The Class EA approach allows for the evaluation of alternatives to a project, and alternative methods of carrying out a project, and identifies potential environmental impacts. The process involves mandatory requirements for public input. Class EA studies are a method of dealing with projects which have the following important characteristics in common:

- They are recurring.
- They are usually similar in nature.

- They are usually limited in scale.
- They have a predictable range of environmental effects.
- They are responsive to mitigating measures.

If a Class EA planning process is followed, a proponent does not have to apply for formal approval under the EA Act. The development of this study has followed the procedures set out in the Class EA. Figure 1.1 presents a graphical outline of the procedures.

The Class EA planning process is divided into the following phases:

- Phase 1 - Problem identification.
- Phase 2 - Evaluation of alternative solutions to the defined problems and selection of a preferred solution.
- Phase 3 - Identification and evaluation of alternative design concepts in selection of a preferred design concept.
- Phase 4 - Preparation and submission of an Environmental Study Report (ESR) for public and government agency review.
- Phase 5 - Implementation of the preferred alternative and monitoring of any impacts.

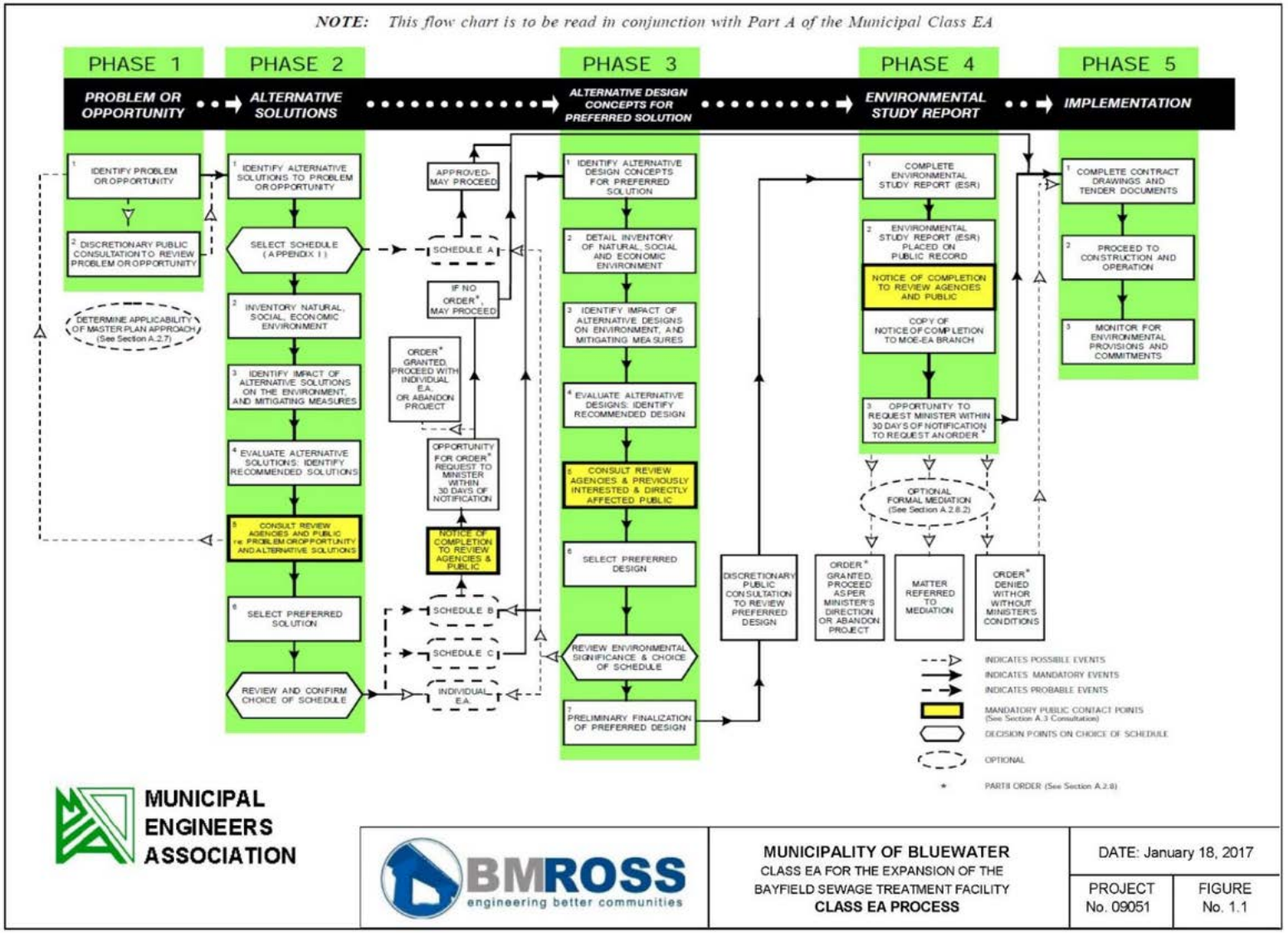
1.3 Classification of Project Schedules

Projects are classified to different project schedules according to the potential complexity and the degree of environmental impacts that could be associated with the project. There are four schedules:

- Schedule A – Projects that are approved with no need to follow the Class EA process.
- Schedule A+ - Projects that are pre-approved but require some form of public notification.
- Schedule B – Projects that are approved following the completion of a screening process that incorporates Phases 1 and 2 of the Class EA process, as a minimum.
- Schedule C – Projects that are approved, subject to following the full Class EA process.

The Class EA process is self-regulatory, and municipalities are expected to identify the appropriate level of environmental assessment based upon the project they are considering.

Figure 1.1- Class EA Process



1.4 Environmental Study Report

The Environmental Study Report (ESR) is prepared at the conclusion of the Class EA process and provides documentation of the decision making that was carried out. The report documents the planning and design phases of the process which will terminate with the construction of a project. It includes a discussion of the purpose of the project, including background information, outlines existing natural and social characteristics of the project area, details the planning alternatives considered, and identifies any environmental impacts and mitigation measures associated with the implementation of the project.

The ESR, when completed, will be submitted to the Municipality for final approval and put into the public record. The report will be made available at various locations for perusal by all interested parties. A Notice of Completion outlining details of the project and locations where the ESR can be reviewed will be advertised in the local newspapers and posted on the Municipal website.

If no written objections are received by the proponents within 30 days of the publication of the Notice of Completion of the ESR, subject to the receipt of all other approvals, the Municipality can proceed with construction of the project.

1.5 Mechanism to Request a Higher Level of Environmental Assessment

Under the terms of the Class EA, the requirement to prepare an individual environmental assessment for approval is waived. However, if it is found that a project going through the Class EA process has associated with it significant environmental impacts, a person/party may convey their concerns to the Municipality of Bluewater, who will consider the identified concerns. A request may be made to the Ministry of the Environment, Conservation and Parks for an order requiring a higher level of study (i.e. requiring an individual/comprehensive EA approval before being able to proceed), or that conditions be imposed (e.g. require further studies), only on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on constitutionally protected aboriginal and treaty rights. Requests on other grounds will not be considered.

1.6 Study Organization

The Municipality of Bluewater is considered the project proponent under the terms of the Class EA document. B. M. Ross and Associates Limited (BMROSS) was engaged by the proponent to carry out the Class EA study process on its behalf.

2.0 BACKGROUND

2.1 Study Area Description

2.1.1 Municipality of Bluewater

In January 2001, the villages of Bayfield, Hensall and Zurich and the Townships of Hay and Stanley amalgamated to form the Municipality of Bluewater. The Municipality has a land base of approximately 417 km^2 and a population of just over 7,000 permanent residents, with an additional seasonal population of approximately 2,500 persons. In general, Bluewater is comprised of a number of small urban settlements dispersed throughout a predominately rural landscape. A significant amount of seasonal development is situated along the Lake Huron shoreline and a large rural area extends approximately 15 km inland from the shoreline of the Lake. The Municipality incorporates a ward structure which generally corresponds to the jurisdictional boundaries of the former incorporated municipalities. However, for Hay and Stanley Townships, the former municipal boundaries were divided into East and West Wards with Provincial Highway No. 21 representing the ward boundary.

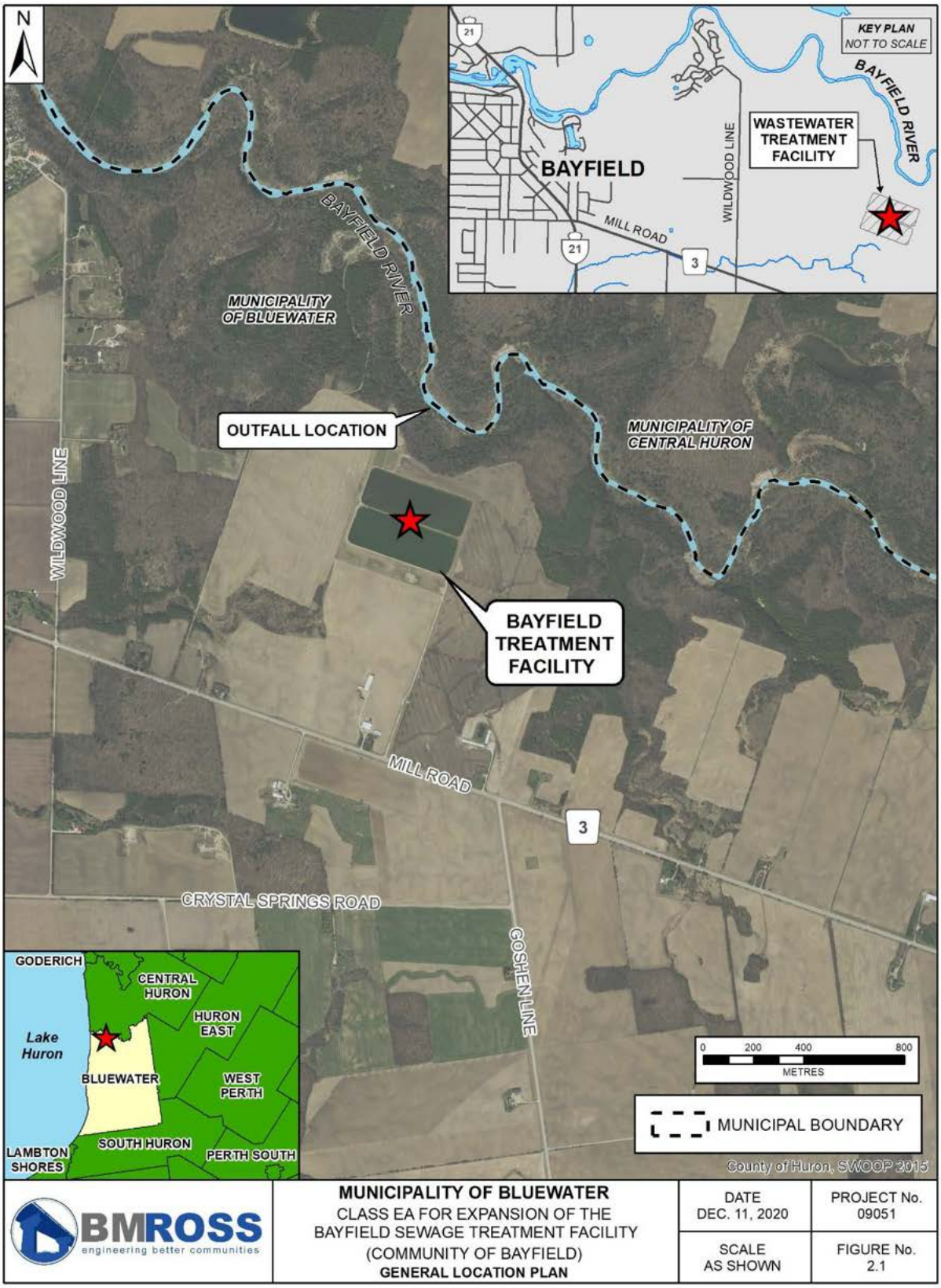
2.1.2 Community of Bayfield

The community of Bayfield represents one of the larger urban settlements in Bluewater. The community is situated along the Lake Huron shoreline at the mouth of the Bayfield River; approximately 20 km south of the Town of Goderich. Bayfield is characterized as a retirement and seasonal recreational community, which includes a strong tourist commercial sector attributable, in part, to the village's proximity to Lake Huron. The community is largely residential in nature, although a well-established downtown commercial core is located along the historic Bayfield Main Street. Bayfield also supports limited highway commercial activity along the Bluewater Highway corridor and a busy recreational/commercial harbour at the mouth of the Bayfield River. Lands located immediately north and south of Bayfield, along the Lake Huron shoreline, have also experienced considerable recreational residential development in recent years. This development area includes lands in the Stanley Ward, as well as lands north of Bayfield in the Municipality of Central Huron. Figure 2.1 illustrates the location of the Municipality of Bluewater and the community of Bayfield.

2.1.3 Project Study Area Description

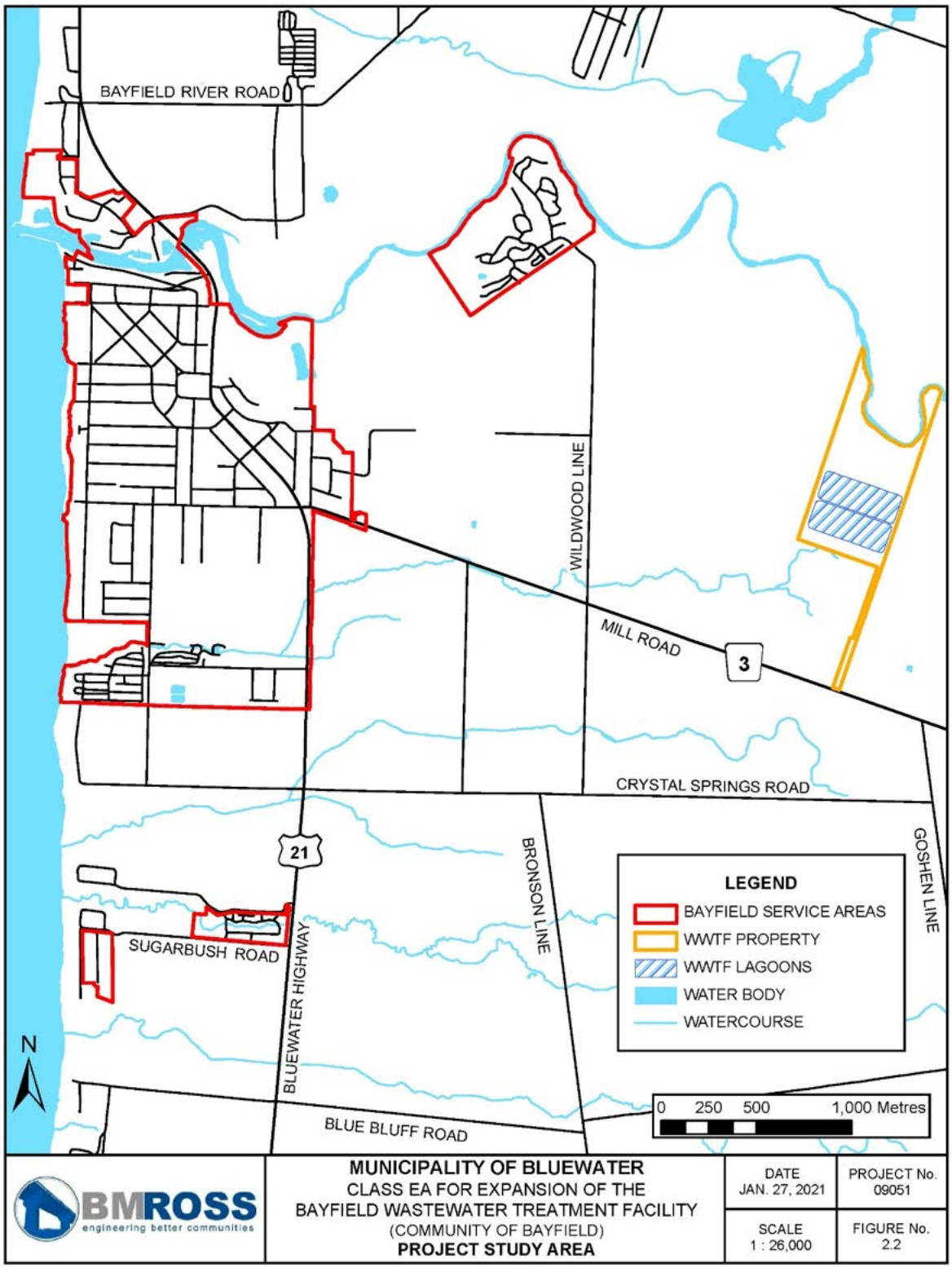
The project study area includes the current urban area of Bayfield as defined in current planning documents, the WWTF site and the Bayfield River from the WWTF to the mouth of the river at Lake Huron. After the sewage treatment facility became operational in 2001, some of the sewage capacity was allocated to three seasonal campgrounds located adjacent to Bayfield in the Stanley Ward (Wildwood, Sugar Bush and Paul Bunyan), and two nearby residential subdivisions (Glitter Bay and Bayfield Mews). With the exception of the Bayfield Mews, each of these developments connected to the sanitary collection system during the period 2003 to 2004. The first phase of the Bayfield Mews development connected to the system in 2008. Figure 2.2 illustrates the general limits of the project study area including the current service area for the Bayfield WWTF.

Figure 2.1 – General Location Plan



BMROSS engineering better communities	**MUNICIPALITY OF BLUEWATER** CLASS EA FOR EXPANSION OF THE BAYFIELD SEWAGE TREATMENT FACILITY (COMMUNITY OF BAYFIELD) **GENERAL LOCATION PLAN**	DATE DEC. 11, 2020	PROJECT No. 09051
		SCALE AS SHOWN	FIGURE No. 2.1

Figure 2.2 – Project Study Area



2.2 Historical Growth and Development

2.2.1 Official Plan Policies

The Bluewater Official Plan (Municipality of Bluewater, July 16, 2018), which was consolidated in January 2019, has identified the former Village of Bayfield as a growth area within the Municipality. The Official Plan calls for new development within designated urban areas to be phased in a contiguous manner with the provision of full municipal water and sewage servicing. To prevent urban sprawl and fringe development on partial servicing, the Official Plan generally restricts residential lot creation to infilling and minor extensions to developed areas, unless full servicing is made available. Figure 2.3 presents the current land use designations within the Bluewater Official Plan for the community of Bayfield and surrounding areas that are serviced by the Bayfield WWTF.

2.2.2 Existing Development Pattern

Bayfield is one of three primary settlement areas in Bluewater and is one of the fastest growing urban areas in the County of Huron. It is comprised primarily of a mix of seasonal and permanent residential land uses with commercial activities focused in the core and along the Highway No. 21 corridor. Due to a significant influx of seasonal cottagers and visitors, the number of residents can swell to three times the permanent population during the peak summer season.

A number of seasonal and permanent residential developments are located north and south of the Bayfield urban area, adjacent to the Lake Huron shoreline. Some of these developments are seasonal campground facilities, although more permanent subdivision developments have also occurred. These developments are serviced by either communal sewage treatment systems or individual on-site sewage treatment (septic) systems. Some of these locations have been allowed to connect to the Bayfield wastewater system.

2.2.3 Recent Growth Trends

The Village of Bayfield developed initially as a seasonal cottage community with some permanent residents and a large seasonal population that primarily utilized the village during the warmer summer period. This began to change following the installation of municipal sewage and water systems within the community and increases in home value. Although seasonal properties are still present within the village, new home construction appears to be primarily permanent dwellings. Table 2.1 summarizes the most recent Statistics Canada Census of Population (Census) data for permanent population households for the Municipality of Bluewater and the Bayfield Ward. A review of the data indicates that the information is possibly unreliable, as evidenced by little change in population between 2006 and 2016, when the number of households grew significantly over the same period. Changes to the Census boundaries may have occurred following municipal amalgamation, which could explain the lower population counts.

Table 2.1 – Permanent Population and Households (2001-2016) [1]

Year	Bayfield Ward		Bluewater	
	Population	Households	Population	Households
2001	909	415	6,919	2595
2006	1,081	-	7,120	2766
2011	951	698	7,044	2820
2016	1,112	851	7,136	4,532
Increase[2]	203 (22%)	436 (105%)	217 (3%)	1937 (75%)
Avg. Annual Growth Rate	1.35%	4.95%	0.55%	3.8%

Notes:
[1]Census data provided for identified municipalities as available.
[2]Values calculated for available reporting periods (i.e., 2001-2016)

As noted previously, in 2001, the Municipality of Bluewater was formed through municipal amalgamation and the Village of Bayfield became the Bayfield Ward. For the reporting period 2001-2016 over 90% of the permanent population growth in Bluewater occurred in Bayfield. This community, which accounts for only 15% of the Municipality's population, experienced a household increase of more than 400 units during this time frame, representing an estimated household increase of approximately 5% per year, which surpassed all other constituent municipalities and urban areas in Huron County over the same period.

Much of the recent development activity within the study area limits has occurred within the south part of the former village. Two residential plans of subdivision were approved in recent years and have quickly started to fill in. A significant amount of infilling has also occurred within the older developed portion of the community. Smaller lots thought to be undevelopable prior to the provision of full municipal services, are now being utilized. A more recent trend in the village is the redevelopment of existing lots. Smaller original cottages with limited fixtures are being removed and larger homes with multiple fixtures are being constructed on the parcels. Building permit data for the project study area was reviewed for the period 2008-2019 to estimate current growth rates. This information is presented in Table 2.2.

Figure 2.3 – Bluewater (Bayfield) Land Use Designations

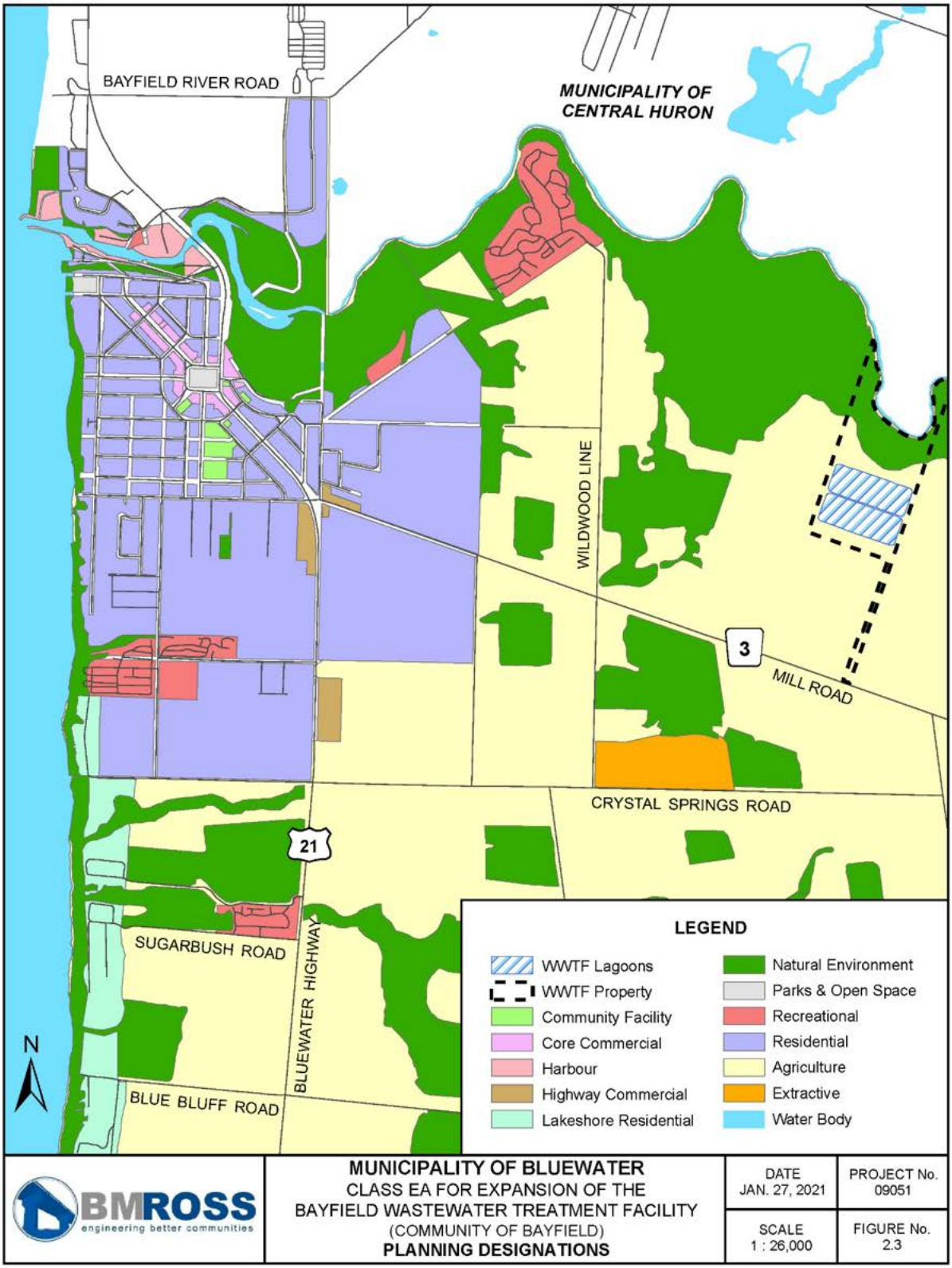


Table 2.2 - Summary of Building Permit Data – Bayfield - 2008-2019

Year	Single Family Dwellings	2-Plex	3-Plex	4-Plex	Non-residential	Total Residential
2008	10	1 (2)		2 (8)		**20**
2009	10		2 (6)	1 (4)		**20**
2010	6		7 (21)			**27**
2011	7		3 (9)			**16**
2012	15		1 (3)	2 (8)	Library (1)	**26**
2013	15			4 (16)	Foodland/LCBO (2)	**31**
2014	11			1 (4)		**15**
2015	10			1 (4)		**14**
2016	15			1 (4)		**19**
2017	10					**10**
2018	6		1 (3)			**9**
2019	14		1 (3)			**17**
Average	**11**		**1.3**	**1.1**		**19**
Total	**129**	**2**	**14 (42)**	**12 (48)**	**3**	**224**

A large proportion of the residential building activity in recent years has occurred within newer subdivisions in Bayfield. Table 2.3 summarizes the current status of larger existing and planned residential developments located within the service area. These developments, along with existing lots of record within the village proper, represent development commitments that must be serviced by the WWTF.

The Bluewater Official Plan also designated large areas at the south end of Bayfield, within the former Stanley Township, as urban, which would permit new residential developments within these areas. Currently only one development has proceeded, the Bayfield Mews, which is serviced by a forcemain connection to the Bayfield sanitary collection system. Figure 2.3 shows the location of lands designated urban within the Official Plan.

Lack of capacity within the existing treatment facility is serving as a constraint to development of these areas. However, once capacity at the plant has been addressed, significant potential exists for additional residential growth.

Table 2.3 – Bayfield Development Area; Approved and Planned Residential Developments

Approved Plans of Subdivision			
Location	**Development**	**Developed Lots**	**Vacant Parcels**
Bayfield	Poth Lane	12	7
	Fawn Creek	11	8
	Bayfield Meadows	61	23
	Existing Village	911	60
Stanley West	Glitter Bay Estates	10	5
	Bayfield Mews	52	0
Total		**1,057**	**103**
Proposed Residential Developments			
Location	**Proposed Development**	**Planned Units**	**Planning Act Approval Status**
Central Huron	Harbour Lights Condominiums (Phase II)	60	Approved
Total		**60**	

The Bayfield Ward has experienced accelerated household growth over the past 20 years (relative to other similar sized urban communities in Southwestern Ontario). The following general conclusions were drawn regarding the future development potential of Bayfield and adjacent growth areas:

- The growth rate experienced in Bayfield is unlikely to decline in the foreseeable future, considering the character and location of the community, existing land use planning policies and the significant availability of land for future development.
- Given that growth has been constrained in recent years, resulting from the lack of treatment capacity available at the WWTF; the potential for rapid development growth, at least in the short-term, exists within the community.
- Growth areas are generally near the north and south limits of the urban settlement area, where several new residential subdivisions have been developed in recent years.
- Given existing Official Plan policies, new growth is expected to develop as a generally contiguous urban extension of Bayfield. New development projects

which may occur within growth areas at the south end of Bayfield are expected to proceed in accordance with current urban design standards for greenfield sites (i.e., full municipal servicing, moderate lot densities).

2.3 Growth Forecast

2.3.1 Methodology

A 25-year growth forecast has been prepared for the project study area in order to predict expected sewage flows and ensure that the expansion will provide sufficient capacity for the expected growth. The forecasting exercise was conducted following an analysis of growth trends and demographic patterns for the Bayfield development area; an area encompassing the Bayfield Ward, developments in Central Huron serviced via Bayfield infrastructure and future development areas located south and east of the former village limits. The population and household forecasts extrapolated from this assessment are considered to be realistic predictions of growth in the study area for the 2020 to 2045 planning period.

For the purposes of this study, a 2020-2045 population forecast for the community of Bayfield was calculated based on the average rates of growth in households experienced historically in the community and growth expectations based upon development inquiries and expected demand. High, medium and low household forecasts were prepared based on the following criteria: a low growth rate based upon the average annual growth rate (AAGR) of 1.0%, the rate typically experienced by communities in southwestern Ontario; a high growth projection based upon an AAGR of 5.0% as developed from the Census data, several times the growth rate of typical communities but consistent with recent growth in the community; and a medium growth rate of 3.0% developed based upon the average of the high and low AAGR values.

2.3.2 Household Growth Projections

Table 2.4 shows the potential increase in households based on the 1% to 5% range in AAGR values.

Table 2.4 – Household Projections 2020-2045

Year	Low (1.0%)	Medium (3.0%)	High (5.0%)
2020	903	903	903
2025	949	1,046	1,152
2030	998	1,213	1,476
2035	1,049	1,407	1,877
2040	1,102	1,630	2,396
2045	1,158	1,890	3,059
Total Increase	**255**	**987**	**2,155**

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2.3.3 Summary and Conclusions for Growth

For several years, development in the Bayfield service area has been constrained by a lack of wastewater treatment capacity. Residential unit growth has been relatively steady at approximately 20 units per year and some non-residential development and re-development has occurred. Municipal and County planning staff have indicated that there is substantial new development interest and believe more development would have occurred had wastewater treatment capacity been available. There is the possibility of significant growth occurring immediately following treatment expansion.

Historic growth in the Bayfield Ward, based on building permit data provided by the Municipality, has averaged approximately 20 units per year. This equates to an increase in households of 500 units over the 25 year timeframe. This is consistent with a value between low and medium growth rates predicted above.

Based on the longer term household growth data developed from the census information (i.e. 5%), over 2,000 units would be added over a 25 year period. Growth on that scale is considered to be unrealistic and not feasible given the current limitations of the urban boundary.

Recognizing the uncertainty, and with consideration to the number of units actually being constructed, we believe any expansion should be based on an expectation of 20 to 40 households per year.

2.4 Natural Heritage Features

2.4.1 General Physiography

The Bayfield area forms part of a narrow strip of land, known as the Huron fringe, which extends approximately 320 km along the Lake Huron shoreline between Sarnia and Tobermory. Between the communities of Port Elgin and Grand Bend, the Huron fringe is bordered by a bluff ranging in height from 15 m to 30 m, with a terrace below the shore cliff (Chapman & and Putnam, 1984). Soils in the Huron fringe area located in the vicinity of Bayfield are typically sandy and gravely loam (overlying clay) and are well to imperfectly drained.

The presence of raised glacial shorelines and recent bluffs in the vicinity of Lake Huron has resulted in the formation of deep-cut valleys in the relatively soft soil materials. The Bayfield River valley represents an excellent example of this formation. The river valley is deeply incised and the valley walls, floodplain and slope vegetation are well developed. The Bayfield River valley is approximately 30 m deep and 0.8 km in width. High-level terraces, old oxbows and isolated meanders are found in the valley.

2.4.2 Bayfield River

The Bayfield River drains an area of 520 km^2 located between the drainage areas of the Maitland and Ausable Rivers. The topography of the watershed is predominately composed of relatively smooth moraines with low elevations, a limited amount of swamp and woodlots, and broad spillways. The tributaries exhibit a trellis pattern at the upper part of the river, with a considerably more defined main channel near Lake Huron resulting from entrenchment by the moraines. The primary tributaries merge into the main river channel approximately 2 km northeast of Varna. The river maintains a year-round permanent flow, given the large drainage area and multiple contributing tributaries.

The headwater region of the Bayfield River is predominately till plain overlaying clay materials with varying degrees of incorporated coarser material and organic matter. These soils are largely Harriston Silt Loam, Listowel Silt Loam and Perth Clay Loam near the eastern extents of the tributaries while Huron Clay Loam predominates in the vicinity of the main channel. Soils nearer the study area are largely Burford Loam (i.e., gravely loam surface soils with gravely parent material) and Perth Silt Loam. The river valley is characterized as bottomland, comprised of alluvial soils. In general, the soil types associated with the Bayfield River corridor exhibit good drainage characteristics. (Hoffman D. W., Richards N.R., Morwick, F.F., February 1952)

The land base of the study area slopes westward towards Lake Huron, exhibiting an elevation difference of approximately 70 m. The highest recorded elevation is found in the vicinity of Varna where it is approximately 270 m above Mean Sea Level (MSL). Bayfield is at the lowest elevation and 200 m above MSL (excluding lands at the Lake Huron shoreline).

2.4.3 Areas of Natural and Scientific Interest (ANSI)

The Bayfield WWTF is immediately adjacent to the provincially significant Bayfield River Valley Area of Natural and Scientific Interest (ANSI) and within the project study area. (J. Schnaithmann, A. Gutteridge, H. Brock, and M. Veliz., 2013)

The Ministry of Natural Resources and Forestry (MNRF) has characterized this sensitive area within its inventory of natural heritage sites. ANSI's take two forms; Earth Science, which are representative of significant land forms, and Life Science, which are representative of significant terrestrial features within the landscape such as wetlands and woodlands. The ANSI located adjacent to Bayfield is a Life Science ANSI. The Bayfield River ANSI is a long, narrow river valley corridor which extends east along the main river channel from County Road No. 31 north of Varna to Bayfield, but excludes lands west of Highway 21. ANSI lands are located in both Bluewater and Central Huron as the river forms the boundary between the two municipalities. In total, the ANSI incorporates approximately 850 ha of land within the river corridor.

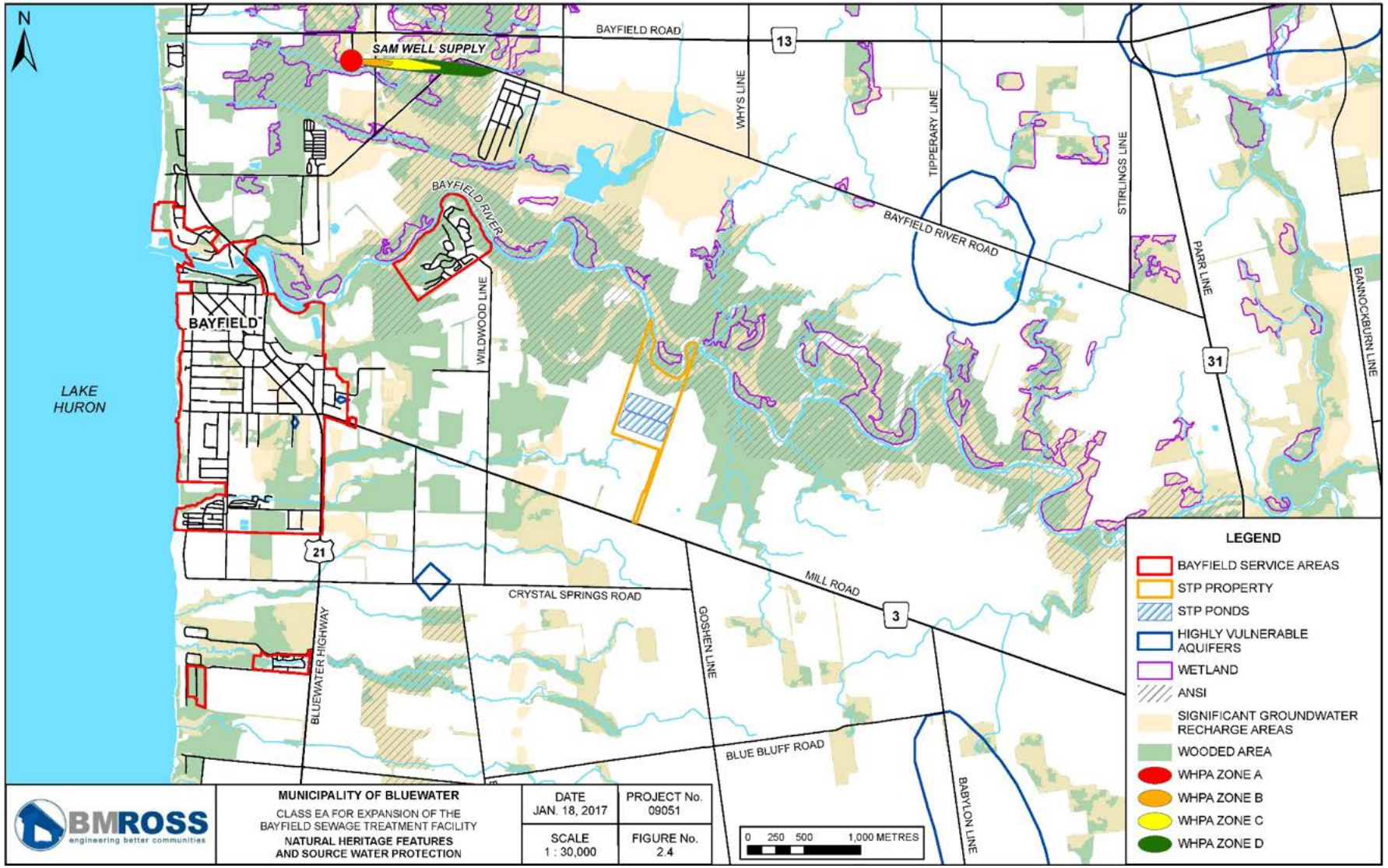
A second provincially significant Life Science ANSI feature is located immediately north of Bayfield, abutting the Bayfield River Valley ANSI at its west extent. The Bayfield North ANSI was originally identified by the MNRF in 1984 but was recently expanded to cover an area measuring 457 ha in size. Valued due to its large, relatively undisturbed tracts of upland woodlands, the area is also known for high quality streams and a number of sensitive terrestrial species found within its limits. Figure 2.4 illustrates the location of the Bayfield River ANSI and Bayfield North ANSI as well as other natural environment features situated within the general vicinity of Bayfield.

2.4.4 Species at Risk Habitat

(a) General

Two categories of species at risk were researched in conjunction with this project. The first are species protected through Federal Legislation; Canada's Species At Risk Act (SARA). The second category represents species identified as rare, threatened or endangered by the Province of Ontario. These species are tracked by the MNRF and are documented on the Ontario Natural Heritage Information Centre (NHIC) web site. To protect the exact location of an identified species, both sites utilize range maps for identification purposes, which provide a large buffer around the actual species location. It is therefore difficult to determine whether a species is actually located within the project study area or has been identified due to the presence of suitable adjacent habitat. A summary of species at risk potentially present in the project study area are displayed on Tables 2.5 and 2.6.

Figure 2.4 – Natural Heritage Features



(b) Federal Species at Risk

A search of the Environment Canada Species at Risk website identified the following Schedule I species that have possible habitat in the project area.

Table 2.5 – Possible Federal Species at Risk[1.] Within the Project Area

Component	Endangered	Extirpated	Threatened	Special Concern
Mammals		-	Grey Fox	
Birds		-	Least Bittern	Yellow Breasted Chat (virens subspecies)
Reptiles		-		Milk Snake
Molluscs	-	-	-	Mapleleaf
Lepidopterans	-	-	-	Monarch
Plants	American Ginseng, Butternut	-		

Notes: 1. Defined by Schedule 1, Species at Risk Act

(c) Provincial Species at Risk

A search of the Natural Heritage Information Centre web site revealed the potential presence of the following species within the project study area.

Table 2.6 – Provincially Protected Species at Risk Possibly in Study Area

Species Name	Common Name	Species Type	Status
Arisaema Dracontium	Green Dragon	Plant	Special Concern
Quadrula quadrula	Mapleleaf Mussel	Mussel	Special Concern
Regina septemvittata	Queensnake	Reptile	Endangered
Emydoidea blandingii	Blandings Turtle	Reptile	Threatened
Moxostoma duquesnei	Black Redhorse	Fish	Threatened

(d) Discussion

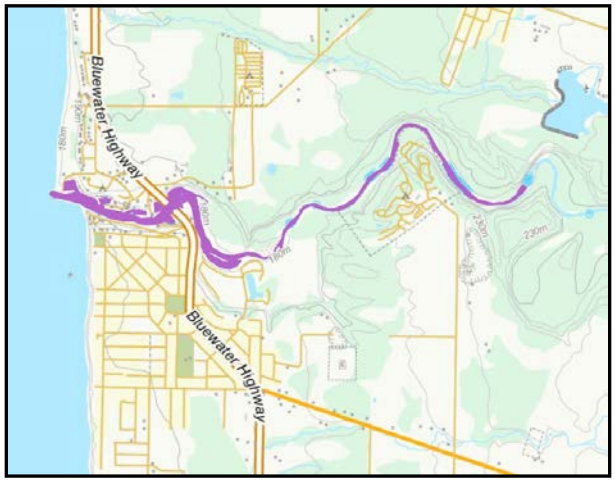
The project study area includes portions of two Provincially Significant Life Science ANSI's which were identified partly due to their large tracts of relatively undisturbed woodlands, which would form idyllic habitat for many of the species identified above. The wastewater treatment facility, in contrast, is located approximately 30 metres from the top of the river valley bank and is surrounded by grassed areas or cultivated farmland. It is anticipated that the proposed expansion to the existing facility will be

accommodated within the limits of the existing site, therefore posing few risks to the identified sensitive species.

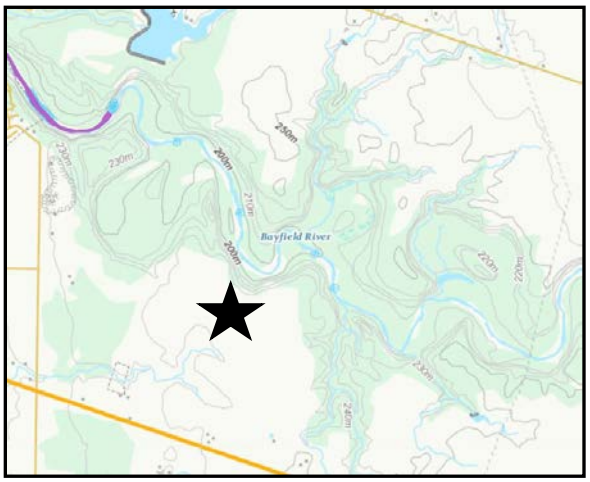
2.4.5 Aquatic Species at Risk

Aquatic Species at Risk are aquatic-based species that either live in, or rely on, an aquatic habitat for a significant portion of their life cycles. Federal and Provincial authorities have developed screening maps to aid in the identification of these rare, threatened or endangered species. The image below at left indicates the potential presence of fish and mussel species at risk within the Bayfield River at the harbour, while the image at right illustrates the potential presence of aquatic SAR within the river adjacent to the WWTF.

Figure 2.5 – Aquatic Species at Risk Screening Maps



Aquatic SAR screening map at harbour



Screening map at WWTF site

Based upon the mapping, one freshwater mussel species (mapleleaf mussel) and one species of fish (black redhorse) are potentially present within the Bayfield River adjacent to the Bayfield harbour area. The coloured section seen on mapping above indicates the potential presence of the noted species. Input will be sought from the Ausable Bayfield Conservation Authority, the Ministry of Natural Resources and Forestry (MNRF) and the Federal Department of Fisheries and Oceans (DFO) as part of the approval process to identify any potential impacts to these species from the proposed wastewater treatment plant expansion. Breeding Bird Habitat

Of 97 bird species identified within the general study area, 22 species were confirmed to be breeding following a review of the most recent Breeding Birding Atlas, (Ontario Breeding Bird Atlas, 2019) including the Eastern Kingbird, Eastern Phoebe, Wood Duck and Barn Swallow. An additional 42 species were categorized as probable. This assessment area, designated Square 17MJ42 of Huron-Perth, includes the Bayfield urban area and portions of the Bayfield River Valley, an area designated as a Provincially Significant Life Science ANSI.

2.5 Source Water Protection

The Municipality of Bluewater is located within the Ausable Bayfield Maitland Valley Source Water Protection Region. The community of Bayfield is currently serviced by a municipal water distribution system which is connected by a pipeline to the Lake Huron Primary Water Supply system just north of Grand Bend on Lake Huron. The community was originally serviced by a number of municipal and private groundwater well supplies, however all of the municipal wells have been decommissioned and a piped distribution system has been extended throughout the community.

Although connection to the municipal distribution system is mandatory, a number of private well supplies are still being utilized throughout the community. As part of the assessment report prepared for the Ausable Bayfield Source Protection Area (Ausable Bayfield Maitland Valley Drinking Water Source Protection Committee, 2015) (Ausable Bayfield Maitland Valley Source Protection Region, 2014), vulnerable areas located within each Municipality were identified. None of the vulnerable areas mapped in conjunction with the Source Water Protection Policies are located in the vicinity of the Bayfield WWTF.

2.6 Bayfield River Water Quality

2.6.1 General

As noted previously, the Bayfield River is located between the Ausable and Maitland River watersheds, draining the central portion of Huron County, including portions of the Municipalities of Huron East, Central Huron and Bluewater before discharging to Lake Huron at Bayfield. Draining a watershed of almost 500 km^2 in a predominantly rural landscape, the Bayfield River is home to a variety of warm water fish species and also supports several salmonid species such as Chinook Salmon, Brook and Rainbow trout which utilize the river for spawning. Low water flows in the summer limit the resident fish population to baitfish throughout most of the river. Smallmouth bass and northern pike can be found in the warm water deeper tributaries of the river along with other species. (J. Schnaithmann, A. Gutteridge, H. Brock, and M. Veliz., 2013) (Fisheries and Oceans Canada, 2020)

The Bayfield WWTF consists of facultative lagoons which provide secondary treatment for wastewater entering the facility as well as storage over the winter months when discharges from the facility are not permitted. During the April to November period treated wastewater is pumped from the lagoons and further treated by intermittent sand filtration prior to being discharged to river.

The WWTF is located at the top of the river valley. After discharging from the facility, treated effluent flows through an outlet pipe a distance of approximately 50 metres before entering a side channel of the Bayfield River. Upon entering the side channel, the effluent flows an additional 700 to 800 metres before entering the main river channel.

2.6.2 Benthic Analysis

In 2010, the Municipality of Bluewater retained John Westwood (Westwood, August 2010), an aquatic biologist, to assess the long-term water quality conditions of the Bayfield River. Effluent from the WWTF is discharged to the Bayfield River adjacent to the plant during the spring to fall period. Given that an expansion to the facility is being contemplated, the condition of the river was assessed in order to establish a baseline for future analysis of the river, if required.

Benthic macro invertebrates were sampled at three locations within the main channel, one upstream of the outfall, one adjacent to the outfall and the final site downstream of the effluent outfall. Samples were analysed using qualitative and quantitative methods.

Figure 2.6 – Side Channel Confluence with Main Bayfield River

The qualitative analysis was completed using the BioMAP Water Quality Index (d) for creeks, streams, and rivers (Griffiths R.W., 1999). The results are shown in Table 2.7 for the three sample locations. The total number of different taxa per site (i.e. species richness) is also displayed in the table.

Table 2.7 – Results of Benthic Analysis

BioMAP Water Quality Index (d) WQI average values and species richness			
	Site 1 (Upstream)	**Site 2 (At Outfall)**	**Site 3 (Downstream)**
BioMAP WQI Index	13.5	13.3	14.0
Species Richness	67	65	69

The results of the analysis indicated unimpaired water quality conditions at all three sites. Species richness was also good at each site with representation of Midge, Mayflies and Caddisflies present, which are characteristic of higher quality stream environments. A copy of the complete report is included in Appendix A.

2.6.3 Assimilation Study

(a) Methodology

In addition to the benthic investigations, an analysis of the Bayfield River water quality was undertaken by Doug Huber, an aquatic biologist retained by the Municipality of Bluewater to complete a water quality and stream assimilation study of the river adjacent to the outfall (Huber Environmental Consulting Inc., September, 2011). The assessment was completed in the spring/summer of 2011 and included chemical and bacteriological analysis of the river as well as a mixing zone study to see how quickly effluent from the WWTF is assimilated into the river under typical stream flow conditions. The photo below shows the side channel, adjacent to the river, which initially receives effluent discharges from the WWTF.

Figure 2.7 - Side Channel of Bayfield River that Receives Effluent Discharges from WWTF

Water quality samples were collected at multiple locations, including the outlet structure at the plant, upstream of where the effluent joins the main channel and several locations downstream within the main river channel. Each sample was analysed for a range of chemical and bacterial compounds including BOD_5 (Biochemical oxygen demand), TSS (Total Suspended Solids), T P (Total Phosphorous), TAN (Total Ammonia Nitrogen), *E. coli*, pH, Temperature and DO (Dissolved Oxygen). Samples routinely collected by the plant operators were also compared to those collected during the analysis to ensure that the results were within the typical range experienced at the facility. The results were then compared to Provincial Water Quality Objectives (PWQO) for surface water systems.

The extent of the mixing zone in the river downstream of the outfall was measured using a conductivity meter at locations near the south shoreline, ¼ the way across the channel, ½ way across, ¾ across and adjacent to the north shore. Stream flow volumes in the channel were also recorded based on measurements taken from the stream gauge located at Varna, Ontario. Flows were approximately 2.45 (m^3/s) on June 14, 2011 and 1.30 (m^3/s) on July 5, 2011.

(b) Observations

The results of the study showed that after leaving the side channel, effluent continued flowing in a relatively concentrated path adjacent to the south bank for a distance of 100 metres prior to being completely mixed across the river at approximately 250 metres below the confluence. On July 5, 2011, the discharge plume was completely incorporated across the river by 100 metres. A series of riffles and runs in the river, below the side channel confluence, aid in creating ideal conditions for mixing of the effluent.

A summary of the sampling results associated with key parameters is included within Table 2.8.

Table 2.8 – Summary of Sampling Results - 2011

Date	Location	BOD_5 mg/L	TSS mg/L	TP mg/L	TAN mg/L	TKN mg/L	NO_2 mg/L	NO_3 mg/L	*E. coli*/ 100ml	pH	Temp. °C	DO mg/L
June-14	Effluent @ V Notch	<4	2	0.15	<0.1	0.6	<0.06	11.10				
	Effluent Structure	<4	7	0.14	<0.1	1.0	<0.06	11.50		7.49	19.9	
	Prior to River	<4	15	0.1	0.3	0.6	0.12	2.11		7.76	18.8	5.20
	Upstream Bayfield River	<4	4	0.04	<0.1	0.8	<0.06	5.92		8.45	20.5	
	100m Downstream South	<4	6	0.03	<0.1	0.8	<0.06	6.03		8.64	18.9	
	100m Downstream North	<4	7	0.04	<0.1	1.0	<0.06	6.11		8.65	19.2	
	Wildwood Park	<4	3	0.04	<0.1	1.9	<0.06	5.45		8.41	25.2	
	Harbour Lights Marina	<4	8	0.06	<0.1	<0.5	<0.06	5.91		8.56	20.5	
July-05	Effluent @ V Notch	<2	<2	0.12	0.1	0.5	<0.06	2.20	9	7.98	23.4	7.64
	Effluent Structure	<2	<2	0.14	<0.1	<0.5	<0.06	2.13	12	8.28	21.4	9.23
	Prior to River	<2	8	0.11	<0.1	<0.5	<0.06	1.04	97	8.01	21.1	8.01
	Upstream Bayfield River	<2	6	<0.03	<0.1	<0.5	<0.06	5.08	34	8.76	23.0	12.39
	100m Downstream South	<2	10	<0.03	0.01	<0.5	<0.06	5.10	29	8.80	22.9	11.40
	100m Downstream North	<2	8	<0.03	<0.1	0.7	<0.06	5.13	31	8.72	23.2	10.68
	Wildwood Park	<2	5	<0.03	<0.1	1.0	<0.06	4.54	30	8.37	25.5	13.70
	Harbour Lights Marina	<2	24	<0.03	<0.1	0.6	<0.06	5.10	64	8.33	24.4	8.47

(c) Conclusions

The Bayfield River, adjacent to the current WWTF outfall, would be characterized as a high quality river system and, based on the results of the sampling and observations made during the various sampling events, is not being negatively impacted by the effluent.

The absence of algal growth on the rocky substrate adjacent to the effluent mixing zone in the river is another indication that the river is not being negatively impacted by effluent discharges. Similarly, the presence of aquatic life (minnows and aquatic invertebrates) in the side channel prior to entering the main river channel indicates that the level of treatment currently being delivered by the Bayfield WWTF is excellent.

2.7 Existing Sewage Facilities

2.7.1 Collection System

The majority of the existing collection system was constructed in 1999-2000. Since that time the system has been extended to serve three campgrounds and new development within and external to the community.

As of 2019 the system consisted of approximately:

- 21.7 km of sewer
- 9.9 km of forcemain
- 947 customers as of January 2019

There are three major sewage pumping stations (SPSs):

- Harbour SPS
- South SPS (Troy St.)
- Main SPS (Mill Road)

The latter discharges to the WWTF.

There are also smaller SPS's serving each of the campgrounds (private facilities) and the south side of the Harbour (a municipal SPS). The Wildwood campground SPS also pumps sewage directly to the WWTF.

2.7.2 Treatment Facilities

(a) Description

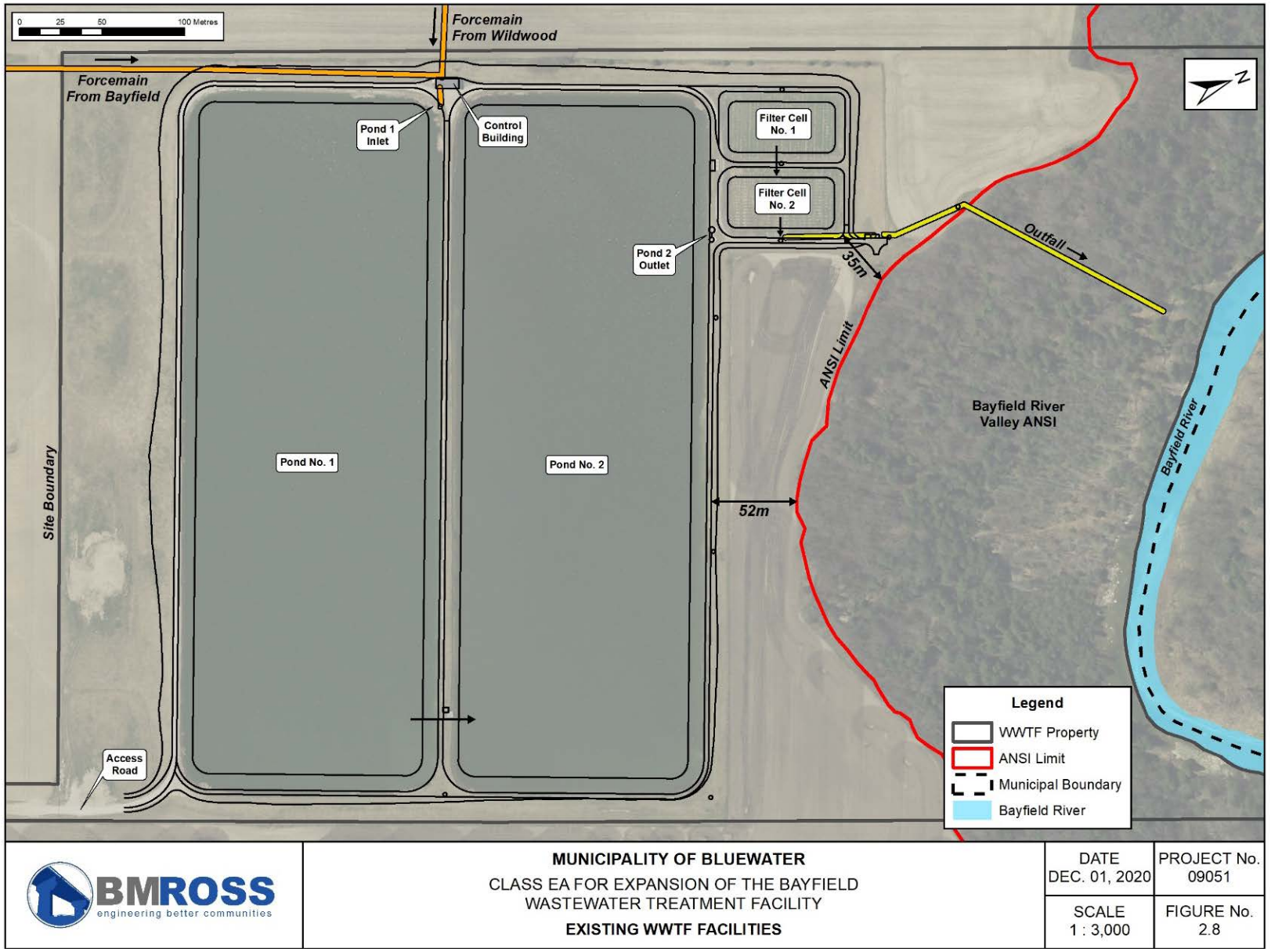
The current version of the Environmental Compliance Approval (ECA) for the WWTF is No. 6250-AB4JCT dated August 26, 2016. The ECA is an Amendment to a previously Amended ECA (AECA) issued in 2011. Figure 2.8 illustrates primary components of the existing WWTF serving Bayfield.

The current AECA describes the works as follows:

- Two facultative lagoon cells with a total effective volume of 221,108 m^3.
- Two intermittent sand filters with a total area of 4,624 m^2 designed for an average flow rate of 1,708 m^3/d and a peak rate of 18,576 m^3/d.
- A phosphorous removal system, including alum storage tank. The system is capable of adding alum at the lagoon inlet and at the interconnecting structure between the two cells.
- An outfall sewer to the Bayfield River.

Within the works there are various pumps, valves and piping.

Figure 2.8 – Existing WWTF Facilities



(b) Operating Constraints

The WWTF is rated to treat an annual average flow of 1,072 m^3/d (391,280 m^3/year). Included within this value is up to 2,000 m^3/year of leachate from the Stanley landfill.

The facility is approved to discharge to the Bayfield River from April 1st to December 15th (259 days).

Table 2.9 sets out the effluent quality objectives and limits.

Table 2.9 – Effluent Quality Criteria

Effluent Parameters	Objective Concentration (mg/L)	Limit Values Concentration (mg/L)	Loading (kg/d)
CBOD5	5.0	10.0	15.1
Total Suspended Solids	5.0	10.0	15.1
Total Phosphorus	0.3	0.5	0.76
Total Ammonia Nitrogen	1.0	4.0	-
Dissolved Oxygen	7.0		
E. coli	100 organisms per 100 mL Monthly Geometric Mean Density		

2.8 Existing Operating Conditions

2.8.1 Annual Raw Sewage Flow

The current Environmental Compliance Approval (ECA) rates the capacity of the Bayfield WWTF at 1,072 m^3/d based on an annual volume of 391,280 m^3/year. Because the allowable discharge period is restricted to the period from April 1 to December 15, the allowable average rate of effluent discharge is greater.

The ECA also sets out maximum annual loading criteria (kg/day) for the effluent discharge. The parameters with loading criteria include: $CBOD_5$, Total Suspended Solids (TSS) and Total Phosphorus (TP).

Recent historical annual flows are presented in the following table.

Table 2.10 – Raw Sewage Flow Summary (2011 to 2019)

Year	Annual Average Flow (m^3/d)	Maximum Day (m^3/d)
2011	877	3060
2012	818	1098
2013	1144	3220
2014	1084	3708
2015	942	2477
2016	1151	3800
2017	1229	2598
2018	1274	4398
2019	1171	3385
2017-2019 Average	1225 m^3/d	--

The above values are measured at the inlet to the WWTF and include flows from the Main Sewage Pumping Station and flows from Wildwood by the River (Wildwood), a seasonal campground, which are also pumped directly to the Plant.

In the three-year period, 2017 to 2019, raw sewage flows have averaged approximately 115+% of the rated WWTF capacity. In several years flows exceeded the rated value. The annual flows have varied significantly from year to year, although 3-year averages show a definite increasing trend. A review of monthly averages indicates that there are definite seasonal variations independent of the summer recreational use.

A more detailed analysis of the causes of the variations is included in Section 2.9. Figures 2.9 and 2.10 present the flow information graphically.

Figure 2.9 – Annual Average Flows 2015 to 2019

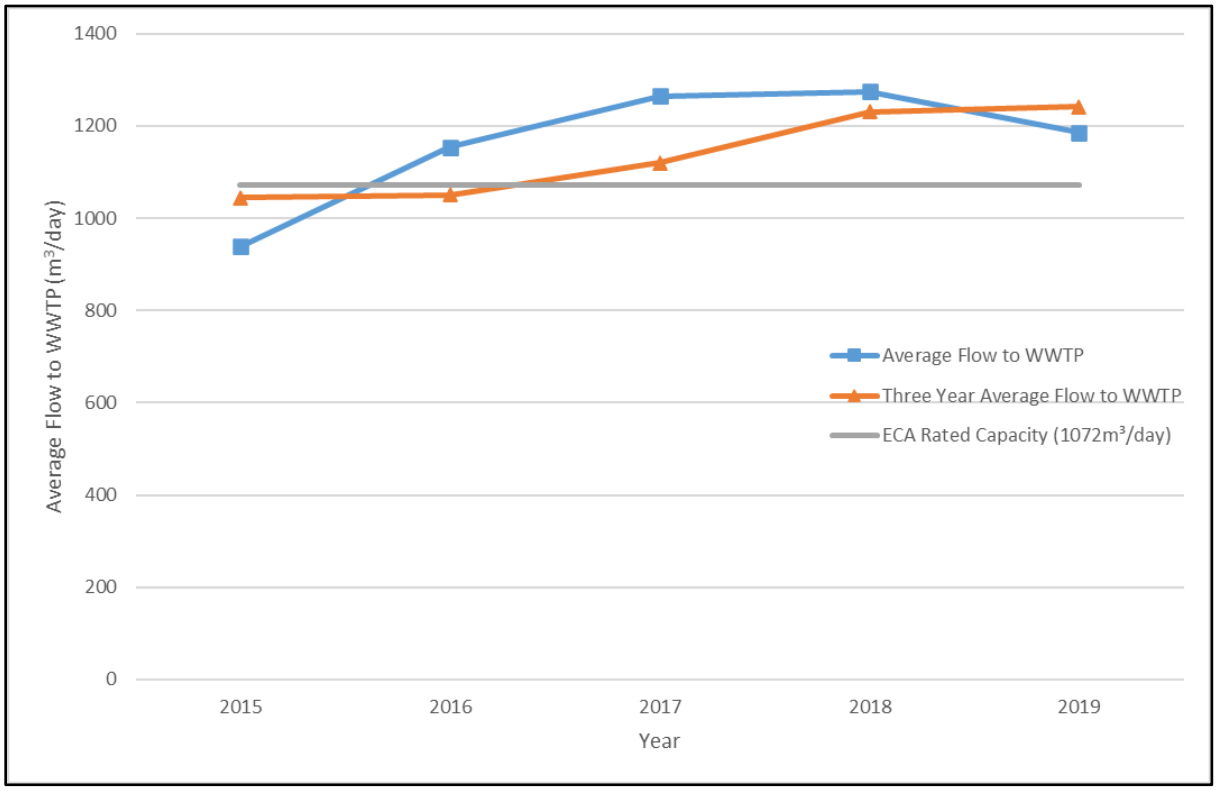
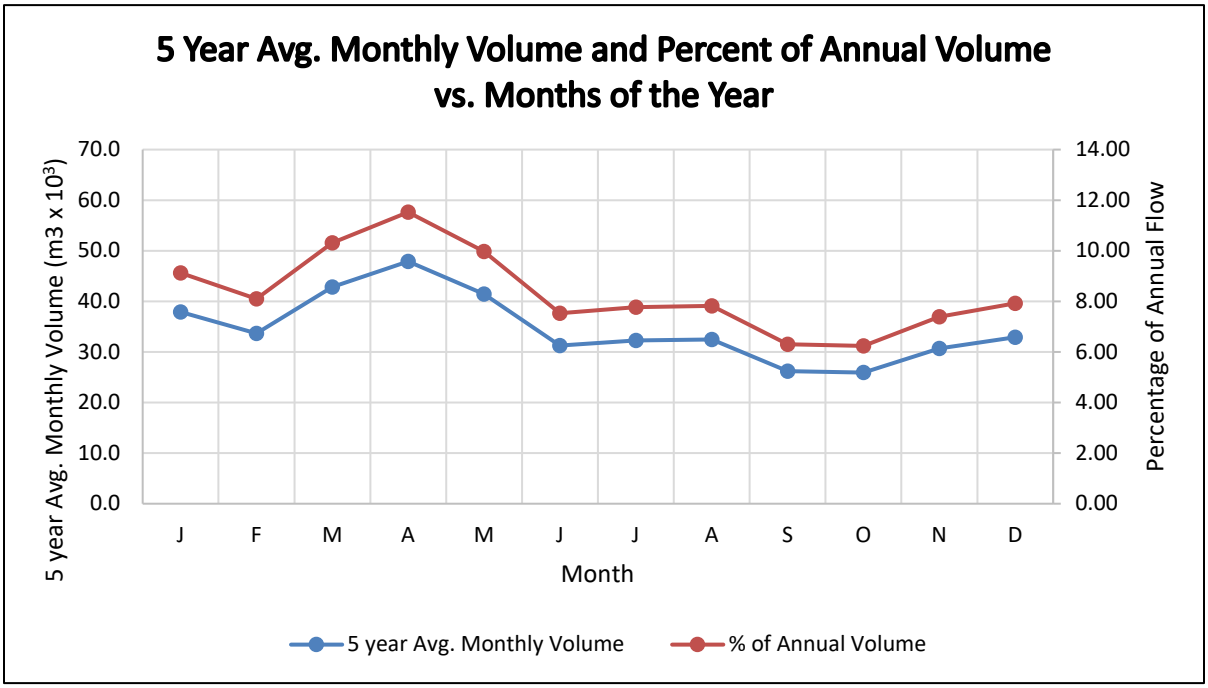


Figure 2.10 - Average Monthly Flows 2015 to 2019



2.8.2 Contributions from Campgrounds

In addition to Wildwood, two other seasonal campgrounds contribute sewage to the Bayfield sewage system; Paul Bunyan Lake Front Resort and Sugarbush Campground. The latter two campgrounds discharge sewage directly to the Bayfield collection system and their wastewater is pumped to the WWTF from the Main SPS (via the South SPS first). All three campgrounds have agreements with the Municipality defining how much they are permitted to discharge annually.

Table 2.11 provides a summary of campground flows for 2010 to 2019.

Table 2.11- Campground Sewage Flows

Year	Campground and Annual Volume (m^3)			
	Paul Bunyan	**Sugarbush**	**Wildwood**	**Total**
2015	30,253	No data	5,669	35,922
2016	27,392	No data	4,912	32,304
2017	18,746	494	8,450	27,690
2018	No data	503	8,193	Incomplete
2019	No data	1091	7142	Incomplete
Average	28,640	488	6,332	34,967
Allowable[1.]	22,800	3,126	7,000	32,926

Notes: 1. The allowable discharge is based on existing agreements.

On an annual basis, the three campgrounds contribute an average of approximately 96 m^3/d.

2.8.3 Leachate Discharged at WWTF

In addition to the above, leachate from the Stanley landfill site is periodically trucked to the WWTF and discharged into the inlet works. The ECA allows up to 2,000 m^3 per year to be discharged to the facility. Table 2.12 summarizes recent quantities.

Table 2.12 – Leachate Quantity Summary

Year	Volume of Leachate (m^3/Year)
2014	1116
2015	831
2016	0
2017	0
2018	0
2019	0

It is apparent from the above that the volume of leachate contributed is not a significant component of the total wastewater flow.

2.8.4 Maximum Day Flows

As noted in Table 2.11, single day maximum flows of approximately 4,400 m^3/d have occurred. These very high maximums occur infrequently. A review of the flow frequency indicates that flows are less than 2,600 m^3/d, 99% of the time.

2.8.5 Peak Rate Flows

The Main SPS is equipped with 3 equally sized pumps. The design basis is 2 pumps operating in parallel will discharge approximately 80 L/s (6,912 m^3/d). An analysis for pump timer records has established that a single pump typically discharges in the order of 70 L/s.

As noted, the sewage flows from Wildwood are discharged directly to the WWTF and measured independently from the Main SPS flows. A draft Certificate of Approval (MOE, March 2001) for the works identified the design capacity of the Wildwood SPS to be 2.5 L/s.

Detailed review of pump operating time data for both the Main and South SPS's established that there are extremely few events that would cause more than one pump to operate simultaneously.

Section 2.10 presents details of a more in-depth analysis of high flow events.

2.8.6 Raw Sewage Characteristics

Table 2.13 provides a summary of the characteristics of the raw sewage entering the WWTF.

Table 2.13 – Summary of Raw Sewage Characteristics

Year	Average Flow to WWTF (m^3/day)	BOD_5 (mg/L)	TSS (mg/L)	TP (mg/L)	TKN (mg/L)
2015	939	133	114	1.9	19.8
2016	1154	151	104	2.3	22.5
2017	1265	88	92	1.9	18.5
2018	1274	80	132	1.9	21.4
2019	1186	93	102	1.7	26.3
5 Year Average		**109**	**109**	**1.9**	**21.7**

The Bayfield raw sewage concentrations would be considered “weak” relative to published values (Metcalfe & Eddy, Inc., 1991) for typical wastewater. In our opinion the low strength wastewater is a result of two factors; the lack of industrial contributions and dilution from extraneous flow.

2.8.7 Effluent Flows

The existing Lagoon/ISF process is designed to discharge treated effluent to the Bayfield River between April 1 and December 15. As a result of the restricted window, the discharge volumes typically do not align with the raw sewage inflows in a calendar year.

Table 2.14 provides a summary of the volumes discharged during the period 2015 to 2019.

Table 2.14 – WWTF Discharges 2015-2019

Year	Total Volume Discharged (m^3)	Average Rate of Discharge (m^3/day)
2015	322,585	1,324
2016	418,210	1,727
2017	451,451	1,932
2018	388,437	2,122
2019	421,656	1,802
5 Year Average	**400,468**	**1,781**

2.8.8 Effluent Quality

As explained in Section 2.7, the ECA establishes effluent limits for quality based on monthly average concentrations and annual loadings. Limits have been set for $CBOD_5$, TSS, TP, Total Ammonia Nitrogen (TAN) and *E. coli*. The criteria set maximum monthly average values for each parameter and annual total loading values (kg/year) for $CBOD_5$, TSS and TP only.

Table 2.15 compares the recent performance of the system to the effluent quality criteria.

Table 2.15 – Summary of Effluent Concentrations

	$CBOD_5$		TSS		TP		TAN		*E. coli*	
Objective (mg/L)	5.0		5.0		0.30		1.00			
Limits (mg/L) as a Monthly Average	10.0		10.0		0.50		4.00		<100cfu/100mL	
	Average	**Max**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**
2015	2.7	5.3	3.1	9.8	0.14	0.27	0.12	0.25	7.9	30.5
2016	6.1	14.3	2.6	5.8	0.18	0.26	0.10	0.13	6.6	18.5
2017	2.9	6.3	2.0	2.3	0.24	0.46	0.19	0.70	4.7	29.4
2018	4.3	10.3	9.9	47.7	0.26	0.66	1.09	6.90	91.3	582.0
2019	2.5	3.6	2.7	4.5	0.26	0.29	0.63	3.45	23.5	129.6

Note: 1. *E. coli* is cfu/100 mL
2. *E. coli* is calculated as a geometric mean

With the exception of the 2018 values, the effluent limits have generally been met. The 2018 values were significantly influenced by the need to discharge in February and March when the quality is typically poorer and it was not possible to use the sand filters.

Table 2.16 – Summary of Effluent Loading

	$CBOD_5$	TSS	TP	TAN
Limits (kg/day) as an Annual Average	15.1	15.1	0.76	-
2015	3.7	4.3	0.19	0.16
2016	12.2	6.1	0.41	0.23
2017	5.4	3.9	0.47	0.36
2018	7.8	21.4	0.50	2.60
2019	4.4	4.7	0.47	0.81

2.9 Reserve Capacity Analysis

2.9.1 Methodology

The method for establishing the Reserve Capacity of a wastewater treatment facility has been set out by the Province (MECP, 2019). The typical approach is to establish the Total Reserve by subtracting the existing annual flows (3 to 5 year average) from the rated capacity as per the ECA. The uncommitted reserve is then determined by subtracting the projected flow from development commitments from the Total Reserve. Development commitments are considered to be lots in approved developments (i.e. registered plans and draft plans).

2.9.2 Total Reserve

For purposes of establishing the current Total Reserve Capacity, we have used the most recent 3 year average flow (see Table 2.11). There has been sufficient growth and development that we believe a 3 year value is more relevant than the 5 year average permitted by the Procedure.

The result is:

ECA Rated Capacity	=	1072 m^3/d
3 year Average Flow	=	1225 m^3/d
Total Reserve at January 2020	=	**-153 m^3/d**

2.9.3 Uncommitted Reserve

The following background information was used to establish the uncommitted reserve:

- 3 year (2016-2018) Average Flow = 1225 m^3/d
- No. of Customers (2019) = 967 including 3 campgrounds
- Total Reserve (from 2.7.2) = -153 m^3/d
- Per Customer Usage = 1225 m^3/d /967 customers = 1.27 m^3/d
- Development Commitments at December 2020 = 103 units
- Uncommitted Reserve = -153 – (103 x 1.27) = **-284 m^3/d**

In our opinion a reasonable allowance for unit flows going forward is 1.15 m^3/d per unit. This is less than the current actual value, but it recognizes that a proportion of the committed development is multi-unit and will connect directly to existing sewers. Thus there will be limited additional infrastructure to cause an increase to existing infiltration quantities. Further, campground expansion is believed to be unlikely.

2.10 Review of Extraneous Flows

2.10.1 Background

In an Inspection Report dated May 5, 2015, the MOE (MOE, May 5, 2015) provided the following comments and required action:

*" **1. The owner was not in conformance with the designed rated capacity for average daily flow into the sewage works.***

Condition 6 (2) of the ECA states that the Owner shall use best efforts to operate the works within the Rated Capacity of the Works and the hydraulic loading rate of 1,708 m^3/d to the intermittent sand filters.

In 2013 and 2014 the average daily flows into the works were 1113 and 1061 m^3/d respectively, exceeding or approaching the 1072 m^3/d faceplate Rated Capacity of the Works.

The 2014 average flow to the sand filters exceeded the 1708 m^3/d annual average hydraulic loading rate to the intermittent sand filters. The operations manual, prepared by the design engineer specifies that this rate is considered an annual average, based on a design annual filter flow of 391,186 m^3 over the 7.5 month forecast filter operation period.

Recommendation:

The Ministry has repeatedly raised the issue of the capacity of the works, especially in conjunction with high raw inflows to the lagoons potentially caused by precipitation or snow melt events and/or inflow and infiltration concerns. The first report of this occurred in March 2004 when an emergency discharge was needed after the sewage system had only been operating for three years and the responding officer determined that inflows to the lagoons had been as high as seven times the design daily flow.

The owner is recommended to continue with the class EA process, initiated in 2011 to consider expansion of the Bayfield sewage works, including an analysis typical of a Pollution Prevention and Control Plan within the scope of the class EA with a view to identifying and addressing sources of higher inflows into the sewage collection system."

The above recommendation makes reference to "...an analysis typical of a Pollution Prevention and Control Plan...". Such plans are described in MOE Procedure F-5-5. (MOE, July 1994).

2.10.2 System Response to Precipitation Events

The best information concerning how the sewer collection system responds to precipitation was developed by means of in-sewer flow metering. Metering projects took place on three separate occasions.

- March 3 to July 24, 2017
- January 8 to March 8, 2020
- June 10 to August 26, 2020

The 2017 flow monitoring program (B. M. Ross and Associates Limited, June 13, 2018) was the most extensive, and examined the entire system. The metering program was completed along with CCTV investigations, smoke testing and inspections of all of the maintenance holes (MHs). The study concluded:

- 48% of the observed flows could be characterized as infiltration and inflow (I-I).
- Three areas of the collection system were identified as contributing almost 80% of the I-I. Key areas included sewers in the northwest but south of the river, sewers in the south-central area draining to the South SPS, and a small area in the south which included the discharge from the Paul Bunyan Campground.

The two metering programs in 2020 (B. M. Ross and Associates Limited, March 31, 2020) (B. M. Ross and Associates Limited, September 16, 2020) assisted in refining the 2017 work. The meters were installed in progressively smaller drainage areas.

Areas upstream of MH B128 (on Cameron Street, near Euphemia Street) are not a significant contributor of (I-I). This would include Sugar Bush Campground.

Direct connections to the surface that would result in inflow are not apparent. This confirms previous studies. The observed inflow values were not an immediate reaction to precipitation.

Total flows at MH B120 (Lidderdale Street, south of Cameron) and MH B116 (Troy Street, west of Hamilton Street) respond to precipitation after a lag of a couple of hours. This is much more significant at MH B116.

The 5 minute flow data indicates the probable connection of sump pump discharges between MH B116 and MH B120.

Areas upstream of MH B12 (located at the intersection of Tuyll Street at Christy Street) are not a significant contributor of (I-I).

Inflow was significant upstream of MH B8, but not as much at MH B12; therefore, the drainage area between the two locations is suspect.

The 5 minute flow data indicates the probable connection of sump pump discharges between MH B15 and MH B12. The influence of sump pumps was not noticeable at MH B15 and B8.

The overall conclusion of the metering studies was that the extraneous flow (I-I) is not the direct result of precipitation, but a rainfall or snow melt event will result in a delayed response by means of sump pump discharges.

2.10.3 Summary re Extraneous Flows

To establish the amount of extraneous flow, (Infiltration and Inflow) entering the sewer system, the March 3 to July 24, 2017 flow monitor data was analyzed. Also, in 2016 and 2017 over 95% of Bayfield's gravity main sewer was investigated by CCTV and smoke testing. OCWA investigated 268 manholes in 2017 and 31 service laterals were investigated from the main sewer to the cleanout in 2018. The investigations have established the following:

- Total Flows typically respond within a day to rainfall events greater than or equal to 10 mm.
- Based on a review of flows during March 3 to July 24, 2017 approximately:
  - 4% of the Total Flow is Inflow
  - 44% of the Total Flow is Infiltration
- Deficiencies identified by CCTV and smoke test investigations are detailed in *Bayfield Infiltration & Inflow Investigations 2017* (B. M. Ross and Associates Limited, June 13, 2018).
- Areas of most concern are identified in *Bayfield Infiltration & Inflow Investigations 2017* (B. M. Ross and Associates Limited, June 13, 2018).
- It was estimated that flow reduction through remedial work of I-I sources could reduce the total annual I-I quantity by 10% to 25%.
- Service lateral clear flow at new development appears to usually originate on the private side.
- None of the SPSs are operating near capacity and there has never been a reported SPS bypass related to high flows.

2.11 Design Sewage Flows

2.11.1 Background

To establish design criteria and flows for the WWTF, it is necessary to:

- Establish a value for the existing total flow.
- Estimate the potential to reduce the existing total flow through I-I reduction. Establish a unit flow to be used for growth and development.
- Estimate the rate of growth and the total growth to potentially be accomodated in any expansion of the WWTF.

Each of the above is essentially an independent decision.

Also, the key design value is the “Annual Average Daily Flow”. The existing system is designed for seasonal flow variations. For the expansion, various components of the WWTF will be designed for Maximum Daily Flows or Peak Daily Flows. For Average Flows, however the ECA rating and the controlling value for growth will be the Annual Average (currently 1,072 m^3/d).

2.11.2 Existing Flow

Table 2.10 provided a summary of the Annual Average and Maximum Day Flows for the period 2011 to 2019. Reserve capacity calculations were based on the most recent three-year average, which in this case is 1,225 m^3/d. Two of the three years had a greater value.

For purposes of evaluating treatment concepts we propose to use the following values for existing flow.

- Average Day – **1,274** m^3/d (greatest value 2017-2019)
- Maximum Day – **4,400** m^3/d (greatest value 2017-2019)
- Peak Instantaneous – **6,912** m^3/d (based on 80 L/s capacity at Main SPS)

2.11.3 Potential I-I Reduction

I-I investigations have identified that approximately 4% of the existing flow as Inflow and approximately 44% as Infiltration. As explained in the *Bayfield Infiltration & Inflow Investigation* (B. M. Ross and Associates Limited, June 13, 2018) there is potential to reduce I-I.

For design purposes we propose to plan for a potential reduction of 25% of the infiltration component. This is a value of 153 m^3/d expressed as an annual average

value. The 25% value is at the high end of reduction projections but there will be many years available to achieve this value post-expansion.

2.11.4 Unit Flow for Growth

Section 2.9 provided an analysis of the existing unit (per customer) flows and established a value of 1.27 m^3/d per customer This value included campground and non-residential flows.

The same Section also proposed a value of 1.15 m^3/d per residential customer for growth. The rationale for a lesser value was that a significant proportion of the existing flow is I-I, which is somewhat proportional to sewer length. Much of the forecasted future development is expected to be higher density and infill which will have lower potential for I-I than seen with existing serviced areas. Lastly, campground expansion is anticipated to be minor.

2.11.5 Growth Projections

Section 2.0 presented a detailed evaluation of historical growth trends and the potential for development. Given that new servicing has been constrained for several years as a consequence of there being no treatment capacity, there is an opinion that there may be some pent-up demand. The potential for growth to increase to 40 or more units per year must be considered.

Section 2 provided a summary of current development commitments and identified approximately 103 units of approved, but unconnected development.

The minimum amount of WWTF capacity created would have to accommodate the existing commitments and allow potential for approval of new development proposals extra to that currently approved.

2.11.6 Sewage Flow Design Values

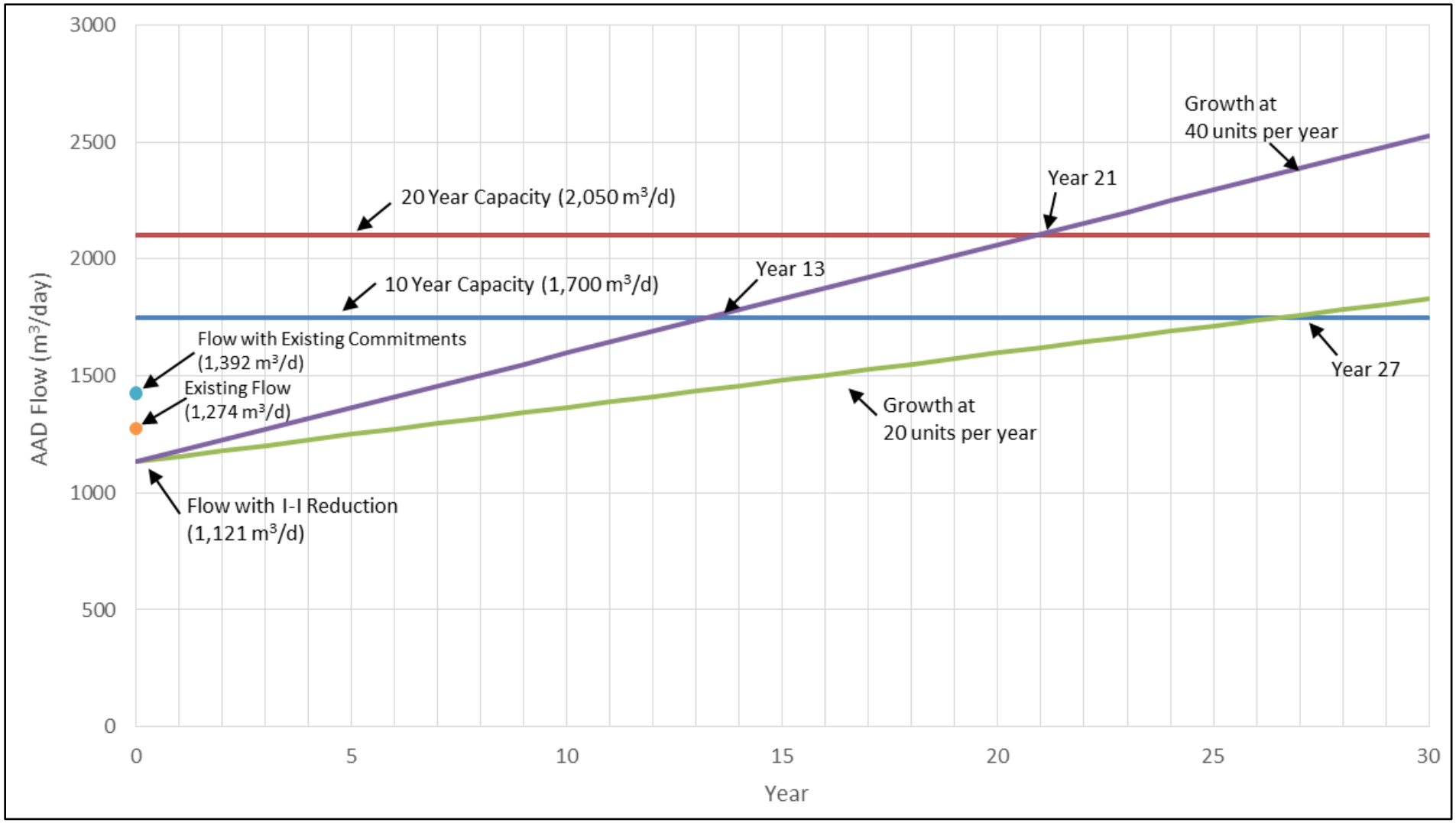
Based on the above discussions, we propose to use the following values for assessment of alternatives.

- Existing Flow = 1,274 m^3/day (maximum 3 year annual average)
- Unit Flow for Growth = 1.15 m^3/day per equivalent residential unit (ERU)
- No. of Units per year = 20 to 40
- Existing Service Commitments = 103 ERUs

Potential I-I Reduction = 25% of estimated I-I = 153 m^3/day

Figure 2.11 presents the outcome of the above values applied on an annual basis.

Figure 2.11 – Forecast of Raw Sewage Flows



What is apparent from Figure 2.11 is the following:

- Even if all of the potential flow reduction achieved by reducing I-I (i.e. 153 m^3/day) was available in Year 1, it would not be adequate to account for the current capacity deficiency (200 m^3/day) and the increased flows from existing commitments.

- Staging expansion in two increments (e.g. from 1,072 m^3/day to 1,700 and then 2,050 m^3/day) provides adequate capacity for more than 10 years at the higher growth rate but reduces the risk of over building for a lower growth rate.

- If I-I reductions of more than 25% are ultimately determined to be achievable it will allow deferment of Stage 2.

The rationale for selecting 1,700 m^3/day and 2,050 m^3/day is explained in a further section of this report.

3.0 CLASS EA STUDY FRAMEWORK

3.1 Study Initiation

The community of Bayfield has experienced significant growth in the past 20 years, since construction of the sanitary sewage system, and is anticipating continued residential growth at similar or greater rates over the next 20-25 years as lands designated for additional residential development proceed to development. Current annual average sewage flows to the wastewater treatment facility are exceeding the facility's rated hydraulic capacity and commitments to future residential developments, already approved within the community, will further increase flows.

3.2 Phase 1 – Problem Definition

The first phase of the Class EA process is to define the problems or opportunities which need to be addressed. Based upon a review of operating data and discussions with the Municipality, the following key problem has been identified with regards to the existing wastewater treatment works:

> *The Bayfield Wastewater Treatment Facility is operating at flows in excess of its approved hydraulic design capacity. Existing servicing commitments to approved future developments within the community will produce flows that will result in increased exceedances of the approved capacity.*

In order to resolve the above issue, the Municipality has investigated a range of alternatives. Among these are projects that may require expansion of the existing treatment facility or the establishment of a new wastewater treatment system. From a Class EA perspective, these types of projects are considered Schedule 'C' activities. Schedule 'C' projects require the proponent to evaluate alternative design concepts for the preferred alternative and to prepare an Environmental Study Report documenting study investigations (i.e., Phases 1 to 4 of the Class EA process). One purpose of the study process is to identify any potential environmental impacts associated with the construction of proposed facilities and plan for appropriate mitigation.

3.3 Phase 2 – Identification of Alternative Solutions

The second phase of the Class EA process involves the identification and evaluation of alternative solutions to address the defined problem. The evaluation of alternatives is undertaken by examining the technical, cultural, economic, social and environmental considerations associated with implementing any alternative. Mitigation measures that could lessen any environmental impact are also defined. A preferred solution or solutions is then selected.

For the defined capacity problem there are a number of considerations related to providing increased treatment capacity for growth. These include:

- The existing facilities are in good condition and provide very good treatment.

- The operational costs for the existing system are significantly less than for an equivalent mechanical treatment system.
- There are advantages to retaining the existing lagoons for raw sewage flow equalization.
- There is considerable uncertainty regarding both the rate and scale of future growth. Staging the increase in capacity will reduce the economic risk of over-building.
- Increased effluent discharges will require expanding the existing April to December discharge window.

The following alternatives have been identified and considered as part of this study.

(1) Reduce Wastewater Quantities from the Existing Community. This option involves the reduction of wastewater flows to the existing facility to lessen the burden on existing treatment systems.

(2) Limit Community Growth. This alternative would require the Municipality to take steps to restrict new development activities in the study area. The adoption of such policies would ensure that wastewater treatment problems do not increase.

(3) Expand the Existing Wastewater Treatment Plant. This option would involve the construction of additional wastewater treatment facilities to operate in conjunction with the existing facility.

(4) Construct a New Municipal Wastewater Treatment Facility. This option would involve the development of a new wastewater treatment facility to replace the existing facility. The implementation of this option could require the selection of a suitable site, the construction of all necessary waste treatment and disposal facilities, and the potential installation of pumping equipment or forcemains to convey the wastewater to the new site or facility.

(5) Re-Rate the Existing Facility. This option would involve an evaluation of the current hydraulic rating of the treatment facility to determine if, based upon the current operational parameters and treatment levels, the facility could be re-rated to treat larger volumes of sewage.

(6) Do Nothing. This option proposes that no improvements or changes be made to address deficiencies at the WWTF. During the Class EA planning and design process, the “Do Nothing” alternative may be implemented at any time prior to the commencement of construction. A decision to “Do Nothing” would typically be made when the costs of all other alternatives, both financial and environmental, significantly outweigh the benefits.

3.4 Preliminary Evaluation of Alternatives

3.4.1 General

The next component of the investigation involved the evaluation of the identified alternatives. The purpose of the evaluation was to examine the potential environmental impacts associated with the proposed works and to examine potential mitigation of any identified impacts. The evaluation generally involved the following activities:

- A preliminary technical review of alternatives.
- Consultation with the general public and review agencies.
- Selection of a preferred alternative (final).

A preliminary engineering analysis was conducted to determine the requirements to implement each of the identified alternatives. A discussion of these findings is included below for each of the project alternatives previously identified in Section 3.3.

3.4.2 Alternative 1: Reduce Wastewater Quantities from the Existing Community

Previous sections have identified that the existing WWTF's hydraulic capacities are already being exceeded. The goal of this alternative would be to reduce existing quantities such that an expansion of capacity is not required.

As a minimum it would be necessary to reduce existing flows to eliminate the existing capacity deficit and also to accommodate flows from current development commitments. With reference to Section 2.9, the current capacity deficit is approximately 153 m^3/day. In addition there are servicing commitments that will generate an additional 131 m^3/day. Therefore it would be necessary to achieve a flow reduction of at least 284 m^3/day as an annual average.

In Section 2.11 it was identified that the projected I-I reductions, based on 25%, are in the order of 153 m^3/day which is 54% of the required reduction. Further, in the absence of a capacity expansion it would be necessary to achieve the full 284 m^3/day reduction essentially immediately. Lastly, if somehow a 284m^3/day reduction was achievable, it would not provide any capacity for growth beyond the current commitments.

In summary, although wastewater flow reduction is important and efforts to achieve it should continue, in our opinion it is not a feasible alternative and is therefore not considered further.

3.4.3 Alternative 2: Limit Community Growth

The implementation of this strategy would most likely require the Municipality to amend its Official Plan and local Zoning By-law to further restrict new development in the community of Bayfield (i.e., limit infilling opportunities and urban expansions) and

restrict potential expansions of the service area into Central Huron to the north. A policy change of this nature would ensure that new development activities would not exacerbate existing problems.

This approach would not resolve the fact that existing flows exceed the treatment facility's capacity nor would they address growth pressures evident in Bayfield, accommodate existing planning commitments and existing lots of record, or the goal of the Official Plan to provide municipal servicing to support community growth. For these reasons, limiting new development is not considered to be a viable method of resolving the defined problem and is not considered further.

3.4.4 Alternative 3: Expand Existing Wastewater Treatment Facility

As mentioned previously, the existing WWTF is a lagoon-based system with slow sand filters used for effluent polishing prior to discharge. The process is commonly known as the New Hamburg process based on the location of the original facility utilizing this process. Treated effluent is discharged to the Bayfield River generally from April to November when the sand filters are operational. The sand filters are open structures and cannot be used when freezing conditions occur.

To expand using the same lagoon and sand filter process would require the purchase of additional lands adjacent to the existing site. The result would be removal of lands currently in agricultural production. This is not considered desirable.

In discussions with the MECP regarding effluent quality and loadings to the Bayfield River it was the Ministry's position that effluent phosphorus loadings (kilograms per day) should not be increased during the months of May to September. Thus, to discharge more effluent through these summer months would require levels of treatment that exceed what can reasonably be assured using the current process (i.e. New Hamburg system). Further, additional lagoon storage capacity would be necessary. This would require the purchase of additional adjacent agricultural land. In summary, it is our opinion that a capacity expansion using the existing lagoon and sand filter process is not a viable alternative. It would however be feasible to increase capacity by constructing a wastewater treatment system (i.e. mechanical plant) to operate in parallel to the existing facility. The mechanical plant would have to provide a level of treatment superior to the existing facilities but it would require a relatively small footprint that could be accommodated within the existing site boundaries.

3.4.5 Alternative 4: Construct New Treatment Facilities

A possible alternative to expanding and upgrading the existing facilities is to construct completely new treatment works, in effect replacing the existing facility. The potential advantages are:

- It would provide sufficient capacity to accommodate future growth within Bayfield and adjacent service areas for an extended period of timeframe.

- Utilization of a different treatment process would provide an opportunity to improve the quality of the effluent being discharged from the facility and possibly allow discharge over a longer timeframe (the current facility is limited to a warm weather discharge period).

- It is considered feasible to construct the new plant on the existing site and avoid the expense of constructing new or modifying existing pumping facilities to convey raw sewage to the plant and effluent disposal facilities and also avoid any requirement to purchase additional lands.

A new treatment facility would be required to handle the design flows of the existing facility, presented in Section 2.8, plus the incremental hydraulic capacity and organic loadings required to address the identified problem. It must also be capable of achieving the effluent quality objectives established by the MECP. Based on the growth potential identified a near 100% increase in treatment capacity is considered the minimum feasible increment although staging of the expansion is possible. To achieve this criteria a new facility would require the following principal components:

- Continued use of the lagoons for flow equalization and biosolids storage.

- Inlet works for flow screening and grit removal.

- An activated sludge or membrane process configuration including effluent filtration and UV disinfection of the effluent.

- Biosolids handling facilities

- Operator amenities

Since there are no other economically feasible receiving waters, it is assumed the facility would be located at the present site and discharge to the Bayfield River utilizing the same discharge facilities.

As the implementation of this option would involve considerable additional capital expense and replace a facility that has already been proven to function very successfully within the prescribed treatment parameters. This option is considered to be a feasible alternative although it may be unrealistic financially

3.4.6 Alternative 5: Re-Rate the Existing Facility

The existing lagoon and sand filter system is fully utilized. The lagoons are sized to provide retention and treatment for the expected wastewater volume from December until March when no discharge is occurring. It is our opinion, from the perspective of treatment capability and storage, it is not feasible to process more wastewater through the existing facilities, thus re-rating is not a viable alternative and is not considered further.

3.4.7 Alternative 6: Do Nothing

The Do Nothing alternative represents the least expensive alternative available. It does not, however, resolve the problem of deficient sewage treatment capacity or the need to accommodate current development commitments. The existing WWTF's hydraulic capacity is over-committed and this must be addressed. The implementation of this option would also not provide opportunity for additional development in the community. Consequently, the 'Do Nothing' option is not considered to be a viable strategy for addressing the identified problem. However, the opportunity to do nothing always exists should all other alternatives prove to be impractical and will continue to be examined in the following sections.

3.4.8 Summary of Preliminary Review of Alternatives

Six alternatives were identified and given consideration. Three of these; reducing wastewater quantities, limiting community growth and re-rating the existing facility have been determined to not be viable solutions to the problem and have been rejected. It should be noted that flow reduction is not viable as a stand-alone solution but could and should be considered a component of any expansion approach.

Three alternative solutions remain for more detailed evaluation. These are:

- Expanding the existing system provided the expansion is in the form of a mechanical WWTF operating in parallel with the existing.
- Constructing a new WWTF that would replace the existing facilities.
- Doing nothing.

3.5 Environmental Considerations

3.5.1 General

Section 3.3 of this report listed the alternative solutions that were identified to resolve deficiencies with the Bayfield WWTF. As part of the evaluation process, it is necessary to assess what affect each alternative may have on the environment and what measures can be taken to mitigate the identified impacts. The two main purposes of this exercise are to:

- Minimize or avoid adverse environmental effects associated with a project.
- Incorporate environmental factors into the decision-making process.

Under the terms of the EA Act, the environment is divided into five general components:

- Natural environment

- Social environment
- Cultural environment
- Economic environment
- Technical environment

The identified environmental components can be further subdivided into specific sub-components that have the potential to be affected by the implementation of the alternative solutions. Table 3.1 provides an overview of the specific environmental components and sub-components considered relevant to this investigation. These were identified following the initial round of public and agency input, and after a preliminary review of each alternative with respect to technical considerations and the environmental setting of the project area.

Table 3.1 – Evaluation of Alternatives: Identification of Environmental Components

Element	Component	Sub-Component
Natural	Aquatic	• Aquatic Resources • Fisheries
	Atmosphere	• Air Quality • Noise
	Surface Water	• Water Quality/ Quantity • Drainage Characteristics
	Terrestrial	• Amphibians & Reptiles • Birds & Mammals • Vegetation and Communities • Species at Risk
	Geologic	• Physiographic Features • Groundwater Quality/ Quantity
Social	Neighbourhood	• Disruption
	Community	• Health and Safety • Recreational Activities
Cultural	Heritage	• Historical/ Cultural Resources
Economic	Project Area	• Capital and Operational Costs
	Community	• Property Taxes
Technical	Infrastructure	• Condition/ Age • Servicing Capacity • Technologies • Utilities

The environmental effects of each study alternative on the specific components are generally determined through an assessment of various impact predictors (i.e. impact criteria). Given the works associated with the alternative solutions, the following key impact criteria were examined during the course of this assessment:

- Magnitude (e.g. scale, intensity, geographic scope, frequency, duration).
- Technical complexity.
- Mitigation potential (e.g. avoidance, compensation, degree of reversibility).
- Public perception.
- Scarcity and uniqueness of affected components.
- Likelihood of compliance with applicable regulations and public policy objectives.

The evaluation process described above provides the proponent with a methodology to predict the potential effects of alternative solutions. The significance of the identified impacts is largely based on the anticipated severity of the following:

- Direct changes occurring at the time of project completion (e.g., habitat disruption).
- Indirect effects following project completion (e.g., increased sedimentation/ erosion).
- Induced changes resulting from a project (e.g., additional activity in sensitive areas).

3.5.2 Summary of Environmental Review

Table 3.2 provides a summary of the key considerations for each option with respect to the environmental components described above. To this end, the table identifies those benefits and impacts that were identified as significant during the initial evaluation of alternatives. Potential mitigation measures for the identified impacts are also presented.

Table 3.2 – General Evaluation of Alternatives: Bayfield WWTF Expansion

Study Alternative	Potential Benefits	Potential Impacts	Impact Mitigation
Alternative 3 - Expand existing WWTF using a parallel mechanical facility.	- Represents a cost-effective use of existing infrastructure. - Minimal disruption to the natural environment due to construction within the existing WWTF site. - Low impact on social and cultural environments. - Use of the existing treatment technologies of a portion of the wastewater would reduce impact on operations and the technical environment. - Allows use of lagoons for peak flow management.	- Would result in some disruptions to existing WWTF operations during construction. - Potential negative impacts on receiving stream from additional effluent loadings. - More expensive than alternatives that do not require physical works to be constructed. - Construction related impacts may be experienced by adjacent properties. - Will require retraining of operational staff. - Additional environmental review of treatment strategy and effluent loadings will be required.	- Provide advance notice of interruptions of existing works to minimize impacts. - Closely monitor performance of treatment works and water quality in receiving stream. - Consider more stringent effluent requirements. - Minimize impacts by implementing standard measures. - Investigate training/technical requirements for plant operators
Alternative 4 - Construct a new WWTF.	- Provides a fully modern wastewater treatment facility and disposal system with potentially improved effluent criteria.	- Higher capital costs than other alternatives. - Minimal use of existing WWTF infrastructure to reduce costs.	- Limited mitigation options for additional capital costs.

Study Alternative	Potential Benefits	Potential Impacts	Impact Mitigation
	- Addresses environmental, social, and technical issues identified with insufficient wastewater treatment capacity. - Eliminates the need to upgrade any of the existing facilities thus reducing capital costs.	- Will require retraining of operational staff - Additional environmental review of treatment strategy and effluent loadings will be required. - Minimal impact on natural and cultural environment assuming that existing site can be utilized	- Investigate training/technical requirements for plant operators - Explore effluent loading/ treatment capabilities of new technologies - Review site requirements of new technologies to ensure that existing site can accommodate the required construction
Alternative 6 - Do Nothing	- Represents the least expensive option.	- Fails to address existing deficiencies with the Bayfield WWTF. - May result in greater impacts to the natural environment if the capacity of the plant is exceeded and inadequately treated effluent is released into the environment. - Wastewater volumes from already approved growth will make conditions worse. - Continued growth and development as proposed in the Official Plan cannot proceed.	- Identified impact of existing problem cannot be mitigated

The results of the preliminary analysis indicated that Alternative 3, expansion of the existing facility, appeared to have fewer unmitigable impacts associated with implementation than the other alternatives. The opportunity to use the existing WWTF in combination with a MWWTP operating in parallel provides economic, operational and construction advantages over Alternative 4 which was complete replacement.

To further examine this preliminary conclusion a more comprehensive environmental effects analysis was completed which examined potential interactions between the identified alternatives and environmental components. The purpose of this analysis was to determine the environmental effects of constructing and operating each identified option on the environmental components and sub-components. The level of effect for each of the environmental interactions was rated as High, Moderate, Low and Minimal/Nil. Potential mitigation measures were also considered as part of this evaluation. Table 3.3 summarizes the outcome of this analysis.

Table 3.3 – Alternative Solutions: Environmental Effects Analysis

Environmental Component	Alternative Solution	Level of Effect	Impact Considerations (Implementation and Operational Activities)
Natural • Aquatic	Alternative 3 Expand WWTF	Low to Moderate	• Impacts to aquatic habitats may occur as a result of increased loadings and discharges to the Bayfield River. Impacts are anticipated to be low given the historic performance of the existing Wastewater Treatment Facility, as determined by previous aquatic assessments undertaken within the river, and the assimilative capacity of the Bayfield River.
	Alternative 4 Construct a New WWTF	Low to Moderate	• Impacts to aquatic habitats may occur as a result of increased loadings and discharges to the Bayfield River. Impacts are anticipated to be low given that a new facility would be constructed to a higher effluent standard. The results of previous aquatic assessments undertaken within the river show few impacts related to current effluent discharges, and the assimilative capacity of the Bayfield River is considered to be adequate.
	Alternative 6 Do Nothing	Moderate	• Given that the current facility is exceeding its hydraulic capacity, the do nothing option could result in significant impacts to the Bayfield River if the STP is overwhelmed resulting in a discharges of poorly treated effluent to the environment.
• Hydrology	Alternative 3 Expand WWTF	Low	• Hydraulic impacts to the Bayfield River are anticipated to be low given that discharge rates are controlled and currently outlet to a side channel adjacent to the river which moderates the flows prior to discharge to the main channel of the river.
	Alternative 4 Construct a New WWTF	Low	• Hydraulic impacts to the Bayfield River are anticipated to be low given that discharge rates are controlled and currently outlet to a side channel adjacent to the river which moderates the flows prior to discharge to the main channel of the river.

Environmental Component	Alternative Solution	Level of Effect	Impact Considerations (Implementation and Operational Activities)
• Terrestrial	Alternative 6 Do Nothing	Moderate	• Given that the current facility is exceeding its hydraulic capacity, the do nothing option could result in significant impacts to the Bayfield River if the WWTF is overwhelmed resulting in a discharge of poorly treated effluent to the river.
	Alternative 3 Expand WWTF	Low to Nil	• There are no natural habitats located in the immediate vicinity of the existing treatment facility that would be impacted by expansion of the existing treatment facility. Impacts to terrestrial components of the environment are therefore anticipated to be low to nil.
	Alternative 4 Construct a New WWTF	Low to Nil	• There are no natural habitats located in the immediate vicinity of the existing treatment facility that would be impacted by construction of a new facility. An expanded plant could be constructed on the existing site, utilizing the existing outlet to the river. Impacts to terrestrial components of the environment are therefore anticipated to be low to nil.
	Alternative 6 Do Nothing	Low to Moderate	• Given that the current facility is nearing its hydraulic capacity, the do nothing option could result in impacts to terrestrial habitats on the river valley bank if the WWTF is overwhelmed resulting in a discharge of poorly treated effluent to the river.
Social • Community	Alternative 3 Expand WWTF	Low	• Implementation of this alternative will have a positive impact on the community by accommodating existing growth commitments and permitting additional growth. • There are no impacts anticipated from the construction of the proposed works, given that few residences are located in the vicinity of the facility.
	Alternative 4 Construct a New WWTF	Low	• Implementation of this alternative will have a positive impact on the community by accommodating existing growth commitments and permitting additional growth. • There are no impacts anticipated from the construction of the proposed works, given that few residences are located in the vicinity of the facility

Environmental Component	Alternative Solution	Level of Effect	Impact Considerations (Implementation and Operational Activities)
	Alternative 6 Do Nothing	Moderate to High	• Implementation of this alternative may result in impacts to the community as the Do Nothing alternative equates to limiting community growth. Additional population growth and development is considered essential for a vital and prosperous community.
Cultural • Heritage	Alternative 3 Expand WWTF	Low to Nil	• The areas to be impacted by expansion of the existing facility are previously disturbed areas with no existing cultural heritage features. Therefore impacts to cultural components of the environment are anticipated to be low to nil.
	Alternative 4 Construct a New WWTF	Low to Moderate	• Construction of a new facility may require expansion beyond the existing facility footprint. This may result in impacts to cultural heritage features if the proposed construction site is located on undisturbed areas.
	Alternative 6 Do Nothing	Low	• No impacts anticipated.
Economic • Municipal	Alternative 3 Expand WWTF	Moderate	• Capital costs of construction would be offset through development charges associated with development of urban development lands located within and adjacent to Bayfield. Funding support will also be sought from various Provincial/Federal infrastructure programs.
	Alternative 4 Construct a New WWTF	High	• Construction of a new facility would require significant capital contributions from the municipality although funding support would be sought from development related fees and Provincial/Federal infrastructure grant programs.
	Alternative 6 Do Nothing	Moderate	• Implementation of this alternative could result in negative impacts to the community. Additional population growth and development is essential for a vital and prosperous community.

Environmental Component	Alternative Solution	Level of Effect	Impact Considerations (Implementation and Operational Activities)
• Community	Alternative 3 Expand WWTF	Moderate	• Capital costs of construction would be offset through development charges associated with development of urban development lands located adjacent to Bayfield. Funding support will also be sought from various Provincial/Federal infrastructure grant programs.
	Alternative 4 Construct a New WWTF	Moderate to High	• Construction of a new facility would require significant capital contributions from the municipality and community although funding support would be sought from development related fees and Provincial/Federal grant programs.
	Alternative 6 Do Nothing	Low to Moderate	• Implementation of this alternative could result in negative impacts to the community. Additional population growth and development is essential for a vital and prosperous community.
Technical	Alternative 3 Expand WWTF	Low to Moderate	• Given that expansion of the existing facility would likely utilize an improved process technology impacts associated with this alternative are anticipated to be low. • Difficulties may arise during construction of the expanded facility in order to maintain use of the existing facility during construction.
	Alternative 4 Construct a New WWTF	Moderate to High	• Construction of a new facility would be more technically demanding than expansion of the existing facility.
	Alternative 6 Do Nothing	Moderate	• Implementation of this option would not address capacity issues with the existing facility and will make the continued operation of the facility very technically demanding.

3.6 Identification of a Preferred Solution

Based on the results of the impact assessment presented above and engineering evaluations of the study alternatives completed by the Municipality and project engineers; Alternative 3: Expansion of the existing WWTF, by means of an addition of a MWWTF to operate in parallel with the existing lagoon and sand filter system, was selected as the preferred alternative. This type of project is classified as a Schedule 'C' activity under the terms of the MEA Class EA document.

A number of relative advantages were identified with the preferred alternative that justified its selection as the preferred approach to increasing capacity. In particular, the preferred alternative provides the following advantages:

- Expansion of the existing treatment facility provides the most cost effective and efficient method to provide additional wastewater treatment capacity to the community, based on the excellent historic performance of the existing facility.
- It utilizes existing infrastructure, thus reducing the capital cost of capacity expansion.
- It minimizes potential impacts to the natural and cultural environments by limiting activities to the existing WWTF site.
- It provides sufficient capacity at the facility to address hydraulic deficiencies.
- It allows for continued growth and development within the community consistent with the Bluewater Official Plan.
- It allows the Municipality to meet all existing planning commitments for already approved development and allow continued growth.

4.0 PHASE 3 – REVIEW OF ALTERNATIVE DESIGN CONCEPTS

4.1 General

As identified in Section 3.6, the preferred solution is to increase wastewater treatment capacity by constructing a mechanical wastewater treatment facility to operate in parallel with the existing lagoon and sand filter system. The facility would receive and treat wastewater and discharge treated effluent to the Bayfield River on a continuous basis.

During Phase 3 of the EA, different approaches to treating the wastewater were evaluated and a preferred treatment process was identified. All approaches were based on retaining the existing facilities and assume on-going investigation and rehabilitation of the sewer collection system to reduce infiltration quantities.

4.2 Design Wastewater Quantities

4.2.1 Design Flow Basis

In Section 2.11 the following design wastewater flows and volumes were developed:

- Existing Flow = 1,274 m^3/d (maximum annual average in previous 3 years)
- Unit Flow for Growth = 1.15 m^3/d per equivalent residential unit
- No. of Units per year = 20 to 40
- Existing Service Commitments = 103 units
- Potential I-I Reduction = 25% of estimated I-I = 153 m^3/d

For several years, development has been constrained by a lack of wastewater treatment capacity. Residential unit growth has been relatively steady at approximately 20 units per year and some non-residential development and re-development has occurred. Municipal and County planning staff have indicated that there is substantial new development interest and believe more development would have occurred had wastewater treatment capacity been available. There is the possibility of significant growth occurring immediately following treatment expansion. Recognizing the uncertainties regarding growth the preferred approach to expansion is to proceed in stages.

The following considerations were made when establishing the design capacity of each stage of the treatment facility expansion:

- The minimum capacity of Stage 1 should accommodate the current commitments (103 units) plus additional potential development (309 units) that might occur

within 10 years. Total potential development of 412 units within 10 years has been identified.

- In addition to new development, Stage 1 should also have capacity to allow service to the existing properties currently on septic systems as far south as Glitter Bay Road. A total of 93 properties have been identified. This would be considered as provisional capacity. The actual servicing of the various areas currently on septic systems will require further analysis and approvals.

- The maximum capacity of Stage 1 and 2 must accommodate the potential development that is believed might occur within 20 years plus the existing properties on septic systems as noted above. Potential development of 288 units in the period 11 to 20 years has been identified.

- An allowance will be made for flow reduction to be achieved through rehabilitation of the existing works.

4.2.2 Design Wastewater Volume

(a) For Stage 1

Previous sections have identified the following wastewater volume and unit flow information expressed as annual average values:

- Existing Flows = 1,274 m^3/day
- Capacity for commitments (103 units x 1.15 m^3/day) = 118 m^3/day
- 10 Year Potential Growth (309 units x 1.15 m^3/day) = 355 m^3/day
- Provisional allowance to replace septics (93 units x 1.15 m^3/day)
  = 107 m^3/day
- Deduction for I-I removal = - 153 m^3/day

Minimum Capacity for Stage 1 = 1,701 m^3/day

Rounded to = 1,700 m^3/day

The above capacity would accommodate slightly more than 40 units per year if growth were to occur at that rate during the first 10 years.

(b) For Stage 1 and 2

The capacity required to accommodate potential development over a 20 year period is as follows:

- Stage 1 design flows = 1,701 m^3/d

- 10 to 20 Year Potential Growth (288 units x 1.15 m^3/day) = 331 m^3/d

  Minimum Capacity for Stage 1 + 2 = 2,032 m^3/d

  Rounded to = 2,050 m^3/day

In total, 2,050 m^3/day could accommodate slightly more than 800 units of new development should real growth occur at 40 units per year over a 20 year period.

4.2.3 Approach to Staging

Wastewater treatment plants are typically constructed with the process units arranged in a series of parallel components commonly referred to as “trains”. Each train must have equal hydraulic capacity in order to maintain symmetry and proper distribution of the inflow across the process treatment units.

Physical space constraints will result in the mechanical plant facility being constructed within the footprint of the existing lagoons. This will result in a slight decrease in lagoon volume. Capacity analysis has determined that the rated capacity of the existing facilities will decrease from 1,072 m^3/day to 1,000 m^3/day.

Based on the above, the minimum capacity of the mechanical treatment facility for the 20 year period must be 2,050 m^3/day less 1,000 m^3/day which is 1,050 m^3/day. This capacity can be accommodated in three parallel trains of 350 m^3/day each with two constructed in Stage 1 and the third for Stage 2. After Stage 1 the capacity will be 1,700 m^3/day and after Stage 2 the total capacity will be 2,050 m^3/day.

4.3 Wastewater Treatment Facility Design

4.3.1 General

An increase in treatment capacity from 1,072 m^3/day to approximately 2,050 m^3/day represents nearly a doubling of the annual discharge to the Bayfield River. Field studies, as summarized in Section 2.6 of this report, have demonstrated that the existing discharge has not had an identifiable negative impact on river quality. Regardless, the significant increase in discharge annual volume and mass loadings will be such that the MECP was reluctant to permit increased loadings through the lower flow and warmer water, summer months.

The Ministry’s requirement was that annual discharges could be increased on the basis that no increase in total phosphorus loadings would occur between May 15 and October 15. The annual total loading would be allowed to increase but the additional loading would occur in the colder winter period.

4.3.2 Effluent Quality Criteria

Based on the loading constraints identified above, the following effluent quality objectives and limits were negotiated with the MECP (MECP, December 18, 2019). Appendix E includes copies of the correspondence with the Ministry.

Table 4.1 – Final Effluent Design Objectives

Final Effluent Parameter	Averaging Calculator	Concentration Objective (milligrams per litre unless otherwise indicated)
$CBOD_5$	Monthly Average Effluent Concentration	5.0 mg/L
Total Suspended Solids (TSS)	Monthly Average Effluent Concentration	5.0 mg/L
Total Phosphorus (TP)	Annual Average Effluent Concentration	0.2 mg/L
Total Ammonia Nitrogen (TAN)	Monthly Average Effluent Concentration	2.0 mg/L
Dissolved Oxygen	Monthly Average Effluent Concentration	greater than 5.0 mg/L
E. coli	Monthly Geometric Mean Density	*50 CFU/100 ml for any calendar month
pH	Single sample results	6.5 to 8.5

Table 4.2 – Concentration Limits

Final Effluent Parameter	Averaging Calculator	Concentration Limit (maximum unless otherwise indicated)
$CBOD_5$	Monthly Average Effluent Concentration	10.0 mg/L
Total Suspended Solids (TSS)	Monthly Average Effluent Concentration	10.0 mg/L
Total Phosphorus (TP)	Annual Average Effluent Concentration	0.25 mg/L
Total Ammonia Nitrogen (TAN)	Monthly Average Effluent Concentration	4.0 mg/L
E. coli	Monthly Geometric Mean Density	*100 CFU per 100 mL
pH	Single Sample Result	between 6.0 - 9.5 inclusive

* If the MPN method is utilized for *E. coli* analysis, the limit shall be 100 MPN/100 mL

Table 4.3 – Loading Limits – Warm Weather (April to November)

Final Effluent Parameter	Averaging Calculator	Limit (maximum unless otherwise indicated)
$CBOD_5$	Seasonal Average Daily Effluent	26.0 kg/day
TSS	Seasonal Average Daily Effluent	26.0 kg/day
TP	Seasonal Average Daily Effluent	0.65 kg/day
TAN	Seasonal Average Daily Effluent	10.4 kg/day

Note: Based on average discharge flow over season of 2,600 m^3/day.

4.3.3 Treatment Process Selection

(a) Processes Evaluated

Several treatment processes for the mechanical wastewater treatment plant (MWWTP) and two were examined in detail:

- A pre-fabricated Membrane Bioreactor (MBR) System.
- A Sequencing Batch Reactor (SBR) system with separate filtration facilities.

Both systems would have separate stand-alone UV disinfection facilities that, subject to evaluation at final design, would be capable of treating the combined effluent from the existing sand-filters as well as the MWWTP.

Both systems would allow peak flow diversion to Lagoon Cell 1 and the discharge of waste biosolids to a separate storage lagoon created by partitioning Cell 1.

(b) Methodology

With the assistance of manufacturers of the above processes a conceptual design for each was developed. The concepts were then compared based on the following considerations:

- Capital cost for Stage 1 and Stage 2.
- Operating costs (focus was on the relative differences).
- Treatment performance.
- Operational complexity.
- Expandability.
- Site footprint required.
- Noise and odour.
- Site work effort.
- Duration from approval to commissioning.
- Operator familiarity with the process.
- Structure durability.

(c) Results of Comparison

Table 4.4 - Comparison of MBR to SBR

Comparator	Pre-fabricated MBR	SBR + Filters
Capital Costs: - Equipment supply - Total including installation in 2021$	 $2,444,500 (2020$) $6,692,020	 $562,013 (2020$) $7,830,824
Annual operating costs	$104,505	$36,923
Total Lifecycle Cost based on 20 Years	$8,782,120	$8,569,324
Approximate Cost to expand to 2,100 m^3/day	$1,841,578	$1,931,465
Treatment performance	Exceeds MECP requirements.	Meets MECP requirements.
Operational complexity	Significant as a consequence of confined spaces.	Normal for a small mechanical WWTP.
Expandability	In our opinion the owner would be committed to the Stage 1 supplier when proceeding with Stage 2.	Multi-supplier opportunities.
Site footprint required	Less area required.	More area required, but available.
Noise and odour	Minimal because of container approach.	Tankage will be open but site is remote so risk of complaints is very low.
Site work effort	Minimal, relative to site-built.	Extensive, relative to factory assembled.
Duration from Approval to Commissioning	12 Months.	18 Months.

Comparator	Pre-fabricated MBR	SBR + Filters
Operator familiarity with process	The expectation is operators will have less familiarity with MBR. Manufacturer is prepared to train operators.	The expectation is operators will have more familiarity with SBR.
Structure durability	All metal construction – means less durable. Manufacturer notes that the use of stainless steel and HDPE liners in critical areas make their system equivalent to concrete	Concrete construction for all tankage – means more durable.

After consideration of the factors summarized above, the Municipality chose the SBR process with effluent filtration as the preferred solution. The site-built SBR is expected to have a greater capital cost but significantly less annual operating costs. On a life-cycle cost basis, breakeven would occur at approximately 20 years. Given that the plant life expectancy and operational requirement will extend well beyond 20 years the site-built approach is more cost effective.

A second consideration was the operability and durability of the two alternatives. The lower capital cost of the MBR is achieved through its pre-fabrication inside shipping containers. Equipment maintenance is made more difficult by the space constraints of the containers and the steel containers themselves would be expected to require more attention than concrete to ensure a life expectancy that needs to be decades long.

The principal advantage of the MBR system, which is potentially a superior effluent quality, was considered but, given that an SBR with effluent filtration can meet the relatively stringent quality requirements imposed by the Ministry, the MBR was rejected in favour of long-term economy and durability. The other advantages of the pre-fabricated MBR approach; smaller footprint and somewhat shorter construction period, were not considered as significant factors for the project.

4.4 Description of the Preferred Design

The preferred design will consist of the following principal components:

- The existing lagoons and sand filters. These will operate generally from April to November. Cell 2 of the lagoons will be reduced in size to accommodate the MWWTP and a small lagoon for waste biosolids from the MWWTP.

- A new headworks and flow diversion facility, complete with screening for the MWWTP that will allow peak flow diversion to the existing lagoons.
- A two train SBR facility for Stage 1 with the capability of expansion with additional trains for future stages.
- An effluent filtration facility to provide tertiary treatment of the discharge from the MWWTP.
- An ultraviolet disinfection facility to potentially treat the discharge from both the sand filters and the MWWTP. The need for disinfection of the sand filter effluent will be evaluated at the time of final design.

Subject to detailed design, it is expected that the actual outfall to the Bayfield River will remain unchanged.

Stage 1 will provide capacity for 1,700 m^3/day as an annual average flow. After Stage 2 the capacity will be 2,050 m^3/day. Discharge to the Bayfield River will become continuous, year round.

Figure 4.1 provides a generalized schematic of the overall process and Figure 4.2 presents, in conceptual terms, how the new facilities will fit into the overall site.

Figure 4.1- Process Schematic

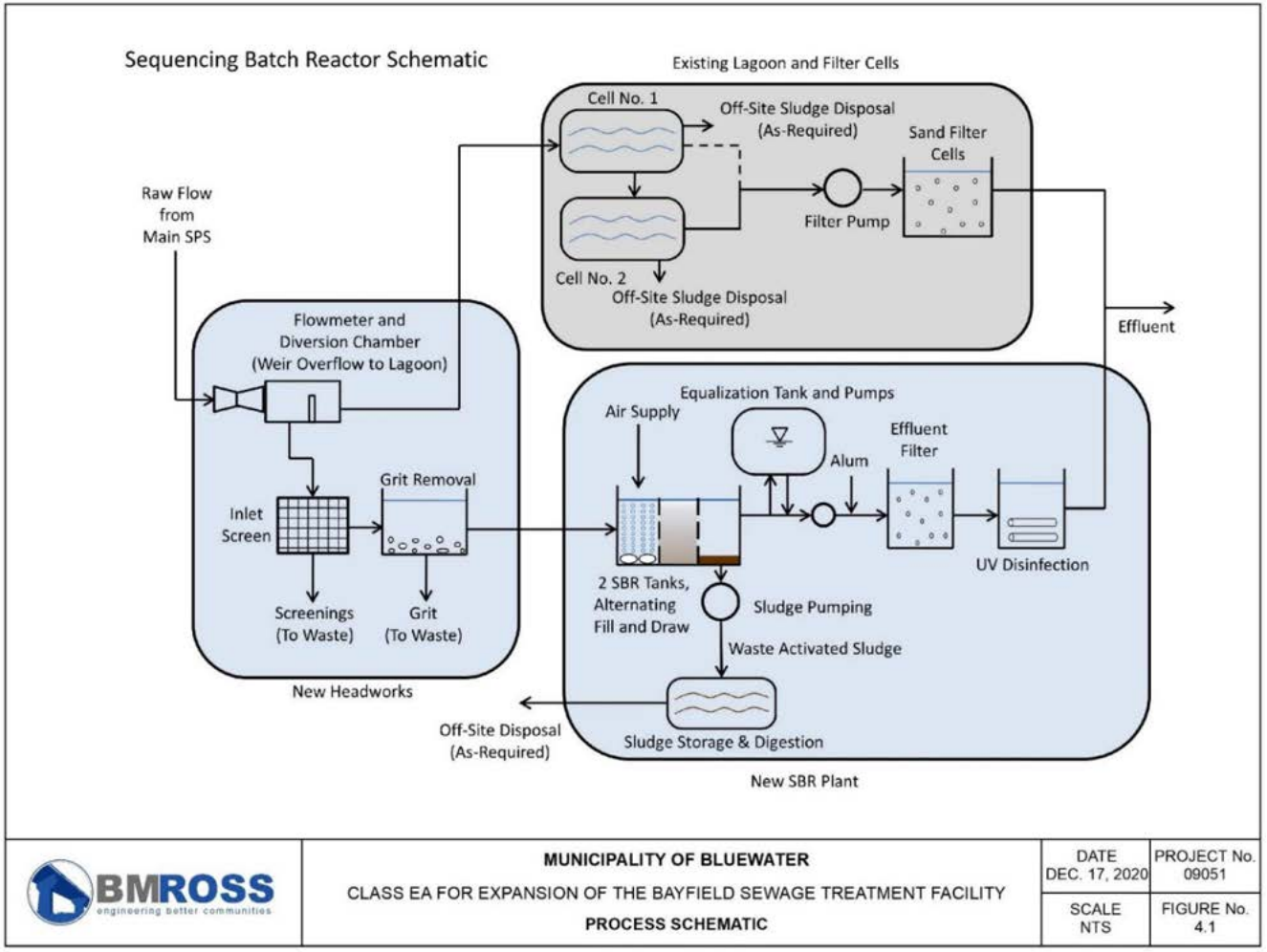
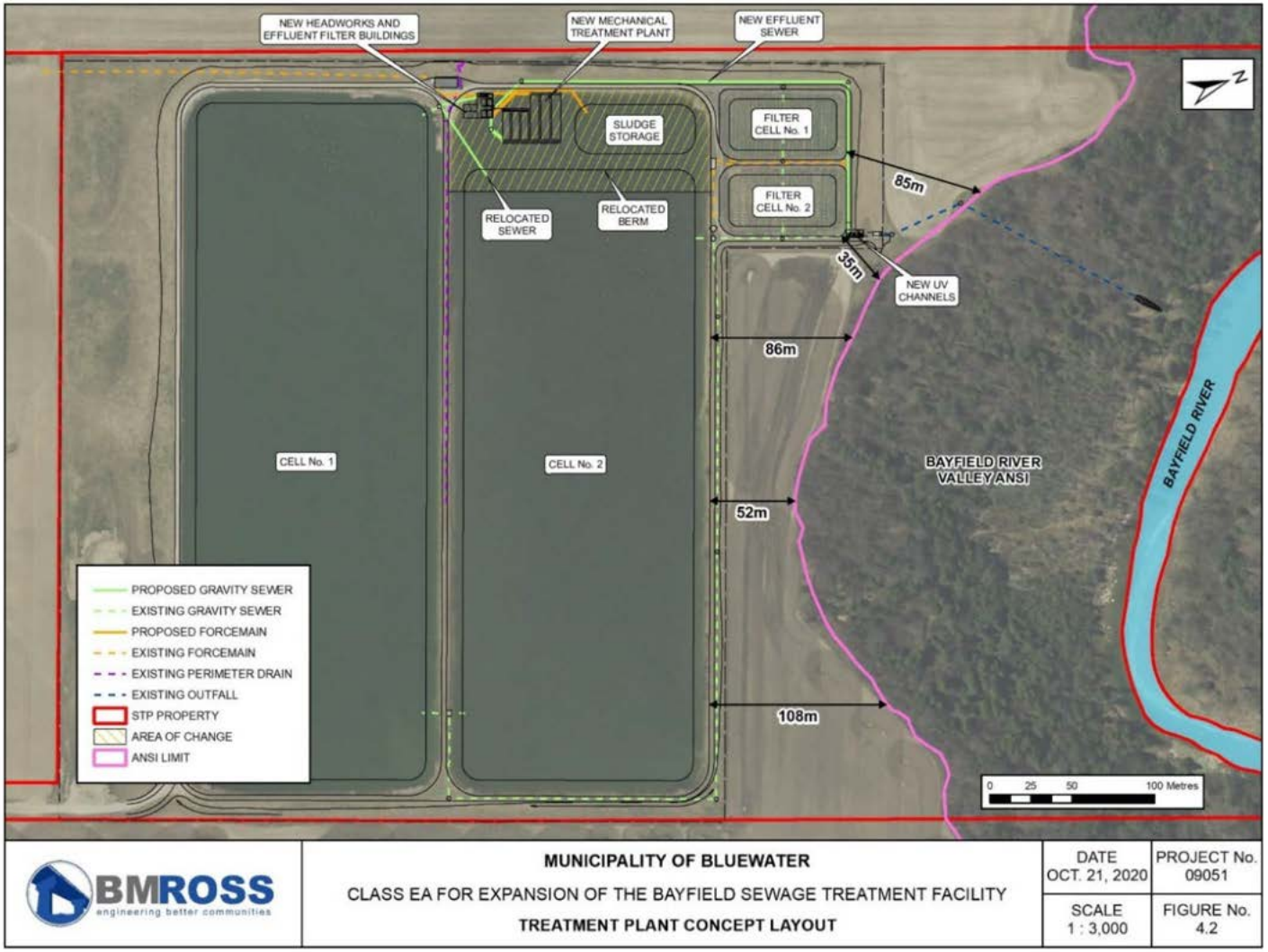


Figure 4.2 – Treatment Plant Concept Layout



4.5 Capital and Operating Costs

4.5.1 Capital Cost of Expansion

The capital cost is the initial expense to put the expanded capacity in place. The following is a summary of the probable costs based on construction in 2021. Given that no detailed design has been completed, the costs are considered to be a Class D estimate (Joint Federal Government/Industry Cost Predictability Taskforce, November 2012). A 10% variance has been added to the equipment costs and a 30% variance on the balance.

Cost Component	Probable Cost (2021$)
• Site works including power supply	$867,000
• Headworks/diversion structure including screening	$417,000
• Concrete for process units	$520,000
• Equipment supply and installation including generator	$1,070,500
• Building for blowers and filters	$962,500
• Lagoon modifications	$276,000
• UV disinfection facilities	$500,000
• Provisionals and miscellaneous	$322,900
• General and overhead	$395,000
• Allowance for design, contract administration and site review	$800,000
Sub-total	$6,130,900
• Cost estimate variance	$1,700,500
Total Probable Cost of Expansion	**$7,831,400**

The total probable cost of constructing Stage 2, as an extension of Stage 1, is **$1,932,000** in 2021$.

4.5.2 Capital Cost of Rehabilitation

In addition to the costs of expansion there are potential simultaneous costs related to rehabilitation of the existing lagoons and sand filter system. Some of the existing equipment (e.g. pumps, valves) has reached its expected life expectancy and requires replacement. The lagoon berm slopes have eroded in some locations and require re-construction. The largest rehabilitation effort will be the removal and disposal of accumulated biosolids (often referred to as sludge) from the lagoon bottom.

None of these activities have to be completed to allow expansion but most cannot be deferred beyond five years. To complete them simultaneously with the expansion provides an opportunity to reduce their cost through economy of scale.

The following is a list of rehabilitation needs and the probable costs of each including a 30% cost variance factor:

Cost Component	Probable Cost (2021$)
• Repair existing lagoon berms.	$225,000
• Rehabilitate or replace pumps, valves, and related mechanical and electrical systems	$375,000
• Biosolids removal from lagoon cells 1 and 2	$1,300,000
• General and overhead	$190,000
• Allowance for design, contract administration and site review	$313,500
Sub-total	$2,403,500
• Cost estimate variance	$721,000
Total Probable Cost of Expansion	**$3,124,500**

4.5.3 Operating Costs

Annual operating costs will increase because the mechanical and process complexity of the new facilities will be greater than that of the existing lagoons and sand filters. Energy costs will also increase significantly. The expected Year 1 operating costs, extra to current costs, is approximately **$60,000** (2021$).

4.6 Financing

4.6.1 Principles

The general principle for allocating both the capital and operating costs is that -- only benefitting properties will pay. Proposed details are as follows:

1. The cost of expansion will be charged to new customers through Development Charges or special charges for existing development converting from septic systems to communal sewage servicing.

2. Existing commitments will be considered as new customers when actual development proceeds.

3. Costs of on-going I-I reduction efforts, including related sewer system rehabilitation, will be charged to all connected customers through the normal sewage service rate.

4. Costs of rehabilitation of the existing treatment works (e.g. lagoon biosolids removal) will be charged to all connected customers through the normal sewage service rate.

The specific charges will be developed and presented through the standard processes of By-law development and approval.

4.6.2 Cost Impacts

The Municipality currently charges new development the costs of municipal services attributable to new development. Development charges for wastewater services vary from community to community and for the type of development. Currently the charge in Bayfield is approximately $7,500 for detached and semi-detached residential buildings. The charge is levied simultaneously with Building Permit approval.

It is expected that the capital costs of expansion will be financed through a combination of borrowing and the application of existing reserves contributed by previous development. Based on current borrowing costs and repayment over a 20 year period, the existing $7,500 per unit development charge will need to increase to approximately $17,200 for a detached or semi-detached home.

As noted above, currently development charges are paid coincident with the issuance of the building permit. Going forward the Municipality may choose to require full or partial payment of the charge at the time of development approval. This would be done to reduce overall interest expenses and also to reduce the risk of approved development not proceeding to construction within a reasonable time period.

Approximately $3.1 million of rehabilitation work and increased operating costs associated with the new facility will be financed through a combination of existing reserves and borrowing. Assuming all of this work is done simultaneously with capital expansion and financed through the normal sewage service rate, the estimated impact on the current rate will be in the order of a $35 (2021$) increase to the quarterly sewage bill.

5.0 IDENTIFICATION OF POTENTIAL IMPACTS

5.1 General

The preferred alternative is to expand wastewater treatment capacity by constructing a MWWTP to operate in parallel with the existing lagoon and sand filter system. All construction will take place at the existing treatment facility site and generally within the existing facility footprint.

Considering the various criteria identified in Section 3 of this report, and additional comments received during the public consultation program, a number of specific environmental elements were identified which could be adversely affected by implementation of the preferred alternative. The impact of construction of the proposed WWTF expansion, on the identified environmental elements, is summarized below. Specific mitigation measures for the identified impacts are also presented in more detail below. These impacts are directly attributable to construction related activities, which are generally short-term in nature and of limited duration. Impacts of a greater magnitude and duration (water quality impacts to the receiving watercourse) are also discussed.

5.2 Construction-Related Activities

Below is a list of anticipated construction activities that will be associated with the proposed plant expansion.

- Contractor mobilization to the site
- Establishment of temporary storage areas
- Installation of sediment and erosion control measures
- Modifications to existing lagoon cell
- Removal of sludge and placement of fill
- Temporary stockpiling of material
- Dewatering, if required
- Temporary storage of fuels
- Construction of mechanical treatment facility
- Installation of additional piping to connect to existing outfall
- Installation of UV disinfection
- Construction traffic
- Site restoration (seeding/topsoil)

Given that a majority of the proposed site work, as noted above, will be limited to the existing site, and will not encroach on adjacent natural areas, there were few impacts identified with the proposed expansion plan.

Based upon the findings of the general impact assessment (Table 3.2), the environmental effects analysis (Table 3.3), and the detailed project review, the project has the potential to impact upon a limited number of specific environmental components. They are as follows:

- Natural environment.
- Community level impacts.
- Technical environment.

The potential impacts to each identified feature are described in detail within this section of the report. Measures designed to minimize the impacts are also presented. The determination of appropriate mitigation measures incorporated an assessment of previous studies and investigations, site specific requirements and an evaluation of a broad range of alternatives. This assessment was based on consideration of three broad approaches to impact mitigation; avoidance, minimization of adverse effects, and compensation.

5.2 Natural Environment

5.2.1 Aquatic Habitat

Expansion of the existing treatment facility has the potential to result in negative impacts to the receiving watercourse (Bayfield River). Currently the facility discharges to a side channel of the river which extends for several hundred metres before merging with the main channel of the river.

As discussed within Section 2.6 of this report, two separate investigations have been undertaken of the river in the vicinity of the outfall in order to gain a general understanding of the current aquatic habitat present within this reach. Both of these assessments confirmed that the aquatic habitat of the river appears to be unaffected by existing discharges associated with the wastewater treatment facility. When considered in conjunction with the excellent treatment performance of the existing facility (consistently meeting provincial criteria), and the planned performance criteria for the expanded facility, particularly the decision to extend discharge into the cold weather months, it is unlikely that increased discharges will adversely affect the aquatic habitat of the Bayfield River.

5.2.2 Terrestrial Habitat

The existing Bayfield WWTF is located immediately adjacent to the Bayfield River ANSI, which is a provincially significant natural feature. Construction activities associated with the proposed expansion should pose no risk to terrestrial habitat located adjacent to the facility.

As proposed, construction activities will be contained within the limits of the existing facility and there will be no encroachment into the ANSI limits, or beyond the current limits of the facility. The existing outfall structure, which extends from the WWTF to the side channel of the river, will remain undisturbed. There are no natural features within the limits of the site that will be negatively impacted by construction of the mechanical plant. A series of protective measures would be incorporated into construction plans to

ensure mitigation of any possible impacts. As well, all lands disturbed by the construction process will be fully restored.

5.3 Social Environment

5.3.1 Disruption Caused by Construction

Construction required for the expansion of the existing WWTF will be fully contained within the existing facility site. As a result, only minor noise and dust disturbances are anticipated during the construction phase. The mitigation measures presented in Table 5.2 of this report will also be implemented to minimize other construction-related impacts (e.g. increased traffic adjacent to the facilities during construction). There are no residences located in close proximity to the site with the closest being approximately 700 metres to the south. Construction traffic may present some localized impacts, as the access lane to the facility is located off of Mill Road and adjacent to a residence fronting on the roadway.

5.3.2 Financial Impacts to Residents

Section 4.6 described the principles proposed to be used for cost allocation. The principles and their application are described as follows:

- The costs of expansion will be paid by new development.
- The costs related to rehabilitation and operation will be paid through the sewage service rate.
- A reserve fund has been established to pay for capital costs associated with the project. On-going development contributes to these reserves.
- A reserve fund is in place to contribute to the costs of rehabilitation.
- New development proposed for lands that are or can be serviced following completion of this project will be subject to development charges.
- New development within the existing serviced area will also be subject to development charges.
- Potential borrowing for capital will take into account financial impacts when establishing debt repayment periods.
- Grant programs and other Federal/Provincial Infrastructure funding programs will be aggressively pursued by municipal staff to help offset capital costs associated with the project.

The Municipality believes the above noted measures will provide some financial mitigation to residents.

5.3.3 Health and Safety and the Environment

The planned works involve construction work that has the potential to adversely impact upon the health and safety of the workers, the general public and existing environmental features. Construction activities associated with the implementation of the preferred alternative will therefore be carried out in accordance with industry standards for health and safety. To this end, a series of measures will be prescribed in contract documentation to minimize the risks posed by construction.

The remedial measures set out in the contract documentation include those defined by the Ontario Provincial Standard Specifications and any special provisions deemed appropriate given the proposed construction technique. In general, the provisions will stipulate that the Contractor shall conduct operations in a manner which reduces the risk of detrimental effects to the environment.

5.4 Mitigation of Impacts

Table 5.1 – Summary of Proposed Mitigation Measures (General Construction Impacts)

Construction Activity	Planned Mitigation
Refuelling and Maintenance	- Identify suitable locations for designated refuelling and maintenance areas. - Restrict refuelling or maintaining equipment near watercourses. Non-spill equipment is required within 30 m of any watercourse. Fuelled equipment shall be stored overnight not less than 30 m from the edge of water. - Avoid cleaning equipment in watercourses and in locations where debris can gain access to sewers or watercourses. - Prepare to intercept, clean-up, and dispose of any spillage which may occur (whether on land or water).
Disposal	- Dispose of all construction debris in approved locations. - Avoid emptying fuel, lubricants or pesticides into sewers or watercourses.
Pesticides	- Coordinate the use of pesticides and herbicides with affected landowners and the local pesticide control officer.
Work in Sensitive Areas	- Avoid encroachment on sensitive natural areas. Do not disturb habitats of rare or endangered species.

Construction Activity	Planned Mitigation
Dust Control	- Cover or wet down dry materials and rubbish to prevent blowing dust and debris. - Avoid the use of chemical dust control products adjacent to wetlands and watercourses.
Site Clearing	- Protective measures shall be taken to safeguard trees from construction operations. - Equipment or vehicles shall not be parked, repaired or refuelled near the dripline area of any tree. Construction and earth materials shall also not be stockpiled within the defined dripline areas. - Minimize stripping of topsoil and vegetation.
Sedimentation/ Erosion Control	- Erect sediment fencing to control excess sediment loss during construction period. - Protect watercourses, catch basins and pipe ends from sediment intrusion. - Complete restoration works following construction.
Noise Control	- Site procedures should be established to minimize noise levels in accordance with local by-laws. - Provide and use devices that will minimize noise levels in the construction area. Night time or Sunday work shall not be permitted, except in emergency situations.

6.0 PUBLIC CONSULTATION

6.1 General

Public consultation is an integral component of the Class EA process. Public consultation allows for an exchange of information, which assists the proponent in making informed decisions during the evaluation of alternative solutions. During Phases 1 and 2 of the study process consultation was undertaken to obtain input from the general public, stakeholders and review agencies that might have an interest in the project. Phase 3 of the process provided additional information to identified stakeholders regarding detailed design alternatives associated with the preferred alternative. The components of the public consultation program employed during the Class EA study are summarized in this section of the screening report and documented in Appendix B. Comments received through the consultation program and related correspondence are also discussed below and documented in the appendix.

6.2 Initial Public Notice

The Municipality issued a Notice of Study Commencement on September 21, 2011 to introduce the Class EA study and summarize the study being undertaken, the problems that had been identified and the alternative solutions being examined. The notice was placed in the September 21 and September 28, 2011 editions of the Clinton News Record. Individuals were given the opportunity to provide initial comments on the project until October 21, 2011. Copies of the newspaper notice are included in Appendix B of this report.

Contents:	General study description, summary of proposed works, key plan
Issued:	September 21, 2011
Placed In:	Clinton News Record (September 21 and September 28, 2011)
Input Period:	Concluded October 21, 2011

One response was received as a result of the Notice. A resident of Bayfield questioned the volume of wastewater flows to the facility and whether existing residents would have to pay for the expanded capacity proposed for the plant. They also asked to be added to the mailing list for the EA process.

6.3 Review Agency Circulation

6.3.1 Project Initiation Phase

Input into the Class EA process was solicited from government review agencies and project stakeholders by way of direct mail correspondence. Agencies that might have an interest in the project were sent an information package detailing the nature of the project and an outline of the environmental assessment process being undertaken. The information was circulated to 12 review agencies on September 20, 2011. Appendix C

contains a copy of the information that was circulated to the review organizations and a list of the agencies that were requested to comment on this project. Table 6.1 summarizes the comments received.

Table 6.1 – Initial Consultation Phase: Agency Responses

Review Agency	Comments	Action Taken
Ministry of Natural Resources and Forestry (MNRF) October 3, 2011 (via mail)	- Noted that the WWTF is located adjacent to the Bayfield River ANSI and that a number of species at risk are potentially present within the ANSI area that could be impacted by the project. Suggested that habitat surveys be completed to confirm the presence/absence of significant species.	- Technical Memo forwarded to MNR providing additional details regarding effluent quality and potential impact to aquatic SAR habitat.
Bayfield Area Chamber of Commerce October 15, 2011 (via mail)	- Concerned with potential water quality problems to Beach and River which may impact tourism in the community.	- Added to circulation list.
Bayfield Watershed Study Group October 24, 2011 (via email)	- Bayfield Watershed group associated with ABCA and would like to be added to the Class EA process as an interested party.	- Added to circulation list.

6.3.2 Pre-Consultation with MECP

Prior to initiation of the formal Class EA process, a pre-consultation meeting was held with the Ministry of Environment and Climate Change, now the Ministry of Environment Conservation and Parks (MECP), to review the Class EA study framework and to establish parameters for conducting the study. The meeting was held on April 19, 2011 and was attended by staff from the Municipality of Bluewater, BMROSS, the Huron County Planning Department and the Ministry. The group reviewed the current operation of the WWTF and discussed what studies would be required to determine effluent quality parameters for an expanded facility. Following completion of the meeting, additional correspondence occurred between project engineering staff and MECP surface water specialists in identifying an accepted level of treatment for the project.

6.4 Aboriginal Consultation

6.4.1 Project Initiation Phase

A number of federal and provincial agencies were contacted at the beginning of the Class EA process to determine if there was an aboriginal interest in the project study area. A response was received from one branch of Indian and Northern Affairs Canada (INAC) recommending that a number of aboriginal communities located in the general vicinity of the project study area be circulated additional project information. An information package was subsequently prepared and was circulated to nine aboriginal communities and organizations. No responses were received as a result of the initial consultation phase. A summary of aboriginal consultation efforts is included within Appendix D.

6.4.1 Project Update

In June of 2015, a project update letter was circulated to the nine Aboriginal Communities that were initially contacted regarding the project. The letter summarized the general components of the project and provided an update on the status of the Class EA. An Aboriginal response form was provided along with a self-addressed stamped envelope. A summary of the feedback received as a result of the second round of consultation is included in Table 6.2.

Table 6.2 – Aboriginal Consultation: Phase 3 Class EA

Agency	Comment
Historic Saugeen Métis July 7, 2015 (via mail)	- Aboriginal response form received indicating that they would like to receive additional information on the project. Information from the Public Information Centre (PIC) was forwarded for review.
Kettle and Stony Point First Nation September 28, 2015 (via mail)	- Correspondence received indicating an interest in the project. Information from the Public Information Centre (PIC) was forwarded for review.
Chippewas of the Thames First Nation October 2, 2015 (via mail)	- Correspondence received indicating they had no concerns with the project but would like to continue to stay informed as the study progresses.

No additional correspondence was received after the PIC information was forwarded for review. Additional information, if received, will be forwarded as the study progresses.

6.5 October 31, 2015 Public Information Meeting

A Public Information Centre (PIC) was held on October 31, 2015 at the Bayfield Community Centre from 10:00 a.m. until 12:30 p.m. A number of display boards were arranged around the room explaining the MEA Class EA process and summarizing studies and investigations completed to date in conjunction with the EA. A formal presentation by project engineering and planning staff, provided a summary of the progress completed to date on the project and provided members of the audience an opportunity to ask questions.

The general purpose of the meeting was to provide audience members with the following:

- A summary of the MEA Class EA process.
- A summary of the progress completed to date on the project.
- A description of the alternatives being considered by the Municipality to address the deficiencies present at the existing facility.
- A tentative timeline for completion of the Class EA.

Approximately 40 residents and stakeholders attended the meeting. A summary of input received as a result of the meeting is included below. A copy of the presentation material is included within Appendix B.

Table 6.3 – Summary of Public Comments: 1st Public Information Centre

Agency/Individual	Comments/ Concerns	Response/Action Taken
Bayfield Resident October 31, 2015 (Comment Sheet)	- Asked to receive a copy of the presentation material from the meeting.	- Copies of the presentation material forwarded by email following the meeting.
Bayfield Resident October 31, 2015 (Comment Sheet)	- Quite upset with how Bluewater has managed the facility since constructed in 2000. - Have contacted the project engineers to advise that they reserve their right to “bump up” the project, should they choose. - Will prepare a more detailed response at a later date.	- Comments noted and filed.
Bayfield Resident November 17, 2015 (email)	- Provided news article about treatment technology that harvests a hydrogen-based gas from manure as an alternative energy source. Wondered if	- Responded to inquiry indicating that size of facility and strength of

Agency/Individual	Comments/ Concerns	Response/Action Taken
	it could be used at the Bayfield WWTF.	sewage would mean the technology would be costly to develop and not very effective.
Bayfield Resident November 17, 2015 (email)	- Questions about additions to waste stream such as leachate and septage? - Is E-coli removed before discharge? - Are there treatment systems that are digesters that capture methane gas? - What are the current cutting edge/leading technologies for sewage treatment?	- Responses to the inquiries forwarded by email.
Bayfield Resident November 17, 2015 (email)	- Questions regarding peak flows within the collection system and how the Bayfield system is designed to deal with seasonal flows. - Questioned if stormwater runoff from roads was to be directed to the sewers, could the system handle the flows?	- Responses to the inquiries forwarded by email.
Bayfield Resident December 11, 2015 (via Registered Mail)	- Submitted a seven page hand written letter including numerous questions regarding the engineering details of the project.	- Arranged for a meeting with Bluewater Staff to review the concerns itemized in the letter.

6.6 Meeting with Concerned Resident – April 26, 2016

On April 26, 2016 staff from the Municipality of Bluewater and BMROSS met with a concerned Bayfield resident at the Bluewater Municipal Office in Zurich. The meeting was arranged at the request of the resident to review concerns related to the Class EA to expand the Bayfield WWTF. A number of questions and concerns had been forwarded to BMROSS in advance. These were discussed in more detail during the course of the meeting.

The resident expressed significant concerns with the historic operation and management of the facility by the Municipality and was concerned with how the proposed expansion would be paid for. The individual felt that capacity within the system had been given to additional developments without sufficient payment and that was the main reason that the plant needed expansion. They didn't think that existing Bayfield residents who paid for the original plant, should have to pay for the proposed expansion.

Following the meeting, a formal response was forwarded to the resident summarizing the discussions held during the meeting. Formal meeting notes can be found within Appendix B.

6.7 Class EA Phase 3 Consultation Efforts

6.7.1 Review Agency and Aboriginal Circulation: Phase 3 Class EA

Once a preliminary preferred Alternative for expansion of the Bayfield WWTF was selected, input into the review of detailed design alternatives was sought from government review agencies and project stakeholders by way of direct mail correspondence. Agencies and aboriginal communities that had previously expressed an interest in the project were sent an information package detailing the preferred project alternative and additional details regarding the design alternatives being considered. The information was circulated to ten indigenous communities and organizations, and ten provincial/federal review agencies on October 22, 2020. Appendix C contains a copy of the information that was circulated to the review organizations and a list of the agencies that were requested to comment on this project. Table 6.4 summarizes the comments received.

Table 6.4 – Summary of Agency and Aboriginal Comments: Phase 3 Class EA

Agency/Individual	Comments/ Concerns	Response/Action Taken
Fallon Burch, Consultation Coordinator, COTTFN (letter via email)	- Project is located within the Chippewas of the Thames First Nation (COTTFN) Big Bear Creek additions to reserve land selection area and COTTFN's traditional territory. - After reviewing information, have minimal concerns and no comments on preferred alternative. - However, if there are substantial changes to the project, they want to be notified.	- Information noted and added to Aboriginal Consultation Log.
Ian Koetsier, Engineering Coordinator, Central Huron November 18, 2020 (via email)	- Acknowledged receipt of our correspondence regarding the WWTF EA. - In 2016 Council decided not to join with Bluewater in the WWTF expansion. - There has been no change in their position.	- Comments noted and filed.

6.7.2 October 24, 2020 Public Information Meeting

A second public information meeting was held on October 24, 2020 to present details of the preferred alternative to the public and to present the results of additional progress completed on the Class EA since the 2016 public meeting. The Public Meeting Notice was published in local newspapers, posted on the Municipal website, and emailed to the Class EA Consultation List compiled during the course of the Class EA.

The meeting was held virtually, due to health concerns related to Covid-19, from 10:00 a.m. until 11:30 a.m. Presentation material was posted in advance of the meeting, on the municipal website, to allow members of the public an opportunity to review the material before the meeting. The presentation was replayed at the beginning of the virtual meeting and then questions were accepted from residents who had pre-registered to participate during the meeting. The general purpose of the meeting was to provide audience members with the following:

- A summary of the MEA Class EA process.
- A summary of the progress completed to date on the project.
- A description of the preferred alternative being considered by the Municipality to address the deficiencies present at the facility.
- Information on anticipated project costs and financing options.
- A tentative timeline for completion of the Class EA.

Six residents pre-registered for the meeting and asked questions of the presenters. Members of the public who didn't want to ask questions were able to view the meeting through the Municipality's website. Comments and questions were received until November 30, 2020. A question and answer document was compiled which summarizes feedback received from residents following the posting of the presentation material on the municipal website. A copy of the presentation material, meeting notes, and Q & A document are included within Appendix B.

7.0 CONCLUSIONS AND PROJECT IMPLEMENTATION

7.1 General Conclusions

Raw sewage flows to Bayfield's existing wastewater treatment facility are exceeding the rated capacity of the system. Already approved growth will make the situation worse.

Based upon an assessment of the ability of six different alternative solutions to resolve the defined problem at the existing Wastewater Treatment Facility, the following conclusions have been reached:

- Alternative 3, which is expansion of the existing treatment facility, represents the preferred strategy for increasing treatment capacity at the existing WWTF. Implementation of this option would result in a 90+% increase in plant capacity, to be constructed in stages over time, through the addition of a mechanical wastewater treatment plant to operate in parallel with the existing facilities.

- The expansion approach will minimize disruptions to the existing operations while expansion is occurring.

- Based on the performance of the existing treatment facilities, an efficiently designed and operated expansion, using a parallel mechanical facility, will provide Bayfield with additional cost-effective wastewater treatment.

- An expansion of the existing treatment facility will permit the use of existing infrastructure for collection and treatment activities while minimizing potential impacts to the natural environment by limiting construction activities to the existing WWTF site.

- The preferred solution allows continued growth and development of the community consistent with the Official Plan, as well as providing wastewater treatment for existing servicing commitments. The preferred solution, utilizing the existing treatment facility with the addition of a mechanical plant with UV disinfection, will expand plant capacity while maintaining the existing high level of treatment.

7.2 Class EA Project Schedule

The recommended proposed WWTF expansion is considered a Schedule "C" project under the terms of the MEA Class EA document. This project is approved subject to the completion of an Environmental Study Report.

7.3 Final Public Consultation

A Notice of Completion, dated March 10, 2021, was circulated to local residents, stakeholders and government review agencies (refer to Appendix C). The notice

identified the preferred alternative, detailed the availability of the Environmental Study Report and provided the basis for appeal of the selected alternative solution.

A request may be made to the MECP for an order requiring a higher level of study (i.e. requiring an individual/comprehensive EA approval before being able to proceed), or that conditions be imposed (e.g. require further studies), only on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights. Requests on other grounds will not be considered. The Notice was advertised in the March 10, 2021 and March 17, 2021 issues of the Clinton News Record and Lakeshore Advance and was also posted on the Municipal website and was mailed to the EA contacts list. The formal 30-day review period for the Notice concluded on April 9, 2021.

7.4 Approvals

7.4.1 Ontario Water Resources Act

The works associated with the preferred alternative are subject to the “Ontario Water Resources Act”. Consequently, the project cannot proceed without the issuance of an amended Environmental Compliance Approval (ECA) from the MECP for the WWTF. The ECA will define how the project must be implemented and operated.

7.4.2 Ministry of Natural Resources and Forestry

The Ontario Ministry of Natural Resources and Forestry regulates land uses within provincially significant natural areas, such as the Bayfield River ANSI located adjacent to the existing WWTF. There are also concerns related to the potential presence of Species at Risk within the Bayfield River system. Consultation with MNRF staff will be ongoing to address these potential concerns prior to moving forward with implementation of the preferred alternative.

7.5 Environmental Commitments

As an outcome of this Class EA planning process, the Municipality is committed to carrying out the following measures to mitigate the potential environmental impacts of project implementation:

- Submission of relevant applications to the MECP and MNRF in conjunction with the proposed works, as well as implementation of all conditions issued in association with the subsequent approvals.

- Implementation of standard mitigation measures during the construction phase of the project, to minimize construction related impacts to the natural and social environments.

- Expansion of the facility within the existing site’s footprint, to minimize impacts to adjacent natural features.

- Continued remediation efforts within the Bayfield sanitary collection system to address inflow and infiltration issues.

- That proposed financing approaches, described within Section 5.0 of this report, be implemented in conjunction with the project.

7.6 Project Schedule

No specific date has been established for the completion of the expansion. Final design, approvals, tendering and construction will require 18 to 24 months to complete**.**

8.0 PROJECT SUMMARY

This report documents the Municipal Class Environmental Assessment process conducted to identify the best means to address deficiencies with the Wastewater Treatment Facility (WWTF) serving the community of Bayfield.

The Class EA process was initiated in September 2011 when flows to the WWTF began to increase and, given the historical growth within the community of Bayfield, means to address a potential exceedance of hydraulic capacity at the plant were required in order to allow for continued growth within the community.

A range of alternatives was identified to address the capacity deficiency. These included:

- reducing sewage flows from the community,
- limiting community growth,
- expanding the existing facility,
- construction of a new facility,
- re-rating the existing facility, and
- doing nothing.

- Following a comprehensive review of the alternatives, in which the potential impacts associated with each of the alternatives was examined in relation to various components of the environment Alternative 3, expansion of the existing facility, was selected as the preferred study alternative. A general description of the preferred facility is as follows:The existing lagoons and sand filters. These will operate generally from April to November. Cell 2 of the lagoons will be reduced in size to accommodate the MWWTP and a small lagoon for waste biosolids from the MWWTP.
- A new headworks and flow diversion facility, complete with screening for the MWWTP that will allow peak flow diversion to the existing lagoons.
- A two train SBR facility for Stage 1 with the capability of expansion with additional trains for future stages.
- An effluent filtration facility to provide tertiary treatment of the discharge from the MWWTP.
- An ultraviolet disinfection facility to potentially treat the discharge from both the sand filters and the MWWTP. The need for disinfection of the sand filter effluent will be evaluated at the time of final design.

Following selection of Alternative 3, Phase 3 of the Class EA process was implemented, which involved the review of detailed design alternatives associated with the preferred alternative. This phase of the process included additional consultation with agencies, aboriginal communities, and project stakeholders, as well as a second public information meeting to inform Bayfield residents and members of the general public about the preferred solution and the MEA Class EA process.

A series of mitigation measures were identified in conjunction with the project to minimize potential impacts associated with implementation of the preferred alternative. These have been incorporated into the planning for this project.

The proposed activity is a Schedule C undertaking under the terms of the Municipal Class Environmental Assessment process. The Municipality of Bluewater intends to proceed with the implementation of this project upon completion of the Class EA investigation and following receipt of necessary approvals.

All of which is respectfully submitted.

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Steve Burns, P. Eng.

Per _____
Kelly Vader, MCIP, RPP
Environmental Planner

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(n.d.).

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APPENDIX A
WATER QUALITY ANALYSIS

2010 BIOLOGICAL MONITORING REPORT FOR THE BAYFIELD RIVER IN THE VICINITY OF THE BAYFIELD SEWAGE TREATMENT PLANT

MUNICIPALITY OF BLUEWATER
HURON COUNTY

Prepared for:

THE MUNICIPALITY OF BLUEWATER

By:

John Westwood

London, Ontario

August 2010

INTRODUCTION

The Bayfield Sewage Treatment Plant (STP) site was constructed in 2002 to service the Village of Bayfield when sanitary sewers were installed within the community. Since that time, several large seasonal campground developments, located immediately adjacent to Bayfield, were connected to the system. As well, significant infilling has occurred within the community along with several large residential subdivision developments. The STP is now nearing it's design capacity and needs to be expanded to service additional infilling within the community and capacity committed to existing residential subdivision developments.

Macroinvertebrate monitoring was conducted in the Bayfield River on April 5, 2010 to document water quality in the river in the vicinity of the outlet of the Bayfield STP. This information will provide background water quality information for the planning processes involved with expanding the sewage system.

MATERIALS AND METHODS

To assess the water quality (ability of the water resource to support aquatic life) of the Bayfield River in the vicinity of the Bayfield STP, three sample sites were established (Figure 1). The final effluent from the STP is discharged on the south side of the river to a side channel, which meanders approximately 430m in a northerly direction where it joins the main channel of the Bayfield River. The flow from the river would inundate portions of this side channel during flood events. Site 1 was located in the main channel of the Bayfield River approximately 100m upstream from the discharge structure of the STP. Site 2 was located approximately 640m downstream from Site 1 and approximately 210m downstream of the confluence of the side channel. Site 3 was located approximately 1km downstream from Site 1.

Courtesy of Huron County 2007

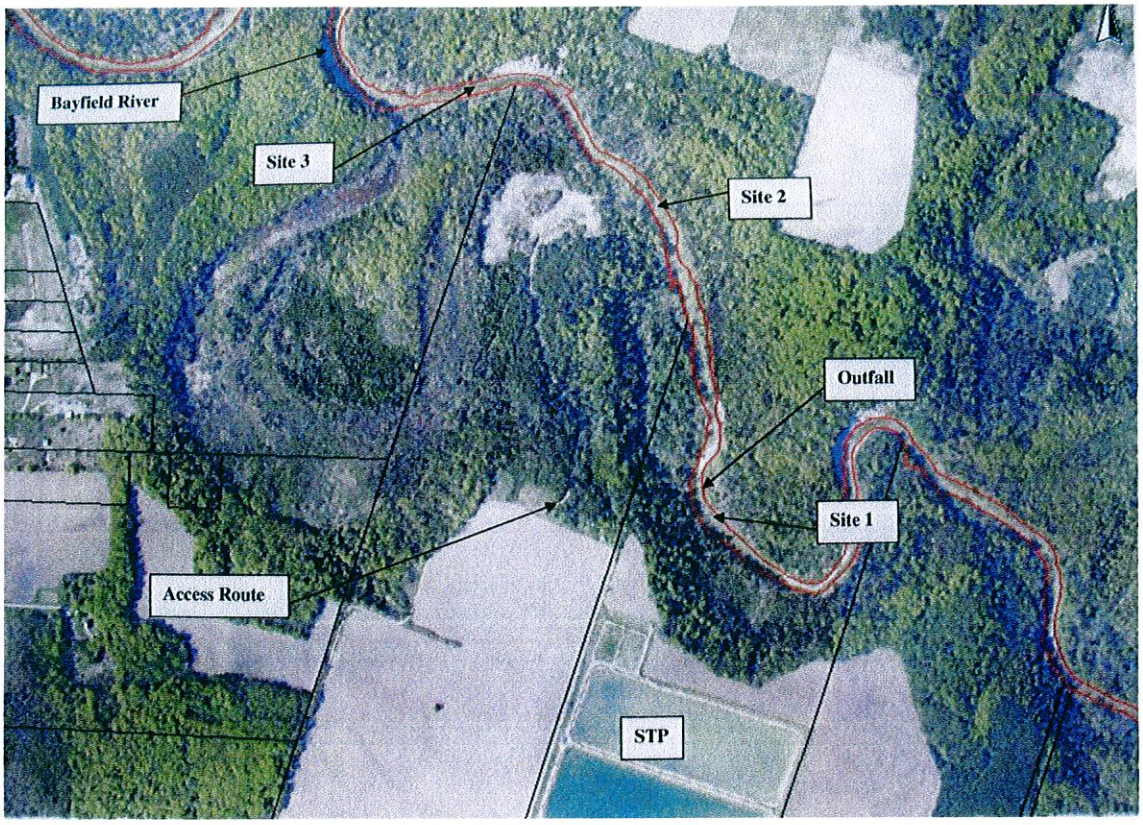

Figure 1: Location of biological sample Site 1, Site 2 and Site 3 in the Bayfield River in the vicinity of the Bayfield Sewage Treatment Plant, April 5, 2010.

Sample Site Locations

Site 1- 43° 33' 3 8" N 81° 39' 13" W

Site 2- 43° 34' 1" N 81° 39' 22" W

Site 3- 43° 34' 7" N 81° 39' 34" W

Benthic macroinvertebrates were collected on April 5, 2010. Standard BioMAP sampling procedures were used to sample the benthic fauna (Griffiths 1999). A Surber sampler (0.09 m^2) was used to collect the quantitative samples. Two samples were collected at each site, sample 1 on the right side of the riffle and sample 2 on the left side looking upstream. Surber samples were taken at a water depth of 30cm to 35cm at all the sites. A 30 minute qualitative sample was also collected at each site by employing a D frame dip net with 600μm mesh. The macroinvertebrates collected were live picked using forceps and white enamel trays. The processed samples were preserved in 80% ethanol and retained for further study. The BioMap (d) and (q) Water Quality Index's (WQI) were used to provide a measure of water quality.

Observations of stream characteristics, plant, algae growth, fish and wildlife were noted. Water temperature was measured with a Taylor mercury pocket case thermometer. Conductivity and pH were measured at each sample site with a Hanna HI 98129 meter. A Hanna HI 3810 dissolved oxygen test kit was used to measure dissolved oxygen levels at each site.

RESULTS AND OBSERVATIONS

The Bayfield STP is located on the North Pt. of Lot 7, Bayfield Concession, within the Stanley Ward of the Municipality of Bluewater. The final effluent from the STP is discharged on the south side of the river on a seasonal basis to a side channel, which meanders approximately 430m in a northerly direction where it joins the main channel of the Bayfield River. The STP was not discharging during the macroinvertebrate sample collection. The stream flows through a steep forested riparian valley area and it has a cobble rock and stone substrate. Site 1 was located in the Bayfield River approximately 100m upstream from the discharge structure. The bankfull width was documented as 45m wide at Site 1 and water depths ranged from 5cm to 0.5m deep. Site 2 had a bankfull width of 61m and water depths ranged from 5cm to 0.5m deep. The bankfull width at Site 3 was 63m and the water depth ranged from 5cm to 0.7m deep.

The substrate of the river at all sample sites was composed of cobble/rock and stones. A light layer of marl (calcium carbonate) covered the larger rocks and cobble.

The field measurements taken during the study are tabulated in TABLE A:

TABLE A: Temperature, dissolved oxygen, conductivity and pH measurements documented April 5, 2010 in the Bayfield River. All measurements were taken between 2:00pm and 3:00pm.

	Site 1	Site 2	Site 3
Sample Date: April 5, 2010			
Water Temperature °C	17	15	15
Dissolved Oxygen mg/L	8.1	8.0	8.0
Conductivity μS/cm.	546	563	560
pH	8.2	8.2	8.2

Dissolved oxygen levels meet the Provincial Water Quality Objectives (PWQO) for cold water biota. The pH levels are characteristic of watercourses located in areas of limestone bedrock in Southern Ontario. The PWQO for pH is a range between 6.5 and 8.5. Conductivity levels are normal at all three sites. Conductivity values for similar type streams in Huron, Bruce and Grey Counties are < 650μS/cm.

The filamentous green alga *Cladophora* was present but sparse at all the sample sites, covering up to 10% of the cobble/rock stream substrate. It was mainly present on the larger rocks. The filament length of the *Cladophora* was short, <1cm long.

Fish were not sampled during the study but observations of their presence were documented. There were unidentified minnows/shiners present at all the sites.

Macroinvertebrate densities (number of organisms per 0.09 m^2) and the number of taxa per sample are listed in TABLE B. The total number of different taxa per site (species richness) is listed in TABLE C. The number of taxa collected at all sites totaled 96. Midge larvae were an abundant group, comprising 22% of the total number of taxa

collected and 48% of the individuals. Midge accounted for 56%, 30% and 62% respectively of the total individuals at each site. Caddisflies were also abundant at all sites and comprised 18% of the total number of taxa and 28% of the total number of individual organisms. They comprised 25% of individuals at Site 1, 35% at Site 2 and 23% at Site 3. Hydropsychids were the most abundant group and were well represented at all the sites. These caddisflies are filter feeders and weave fine silk nets to trap fine organic particulate matter, mostly algae/diatoms.

Mayflies were represented at all the sites comprising approximately 8%, 6% and 9% of the total number of individuals, respectively, while the numbers of types accounted for 28% of the total number of taxa collected from all sites. Mayflies belonging to the Family Heptageniidae were common to all sites. These mayflies feed on algae/diatoms by scraping and collecting.

Beetles were present at all the sites, comprising < 3% of total numbers of organisms respectively but comprised 11% of the total taxa. Beetles of the Family Elmidae were common to all the sites. These beetles feed by scraping, collecting and gathering fine organic particulate. They are characteristic of clear flowing well-oxygenated waters.

Blackfly (Simuliidae) larvae were collected at all sites but were only abundant at Site 2 where they accounted for 23% of the total number of individuals. At Site 1 and Site 3 these larvae accounted for 4% and 2% of the total number of individuals. Blackfly larvae can be filter feeders and/or collectors feeding on organic detritus. They are characteristic of clear flowing water.

The BioMAP Water Quality Index (d), a biological measure of water quality for creeks, streams and rivers (Griffiths 1999), was calculated for the macroinvertebrate data collected at each of the three sites (TABLE B). The Water Quality Index (d) values are listed in TABLE C.

TABLE C: BioMAP Water Quality Index (d) (WQI) average values and species richness at three Sites along the Bayfield River on April 5, 2010.			
	Site 1	Site 2	Site 3
BioMap Water Quality Index (d)	13.5	13.3	14.0
Species Richness Per Site	67	65	69

The BioMAP (d) WQI provides a water quality classification at sites in creeks, streams and rivers. The water quality is deemed to be unimpaired or impaired or in a gray zone between threshold values. The following chart outlines the BioMAP (d) WQI values.

Water Quality Classification

	Unimpaired	Impaired
Creeks	>16	<14
Streams	>12	<10
Rivers	>9	<7

Unimpaired water quality is recognized by the presence of benthic species whose environmental requirements match those expected at that site. For example, creeks contain specific creek dwelling species. Impaired water quality is indicated by the occurrence of species that are out of place, for example, the predominance of stream dwelling organisms in a creek. The Bayfield River Sites 1, 2 and 3 are considered to be river sites as defined by the BioMAP protocols (bankfull width 16m to 64m).

The BioMap qualitative (q) WQI was also applied and it provides a measure of water quality based solely on the value of the top 25% of the taxa at a site. The BioMap (d) WQI provides a more detailed expression of water quality as an abundance weighted sensitivity value that uses all the taxa to contribute to this value. A (q) WQI value of 3.06 was calculated for Site 1, a value of 3.13 at Site 2 and a value of 3.16 at Site 3. The BioMap (q) WQI values for rivers >2.4 classifies the water quality as unimpaired and

<2.0 as impaired. Based on the BioMap (q) WQI values calculated the water quality is therefore unimpaired at all of the three sites.

The number of taxa per site at the three sites is within the expected range of 40 to 80 for rivers in southern Ontario. Density of organisms, number of individuals per 0.9 m^2, was low for all three sites as average densities of 293, 322 and 264, respectively, were documented. Densities of 360 to 1440 per 0.9 m^2 are characteristic of southern Ontario rivers. Southern Ontario streams have densities of individual organisms of 180 to 720 per 0.9 m^2.

In summary, the BioMAP (d) WQI values for rivers indicate unimpaired water quality conditions at Site 1, Site 2 and Site 3 in the Bayfield River upstream and downstream from the discharge of the community of Bayfield's STP as the (d) WQI values of 13.5, 13.3 and 14 were >9. The BioMap (q) WQI values of 3.06, 3.13 and 3.16 were >2.4. The BioMAP (q) WQI values indicate unimpaired water quality conditions.

Species richness was good at all sites with representation of Midge, Mayflies and Caddisflies characteristic of higher quality stream environments. The density of organisms was also more indicative of stream environments.

The data and information outlined in this monitoring report provides baseline data (historical measure) sufficient to allow comparison with any future biological monitoring surveys.

John D. Westwood

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TABLE B: BENTHIC MACROINVERTEBRATES COLLECTED FROM BAYFIELD RIVER, APRIL 2010.

Station / Replicate	Sensitivity Value	STN 1 Q	STN 1 1	STN 1 2	STN 2 Q	STN 2 1	STN 2 2	STN 3 Q	STN 3 1	STN 3 2
FLATWORMS										
P. Platyhelminthes										
Cl. Turbellaria										
O. Tricladida	3	-	-	-	✓	1	1	✓	-	-
ANNELIDS										
P. Annelida										
WORMS										
Cl. Oligochaeta										
F. Tubificidae										
Limnodrilus hoffmeisteri	0	-	-	1	-	-	-	✓	-	-
immatures without hair chaetae	0	-	-	-	-	-	1	-	-	-
F. Lumbriculidae										
Stylodrilus heringianus	*	-	-	1	✓	-	-	-	-	-
LEECHES										
Cl. Hirudinea										
F. Haemopidae										
Haemopis marmorata	1	-	-	-	-	-	-	✓	-	-
ARTHROPODS										
P. Arthropoda										
MITES										
Cl. Arachnida										
O. Acarina	*	-	-	-	-	-	-	-	-	1
WATER SCUDS										
O. Amphipoda										
F. Hyalellidae										
Hyalella	2	✓	-	-	✓	-	-	✓	-	-
AQUATIC SOW BUGS										
O. Isopoda										
F. Asellidae										
Caecidotea	1	-	-	-	✓	-	-	-	-	1
CRAYFISH										
O. Decapoda										
F. Cambaridae										
Cambarus robustus	1	-	-	-	-	-	-	✓	-	-
Orconectes propinquus	2	✓	-	-	-	-	-	-	1	-
Orconectes	2	-	-	-	-	-	-	✓	-	-
SPRINGTAILS										
Cl. Entognatha										
O. Collembola	*	-	-	-	-	1	-	-	-	-
INSECTS										
Cl. Insecta										
BEETLES										
O. Coleoptera										
F. Dryopidae										
Helichus	2	-	-	-	✓	-	-	-	-	-
F. Dytiscidae										
Agabus	2	✓	-	-	✓	-	-	-	-	-
Neoporus	2	✓	-	-	✓	-	-	-	-	-
F. Elmidae										
Dubiraphia minima	1	-	-	-	✓	-	-	-	-	1
Dubiraphia larvae	*	-	-	1	-	-	-	-	-	-
Microcylloepus pusillus	3	-	-	-	✓	-	-	-	2	2
Stenelmis crenata	2	✓	1	-	✓	-	-	✓	1	2
Stenelmis larvae	*	✓	3	3	✓	1	1	✓	1	3
F. Gyrinidae										
Gyrinus	1	✓	-	-	-	-	-	-	-	-
F. Psephenidae										
Ectopria	3	-	-	-	-	-	-	-	-	1

TABLE B: BENTHIC MACROINVERTEBRATES COLLECTED FROM BAYFIELD RIVER, APRIL 2010.

Station / Replicate	Sensitivity Value	STN 1 Q	STN 1 1	STN 1 2	STN 2 Q	STN 2 1	STN 2 2	STN 3 Q	STN 3 1	STN 3 2
MAYFLIES										
O. Ephemeroptera										
F. Ameletidae										
Ameletus	4	✓	-	-	✓	-	-	✓	-	-
F. Baetidae										
Acerpenna pygmaea	2	-	2	1	-	-	-	✓	1	-
Baetis	*	-	-	1	✓	1	-	-	-	-
F. Caenidae										
Caenis	1	✓	7	-	✓	1	6	✓	-	3
F. Caenidae										
Ephemera	2	✓	1	1	✓	-	-	-	-	1
F. Ephemerellidae										
Ephemerella subvaria	3	✓	5	9	✓	-	2	✓	2	3
Eurylophella bicolor	3	✓	2	-	✓	-	1	✓	1	-
Serratella	3	✓	-	1	-	2	4	-	1	-
F. Heptageniidae										
Maccaffertium mediopunctatum	3	✓	2	4	✓	-	8	-	-	4
Maccaffertium terminatum	2	✓	4	-	-	-	2	✓	4	2
Maccaffertium vicarium	3	-	3	-	✓	-	-	✓	6	3
Stenacron	2	✓	1	-	✓	-	1	✓	-	6
Stenonema femoratum	1	-	1	-	-	-	-	-	-	-
F. Isonychiidae										
Isonychia	2	✓	1	-	✓	-	4	✓	2	-
F. Leptohyphidae										
Tricorythodes	2	-	1	-	✓	-	8	-	-	4
F. Leptophlebiidae										
Leptophlebia	1	✓	-	-	✓	-	-	-	-	-
O. Megaloptera										
FISHFLIES & DOBSONFLIES										
F. Corydalidae										
Corydalus	2	-	-	-	-	-	-	✓	-	-
Nigronia	3	✓	-	-	✓	-	-	-	-	-
O. Odonata										
DAMSELFLIES										
F. Calopterygidae										
Calopteryx maculata	3	-	-	-	✓	-	-	-	-	-
F. Coenagrionidae										
Enallagma	*	✓	-	-	-	-	-	-	-	-
DRAGONFLIES										
F. Aeshnidae										
Aeshna	2	✓	-	-	-	-	-	-	-	-
Basiaeschna janata	1	-	-	-	-	-	-	✓	-	-
Boyeria	2	-	-	-	✓	-	-	-	-	-
STONEFLIES										
O. Plecoptera										
F. Capniidae										
Allocapnia	*	✓	-	-	✓	-	-	✓	-	-
F. Nemouridae										
Nemoura	3	-	-	-	✓	-	-	-	-	-
F. Nemouridae										
Acroneuria	2	-	-	1	✓	-	-	-	-	-
Paragnetina	3	✓	1	-	✓	1	1	✓	-	-
F. Taeniopterygidae										
Strophopteryx	4	-	-	-	-	-	-	✓	-	-
BUGS										
O. Hemiptera										
F. Belostomatidae										
Belostoma	0	-	-	-	✓	-	-	-	-	-
F. Corixidae										
Sigara modesta	0	✓	-	-	-	-	-	-	-	-
CADDISFLIES										

TABLE B: BENTHIC MACROINVERTEBRATES COLLECTED FROM BAYFIELD RIVER, APRIL 2010.

Station / Replicate	Sensitivity Value	STN 1 Q	STN 1 1	STN 1 2	STN 2 Q	STN 2 1	STN 2 2	STN 3 Q	STN 3 1	STN 3 2
O. Trichoptera										
F. Brachycentridae										
Micrasema	4	-	-	-	-	-	-	-	-	1
F. Helicopsychidae										
Helicopsyche	2	-	-	-	✓	-	2	-	-	1
F. Hydropsychidae										
Cheumatopsyche	*	✓	7	8	✓	10	21	✓	3	17
Hydropsyche betteni	2	-	2	3	✓	3	-	-	-	-
Hydropsyche bronta	3	✓	11	11	✓	6	16	✓	8	13
Hydropsyche dicantha	2	✓	16	10	✓	11	35	✓	7	9
Hydropsyche morosa	2	✓	25	23	✓	17	80	✓	16	25
Hydropsyche placoda	2	✓	3	1	-	1	2	✓	2	4
Hydropsyche sparna	3	-	5	4	-	2	6	✓	1	2
F. Leptoceridae										
Ceraclea	1	-	-	-	-	-	-	-	2	3
Oecetis	2	-	-	4	-	-	1	-	-	1
F. Limnephilidae										
Hydatophylax	4	-	-	-	✓	-	-	-	-	-
Pycnopsyche	3	✓	-	-	-	-	-	✓	-	-
F. Philopotamidae										
Chimarra	3	✓	7	3	✓	8	7	✓	1	3
F. Phryganeidae										
Ptilostomis	2	-	-	-	✓	-	-	✓	-	-
F. Polycentropodidae										
Neureclipsis	2	-	1	1	-	-	-	-	-	-
F. Rhyacophilidae										
Rhyacophila lobifera	3	-	1	-	-	-	-	✓	-	-
TRUE FLIES										
O. Diptera										
F. Athericidae										
Atherix	3	-	1	-	✓	-	-	-	-	-
MIDGES										
F. Chironomidae										
chironomid pupae	*	✓	**5**	**8**	-	**4**	**1**	-	**1**	**2**
S.F. Chironominae										
Chironomus	0	-	1	-	-	-	-	-	-	-
Micropsectra	3	-	1	1	-	-	1	✓	-	2
Microtendipes	2	✓	1	1	✓	1	-	-	-	-
Paratanytarsus	1	✓	-	-	-	-	-	-	-	-
Rheotanytarsus	3	✓	-	-	-	-	-	-	1	1
Stempellinella	3	-	-	-	-	-	-	✓	-	-
Tanytarsus	2	✓	-	-	-	-	-	✓	-	-
S.F. Diamesinae										
Diamesa	3	-	-	-	✓	-	-	-	-	-
S.F. Orthocladiinae										
Cricotopus/Orthocladius	*	✓	39	66	✓	16	13	✓	20	85
Eukiefferiella brevicalcar group	3	✓	49	52	✓	15	17	✓	25	77
Eukiefferiella devonica group	3	-	1	4	✓	3	3	-	2	6
Hydrobaenus	1	-	-	-	-	-	-	✓	-	-
Orthocladius	*	✓	42	17	✓	42	40	✓	27	39
Orthocladius (Euorthocladius) rivularun	*	-	-	-	✓	1	2	-	-	3
Orthocladius (Euorthocladius)	*	✓	28	15	-	20	15	✓	26	3
Parakiefferiella	2	-	-	-	-	-	-	✓	-	-
Parametriocnemus	3	-	-	-	-	1	3	✓	-	1
Tvetenia	2	-	3	-	-	1	1	-	1	-
S.F. Tanypodinae										
Conchapelopia	2	✓	-	-	-	-	-	✓	-	-
Helopelopia	3	-	-	-	-	-	-	✓	-	-
Rheopelopia	3	-	1	1	✓	-	-	✓	1	5
Thienemannimyia complex	*	✓	-	-	✓	-	-	✓	-	-
F. Empididae										

TABLE B: BENTHIC MACROINVERTEBRATES COLLECTED FROM BAYFIELD RIVER, APRIL 2010.

Station	Sensitivity	STN 1			STN 2			STN 3		
Replicate	Value	Q	1	2	Q	1	2	Q	1	2
Clinocera	2	✓	1	1	✓	-	-	-	-	2
Hemerodromia	2	-	-	1	-	-	1	-	1	-
F. Simuliidae	2	✓	4	22	✓	75	74	✓	8	2
F. Tipulidae										
Antocha	3	-	10	5	✓	11	6	-	2	6
MOLLUSCS										
P. Mollusca										
SNAILS										
Cl. Gastropoda										
F. Lymnaeidae										
Fossaria	1	✓	-	-	-	-	-	✓	-	-
F. Physidae										
Physella	0	✓	-	-	✓	1	-	✓	-	-
CLAMS										
Cl. Bivalvia										
F. Sphaeriidae										
Sphaerium (Amesoda) striatinum	2	-	-	-	-	-	-	✓	-	-
TOTAL NUMBER OF ORGANISMS		-	300	286	-	257	387	-	177	350
TOTAL NUMBER OF TAXA *		44	38	33	53	27	34	49	29	38
BioMAP (WQI_d)			13.2	13.8		13.6	13.1		13.7	14.3
Average BioMAP (WQI_a)				13.5			13.3			14
BioMAP (WQI_a)		3.06			3.13			3.16		

*Bold entries excluded from taxa count

Huber Environmental Consulting Inc.

314 Sunset Drive
St. Thomas, Ontario, Canada
N5R 3C7
Phone (519) 633-5889 Fax (519) 633-1970 Email: douglas.huber@rogers.com

Water Quality Study of the Bayfield River Downstream of the Municipality of Bluewater's Bayfield Sewage Treatment Facility

September 2011

OVERVIEW

Huber Environmental Consulting Inc. was retained by B.M. Ross to conduct a water sampling study below the discharge of the Bayfield wastewater treatment facility during the spring/summer of 2011. This study included taking water chemistry and bacteriological samples both upstream and at a number of locations downstream in the Bayfield River. A simple mixing zone study was also undertaken during using a conductivity meter to document the size and extent of the mixing zone under the streamflow conditions present during the sampling. Preliminary streamflow information was obtained from the Water Survey Canada website for their stream gauge on the Bayfield River 02FF007. Photographs were also taken to document the physical conditions in the river during the sampling.

BACKGROUND

The Bayfield sewage treatment facility is located approximately 750 m north of Huron County Road No.3 and 2.5 km east of the east boundary of the community of Bayfield. This wastewater treatment facility consists of a twin celled facultative sewage lagoon system followed by intermittent sand filtration. According to the existing Certificate of Approval, this facility is rated at an average daily raw sewage flow not to exceed 1072 m^3/day for any period of time greater than one calendar year.

The discharge is to the Bayfield River approximately 3.5 km upstream from the point where the Bayfield River discharges to Lake Huron. Treated effluent is typically discharged intermittently in the spring and fall between March to June and October to December. The actual number of days of discharge varies from 50 to 100 days per year depending mainly on weather conditions.

Since the actual treatment facility is located above the river valley, the discharge cascades over an approximate 50 meter vertical drop to the forested valley floor before entering near the head of a side channel to the Bayfield River. It is estimated that the upper end of this side channel is separated from the main Bayfield River for all periods other than spring melt and following major precipitation events. This side channel receiving the treated wastewater discharge flows collecting seepage from the valley walls for approximately 700 to 800 meters before connecting with the main Bayfield River.

The Water Survey of Canada Stream Gauge 02FF007 Bayfield River near Varna is located at the 1st concession upstream of the Bayfield Wastewater Treatment Facility. This gauge has been collecting continuous water level and streamflow information at this location for the last 41 years. The flow in the Bayfield River is considered natural or non-regulated.

The Bayfield River has been part of the Provincial Water Quality Monitoring Program since 1964. However, presently only station 08004000802 Bayfield River, Huron County Rd 31, North of Varna (1975 to present) and station 08004000202 Bayfield River, Kippen Rd, Egmondville (1964 to present) are active stations and both are located upstream of the treated discharge from Bayfield. Between the period 1964 to 1975, water quality samples were taken downstream at station 08004000102 Bayfield River, Hwy 21 when it was part of the network.

INTRODUCTION

Water samples were taken as part of this study on June 14 and July 5, 2011 from the locations shown in Figure 1 and described below.

Station	UTM Zone	Easting	Northing	Accuracy	Location
1	17T	447076	4823139	+-4 m	Bayfield treated effluent @ v notch weir
2	17T	447167	4823274	+-10m	Bayfield treated effluent @ discharge structure
3	17T	447695	4823748	+-6 m	Bayfield treated effluent prior to confluence with Bayfield River
4	17T	447137	4823785	+-7m	upstream in Bayfield River
5	17T	447079	4823945	+-8m	100 m D/S of the confluence with the Bayfield River 1/3 across from south side
6	17T	447085	4823949	+-8m	100 m D/S of the confluence with the Bayfield River 2/3 across from south side
7	17T	445260	4824611	+-8m	Bayfield River at end of road in Wildwood Trailer Park
8	17T	443443	4824162	+-8m	Bayfield River beside gas pumps @ Harbour Lights Marina

Insitu water temperature, pH and conductivity measurements were taken with a Hanna Instruments Model HI 98129 Combo temperature, pH & EC meter. Dissolved oxygen was measured on June 4, 2011 by the use of a Hack Dissolved Oxygen kit while for the July sampling, a YSI Model 55D Dissolved Oxygen Meter was used.

Preliminary streamflow information was obtained from the Water Survey Canada website for their stream gauge on the Bayfield River near Varna (02FF007) for the dates the samples were taken.

The lagoon treated waste water is applied to the intermittent sand filters on an alternating basis by the use of a timer and pumps. The filtered waste water is then collected and directed

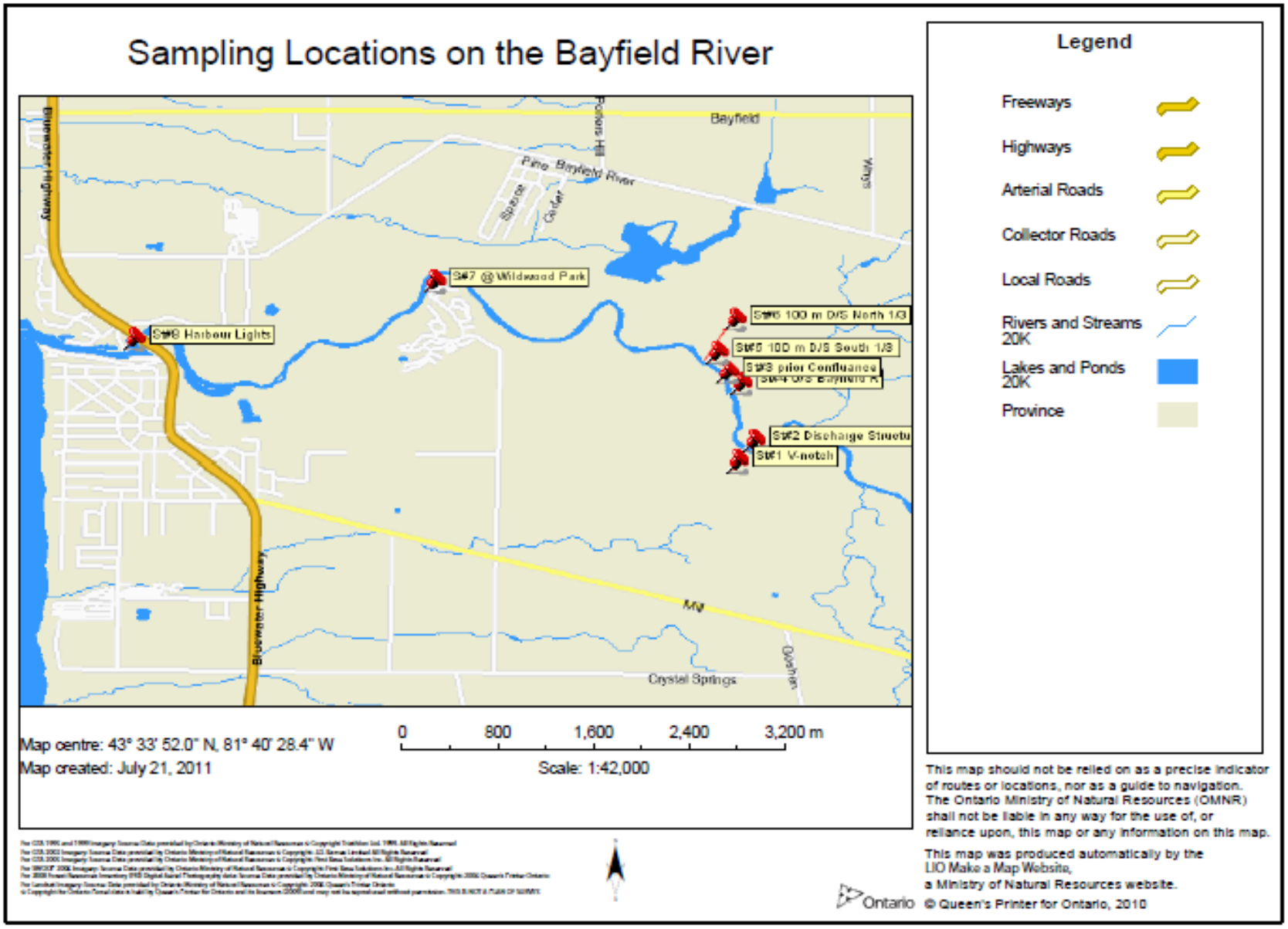


Figure 1: Map showing chemical and bacteriological sampling locations used on the Bayfield River during this 2011 survey.

through a the v-notch weir which incorporates a flow totalizer. The total daily volume of discharge is calculated by taking a daily reading at approximately the same time and subtracting the previous day's reading. Based strictly on visual observations, it appeared that the treated wastewater discharge rate was approximately twice as much on the first sampling day compared to the second sampling date. This comment is based on observations made at the discharge structure at the bottom of the embankment and flow in the corrugated pipe prior to entering the side channel.

Monitoring Results

The chemical and bacteriological monitoring results are summarized in Table 1. As shown by Table 1, the effluent from the Bayfield Sewage Treatment Facility would be considered of very high quality for the parameters measured. The existing Certificate of Approval approving their discharge allows for the discharge concentration of 10 mg/l BOD5, 10 mg/l suspended solids, 0.5 mg/l total phosphorous and 4.0 mg/l total ammonia. The average concentrations of these parameters during our sampling was <3 mg/l BOD5, <2 mg/l suspended solids, 0.14 mg/l total phosphorous and <0.1 total ammonia. Sampling of the side channel prior to mixing with the Bayfield River showed these parameters to typically be further reduced prior to mixing with the Bayfield River. Comparing the downstream samples in the Bayfield River to the upstream sampling station revealed no significant change in any of the parameters monitored that could be contributed to the treated discharge from the Bayfield Sewage Treatment Facility.

Discussion of Water Quality Monitoring Results

As stated previously, the effluent from the Bayfield Waste Water Treatment Facility would be considered of very high quality. During our sampling, the parameters that are regulated by their Certificate of Approval were only about 20% of the concentrations which they are legally allowed to discharge. To obtain an indication of how typical the effluent was on the days of our sampling, we compared our sample results to the routine monitoring of the discharge which is required by their Certificate of Approval. As shown in Table 3, the samples taken by Huber Environmental Consulting Inc. were very similar to the samples taken by the Ontario Clean Water Agency (OCWA) the operators.

As to what is considered acceptable river water quality, this is defined by the Ontario Provincial Water Quality Objectives (PWQO's). Of the various other chemical and bacteriological parameters shown in Table 1, there are only PWQO's for unionized ammonia (based on the laboratory measured total ammonia concentration and the in-situ or field measured water temperature and pH), pH, dissolved oxygen, total phosphorus and Ecoli.

Table 1: Water quality monitoring data of Bayfield's treated discharge and the Bayfield River at select locations in 2011.

Date	Location	BOD5 mg/l	TSS mg/l	T. Phos mg/l	S. Phos mg/l	T.Amm mg/l	TKN mg/l	NO2 mg/l	NO3 mg/l	Cl⁻ mg/l	Cond. mg/l	Ecoli /100 cc	F. pH	F. Temp C°	F. DO mg/l
6/14/11	Eff @ V notch	< 4	2	0.15	0.10	<0.1	0.6	<0.06	11.1	96	792	-	-	-	-
7/5/11		<2	<2	0.12	0.12	0.1	0.5	<0.06	2.25	120	770	9	7.98	23.4	7.64
6/14/11	Eff Structure	<4	7	0.14	0.17	<0.1	1.0	<0.06	11.5	94	793	-	7.49	19.9	-
7/5/11		<2	<2	0.14	0.10	<0.1	<0.5	<0.06	2.13	120	759	12	8.28	21.4	9.23
6/14/11	Prior to con	<4	15	0.10	0.06	0.3	0.6	0.12	2.11	57	749	-	7.76	18.8	5.20
7/5/11		<2	8	0.11	0.10	<0.1	<0.5	<0.06	1.04	130	719	97	8.01	21.1	8.01
6/14/11	U/S Bayfield R	<4	4	0.04	0.07	<0.1	0.8	<0.06	5.92	24	559	-	8.45	20.5	-
7/5/11		<2	6	<0.03	<0.03	<0.1	<0.5	<0.06	5.08	33	511	34	8.76	23.0	12.39
6/14/11	100 m D/S South	<4	6	0.03	0.04	<0.1	0.8	<0.06	6.03	24	559	-	8.64	18.9	-
7/5/11		<2	10	<0.03	<0.03	0.1	<0.5	<0.06	5.10	33	503	29	8.80	22.9	11.40
6/14/11	100 m D/S North	<4	7	0.04	<0.03	<0.1	1.0	<0.06	6.11	23	544	-	8.65	19.2	-
7/5/11		<2	8	<0.03	<0.03	<0.1	0.7	<0.06	5.13	31	505	31	8.72	23.2	10.68
6/14/11	Wildwood Park	<4	3	0.04	0.03	<0.1	1.9	<0.06	5.45	23	522	-	8.41	25.2	-
7/5/11		<2	5	<0.03	<0.03	<0.1	1.0	<0.06	4.54	32	481	30	8.37	25.5	13.70
6/14/11	H.L. Marina	<4	8	0.06	<0.03	<0.1	<0.5	<0.06	5.91	23	548	-	8.56	20.5	-
7/5/11		<2	24	<0.03	0.06	<0.1	0.6	<0.06	5.10	32	492	64	8.33	24.4	8.47

Preliminary streamflow as recorded at Federal Gauge (02FF007) Bayfield River near Varna

June 24, 2011	2.45 cms
July 5, 2011	1.30 cms

Table 3: Comparison of effluent samples taken by the plant operators versus HEC Inc.

Date	CBOD5	Susp.Solids	T. Phos.	T. Amm.	Ecoli	Field pH	Field Temp	Field O2
	mg/l	mg/l	mg/l	mg/l	/100 cc	pH	°C	mg/l
5/4/2011				0.1				
5/6/2011				0.2				
5/16/2011	<2	2	0.09	<0.1	<2			
5/15/2011	<2	2	0.09	<0.1	<2			
6/14/2011	**<4**	**2**	**0.15**	**<0.1**				
6/29/2011	<2	9	0.14	<0.1	660	7.31	19.5	
7/4/2011	<2	<2	0.06	<0.1	40	7.41	20.5	
7/5/2011	**<2**	**<2**	**0.12**	**0.1**	**9**	**7.98**	**23.4**	**7.64**
7/11/2011	<2	2	0.1	0.1		7.64	25.5	
7/18/2011	5	2	0.13	<0.1		7.79	26.5	7.49

samples in **bold** and highlighted taken by HEC Inc.

The Provincial Water Quality Objective for Unionized Ammonia is 0.020 mg/l. The percentage of unionized ammonia (NH_3) in aqueous ammonia solutions is different under different water temperatures and pH's. The maximum total ammonia measured in the Bayfield River was 0.1 mg/l which under the measured field pH and water temperature conditions relates to a unionized ammonia concentration of 0.024 mg/l. All the other water samples from the Bayfield River came back <0.1 mg/l total ammonia nitrogen or less than the detection limit. This unionized ammonia criterion has at least a safety factor of 10 prior to it impacting on any form of aquatic life. In fact, during every sampling event, minnows and fish fry were observed in the side channel prior to any mixing of the treated effluent with the main Bayfield River and larger bass where observed holding in the initial mixing zone. The factor that resulted in the elevated unionized ammonia is the pH of the river. PH can naturally fluctuate diurnally in a water body as a result of the respiration and photosynthesis of the aquatic plants.

The water quality objective for pH is for it to remain in the range of 6.5 to 8.5. The pH measured in the Bayfield River typically was above 8.5 and had a maximum concentration of 8.8 during our sampling. Since the pH sampled in the Bayfield Waste Water Treatment Facility was consistently less than measured upstream in the Bayfield River, the discharge was not directly negatively impacting on the pH in the river. Any exceedance in pH would appear to originate upstream of the confluence with the discharge from the Bayfield facility. It would appear that the exceedance of the above mentioned unionized ammonia criterion had nothing to do with the treated waste water discharge from Bayfield.

The PWQO for dissolved oxygen (DO) to protect warm water biota is 48% saturation or 4 mg/l at the warmer temperatures measured during our survey. All DO measurements taken during the survey were above 4 mg/l thus meeting the criteria. In fact all the samples in the Bayfield River were at over 100% saturation. This is not surprising because of the natural re-

aeration that occurs in the river as a result of the long series of riffles and rapids as shown in the attached pictures. The Bayfield River is a migratory river for trout during the spring and fall. It is expected that this reach of the river would also meet the more restrictive cold water biota criteria during those periods of the year.

Total phosphorus is probably the parameter of most potential concern in the discharge from the Bayfield facility. The PWQO for total phosphorus for a riverine environment is 0.03 mg/l. Total phosphorus is not directly lethal or toxic to the various forms of aquatic life but was established to prevent excessive plant growth in rivers. As shown by the sampling data, the total phosphorus concentration in the discharge was reduced as it flowed down the side channel prior to mixing with the main Bayfield River. This reduction was probably a result of dilution, assimilation and uptake by aquatic plants and sedimentation. During our 1st sampling run, the upstream concentration of total phosphorus in the Bayfield River was 0.07 mg/l exceeding the criteria. The concentration of total phosphorus then decreased below the confluence with the side channel. During this sampling run, the Bayfield River would have been considered a Policy 2 receiver for total phosphorus based on the upstream sample. However, it should be noted that the total phosphorus concentration in the side channel as a result of the treated waste water discharge did not increase the total phosphorus concentrations in the river downstream. During the 2nd sampling, the upstream Bayfield River sample contained <0.03 mg/l total phosphorus. All other downstream monitoring stations also contained less than <0.03 mg/l total phosphorus other than down near the mouth in the backwater beside the marina. This sample would infer that the Bayfield River at the point of discharge would be a Policy 1 receiver for total phosphorus.

To get an idea of the typical total phosphorus concentration in the Bayfield River upstream of the discharge, the 2009 Provincial Water Quality Monitoring Network Data Base was reviewed because it was the most recent data downloadable. The closest active station is St# 08004000802 which is at the 1st bridge upstream on Huron County Rd 31, north of Varna. Five water samples were taken between March and July of 2009. The total phosphorus concentration is those samples were 0.040 mg/l, 0.018 mg/l, 0.011 mg/l, 0.012, and 0.018 mg/l. This would strongly suggest that the samples taken during our survey were representative and for extended periods of time during the summer, this stretch of the Bayfield River would be a Policy 1 river for total phosphorus.

Ecoli (*Escherichia coli*) was another parameter that was monitored and has a PWQO. The PWQO for Ecoli to protect recreational water uses is 100 organisms per 100 ml. All samples including the treated effluent sample contained less than 100 Ecoli /100 ml and thus met the criteria.

Plume Study Results

A conductivity meter was used to estimate the size of the mixing zone of the treated effluent in the Bayfield River. Conductivity readings were taken at the south shore, approximately a ¼ way across, approximately a ½ way across, approximately a ¾ way across and along the north shore. The various downstream measuring locations and values are shown in

Table 2. On June 14, 2011, the streamflow in the Bayfield River was approximately 2.45 cms (m^3/s) at the Federal Gauge upstream near Varna while on July 5 the streamflow was 1.30 cms.

During the June 14 survey, the discharge hugged the south bank for over 100 meters prior to being completely mixed across the river at approximately 250 meters below the confluence. On July 5, the discharge plume was completely mixed across the river by 100 meters downstream.

Table 2: Mixing Zone Study Below the Bayfield Wastewater Treatment Works in the Bayfield River

sampling date June 14, 2011						
location	Conductivity	South shore	1/4 across	1/2 way	3/4 across	north shore
discharge structure	793					
prior to confluence	750					
U/S Bayfield River	524					
≈ 30 yds D/S conflu		581	552	554	555	558
≈ 70 yds D/S conflu		586	565	560	561	561
≈ 100 yds D/S conflu		584	569	561	560	558
≈ 250 yds D/S conflu		565	565	564	564	565
@ Wildwood Park	505					
@ Harbour Lights	537					
sampling date July 5, 2011						
discharge structure	734					
prior to confluence	697					
U/S Bayfield River	516					
≈ 100 yds D/S conflu		508	503	504	505	505
@ Wildwood Park	500					
@ Harbour Lights	480					

notes
conductivity measurements taken with a Hanna Combo pH & EC meter
measurements shown in µ/s

Discussion of Mixing Study Results

The Ministry of the Environments policy that deals with mixing zones states that "Mixing zones should be as small as possible and not interfere with beneficial uses". It goes on to say "Conditions within a mixing zone must not result in toxic conditions or irreparable environmental damage including risk to ecosystem integrity and human health nor interfere with water supply, recreational or other water uses.

The side channel receiving the treated waste water discharge enters the Bayfield River from the south in a ponded embayment type of area. This is shown in one of the following attached pictures. During the first survey, the flow from the side channel basically remained

Picture showing confluence of the side channel that receives the treated waste water discharge and the Bayfield River on July 5, 2011.

along the south bank through the different riffle areas until a kink in the river approximately 250 meters below the confluence. At this small bend in the river to the south, the side channel flow traversed across the complete riffle mixing rapidly under the streamflow conditions present during our sampling on June 14, 2011. During our July 5, 2011 sampling when the streamflow in the Bayfield River dropped to nearly half of what is was on the previous sampling, the side channel flow mixed much faster and was completely mixed within the first 100 meters downstream.

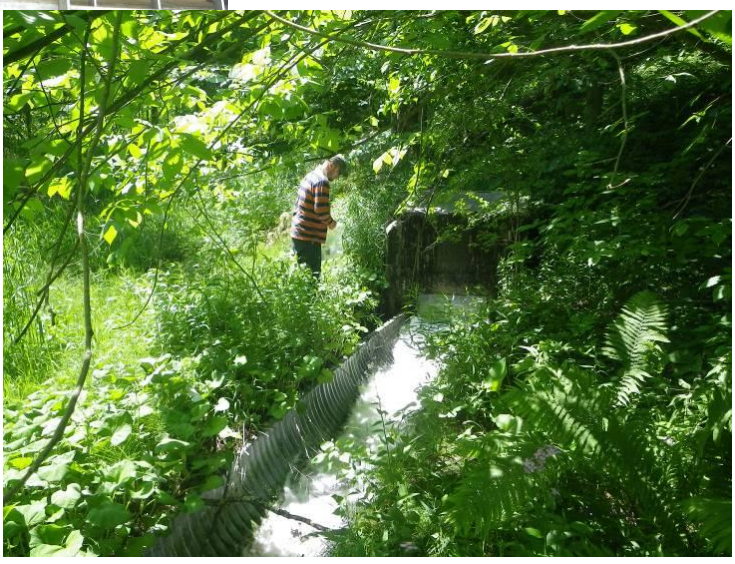
Due to circumstances beyond our control, readings were not taken from the totalizer at the V-notch weir on the days preceding our sampling and on the actual day of our sampling. These readings would have allowed us to estimate the dilution that was achieved in the Bayfield River during our sampling events. However, because of the intermittent nature of the way the waste water is applied to the sand filters, the actual rate of discharge would have varied throughout the day anyway. This would result in a series of slugs being discharged to the side channel and making their way downstream. Since it appeared that the vast majority of water in this side channel was treated wastewater, it is expected that the water quality of the side channel would be relatively consistent and only really vary in result to quantity discharging to the Bayfield River at any point in time throughout the day. Whatever, the rate of discharge was during our study; it appeared not to impact on the quality of the Bayfield River.

Additional pictures taken during the survey

Treated waste water being applied to the intermittent sand filters.

Under drainage from sand filters passing through V-notch weir.

Discharge structure at bottom of the river valley.



Size of side channel that receives treated effluent prior to mixing with the Bayfield River.

Bayfield River looking downstream from the confluence with the side channel.

Bayfield River looking upstream and across the river from the upstream sampling location.

Bayfield River downstream in the area of complete mixing during the first sampling run.

Bayfield River at end of road in Wildwood Trailer Park.

Bayfield River at Harbour Lights Marina near the gas pumps.

Conclusions

The Bayfield River through this stretch would have to be considered a high quality river and based on the chemical and bacteriological samples taken during our study was not seriously negatively impacted by the treated waste water discharge from Bayfield. The upstream river water quality, effluent quality and streamflows were all within typical ranges during the study.

Other observations that support the apparent nonimpact of the treated waste water discharge based on the chemical and bacterial monitoring is that no increase in algae growth was observed in the riffles upstream to downstream of the discharge. The rocky hard substrate of the Bayfield River through this stretch is ideal for filamentous green algae (Cladophora). During both surveys, special notice was taken of the riffle areas both upstream and downstream of the confluence along north side and south side of the river within the mixing zone. No visible difference was observed and in fact very little algae were observed on the rocks.

The shallow rocky nature of the Bayfield River as shown in the following picture is ideal for natural re-aeration keeping the dissolved oxygen levels high to support the various forms of

aquatic life present. One of the few species of aquatic life that would not find this type of habitat ideal is mussels. Most species of native mussels require softer and finer sediment so they can burrow into the sediment and filter out the phytoplankton drifting by.

Another observation that would support the non-impactive nature of the discharge was the presence of minnows and aquatic invertebrates in the side channel receiving the treated waste water discharge. During both surveys minnows and surface aquatic invertebrates were observed in the side channel between the treated discharge and confluence with the Bayfield River. A large bass appeared to make the actual confluence its home territory scurrying away every time we passed through the area during both surveys.

During the first survey in June we met fly fishermen who fished for trout both upstream and downstream of the discharge from the Bayfield treatment facility. We also observed people fishing downstream at the end of the road in the Wildwood Trailer Park during both sampling events.

The findings of this study are consistent with the conclusions of the *2010 Biological Monitoring Report For The Bayfield River In The Vicinity Of The Bayfield Sewage Treatment Plant* prepared by John Westwood. His report concluded "In summary, the BioMap (d) WQI values for rivers indicate unimpaired water quality conditions at Site 1, Site 2 and Site 3 in the Bayfield River upstream and downstream from the discharge of the community of Bayfield's STP as the (d) WQI values of 13.5, 13.3 and 14 were >9. The BioMap (q) WQI values of 3.06, 3.13 and 3.16 were > 2.4. The BioMap (q) WQI values indicate unimpaired water quality conditions."

In summary, based on all the chemical and bacteriological data and our visual observations made during our survey, the treated wastewater discharge from Bayfield (Municipality of Bluewater) does not appear to be noticeably impacting on the Bayfield River.

Douglas M. Huber, P.Geo

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APPENDIX B

PUBLIC CONSULTATION

MUNICIPALITY OF BLUEWATER

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT FOR EXPANSION OF THE BAYFIELD SEWAGE TREATMENT FACILITY

NOTICE OF STUDY COMMENCEMENT

THE PROJECT:

The Municipality of Bluewater installed a communal sewage collection and treatment system servicing the community of Bayfield in 2001. The treatment facility, a two cell facultative lagoon with sand filters, was sized to accommodate existing and expected growth within the community for a twenty year planning period. The Bayfield service area has experienced rapid growth since construction of the sewage collection system and the treatment facility is now nearing its design capacity. To accommodate expected growth in and around Bayfield, the plant requires expansion. Modifications to the existing forcemain and main sewage pumping station will also be required to accommodate anticipated flows.

A range of treatment technologies will be assessed in order to determine how best to expand the capacity of the treatment facility while still maintaining a high level of effluent quality. Expansion of the existing facilities or the provision of mechanical treatment, are some of the alternatives being considered in conjunction with the Class EA process.

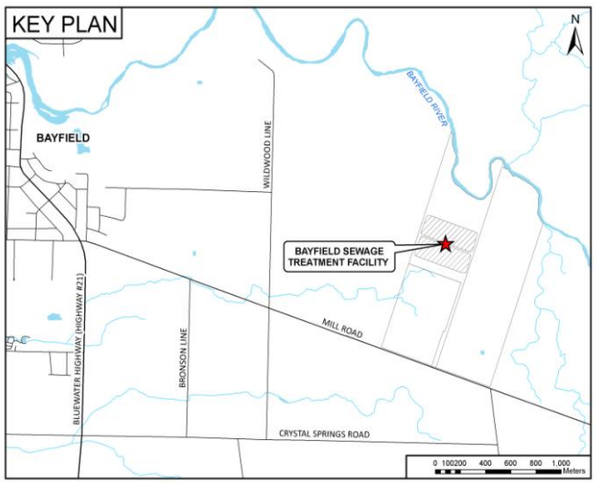
The possible expansion of the service area associated with the existing facility is an option also being considered in conjunction with this project. Currently the treatment facility services the Former Village of Bayfield as well as adjacent campground facilities in the Municipality of Bluewater.

THE ENVIRONMENTAL SCREENING PROCESS:

The planning for this project is following the environmental screening process set out for Schedule C activities under the Municipal Class Environmental Assessment (Class EA). The purpose of the Class EA screening process is to identify any potential environmental impacts associated with the proposed works and to plan for appropriate mitigation of any identified impacts. The process includes consultation with the public, stakeholders and review agencies. This notice is being issued to advise of the start of study investigations. There will be additional opportunities for public input and involvement as the study progresses.

PUBLIC INVOLVEMENT:

The consultation program for this Class EA includes several opportunities for public involvement. For the initial phase of the program, public input into the planning and design of this project will be received until **October 21st, 2011**. Additional opportunities for comment will be provided as the process proceeds. Any comments collected in conjunction with this Class EA will be maintained on file for use during the project and may be included in project documentation. With the exception of personal information, all comments will become part of the public record.



For further information on this project, or to review the Class EA process, please contact the project engineers: B.M. Ross and Associates, 62 North Street, Goderich, Ontario, N7A 2T4. Telephone (519) 524-2641, Fax (519) 524-4403. Kelly Vader, Environmental Planner; (e-mail: kvader@bmross.net).

This Notice issued September 21st, 2011.
Lori Wolfe, CAO
Municipality of Bluewater

MUNICIPALITY OF BLUEWATER
BAYFIELD - HAY - HENSALL - STANLEY - ZURICH
2001

FAX TRANSMITTAL

TO: ① KELLY VADER ② LORI WOLFE

ORGANIZATION: BMR BW

FAX NO.: 524-4403

FROM: [redacted]

DATE: 2011.10.12

SUBJECT: BAYFIELD STF EA

OUR FILE: personal recoverable **TOTAL PAGES:** 2

[redacted]
London Ont.
[redacted]

B. M. Ross and Associates,
62 North St.,
Goderich Ont.
N7A 2T4

Attn.: Ms. Kelly Vader,
Environmental Planner

Municipality of Bluewater
Municipal Class Environmental Assessment for
Expansion of the Bayfield Sewage Treatment Facility

Dear Ms. Vader:

I understand that in 2005 when the MOE D-5-1 calculation was completed that between existing flows and commited flows this facility was at the C of A design capacity.

I understand that in 2010 when this same calculation was done this facility was 30% over committed.

Are the people who were in the existing flows prior to 2005 going to have to pay for this expansion ?

I trust that the lessons learned here will assist Council in making future decisions for sanitary sewage treatment needs in the Municipality.

I note in the Notice's description of the project that there is no mention of the existing gravity collection system being reviewed. Is all the piping sufficient in size ?

I request that I be placed on the mailing\notice list for all future issuings on this project.

Respectfully,

[redacted]
Bayfield,
[redacted]

Kelly Vader

From: [redacted]
Sent: October-24-11 1:57 PM
To: Kelly Vader
Cc: Jessica Schnaithmann
Subject: Re EA for Bayfield Lagoons

Importance: High

Hello Kelly , I am involved in a Bayfield Watershed Study group coordinated by the ABCA. would you include the group as an interested party for the EA process? Group Contact is : Jessica Schnaithmann <jschnaithmann@abca.on.ca> from ABCA

Thank you , regards, [redacted]

MUNICIPALITY OF BLUEWATER
NOTICE OF PUBLIC INFORMATION CENTRE

COMMUNITY OF BAYFIELD

CLASS EA FOR EXPANSION OF THE BAYFIELD SEWAGE TREATMENT FACILITY

INFORMATION SESSION FOR RESIDENTS

The Municipality of Bluewater has initiated a Class Environmental Assessment process for expansion of the Bayfield Sewage Treatment Facility. A public information meeting has been planned to advise residents of the status of study investigations and to provide a tentative timeline for completion of the Environmental Assessment and implementation of the project. The following information will be presented:

- Project background and description
- Current facility description and performance
- What expansion options are being explored
- Potential service area expansion into Central Huron
- Expected timeline for implementation

Representatives of the Municipality and the Project Engineers will be in attendance.

DATE:	**Saturday October 31st, 2015**
LOCATION:	**Bayfield Community Centre**
TIME:	**10:00 a.m. – 12:00 p.m.**
PRESENTATION:	**10:30 a.m.**

Municipality of Bluewater

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Class Environmental Assessment for Expansion of the Bayfield STP

WELCOME

Public Information Meeting

October 31, 2015

Municipality of Bluewater

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MEETING AGENDA

- 10:00 AM – 10:30 AM - OPEN HOUSE
- 10:30 AM – 11:15 AM – PRESENTATION
- 11:15 AM – 12:00 PM – QUESTIONS
- 12:00 PM Onward – OPEN HOUSE

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Presentation

1. The Existing Sewage System
2. The Problem
3. The Class EA Process
4. Possible Solutions
5. Work to Date
6. Next Steps

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THE EXISTING BAYFIELD SEWAGE SYSTEM

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Service Area Details

- **Facilities were constructed in 1999/2000**
  - Constructed to Service the former Village of Bayfield.
  - Planned for existing (1999) development + 300 vacant lots.
  - Harbour Lights and Paul Bunyan were in the original service area.
- **Additions to Original Service Area**
  - Post-Amalgamation Capacity Granted to a number of Trailer Parks and Subdivision Development.

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General Details of System

- There are currently about 880 customers.
- Growing at approximately 20 per year.

- 22 km of Main Sewer
- 272 Maintenance Holes
- 4 sewage pumping stations
- 12 km of pressure forcemain

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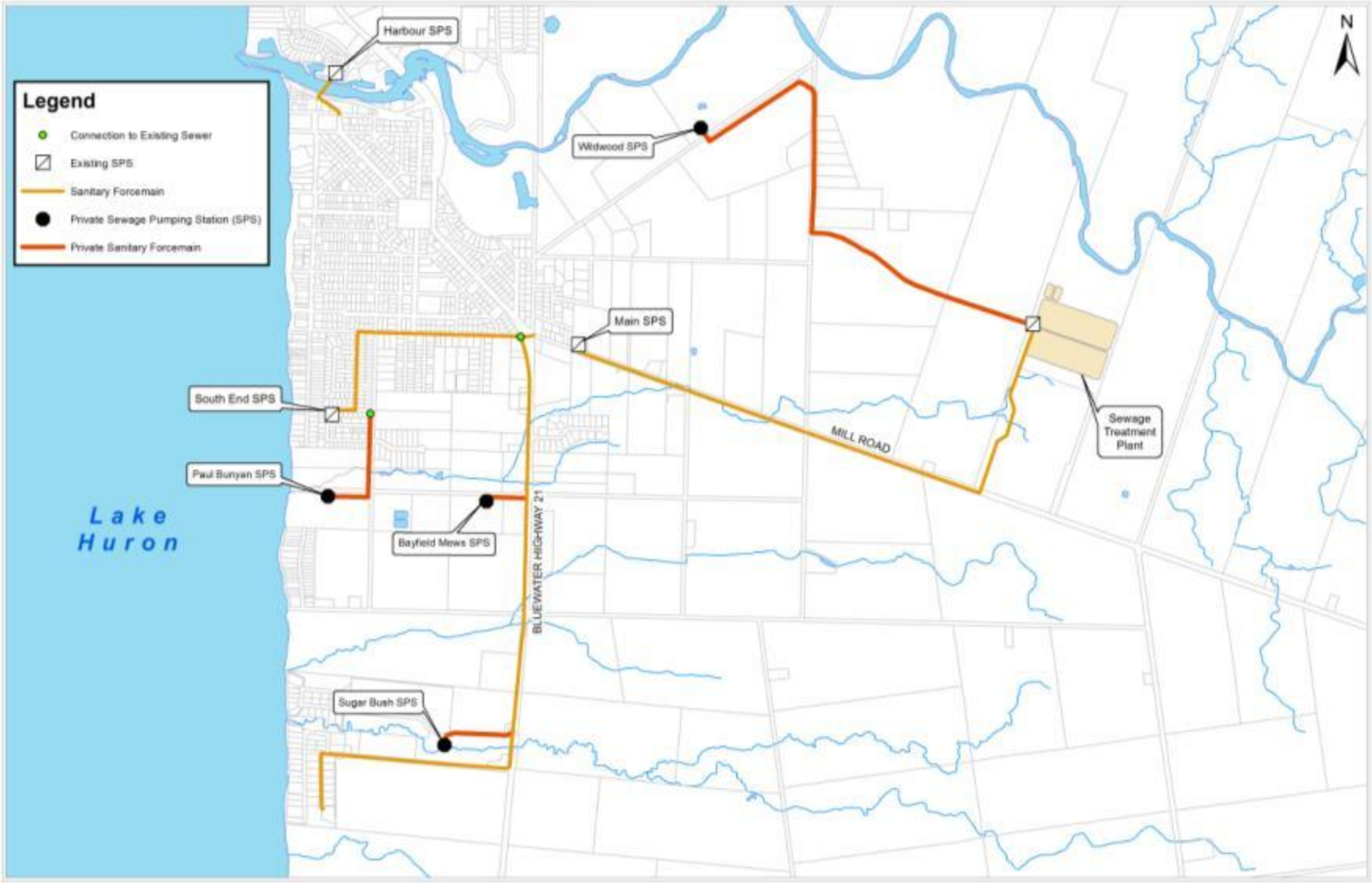
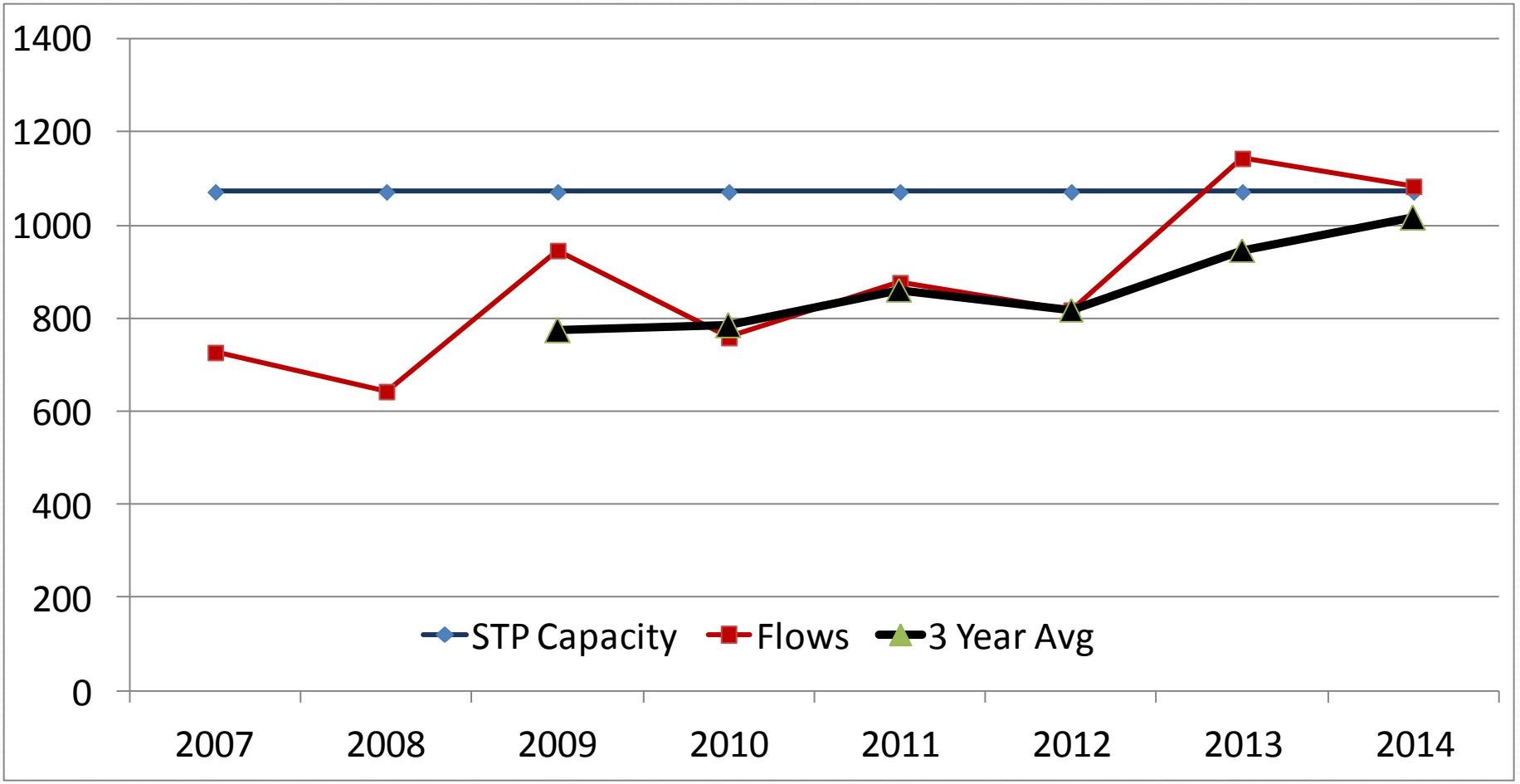
The Major Facilities

Additional Sewage Infrastructure



Bayfield Sewage Treatment Facility

Annual Sewage Flows (m3/day)



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Effluent Quality Summary

			Year		
Parameter	**Objective Criteria**	**Unit**	**2012**	**2013**	**2014**
BOD_5	5.0	mg/L	2.7	2.1	3.6
TSS	5.0	mg/L	2.3	2.5	4
TP	0.3	mg/L	0.05	0.08	0.1
TAN	1.0	mg/L	0.55	0.12	0.86

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PROBLEM/OPPORTUNITY IDENTIFICATION

- Existing STP is operating near capacity.
- Facility currently over-committed.
- Possible infiltration issues within collection system.
- Central Huron is interested in sewage capacity.
- At the current rate of growth (± 20 units/year), facility will need to be expanded within next 3-5 years.

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CLASS EA PROCESS

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Problem/Opportunity Statement

The Bayfield Wastewater Treatment Plant is operating near its approved hydraulic design capacity. Existing servicing commitments to future developments within the community will produce flows that will result in an exceedance of the approved capacity. Additional treatment capacity is required to address the current deficiency, and ensure the Plant continues to produce high quality effluent and to allow for continued growth and development within Bayfield and the surrounding areas.

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Municipal Class Environmental Assessment (Class EA)

- Planning and Design Process for Municipal Water, Wastewater and Road Projects
- Conducted to Evaluate the Potential Impacts of Municipal Projects and Impact Mitigation
- Involves Consultation with the Public, Regulatory Agencies, First Nations, Adjacent Property Owners
- Requires Consideration of Natural, Social, Cultural, Economic and Built Environments

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CLASS EA STUDY PHASES

PROBLEM/OPPORTUNITY DEFINITION

IDENTIFICATION OF ALTERNATIVES

CONSULTATION WITH PUBLIC AND REVIEW AGENCIES

EVALUATION OF ALTERNATIVES

SELECTION OF PREFERRED ALTERNATIVE

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Possible Solutions

1) Reduce Sewage Flows within the Community
2) Limit Community Growth
3) Expand the Existing Treatment Facility
4) Construct a new Sewage Treatment Facility
5) Do Nothing

WORK COMPLETED TO DATE

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Study Effort to Date

- Pre-consultation with MOECC.
- Aquatic studies of Bayfield River.
- Detailed review of existing sewage flows.
- Preliminary long-list and short list for expansion alternatives.
- On-going discussions with Central Huron regarding service.

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Evaluation of Alternatives

1) Reduce Sewage Flows within the Community
   - Flow Reductions are possible but not likely sufficient to address growth and commitments.
2) Limit Community Growth
   - Negative impact on Community and difficult given current commitments and growth pressure.
3) Expand the Existing Treatment Facility
   - Possible, however there are limited expansion options given that sand filters cannot operate in the winter and space issues.

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Evaluation of Alternatives

4) Construct a new Sewage Treatment Facility

- Possible, however utilizing portions of the existing facilities (Lagoons) would be preferred.

5) Do Nothing

- This alternative would only be implemented if other solutions were economically or technically impractical to implement.

➢ **Preliminary Recommendation: Explore Alternatives 1, 3 & 4 in more detail.**

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Preliminary Growth Projections

Year	Households*	Population
2015	850	2135
2020	950	2330
2025	1050	2520
2030	1150	2715
2035	1250	2910
2040	1350	3120
Total Growth	+ 500 (59%)	+ 985 (46%)

***Average Growth Rate of 20 Units/Year**

Other Considerations

- Central Huron Involvement
- Seasonal Nature of Flows

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BAYFIELD RIVER WATER QUALITY STUDIES

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Benthic Analysis

- COMPLETED IN SPRING OF 2010
- ANALYSIS OF BUGS/ORGANISMS LIVING IN RIVER CHANNEL SUBSTRATES
- PROVIDES A MORE ACCURATE LONG-TERM ASSESSMENT OF WATER QUALITY

RESULTS

- SAMPLES COLLECTED AT 3 LOCATIONS IN RIVER (ONE UPSTREAM OF OUTFALL, TWO DOWNSTREAM)
- RESULTS INDICATE UNIMPAIRED WATER QUALITY AT ALL THREE SAMPLE LOCATIONS
- SPECIES RICHNESS GOOD, INDICATING HIGH QUALITY STREAM ENVIRONMENT
- STUDY WILL SERVE AS A BASELINE FOR FUTURE

STP Outfall at River

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Water Quality Analysis

ASSIMILATION STUDY

- COMPLETED IN SUMMER OF 2011
- CHEMICAL AND BACTERIOLOGICAL ANALYSIS OF BAYFIELD RIVER WATER QUALITY
- MIXING ZONE STUDY ALSO CONDUCTED TO SEE HOW STP EFFLUENT ASSIMILATES WITHIN THE RIVER CHANNEL

RESULTS

- SAMPLES COLLECTED AT 8 LOCATIONS (1 AT PLANT, 2 AT OUTFALL, 1 UPSTREAM , 4 DOWNSTREAM)
- EFFLUENT VERY HIGH QUALITY FOR PARAMETERS MEASURED
- NO NEGATIVE INDICES IN RIVER THAT ARE ATTRIBUTABLE TO THE PLANT EFFLUENT
- EFFLUENT STREAM IS EFFECTIVELY ASSIMILATED WITHIN 100 METRES

Bayfield River at Mixing Zone

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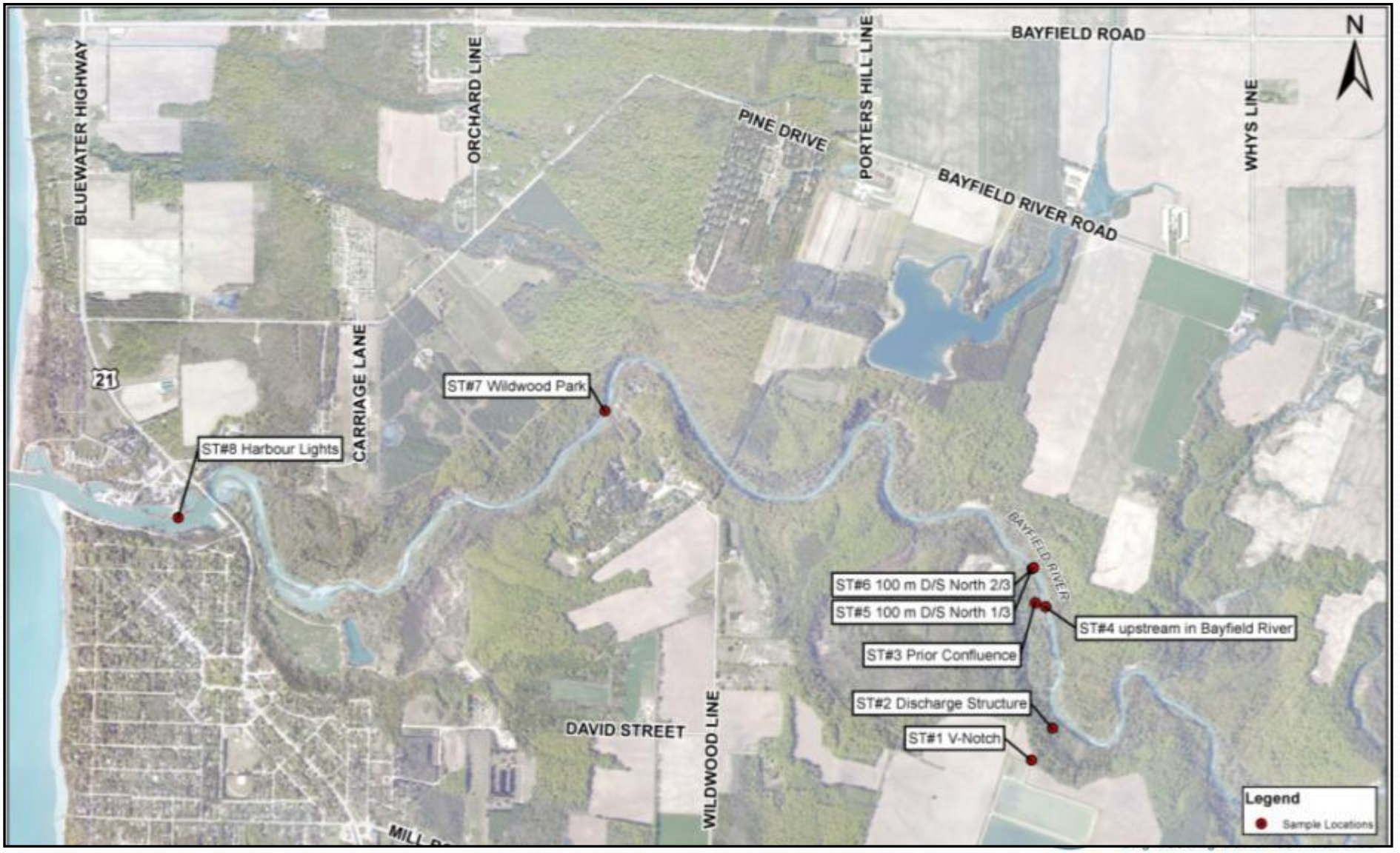
Water Quality Analysis



STP Treatment Technology Alternatives

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Treatment Alternatives

- Key considerations:
  - Develop a winter discharge.
  - Maximize use of existing
  - Work within site footprint.
  - Expand in stages rather than for a long design period.
  - Consider both capital and operating costs.

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NEXT STEPS

- Continue to investigate flow reduction and treatment options.
- Collect Additional Public and Agency input
- Finalize Class EA recommendations and present to Municipal Council.
- Complete Environmental Study Report (ESR)
- Publish Notice of Study Completion

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Questions?

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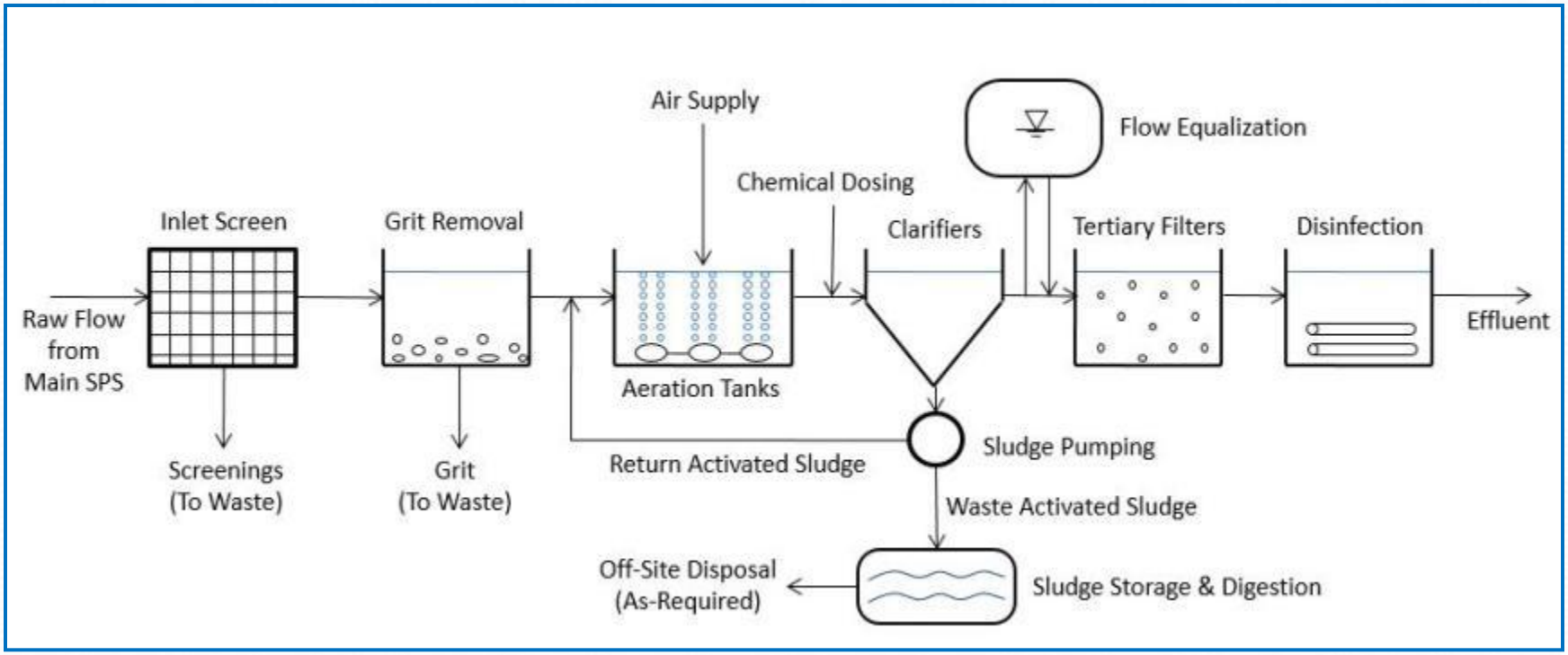
Extended Aeration



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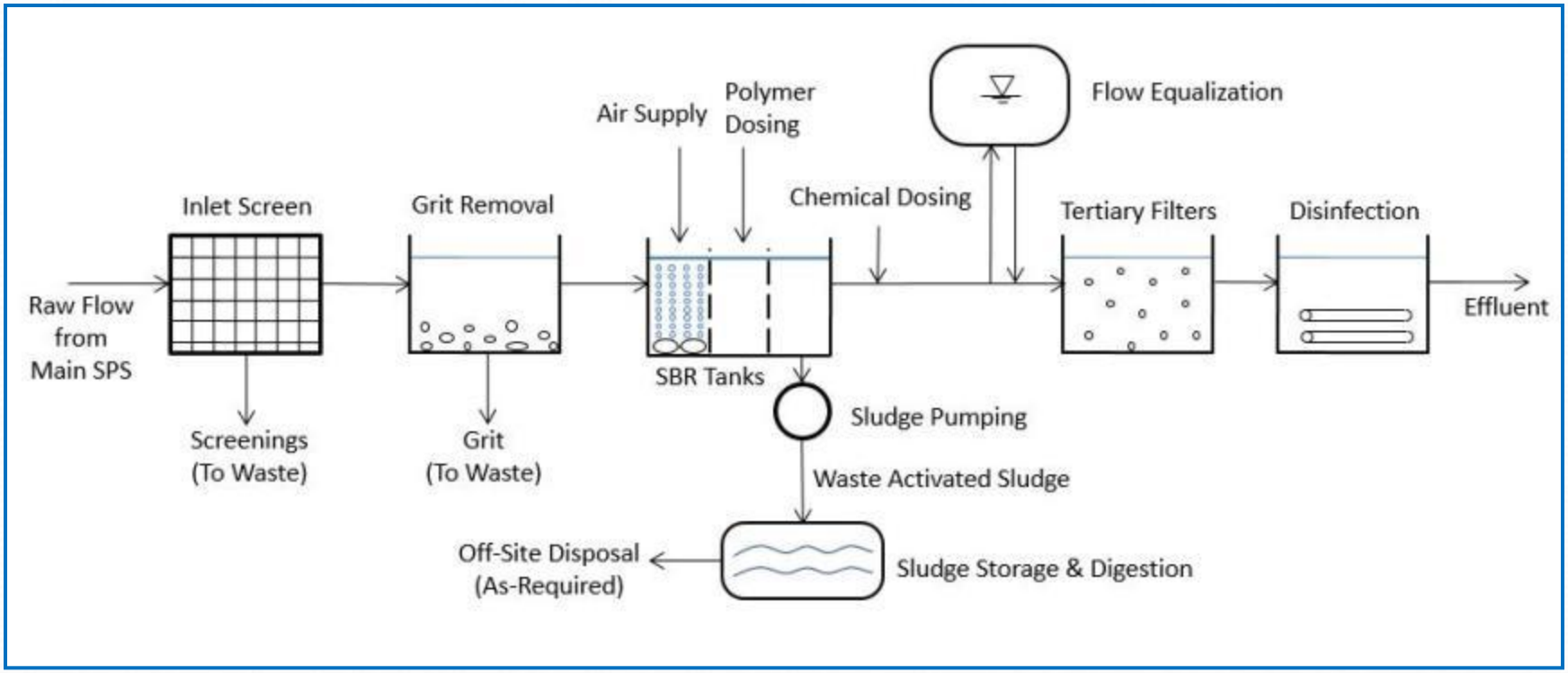
Sequencing Batch Reactor



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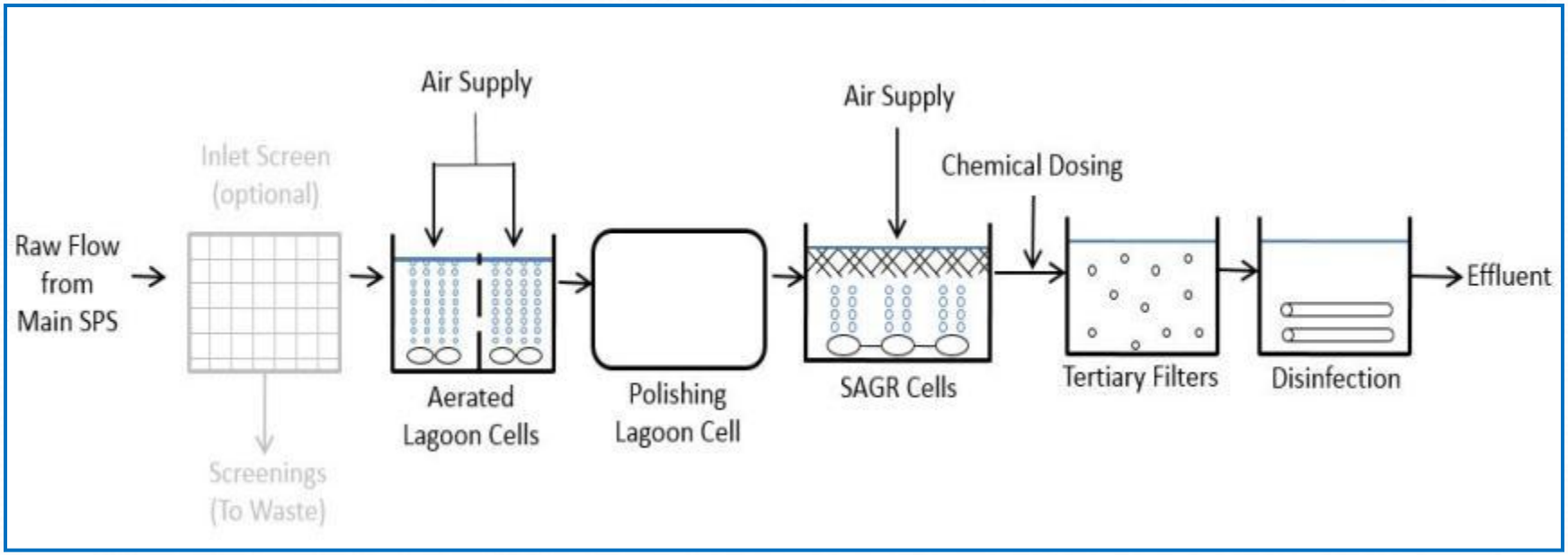
Submerged Attached Growth Reactors (SAGR)



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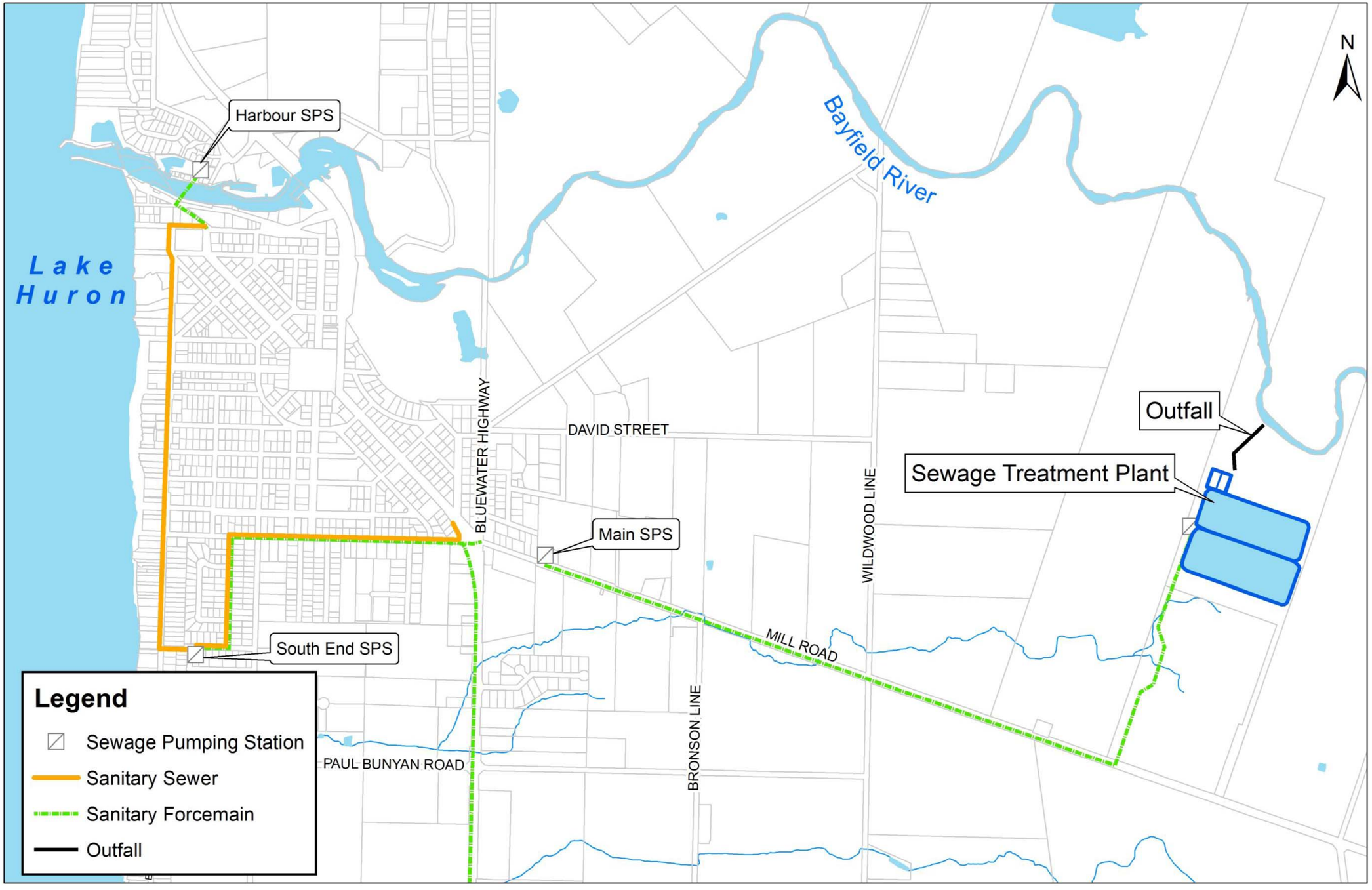
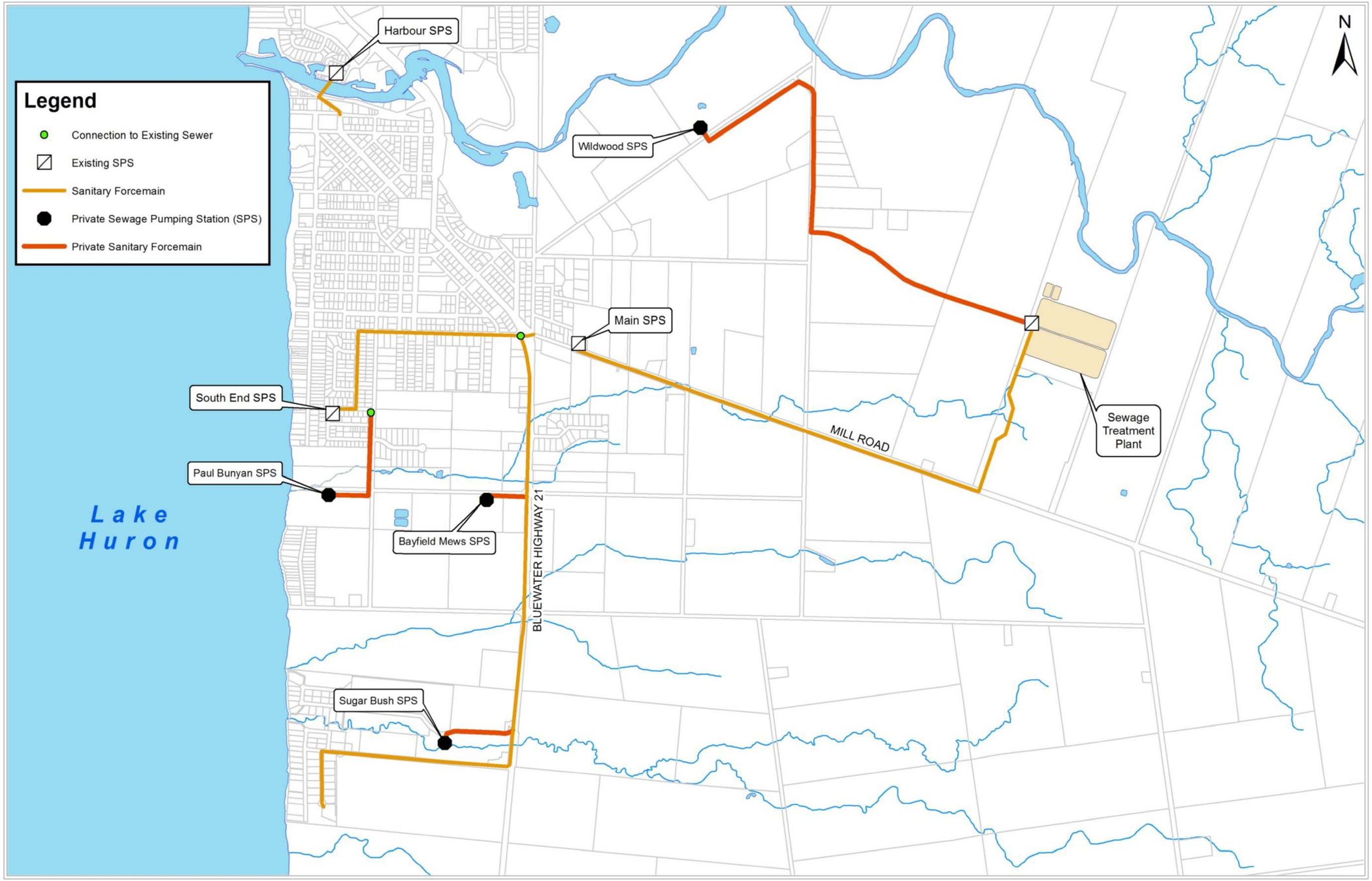
BAYFIELD SEWAGE TREATMENT FACILITY

PRIMARY COLLECTION SYSTEM COMPONENTS



ADDITIONAL SEWAGE INFRASTRUCTURE



MUNICIPALITY OF BLUEWATER (BAYFIELD)

CLASS EA FOR EXPANSION OF THE BAYFIELD SEWAGE TREATMENT FACILITY

PUBLIC INFORMATION CENTRE SCHEDULED FOR OCTOBER 31ST, 2015

WELCOME

Municipality of Bluewater

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MUNICIPALITY OF BLUEWATER COMMUNITY OF BAYFIELD

PUBLIC INFORMATION MEETING
OCTOBER 31, 2015

AGENDA

10:00 a.m. – 10:30 am	OPEN HOUSE
10:30 – 11:15 a.m.	PRESENTATION
11:15 – 11:45 a.m.	QUESTIONS
11:45 – 12:00 p.m.	OPEN HOUSE

PROJECT TIMELINES

- **AUGUST 2011** – CLASS EA PROCESS INITIATED
- **SUMMER 2010 - 2011** – BAYFIELD RIVER WATER QUALITY INVESTIGATIONS COMPLETED
- **2011 - 2015 –** ONGOING DISCUSSIONS WITH CENTRAL HURON REGARDING SHARED STP EXPANSION
- **2012 – 2014 –** INVESTIGATION OF TREATMENT PLANT EXPANSION OPTIONS
- **OCTOBER 2015 –** PUBLIC INFORMATION CENTRE
- **FEBRUARY 2016** – PREFERRED ALTERNATIVE PRESENTED TO MUNICIPAL COUNCIL(S)
- **APRIL 2016** – FINAL PUBLIC INFORMATION CENTRE
- **JUNE 2016** – FINALIZE CLASS EA PROCESS AND PUBLISH ENVIRONMENTAL STUDY REPORT (ESR) FOR PUBLIC REVIEW

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

SUMMARY OF CLASS EA PROCESS:

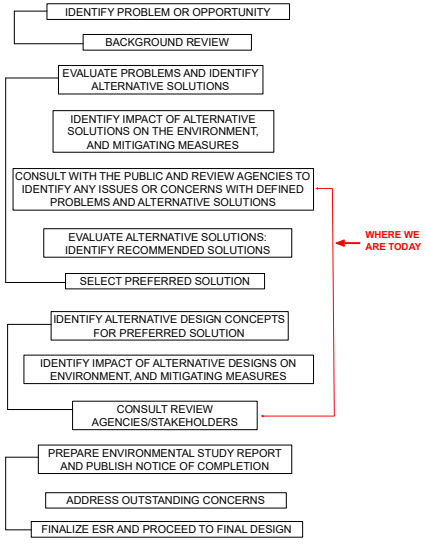
- PLANNING AND DESIGN PROCESS FOR MUNICIPAL WATER, WASTEWATER, AND ROAD PROJECTS
- CONDUCTED TO EVALUATE THE POTENTIAL IMPACTS OF THE PROJECT ON THE NATURAL, CULTURAL, SOCIAL, ECONOMIC, AND BUILT ENVIRONMENTS

STUDY PHASES:

SCOPE OF THIS STUDY:

- EXPAND EXISTING SEWAGE TREATMENT PLANT BEYOND EXISTING RATED CAPACITY INCLUDING OUTFALL TO RECEIVING WATER BODY CLASSIFIED AS A "SCHEDULE C" ACTIVITY
  - SCHEDULE C PROJECTS APPROVED SUBJECT TO COMPLETION OF FULL CLASS EA PROCESS (PHASES 1 THRU 5)
- GENERAL STUDY COMPONENTS:
  - DEFINE PROBLEM / OPPORTUNITY;
  - IDENTIFICATION OF ALTERNATIVE SOLUTIONS;
  - CONSULTATION WITH THE PUBLIC / REVIEW AGENCIES;
  - SELECTION OF A PREFERRED ALTERNATIVE;
  - EVALUATION OF ALTERNATIVES / IMPACT MITIGATION;
  - PREPARATION OF ENVIRONMENTAL STUDY REPORT (ESR); AND
  - FINAL PUBLIC NOTIFICATION.

CLASS EA STUDY PROCESS
(PHASES 1 -5)



BAYFIELD STP CAPACITY

- **FACILITY CONSTRUCTED IN 1999/2000**
- **CAPACITY FOR APPROXIMATELY 1000 HOMES**
  - 660 HOMES SERVICED INITIALLY
  - 250/300 VACANT LOTS
  - CONSTRUCTED TO SERVICE FORMER VILLAGE OF BAYFIELD ONLY – PRE-AMALGAMATION
- **ADDITIONS TO SERVICE AREA**
  - POST-AMALGAMATION CAPACITY GRANTED TO A NUMBER OF TRAILER PARK FACILITIES AND SUBDIVISION DEVELOPMENTS
  - NEW CONSTRUCTION IN BAYFIELD AVERAGING 20 UNITS PER YEAR
  - PLANT IS CURRENTLY OVER-COMMITTED ALTHOUGH STILL OPERATING WITHIN DESIGN LIMITS
- **ADDITIONAL CAPACITY NEEDED WITHIN 2-3 YEARS TO ALLOW DEVELOPMENT TO PROCEED AT CURRENT GROWTH RATE**

CLASS EA INVESTIGATION

STUDY PURPOSE:

- TO IDENTIFY PLANT EXPANSION OPTIONS WHICH WILL MEET HIGH TREATMENT STANDARDS AND PROVIDE SUFFICIENT CAPACITY FOR 20 – 25 YEARS;
- REVIEW PLANT EXPANSION ALTERNATIVES AVAILABLE TO ADDRESS STUDY SCOPE;
- DEFINE ANY POTENTIAL IMPACTS WITH THE PROPOSED ALTERNATIVES AND EVALUATE MEASURES TO MITIGATE ANY IDENTIFIED CONCERNS; AND
- SELECT A PREFERRED EXPANSION ALTERNATIVE (INCLUDING DEFINING ANY REQUIRED MITIGATION).

CLASS EA ALTERNATIVES:

1) REDUCE SEWAGE FLOWS IN THE COMMUNITY

2) LIMIT COMMUNITY GROWTH

3) EXPAND THE EXISTING SEWAGE FACILITY

4) CONSTRUCT A NEW SEWAGE TREATMENT FACILITY

5) DO NOTHING

FUTURE DEVELOPMENT AREAS

DEVELOPMENT PARCELS

- EXISTING LOTS OF RECORD IN BAYFIELD
- APPROVED PLAN OF SUBDIVISION DEVELOPMENTS

BAYFIELD RIVER WATER QUALITY

- **BENTHIC ANALYSIS**
- ANALYSIS OF BUGS/ORGANISMS LIVING IN RIVER CHANNEL SUBSTRATE
- PROVIDES A MORE ACCURATE LONG-TERM ASSESSMENT OF WATER QUALITY
- CONDUCTED DURING SPRING 2010

Outfall discharge at side channel

River at junction with side channel

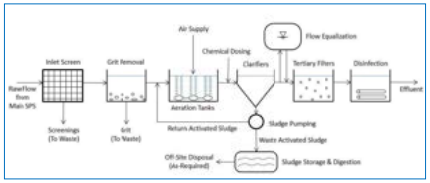
- **RESULTS**
- SAMPLES COLLECTED AT 3 LOCATIONS IN RIVER (ONE UPSTREAM OF OUTFALL, TWO DOWNSTREAM)
- RESULTS INDICATE UNIMPAIRED WATER QUALITY AT ALL THREE SAMPLE LOCATIONS
- SPECIES RICHNESS GOOD, INDICATING HIGH QUALITY STREAM ENVIRONMENT
- STUDY WILL SERVE AS A BASELINE FOR FUTURE

BAYFIELD RIVER WATER QUALITY

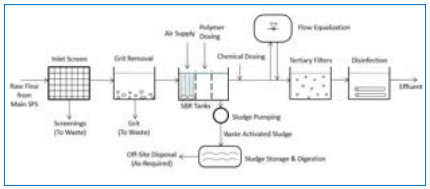
- **ASSIMILATION STUDY**
- CHEMICAL AND BACTERIOLOGICAL ANALYSIS OF BAYFIELD RIVER WATER QUALITY
- MIXING ZONE STUDY ALSO CONDUCTED TO SEE HOW STP EFFLUENT ASSIMILATES WITHIN THE CHANNEL
- CONDUCTED DURING SUMMER 2011

- **RESULTS**
- SAMPLES COLLECTED AT 8 LOCATIONS (1 AT PLANT, 2 AT OUTFALL, 1 UPSTREAM, 4 DOWNSTREAM)
- EFFLUENT OF VERY HIGH QUALITY FOR PARAMETERS MEASURED
- NO NEGATIVE INDICES IN RIVER THAT ARE ATTRIBUTABLE TO THE PLANT EFFLUENT
- EFFLUENT STREAM IS EFFECTIVELY ASSIMILATED WITHIN RIVER WITHIN 100 METRES OF SIDE CHANNEL MERGING

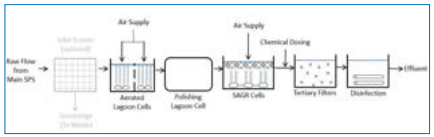
PRELIMINARY DESIGN ALTERNATIVES



Extended Aeration Alternative



Sequencing Batch Reactor Alternative



SAGR Alternative

File: 09051

MUNICIPALITY OF BLUEWATER
CLASS ENVIRONMENTAL ASSESSMENT
FOR EXPANSION OF THE BAYFIELD SEWAGE TREATMENT FACILITY
COMMUNITY OF BAYFIELD

PUBLIC INFORMATION MEETING

October 31, 2015

ATTENDANCE LIST

(PLEASE PRINT)

Name	Address

File: 08175

MUNICIPALITY OF BLUEWATER
CLASS ENVIRONMENTAL ASSESSMENT
FOR EXPANSION OF THE BAYFIELD SEWAGE TREATMENT FACILITY
COMMUNITY OF BAYFIELD

PUBLIC INFORMATION MEETING

OCTOBER 31, 2015

COMMENTS

Name: _____

Address: _____

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PLEASE HAND IN, MAIL, OR FAX TO:

B. M. ROSS AND ASSOCIATES LIMITED
Consulting Engineers
62 North Street
Goderich, Ontario
N7A 2T4

Phone: (519) 524-2641 Fax: (519) 524-4403
Email: kvader@bmross.net
Attention: Kelly Vader, Environmental Planner

Comments and Information collected by B.M. Ross & Associates Limited on behalf of the Municipality of Bluewater will assist in decision making pertaining to the Environmental Assessment study. Comments and opinions will be kept on file but will not be included in study documentation made available for public review. Under the Freedom of Information and Protection Act (1987) personal information provided to the Municipality of Bluewater will remain confidential unless prior consent is obtained.

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 09051

MUNICIPALITY OF BLUEWATER

CLASS EA FOR EXPANSION OF THE BAYFIELD STP COMMUNITY OF BAYFIELD

PUBLIC MEETING NOTES

Details: Saturday October 31, 2015
Municipality of Bluewater, Bayfield Community Centre

Open House:	10:00 am - 10:30 am
Presentation:	10:30 am - 11:15 am
Questions:	11:15 am - 11:45 am
Open House:	11:45 am - 12:30 pm

In Attendance:

Tyler Hessel, Mayor	) Municipality of Bluewater
Jim Fergusson, Deputy Mayor	)
Bill Whetstone, Bayfield Ward Councillor	)
John Becker, Hay East Ward Councillor	)
Marnie Hill, Hensall Ward Councillor	)
Jennette Walker, Manager of Public Works	)
Steve Burns	) B.M. Ross and Associates (BMROSS)
Kelly Vader	)
Cameron Adams	)

Members of the public: 40±

10:00 a.m. - 10:30 a.m. – Open House

Public Arrival

- Members of the public signed in upon arrival.
- Poster boards were on display for the public to view *(attached)*
- Representatives of BMROSS and the Municipality made themselves available to talk to the public as they arrived.

10:30 a.m. – 11:15 a.m. – Presentation

Power Point Presentation (attached)

- Tyler Hessel, Bluewater Mayor, welcomed those in attendance on behalf of the Municipality of Bluewater and then introduced Steve Burns and Kelly Vader from BMROSS to start the formal presentation.

- Steve Burns discussed the purpose of the meeting and provided an overview of the agenda. He then reviewed details of the existing Bayfield Sewage System including a description of the primary components and details regarding sewage flows and effluent quality.

- Steve B. then reviewed the problems or opportunities facing the facility and why the Class EA process was initiated by the Municipality of Bluewater.

- Kelly Vader discussed the Class EA process beginning with the problem/opportunity statement developed for the project and explaining the primary stages in a Schedule C Class EA undertaking.

- Steve Burns provided an overview of the work completed to date on the project, including pre-consultation with the MOECC, water quality studies of the Bayfield River and detailed flow analysis of the facility. Steve also reviewed expansion options which were being explored for the facility and noted that the Municipality of Central Huron was considering joining with Bluewater on the expanded facility.

- Kelly provided more detail on the two water quality studies completed for the Bayfield River, the Benthic Study completed in 2010 and the Water Quality Analysis completed in 2011.

- Steve completed the presentation by providing a more detailed description of the treatment alternatives being considered for the expanded Bayfield facility and the next steps in the Class EA process.

11:15 a.m. – 11:45 a.m. – Questions

After concluding the presentation, questions were invited from the public. Copies of the meeting notes and presentation material will be made available on the Municipal website as well as the BMROSS website.

Summary of Questions and Answers

Q. Why is BMROSS and the Municipality not examining infiltration into the sewage collection system at the same time as the Class EA? Reducing infiltration would be considered "optimization" .

A. Steve Burns explained that as a component of the EA process, infiltration and inflow into the collection system is being examined. He noted that a camera investigation of the sewage collection system is being considered by the Municipality. Steve also explained that, based on the current population using the sewage collection system, and the flows recorded at the sewage treatment facility, it doesn't appear that the flows per customer differ significantly from other communities.

Q. Are sewage flows from the trailer parks that have connected to the system being examined as part of the inflow and infiltration study component of the study? There have been historical problems with groundwater infiltration into these campgrounds and Bayfield shouldn't have to pay to treat clean groundwater getting into the collection system through the campgrounds.

A. Steve indicated that there were no plans at present to investigate the sewers in the campgrounds specifically. However he noted that the agreements with the campgrounds stipulate that they will pay for the sewage that is treated from their collection systems, so they will not be able to increase flows into the system without resulting in increased costs to treat the sewage.

Q. A resident asked if BMROSS was aware of the award winning sewage treatment plant constructed recently to service Grand Bend and whether this type of system would work in Bayfield.

A. Steve explained that he was aware of the Grand Bend system, however did not believe that the technology would suit Bayfield. He noted that the Grand Bend system had different needs than Bayfield and this type of technology did not lend itself to a staged expansion approach that was desired for Bayfield. Consideration would be given to relevant aspects of the Grand Bend STP design.

Q. A resident questioned how much money had been set aside in the STP reserve which is funded by the expansions to the collection system to service the trailer parks and other developments. They also wondered if the flow data from the Trailer Parks could be made available to the public.

A. Tyler Hessel responded that an investigation into infiltration into the collection system was a priority for the Municipality but that expansion of the facility was needed to accommodate growth within the community. He noted that he did not have the information related to the reserve fund available at the meeting but that the information could be made available.

Q. A resident suggested that an opportunity be made available for residents to comment on the Class EA who might find it difficult to put their comments in writing.

Q. Could flows from the Sugar Bush Trailer Park be directed south to the Grand Bend System rather than going to Bayfield in order to free up sewage capacity in the Bayfield System?

A. Tyler Hessel explained that the Municipality of Bayfield completed a Class EA process to take sewage flows from within the south portion of the Bluewater shoreline area to the Grand Bend facility however the service area for the study did not go further north than Hessenland. Therefore it would be unlikely that flows from Sugar Bush could be directed to the south.

Q. A resident asked how much of the project costs would have to be paid by existing Bayfield residents?

A. Steve indicated that it was too early in the process to discuss the allocation of costs. He also noted that the possible participation by Central Huron will play a big role in how costs are distributed.

Q. A resident asked if it was uncommon for a sewage treatment facility to reach capacity within 15 years of being constructed.

A. Steve explained that it was relatively uncommon within Huron County for a treatment facility to reach capacity this quickly, however it is not unsurprising for the Bayfield facility given the rate of growth and extensions to the collection system that were added post-amalgamation. Steve noted that sewage treatment facilities are typically designed for a 20-25 year growth period and it will likely be near the 20 year mark when the plant is ultimately expanded, given that the facility is 15 years old at present.

Q. A resident questioned how much capacity Central Huron was asking for and what area this would service? Would the inclusion of Central Huron not result in the same problems the plant has currently?

A. Steve provided background on Central Huron's request and explained that oversizing of the sewers was purchased by the former Township of Goderich when the plant was originally constructed. He explained that Central Huron will need to determine how much capacity in the plant they would like to purchase, however they are focusing on the lakeshore area immediately north of Bayfield. Steve also noted that Central Huron's involvement would not be problematic for the STP because we would know how much capacity they want before the plant is expanded.

Q. Does BMROSS have copies of the growth projections and flow data from the original EA report when the STP was constructed to see how accurate the predictions were?
A. Steve indicated that he could get this information.

Q. A resident questioned whether the plant was designed to accommodate vacant lots?
A. Steve explained that when the STP was originally built, a grant was received from the province to assist with construction of the collection and treatment system. The grant could not be used to fund capacity for future development however Bayfield paid 100% of the costs to service vacant lots within the Village. Tyler Hessel explained that residents in the community with a serviced lot are currently allowed to get a building permit if they want to build on a vacant lot. Jennette Walker, Manager of Public Works, added that parcels that would require a severance to create a building lot, or new development applications, would need to be reviewed before a building permit could be issued.

Q. A resident indicated that he had a lot of questions regarding the process and would put them in writing rather than discuss them all at the meeting. He explained that he was unhappy with how the Municipality has managed the STP capacity to date and would like to put the Municipality on Notice that he will likely appeal the EA when it is completed.
A. Steve suggested that the resident put his comments in writing.

11:45 a.m. – 12:30 p.m. – Open House

Members of the public were given the opportunity to have one-on-one time with members of BMROSS and municipal staff after the presentation and Question & Answer period.

Should there be any errors or omissions to these meeting notes, please notify the undersigned.

Meeting Notes Prepared by
B. M. ROSS AND ASSOCIATES LIMITED

Kelly Vader, Environmental Planner

KV:hv

Distribution
Tyler Hessel, Bluewater Mayor
Jennette Walker, Municipality of Bluewater
Steve Burns, BMROSS
Kelly Vader, BMROSS

Kelly Vader

From: Kelly Vader <kvader@bmross.net>
Sent: November 20, 2015 11:08 AM
To: [redacted]
Cc: [redacted]
Subject: FW: Bayfield sewage lagoon EA

Hi [redacted]:

I have discussed your questions with Steve Burns, the project engineer from our office for the Bayfield STP expansion project, as well as Darren Alexander and Dale Erb, project engineers working on the Main Street reconstruction project. We're still looking into Roger's other questions.

1) In response to your first question regarding peak flows: We have analysed daily records for both sewage flows and water supply and feel we have a pretty good understanding of the relationships between summer and winter, week days and weekends, average and peak flows. The information will be taken into account in the design. One of the advantages of lagoon technology is its ability to manage short term peak flows.
2) Your second question was regarding storm water management. It is not entirely correct that all new developments need holding ponds to mitigate runoff. There are a number of methods to address stormwater management in a development, a holding pond (which is an end-of-pipe solution) is just one means of accomplishing this. Incorporating Low Impact Development (LID) concepts or providing storage within the development itself (roadside ditches or ponding areas at the rear of lots) can also be used, among other measures. The Bayfield Stormwater Servicing Master Plan provides a good explanation of these concepts if you have an interest in researching this further. For the Bayfield Main Street project, LID measures are being incorporated into the design, as well as exfiltration pipes (water can seep out of the pipes into the surrounding soil) to provide some stormwater management measures within the streetscape itself. However, due to the limitations of working within an established area, a majority of the runoff will be directed to the storm sewer collection system, which will ultimately discharge to Lake Huron at Delevan Street (what drainage currently exists on Main Street is already directed to this outlet). In Bayfield, stormwater runoff is not directed into the sanitary collection system, instead it goes into the storm sewer collection system and is discharged at several existing outlets, a majority of which are located adjacent to the shoreline.

Please let me know if you have any additional questions regarding this.

Kelly Vader, MCIP, RPP
B. M. Ross and Associates Limited
Engineers and Planners
62 North Street

Goderich, ON N7A 2T4

Ph: (519) 524-2641
Fax: (519) 524-4403
kvader@bmross.net
www.bmross.net

From: Dave and Lynne Gillians [mailto:lynnegillians@hotmail.com]
Sent: November-17-15 9:09 PM
To: Roger Lewington; Kelly Vader
Subject: Re: Bayfield sewage lagoon EA

Kelly
I know that I'm coming in late to this discussion but I have two questions.
1. Any sewage lagoon in a community should be sized to be able to handle peak usage plus a margin of error. Most estimates calculate Bayfields population on August 1st or Labour Day in excess of 8000 or 500 on February 1st. If Bayfield grows to 3000, will we need a sewage system that can handle 24,000 people on Labour Day?
2. I understand all new developments need holding ponds to mitigate runoff. Since Bayfield's Main Street and adjacent streets will never have holding ponds to stop run off into the lake, I have been told that the most predictable solution is to redirect road runoff into the sewers. Is this factor being calculated for a future sewage lagoon?

Best wishes
Dave Gillians

Sent from Samsung tablet

-------- Original message --------
From: rlewington@tcc.on.ca
Date: 11-17-2015 6:46 PM (GMT-05:00)
To: Kelly Vader <kvader@bmross.net>
Subject: Bayfield sewage lagoon EA

Hello Kelly , a couple of questions following the presentation on treatment options :

1) Other than Bayfield sewage , what goes in the lagoons ....are private contractors allowed access ? Does leachate from landfills go into the system ? If so , do we know what's in the leachate ?

2) is removal of ecoli a priority ? (issue being ecoli ending up in the lake) I understand Clinton has uv light treatment to remove ecoli .

3) are there any treatment systems that are digesters that capture methane gas ?

4) what are the current leading / cutting edge technologies for wastewater treatment ?

Regards, Roger

From: Kelly Vader
Sent: Thursday, October 29, 2015 11:01 AM
To: mailto:rlewington@tcc.on.ca
Subject: Public Meeting on Saturday

Hi Roger:

Just wanted to make sure you were aware of the meeting this Saturday. Feel free to pass this along.

Thanks,

Kelly Vader, MCIP, RPP
B. M. Ross and Associates Limited
Engineers and Planners
62 North Street
Goderich, ON N7A 2T4

Ph: (519) 524-2641
Fax: (519) 524-4403
kvader@bmross.net
www.bmross.net

Kelly Vader

From: Kelly Vader <kvader@bmross.net>
Sent: November 26, 2015 2:22 PM
To: [redacted]a)
Subject: FW: MagneGas Corporation News - The New York Times

Hi [redacted]:

I discussed your question with Steve Burns, P. Eng., the project engineer for the Bayfield STP expansion project. He indicated that we are always interested in new ideas and technologies. Gas generation technologies have been used at wastewater treatment plants for generations. However Bayfield is a relatively small facility with a raw waste stream that is quite variable and generally considered weak organically. To use a process that realistically could take advantage of potential gas generation opportunities would increase the complexity and operational costs by an order of magnitude or more.

We're still in the process of collecting information in order to respond to your other question.

Kelly Vader, MCIP, RPP
B. M. Ross and Associates Limited
Engineers and Planners
62 North Street
Goderich, ON N7A 2T4

Ph: (519) 524-2641
Fax: (519) 524-4403
kvader@bmross.net
www.bmross.net

From: [redacted]a]
Sent: November-17-15 4:07 PM
To: Kelly Vader
Subject: Fw: MagneGas Corporation News - The New York Times

Kelly , re the Bayfield sewage lagoon , you might want to look at this technology. I saw an article in Ontario Farmer as a treatment option for hog manure . Eliminates ecoli and the by-product is a commercial gas . Wondering if it might have an application here. regards, [redacted]

MagneGas Corporation

MNGA: Nasdaq; Energy/Oil & Gas Refining & Marketing

PRIMARY EXCHANGE: NASDAQ

News about MagneGas Corporation, including commentary and archival articles published in The New York Times.

COMPANY INFORMATION

MagneGas Corporation is an alternative energy company. The Company creates and produces hydrogen-based alternative fuel through the gasification of carbon-rich liquids, including certain liquids and liquid wastes. The Company has two products: a fuel called MagneGas and the machines that produce that gas known as, Plasma Arc Flow System. It has developed a process, which transforms various types of liquid waste through a plasma arc machine. The Company produces gas bottled in cylinders for the purpose of distribution to the metalworking market as an alternative to acetylene. The Company has retail and wholesale platforms to sell its fuel for use in the metalworking and manufacturing industries. The Company produces fuel for the metalworking fuel market. It distributes products through several industrial gas companies in California, Michigan, Florida, Georgia, Indiana, and Pennsylvania. In addition, it has direct retail customers in Florida and New York.

MagneGas Corporation
150 Rainville Rd TARPON SPRINGS FL 34689-6930
Phone: +1 (727) 932-9593
Fax: +1 (727) 934-6260

Subject: MagneGas Corporation News - The New York Times

http://topics.nytimes.com/top/news/business/companies/magnegas-corporation/index.html

2015.12.04 "by registered mail"

[redacted]

London Ont., [redacted]

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B. M. Ross & Assoc.,
62 North St.
Goderich Ont., N7A 2T4

attn.: Ms. Kelly Vader
Environmental Planner

Dear Sirs:

Following, in informal point form, further to:
- the public information meeting of 2015.10.30
- my letter of 2011.10.12 (no response)
- phone conversations over the past few years with Ms. Vader & Mr. Burns.

- does BW have a master sanitary sewage servicing plan for all areas, especially urban areas like along the lake between St. Joseph and Bayfield?

- does BW have a sanitary sewage servicing policy including design guidelines and construction standards as it relates to collection, pumping, forcemains and treatment, especially trailer parks?

- can/does your plans show EA study areas and subsequent service areas? (1999 project : 2015 project)

- Central Huron's EA:
  - what about the lake shore urban area between the lake & 21, Bayfield to Goderich?
  - are they speaking to Goderich the same as BW?
  - are they looking at a plant in this area?
  - a couple of years down the road after BW's Bayfield plant expansion, every couple of years are they going to request capacity for:
    - Homestead Trailer park?
    - the golf course " " ?
    - the Light House " " ?
    - Pine Lake?

- is this BW EA considering:
  - pressure sewers?
  - pump station pressure sewer separate system?
  - septic tanks and tile beds (previous Council was very "status quo" on this)

- was the 300 lots committed in 2005?

- there is a reason why there was 20 building permits per year pre and post 2008:
  - more lots per acre since no tile beds
  - no treatment costs: - tile beds at $20-25000 free
    or - treatment at $15-20,000 free

- the municipal boundary to treatment facility boundary:
  - how do you view them?
  - amalgamation is not an excuse
  - what will you do if next amalgamation is county wide?

- where are First Nations in this project? who?

- given the events since the 1999 project how can you look 25 years into the future (1999 project over committed within 5 years)

- can you list separately the 1999 infill lots and approved plan of subdivisions lots ("green field private development") since 1999, where is the +300 lots in this.

- other than infill lots, do all additional flows committed, esp. subdivisions have sunset clauses?

- for the trailer parks connected to date:
  - are the pump stations metered? who owns and operates?
  - do they have an acceptable storm drainage system and outlet? modern, urban, engineered
  - how is BW adjusting for lower winter or higher summer weekend peak flows

- existing on lot connection requirements:
  - floor drains
  - foundation/footing drains
  - sump pump discharge outlet
  - connection permit inspections ("sunday morning connections")
  - how did BW handle the above to date?

- re: - MOE D-5-1 calculation
  - existing flows less than design flow currently
  - existing flow plus 20 year project / design period
  - procedure for granting committed flow amounts
  - existing flows divided by number of connections = 1300 l/day/connection,
  - infill lots ("300"?)
  - can a correlation between the above be "fixed" so that there are no miss connections?

- to date pumping stations and forcemains have been added to components of the 1999 project (gravity pipe, pumping stations and forcemains, treatment) and have not paid for their share of these

- I do not feel that the 1300 l/day/connection is a "normal" or typical/acceptable value in 2015 SW Ont.
  - has BW investigated/managed I&I
  - original allowance (1999): current water meter readings
  - Bayfield demographics:
    - people/house (< 2/house, kids are grandchildren)
    - seasonal (6 mo) - weekends only
    - "snow birds" (away 3-4 mo.)
    - vacationers (3-4 2 weeks/yr.)
    - day visitors
    - recreational facilities (splash pads, public taps...)
  - an I&I study/investigation is desperately needed to illiminate "rain from the sky"
  - I would suggest this system is approaching 20-40% I&I

- why did BW sell the front half of the 1999 farm
- is there enough property left to keep existing facilities operational and not be interupted building the new

- noted 880 connections include "+300 vacent lots (infill)"?

- is I : I in the collection system or on lot

- has proposed treatment process alternatives considered staging / parallel trains?

- if slow sand filters are part of the existing facility can they be paralleled or covered (ie "coverall") to optimize the existing, has an optimization study been completed?

- more / aeration in existing cells?

- post 2005 flows should pay for:
  - 100% of all new work
  - their share of the existing system they are using (collection, pumping & treatment)
  - post O&M of all new work

- has BW completed a master sewer rate structure based on system provided and system usage (m^3/year)

- is this project in the flavour of health & environmental concerns (ie 1999 project) or is it private "green field" growth development?

- growth pays 100% for growth

- remember there were quite a number of properties that had regulatory compliance, acceptable performance private potable water wells and sub surface sewage disposal systems in 1999

- provincial and federal funding is not for private development. (Big 1999 project ≈ 88+ #?)

- development charges are too late for committed to date

- has BW considered other methods of charges?

- how are Hensall's & Zurich's rates compared to Bayfield?

- if there are 880 connections, I was very disappointed with the turnout at the PIM

- has this EA been going on since 2011?

- dispite my comments on BW's management of the existing treatment facility, please take this letter as constructive consideration

- the costs of sanitary sewage sevice are approaching affordability for likely a number of residents.

Respectfully

[redacted]

2016.01.06

[redacted]
London Ont. [redacted]

B.M. Ross & Assoc. Limited
62 North St.
Goderich Ont. N7A 2T4

attn.: K. Vader, RPP, MCIP.

Bayfield WWTP Class EA

Dear Ms. Vader:

I am in receipt of your letter dated 2016.05.31.

After review of the above noted letter with my consultants' sanitary sewage treatment engineer and environmental planner, I will forward my formal response.

In the interim will you please forward:

1. A current copy of the phase EA document
2. Your schedule dates for the EA phases
3. Your schedule dates for notices of completion

..... pg. 2

4. Please include my name on all future notices/circulations/mailings.

Respectfully,

[redacted]

Kelly Vader

From: [redacted]
Sent: January 26, 2016 2:14 PM
To: Kelly Vader
Subject: Re: Bayfield sewage lagoon EA

Thanks ! [redacted]

From: Kelly Vader
Sent: Tuesday, January 26, 2016 1:49 PM
To: mailto:[redacted]
Subject: FW: Bayfield sewage lagoon EA

Hi [redacted]

I'm very sorry it has taken so long to get back to you on this one. Please let me know if you have any additional questions or need clarification on any of this information.

Kelly

[redacted]
Sent: November-17-15 6:47 PM
To: Kelly Vader
Subject: Bayfield sewage lagoon EA

Hello Kelly , a couple of questions following the presentation on treatment options :

1) Other than Bayfield sewage , what goes in the lagoons ....are private contractors allowed access ? Does leachate from landfills go into the system ? If so , do we know what's in the leachate ?

Other than Bayfield sewage, private sewage pumpers are allowed to discharge into the lagoons. Based on information provided to us by the Municipality, this volume represents a very small percentage (ie. much less than 1%) of total flows to the facility (see table below).

Leachate from the Stanley landfill is also trucked to the lagoon. Similar to the septage, quantities are quite small, much less than 1% of total sewage flows and is limited to not more than 2,000 m3/year. As you can see, this limit has not been fully used and even if it were, represents less than 1% of the plant capacity. We

anticipate that this volume should be reduced significantly and eventually eliminated following recent upgrades implemented at the Stanley Landfill aimed at reducing infiltration into the active landfill areas.

Bayfield WWTP Class EA
Septage Quantities for 2013 to 2015

Year	Septage Volume (m^3)	Total Sewage (m^3)	Septage % of Total
2013	101.9	417560	0.02
2014	138.2	395660	0.03
2015	84.3	342687	0.02
Average	108.1	385302	0.02

Bayfield WWTP Class EA
Leachate Quantities for 2013 to 2015

Year	Leachate Volume (m^3)	Total Sewage (m^3)	Leachate % of Total
2013	720	417560	0.17
2014	1116	395660	0.28
2015	831	342687	0.24
Average	889	385302	0.23

2) is removal of ecoli a priority ? (issue being ecoli ending up in the lake) I understand Clinton has uv light treatment to remove ecoli .

E-coli is tracked at the Bayfield facility and is not a significant concern as a majority of the e-coli is removed during the sand filtration process. The 2015 WWTP operating data indicates the monthly mean E. Coli concentrations in the effluent ranged from 1 to 31 cfu/100ml (The limit for E.Coli is 100 cfu/100ml). E-coli present in the river, from other sources, would be a bigger concern than that coming from the STP. Below is an excerpt from the water quality sampling completed in the river as part of the Class EA investigations. The full report is available on our website.

Ecoli (*Escherichia coli*) was another parameter that was monitored and has a PWQO. The PWQO for Ecoli to protect recreational water uses is 100 organisms per 100 ml. All samples including the treated effluent sample contained less than 100 Ecoli /100 ml and thus met the criteria.

3) are there any treatment systems that are digesters that capture methane gas ? There are such facilities but they are very seldom used in smaller facilities because of the capital and operational costs. We are not expecting they will be economical or practical for Bayfield.

4) what are the current leading / cutting edge technologies for wastewater treatment ? New ideas come along regularly and we make sure we are aware of them. For Municipal facilities we believe that it is far more important that a technology be "proven" than it be "leading edge". Our approach is to determine the Best Available Technology (BAT) applicable to the situation. Over the last few years more wastewater treatment facilities have been incorporating membrane type systems. These are being considered for Bayfield. We fully expect that some of the plant components (e.g. effluent filters, front end screening, pumps and controls) will be very new technologies.

Kelly Vader, MCIP, RPP
B. M. Ross and Associates Limited
Engineers and Planners
62 North Street
Goderich, ON N7A 2T4

Ph: (519) 524-2641
Fax: (519) 524-4403
kvader@bmross.net
www.bmross.net

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 09051
May 31, 2016

BAYFIELD WWTP CLASS EA
RESPONSE TO [redacted]
LETTER OF DECEMBER 4, 2015

Introduction

For reference purposes, we have numbered [redacted] questions and comments and attached a numbered copy to this response.

Response to Questions

1. Bluewater does not have a Sanitary Servicing Master Plan. BMROSS has completed some conceptual work for the areas adjacent to Bayfield.

2. Bluewater does not have a formal servicing policy or standards. Bluewater has a typical street cross-section and a list of standard materials for development agreements and new construction projects. Generally OPSS and OPSD documents are used.

3. Study Areas – The 1999 ESR showed the areas the collection system was designed for, including areas in Stanley and Goderich Townships. The area serviced was:
   - Bayfield Village Boundary + Paul Bunyan Camp
   - There was a flow allowance for the Township areas

   The 2016 ESR will contain a map showing the current urban designation for Bayfield.

   It is important to note the current Class EA is not about servicing a specific area. It is about providing wastewater treatment for a defined flow.

4. Central Huron has not yet established what area they will service, if anything, or when they will service, if ever, and therefore how they will do it.

   They have made a commitment to tell Bluewater their intensions so Bluewater can move on with EA. The deadline for the commitment has expired.

   There are constraints to servicing Central Huron which are well documented but may not be well understood.

5. This EA is not about collection and it is not about servicing an area. It is about treatment capacity.

6. At the conclusion of construction in 2000, there were 210 lots of record serviced but vacant. In addition there were 65 extra services paid for by property owners. The latter are not considered commitments because they would require further planning approvals.

7. No comment

8. Re - Service Boundaries – Not really an issue for what is being done at this time. (refer to answers for 3 and 5 above). This is not a collection EA it is a treatment EA. Council will have to decide what is a reasonable growth allowance – where the sewage comes from is less critical for this study.

9. First Nations – have been contacted as part of the EA consultation process.

10. Council is going to have to look ahead and make a decision about expected growth. Growth has been very consistent – 20 to 25 units per year.

    The treatment facilities may not be constructed for a full 20 or 25 year period but would be expandable. The smallest increment will depend on considerations of construction feasibility and economy of scale.

11. Originally there would have been 210 lots in the Village that were vacant (approx. 660 built on). At the last count there were 90 of these left. The 65 for future severance are not considered commitments. The original 210 commitments can all be identified by Assessment Roll No.

12. We are not aware of any "sunset clauses" in any agreements.

13. Re Trailer Parks
    - They are all metered. The meters are owned by the Parks. Annual calibration is required by Bluewater. The SPS's are operated by the Parks.
    - Storm drainage/sewer standards etc. are up to the Parks.

14. The Ontario Building Code applies to all new construction. Sump pumps are not to discharge to the sanitary system.

15. Current 3 year average – 1030 m^3/d <1076 m^3/d design capacity.

    In 2015 the annual average flow was 939 m^3/d (87% of rated capacity).
    In 2015 there was approximately 890 customers, therefore the average flow was 1160 L/customer/day.

    The original design basis was 450 L/cap x 2.5 people per lot including infiltration – 1125 L/customer/day.

    The original design also took into account expectations of seasonal vs year round use.

Any properties that are considered commitments (e.g. approved lots, either infill or in new development) are allowed to connect. Re-development proposals on existing lots, where there is an existing use, are approved. The Municipality is deferring approval of any new development.

16. All of the Trailer Parks and all subdivision developments have contributed to a reserve fund based on a share of the cost of the original (2000) works. The possibility of Development Charges is being considered.

17. BMROSS is using water supply data (from meters) to understand what is seasonal and year round use per household to project into the future.

    Going forward we expect all new development will be permanent.

    Total flows are not too far off expectations but water meter data is confirming there is infiltration.

    This year Bluewater is doing CCTV + Smoke + extra metering to look for I/I.

18. Sale of farm - The Village of Bayfield sold the property, not Bluewater. They felt the need to keep the overall project costs down.

19. There are now about 900 customers and about 90 infill vacant lots.

20. It is expected the I/I is on the private side. Hopefully smoke and CCTV will provide an indication.

21. Staging will definitely be considered. We will select a treatment concept for 25+ years but build as little as practical (perhaps 10 years).

22. Sand filters cannot be used except in non-freezing conditions.

    The MOECC wants any additional discharge to be in cold weather.

    We have not completed an optimization study – the existing treatment facility is pretty simple and therefore hard to optimize.

23. Aerating the existing cells won't help get more flow out. Aerating shallow lagoons is not efficient from an energy standpoint. Further, the MOECC does not want to increase the volume discharged during the April to October period.

24. Question-What is the reference to 2005?
    New development has paid a share of the cost of the existing works (see 16 above),

    There have been no discussions regarding how the costs of expansion will be allocated.

25. Re-Rate Structure – This year BW is moving to common charge for Bayfield/Zurich/ Hensall. It will have a volumetric component based on water consumption.

26. Definitely growth and development. There may be a small component that is upgrade and/or replacement.

27. A Development Charges Bylaw would facilitate this.

28. No comment

29. Overall grant % was approx. 72%
    Most new development has bought in at the full original cost.

30. Agreed

31. Question-What other methods? Have not considered anything yet. Allocation of costs has not been discussed by Council.

32. Rates – Annual costs (2015) were:
    - Bayfield - $219
    - Hensall - $312
    - Zurich - $348

    Currently, a new rate Bylaw is being put into place.

33. No comment

34. The Class EA started in 2009

35. and 36. – Received for information

Prepared by:

S. D. Burns, P. Eng.

K. Vader, RPP, MCIP

2016.09.28.

"by registered mail"

[redacted]
London Ont. [redacted]

B. M. Ross & Assoc. Limited,
62 North St.,
Goderich Ont. N7A 2T4

attn.: Ms. K. Vader, RPP, MCIP

Bayfield WWTP Class EA

Dear Ms. Vader:

Following further to my letter of 2016.06.01.

I await a copy of your findings, conclusions and actions for items 10, 17, 20, 25 and 31.

I cannot accept the response to items 1, 2, 3, 5, 6, 7, 8, 12, 13, 14, 18, 24 and 26.

In general, without prejudice, I feel:

1. The municipality of Bluewater mismanaged the existing Sewage Treatment Facilities

1 of 1, pg. 2

2. This project is pre-mature and lacking scope

3. The municipality of Bluewater does not have the financial ability to persue this current project.

Unless provided otherwise, I will be on a division to request a "bump up".

I will provide a detailed item by item discussion on the above unaccepted items in the "bump up" request submission.

Respectfully

[redacted]

MUNICIPALITY OF BLUEWATER

NOTICE OF PUBLIC INFORMATION MEETING

BAYFIELD WASTEWATER TREATMENT FACILITY EXPANSION

The Municipality of Bluewater has initiated a Class Environmental Assessment process for expansion of the Bayfield Wastewater Treatment Facility. A public information meeting has been planned to advise residents of the status of study investigations and to provide a tentative timeline for completion of the Environmental Assessment and implementation of the project. The following information will be presented:

- Project background and description
- Current facility description and performance
- What expansion options were considered
- What expansion option is recommended
- Anticipated Project Costs and Timelines

Representatives of the Municipality and the Project Engineers will be in attendance.

DATE:	**Saturday October 24, 2020**
LOCATION:	**Electronic Meeting** **(For public viewing visit the Municipality of Bluewater Youtube Channel)**
TIME:	**10:00 AM**

Presentation material for the meeting will be made available for public review as of October 16th, 2020 on the Bluewater website. Individuals wanting to provide input on the project are encouraged to send their feedback via email to Kelly Vader, Environmental Planner at kvader@bmross.net. Feedback on the presentation information will be accepted until November 30th, 2020.

Individuals wanting to participate during the Public Meeting on October 24th will be required to pre-register by contacting Lacey Vander Burgt at lvanderburgt@municipalityofbluewater.ca (519-236-4351 ext.238) by Thursday,October 22, 2020 at 4:30 pm.

Municipality of Bluewater

BMROSS engineering better communities

Class Environmental Assessment for Expansion of the Bayfield WWTP

WELCOME

Public Information Meeting
October 24, 2020

Presentation

1. The Existing Sewage System
2. Background completed for the Environmental Assessment
3. Class EA - Detailed Design Alternatives
4. Costs and allocation of costs
5. Next Steps

THE EXISTING BAYFIELD SEWAGE SYSTEM

Service Area Details

- **Facilities were constructed in 1999/2000**
  - Constructed to Service the former Village of Bayfield.
  - Built for existing (1999) development + 300 vacant lots.
  - Harbour Lights and Paul Bunyan were in the original service area.
- **Additions to Original Service Area**
  - Post-Amalgamation, capacity was allocated to two more trailer parks and newer subdivision developments.

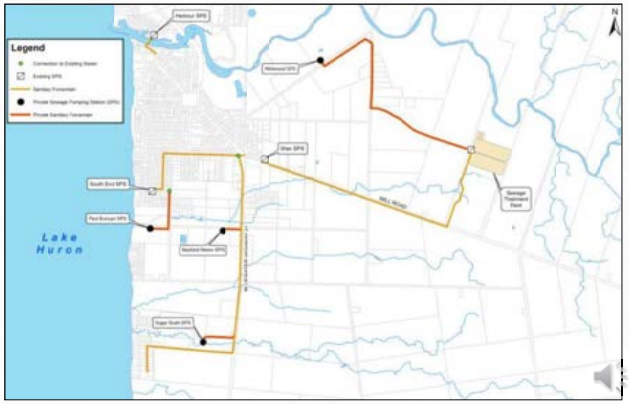
General Details of System

- There are currently about 980 customers.
- Growing at approximately 20 customers per year.

- 22 km of Main Sewer
- 272 Maintenance Holes
- 4 sewage pumping stations
- 12 km of pressure forcemain

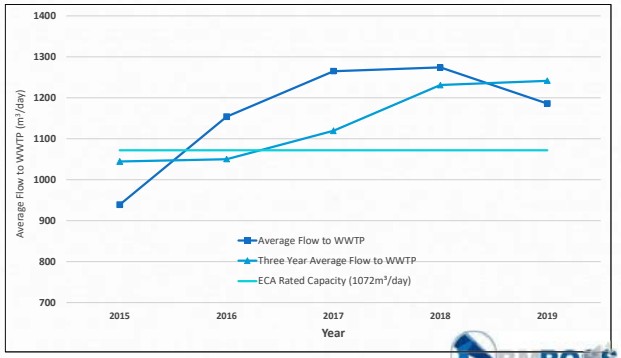
The Major Facilities

Additional Sewage Infrastructure



Bayfield Wastewater Treatment Facility

Annual Sewage Flows (m^3/day)



PROBLEM/OPPORTUNITY IDENTIFICATION

- Existing Wastewater Treatment Facility is operating beyond its rated capacity.
- Facility has additional commitments within the community.
- Infiltration issues within collection system.
- Capacity needs to be increased.

BACKGROUND WORK for the ENVIRONMENTAL ASSESSMENT

Work Completed to Date

- Aquatic Studies of Bayfield River
- Growth and development evaluation.
- Detailed review of existing sewage flows.
- Inflow and infiltration investigation of the Bayfield sewer collection system.
- Detailed evaluation of expansion alternatives.

Bayfield River Studies

Benthic Analysis

- An analysis of bugs and organisms living in the stream.
- An assessment of the impact of the existing discharge.
- Provides an understanding of present and potential long-term water quality.
- Samples were collected at 3 locations – one upstream and two downstream.

RESULTS

- Results indicated un-impaired water quality at all 3 locations.
- Species richness was good and indicated a high quality stream environment.
- The study serves as a baseline for the future.

WWTF Outfall at River

Water Quality Analysis

ASSIMILATION STUDY

- A chemical and bacteriological evaluation of the River water quality.
- A mixing zone study was also completed to understand how the existing discharge interacts with the River.

RESULTS

- Samples were collected at 8 locations (1 at the Plant, 2 at the outfall, 1 upstream and 4 downstream.
- The Plant effluent is was observed to be high quality.
- There were no negative indicators found attributable to the Plant discharge .
- It was found that the effluent is assimilated into the stream within 100 metres of the discharge location.

Bayfield River at Mixing Zone

Growth and Development

Preliminary Growth Projections

Year	Households*	Population**
2020	950	2330
2025	1050	2520
2030	1150	2715
2035	1250	2910
2040	1350	3120
Total Growth	+ 400 (42%)	+ 790 (34%)

*Historical average growth of 15 to 20 Units/Year.
**Population based on decreasing PPHH value.

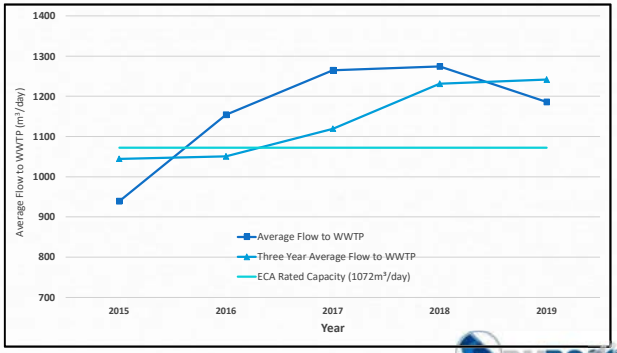
Growth and Development

- **820 units of <u>potential</u> residential development** have been identified as requiring sewage capacity.
- This includes:
  - 70 Existing general infill lots.
  - 60 for Harbour Lights Phase 2.
  - 14 Potential new development sites.
  - 93 Currently on septic systems.
    - Includes Crystal Springs & Glitter Bay areas.
    - Excludes Carriage Lane

Growth and Development Cont'd:

- **Estimated timing (speculative):**
  - **1st 5 years – 420 units**
    - Includes all current commitments (98 units)
    - Includes Harbour Lights Phase 2 (60 units)
    - Includes properties that have expressed high interest.
    - Includes properties where there is reasonable access to the existing system.
  - **6 to 10 years – 110 units**
    - 93 units currently on septic systems.
  - **11 to 20 years – 290 units**
    - Mostly potential development lands with no current proposal.

Annual Sewage Flows (m^3/day)



Inflow and Infiltration (I-I) Study

- Flows are high – an I-I study was completed to find out why and to assist in determining expansion needs.
- Study was funded in part by Infrastructure Canada through the Clean Water and Wastewater Fund.
- Initiated in 2017 and completed in 2020.
- Investigations and remediation work is ongoing.

Conclusions from the I-I Study

- 44% (approximately 560 m^3/day) of the Total Flow is groundwater INFILTRATION.
- The physical condition of the main sewers is generally good.
- Most of the I-I is believed to be coming from the private side of the system.
- Conclusion was that between 10% and 25% of the I-I flows probably can be eliminated economically.
- **SUGGESTED DESIGN I-I REDUCTION (25%) = 140 m^3/day**

I-I Reduction efforts to date:

- The entire collection system has been CCTV inspected and smoke tested.
- All the maintenance holes have been inspected.
- Approximately 80 sewer laterals were examined by CCTV.
- In-sewer flow metering has been completed at approximately 12 locations.
- Repairs have been completed at the maintenance holes with the greatest need for repair.
- Spot repairs have been completed in the sewers with the highest priority for repair.

Sewage Flow Analysis

Initial Flow Assumptions:

- WWTF Rated Capacity = 1,072 m^3/day.
- 3 Year Average Flow (2017 to 2019 Average) = 1,236 m^3/day.
- 2018 Annual Average = 1,274 m^3/day.
- **DESIGN EXISTING FLOW = 1,274 m^3/day**

- 2018 Annual Average per Customer = 1.25 m^3/day excluding campgrounds.
- **DESIGN UNIT FLOW = 1.16 m^3/day per residential unit.**

Future Capacity Required:

- Starting point is a 2018 Average Flow less 25% Infiltration reduction.
- Create capacity for current commitments + potential commitments (up to 820 units).
- Assume growth = 20 to 40 units per year.
- **Approximate Design Flows:**
  - **For Year 2030 = 1,750 m^3/day**
  - **For Year 2040 = 2,100 m^3/day**

CLASS EA PROCESS

CLASS EA STUDY PHASES

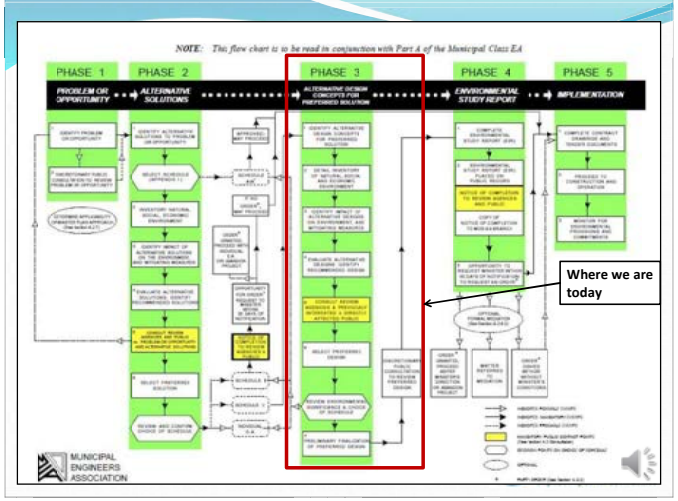
1 - PROBLEM DEFINITION

2 - EVALUATION OF ALTERNATIVES

3 - EVALUATION OF DESIGN CONCEPTS

4 - PREPARE ENVIRONMENTAL STUDY REPORT

5 - PROJECT IMPLEMENTATION



The Problem

- The Bayfield Wastewater Treatment Facility is operating at flows that already exceed its rated capacity. Existing servicing commitments to future developments within the community will produce additional flow that must also be treated.

Possible Solutions – Class EA Phase 2

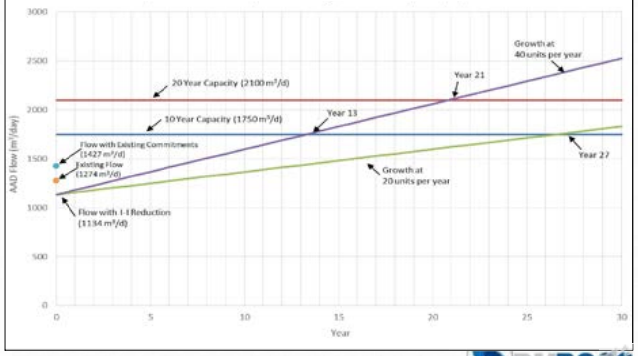
1) Reduce existing sewage flows within the community.
2) Limit community growth.
3) Expand the existing treatment facility*.
4) Construct a new sewage treatment facility.
5) Do Nothing.

* Expansion of the existing facility was selected as preferred approach.

Detailed Design Alternatives for an Expansion

- Key considerations:
  - Develop a winter discharge.
  - Maximize use of the existing facilities.
  - Work within the existing site footprint.
  - Expand in stages rather than for a long design period.
  - Consider both capital and operating costs.

Bayfield WWTF Flow & Capacity Options



Treatment Alternatives

- Two approaches were evaluated:
  - A pre-fabricated Membrane Bio-reactor (MBR) system.
    - Lower capital cost.
    - Relatively high operating costs.
    - Less time to implement.
    - Potentially better treatment.
  - A site-built Sequencing Bio-reactor (SBR) system.
    - Lower operating and maintenance costs.
    - Higher capital costs but equivalent life-cycle costs over 20 years.
    - Adequate treatment.
    - More common process technology.

Anticipated Costs

Capital Cost ($2021)

- Probable cost for 750 m^3/day (1,750 total) = **$6.7M to $7.8M.**
- Probable cost for 1,100 (2,100 total) m^3/day = **$ 8.6M to $9.8M.**
- Additional costs for rehabilitation of existing:
  - Berm repairs + equipment that has reached it useful life **$0.8M**
  - Sludge Removal **$2.3M**

Financing Considerations

Suggested Principles:

1. Only benefitting properties pay.
   a) There is very little benefit of WWTP expansion to existing customers.
2. Cost of expansion is charged to new customers.
3. Existing commitments will be considered new customers.
4. Costs of I-I reduction will be charged to all connected customers (existing and new).
5. Costs of repairs of existing will be charged to all connected customers (existing and new).

CONCLUSIONS TO DATE

The Treatment Concept:

- Add a mechanical wastewater treatment plant (MWWTP) to operate in parallel with the existing system.
- MWWTP discharges to the Bayfield River year-round.
- Expand in stages:
  - Stage 1 – from 1,072 m^3/day to 1,750 m^3/day.
  - Stage 2 - from 1,750 m^3/day to 2,100 m^3/day.
- Capacities assume a 25% reduction in existing infiltration.

Service Expansion:

For Stage 1 (530 residential units):

- Addresses existing capacity deficiency.
- Addresses existing servicing commitments.
- Potential new development proposals that might occur within 10 years as defined by a review of interest and feasibility.
- Capacity to allow elimination of existing septic systems in cottage areas south as far as Glitter Bay Road.

For Stage 2 (290 residential units):

- Potential new development proposals that might occur between 10 and 20 years as defined by a review of interest and feasibility.

Treatment Technology:

- We need to:
  - Discharge year round and achieve a very high quality effluent as required by the MECP.
- Two approaches were evaluated:
  - A pre-fabricated Membrane Bio-reactor (MBR) system.
    - Lower capital cost but higher operating cost.
    - Less time to implement.
    - Potentially better treatment.
  - A site-built Sequencing Bio-reactor (SBR) system.
    - Lower operating and maintenance costs.
    - Higher capital cost but equivalent life-cycle costs over 20 years.
    - Adequate treatment.
    - More common process technology.

Probable costs:

Based on construction in 2021.

- Capital cost for Stage 1 is $6.7 M to $7.8M.
- Capital cost for rehabilitation of existing facilities = $3.1M.

MBR will be $1.1M less costly to construct.

MBR will be $68,000 per year more costly to operate.

Rehab at existing site includes $2.3M for biosolids removal from the lagoon.

Financing Approach (Tentative):

1. Apply current Reserves to capital:
   - $0.9M for growth component.
   - $0.9M for Rehabilitation.
2. Finance balance over 20 years. Interest costs (for the SBR):
   - $2.1M for growth.
   - $0.7 M for rehabilitation.
3. Growth related costs to be raised by increasing Development Charge for detached residential from $7,320 to $17,200 per unit.
4. Rehab and increased operating costs to be raised by increasing quarterly sewage bill by $35 +/-.
5. Apply Financing Principles Discussed Previously

Next Steps –

1. Collect input from Public resulting from Public Meeting.
2. Make a decision on Pre-fab Modular or Site-built Plant.
3. Finalize Environmental Study Report (ESR).
4. Finalize Class EA process (tentatively fall/winter 2020)
5. Continue to address I-I issue.
6. Begin work on a Capacity Allocation Policy.
7. Confirm financing approaches.
8. Determine what rehabilitation will occur simultaneously.
9. Proceed to implement project.

Questions?

Comments on the presentation material can be submitted to Kelly Vader, Environmental Planner at BMROSS via email at kvader@bmross.net until November 30th, 2020.

Class EA for Expansion of the Bayfield WWTF
October 24, 2020 Public Meeting
QUESTIONS AND ANSWERS

Inflow & Infiltration Investigation

Q1. The presentation indicates that a number of problems/issues were identified and the ones with the highest priority were dealt with. Is it possible to find out the total number of problems/issues that were identified, the number that were addressed/fixed and what was the criteria used to qualify the issue as a high priority.

A. Maintenance Holes – 85 issues in approximately 270 MHs. 15 locations defined as higher priority (based on observed I-I). 11 were repaired in 2018. Mainline sewers – 9 locations designated for repair, the 3 worst (based on observed I-I) were repaired in 2020. Priority has been based on observed I-I. If there were potential structural problems that would have been a higher priority, there were not.

Q2. My concern is how many, and when or if the non-high priority issues will become a problem to a point when they need to be addressed. And secondly are there any mitigating steps that could be done now to avoid any of these secondary issues from becoming high priority concerns.

A. Anything that we have defined as a priority should be addressed as soon as feasible. Some increasing deterioration would be expected if no repairs are done.

Q3. What are the factors that have led you to believe that the majority of the I-I defects of the system currently come from the private side of the system, rather than the public or commercial side of the system? It was not clear to me what facts were used to formulate this statement.

A. Several points – (1) By default – we examined the entire municipal system and found few issues therefore must be from private side. (2) Using CCTV we saw numerous instances of clear water discharging from laterals (3) Smoke testing showed nothing from the municipal side (4) Flow metering shows pulses of higher flows after a rain event – flow pulses are a strong indication of sump pump connections.

Financing

Q4. Will the increased cost for existing customers currently hooked up to the system (an increase of $140.00 per year) be introduced regardless if there are upgrades to the WWTP. Or will they only be introduced if the upgrades to the system are introduced?

A. This is up to Council. About 60% of the increase is directly related to rehab. The balance is related to forecasted increased operating costs for the new system.

Q5. Of the remaining monies that are in the reserve funds that have been paid for by existing customers hooked up to the system, how much is needed to bring the WWTP up to grade for the existing users?

A. There are two reserves; one for rehab raised through the rates and one for capital that has been charged to new development. The expectation is that the full amounts of each would be used. The final decision is up to Council.

Q6. My point is that existing users who have bared the cost of the initial system and who have paid ongoing fees into a reserve for ongoing maintenance, should not be saddled with any of the additional expenses to build or upgrade a WWTP that would support new users. New users should pay for all additional up front and all additional ongoing costs going forward.

A. This is again up to Council. The expectation is that the full cost of expansion including any financing costs would be charged to new development. Post expansion, the operating costs and future rehab costs would be shared equally across the entire system including users in the other Bluewater sewage systems (e.g. Hensall).

Q7. Regarding the financing principles: you've indicated possible principles such as having only the benefitting properties pay for the expansion, or new customers only. Based on your Stage 1 roll-out plan having a $6.7-9.8M projected cost, and estimated 530 residents who will benefit from Stage 1 expansion, what approximate cost are you assuming each household would pay?

A. The final decision is up to Council but it is expected that the cost of expansion will be charged to new development as a Development Charge. There is already such a charge in place and being applied, however at this time we believe it will have to increase to something in the order of $17,200 for a typical residential unit.

Q8. The B.M. Ross estimate that sewage lagoon development charges for new builds and for new infill housing would be approximately $17,200, does not include all of the other infrastructure costs that would have to assigned to new development. Since most community facilities, beaches and Main Street parking are at or close to capacity for the existing population base, the new costs for expanded facilities would logically be added to the development charges assigned to new builds. An analysis of current Bayfield mill rates shows that the village's property taxes are in the top quartile when compared to similar communities in Ontario. This high rate of taxes plus extraordinarily high new development charges could conceivably impede future development and invalidate projections. If growth is slower than projected, would existing residents be compelled to pay for the already imbedded sewage lagoon construction costs?

A. The $17,200 is an estimated value and only the sanitary sewage component of the Development Charge. If development proceeds slower than expected then interest costs will increase. It is normal that interest expenses are included in the Development Charge and are passed along to new development, not the existing community.

Project Timelines

Q9. We're looking to better understand timelines of your items indicated in next steps. When are you looking to confirm financing options? When are you hoping to gain final approvals to proceed to implement the project? Assuming it's approved, how long until the project is completed and the properties would actually benefit from the expansion?

A. It is anticipated that the project would be presented to Bluewater Council for final approval of the Class EA early in the New Year once all input has been received from residents following the public meeting. An outline of the financing approach would be presented in the EA report, but it will not be finalized until the project is ready for construction. Once the EA is finalized the project would move to the final design stage, which could take 4 to 5 months to complete. The design is then submitted to the Ministry of the Environment, Conservation and Parks (MECP) for approval, a process that can take a further 6 to 8 months. Once approved, the project would be tendered for construction. Construction could take a further 8 to 12 months. In total, the whole process could take 1 ½ to 2 years from the decision to proceed.

Q10. You've indicated that Stage 1 of the proposed plan would unlock capacity to allow elimination of existing septic systems in cottage areas south as far as Glitter Bay Road. Did we read correctly that this Stage 1 is based on construction in 2021? Understanding proposed timing is crucial for us given we're currently developing plans to convert our own property from a holding tank to a weeping tile system, therefore the municipality's plans would greatly impact our own.

A. Actual extension of the collection system to currently developed but un-serviced areas such as Glitter Bay is not part of the current proposal nor has extension been discussed with Council. The current proposal relates only to providing capacity in the treatment facility. As currently proposed there would be capacity constructed in Stage 1 to allow extension to Glitter Bay in Stage 1. The timing of actual extension would be subject to future review and approvals.

Q11. The B.M. Ross projections and graphs worked from averages but since the community's population changes dramatically depending upon the season, were projections done based upon peak Inflows? Averages don't mean much when the population can vary from 500 to 7000 depending upon whether it is summer or winter.

A. Peak and seasonal flow changes have been considered and will be evaluated further during the final design. The presentation uses averages because the treatment facility rating is expressed as an annual average value.

Q12. My wife and I recently purchased a property on Glitter Bay Dr. that is currently on a septic system. So I read with great interest the plans for expansion of the wastewater treatment facility and the plans to include Glitter Bay Dr. as part of the system. In general, I would say that we have high interest in converting from septic to the municipal system and so are very supportive of the project. I would be interested in learning more about whether there is any further information or commentary that would be helpful from your perspective. I read the presentation that was recently given. I saw that the plans are to do the expansion sometime in the next 5 years for a first phase and the next 10 years for the second phase. It also looked like costs to connect (for individual homeowners) would be

approximately $7-17K. Did I interpret the presentation correctly? Would Glitter Bay be considered part of the first 5 years or the second 5 years?

A. With regards to the timing please see the response to Question 10 above. Regarding the cost, the $17K is the currently projected cost per unit to provide treatment capacity. Any costs to actually extend service to currently un-serviced areas would be extra to this and has not yet been established.

Stormwater-related Questions

Q13. Since only new developments have holding ponds for street run-off, currently in Bayfield the run-off of street pollution, fertilizers and pesticides run directly into and pollutes the lake. Since it is likely the Municipality of Bluewater is going to be subject to much more stringent environmental controls in future, did B.M. Ross consider the impact of a possible redirection of street run-off into the sewers?

A. No. There would need to be a significant change in Provincial Policy before the Municipality would ever consider directing storm drainage runoff into the sanitary collection system. A portion of the proposed additional treatment capacity is to address existing groundwater flows that are entering the collection system and being sent to the wastewater treatment plant. To purposely allow stormwater to enter the system would over-tax the collection system and create a need for treatment expansion that would be economically infeasible.

Q14. Today, after a rainstorm, I'm looking at a very brown river and a pollution plume that extends about a ¼ of a mile into the lake. Were E.coli counts done as part of the water quality analysis? I've been visiting Bayfield for almost 50 years and remember when children used to swim at the River Flats and the river quality appeared to be much better.

A. A copy of the Water Quality Analysis will be included in the Environmental Study Report that is published at the conclusion of the Class EA process. E-coli counts in the river were collected as part of the study and were uniformly measured at less than 100 cfu/ 100ml (recreational swimming limit). E. coli concentrations are routinely (weekly) monitored at the wastewater treatment plant's discharge. During the April to November normal discharge period values are typically less than 10 cfu/100 ml.

Q15. You and I have informally discussed street run-off before and I'd forgotten but it is an interesting side question to sewage lagoon capacity. After the infiltration tests were done, there is a good idea of where that problem lies and that should be remedied but no one is talking about the road salt and fertilizers and weed killers that are being directed into the lake. Since the village has no holding ponds aside from the little rain garden beside Pioneer Park, to my layman's eyes, the only answer is to either create holding ponds, (I seem to remember you suggested some of the unopened right of ways) or redirect into the sewage system. I don't know if this subject will arise on Saturday but I'd be interested to learn if it has been considered.

A. Similar to the answer to Question 14 above, current provincial policy would not permit stormwater runoff to be directed to the sanitary collection system so it is very unlikely that that would be a possible outcome. The Municipality did complete a Stormwater Drainage Master Plan in 2016 for Bayfield. A copy is on the Bluewater website. Infiltration basins that are included in the Main Street reconstruction project, were identified through that report.

Treatment Alternatives

Q16. Was methane recapture or alternative natural energy sources considered when assessing operating costs?

A: No it was not. The Bayfield facility is a very small treatment plant even after expansion. Methane generation and capture is typically only practiced at much larger facilities. To construct and then operate such a system would add significantly to both the capital and operating costs.

Q17. Was there any consideration given to palletisation of sewage sludge into fertilizer for resale?

A. No it was not. The answer is similar to the response regarding methane. The sludge or biosolids are applied to agricultural land when disposed and some credit for their agricultural value does reduce disposal costs somewhat .

Q18. Is B.M. Ross suggesting that the sewage lagoon discharge onto (into) a frozen river in winter?

A: The River does not completely freeze during the winter. Regardless, the system does not discharge during the winter now and there are no future plans to discharge from the lagoons in the winter. However the expansion will be achieved by means of a mechanical treatment facility operating parallel to the lagoon and the new facility will discharge year round.

Q19. What efforts (either by increased usage fees or moral suasion) have been employed by the Municipality to curb the daily increase in residential/commercial waste water since 2015 when daily waste water discharge began to exceed the WWTP daily capacity?

A. The Municipality is developing an information brochure aimed at curbing wasteful water use and encouraging residents to exchange aging, inefficient fixtures with more efficient units.

Q20. Was there any consideration given to municipal incentives to redirect sump pump flows or purchase low flush toilets?

A. The Municipality recently passed a by-law regarding discharge of sump pumps into the sanitary collection system and will ensure that potential problem areas within the community are advised of the new by-law. An incentive program is being investigated to exchange inefficient fixtures with low-flow alternatives.

Comment. We are listening to today's public WWTP discussion with great interest. Although we haven't registered to speak we would like to voice our support for either mechanical solution (SBR does however seem more practical). We believe also that your plan to proceed in stages is prudent as latter stages can be adjusted in size and scope as real demand is observed over time. We also agree in principle with the funding model.

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 09051

MUNICIPALITY OF BLUEWATER
CLASS EA FOR EXPANSION OF THE BAYFIELD WWTF

PUBLIC MEETING NOTES

Details: Saturday October 24, 2020
Virtual Public Meeting

Opening Remarks:	10:00 am - 10:10 am
Presentation:	10:10 am – 10:45 am
Questions:	10:45 am – 11:30 am

In Attendance:

Dave Kester, Public Works Manager	) Municipality of Bluewater
Lacey Vander Burgt, Administrative Assistant	)
Paul Klopp, Mayor	)
Jim Ferguson, Deputy Mayor	)
Bill Whetstone, Bayfield Ward Councillor	)
Steve Burns	) B.M. Ross and Associates (BMROSS)
Kelly Vader	)

Members of the public: 6 ±

10:00 a.m. - 10:10 p.m. – Opening Remarks

- Panelists from Bluewater and BMROSS signed in to the meeting
- Previously registered members of the public signed in to the Zoom meeting after logging on
- Dave Kester provided brief opening remarks and then began the presentation.

10:10 a.m. – 10:45 a.m. – Presentation

Power Point Presentation (attached)

- Dave Kester, began the presentation by thanking everyone for attending the virtual meeting. He explained the purpose of the meeting and asked that questions be limited to the project at hand, being the WWTP expansion and Class EA.
- Steve Burns reviewed the agenda for the presentation, which included project background, information on the Class EA process, a review of alternatives considered for expansion of the plant, and a discussion of costs and financing.
- Steve provided information on the current Bayfield Wastewater Treatment Facility (WWTF), including details on the existing collections system, additions to the system since it was constructed, and current flow details.

- Kelly Vader provided details related to background water quality studies conducted within the Bayfield River in support of the Class EA. She provided information on a benthic analysis conducted in the river as well as a water quality assessment.

- Kelly reviewed growth details for the community which have been used to estimate the proposed expansion of the plant. This included a review of historic growth in Bayfield, as well as an estimate of anticipated growth within Bayfield and adjacent areas, should the expansion proceed.

- Steve Burns provided a summary of the Inflow and Infiltration (I & I) Study conducted for the Bayfield sanitary collection system. He explained that funding for the study was partly provided by the Clean Water and Wastewater Fund, administered by Infrastructure Canada, and that all of the collection system was assessed through the investigation. It was determined that a majority of the problems are believed to be on the private side of the system and that generally the existing collection system is in good condition. For planning purposes it is projected that I & I flows can be reduced by 25%.

- Steve then reviewed a sewage flow analysis that was conducted in conjunction with the Class EA. Based on the analysis, a staged expansion of the WWTP is proposed which would increase capacity to 1,750 m^3/day in stage 1 and then to 2,100 m^3/day in stage 2. Steve also explained a graph which illustrated different timelines the expansion would provide, depending on the rates of growth within the community.

- Kelly Vader reviewed the stages in the Class Environmental Assessment (Class EA) process and described a flow chart outlining the current status of the Class EA for this project. She explained the various phases that were included in the EA process and that all 5 phases would be completed for the Bayfield WWTF EA. She noted that we are currently reviewing detailed design components associated with the preferred alternative, which is to expand the capacity of the Bayfield WWTF.

- Steve Burns reviewed details related to different treatment options being considered for expansion of the WWTF, including a pre-fabricated membrane bio-reactor (MBR) system, or a site-built sequencing bio-reactor (SBR) system. Each has advantages and disadvantages and would be suitable for the expansion.

- Steve then described the anticipated project costs and possible financing options available to the Municipality. The MBR system has a lower initial capital cost, but would be more costly to operate. The SBR system is more costly to construct, but has lower operating costs. Over a 20 year time frame the costs of each system are essentially the same. Steve also provided costs associated with rehabilitation work required at the existing WWTF, primarily associated with sludge removal from the lagoons.

- Steve provided a summary of conclusions to date associated with the expansion. These included a recommendation to expand the existing Bayfield WWTF by adding a mechanical plant in stages. He summarized the two treatment systems being considered, including the MBR and SBR treatment technologies, and the associated costs and financing options for the proposed expansion.

- Kelly concluded the presentation by reviewing the next steps in the process.

10:45 a.m. – 11:30 a.m. – Questions and Answers

After concluding the presentation, questions were invited from those members of the public who had pre-registered to attend the virtual public meeting. Copies of the presentation material and video of the public meeting will be made available on the Bluewater website.

Summary of Questions and Answers

Q. Dave McLaren from the Bayfield Ratepayers Association had questions concerning the growth projections presented during the presentation and expressed an opinion that if additional capacity is provided the outcome will be to encourage more people to move to Bayfield, whether the growth is required or not. He questioned whether the "limit community growth" option was considered seriously during the Class EA process.

A. Kelly Vader responded to the question. She explained that the EA process has been underway for a number of years and selection of the alternative to expand the plant was selected earlier in the EA process when a different council was in place. At the time, growth within the community was seen as desirable and the Official Plan for Bayfield had designated additional lands to the south of Bayfield as an urban development area. With rapid growth occurring, expansion of the plant was seen as the only viable alternative.

Dave Kester added that the existing plant is over capacity and the Municipality has an obligation to treat the current flows coming to the plant as well as providing treatment for properties that have capacity allocated to them already.

Q. Dave McLaren asked if footing drain connections, which were identified as a potential source of inflow within the collection system, was a building code issue.

A. Steve Burns responded that it is a building code violation to have a direct connection from the footing drain of a home to the sanitary sewer, however he believes that the connections could have been made after the homes are constructed. With high water table elevations present in many parts of Bayfield, which could result in water being present in the footing drains and sump pumps running continually, it would be possible to outlet the footing drain to a laundry tub or floor drain which would then discharge directly to the sanitary sewer.

Q. Dave McLaren asked how this problem can be corrected.

A. Dave Kester indicated that the Municipality is exploring different strategies to correct the problem. A by-law was passed earlier this year confirming that it was illegal to discharge footing drains to the sanitary collection system. He indicated that some residents may not be aware that an illegal connection has been made within their home. Dave indicated that other approaches will be pursued, including identifying individual properties and pursuing options with the owners, however it gets difficult when dealing with issues within private residences.

Q. Dave McLaren asked how realistic the 25% reduction target is for I & I removal given the problems with correcting footing drain connections. He asked how much it would cost to correct the problem if it was present in a home.

A. Dave Kester indicated that it would be very difficult to estimate the cost to correct it as each situation would be very different.

Q. Dave McLaren asked if the proposed reduction in I & I would balance out the existing commitments, if the plant were not expanded.

A. Steve Burns replied that the anticipated 25% reduction equates to approximately 140 m^3/day, which is close to the volume of extra flows seen at the plant currently, so they would be roughly equal. However, there is an opportunity for a longer time frame associated with achieving I & I reductions if the plant is expanded – 10 to 20 years. If the plant isn't expanded the reduction would be needed immediately. The plant is already exceeding its rated capacity and flows are going to continue to increase, so they really aren't equivalent.

Q. Dave McLaren asked about the $35 quarterly increase in the sewage/water bill needed to pay for repairs to the WWTF. He noted that residents have been paying into a reserve fund for a number of years and was surprised that there wasn't sufficient funding present to cover the rehabilitation costs.
A. Dave Kester confirmed that the reserve fund does not have sufficient funds available to cover the rehabilitation costs.

Q. Dave McLaren asked if a prior recommendation from council, to delay completion of the Class EA process until the Bayfield Secondary Plan process is completed, was still valid.
A. Dave Kester agreed that the commitment is still valid and that the Municipality is planning to work on the two processes in tandem with one another.

Q. Dave McLaren asked if a smaller expansion of the plant could be constructed rather than the 75% expansion that is currently proposed as part of stage 1.
A. Steve Burns explained that a smaller expansion could be constructed however it would be more costly on a unit basis for new residents. Another consideration is that the treatment technologies that are being considered are constructed in standard sizes or treatment trains. BMROSS has estimated that three treatments trains would be needed to expand the plant to the 2,100 m^3/day size. Two would be constructed initially to achieve the stage 1 expansion. Constructing only one does not provide as much capacity for growth and would be very expensive on a unit basis

Q. Jim Ferguson, Deputy Mayor for Bluewater provided comments on the meeting. He thanked BMROSS for the presentation and members of the public for participating and confirmed that council would be considering the information as they move forward and would select the best long-term solution that would benefit all members of the community.

Q. Bill Whetstone, Bayfield Ward Councillor also made comments. He referenced comments made by Dave McLaren on behalf of the Bayfield Ratepayers and agreed that discussions of growth and the Bayfield Secondary Plan will be important considerations when moving forward. He agreed it would be important to continue to consult with residents to ensure that council makes decisions that will best service Bayfield and Bluewater for the long term.

Q. Paul Klopp, Bluewater Mayor also commented. Paul agreed with statements previously made by council and comments from Dave Kester indicating that the secondary plan process would be dovetailed with the EA process. He noted that residents who were unable to attend today's meeting have more than a month to submit their comments and their feedback is wanted.

Q. Kelly Vader asked Steve Burns if he could comment on the timelines involved with the actual expansion of the plant and having new capacity available.
A. Steve responded that if the EA were completed early in 2021, council would first need to decide to move forward with expansion of the WWTF. The design could take 8-10 months to complete and then approvals can also be lengthy. Then construction would take an additional 10-12 months. So the timeline could be 1.5 to 2 years after completion of the EA before capacity would be available.

Q. Kelly Vader noted that completion of the EA would not commit the Municipality to moving forward with the plant expansion, it would simply define how the expansion would occur should expansion be desired.

11:30 a.m. – Meeting Conclusion

The meeting was concluded at 11:30 a.m. Dave Kester thanked everyone for attending.
Should there be any errors or omissions to these meeting notes, please notify the undersigned.

Meeting Notes Prepared by
B. M. ROSS AND ASSOCIATES LIMITED
Kelly Vader, Environmental Planner

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 09051

November 2, 2016

[redacted]

Dear Sir:

RE: Bayfield WWTP Class EA
Municipality of Bluewater

We acknowledge receipt of your correspondence received on July 9, 2016 and September 30, 2016, regarding the above-noted Class Environmental Assessment process.

Be advised that there have been some recent updates to the project which were not addressed in our previous correspondence.

1) Municipal Council Presentation

On October 17, 2016, staff from BMROSS attended a Bluewater Municipal Council meeting to update Councillors on the status of study investigations. A copy of the presentation material is attached to this letter for your information.

2) Public Update

An update on the EA will also be provided to Municipal residents in a Newsletter that will be posted on the Municipal website and mailed to residents along with the quarterly sewage and water bills.

3) Inflow and Infiltration Study

As outlined in the Council Presentation noted in 1) above, an initial I & I study was undertaken this past summer by BMROSS and the system operators (OCWA). Based on the results of the initial investigation, which resulted in the identification of some infiltration and inflow sources, an expanded study has been proposed for the Bayfield collection system.

4) Class EA Schedule

Subject to additional feedback from Municipal Council, which may be forthcoming following the project update presented on October 17, 2016, the following tentative schedule has been proposed for completion of the Class EA process:

Fall 2016 -	Update letter for Aboriginal Communities and Review Agencies
Winter 2017 -	Prepare Draft Environmental Study Report (ESR), Conceptual Design of STP Expansion Technology
Spring 2017 -	Public Information Meeting to Update Public on Study Investigations and Receive input on Preferred Alternative
Summer 2017 -	Finalize ESR and Publish Notice of Study Completion

Please note that the above-noted timelines are tentative and may need to be adjusted based on additional input from Council and Municipal Public Works staff.

I trust that this has addressed your comments. Please do not hesitate to contact me if you have any additional comments or questions.

Prepared by:

S. D. Burns, P. Eng.

K. Vader, RPP, MCIP

2020.11.23.

[redacted]

London. Ont. [redacted]

B.M. Ross & Assoc. Ltd.,
62 North St.
Goderich Ont. N7A 2T4

attn: Ms. Kelley Vader, MCIP, RPP

Dear. Ms. Vader:

Thankyou for mailing a hard copy of your Oct. 24 presentation.

My comments are:

1. No inflows (rain from the sky)
2. Illiminate inflows (rain from the sky)
3. Stop inflows (rain from the sky)
4. No provision for treatment of Landfill leachate to be ever allowed

I look forward to the meeting you intend to have with myself

Please keep me on the EA Contact List.

Respectfully,

[redacted]

MUNICIPALITY OF BLUEWATER

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT FOR EXPANSION AND UPGRADING OF THE BAYFIELD WASTEWATER TREATMENT FACILITY

NOTICE OF STUDY COMPLETION

THE PROJECT:

In 2001 the Municipality of Bluewater completed a communal wastewater collection and treatment system to serve the community of Bayfield. The treatment facility (WWTF), a two cell facultative lagoon with sand filters, was sized to accommodate existing and expected growth within the community for a twenty year planning period. The Bayfield service area has experienced significant growth since construction of the original treatment facility and wastewater flows are now exceeding its design capacity. To accommodate existing flows and expected growth in and around Bayfield, the facility requires expansion.

Following a detailed analysis of alternatives, expansion of the facility using a mechanical wastewater treatment plant, to be operated in conjunction with the existing facilities, was selected as the preferred method to increase capacity. Removal of accumulated biosolids within the lagoons at the existing facility, and other general maintenance upgrades, may also be completed as part of the expansion project.

THE ENVIRONMENTAL SCREENING PROCESS:

The planning for this project is following the environmental screening process set out for Schedule C activities under the Municipal Class Environmental Assessment (Class EA). The purpose of the Class EA process is to identify potential environmental impacts associated with the proposed works and to plan for appropriate mitigation of any identified impacts. The environmental assessment process has now been completed. There were no negative impacts identified with the project that could not be mitigated.

For further information on this project, please contact the project engineers: B.M. Ross and Associates Ltd.: 62 North Street, Goderich, Ontario, N7A 2T4. Telephone (Toll Free): (888) 524-2641. Kelly Vader, Environmental Planner (e-mail: kvader@bmross.net), prior to April 9, 2021. Information will be collected in accordance with the Municipal Freedom of Information and Protection of Privacy Act. With the exception of personal information, all comments will become part of the public record. An Environmental Study Report, documenting the environmental assessment conducted for this project, will be available for public review on the Bluewater website at www.municipalityofbluewater.ca as of March 10, 2021.

Interested persons may provide written comments to the project team by April 9, 2021. All comments and concerns should be sent to the project engineers at the address noted above, and to Mr. Dave Kester, Manager of Public Works, Municipality of Bluewater (publicworks@municipalityofbluewater.ca).

In addition, a request may be made to the Ministry of the Environment, Conservation and Parks for an order requiring a higher level of study (i.e. requiring an individual/comprehensive EA approval before being able to proceed), or that conditions be imposed (e.g. require further studies), only on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights. Requests on other grounds will not be considered. Requests should include the requester contact information and full name for the ministry.

Requests should specify what kind of order is being requested (request for additional conditions or a request for an individual/comprehensive environmental assessment), how an order may prevent, mitigate or remedy those potential adverse impacts, and any information in support of the statements in the request. This will ensure that the ministry is able to efficiently begin reviewing the request. The request should be sent in writing or by email to:

Minister of Environment, Conservation and Parks
Ministry of Environment, Conservation and Parks
777 Bay Street, 5th Floor
Toronto ON M7A 2J3
minister.mecp@ontario.ca

Director, Environmental Assessment Branch
Ministry of Environment, Conservation and Parks
135 St. Clair Ave. W, 1st Floor
Toronto ON, M4V 1P5
EABDirector@ontario.ca

Requests should also be sent to the Municipality of Bluewater by mail or by e-mail.

Dave Kester, Manager of Public Works
Municipality of Bluewater

This Notice First Issued March 10, 2021.

Municipality of Bluewater

APPENDIX C

AGENCY CONSULTATION RECORD

MUNICIPALITY OF BLUEWATER

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
FOR EXPANSION OF THE BAYFIELD SEWAGE TREATMENT FACILITY

REVIEW AGENCY CIRCULATION LIST

REVIEW AGENCY	INVOLVEMENT
Ministry of the Environment and Climate Change (MOECC) - EA Coordinator	Mandatory Contact
Ministry of Natural Resources and Forestry (Guelph)	Potential Impact on Natural Features
Ministry of Tourism, Culture and Sport (Toronto)	Potential Impact to Heritage Features
Ministry of Transportation (Owen Sound)	General Information
County of Huron - Administration Department - Planning & Development Department - Huron County Health Unit - Highways Department	General Information
Ausable Bayfield Conservation Authority	Potential Impact on Natural Features
Municipality of Central Huron	General Information
Bayfield Ratepayers Association	General Information
Bayfield and Area Chamber of Commerce	General Information

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 09051

September 20, 2011

'Agency'

RE: Municipality of Bluewater
Class EA for Expansion of the
Bayfield Sewage Treatment Facility

The Municipality of Bluewater installed a communal sewage collection and treatment system servicing the community of Bayfield in 2001. The treatment facility, a two cell facultative lagoon with sand filters, was sized to accommodate existing and expected growth within the community for a twenty year planning period. The Bayfield service area has experienced rapid growth since construction of the sewage collection system and the treatment facility is now nearing its design capacity. To accommodate expected growth in and around Bayfield, the plant requires expansion. Modifications to the existing forcemain and main sewage pumping station will also be required to accommodate anticipated flows.

A range of treatment technologies will be assessed in order to determine how best to expand the capacity of the treatment facility while still maintaining a high level of effluent quality. Expansion of the existing facilities or the provision of mechanical treatment, are some of the alternatives being considered in conjunction with the Class EA process.

The possible expansion of the service area associated with the existing facility is an option also being considered in conjunction with this project. Currently the treatment facility services the Former Village of Bayfield as well as adjacent campground facilities in the Municipality of Bluewater.

The project is following the planning process set out for Schedule C activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule C projects are finalized following completion of all 5 phases of the Class EA process. One purpose of the EA process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders and government review agencies.

Your organization has been identified as possibly having an interest in the project and we are soliciting your input. Please forward your response to our office by October 28, 2011. If you have any questions or require further information, please contact the undersigned.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, MCIP, RPP
Environmental Planner

KV:hv
Encl.
c.c. Lori Wolfe, Municipality of Bluewater

PO Box 2065 Bayfield Ontario N0M 1G0

TO: BM ROSS AND ASSOCIATES ATTN K VADER

FROM: BAYFIELD AND AREA CHAMBER OF COMMERCE

SUBJECT: BAYFIELD LAGOON EXPANSION FILE 09051

DATE: OCTOBER 15 2011

CC:

Dear Kelly,

Thank you for your letter of September 20 th regarding the Bayfield Lagoon. The BACC has an interest in this project, and would appreciate any updates as available.

Although not knowledgeable in the treatment options, we are concerned about water quality in the Bayfield River and Lake Huron. The quality of the river and lake directly impact the tourism industry in the area, as well as the pleasure and enjoyment of all residents and visitors. All options should be considered to lead to improved water quality. The Blue Flag Program is example of the value of these resources to the community.

We look further to coming updates.

Yours Truly,

Roger Lewington for the BACC

Ministry of Natural Resources
Ministère des Richesses naturelles

Guelph District
1 Stone Road West
Guelph, Ontario
N1G 4Y2

Telephone: (519) 826-4955
Facsimile: (519) 826-4929

Ontario

November 30, 2011

Kelly Vader (Environmental Planner)
B.M. Ross and Associates Ltd
62 North Street
Goderich, Ontario
N7A 2T4

Re: Bayfield Sewage Treatment Facility Expansion – Municipal Class Environmental Assessment (Schedule C) – Municipality of Bluewater, Huron County - MNR Comments November 2011

Ms. Vader

The Ministry of Natural Resources (MNR) is in receipt of the technical memorandum, including the studies completed in support of the Municipal Class Environmental Assessment (EA) Schedule C project, in response to the Ministry's October 3, 2011 comments. Ministry staff appreciates the additional details on the proposed Sewage Treatment Facility (STF) expansion provided in the technical memorandum, and offers the following further comments for your consideration.

It is understood that the preferred alternative (mechanical treatment facility) is proposed to occupy the existing footprint of the STF sand filter treatment beds (technical memorandum figure); as such, an approximate 30 meter setback from the Bayfield River provincially significant life science Area of Natural Scientific Interest (ANSI) will be maintained.

It is additionally understood that the infrastructure and design of the existing STF outfall, aligned within the ANSI and discharging into the Bayfield River, will not require any improvements to accommodate the facility's expanded capacity (technical memorandum Section 2). As such, no development or site alteration will be required within the ANSI or within 30 meters of the feature in support of the project.

Section 3 of the technical memorandum concludes that the Bayfield River downstream from the outfall is unsuitable for mussel species; a position stated in the supporting Water Quality Study (Huber Environmental Consulting, September 2011). This conclusion appears to be based on a description of the Bayfield River (rocky substrate) at the outfall location.

The conclusion that the shallow rocky substrate of the Bayfield River in the vicinity of the outfall is not suitable habitat for mussels requires further clarification. Ministry staff would appreciate if the terms 'shallow' and 'rocky' could be further defined as they pertain to the project area. Although Wavy-rayed Lampmussel and Rainbow Mussels (both listed as threatened pursuant to Ontario Regulation 230/08) prefer and therefore reach higher densities in riffle areas with sand or gravel substrates, these mussels do occupy other habitat conditions.

For example, mussel relocation studies in support of an authorization under Section 17 (2) (c) of the *Endangered Species Act* in the Grand River have confirmed the presence of both species in areas characterized by rock and boulder substrates. In habitat characterized by closely packed large rocks and boulders the density is 1 to 3 orders of magnitude lower then areas characterized by gravely or sandy bottoms. The same studies have also demonstrated that in areas where the boulders are too large for mussel's to bury beneath, and extend their siphon for respiration, are unsuitable and mussel species are absent.

Pursuant to Section 9 (1) and 10 (1) of the *Endangered Species Act* it is prohibited to kill, harm, harass or capture an endangered or threatened species, or destroy or damage its habitat, in the absence of an authorization from the Ministry.

As noted in the Ministry correspondence dated October 3, 2011, it is recommended that areas that may be subject to direct and indirect impacts within the project area be screened for potential species at risk (please refer to the species list attached to the previous comments). If a species at risk has the potential to occur within the project area, and may be subject to direct and/or indirect impacts, the Ministry recommends that the species be surveyed for to confirm presence/absence.

If species at risk surveys are not to be considered in support of the Environment Study Report (ESR), it is recommended that a clear rationale be included in the ESR stating why listed species referred to in the provided list were not afforded a survey (e.g. habitat within the study area is not suitable for specific species at risk, particular areas will not be directly or indirectly impacted etc.).

In support of the EA you may also wish to correlate the water quality monitoring data presented in Table 1 of the Water Quality Study (September 2011), with the information presented in the status reports for Wavy-rayed Lampmussel and Rainbow Mussel. These reports are available from the Species at Risk Act (SARA) Registry (http://www.sararegistry.gc.ca/default_e.cfm). Information on the known occurrences of mussels at risk is also available from the Department of Fisheries and Oceans (http://conservation-ontario.on.ca/projects/DFO/find/southwestern.html).

Ministry staff would be pleased to review any additional information that would support the technical memorandums conclusion that listed mussels are not present within the project area, or will not be negatively impacted by the treated effluent being discharged from the expanded STF.

If further comment or clarification on the *Endangered Species Act* is required, please contact Graham Buck (Species at Risk Biologist) at 519-826-4505 or graham.buck@ontario.ca.

Regards

Originally signed by

Dave Marriott (District Planner)
Ministry of Natural Resources, Guelph District
1 Stone Road West
Guelph, ON, N1G 4Y2
Phone: (519) 826-4926

Cc: Mike Malhiot, MNR

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 **www.bmross.net**

File No. 09051

October 22, 2020

Agency

RE: Municipality of Bluewater
Class EA for Expansion of the
Bayfield Wastewater Treatment Facility

The Municipality of Bluewater initiated a Class Environmental Assessment process in 2011 to examine alternatives associated with increased flows at the Bayfield Wastewater Treatment Facility, constructed to service the community of Bayfield in 2001. The Bayfield service area has experienced significant growth since construction of the sewage collection system and flows to the treatment facility are now exceeding its design capacity. To accommodate existing commitments and expected growth in and around Bayfield, the capacity of the facility must be increased. The attached general location plan shows the location of Bayfield and the existing wastewater treatment facility.

A range of alternatives to address the high flows were evaluated. It was determined that expansion of the existing facility was the preferred method to increase capacity, while maintaining a high level of effluent quality. An assessment of different treatment methodologies was also undertaken. It was concluded that construction of a mechanical plant within the existing plant's footprint, that would be operated in parallel with the existing lagoon and sand filter system, was the preferred treatment method to increase capacity. The attached figure illustrates the location of the proposed mechanical plant at the existing site.

The project is following the planning process set out for Schedule C activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule C projects are finalized following completion of all five phases of the Class EA process. One purpose of the EA process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders and government review agencies.

A public information meeting is being held virtually on Saturday, October 24, 2020 to advise local residents of the status of the Class EA process. A copy of the presentation material can be viewed on the Municipality of Bluewater website at www.municipalityofbluewater.ca.

Your organization has been identified as possibly having an interest in the project and we are soliciting your input. Please forward any comments or questions you may have on this project to the undersigned by November 30, 2020.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, MCIP, RPP
Environmental Planner

KV:hl
Encl.
c.c. Dave Kester, Municipality of Bluewater

MUNICIPALITY OF BLUEWATER

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
FOR EXPANSION OF THE BAYFIELD SEWAGE TREATMENT FACILITY

REVIEW AGENCY CIRCULATION LIST

REVIEW AGENCY	INVOLVEMENT
Ministry of the Environment, Conservation and Parks (MECP) - EA Coordinator	Mandatory Contact
Ministry of Natural Resources and Forestry (Guelph)	Potential Impact on Natural Features
Ministry of Heritage, Sport, Tourism and Culture Industries (Toronto)	Potential Impact to Heritage Features
Municipality of Central Huron	General Information
Bayfield Ratepayers Association	General Information
County of Huron - Administration Department - Planning & Development Department - Huron County Health Unit	General Information
Ausable Bayfield Conservation Authority	Potential Impact on Natural Features
Bluewater & Area Chamber of Commerce 75778 Bluewater Hwy Bluewater, ON N0M 1G0	General Information

Kelly Vader

From: Ian Koetsier <ikoetsier@centralhuron.com>
Sent: November 18, 2020 5:51 PM
To: 'Kelly Vader'
Subject: Bayfield WTF expansion

Hi Kelly,

I hope all is well with you and your family.
Just wanted to acknowledge receipt of your letter from Oct 27th regarding the Bayfield WTF expansion. The letter was discussed at our Management level for a formal response.
Central Huron's Council voted against participating in any option of Bayfield Sewage Treatment Plant upgrades in 2016. The decision was based on financial impacts and from a development interest standpoint it was not viable.
At this time the Municipality does not further input on the Bayfield WTF project other than Council's decision in 2016.
If you have any questions or comments feel free to contact me.
Regards,

Ian Koetsier | Engineering Coordinator
T: 519 482-3997x1227 | C: 519 525-0163
23 Albert ST PO Box 400 Clinton ON N0M 1L0

APPENDIX D

ABORIGINAL CONSULTATION

Aboriginal Consultation Log – Bayfield STP Expansion: Class EA

Contact Number	Aboriginal Contact	Date	Type of Contact	Details/Response
1	Don Boswell, Senior Claims Analyst, Specific Claims Branch Indian and Northern Affairs Canada	July 24, 2009	Letter sent by BMROSS	- Pre-consultation for the Class EA to identify Aboriginal Communities to consult with on the project.
2	Nicole Cheechoo, Policy Analysis Treaties and Aboriginal Government, Indian and Northern Affairs Canada	July 24, 2009	Letter sent by BMROSS	- Pre-consultation for the Class EA to identify Aboriginal Communities to consult with on the project. No response received.
3	Gregg Dahl, Senior Policy Analyst Office of the Federal Interlocutor for Metis and non-status Indians	July 24, 2009	Letter sent by BMROSS	- Pre-consultation for the Class EA to identify Aboriginal Communities to consult with on the project. No response received.
4	Franklin Roy, Director Litigation Management and Resolution Branch, Indian and Northern Affairs Canada	July 24, 2009	Letter sent by BMROSS	- Pre-consultation for the Class EA to identify Aboriginal Communities to consult with on the project. No response received.
5	Pam Wheaton, Director Aboriginal and Ministry Relationships Branch, Ministry of Aboriginal Affairs	July 24, 2009	Letter sent by BMROSS	- Pre-consultation for the Class EA to identify Aboriginal Communities to consult with on the project. No response received.
6	Don Boswell, Senior Claims Analyst, Specific Claims Branch Indian and Northern Affairs Canada	August 6, 2009	Response received from INAC	- Letter of response received from Don Boswell, indicating a number of Aboriginal Communities to contact in conjunction with the Class EA.
7	Chippewas of Kettle & Stony Point	August 20, 2009	Letter sent by BMROSS	- Project Initiation – Initial Contact Sent – No Response Received
8	Chippewas of the Thames FN	August 20, 2009	Letter sent by BMROSS	- Project Initiation – Initial Contact Sent – No Response Received.
9	Aamjiwnaang First Nation	August 20, 2009	Letter sent by BMROSS	- Project Initiation – Initial Contact Sent – No Response Received
10	Oneida Nation of the Thames	August 20, 2009	Letter sent by BMROSS	- Project Initiation – Initial Contact Sent – No Response Received

Contact Number	Aboriginal Contact	Date	Type of Contact	Details/Response
11	Munsee-Delaware Nation	August 20, 2009	Letter sent by BMROSS	- Project Initiation – Initial Contact Sent – No Response Received
12	Historic Saugeen Métis	August 20, 2009	Letter sent by BMROSS	- Project Initiation – Initial Contact Sent – No Response Received
13	Métis Nation of Ontario	August 20, 2009	Letter sent by BMROSS	- Project Initiation – Initial Contact Sent – No Response Received
14	Saugeen Ojibway Nation	August 20, 2009	Letter sent by BMROSS	- Project Initiation – Initial Contact Sent – No Response Received
15	Moravian of the Thames First Nation	August 20, 2009	Letter sent by BMROSS	- Project Initiation – Initial Contact Sent – No Response Received
16	Chippewas of Kettle & Stony Point	June 29, 2015	Letter sent by BMROSS	- Project update letter sent.
17	Chippewas of the Thames FN	June 29, 2015	Letter sent by BMROSS	- Project update letter sent.
18	Aamjiwnaang First Nation	June 29, 2015	Letter sent by BMROSS	- Project update letter sent. No response received.
19	Oneida Nation of the Thames	June 29, 2015	Letter sent by BMROSS	- Project update letter sent. No response received.
20	Munsee-Delaware Nation	June 29, 2015	Letter sent by BMROSS	- Project update letter sent. No response received.
21	Historic Saugeen Métis	June 29, 2015	Letter sent by BMROSS	- Project update letter sent.
22	Métis Nation of Ontario	June 29, 2015	Letter sent by BMROSS	- Project update letter sent. No response received.
23	Saugeen Ojibway Nation	June 29, 2015	Letter sent by BMROSS	- Project update letter sent. No response received.
24	Moravian of the Thames First Nation	June 29, 2015	Letter sent by BMROSS	- Project update letter sent. No response received.
25	Historic Saugeen Métis , George Govier, Lands, Resources and Consultation Coordinator	July 7, 2015	Response Form	- Response form received indicating that they would like to receive more information on the project.

Contact Number	Aboriginal Contact	Date	Type of Contact	Details/Response
26	Chippewas of Kettle & Stony Point, Suzanne Bressette	September 28, 2015	Letter received	- Response received from Suzanne Bressette, Consultation Coordinator for the Kettle and Stony Point FN. Indicated that they have no comments on the project at present but would like to continue receiving updates on the project.
27	Chippewas of the Thames FN	October 2, 2015	Letter received	- Response received from Mary Alikakos, Consultation Coordinator with the COTTFN. They have no concerns with the project but wanted to continue to stay informed.
28	Historic Saugeen Métis , George Govier, Lands, Resources and Consultation Coordinator	November 3, 2015	Letter Sent	- A copy of the presentation material from the Public Meeting was forwarded to provide more information on the project.
29	Chippewas of Kettle & Stony Point, Suzanne Bressette	November 3, 2015	Letter Sent	- A copy of the presentation material from the Public Meeting was forwarded to provide more information on the project.
30	Chippewas of Kettle & Stony Point	October 22, 2020	Letter sent by BMROSS	- Project update letter sent. Public meeting date and information provided with a link to the presentation material.
31	Chippewas of the Thames FN	October 22, 2020	Letter sent by BMROSS	- Project update letter sent. Public meeting date and information provided with a link to the presentation material.
32	Aamjiwnaang First Nation	October 22, 2020	Letter sent by BMROSS	- Project update letter sent. Public meeting date and information provided with a link to the presentation material.
33	Oneida Nation of the Thames	October 22, 2020	Letter sent by BMROSS	- Project update letter sent. Public meeting date and information provided with a link to the presentation material.
34	Delaware Nation	October 22, 2020	Letter sent by BMROSS	- Project update letter sent. Public meeting date and information provided with a link to the presentation material.
35	Chippewas of Saugeen First Nation	October 22, 2020	Letter sent by BMROSS	- Project update letter sent. Public meeting date and information provided with a link to the presentation material.
36	Chippewas of Nawash Unceded First Nation	October 22, 2020	Letter sent by BMROSS	- Project update letter sent. Public meeting date and information provided with a link to the presentation material.

Contact Number	Aboriginal Contact	Date	Type of Contact	Details/Response
37	Historic Saugeen Métis	October 22, 2020	Letter sent by BMROSS	- Project update letter sent. Public meeting date and information provided with a link to the presentation material.
38	Métis Nation of Ontario	October 22, 2020	Letter sent by BMROSS	- Project update letter sent. Public meeting date and information provided with a link to the presentation material.
39	Saugeen Ojibway Nation	October 22, 2020	Letter sent by BMROSS	- Project update letter sent. Public meeting date and information provided with a link to the presentation material.
40	Moravian of the Thames First Nation	October 22, 2020	Letter sent by BMROSS	- Project update letter sent. Public meeting date and information provided with a link to the presentation material.
41	Chippewas of the Thames FN	October 2, 2015	Letter received	- Response received from Fallon Burch, Consultation Coordinator with the COTTFN. They have no concerns with the project but wanted to continue to stay informed.

B. M. ROSS AND ASSOCIATES LIMITED
Consulting Engineers
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 09050

July 20, 2009

See attached List

RE: Municipal Class Environmental Assessments

Our firm is undertaking a number of Municipal Class EA investigations on behalf of local Municipalities to evaluate the potential environmental impacts associated with a proposed project and to identify measures to mitigate any identified adverse impacts. The process includes consultation with the public, stakeholders and government review agencies.

The Ministry of the Environment, in correspondence prepared by the Environmental Assessment & Planning Coordinator, West Central Regional Office (dated December 5, 2006), has recommended that your agency be contacted to determine if Aboriginal communities may be potentially affected by these projects and we are soliciting your input. The individual projects are described in more detail below. Maps detailing the project locations are also appended for your information.

1) Pedestrian Bridge construction spanning the Penetangore River
County of Bruce, Municipality of Kincardine
Located on Park Street road allowance at main branch of the Penetangore River

2) Proposed watermain crossing of the Bayfield River
County of Huron, Municipality of Bluewater
West of Bluewater Highway (Hwy. # 21), Village of Bayfield

3) Expansion of the Bayfield Sewage Treatment Facility
County of Huron, Municipality of Bluewater
Part of Lot 7, Concession B.R.N., Former Township of Stanley

4) Re-rating of the Strathroy Sewage Treatment Facility
County of Middlesex, Municipality of Strathroy-Caradoc
Pt. Lot 19, Concession 5 S.E.R., Township of Adelaide Metcalfe

5) Proposed upgrades to the McNab Street Sewage Pumping Station
County of Middlesex, Municipality of Strathroy-Caradoc
120 McNab Street, Strathroy

Please forward your comments on these project to our office by September 18, 2009 (please advise prior to this date if additional time is required to respond to this request).

If have any questions on his matter or require further information, please contact the undersigned.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, MCIP, RPP
Environmental Planner

KV:hv
Encl.

AGENCY CIRCULATION LIST:
ABORIGINAL INTERESTS

Don Boswell, Senior Claims Analyst,
Specific Claims Branch
Indian and Northern Affairs Canada
10 Wellington St., Room 1310
Gatineau, QC K1A 0H4

Franklin Roy, Director
Litigation Management and Resolution Branch
Indian and Northern Affairs Canada
10 Wellington Street, 25 Eddie 1430
Gatineau, QC K1A 0H4

Pam Wheaton, Director
Aboriginal and Ministry Relationships Branch
Ministry of Aboriginal Affairs
160 Bloor Street East, 9th Floor
Toronto, ON M7A 2E6

Nicole Cheechoo, Policy Analysis
Treaties and Aboriginal Government
Indian and Northern Affairs Canada
10 Wellington Street, 8th Floor
Gatineau, QC K1A 0H4

Gregg Dahl, Senior Policy Analyst
Office of the Federal Interlocutor for
Metis and non-status Indians
66 Slater Street, Room 1218
Ottawa, ON K1A 0H4

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p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 09050 & 09051

August 13, 2009

RE: Municipality of Bluewater
Class EA for Extension of Municipal Water Servicing,
and Expansion of the Bayfield Sewage Treatment Facility

The Municipality of Bluewater is planning to extend municipal water servicing to those portions of Bayfield not currently serviced with a municipal water supply. The south portion of the Village was serviced in 2003 through connection to the Lake Huron Primary Water Supply System (LHPWSS) based in Grand Bend. In keeping with recommendations from the Bayfield Water Supply Master Plan, completed in 2005, a water tower is currently under construction in the southeast part of the community. Upon completion of the tower, sufficient capacity and pressure will be in place to permit extension of the municipal pipeline water supply to the remainder of the Village.

The Municipality is also planning to expand the sewage treatment facility servicing the community of Bayfield in 2003. The treatment facility, a two cell facultative lagoon with sand filters, was sized to accommodate existing and expected growth within the community for a twenty year planning period. Since completion of the works, capacity from the plant has been extended to several adjacent developments (Sugarbush Trailer Park, Wildwood Trailer Park, Paul Bunyan Trailer Park and Bayfield Mews). As a result of these additions, the plant is now approaching its design capacity and must be expanded to allow for continued growth and development within Bayfield and surrounding areas.

These projects are following the planning process set out for Schedule B activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule B projects are approved subject to a screening process. The purpose of the screening process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders and government review agencies.

If you have any questions regarding these projects or require further information, please contact the undersigned.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, MCIP, RPP
Environmental Planner

KV:
Encl.

Affaires indiennes et du Nord Canada
Indian and Northern Affairs Canada

www.ainc-inac.gc.ca

AOUT AUG 06 2009

Votre référence - Your file
B-8260-12
Notre référence - Our file

Kelly Vader
Environmental Planner
B.M. Ross and Associates Limited
62 North Street
Goderich ON N7A 2T4

Re: Municipal Class Environmental Assessments: Pedestrian Bridge, Municipality of Kicardine – Proposed Watermain Crossing of the Bayfield River, Municipality of Bluewater – Expansion of the Bayfield Sewage Treatment Facility, Municipality of Bluewater – Re-rating of the Strathroy Sewage Treatment Facility, Municipality of Strathroy-Caradoc – Proposed Upgrades to the McNab Street Sewage Pumping Station, Municipality of Strathroy-Caradoc

I am writing in response to your letter of July 24, 2009, inquiring about claims in the above noted area.

We have conducted a brief search of our records and determined that the following First Nations in the vicinity of the area of interest have submitted specific claims:

Chippewas of Kettle and Stony Point First Nation
6247 Indian Lane, RR#2, FOREST, ON N0N 1J0
(519)786-2125

Aamjiwnaang First Nation
978 Tashmoo Avenue, SARNIA ON N7T 7H5
(519) 336-8410

Chippewas of the Thames First Nation
RR 1, MUNCEY, ON N0L 1Y0
(519) 289-5555

Moravian of the Thames First Nation
RR 3, THAMESVILLE, ON N0P 2K0
(519) 692-3936

.../2

Munsee-Delaware Nation
RR 1, MUNCEY, ON N0L 1Y0
(519) 289-5396

In addition, there are First Nations in the vicinity of your area of interest. You may wish to contact the First Nations to advise them of your intentions. They can be reached at:

Saugeen First Nation No.29
Highway #21, R.R. #1, SOUTHAMPTON, ON N0H 2L0
(519) 797-2781

Oneida Nation of the Thames
RR 2, SOUTHWOLD, ON N0L 2G0
(519) 652-3244

For more information, you may wish to consult a "Public Information Status Report" all claims which have been submitted to date. This information is available to the public on the Indian and Northern Affairs Canada (INAC) website and can be found at http://www.ainc-inac.gc.ca/al/ldc/spc/scl/index-eng.asp.

It should be noted that the reports available on the INAC website are updated regularly and therefore, you may want to check this site often for updates. In accordance with legislative requirements, confidential information has not been disclosed.

Please rest assured that it is the policy of the Government of Canada as expressed in *The Specific Claims Policy and Process Guide* that "in any settlement of specific native claims the government will take third party interests into account. As a general rule, the government will not accept any settlement which will lead to third parties being dispossessed."

We can only speak directly to claims filed under the Specific Claims Policy in the Province of Ontario. We cannot make any comments regarding potential or future claims, or claims filed under other departmental policies. This includes claims under Canada's Comprehensive Claims Policy or legal action by a First Nation against the Crown. You may wish to contact the Assessment and Historical Research Directorate at (819) 994-6453, the Consultation and Accommodation Unit at (613) 944-9313 and Litigation Management and Resolution Branch at (819) 934-2185 directly for more information.

You may also wish to visit http://www.ainc-inac.gc.ca/ai/mr/is/acp/acp-eng.asp on the INAC website for information regarding the Federal Action Plan on Aboriginal Consultation and Accommodation.

.../3

To the best of our knowledge, the information we have provided you is current and up-to-date. However, this information may not be exhaustive with regard to your needs and you may wish to consider seeking information from other government and private sources (including Aboriginal groups). In addition, please note that Canada does not act as a representative for any Aboriginal group for the purpose of any claim or the purpose of consultation.

I hope this information will be of assistance to you. I trust that this satisfactorily addresses your concerns. If you wish to discuss this matter further please contact me at (819) 953-1940.

Sincerely,

Don Boswell
Sr. Claims Analyst
Ontario Research Team
Specific Claims Branch

B. M. ROSS AND ASSOCIATES LIMITED
Consulting Engineers
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 09050 & 09051

August 20, 2009

Aamjiwnaang First Nation
978 Tashmoo Avenue
Sarnia, ON N7T 7H5

RE: Municipality of Bluewater
Class EA for Extension of Municipal Water Servicing,
and Expansion of the Bayfield Sewage Treatment Facility

The Municipality of Bluewater is planning to extend municipal water servicing to those portions of Bayfield not currently serviced with a municipal water supply. The south portion of the Village was serviced in 2003 through connection to the Lake Huron Primary Water Supply System (LHPWSS) based in Grand Bend. In keeping with recommendations from the Bayfield Water Supply Master Plan, completed in 2005, a water tower is currently under construction in the southeast part of the community. Upon completion of the tower, sufficient capacity and pressure will be in place to permit extension of the municipal pipeline water supply to the remainder of the Village.

The Municipality is also planning to expand the sewage treatment facility servicing the community of Bayfield in 2003. The treatment facility, a two cell facultative lagoon with sand filters, was sized to accommodate existing and expected growth within the community for a twenty year planning period. Since completion of the works, capacity from the plant has been extended to several adjacent developments (Sugarbush Trailer Park, Wildwood Trailer Park, Paul Bunyan Trailer Park and Bayfield Mews). As a result of these additions, the plant is now approaching its design capacity and must be expanded to allow for continued growth and development within Bayfield and surrounding areas.

These projects are following the planning process set out for Schedule B activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule B projects are approved subject to a screening process. The purpose of the screening process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders and government review agencies.

If you have any questions regarding these projects or require further information, please contact the undersigned.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Mike Corby, Planner

MC:dmd
Encl.

B. M. ROSS AND ASSOCIATES LIMITED
Consulting Engineers
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
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File No. 09050 & 09051

August 20, 2009

Chippewas of Kettle and Stony Point First Nation
6247 Indian Lane, R. R. 2
Forest, ON N0N 1J0

RE: Municipality of Bluewater
Class EA for Extension of Municipal Water Servicing,
and Expansion of the Bayfield Sewage Treatment Facility

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If you have any questions regarding these projects or require further information, please contact the undersigned.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Mike Corby, Planner

MC:dmd
Encl.

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Consulting Engineers
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 09050 & 09051

August 20, 2009

Saugeen First Nation No. 29
Highway 21, R. R. 1
Southampton, ON N0H 2L0

RE: Municipality of Bluewater
Class EA for Extension of Municipal Water Servicing,
and Expansion of the Bayfield Sewage Treatment Facility

The Municipality of Bluewater is planning to extend municipal water servicing to those portions of Bayfield not currently serviced with a municipal water supply. The south portion of the Village was serviced in 2003 through connection to the Lake Huron Primary Water Supply System (LHPWSS) based in Grand Bend. In keeping with recommendations from the Bayfield Water Supply Master Plan, completed in 2005, a water tower is currently under construction in the southeast part of the community. Upon completion of the tower, sufficient capacity and pressure will be in place to permit extension of the municipal pipeline water supply to the remainder of the Village.

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These projects are following the planning process set out for Schedule B activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule B projects are approved subject to a screening process. The purpose of the screening process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders and government review agencies.

If you have any questions regarding these projects or require further information, please contact the undersigned.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Mike Corby, Planner

MC:dmd
Encl.

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 09051

June 29, 2015

Aboriginal Community

RE: Municipality of Bluewater
Class EA for Expansion of the
Bayfield Sewage Treatment Facility

The Municipality of Bluewater installed a communal sewage collection and treatment system servicing the community of Bayfield in 2001. The treatment facility, a two cell facultative lagoon with sand filters, was sized to accommodate existing and expected growth within the community for a twenty year planning period. The Bayfield service area has experienced rapid growth since construction of the sewage collection system and the treatment facility is now nearing its design capacity. To accommodate expected growth in and around Bayfield, the plant requires expansion. Modifications to the existing forcemain and main sewage pumping station will also be required to accommodate anticipated flows.

A range of treatment technologies will be assessed in order to determine how best to expand the capacity of the treatment facility while still maintaining a high level of effluent quality. Expansion of the existing facilities or the provision of mechanical treatment, are some of the alternatives being considered in conjunction with the Class EA process.

The possible expansion of the service area associated with the existing facility is an option also being considered in conjunction with this project. Currently the treatment facility services the Former Village of Bayfield as well as adjacent campground facilities in the Municipality of Bluewater.

The project is following the planning process set out for Schedule ‘C’ activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule C projects are finalized following completion of all 5 phases of the Class EA process. One purpose of the EA process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders and government review agencies.

Your community has been identified as possibly having an interest in this project. For your convenience, a response form is enclosed along with a self-addressed stamped envelope. Please return by **July 31, 2015**. If you have any questions on this matter or require further information, please contact the undersigned at 1-888-524-2641 or by e-mail at kvader@bmross.net.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, MCIP, RPP
Environmental Planner

KV:hv
Encl.

c.c. Gary Long, Municipality of Bluewater

MUNICIPALITY OF BLUEWATER
COMMUNITY OF BAYFIELD

CLASS ENVIRONMENTAL ASSESSMENT
EXPANSION OF THE BAYFIELD SEWAGE TREATMENT FACILITY
PROJECT 09051

AGENCY CIRCULATION LIST: ABORIGINAL INTERESTS

Chippewas of Kettle and Stony Point First Nation
6247 Indian Lane
RR #2 Forest, Ontario
N0N 1J0
Ph: 519-786-2125

Aamjiwnaang First Nation
Aamjiwnaang Administration Office
978 Tashmoo Ave.
Sarnia, ON
N7T 7H5
Ph: 519-336-8410

Chippewas of the Thames First Nation
Chief Vaughn Albert Sr.
320 Chippewa Road, Muncey, ON
N0L 1Y0
519-289-5555
Consultation and Accommodation Unit
4 Anishnabeg Drive, Muncey Ontario N0L 1Y0
519-289-2662

Oneida Nation of the Thames
2212 Elm Ave
Southwold, Ontario
N0L 2G0
Ph: 519-652-3244

Munsee-Delaware Nation
RR#1
Muncey, Ontario
N0L 1Y0
519.289.5396

Historic Saugeen Métis
204 High Street, Box 1492
Southampton, Ontario
N0H 2L0

Métis Nation of Ontario
500 Old St. Patrick St., Unit 3
Ottawa, ON K1N 9G4

Saugeen Ojibway Nation (SON) – Chippewas of Saugeen (Chief Vernon Roote)
& Chippewas of Nawash (Chief Arlene Chegahno)
Environmental Office
25 Maadookii Subdivision
Neyaashiinigmiing ON N0H 2T0

Moravian of the Thames First Nation
Chief Greg Peters
R.R.#3 Thamesville, ON
N0P 2K0

CHIPPEWAS OF THE THAMES FIRST NATION

October 2, 2015

B.M. Ross and Associates Limited
Engineers and Planners
62 North Street
Goderich, ON N7A 2T4

Attn: Kelly Vader
Environmental Planner

Subject: Municipality of Bluewater
Class EA for Expansion of the Bayfield Sewage Treatment Facility

Dear Ms. Vader

We are in receipt of correspondence of the aforementioned project.

In the screening of the correspondence, we have identified no concerns with the project or the information that has been presented to us as this time.

We ask to be kept informed of any changes that are of a substantive nature.

Also, please be advised that Leslee White-eye is now Chief of Chippewas of the Thames First Nation.

Respectfully,

Mary Alikakos
Consultation Coordinator
Chippewa of the Thames First Nation
(519) 289-2662 Ext. 213
malikakos@cottfn.com

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

Transmittal Record

From: Kelly Vader
kvader@bmross.net

☑ Regular Mail ☐ Hand Delivered
☐ Courier

To: George Govier
Historic Saugeen Métis
204 High St, Southampton, ON N0H 2L0

Re: Class EA for Expansion of the Bayfield STP

Date: November 3, 2015 **File #:** 09051

We enclose: Enclosed for your review is the Presentation Material from a recent Public Information Meeting held for this project.

Chippewas of Kettle & Stony Point First Nation
6247 Indian Lane
Kettle & Stony Point FN. Ontario. Canada N0N 1J1

September 28, 2015

B.M. Ross and Associates Ltd.
62 North Street
Goderich, Ontario
N7A 2T4
ATT: Kelly Vader, RPP, MCIP, Environmental Planner

Dear Ms. Vader:

RE: Municipality of Bluewater and Class EA for Expansion of the Bayfield Sewage Treatment Facility on Kettle and Stony Point First Nation Traditional Territory.

I'd like to take the opportunity to introduce myself as the Consultation Coordinator for Chippewas of Kettle and Stony Point First Nation ("Kettle & Stony Point"). Kettle & Stony Point have asserted it's Aboriginal and Treaty Rights, and Aboriginal Title in their traditional territory ("Traditional Territory") since time immemorial. These constitutionally entrenched rights and title to our Traditional Territory have been legally recognized by the provincial and federal Crowns, as signatories to the Huron Tract Treaty #29.

We are aware that the Municipality of Bluewater. is either engaged, or is interested in engaging in an activity that may have an impact on Kettle & Stony Point's Traditional Territory. Please be advised that Kettle & Stony Point has not surrendered, relinquished, extinguished, or conveyed, its interests, rights, and/or title to any of the assets, land, water, surface and subsurface resources, and all other natural resources.

We acknowledge that industry does not have a court-imposed duty to consult with First Nations; however, it is our expectation that if the Municipality of Bluewater is either engaging, or is interested in engaging, an activity in Kettle & Stony Point's Traditional Territory, it will have an interest in becoming involved in consultation and accommodation efforts with our First Nation.

Consequently, if the Municipality of Bluewater is prepared to engage in meaningful consultations to understand, address and accommodate our concerns, then Kettle & Stony Point will welcome your participation as a sign of good faith and cooperation and we will respond in kind.

At present time, the First Nation does not have any additional comments or concerns with the activity / project you are proposing in our Traditional Territory. Therefore, on behalf of the Kettle & Stony Point First Nation, we thank you for providing information to our First Nation and reserve the right to initiate meaningful consultation discussions should the need arise.

In the event the scope of the project changes and/or amendments are made, please ensure that the First Nation receives notification. Thank you in advance for your cooperation in this regard.

Sincerely,

K. Suzanne Bressette
Chippewas of Kettle and Stony Point First Nation

Ph: 519-786-2125 Toll Free: 1-877-787-5213 Fax: 519-786-2108 http://www.kettlepoint.org

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 **www.bmross.net**

File No. 09051

October 22, 2020

'Indigenous Community'

RE: Municipality of Bluewater
Class EA for Expansion of the
Bayfield Wastewater Treatment Facility

The Municipality of Bluewater initiated a Class Environmental Assessment process in 2011 to examine alternatives associated with increased flows at the Bayfield Wastewater Treatment Facility, constructed to service the community of Bayfield in 2001. The Bayfield service area has experienced significant growth since construction of the sewage collection system and flows to the treatment facility are now exceeding its design capacity. To accommodate existing commitments and expected growth in and around Bayfield, the capacity of the facility must be increased. The attached general location plan shows the location of Bayfield and the existing wastewater treatment facility.

A range of alternatives to address the high flows were evaluated. It was determined that expansion of the existing facility was the preferred method to increase capacity, while maintaining a high level of effluent quality. An assessment of different treatment methodologies was also undertaken. It was concluded that construction of a mechanical plant within the existing plant's footprint, that would be operated in parallel with the existing lagoon and sand filter system, was the preferred treatment method to increase capacity. The attached figure illustrates the location of the proposed mechanical plant at the existing site.

The project is following the planning process set out for Schedule C activities under the Municipal Class Environmental Assessment (Class EA) document. Schedule C projects are finalized following completion of all five phases of the Class EA process. One purpose of the EA process is to identify any potential environmental impacts associated with the proposal and to plan for appropriate mitigation of any impacts. The process includes consultation with the public, stakeholders and government review agencies.

A public information meeting is being held virtually on Saturday, October 24, 2020 to advise local residents of the status of the Class EA process. A copy of the presentation material can be viewed on the Municipality of Bluewater website at www.municipalityofbluewater.ca.

Your community was contacted previously about this project. We are seeking additional input on the preferred alternative selected for this project. Please forward any comments or questions you may have on this project to the undersigned by November 30, 2020.

Yours very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Kelly Vader, MCIP, RPP
Environmental Planner

KV:hl
Encl.
c.c. Dave Kester, Municipality of Bluewater

MUNICIPALITY OF BLUEWATER
COMMUNITY OF BAYFIELD

CLASS ENVIRONMENTAL ASSESSMENT
EXPANSION OF THE BAYFIELD WASTEWATER TREATMENT FACILITY
PROJECT 09051

INDIGENOUS CONSULTATION LIST:

Chippewas of Kettle and Stony Point First Nation
Chief Jason Henry
6247 Indian Lane
RR #2 Forest, Ontario N0N 1J0
kpassistant@kettlepoint.org

Aamjiwnaang First Nation
Chief Chris Plain
Aamjiwnaang Administration Office
978 Tashmoo Ave.
Sarnia, ON N7T 7H5
chief.plain@aamjiwnaang.ca

Chippewas of the Thames First Nation
Chief Jacqueline French
320 Chippewa Road, Muncey, ON
N0L 1Y0
consultation@cottfn.com

Oneida Nation of the Thames
Chief Adrian Chrisjohn
2212 Elm Ave
Southwold, Ontario
N0L 2G0
environment@oneida.on.ca

Chief Gregory Nadjiwon
Chippewas of Nawash, Unceded First Nation
RR #5 Wiarton, ON N0H 2T0
chiefsdesk@nawash.ca

Chief Lester Anoquot
Chippewas of Saugeen First Nation
Hwy. 21, R.R. #1
Southampton, ON N0H 2L0
lanoquot@saugeenfirstnation.ca

Great Lakes Métis Council
380 9th Street East
Owen Sound, ON N4K 1P3

greatlakesmetis@gmail.com

Saugeen Ojibway Nation (SON) – Chippewas of Saugeen &
Chippewas of Nawash
25 Maadookii Subdivision,
Neyaashiinigmiing, ON N0H 2T0
juanita.meekins@saugeenojibwaynation.ca

Historic Saugeen Métis
Chris Hachey, Consultation Coordinator
204 High Street, Box 1492
Southampton, Ontario
N0H 2L0
saugeenmetis@bmts.com

Métis Nation of Ontario
500 Old St. Patrick St., Unit 3
Ottawa, ON K1N 9G4
marcs@metisnation.org

Delaware Nation
Chief Denise Stonefish
14760 School House Line, R.R.3
Thamesville, ON N0P 2K0

CHIPPEWAS OF THE THAMES FIRST NATION

November 16, 2020

VIA EMAIL

Kelly Vader
Environmental Planner
B.M. Ross and Associates Ltd.
62 North Street
Goderich, ON N7A 2T4

RE: Bayfield Wastewater Treatment Facility

Dear: Kelly,

We have reviewed information concerning the aforementioned project. The proposed project is located within Chippewas of the Thames First Nation (COTTFN) big bear creek additions to reserve (ATR) land selection area, as well as COTTFN's Traditional Territory.

After reviewing the project information, we have identified minimal concerns and have no recommendations or comments on the preferred alternative for this project. However, if there are any substantial changes to your project, we ask that you keep us informed by emailing an electronic notification to consultation@cottfn.com.

We look forward to continuing this open line of communication. To implement meaningful consultation, COTTFN has developed its own protocol - a document and a process that will guide positive working relationships. We would be happy to meet with you to review COTTFN's Consultation Protocol.

As per 'Appendix D' of the Wiindmaagewin attached is invoice 0062. Please do not hesitate to contact me if you need further clarification of this letter.

Sincerely,

F Burch

Fallon Burch
Consultation Coordinator
Chippewa of the Thames First Nation
(519) 289-5555 Ext 251
consultation@cottfn.com

c: Dave Kester, Municipality of Bluewater

APPENDIX E

INFORMATION SUBMITTED TO THE MINISTRY OF THE ENVIRONMENT CONSERVATION AND PARKS

B. M. ROSS AND ASSOCIATES LIMITED
Consulting Engineers
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 09051

MUNICIPALITY OF BLUEWATER
BAYFIELD SEWAGE TREATMENT PLANT EXPANSION
PROJECT NO. 09051

MEETING NOTES – APRIL 19, 2011

A meeting for the above project was held on Tuesday April 19, commencing at 10 a.m. at the Bayfield Arena and Community Centre in Bayfield. The following were in attendance:

Bill Dowson (Mayor) Brent Kittmer Lori Wolfe	Municipality of Bluewater
Alison Munro Craig E. Newton	Ministry of the Environment - Southwestern Region
Ian Mitchell Scott Gass	Ministry of the Environment – Owen Sound District
Craig Metzger Susanna Reid	Huron County Planning and Development Dept.
Steve Burns Jane Simmons Kelly Vader	B. M. Ross and Associates (BMROSS)

The following matters were discussed:

		ACTION BY
1. MOE Position and Concerns		
- Craig Newton handed out copies of information on sensitive land uses and First Nations consultation.		
- Craig brought to everyone's attention that for First Nations consultation, the MOE is encouraging a phone call and/or meeting.		
- It was noted that the MOE did not have an up to date Official Plan for the proposed service area in Bluewater and Central Huron. Kelly, Susanna and Craig agreed to find the most recent copies and send it along.		BMROSS (complete)

-	The MOE requested that a draft report be sent to their office at least two months prior to the publication of Notice of Completion.		
2.	**Effluent Quality Criteria**		
-	Alison noted that the existing limits are fairly tight, but they would likely start "from scratch" to establish what the river could handle.		
-	Allison noted that it may be possible to justify increased loading by reducing the number of septic systems.		
-	Craig indicated that the MOE would prefer to see full servicing (water and sanitary), but that it may be preferable to have sewer servicing in the absence of water rather than vice versa.		
3.	**Impact of Central Huron**		
-	Steve explained that Central Huron is looking to participate in the proposed expansion, to secure capacity for the Lakeshore Service Area, north of Bayfield.		
-	Craig noted that the MOE would prefer to see one facility.		
4.	**Treatment Alternatives and Studies Required**		
-	Steve noted that it is not possible to expand the plant keeping the existing treatment method. He also noted that the summer conditions are such that the river has a very low capacity.		
-	Alison confirmed that the key parameters of concern would be total phosphorous, e-coli and ammonia.		
-	Alison will provide more information on what the MOE has set for discharge requirements based on the treatment technology used.		Alison
-	Alison indicted that if Policy II requirements cannot be met there is a procedure to request a deviation outlined in Procedure B-1-5.		
-	Alison noted that mixing zone studies would typically be completed in addition to compiling background quality data.		
-	Steve asked about the possibility of water quality trading programs. Alison indicated that she may be able to find examples of where this has been considered in the Region.		Alison
5.	**Planning Considerations**		
-	BMROSS and the Huron County Planners discussed that all areas have been designated under OP's in 2005 and that there are separate pans for each of the municipalities.		
-	It was also noted that there are draft approved developments in Bluewater that result in the sewage treatment plant being over-committed.		
6.	**Planning Considerations**		
-	It was agreed that a technical steering committee should be established. As part of the Class EA process Kelly will look after setting this up.		Kelly

Should there be any errors or omissions to these meeting notes, please notify the undersigned.

Meeting Notes prepared by: Jane Simmons
B. M. ROSS AND ASSOCIATES LIMITED

Distribution:

Bill Dowson
Brent Kittmer
Alison Munro
Craig E. Newton
Ian Mitchell
Scott Gass
Craig Metzger
Susanna Reid
Steve Burns
Jane Simmons
Kelly Vader

From: Geurts, Hugh (ENE) [Hugh.Geurts@ontario.ca]
Sent: Friday, May 20, 2011 2:14 PM
To: Steve Burns
Cc: Munro, Alison (ENE); Aggerholm, Bob (ENE); Mitchell, Ian (ENE); Gass, Scott (ENE); Abernethy, Scott (ENE)
Subject: Bayfield - Proposed expansion of Sanitary Sewer Capacity

Steve:

Further to our telephone conversation of this Wednesday and Thursday and in line with your preliminary conversations with the Region and District I offer the following

I understand from your discussions to date that the Municipality is considering sanitary servicing options to deal with potential growth within the community of Bayfield and possibly the inclusion of abutting Central Huron communities. The current sewage treatment system is Lagoon/Sand Filter with a April 01 to Dec 15th daily discharge window of 1072 m3/d max discharge into the Bayfield River (when sand filters are operational as designed). I further understand that the municipality will consider a mechanical tertiary treatment system that will allow for year round discharge to accommodate expansion.

The Ministry currently allows summer discharge of up to 1072 m3/day with limits of 10 BOD,10 TSS, 0.5 TP and 4.0 ammonia. In our discussion there was preliminary agreement that if these water quality values can be improved upon during summer low flow (say June 15th to October 15th inclusive) to allow for improved water quality and minimize impact within the mixing zone , there may be opportunity to recognize a broader assimilative capacity (year round) to deal with projected greater flows.

In discussions with the District, there is a concern that there may be associated combined sewer/and/or footing drain and/or high water table infiltration into the existing sewage collection infrastructure. As part of the EA process, the District has requested that specific discussion be afforded this concern.

Please note that these discussions were specific to effluent criteria only and does not reflect a thorough and complete review of the proposed works by the Ministry.

Best Available Technology

Beyond the discussion provided in Section 15 of the Ministry's Sewage Design Manual, the Ministry has no blanket Best Available Technology numbers for Ammonia and Phosphorous. In discussion with the Ministry's Standards and Development Branch, A total Phosphorous of less than 0.3 mg/l and a total ammonia limit of less than 3.0 mg/l would be in the realm of "recognized and accepted tertiary level treatment"

I trust the information provided is sufficient for your consideration.

Hugh Geurts
Surface Water Evaluator
Southwest Region. Ministry of the Environment
733 Exeter Road, London, Ontario
N6E 1L3
519-873-5039

B. M. ROSS AND ASSOCIATES LIMITED
Consulting Engineers
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

Memo

From: Steve Burns
sburns@bmross.net

To:	Ministry of the Environment
Re:	Bayfield Sewage Class EA – Pre Consultation
File #:	09051
Date:	March 23, 2011

1.0 PURPOSE OF MEMO

The Municipality of Bluewater's Bayfield Sewage Treatment facility is operating near capacity. Servicing commitments and projected growth requires that the capacity of the facility be increased. The Municipality is about to initiate a Class EA process to plan the expansion. Prior to starting the EA the Municipality wishes to enter into pre-consultation with the MOE to identify potential constraints regarding future capacity and effluent quality requirements. The purpose of this Memo is to provide background for the first part of the pre-consultation.

After the Ministry has had an opportunity to review this memo, we request that you contact us to arrange a meeting at which issues can be discussed.

2.0 DESCRIPTION OF EXISTING FACILITY

2.1 Overview

The Bayfield sewage treatment facility is located approximately 750 m north of Huron County Road No.3 and 2.5 km east of the east boundary of the community of Bayfield. The facility consists of a twin celled sewage lagoon system with intermittent sand filtration. According to the existing Certificate of Approval No. 6171-4HEJQS (Appendix A) the average daily flow of raw sewage must not exceed 1072 m^3/day for any period of time greater than one calendar year. The STP is designed to treat an annual total sewage volume of 391,186 m^3. The treated effluent is typically discharged intermittently in the spring and fall between March to June and October to December. The actual number of days of discharge varies from 50 to 100 days per year.

Discharge is to the Bayfield River. The discharge is approximately 3.5 km from the point where the Bayfield River discharges to Lake Huron.

2.2 Existing Hydraulic Capacity

The Bayfield sewage treatment plant receives wastewater from the Community of Bayfield and four seasonal trailer parks. The total annual flow to the STP is summarized in Table 2.1.

. **Table 2.1**
Total Annual Wastewater Flows –2007-2009

Year	Annual Inflow to STP (m^3)	% of Design Flow
2007	278,410	71
2008[1]	407,883	104
2009	344,819	88
Average	343,704	88

Note: 1. There was an error with the flow meter in 2008 which reportedly caused the meter to measure flows greater than actual

The Bayfield STP is currently operating near the design capacity of the plant. Additionally, the STP is currently over-committed by 336 m^3/day (roughly 240 equivalent units of development). BMROSS has established that there is sufficient reserve capacity for approximately 4 years of development at current growth rates.

2.3 Existing Flows and Raw Sewage Characteristics

Average daily sewage flows and sewage quality data from 2006 to 2009 has been reviewed. The daily sewage flows and influent quality are summarized in Table 2.2 and 2.3, respectively.

Table 2.2
Average Wastewater Flows –2007-2009

Year	Daily Inflow to STP (m^3/day)	% of Design Flow
2007	763	71
2008[1]	1,122	105
2009	946	88
Average	944	88

Note: 1. There was an error with the flow meter in 2008 which reportedly caused the meter to measure flows greater than actual

Table 2.3
Bayfield Sewage Influent Quality and Loading (2006 – 2009)

Parameter	Average Concentration (mg/L)	Average Daily Loading (kg/d)
BOD_5[1]	114	104
Suspended Solids	128	104
Total Phosphorous	3.54	2.83
TKN	17.3	14.7

1. From CBOD values when BOD_5 not available

2.4 Existing Treatment Performance

As per the Certificate of Approval requirements the STP must be operated such that the concentration and loadings of the materials listed in Table 2.4 as effluent parameters are not exceeded in the effluent from the plant.

Table 2.4
Existing Objective Criteria (C of A No. 6171-4HEJQS)

Effluent Parameter	Annual Average Concentration (mg/L)	Annual Loading (kg)
BOD_5 (a)	5	1,955.93
BOD_5 (b)	10	
Suspended Solids (a)	5	1,955.93
Suspended Solids (b)	10	
*Total Ammonia Nitrogen (a)	1	391.19
*Total Ammonia Nitrogen (b)	3	
Total Phosphorus (a)	0.3	117.35
Total Phosphorous (b)	0.3	
**Dissolved Oxygen (a)	5	
**Dissolved Oxygen (b)	7	
Total Chlorine Residual	0.0	
***E. Coli	100/100mL	

NOTE: Annual Loading is based on the design annual sewage volume of 391,186 m^3 of filtered effluent during the discharge period.

(a) When stream temperatures are greater than 5°C.
(b) When stream temperatures are less then or equal to 5°C.
* Any discharge condition, which will result in greater than 0.1mg/L un-ionized ammonia (based on river temperature and pH) results in non-compliance.
** Value shown is a minimum.
*** The geometric mean density of E. Coli in the effluent shall not exceed 200 organisms per 100mL for any calendar month.

Tables 2.5 and 2.6 summarize recent STP performance for both concentration and loading of effluent parameters. The data is generally from the period 2006 to 2009. In keeping with the

definitions prescribed by the Certificate of Approval the *annual average concentration* has been calculated as the arithmetic mean (except for E. Coli) of the monthly average concentrations of a contaminant in the effluent calculated for any particular calendar year. Similarly, the *annual average loading* is the value obtained by multiplying the annual average concentration of a particular contaminate by the average daily flow over the same year. The following tables show that in three of the past four years one or more of the objective criteria have not been met. The exceedances appear to be random.

Table 2.5
STP Performance (2006 to 2009) –Objectives versus Annual Concentration

Effluent Parameter	Objective [1] (mg/L)	4-Year Avg. Concentration (mg/L)	2006	2007	2008	2009
Bio. Oxygen Demand[2]	5	4.02	6.00	3.67	3.08	3.33
Suspended Solids	5	6.00	2.00	6.50	3.17	12.33
Total Ammonia Nitrogen	1	0.49	0.371	0.098	0.170	1.307
Total Phosphorous	0.3	0.11	0.135	0.073	0.080	0.137
Dissolved Oxygen	5	--	--	--	--	--
E. Coli (org./100ml)	100	26	32	20	35	19

1. From C of A No. 6171-4HEJQS
2. CBOD values are reported rather than BOD_5

Table 2.6
STP Performance (2006 to 2009) – Objectives versus Annual Loading

Effluent Parameter	Objective[1] (kg)	4-Year Avg. Loading (kg)	2006	2007	2008	2009
Bio. Oxygen Demand[2]	1955.9	902	1512.6	823.8	671.4	600.1
Suspended Solids	1955.9	1391	504.2	2059.6	626.6	2372.2
Total Ammonia Nitrogen	391.2	80	119.7	28.9	30.1	140.4
Total Phosphorous	117.4	24	35.4	19.5	15.4	26.8
Dissolved Oxygen	--	--	--	--	--	--
E. Coli	--	--	--	--	--	--

1. From C of A No. 6171-4HEJQS
2. CBOD values are reported rather than BOD_5

3.0 FUTURE CAPACITY REQUIREMENTS

3.1 Future Service Populations

As discussed in Section 2.2 there is a need to expand the STP to accommodate future development in Bayfield. The neighboring Municipality of Central Huron has also expressed interest in securing capacity at the Bayfield STP to service development along the lakeshore. The

25-year capacity requirements for Bayfield and for Bayfield and Central Huron are summarized in Table 3.1.

Table 3.1
25-Year Bayfield STP Capacity Requirements

Service Area	Serviced Population in 2036	Capacity Required (m^3/day)
Bayfield	4586	2410
Central Huron	3759	1600
Bayfield and Central Huron	8345	4010

4.0 STREAM ASSIMILATION CAPACITY

4.1 Flows

The Water Survey of Canada has maintained Water Gauging Station No. 02FF007 (Latitude 43°33'4" N and Longitude 81°35'22" W) upstream of the Village of Bayfield at the intersection of the Bayfield River and Parr Line north of Varna. Continuous flow data is available from 1966 to the present. The average, lower quartile and 7Q20 flows (1966-2008) have been summarized on a monthly basis in Table 4.1. The catchment area method was used to estimate flows downstream of the gauge. The 7Q20 flow is defined as the minimum flow averaged over a 7-day period that could be expected to occur once every 20 years. The annual 7Q20 value for the stream at the discharge point of the STP, based on data to 2008, is 0.051 m^3/s (4,406 m^3/day).

Table 4.1
Summary of Flow Data – Bayfield STP Discharge Location[1]

Month	Mean Monthly Discharge (m^3/s)	Lower Quartile (m^3/s)	7Q20 (m^3/s)
January	8.02	3.90	0.556
February	8.86	2.40	0.720
March	17.6	10.7	0.794
April	10.9	5.40	1.752
May	4.45	1.85	0.634
June	2.09	0.733	0.133
July	1.30	0.331	0.062
August	0.894	0.170	0.067
September	2.63	0.147	0.062
October	3.88	0.410	0.085
November	7.35	3.16	0.194
December	9.48	5.67	0.511
Annual	6.44	5.15	0.051

Note: 1. Streamflow data for Bayfield River at the Bayfield STP as calculated from Federal Gauge 02FF007, Bayfield River near Varna. The drainage area at the gauge is 466 km^2 and at the STP, 479 km^2.

Low flow conditions in the summer months are expected due to the relatively small drainage area and intensive agricultural land uses. As well, it should be noted that there is only a slight difference between the 7Q10 (0.059 m^3/s) and 7Q20 (0.050 m^3/s) values at the Federal Gauge Station near Varna, suggesting that there is a high frequency of low flow events.

4.2 Quality

Water Quality Data for the Bayfield River has been collected by the Ausable Bayfield Conservation Authority (ABCA) at the Water Gauging Station No. 02FF007 north of Varna, upstream of Bayfield. Water quality data has been collected on a monthly basis for approximately 30 years. The median and upper quartile values for water quality parameters reported are tabulated in Table 4.2 along with a comparison to the Ontario Provincial Water Quality Objectives[1] (PWQO).

1 MOEE. *Water Management – Policies, Guidelines and Provincial Water Quality Objectives of the Ministry of the Environment and Energy*. 1994.

Table 4.2
Summary of Water Quality – Upstream STP (Sta. #02FF007)

Parameter	Median[1,2]	Upper Quartile	PWQO	**Samples meeting or exceeding PWQO**
pH	8.27	8.37	--	--
Temperature (°C)	14.5	19.0	--	--
DO (mg/L)	11.35	10.69	5 [3.]	100%
BOD_5 (mg/L)	1.5	1.7	--	--
Total Phosphorous (mg/L)	0.021	0.042	0.03	65%
TKN (mg/L)	0.51	0.65	--	--
NH_4-N (mg/L)	0.017	0.030	--	--
Ammonia NH_3 (mg/L)	0.014	0.023	--	--
Ammonia (un-ionized)[4] (mg/L)		0.004	0.02	
Nitrate (mg/L)	5.3	8.6	--	--
TSS (mg/L)	4.0	7.4	--	--
E.Coli (No./100ml)	90	300	100/100mL	55%

NOTE: 1. pH, Temperature, Phosphorus, and NH_4-N data available 1976-1995 and 2000-2008
2. DO, BOD, TSS, TKN, NH3, Nitrate, and E.Coli data available 2000-2008
3. PWQO limit for DO is a minimum.
4. Based on upper quartile river pH and temperature calculated monthly. Shown is worst case, occurring in June.

Water quality in the Bayfield River is for the most part, typical of the quality associated with a stream of this nature in a predominantly rural watershed.

Historical data indicate that water quality has generally not shown any trends towards increasing or decreasing concentrations as a result of activity in the watershed. Of importance for this study is the correlation of concentration with flow. Graphs showing the seasonal variation in concentration of a variety of parameters are included in Appendix B.

The pH of the water in the Bayfield River is somewhat elevated with an annual 75^{th} percentile of 8.37. The temperature and low suspended solids provide a water quality that is typical for warm water fisheries. Low BOD_5 levels and Dissolved Oxygen at or near saturation indicate that the stream historically has not been enriched with organic material. However, the concentrations of the various forms of Nitrogen (TKN, NH_4-N, and NO_3-N) are somewhat high. This is particularly true of nitrate (8.6 mg/L), which is indicative of runoff from fertilized cropland.

The average Total Phosphorous concentration range from less than 0.02 mg/L in low flow months to over 0.10 mg/L in April. The annual 75^{th} percentile for Total Phosphorous (0.04 mg/L) is above the MOE's Objective of 0.03 mg/L. The only months that the average Total Phosphorous concentration is at, or below, the Objective are May and August.

The 75th percentile for Escherichia coli (E. coli) exceeds the MOE's Objective of 100 cfu/100 mL.

Historical data shows that water quality is generally degraded by the impacts of land use and human activities in the area. The MOE Objectives are not met for Total Phosphorous and E. coli.

The MOE policy for surface water quality states that where water quality does not presently meet the provincial Water Quality Objectives (Policy 2) it shall not be degraded further and all practical measures must be taken to upgrade the water quality to the Objectives. Based on the information presented above, the Bayfield River can be considered a Policy 2 stream.

4.3 2010 Biological Monitoring Report

In order to assess the water quality of the Bayfield River in the vicinity of the Bayfield STP biological monitoring data was collected on April 5, 2010. Data was collected and observations were made at three biological sampling sites located upstream and downstream from the discharge of the Community of Bayfield's STP. It was concluded that at the time of observation the BioMAP (d) WQI values for the river indicates unimpaired water quality conditions at all three sites[2]. As well, species richness was good at all sites with representation of Midge, Mayflies and Caddis flies characteristic of higher quality stream environments.

All of which is respectfully submitted.

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Stephen D. Burns, P. Eng.

2 John Westwood. *2010 Biological Monitoring Report for the Bayfield River in the Vicinity of the Bayfield Sewage Treatment Plant*. August 2010.

B. M. ROSS AND ASSOCIATES LIMITED
Engineers and Planners
62 North Street, Goderich, ON N7A 2T4
p. (519) 524-2641 • f. (519) 524-4403
www.bmross.net

File No. 09051

VIA EMAIL ONLY

December 12, 2019

Craig Newton
Regional Environmental Planner/EA Coordinator
Ministry of the Environment, Conservation and Parks
Southwest Region
733 Exeter Road
London, ON N6E 1L3

Craig

Re: Municipality of Bluewater
Bayfield WWTP Expansion Class EA

The purpose of this letter is to set out proposed Effluent Quality Objectives and Limits for expansion of the Municipality of Bluewater's Bayfield Wastewater Treatment Plant (WWTP). The values below are based on treating an annual average daily flow of 2,100 m^3/day. The expected facility will be a new mechanical plant (MWWTP) rated 1,100 m^3/day (AADF) operating in parallel with the existing lagoon and intermittent sand filter (ISF) system. The ISF will generally be operational from April 1st to November 30th annually.

Proposed final effluent objectives are set out in the following table:

Final Effluent Design Objectives

Final Effluent Parameter	Averaging Calculator	Concentration Objective (milligrams per litre unless otherwise indicated)
$CBOD_5$	Monthly Average Effluent Concentration	5.0 mg/L
Total Suspended Solids (TSS)	Monthly Average Effluent Concentration	5.0 mg/L
Total Phosphorus (TP)	Annual Average Effluent Concentration	0.2 mg/L
Total Ammonia Nitrogen (TAN)	Monthly Average Effluent Concentration	2.0 mg/L
Dissolved Oxygen	Monthly Average Effluent Concentration	greater than 5.0 mg/L
E.Coli	Monthly Geometric Mean Density	*50 CFU/100 ml for any calendar month
pH	Single sample results	6.5 to 8.5

* If the MPN method is utilized for E.Coli analysis, the limit shall be 50 MPN/100 mL.

Proposed concentration limits are as follows:

Concentration Limits

Final Effluent Parameter	Averaging Calculator	Concentration Limit (maximum unless otherwise indicated)
$CBOD_5$	Monthly Average Effluent Concentration	10.0 mg/L
Total Suspended Solids (TSS)	Monthly Average Effluent Concentration	10.0 mg/L
Total Phosphorus (TP)	Annual Average Effluent Concentration	0.25 mg/L
Total Ammonia Nitrogen (TAN)	Monthly Average Effluent Concentration	4.0 mg/L
E. Coli	Monthly Geometric Mean Density	*100 CFU per 100 mL
pH	Single Sample Result	between 6.0 - 9.5 inclusive

* If the MPN method is utilized for E.Coli analysis, the limit shall be 100 MPN/100 mL.

Loading limits have been established based on two operational seasons.

- Warm weather – ISFs operating – April 1st to November 30
- Cold weather – only the MWWTP operating December 1st to March 31st

We have provided separate tables for each.

Loading Limits – Warm Weather (April to November)

Final Effluent Parameter	Averaging Calculator	Limit (maximum unless otherwise indicated)
$CBOD_5$	Seasonal Average Daily Effluent	26.0 kg/day
TSS	Seasonal Average Daily Effluent	26.0 kg/day
TP	Seasonal Average Daily Effluent	0.65 kg/day
TAN	Seasonal Average Daily Effluent	10.4 kg/day

Note: Based on average discharge flow over season of 2,600 m^3/day.

Loading Limits – Cold Weather (December to March)

Final Effluent Parameter	Averaging Calculator	Limit (maximum unless otherwise indicated)
$CBOD_5$	Seasonal Average Daily Effluent	11.0 kg/day
TSS	Seasonal Average Daily Effluent	11.0 kg/day
TP	Seasonal Average Daily Effluent	0.275 kg/day
TAN	Seasonal Average Daily Effluent	4.4 kg/day

Note: Based on average discharge flow over season of 1,100 m^3/day.

If you have any questions or require additional information please let me know.

Your very truly

B. M. ROSS AND ASSOCIATES LIMITED

Per _____
Stephen D. Burns. P. Eng.

SDB:es
c.c. Dave Kester, Municipality of Bluewater
Hugh Geurts, MECP London
Jill Wales, MECP Sarnia
Marc Bechard, MECP Sarnia
Frederick Lam, MECP Toronto

From: Newton, Craig (MECP) <Craig.Newton@ontario.ca>
Sent: December 18, 2019 8:15 AM
To: Steve Burns
Cc: Kelly Vader; Geurts, Hugh (MECP); Wales, Jill (MECP); Bechard, Marc (MECP); Pannu, Fariha (MECP); Adenowo, Adedoyin (MECP); Lam, Frederick (MECP)
Subject: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Proposal

Follow Up Flag: Follow Up
Flag Status: Flagged

Dear Steve:

This email acknowledges this ministry's receipt, with thanks, your immediately preceding email of December 12th, 2019, and accompanying letter attachment also dated December 12th, 2019 pertaining to the Municipality of Bluewater's "Bayfield WWTP Expansion Class EA".

In response, the concentration objectives and limits appear to be consistent with the values MECP communicated to you via email back on September 26, 2019 (Newton to Burns) . Accordingly, MECP SWR has no issues with the BM ROSS letter of Dec 12, 2019 as presented and attached.

Steve, this acknowledgement and concurrence from MECP SWR Technical Support Section as described herein has to be included in the eventual application for approval. I have copied this email to the MECP EAPB Manager and Review Coordinator for information of the pre-submission consultation that has taken place for this proposed expansion.

Yours truly,

Craig Newton
Regional Environmental Planner / Regional EA Coordinator
Ministry of the Environment, Conservation and Parks
Southwestern Region
733 Exeter Road
London, Ontario
N6E 1L3

Telephone: (519) 873-5014
E-mail: craig.newton@ontario.ca

From: Steve Burns <sburns@bmross.net>
Sent: December-12-19 4:30 PM
To: Newton, Craig (MECP) <Craig.Newton@ontario.ca>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; Pannu, Fariha (MECP) <Fariha.Pannu@ontario.ca>; Dave Kester (publicworks@municipalityofbluewater.ca) <publicworks@municipalityofbluewater.ca>; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>
Subject: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Proposal

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Craig:
Attached is a letter summarizing our effluent quality proposals as worked out over time based on the email train below.
Steve

From: Lam, Frederick (MECP) [mailto:Frederick.Lam@ontario.ca]
Sent: December 12, 2019 10:35 AM
To: Steve Burns <sburns@bmross.net>; Newton, Craig (MECP) <Craig.Newton@ontario.ca>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; Pannu, Fariha (MECP) <Fariha.Pannu@ontario.ca>
Subject: RE: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Response to Sept 26 email

Steve,

Sorry I missed commenting on that. I think it is fine since during summer time both the Lagoon/ISF and mechanical trains will be operating at the same time. Objective for TP on a monthly average basis may be a bit tight for the combined effluent when the overall system is close to capacity.

I concur with the objective and limit on TP both based on Annual Average Concentration.

Frederick Lam, P.Eng., M.Eng., LL.B.
Senior Engineer, Permission Services Section
Environmental Assessment and Permissions Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, ON, M4V 1P5
416-325-5358 (Office)

If you have any accommodation needs or require communication supports or alternate formats, please let me know.

Si vous avez des besoins en matière d'adaptation, ou si vous nécessitez des aides à la communication ou des médias substituts, veuillez me le faire savoir.

From: Steve Burns <sburns@bmross.net>
Sent: December 12, 2019 10:28 AM
To: Newton, Craig (MECP) <Craig.Newton@ontario.ca>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; Pannu, Fariha (MECP) <Fariha.Pannu@ontario.ca>
Subject: RE: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Response to Sept 26 email

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Craig:
Frederick has responded regarding the loading issue.
I still need a response regarding the averaging calculator for the TP Objective concentration (see below).
Steve

From: Steve Burns [mailto:sburns@bmross.net]
Sent: December 10, 2019 2:41 PM
To: Newton, Craig (MECP) <Craig.Newton@ontario.ca>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; Pannu, Fariha (MECP) <Fariha.Pannu@ontario.ca>
Subject: RE: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Response to Sept 26 email

Craig:
With regards to the criteria set out below (Sept. 26/19) we have two comments:

1. The Total Phosphorus Concentration Limit (i.e. 0.25 mg/L) is to be an "Annual Average", however the Objective value (0.2 mg/L) is proposed to be defined as a "Monthly Average". Although this is consistent with our original request, in hindsight we believe the averaging method should be consistent for the same parameter. Therefore we ask that the "Objective" TP concentration be defined as 0.2 mg/L as an ANNUAL AVERAGE.

2. The Loading Limits averaging has been adjusted from "Annual" (BMROSS) to "Seasonal" (MECP). As noted below "seasonal" has been established as the period during which the sand filters are operating. We have no issue with this except to note that there were no loading limits for the period when only the mechanical plant is operating (roughly, December 1 to March 31). If annual averaging is not acceptable, our suggestion is to have two sets of seasonal loading criteria. In this regard we have attached a Memo presenting suggested Loading Limits for both seasons.

   If you are in agreement with the above points we will incorporate the proposal into a final version of a letter summarizing all of the effluent criteria.

Steve

From: Newton, Craig (MECP) [mailto:Craig.Newton@ontario.ca]
Sent: October 1, 2019 1:36 PM
To: Steve Burns <sburns@bmross.net>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; Pannu, Fariha (MECP) <Fariha.Pannu@ontario.ca>
Subject: RE: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Response to Sept 26 email

Steve:

Thank you for your preceding e-mail of earlier today, October 1st, 2019. MECP SWR provides the following answers in response to your queries:

***Q1.* I need to run these numbers by the Municipality and their Operator. If everyone is ok with the EQC I assume that I do a final version of my letter (previous version was draft) and that becomes part of the EA record. Correct?**

MECP SWR Answer 1: Yes, the final version of your letter becomes part of the EA Record.

Q2. Also, the term "seasonal" is used but not defined. I assume the loading values would apply when the Intermittent Sand Filters are discharging?

***MECP SWR Answer 2: From MECP SWR's perspective* " Seasonal" means when the sand filters are working so, yes Steve, you are correct for this portion of your query.**

Q3. ***When they are not discharging, the parallel mechanical plant will still be discharging and for that period (say Nov/Dec to Mar/April) there will be monthly average loading limits. Correct?***

MECP SWR Answer 3: MECP SWR can't speak to the loading limits aspect of your query as loading limits are more a performance criteria and not an impact to the receiver. The loading limits originated from Frederick Lam of MECP's Environmental Assessment and Permissions Branch. It is my understanding that Fredrick is not currently available to respond. Frederick is not returning to the office until December 3rd, 2019. If this aspect of your query cannot await Frederick's return, you may want to consider approaching Frederick's Supervisor, Fariha Pannu, to see if she or her designate are willing and or able to respond on Frederick Lam's behalf. To assist, I have copied Fariha on this e-mail chain.

Yours truly,

Craig Newton
Regional Environmental Planner / Regional EA Coordinator
Ministry of the Environment, Conservation and Parks
Southwestern Region
733 Exeter Road
London, Ontario
N6E 1L3

Telephone: (519) 873-5014
E-mail: craig.newton@ontario.ca

From: Steve Burns <sburns@bmross.net>
Sent: October-01-19 9:25 AM
To: Newton, Craig (MECP) <Craig.Newton@ontario.ca>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>
Subject: RE: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Response to Sept 26 email

Hi Craig:
Thanks for the response.
I need to run these numbers by the Municipality and their Operator. If everyone is ok with the EQC I assume that I do a final version of my letter (previous version was draft) and that becomes part of the EA record. Correct?
Also, the term "seasonal" is used but not defined. I assume the loading values would apply when the Intermittent Sand Filters are discharging. When they are not discharging, the parallel mechanical plant will still be discharging and for that period (say Nov/Dec to Mar/April) there will be monthly average loading limits. Correct?
Steve

From: Newton, Craig (MECP) [mailto:Craig.Newton@ontario.ca]
Sent: September 26, 2019 10:51 AM
To: 'sburns@bmross.net' <sburns@bmross.net>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP)

<Marc.Bechard@ontario.ca>
Subject: FW: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Response to June4 email

Good Morning Steve:

Thank you for your immediately preceding e-mail of September 25th, 2019. I apologize for the ministry's delay in providing a response.

This Ministry's recommendations are as noted immediately below:

Final Effluent Design Objectives

Final Effluent Parameter	Averaging Calculator	Concentration Objective (milligrams per litre unless otherwise indicated)
CBOD5	Monthly Average Effluent Concentration	5 mg/L[1.]
Total Suspended Solids	Monthly Average Effluent Concentration	5 mg/L[1.]
Total Phosphorus	Monthly Average Effluent Concentration	0.2 mg/L[2.]
Total Ammonia Nitrogen	Monthly Average Effluent Concentration	2.0 mg/L
Dissolved Oxygen	Monthly Average Effluent Concentration	greater than 5
E.Coli	Monthly Geometric Mean Density	*50 CFU/100 ml for any calendar month
pH	Single sample results	6.5 to 8.5

* If the MPN method is utilized for E.Coli analysis, the limit shall be 50 MPN/100 mL.

Concentration Limits

Final Effluent Parameter	Averaging Calculator	Concentration Limit (maximum unless otherwise indicated)
CBOD5	Monthly Average Effluent Concentration	10 mg/L
Total Suspended Solids	Monthly Average Effluent Concentration	10 mg/L
Total Phosphorus	Annual Average Effluent Concentration	0.25 mg/L
Total Ammonia Nitrogen	Monthly Average Effluent Concentration	4.0 mg/L
E. Coli	Monthly Geometric Mean Density	*100 CFU per 100 mL
pH	Single Sample Result	between 6.0 - 9.5 inclusive

* If the MPN method is utilized for E.Coli analysis, the limit shall be 100 MPN/100 mL.

Loading Limits

Final Effluent Parameter	Averaging Calculator	Limit (maximum unless otherwise indicated)
CBOD5	Seasonal Average Daily Effluent Loading	21.0 kg/d
Total Suspended Solids	Seasonal Average Daily Effluent Loading	21.0 kg/d
Total Phosphorus	Seasonal Average Daily Effluent Loading	0.75 kg/d

A Very Important Note for Steve:

There is no active disinfection process in the existing lagoon/ISSF plant. When the sewage works is expanded with a new mechanical plant, the effluent from both plants will have to be blended together and then disinfected. That means while the treatment process of the mechanical plant is designed to 1,100 m3/d (annual average), the disinfection system has to be designed for the peak hourly flow that corresponds to the Rated Capacity of 2,100 m3/s.

Yours truly,

Craig Newton
Regional Environmental Planner / Regional EA Coordinator
Ministry of the Environment, Conservation and Parks
Southwestern Region
733 Exeter Road
London, Ontario
N6E 1L3

Telephone: (519) 873-5014
E-mail: craig.newton@ontario.ca

From: Steve Burns <sburns@bmross.net>
Sent: September-25-19 11:04 AM
To: Newton, Craig (MECP) <Craig.Newton@ontario.ca>
Cc: Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Kelly Vader (kvader@bmross.net) <kvader@bmross.net>
Subject: FW: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Response to June4 email

Craig:
Has there been any progress regarding the attached?
Steve

From: Steve Burns [mailto:sburns@bmross.net]
Sent: August 12, 2019 2:16 PM
To: Newton, Craig (MECP) <Craig.Newton@ontario.ca>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; Lam, Frederick (MECP)

<Frederick.Lam@ontario.ca>; publicworks@municipalityofbluewater.ca
Subject: RE: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Response to June4 email

Craig:
With respect to the comment below, we have attached a DRAFT proposal for Effluent Quality Criteria.
When there is agreement on the Tables we will produce a final version.
Steve

From: Newton, Craig (MECP) [mailto:Craig.Newton@ontario.ca]
Sent: July 25, 2019 2:03 PM
To: 'sburns@bmross.net' <sburns@bmross.net>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>; publicworks@municipalityofbluewater.ca
Subject: FW: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Response to June4 email

Good Afternoon Steve:

This e-mail acknowledges this ministry's receipt, with thanks, of your immediately preceding e-mail response of July 23rd, 2019.

This ministry's Southwestern Region accepts your June 25th, 2019 response to MECP's previous query as to whether there is an opportunity at this time to provide municipal sanitary sewage servicing economically to any properties in close proximity to the Bayfield Sewage Treatment Works. More specifically, your June 25th, 2019 response read as follows"

"The problem being addressed in the Bayfield Sewage EA is "inadequate existing treatment capacity to accommodate existing wastewater flows and allow growth". To do as you suggest expands the scope of the EA considerably. To date the EA has focussed on how much sewage to treat and how best to treat it, not where the sewage is coming from. The issue of service area is not part of the current problem definition and in our opinion should really be addressed through a separate EA when and if problems arise."

Steve, please ensure that the text of the final EA appropriately incorporates your argument as denoted in italics immediately above.

Please advise the MECP whether a pumping station will be built at the lagoons to allow the contents to be pumped back to the headworks of the mechanical plant when the plant can handle it?

This ministry accepts the responses provided in your July 23rd, 2019 e-mail addressed to the MECP.

Please note that the effluent compliance limits and design objectives in the Tables in the current ECA (6250-AB4JCT) need to be modified with respect to TP concentration and seasonal loading.

MECP suggests that B.M Ross and Associates propose new tables to be applied to the expanded Bayfield WWTP based on the previous discussions and the ministry can then comment/concur. The application for approval for the expansion must come with the MECP concurrence letter.

The only other MECP comment is that the preferred operation sequence should first be the mechanical plant, then the lagoon/ISF.

Should you have any question(s) with respect to the ministry responses, and the single ministry query as posed to you herein, please do not hestiate to contact the MECP and we will do our best to answer them.

Yours truly,

Craig Newton
Regional Environmental Planner / Regional EA Coordinator
Ministry of the Environment, Conservation and Parks
Southwestern Region
733 Exeter Road
London, Ontario
N6E 1L3

Telephone: (519) 873-5014
E-mail: craig.newton@ontario.ca

From: Steve Burns <sburns@bmross.net>
Sent: July-23-19 2:05 PM
To: Newton, Craig (MECP) <Craig.Newton@ontario.ca>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; publicworks@municipalityofbluewater.ca; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>
Subject: RE: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Response to June4 email

Craig:
Sorry for the delayed response. I left on holidays the same day as your email.
Our responses to the three points is below.
Steve

From: Newton, Craig (MECP) [mailto:Craig.Newton@ontario.ca]
Sent: July 5, 2019 2:26 PM
To: 'sburns@bmross.net' <sburns@bmross.net>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; publicworks@municipalityofbluewater.ca; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>
Subject: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Response to June4 email

Good Afternoon Steve:

Thank you for your immediately preceding e-mail of June 25th, 2019.

MECP still needs more information over and above the submitted spreadsheet. A few questions now that we are into more technical details:

1. What is the proposed design treatment level of the new mechanical plant – secondary or tertiary? In order to achieve TP compliance limit of 0.25 mg/L, it has to be tertiary. I don't remember having that information before. If the proposed is secondary treatment level, we will most likely not approve. If the proposed is tertiary, then the design of the new mechanical may be tweaked a bit to achieve even better than 0.25 mg/L. That will provide more room for margin of safety to accommodate variations of performance of the lagoon/ISSF train.

The proposed design treatment level for the mechanical plant is "tertiary". Filtration will be included for all flow through the mechanical plant. The biological treatment process has not been chosen but could be Extended Aeration, SBR or MBR. Peak flows will be diverted to the lagoon to allow more uniform flow to the mechanical plant which should assist in optimizing performance. We agree that a mechanical plant with filters can likely do better than 0.25 mg/L TP.

2. The performance of the lagoon/ISSF train during spring and early summer is projected to achieve 0.25 mg/L TP and then fall back to 0.5 in November. Typically TP reduction is not a temperature dependent process and I am not sure why there is such a variation of performance over the discharge season. Additional, the capability of the lagoon/ISSF to achieve a 0.25 mg/L may be questionable. More research on similar facilities and performance data are required to substantiate that level of performance consistency.
   We have attached a summary of the historical performance, of the Bayfield WWTP with respect to TP. For the last three years the plant has been operating at greater than it's rated capacity. You will see from the concentration data that < 0.25 mg/L effluent TP, as a monthly average value, is almost always achieved from start-up in April to September. Looking at the individual sample data, the performance begins to deteriorate starting in about mid-September and gets poorer until the end of the discharge season in November. In our opinion the deterioration is a function of the fact that the biological treatment is by a conventional lagoon. At the end of the discharge season, lagoon liquid depths are at their lowest thus there is increased TSS in the lagoon effluent being applied to the sand filters.

   The average annual flow from 2016 to 2018 has been 1,228 m^3/day. Our design concept is to size the mechanical plant on the basis that flows through the existing system will be 1,000 m^3/day. This reduction (19%) should improve effluent quality from the existing system.

3. The averaging over the entire summer seasonal discharge period for the TP loading requirement is set in previous approvals and I think we can keep that, as long as we also put different and technologically appropriate compliance concentration limits (and corresponding acceptable design objectives) on the two trains and provide a site specific methodology for calculating the average loading.
   The ability to average over the summer/fall discharge period is important recognizing the deterioration in the effluent from the existing system starting in the fall.

Thank you in advance for your response to this e-mail Steve.

Yours truly,

Craig Newton
Regional Environmental Planner / Regional EA Coordinator
Ministry of the Environment, Conservation and Parks
Southwestern Region
733 Exeter Road
London, Ontario
N6E 1L3

Telephone: (519) 873-5014
E-mail: craig.newton@ontario.ca

From: Steve Burns <sburns@bmross.net>
Sent: June-25-19 10:32 AM
To: Newton, Craig (MECP) <Craig.Newton@ontario.ca>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>; Kelly Vader (kvader@bmross.net) <kvader@bmross.net>; Dave Kester (publicworks@municipalityofbluewater.ca) <publicworks@municipalityofbluewater.ca>
Subject: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Response to June4 email

Craig:
This is our response to the following email.
Steve

From: Newton, Craig (MECP) [mailto:Craig.Newton@ontario.ca]
Sent: June 4, 2019 3:05 PM
To: 'sburns@bmross.net' <sburns@bmross.net>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>
Subject: FW: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Revised Letter of May 23/19

Dear Steve:

I am writing to you today in response to your immediately preceding e-mail of May 27th, 2019 and accompanying attachment. In response, thank you for the update on the number of properties serviced by individual septic systems within the economic servicing radius of Bayfield. If there is an opportunity to provide municipal sanitary sewage servicing economically to any properties in close proximity to the Bayfield Sewage Treatment Works it should be considered in the EA, and if not viable, the EA should include a discussion as to why such is not economically viable, or otherwise, to pursue.

The problem being addressed in the Bayfield Sewage EA is "inadequate existing treatment capacity to accommodate existing wastewater flows and allow growth". To do as you suggest expands the scope of the EA considerably. To date the EA has focussed on how much sewage to treat and how best to treat it, not where the sewage is coming from. The issue of service area is not part of the current problem definition and in our opinion should really be addressed through a separate EA when and if problems arise.

With respect to effluent quality criteria, the ministry is prepared to consider accepting the proposed TP loading to remain at 0.76 kg/d. But this loading limit will have to be based on the average over the summer months discharge window. The MECP will need BM Ross to provide detailed calculation on how the two trains will operate together to meet the loading limit of 0.76 kg/d in the summer.

Attached is a spreadsheet that shows the following:

- The expected sewage inflow month by month based on a 2,100 m^3/day AADF and historical monthly variations.
- The amount that would be processed in a 1090 m^3/day Mechanical WWTP (MWWTP) and continually discharged.
- The amount that would be diverted to the existing lagoon/ISSF system and seasonally discharged.
- The combined effluent quantity and corresponding TP loading month by month.
- The average loading over the "summer" (May to October) period which is 0.72 mg/L

Note:

- The ISSF effluent TP concentrations used in the analysis are consistent with long-term operational experience.

- We have assumed the TP loading restriction and criteria applies to an "Average over the Summer period" and not individual monthly values.
- The amount being processed through the lagoon takes into consideration: ISSF capacity, available storage, lagoon retention period and effluent TP requirements.

Let me know if you have any questions.

The MECP awaits BM Ross's response. Thanks in advance.

Yours truly,

Craig Newton
Regional Environmental Planner / Regional EA Coordinator
Ministry of the Environment, Conservation and Parks
Southwestern Region
733 Exeter Road
London, Ontario
N6E 1L3

Telephone: (519) 873-5014
E-mail: craig.newton@ontario.ca

From: Steve Burns <sburns@bmross.net>
Sent: May-27-19 2:21 PM
To: Newton, Craig (MECP) <Craig.Newton@ontario.ca>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>
Subject: RE: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria - Revised Letter of May 23/19

Craig:
Attached is a revision to our letter of May 23/19. We have added a paragraph on Page 4 to clarify our proposal regarding TP effluent loading. If there are any questions please let me know.
Steve

From: Steve Burns [mailto:sburns@bmross.net]
Sent: May 23, 2019 3:01 PM
To: Newton, Craig (MECP) <Craig.Newton@ontario.ca>
Cc: Kelly Vader <kvader@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>; Pannu, Fariha (MECP) <Fariha.Pannu@ontario.ca>
Subject: 09051 RE: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria for Expansion of the Bayfield Watewater Treatment Facility

Craig:
Attached is our response to the questions and comments set out in your email below.
Steve

Steve Burns, P. Eng.
B. M. Ross and Associates Limited
Engineers and Planners

62 North Street
Goderich, ON N7A 2T4

Ph: (519) 524-2641
Fax: (519) 524-4403
sburns@bmross.net
www.bmross.net

From: Newton, Craig (MECP) [mailto:Craig.Newton@ontario.ca]
Sent: October 2, 2018 3:55 PM
To: Steve Burns <sburns@bmross.net>
Cc: Kelly Vader <kvader@bmross.net>; Lisa Courtney <lcourtney@bmross.net>; Geurts, Hugh (MECP) <Hugh.Geurts@ontario.ca>; Wales, Jill (MECP) <Jill.Wales@ontario.ca>; Bechard, Marc (MECP) <Marc.Bechard@ontario.ca>; Lam, Frederick (MECP) <Frederick.Lam@ontario.ca>; Pannu, Fariha (MECP) <Fariha.Pannu@ontario.ca>
Subject: Proposed Bayfield WWTF Expansion - Effluent Quality Criteria for Expansion of the Bayfield Watewater Treatment Facility

Dear Steve:

Thank you for your attached letter of September 5th, 2018 addressed to Hugh Geurts, Ministry of Environment, Conservation and Parks (MECP) Surface Water Specialist, pertaining to effluent criteria options for the Bayfield Sewage Treatment Plant.

Hugh has asked that I respond to your September 5th, 2018 letter on behalf of the ministry.

Until such time as this Class EA is fully completed, please be advised that I will be the one window contact into this ministry for this file. Please direct future correspondence on this file to my attention. I will act as the one window and seek input from Hugh and other staff as needed, prior to sending ministry responses back to you.

Within your September 5th, 2018 letter, BM Ross poses two questions, and I quote:.

"The purpose of this letter is to determine:

1. Do the effluent criteria negotiated in 2011 still apply?

2. Is a concept whereby there would be two WWTFs operating in parallel acceptable to the MECP?"

This Ministry offers the following responses:

1. Do the effluent criteria negotiated in 2011 still apply?.

The Ministry is not in a position to answer this question at this time.

Firstly, the Ministry has insufficient information with respect to how recent developments regarding preferred options will reconcile with Class EA work that has been done up to and until this date. The Ministry will likely need to review where the Municipality is within the Class EA process and how recent developments need to be addressed to satisfy the intent of the Class EA process.

Secondly, and only after point #1 above has been resolved, the Ministry would require more specifics with respect to design detail and discharge flows (seasonal and annual) before the Ministry would be able to address whether assimilative capacity issues need to be re-examined.

2. Is a concept whereby there would be two WWTFs operating in parallel acceptable to the MECP?

The Ministry has accepted parallel streams whereby different treatment technology is applied to each stream . The Ministry reviews each application for such proposed works on a case by case basis. Nevertheless all parallel streams must be demonstrated to be able to meet independently the new design objectives and compliance limits applicable to the effluent criteria stipulated for the increased discharge to the receiver.

Additional MECP Comment:

Steve, I tried but could not locate either a Class EA , nor a Notice of Commencement of an EA for the Bayfield Sewage Treatment Works expansion in MECP SWR file room. It appears, subject to confirmation by you, that this Class EA reportedly started back in 2011, has yet to be completed, and presumably is still being worked on by BM Ross? Perhaps that is why I could not find any Class EA for this project in the MECP SWR file room. Could you please confirm the accuracy of the foregoing, and also please provide to me a copy of the Notice of Commencement for this project, assuming it was previously issued.

Also, it appears from my recent review, that the Township is now considering downsizing the extent of STP expansion from what was originally proposed back in 2011. I am hopeful that downsizing of the plant expansion is not at the expense of the expanded plant being capable of servicing existing development in close proximity to Bayfield that are currently serviced by individual septic systems, and some of the nearby Trailer Parks as well? Please advise / confirm.

Scheduling of Possible Teleconference

Finally, it is my understanding that a teleconference has reportedly been suggested to take place on this file. From MECP's perspective, it would be premature to hold a teleconference on this file until at least mid-November 2018, when either Frederick Lam or another MECP Engineer from this ministry's Environmental Assessment and Permissions Branch could conceivably be assigned to this file.

The MECP awaits your response to this e-mail.

Thanks in advance Steve.

Yours truly,

Craig Newton
Regional Environmental Planner / EA Coordinator
Ministry of the Environment, Conservation and Parks
Southwestern Region
(519) 873-5014