

**“Upgrade of Esgenoôpetitj First Nation
Wastewater Collection and Treatment System”**

EIA Registration Document

Prepared for:



Esgenoôpetitj First Nation
620 Bayview Drive
Burnt Church, New Brunswick
E9G 2A8

Prepared by:



Crandall Engineering Ltd.
1077 St. George Blvd., Suite 400
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June 30, 2015
Project No. 14239-1



Crandall File: 14239-1
June 30, 2015

Project Assessment and Approvals Branch
Department of Environment
20 McGloin Street
P. O. Box 6000, Fredericton, NB
E3B 5H1

Attention: Mr. David Maguire - Director, Project Assessment and Approvals Branch

Dear David,

EIA Registration Document
Upgrade of the Wastewater Treatment System
Esgenoôpetitj First Nation
Burnt Church, N.B.

In regard to the above, Crandall Engineering Ltd. is pleased to provide the Department with six (6) copies of the EIA Registration Document for your review and comments, on behalf of our Client, the Esgenoôpetitj First Nation.

Please do not hesitate to contact us should you require any additional information.

Yours very truly,

CRANDALL ENGINEERING LTD.

Pierre Plourde, P.Eng.
Partner

- C. Mr. Alvery Paul, Chief - Esgenoôpetitj First Nation
Mr. Ashley Dedam, Band Manager - Esgenoôpetitj First Nation
Ms. Janelle Vautour, P.Eng., Project Engineer - AANDC

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Esgenoôpetitj First Nation

EIA Registration Document

**“Upgrade of Esgenoôpetitj First Nation Wastewater
Collection and Treatment System”**

Submitted to:

PROVINCE OF NEW BRUNSWICK
DEPARTMENT OF ENVIRONMENT AND LOCAL GOVERNMENT
P.O. Box 6000
Fredericton, N.B.
E3B 5H1

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TABLE OF CONTENTS

1.0	THE PROPONENT	1
2.0	THE UNDERTAKING	2
3.0	DESCRIPTION OF THE EXISTING ENVIRONMENT	28
4.0	SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES	29
5.0	SUMMARY OF PROPOSED MITIGATION.....	36
6.0	PUBLIC INVOLVEMENT.....	36
7.0	APPROVAL OF THE UNDERTAKING.....	37
8.0	FUNDING	37
9.0	SIGNATURE.....	38

TABLES

Table 1 - Summary of New WWTF Site Characteristics	page 7
Table 2 - Summary of New Pumping Station #2 Pump Capacity	page 19
Table 3 - Summary of Effluent Pumping Station Pump Capacity	page 22
Table 4 - Summary of Aeration System Blower Capacity	page 22
Table 5 - Summary of Design Influent and Effluent Characteristics	page 23
Table 6 - Summary of Major WWTF Power Requirements	page 25
Table 7 - Summary Schedule of Proposed Public Involvement Activities	page 37

APPENDICES

Appendix "A": "Property Ownership Plans: Existing and Proposed Esgenoôpetitj First Nation Wastewater Treatment Facilities"

Appendix "B": "Drawings to Accompany the ERA Registration Document for the Upgrading of the Wastewater Collection and Treatment System"
- 12145-1P-C101 "Site Plan"
- 12145-1P-C102 "Existing Wastewater System Details"

- 12145-1P-C105B "Collection System Modifications and New Outfall Plan Options 2 & 3"
- 12145-1P-C106B "New Aerated Lagoon with Future SAGR Option 2"
- 14239-1D-C08 "Outfall Plan and Profile Sta.0+000 to 0+330"
- 14239-1D-C09 "Outfall Plan and Profile Sta.0+330 to 0+590"

Appendix "C": "GeoNB Aerial Photographic Plans Showing Adjacent Development, Esgenoôpetitj First Nation Proposed WWTF Site"

Appendix "D": "Receiving Water Characterization Study for a Future Outfall Of the Burnt Church Wastewater Treatment Plant", NATECH

Appendix "E":

- "Geotechnical Information, Proposed Esgenoôpetitj First Nation Proposed WWTF Site", Conquest Engineering Ltd.
- "Supplementary Geotechnical Investigation, New WWTF, Esgenoôpetitj First Nation, Burnt Church, NB", Conquest Engineering Ltd.
- "Geotechnical Investigation for a New Treated Wastewater Outfall, Esgenoôpetitj First Nation, Burnt Church, NB", Conquest Engineering Ltd. (to follow)

Appendix "F": Proposed "Environmental Management Plan"
Proposed "Sewage Management Plan"

Appendix "G": "Report on Wildlife and Rare Species", Stantec (to follow)

REGISTRATION FORM

**PURSUANT TO SECTION 5 (2) OF
THE ENVIRONMENTAL IMPACT ASSESSMENT REGULATION 87-83
CLEAN ENVIRONMENT ACT**

1.0 THE PROPONENT

(i) Name of Proponent: Esgenoôpetitj First Nation

(ii) Address: 620 Bayview Drive
Burnt Church, N.B.
E9G 2A8

(iii) Chief Executive Officer:

Name: Mr. Ashley Dedam
Official Title: Band Manager, Esgenoôpetitj First Nation
Telephone: 506-776-1200
Fax: 506-776-1243
e-mail: ashley.dedam@nb.aibn.com

(iv) Principal Contact Person for purposes of Environmental Impact Assessment:

Name: Mr. Pierre Plourde, P. Eng., or
Mr. Jeff MacKinnon, P. Eng.
Official Title: Project Engineer - Crandall Engineering Ltd.
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(v) Property Ownership:

The current Burnt Church WWTF, a facultative two-cell lagoon system which is to be replaced by this project, is located on lands that are a part of the Esgenoôpetitj First Nation. First Nation lands are not subdivided into individual parcels, except for public rights-of-way. The new facility that will replace the existing WWTF is also located entirely on Esgenoôpetitj First

Nation lands. Copies of Planet Internet Browser plans are attached in Appendix "A" which indicate the parcel location, PID, and ownership for these facilities. These identify the Esgenoôpetitj First Nation lands as PID 40014672 and PAN 2588363, under the Government of Canada Department of Indian and Northern Affairs.

The proposed upgrading of the wastewater collection and treatment system will also involve the upgrading of an existing sewage Pumping Station near the site of the existing WWTF, to provide the capacity to re-direct wastewater flows to the new facility, and to improve the reliability of the PS. This Pumping Station work will also be on the same land which comprises the Esgenoôpetitj First Nation, as shown on the plans in Appendix "A". The new force main from this pumping station to the new WWTF will be installed largely within public rights-of-way along Micmac Road.

2.0 THE UNDERTAKING

(i) Name of the Undertaking:

"Upgrade of the Esgenoôpetitj First Nation's Wastewater Collection and Treatment System",
Burnt Church, NB.

(ii) Project Overview:

The Esgenoôpetitj First Nation presently treats its wastewater in a two-cell lagoon system which has partial aeration in the first cell. This is situated in an area where the setback recommendations of the "Atlantic Canada Wastewater Guidelines" are not met. All wastewater from the serviced areas of the First Nation is directed to this WWTF by several sewage Pumping Stations. The effluent from this WWTF is discharged into the Burnt Church River, a short distance from the Inner Miramichi Bay. This is a potential shellfish, sport fishing and recreational area. The layout of the Esgenoôpetitj First Nation and the locations of the existing WWTF and Pumping Stations are shown on attached Drawing 12145-1P-C101, Appendix "B".

A comprehensive Study was carried out which included several alternative treatment concepts, including upgrading the existing facility. This Study concluded that the most appropriate approach was the establishment of a single new aerated lagoon treatment facility at a new location within the First Nation to treat all municipal wastewater to current and anticipated standards and provide the capacity for growth within the service area. The proposed site for this new facility also meets the minimum setbacks stated in the "Atlantic Canada Wastewater Guidelines".

This project is proposed to include the following components and considerations:

- The existing WWTF will remain in use during the period when the new treatment facility is being constructed; there will be no interruption in treatment to the First Nation while this work is carried out.
- The elevation of the new WWTF site will be safely above the projected flood level in the Miramichi River.
- The new WWTF is being designed with the capacity not only for the existing serviced area within the First Nation, but also will have capacity for anticipated growth and extension of the wastewater collection system to service new development areas. There is a large area north of the WWTF site that is planned for future residential development, and in addition to sizing the WWTF for a 25-year design period, piping systems include stubs to allow for the convenient connection of these future wastewater flows.
- The new WWTF will be an aerated lagoon facility, with four cells operating in series with a diffused aeration system; there will be a Blower Building to house the blowers to supply air to the treatment process. This Building will also include a UV disinfection system for the effluent prior to discharge, and the controls for the effluent pumping station that will convey treated effluent to the receiving water. Flow measurement will be done here.
- The aeration system has been designed for operational and energy efficiency. Since oxygen demands can vary considerably, the blowers will operate through a variable-frequency drive (VFD) system so that air output can be matched to oxygen requirements of the system.
- The Blower Building at the new WWTF will have stand-by power facilities to ensure continuous operation during power outages. The stand-by power will operate not only the blowers, but also the UV system and the effluent Pumping Station.
- Rather than continue to discharge to the Burnt Church River, the effluent from the new WWTF will be directed to the Inner Miramichi Bay where it will provide proper dilution and dispersion and remove effluent from the recreational water use area of the Burnt Church River, resulting in significant environmental improvements. The new outfall will be installed by HDD (horizontal directional drilling) to avoid disturbance of and impacts to the Inner Miramichi Bay. The effluent force main from the WWTF to the outfall crosses one watercourse, Indian Brook, and this crossing will also be done by HDD.
- The new WWTF will be fenced for both system security and the safety of the public.
- Because the new WWTF is in a different area of the First Nation than the existing lagoon, modifications to the wastewater collection system are required. This includes upgrading the pumping capacity of an existing Pumping Station, and installing new force main sections to convey the wastewater to the new WWTF. The new force main will require crossing the Burnt Church River and Indian Brook; each of these crossings will be done by HDD to avoid disturbing the watercourses. Since this Pumping Station will convey a majority of the flows to the WWTF, it will

also have full stand-by power to maintain operation and avoid by-passing raw wastewater during power outages.

- The new facilities will include a new SCADA (supervisory control and data acquisition) system that will monitor the operating status of key system components, record data such as flow rates and totalized flow and receive signals for alarms to immediately notify operating staff on a 24-7 basis if any problems arise.
- When the new WWTF system is fully operational, the existing WWTF will be decommissioned in accordance with appropriate environmental protection procedures. It is anticipated that the site will be restored for use as recreational land, taking advantage of its proximity to residential land within the community.
- The proposed system will result in the Esgenoôpetitj First Nation having an efficient, reliable and convenient to operate wastewater treatment system that will not only meet current and anticipated treatment standards but will also have the capacity to receive flows from projected growth over the next 25 years without requiring expansion of the WWTF.

(iii) Purpose / Rationale / Need for the Undertaking:

The Esgenoôpetitj First Nation's existing facultative/partially aerated lagoon was built in several stages over the past 50 years, under different standards for wastewater treatment objectives. Such systems are no longer able to meet current effluent treatment objectives on a consistent, year-round basis. Although not subject to a NB DELG "Certificate of Approval to Operate", in the past (pre-WSER) the CAO recognized that lagoons are not capable of year-round treatment and only required them to meet effluent standards of 20 mg/L for BOD₅ and 40 mg/L TSS from May 01 through October 31 of each year. They cannot meet the current WSER requirements of 25 mg/L for CBOD₅ and TSS on a year-round basis.

Testing done during the ERA Study indicates that while the existing facility meets a 25 mg/L effluent objective for CBOD₅ during summer months, it does not meet this objective for TSS.

It is not possible for the operators to have any significant control over the process, apart from varying the number of small aerators in operation.

In addition, the current facility no longer has effluent disinfection. It did have a simple effluent chlorination system, but its use was discontinued when the Department of Fisheries and Oceans identified chlorine and chlorine compounds as being harmful to marine life. Therefore, the effluent contains high concentrations of E-coli and fecal coliform. Shellfish beds in the area have been closed for some time.

Where it has been built adjacent to the Burnt Church River, its effluent flows into the River at a point where flows are somewhat restricted by tidal influences, but acceptable effluent dilution is being achieved.

The present facility does not have recommended minimum separation from residential structures. It has a current design capacity estimated at 635 person-equivalents, while receiving flows from an estimated 785 persons. While an attempt could be made to upgrade the existing facility, it would still be too close to residential areas. Also, the projected 25-year (to 2040) population of the First Nation community is 1,820 which would require a nearly three-fold increase in treatment capacity at this site.

The purpose of this project is to provide the Esgenoôpetitj First Nation with a wastewater treatment system that:

- 1) meets all current treatment objectives;
- 2) has proper separation from residential development;
- 3) has the capacity to meet the community's needs well into the future;
- 4) allows the operators to conveniently optimize plant operation;
- 5) has disinfection to reduce E. coli and fecal coliform levels;
- 6) does not discharge treated effluent to environmentally sensitive areas; and,
- 7) is both economical and straightforward to operate.

Because these objectives cannot all be met by trying to upgrade the existing facility, alternative sites were evaluated, and an acceptable location was identified. The project proposed herein was developed after a comprehensive assessment of alternatives, meetings with the Client, and investigative work including on-site surveys and geotechnical investigations.

A very purpose-specific study was conducted on the Inner Miramichi Bay area adjacent to the First Nation to evaluate dilution and dispersion conditions there as a receiving water alternative to the Burnt Church River. Currents and dispersion were evaluated over full tide cycles, to ensure that a rising tide would not carry effluent back into sensitive areas. The outfall discharge location shown in the accompanying documents is the result of that study, which is also attached as Appendix "D".

There are several advantages to implementing this project as described herein:

- a) It will eliminate an underperforming lagoon system;
- b) It will meet recommended set-back requirements from residential areas;
- c) It will better meet or exceed current treatment standards on a consistent basis;
- d) It will include an efficient effluent disinfection system that does not discharge any environmentally hazardous substances;

- e) It will provide the operators with the ability to control key aspects of the treatment process in order to not only achieve required treatment levels, but also to optimize the operating cost of the facility;
- f) It will result in the new wastewater collection and treatment system having back-up power to avoid interruptions in conveyance or treatment during power outages;
- g) It will provide the Esgenoôpetitj First Nation with a modern and comprehensive SCADA monitoring system to assist in operations, system security, documentation, and reporting;
- h) It allows for the future addition of a denitrification treatment stage, should effluent standards be changed to require this; and,
- i) It will provide for the community's wastewater treatment requirements for a design period projected to 2040.

A "do-nothing" approach is not acceptable in this case, as the existing treatment system structure will continue to have a negative impact on the local environment, will not have capacity for new growth, and will fail to meet the new effluent treatment standards.

(iv) Project Location:

The proposed project is within the boundaries of the Esgenoôpetitj First Nation, Burnt Church, NB. It is situated along the northwest bank of the Miramichi River, east of the City of Miramichi. Specifically, the new WWTF is to be constructed on a parcel of land west of Micmac Road and a short distance north of Indian Brook. All work is on First Nations land, PID #40014672.

The new WWTF site and the location of the new and upgraded sewage Pumping Stations are shown on the attached Drawings 12145-1P-C105B and 12145-1P-C106B, Appendix "B".

The coordinates for the approximate centre of the site of the proposed WWTF are:

Latitude: 47° 13' 07" (N)
Longitude: -65° 07' 23" (W)

N 7580792.50
E 2604279.66

Several aerial photographs as provided by GeoNB show the Esgenoôpetitj First Nation and the proposed site in reference to the existing features; these are attached in Appendix "B". A photograph is also included which shows the congested primarily residential development area around the existing lagoon facility.

(v) Siting Considerations:

GENERAL SITE CONSIDERATIONS

Concerning the replacement of the existing WWTF with a new facility at a different location, various site evaluation criteria were considered. These considerations, and related comments specific to the proposed site, are presented in Table 1 below:

TABLE 1 - SUMMARY OF NEW SITE WWTF SITE CHARACTERISTICS

<u>NO.</u>	<u>EVALUATION CRITERIA</u>	<u>COMMENT ON EVALUATION CRITERIA</u>
1	Not being affected by wetland or watercourse considerations	The site is outside of any Provincial mapping of wetland or watercourse setback areas
2	Having sufficient area to satisfy the "Atlantic Canada Wastewater Guidelines" for setback from development	The proposed facility has been situated on the site to ensure the setback Guidelines are met
3	Not being in a flood risk area	The land elevations are above any indicated flood levels
4	Not being otherwise in an environmentally significant area	No other environmental concerns have been identified; a rare wildlife and plant species survey is being conducted
5	Having topography compatible with the economical development of the proposed WWTF	The site has gentle slopes which will not require large amounts of excavation to create the basic site
6	Having acceptable soil conditions	Preliminary geotechnical investigations indicate that soil conditions are suitable for the proposed development
7	Being conveniently available; i.e., not being presently owned or controlled by several entities	This is not an issue on First Nations lands; the Band Council is in agreement with the proposed site selection
8	Not interfering with possible future development plans	There are no other plans identified for the development of this site
9	Being in reasonable proximity to the areas where wastewater is or will be generated	The site is in close proximity to existing development, between the present and future development areas.
10	Does not have any prior use(s) that would make approval or development of the site difficult	Based on information provided by the Band, there was no prior development on or near the proposed site
11	There will be no potential impact on potable water supplies	The majority of the developed area is served by a municipal water supply and distribution system; the wells are located on the opposite side of the Burnt Church River, and the proposed outfall will be well down gradient of its location
12	Future expansion can be accommodated	There is considerable additional land to the west of this site that could be used if additional expansion is ever required; also, the site being developed has allowed for the possible addition of a denitrification facility should that ever become a requirement
13	Electric power is conveniently available	Electric power is available from Micmac Road, about 200 m to the east of the site

WWTP SITE DEVELOPMENT REQUIREMENTS

The site proposed for the new WWTF is currently undeveloped and therefore little work is required to prepare it for WWTF construction. It is lightly wooded so requires clearing and grubbing as part of the site preparation. Also, where structures, including the lagoons and buildings, will be constructed, the layer of topsoil must also be removed. Any other work, such as construction of an access road, extension of electrical power, etc., will be done as part of the appropriate construction contracts.

ZONING

The Esgenoôpetitj First Nation does have a zoning plan, and the present land designation for the new WWTF site does not include wastewater facilities. However, the Band Council is in the process of revising the zoning for the designated parcel, including a 150 m set-back zone, to permit this use. A survey plan is being prepared to identify specific coordinates for the property and set-back limits. This rezoning will be concluded prior to any construction work being carried out on the site.

PROXIMITY TO WATERCOURSES/WETLANDS

There are several components to this project, some of which are in proximity to watercourses. None are within designated wetland areas except for the small area where the proposed outfall drilling pit will be located. Reference is made to the attached Drawings which show the locations of these components. The relationships of the various portions of this project to watercourses are summarized below:

- i. **Wastewater Treatment Facility:** It was possible to select the site for the proposed WWTF so as to avoid conflicts with watercourses or wetlands. The entire facility is more than 30 m from the nearest watercourse, Indian Brook, except for the drainage and emergency by-pass discharge in the southeast corner of the site. The emergency by-pass exists only if it became necessary to by-pass the Effluent Pumping Station, and therefore would discharge *only treated effluent*. With both duplex pumps and stand-by power, it is very unlikely that this would ever be required. If used, there is a flow meter in the UV system that is connected to the SCADA system that will record the time, duration, and flow volume of the by-pass. The site drainage passes through a settling basin prior to discharging to Indian Brook. No new drainage is being discharged to Indian Brook; it is only the same surface drainage that presently would flow to the Brook.
- ii. **Wastewater Force Main from Upgraded Pumping Station #2:** In order to deliver the raw wastewater going to the existing lagoon to the new WWTF, Pumping Station #2 must be upgraded and a new force main installed to deliver wastewater to the new WWTF. The force main must cross the Burnt Church River a short distance north of the Micmac Road Bridge over the River. The 200 mm diameter force main will be

installed under the River by horizontal directional drilling (HDD) so there will be no disturbance of the River bed. This force main also crosses Indian Brook at Micmac Road, which will also be done by HDD. It will actually be installed under the culvert that Indian Brook flows through to cross Micmac Road.

- iii. Treated Effluent Outfall: The new WWTF will require a new outfall to discharge treated effluent. A "Receiving Water Characterization Study" has been carried out to determine a suitable outfall discharge point. The outfall discharge is approximately 500 m from the shore line into the Inner Miramichi Bay; this is shown on attached Drawings 14239-1D-C08 and 14239-1D-C09, attached in Appendix "B". The outfall will be installed from a boring pit on the shore by HDD to the outfall discharge point by HDD to avoid any disturbance to the bottom of the Bay. A short length of outfall pipe from Micmac Road and the boring pit will be the only activities within the wetland area. More information on this outfall and the receiving water is presented in the following section.

RECEIVING WATER CHARACTERISTICS

The receiving water for the new WWTF treated effluent is the Miramichi Inner Bay. This is in the area where the Miramichi River enters the Gulf of St. Lawrence. This watercourse is approximately 14 km wide across from the Esgenoôpetitj First Nation. The Miramichi Inner Bay has some tidal influence. High tides vary from 1.3 m geodetic for "mean tides" to 1.6 m geodetic for "large tides". Low tides for the same conditions varied from 0.3 m to 0.2 m geodetic.

Where this is a new outfall location, it provided the opportunity to carry out a thorough evaluation of the receiving water to identify a suitable discharge point that met the discharge and dilution criteria and secondly was a cost-effective solution. This Study was conducted by NATECH Environmental Services Inc. in accordance with Terms of Reference prepared by Crandall Engineering Ltd.

Current direction and dilution tests were carried out for a number of points offshore of Burnt Church, varying from 210 m to 500 m from the shore. These tests were carried out under various tidal conditions, including:

- Falling tide;
- Low tide;
- Rising tide; and,
- High tide

A bottom profile was also taken so the depth of the outfall discharge relative to tides could be determined. It was considered that a minimum water depth of 2.0 m over the outfall discharge at low tide was desirable to avoid possible damage from ice. The results of the

dilution studies were used to identify approximate plume dimensions for various dilutions, and the plume directions were also indicated for rising and falling tides. There was considerable variation in plume lengths, indicating the effectiveness of water movement in the receiving water. An important consideration was ensuring that the dispersion of effluent was not carried back to the shore of Burnt Church River under any tidal conditions.

As a result of the comprehensive information obtained, it has been possible to select an effluent discharge point that satisfies the various considerations for effluent discharge and dispersion, as well as being technically sound. The proposed outfall routing and effluent discharge point are shown on the previously referenced Drawings 14239-1D-C08 and 14239-1D-C09.

The NATECH Report for the outfall study is attached as Appendix "D".

(vi) Physical Components and Dimensions of the Project:

The attached Drawings in Appendix "A" show the overall location of the various components of the proposed work from the upgraded Pumping Station #2 at the existing WWTF site to the force mains to the new WWTF site, the WWTF itself, and the outfall from the WWTF to Inner Miramichi Bay.

Also attached is the site plan of the new WWTF, Drawing 12145-1P-C106B, as developed through the Preliminary Design process. The area that will be occupied by the new WWTF and associated structures, access road, etc., is approximately 3.0 hectares (7.5 acres). The total area required for the facility, including the 150 m set-back zones, is 480 m x 385 m or 18.5 ha (45 acres). The treatment process proposed is a four (4) cell (two lagoons) aerated lagoon treatment system with UV effluent disinfection. The various processes of the overall system are each described briefly in the following paragraphs:

- 1) Upgraded Pumping Station #2: The existing PS #2 does not have adequate capacity to convey wastewater flows to the new WWTF site. An upgraded PS #2 will be located on the north side of Micmac Road east of the existing treatment lagoon. All flows from this area of the Esgenoôpetitj First Nation will be directed to a new wet well adjacent to a control building that will also include a stand-by power system. The existing PS #2 will be left in service during the construction of the new PS #2, and will then be decommissioned as part of the Contract. When upgraded PS #2 is commissioned, it will initially discharge flow to the existing force main to the existing treatment lagoon. However, it will include all connections and valves required to re-direct flow to a new force main that will deliver flows to the new WWTF. The upgraded PS #2 will have duplex pumps (2 x 100% capacity), and a flow meter on the discharge force main. PS #2 will also be connected to the new SCADA system. Upgraded PS #2 will have 2 x 28.4 L/s (450 US gpm) 30 hp pumps, with a TDH of 20.5 m (67 ft), and the site will

- have an area of about 35 m wide x 50 m deep, 0.175 ha (0.43 ac). A 50kW diesel gen-set (with an installed engine of 80 hp) will also be installed at this PS.
- 2) New Force Main from Upgraded PS #2: Because of the new location of the proposed WWTF, a new force main is required from upgraded PS #2 to the WWTF site. This will include approximately 1,370 m of 200-mm diameter force main piping. Crossings of the Burnt Church River and Indian Brook will be done by horizontal directional drilling to avoid disturbing the watercourses. The remainder of the force main will be installed by open cut trench construction. The force main will discharge directly into the inlet chamber to the first cell of the WWTF.
 - 3) WWTF Aerated Cells: The new WWTF will include four (4) aerated cells in series. A floating diffused aeration system will provide a controlled amount of air to each cell to provide the oxygen required for the treatment process and to keep biosolids in suspension. The four cells will be created from two (2) separate lagoons built by earth filled dikes, and a floating baffle will be installed in each lagoon to divide them into two cells each. The inner dikes and floor of each lagoon will have a continuous 60-mil HDPE impervious liner. The aeration system in each cell will be sized based upon the treatment requirements (CBOD₅ reduction) for each. Each cell will have a liquid depth of 3.0 m to reduce the overall area requirement, result in good circulation patterns, improve oxygen transfer rates, and provide better heat retention. The WWTF is designed for a 25-year design period and an average daily flow volume of 663 m³/day (7.67 L/s design average daily flow rate). The design population is 1,543 persons. Treatment objectives at design flow are effluent CBOD₅ and TSS concentrations not to exceed 25 mg/L for each parameter. The overall size of the WWTF facilities site, excluding any setback areas, is about 180 m x 300 m, or 5.4 ha (13.4 ac). The total surface area of the four cells is 12,200 m².
 - 4) Effluent Disinfection: The treated effluent from the aerated lagoon system will be directed to an ultraviolet (UV) disinfection system which will be attached to the facility's Blower and Control Building. It will be totally enclosed for protection from weather and for ease of maintenance. It is designed to achieve an effluent fecal coliform concentration not exceeding 200 MPN/100 mL. A Parshall flume will be installed immediately downstream of the UV system to measure flow rates and totalize flows through the WWTF. This will be connected to the new SCADA system.
 - 5) Effluent Pumping Station and Force Main Outfall: Because of the location of the WWTF relative to the receiving water and the topography of the area, it is necessary to pump the effluent. A portion of the outfall on land could be gravity sewer, but it was decided to be most effective for the discharge of effluent to be pumped the entire distance from the WWTF site to the outfall discharge point in Inner Miramichi Bay. This ensures that effluent is discharged at a controlled rate. The effluent from the UV system will flow to a wet well, with a duplex pump (2 x 100% capacity) system. The

controls and flow meter on the force main will be in the facility's Blower and Control Building. The size of the effluent force main and outfall is 150 mm diameter. The overland distance from the WWTF to the shore at Miramichi Inner Bay is approximately 1,095 m, and this section will be PVC pressure pipe, except for the crossing of Indian Brook which will be HDPE pipe installed by HDD. A chamber with a pressure-sustaining valve will be installed on the FM just prior to the marine portion of the outfall to provide the back-pressure required for pump operation. The marine length of the outfall from the shore into the Bay to the discharge point is approximately 500 m, also installed by HDD. A Tideflex-style duckbill check valve will be installed at the outlet point to prevent any sea water or marine life from entering the outfall pipe. Rip-rap will be placed at the end of the outfall for protection.

- 6) Multi-purpose Blower Building: This building will be on the WWTF site, and will have several functions. It was previously noted that it will include the UV disinfection facilities and effluent flow meter, and the controls for the Effluent Pumping Station. In addition, it will house the blowers for the aeration system, an office/lab area for the WWTF Operator, washroom facilities, a storage area, and a bay for vehicle storage. The aeration system will consist of three (3) blowers each rated to provide 50% of the peak air requirement ($5.66 \text{ m}^3/\text{min}$ [200 SCFM] @ 58 kPa [8.4 psi], 15 hp each). This provides for a stand-by blower always on line. In normal operation, the three blowers will alternate in operation for even use of all units. The blower motor will operate on a variable-frequency drive (VFD) so air flow can be adjusted to suit oxygen requirements, resulting in economical operation. Each blower will also have an air flow meter to measure flow rates. A SCADA system console will be placed in the Operator's office area. The overall size (building footprint) of the Blower Building is approximately 200 m^2 (2,150 ft^2).

- 7) Site Piping and Operational Flexibility: The WWTF will be designed with piping, valve and related components to result in a high degree of flexibility in the way the facility can be operated. For example, if the second lagoon (Cells #3 and #4) had to be removed from service, the chambers, valves and piping proposed will allow flow through Cells #1 and #2 and then to the UV system. Similarly, if Cells #1 and #2 (Lagoon 1) had to be removed from service, piping allows influent to be directed to the second lagoon (Cells #3 and #4) for treatment prior to going to the UV system. Also, piping and chambers will be installed to by-pass the UV system if that were required for any reason. The objective is that, if service is required on any WWTF component, there is operational flexibility provided such that no other important components are incidentally removed from operation.

- 8) Site Facilities and Security: The site will be developed in a clean and attractive way, with paved driving and parking services, appropriate landscaping, chain-link fencing with a lockable gate for security and safety, and site lighting. Site lighting will be as

required for safety and security at the site. The access road enters the site from Micmac Road.

The Esgenoôpetitj First Nation's wastewater collection and treatment system will operate continuously, 24-hours/day, 7-days/week, and 52-weeks of the year. It is anticipated that the new WWTF will require on-site personnel for 1 - 8-hour shift per day, five days of the week. Provision should also be made for on-call weekend O & M staff to be available as required. The new SCADA system will send any alarm advisories as they arise to a 24-hour/day receiving station so any issues that arise can be addressed as quickly as possible. The SCADA system will also include the capability to monitor the operation of major system components including blowers, pumps at Pumping Stations, system flow rates, etc.

It is anticipated that the WWTF as a whole will, if properly maintained, have a minimum service life of 75 - 100 years. The municipal growth design period is to the year 2040 (25-years). Operating mechanical components such as blowers and pumps will require periodic maintenance but are expected to have a service life of 10 - 15 years.

No off-site facilities are required.

(vii) Construction Details:

The proposed upgrade of the Esgenoôpetitj First Nation Wastewater Collection and Treatment System is a major undertaking. It has, to this point, gone through considerable assessment and evaluation of alternatives, not only by the Consultant but also by the Client and Federal Government Departments. The Consultant has also put the proposed project through careful planning in order to implement it in the most efficient and appropriate manner, and in a way that ensures that there is *continuous treatment of wastewater throughout the construction period*. Some of the information presented previously in this Registration document has described certain aspects of the construction process.

It is very important to maintain wastewater treatment throughout the construction process and to commission the new components prior to their being brought into service.

In order to maintain treatment during the WWTF construction period, the upgraded Pumping Station #2 will be constructed as described earlier and will discharge to the existing lagoon system on a temporary basis. Therefore the same level of treatment will be provided through construction as presently exists. The major external piping (PS #2 force main and WWTF outfall) and the WWTF facility itself will be constructed and commissioned. Flow will then be diverted to the new WWTF and the existing lagoon treatment system taken out of service. It is anticipated that there will be a seamless transition from the old system to the new. Based upon the Client's anticipated budget and cash flow, the various components will be constructed over a four (4) to five (5) year period.

The proposed construction breakdown for the entire project by Contract is summarized below:

- 1) Contract #1: Force Main and Outfall Piping: The new force main from upgraded PS #2 to the WWTF site will be installed as a separate contract. Crossings of the Burnt Church River and Indian Brook will be done by HDD. It will be possible to fully test this force main prior to it being brought into service. It will be connected to the force main stub at the PS #2 site. (The force main at upgraded PS #2 will have isolation valves to permit temporary flow to the existing lagoon without any sewage entering the new FM to the WWTF until the new WWTF is commissioned.) This contract will also include the installation of the outfall force main from the entrance to the WWTF site to the shore of the Inner Miramichi Bay, and the HDD portion from the shore to the outfall discharge point. (The force main's crossing of Indian Brook will also be done by HDD.) The outfall piping will be fully tested prior to being brought into service. This contract also includes a portion of the entrance road to the WWTF site from Micmac Road. Any suitable surplus excavated material from this contract will be stored on the WWTF site for re-use.

- 2) Contract #2: Construct and Commission the Upgraded PS #2: The existing Pumping Station #2 at the intersection of Micmac Road and Bayview Drive will remain in service while an upgraded PS #2 is constructed on the opposite side of Micmac Road. This will enable the upgraded PS #2 to be fully constructed and commissioned before the existing PS#2 is removed from service. A cut-over sequence has been prepared, including temporary pumping, to allow new gravity sewer and force main connections to be made without discharging any raw wastewater. Removal and decommissioning of the existing PS #2 will also be done under this contract to allow the new connections to be made. As the major pumping station on the new system, stand-by power will be included.

- 3) Contract #3: WWTF Earthworks and Site Piping: This is the first of two major contracts for work at the WWTF site. This will include:
 - a) Protecting the area around the site with erosion protection (silt fences, erosion control structures, etc.);
 - b) Clearing and grubbing of the WWTF site;
 - c) Excavation of topsoil and unsuitable material under structurally significant areas (note that all surplus material from this work will be stockpiled for later use on site, or for decommissioning of the existing lagoon system);
 - d) Importing structural fill to bring the site up to the required sub-grade, for the construction of lagoon dikes, and for fill of areas to be used for vehicle movement and building construction; this material will be spread in layers and well compacted to avoid settlement;

- e) Completion of the entrance road embankment from Micmac Road started under Contract #1, including the culvert pipe;
 - f) Supply and install sub-drainage system under each lagoon;
 - g) Supply and installation of structures for control of wastewater flow to and from the various system components; associated piping systems between structures and facilities; supply and install air distribution system to lagoons;
 - h) Supply and install the wet well for the Effluent Pumping Station;
 - i) Preparation of the interior of the two (2) lagoons for the placement of the impervious liner; placement of the impervious liner including water-tight "boots" for pipe penetrations;
 - j) Site grading and drainage, including intercepting ditches to carry overland flow around the WWTF site and allow it to continue to flow into Indian Brook;
 - k) Supply and installation of security fencing and entrance control gate for safety and security;
 - l) Supply and place crushed stone roadway base material on the entrance roadway, tops of dikes, and other driving surfaces (except for the area that will be disturbed by the upcoming construction of the Blower and UV Building);
 - m) Final site grading; place topsoil on the outer dikes and other surfaces to be reinstated and hydro-seed.
- 4) Contract #4: Construction of the Blower/UV/Effluent PS Building: This second contract on the WWTF site will not begin until Contract #3 is completed, and includes the following work components:
- a) Construction of the foundation for the Blower Building, including the UV foundation and channel, and related work;
 - b) Construction of the Blower Building structure, including walls, roof, doors, window, partitions, electrical entrance, heating and ventilation systems, exterior finishes, etc.;
 - c) UV disinfection system, including UV racks, power supply, control system, grating, flow meter, and related work;
 - d) Blowers and blower piping system, including valves, flow meters; power supply and control system;
 - e) Supply and installation of the stand-by power system, including fuel system, control system, integration with the Building power supply;
 - f) Effluent Pumping Station power supply, control system, piping, fittings, valves, flow meter, etc.;
 - g) SCADA system for the WWTF and Pumping Stations, including terminals, antennae, programming, etc;
 - h) Interior fittings and finishes;
 - i) Exterior piping connections (to and from the UV system, to the aeration distribution system, to the Effluent PS wet well, to the effluent force main);
 - j) Site finishing, including bollards, crushed stone base material, asphalt paving;

- k) Commissioning of equipment;
 - l) Start-up of new WWTF system including filling treatment cells, installing aeration diffuser laterals and floating baffles to create the four (4) cells (filling the new WWTF cells will be expedited by pumping the contents of the existing lagoon treatment system to upgraded PS #2 at a controlled rate and pumping it to the new WWTF; this will also “seed” the new process with active bacteria from the current facility. Diverting normal system flows to the new WWTF will be as simple as opening one valve to the new FM at PS #2 and closing the one to the old force main.)
- 5) Contract #5: Decommissioning of the Existing WWTF: Once the new WWTF is fully operational, the existing lagoon facility becomes redundant and is to be decommissioned. Existing PS #2 will be decommissioned as part of Contract #2. This final contract, Contract #5, will be for the decommissioning of the existing lagoon system, and related appurtenances. A major consideration in decommissioning a lagoon is dealing with the sludge accumulated on the bottom. For Burnt Church, it is proposed to leave the sludge in place and fill the cells with earth to cover it. Some of the fill material required can come from pushing the dikes into the cells; additional fill material will come from a local Borrow “A” pit, and for topsoil, the surplus material stockpiled at the new WWTF site will be utilized. Discussions with the Esgenoôpetitj First Nation indicate that some recreational use potential is desired for the site which would allow the sludge to remain on site if covered. Other work to be done as part of the decommissioning (after the lagoons have been drained) will include:
- a) Removal and disposal of the existing surface aerators, power supply and control panels;
 - b) Removal of structures (manholes, chambers, etc., on the site); structures could have the tops removed and bases filled;
 - c) Leveling dikes and pushing material into the drained lagoons;
 - d) Trucking general fill from the Band pit to bring the site to sub-grade below topsoil layer;
 - e) Trucking surplus material from the storage site and placement and grading as topsoil to restore the site;
 - f) Removal and disposal of fencing (this should not be done until the site is safe);
 - g) Final grading and hydro-seeding to restore the site.
- 6) Geotechnical Information: During the preparation of the Preliminary Design Feasibility Study, three (3) groups of geotechnical investigations were conducted. The first was carried out early in the Study, April 2014, to obtain information that might suggest where to place the collection and treatment facilities. Sixteen (16) boreholes (BH) were drilled and information on soil types and thickness, water table, and depth to rock (where found) was obtained. Ten (10) of the BH were along Micmac Road and the remainder were in undeveloped areas to obtain information. The second set of five

(5) BH was done in December 2014 after a collection and treatment concept was developed to obtain more site-specific information. These were located at the site of upgraded PS #2, the proposed WWTF, and on the shore where the proposed outfall would head out to the discharge point. The third set of BHs was obtained in June 2015 by a barge mounted drill rig on the Inner Miramichi Bay along the route of the proposed outfall. Relevant information from these BHs will be utilized in the detailed design of the various system components, and in developing construction cost estimates. Borehole locations and logs relevant to the WWTF construction are included as Appendix "E".

It is anticipated that the contract for Upgrading Pumping Station #2 will begin in 2015. Subsequent contracts will be issued as funds are budgeted over the next 3 -4 years.

The project will be carried out by the Esgenoôpetitj First Nation. The actual work will be done by qualified contractors selected through a public tendering process in accordance with the requirements of the Crown Construction Contracts Act. The specific contractors who will be involved, sources of materials, etc., cannot be confirmed until the tendering and contract award process has been carried out. Imported materials will include, where "imported" is interpreted to mean "brought in from off the construction site":

- Imported structural fill;
- Imported common fill and topsoil;
- Imported bedding for pipes;
- Imported granular material for structure foundations, roadway base material, etc.;
- Imported asphalt for roadway and parking lot surfaces;
- Imported construction materials for pipeline installation;
- Imported construction materials for buildings: steel, concrete, etc.; and,
- Imported equipment for pumping, blowers, etc.

The anticipated hours of construction are from 7 am to 7 pm Monday through Friday. A new dedicated access road from Micmac Road will be used to access the new WWTF and Pumping Station construction sites, and will be constructed to good quality finished standards at the completion of the work. The contract specifications will require the contractors to keep local streets cleaned of dirt from the construction site.

The access to the site from Micmac Road is approximately 1.3 km south of its intersection with Route 11. This location information is shown on attached Drawing 12145-1P-C101, Appendix "B".

The following equipment is anticipated to be used for the following major construction procedures that will be a part of this project:

- Earthwork: Excavators, trucks to remove unsuitable materials and bring fill material to the site, dozers, compaction equipment;
- Pipe work (open trench): Excavators, compaction equipment;
- Pipe work (horizontal directional drilling): Excavators, sheet steel piling, specialized drilling equipment;
- Structures: Excavators for foundations, concrete trucks, supply trucks for trades, cranes for lifting items such as trusses;
- Landscaping: Trucks importing topsoil, fencing materials;
- Street construction: dozers to grade the roadbeds, trucks to bring in base material and asphalt; compaction equipment.

Potential sources of pollutants during the construction period are anticipated to include:

- Exhaust emissions from construction equipment;
- Noise from construction equipment;
- Runoff from disturbed surface areas during wet weather events. This will be minimized by requiring the contractor to install silt fences and other erosion protection devices to protect Burnt Church River, Indian Brook, Inner Miramichi Bay, around excavations and stockpiles, and to reinstate disturbed areas as soon as is practical;
- Petroleum hydrocarbons from possible leaks, spills or accidents from construction equipment and vehicles. This will be minimized by requiring the Contractor to have spill kits on site and to conduct daily inspections of his equipment. Contractors will be required to have site-specific Safety and Environmental Protection Plans in place. No refueling or maintenance of vehicles will occur within 30 m of a watercourse.

All wastes generated during construction will be stored in suitable containers and/or removed off-site for disposal by the Contractor.

A construction sequence and construction procedures have been developed which will avoid and attempt to prevent the discharge of any wastewater into adjacent watercourses, including the decommissioning of existing PS #2 and the existing lagoon treatment site.

It was noted that some of the work may be within 30 m of an existing watercourse, including pipeline crossings of watercourses, the emergency outlet to Indian Brook, installation of the outfall to Inner Miramichi Bay, and portions of the WWTF decommissioning. Such work will be protected from silt run-off by installing silt fencing and erosion control devices that will be maintained for the duration of the construction, and by specific construction procedures. It is not anticipated that there are any significant wildlife habitats that will be disturbed by this construction.

A proposed Environmental Management Plan and a Sewage Management Plan have been prepared for review, and are included in Appendix "F".

(viii) Operation and Maintenance Details:

The anticipated sequence of operation for the new Esgenoôpetitj First Nation WWTF is summarized below. For each item in the sequence, a list of operating and maintenance requirements is included.

- 1) Pumping of Raw Wastewater: Wastewater is pumped to the new WWTF facility by a new Pumping Station #2 that replaces the existing low head, low capacity PS #2 that pumps to the existing lagoon treatment facility. The new Pumping Station has larger capacity pumps, flow measurement, and stand-by power. This PS will be connected through the new SCADA system that will constantly monitor conditions, record operating data and advise of problems such as loss of power, intrusion, etc. The number of pumps and their capacity is summarized in the following Table (this Table shows the total number of pumps installed; one [1] will be stand-by so one less than the total shown shall be the maximum number intended to operate at any one time):

TABLE 2 - SUMMARY OF NEW PUMPING STATION #2 PUMP CAPACITY

NAME OF PUMPING STATION	NO. OF PUMPS	CAPACITY OF EACH PUMP	INSTALLED HORSEPOWER OF EACH PUMP
New Pumping Station #2, Micmac Road at Bayside Drive	2	28.4 L/s (450 US gpm)	30 hp

Normal O & M procedures for the Pumping Station will include:

- Monitor operational status through SCADA system;
- Regular on-site checks of PS facilities (daily);
- Periodic PS site clean-up, grass cutting, etc.;
- Pump system lubrication and maintenance; schedule as recommended by equipment manufacturer;
- Annual facility paint touch-up and other maintenance;
- Regular "exercising" of stand-by power unit; and,
- Monitor flows to the PS as they relate to weather, time of year, to determine if any changes are occurring that should be addressed.

- 2) WWTF Influent Chamber: Raw wastewater will enter the WWTF at the inlet chamber adjacent to Cell #1. The piping system is arranged such that if the first lagoon must be removed from service, influent flows can be directed to Cells #3 and #4.

Normal O & M procedures for the headworks will include:

- Checking the inlet chamber three (3) times per week to check level setting and for accumulation of solids that should be removed.

- 3) Aerated Lagoon System: The wastewater passes through four (4) cells that operate in series to maximize treatment efficiency. Each cell has a diffused aeration system to provide oxygen to the microbial population that breaks down organic material to achieve treatment and maintain positive dissolved oxygen (DO) levels. There is gravity flow from one cell to another. The amount of aeration in each cell is a function of the remaining wastewater strength (CBOD₅) entering each cell. The amount of aeration can be controlled at the Blower Building where blowers are housed through the variable frequency drive (VFD) on each unit. The retention time in the treatment cells is 44.2 days, based on the ultimate 2040 design flow rate of 663 m³/day. The process is a variation of the extended aeration process, which results in minimal waste solids production. The waste material from the treatment processes settles to the bottom of the cell. Due to low accumulation rates, this type of system only requires solids removal every 10 - 15 years. The type of aeration system proposed for this facility is easily removed to facilitate the cleaning process without being damaged or restrictive to the cleaning process. A sand layer will protect the impervious liner during such cleaning periods.

Normal O & M procedures associated with the aerated lagoon operation will include:

- Checking operation of the blowers (daily);
- Checking the aeration pattern in each cell to determine if there are any diffuser issues; any diffusers requiring attention will be cleaned or replaced as required (weekly);
- Checking the dissolved oxygen concentrations leaving the first and second lagoons (i.e., from Cells #2 and #4) to ensure it is being maintained at acceptable levels and adjusting air flow rates as appropriate (daily);
- Visually checking the sides of each cell for accumulations at the edges; wash down or remove as appropriate (weekly);
- Visually check the condition and tension on the floating baffles between Cells; adjust as required (monthly);
- Visually check the tension in the individual aeration lines; adjust as required (monthly).

Based on the 2012 flows as measured during the ERA Assessment Study, the new WWTF will operate at approximately 60% of its ultimate capacity upon start-up so maintaining a stable biological treatment process should not be a problem.

- 4) Effluent Disinfection: Treated wastewater leaving the aerated lagoon system is next directed to the ultraviolet (UV) disinfection system. This system is located in a separate structure that is part of the Blower Building. Flows to and through the UV system are by gravity. The effluent flows through a channel containing special UV lamps in protective quartz sleeves where bacteria are neutralized to meet effluent objectives. The level in this channel is controlled to ensure correct submergence of the lamps. The UV system is designed to achieve the required effluent fecal coliform reduction at the peak design flow rate. This system is enclosed to protect the equipment. At the end of the UV channel is a Parshall flume that measures the flow rate through the facility and is connected to the SCADA system that will record flow rates and totalize flows.

Normal O & M procedures associated with the UV disinfection system include:

- The lamp sleeves are cleaned periodically in order to ensure the light from the UV lamps is not blocked or reduced in effectiveness (weekly);
 - The lamp transmittance is checked periodically to ensure a sufficiently strong light is provided to achieve bacterial neutralization (weekly);
 - Channels and grates are kept free of any debris or accumulations, although there is very low TSS in the effluent at this point (as required);
 - The flow meter will be checked to ensure it is kept free of any debris or accumulations, and that the level sensor is properly adjusted (weekly);
 - UV bulbs will be replaced when their transmittance drops below acceptable levels (approximately annually).
- 5) Effluent Pumping Station: The treated effluent leaving the UV system is then directed to the wet well of the Effluent Pumping Station. The wet well has two (2) submersible pumps, each rated for the peak flow rate anticipated for the system, giving 100% stand-by pumping capacity. The controls for these pumps are in the Blower Building. The discharge pipelines from each pump run to the Blower Building where they connect to the Effluent Force Main. The Effluent Force Main conveys the treated wastewater to the outfall in Inner Miramichi Bay. There is also a flow meter in the force main at the Blower Building which also provides information on effluent flows, and is also used to monitor pump performance. The flow meter is connected to the facility's SCADA system, as is pump operating information. The Inner Miramichi Bay is the ultimate discharge point for effluent from the WWTF.

TABLE 3 - SUMMARY OF EFFLUENT PUMPING STATION PUMP CAPACITY

NAME OF PUMPING STATION	NO. OF PUMPS	CAPACITY OF EACH PUMP	INSTALLED HORSEPOWER OF EACH PUMP
Effluent Pumping Station, WWTF Site	2	12.6 L/s (200 US gpm) @ 4.5 m (15 ft)	7.5 hp

Normal O & M procedures related to the Effluent Pumping Station include:

- Monitor operational status through SCADA system;
- Check pump power amperage versus flow compared to manufacturer's curves to verify operational conditions (weekly);
- Regular on-site checks of PS facilities, wet well condition, etc. (daily);
- Pump system maintenance (schedule as recommended by equipment manufacturer);
- Monitor flows to the PS from the WWTF as they relate to weather, time of year, to identify patterns that will be helpful in operation.

6) Aeration System Blowers: There will be three (3) blowers of equal size in the Blower Building, each rated at 50% of the peak aeration requirement to the treatment process. Therefore, only two of three blowers are required at any time at design flow, providing installed and immediately available back-up capacity. In normal operation, the blowers will be alternated in operation for uniform wear. Each blower operates via a VFD controller which allows the air flow rate (and therefore power requirement) to be adjusted to meet actual conditions, for process control and energy conservation. Each blower discharge also has an air flow meter, to confirm airflow into the system. The blower control panel will provide signals to the SCADA system to indicate blower operation, air flow rate, convey alarm signals, etc.

TABLE 4 - SUMMARY OF AERATION SYSTEM BLOWER CAPACITY

NUMBER OF BLOWERS	AIRFLOW CAPACITY OF EACH BLOWER	INSTALLED HORSEPOWER OF EACH BLOWER MOTOR
3	5.66 m ³ /min (200 cfm) @ 58 kPa (8.4 psig)	15 hp 600v/3p/60c

Normal O & M procedures related to the blower system include:

- Alternate the lead blower setting to provide uniform wear on the units (monthly, or monthly automatically through the control system);

- Blower system lubrication and maintenance (schedule as recommended by equipment manufacturer);
- Check equipment for leaks, vibrations, or other unusual conditions (not less than weekly);
- Check piping system, connections, exercise valves, etc. (weekly);
- As a function of DO concentration in the effluent leaving Cell #4, and/or based upon influent CBOD₅ test results, adjust air flow rates for process requirements and effluent DO level (monthly or as required).

7) Stand-by Power Generator: A diesel powered stand-by generator unit will be installed in the Blower Building. The generator will be sized to provide power to all WWTF components in the event of a power interruption. This includes the aeration system blowers, UV disinfection system, Effluent Pumping Station, control systems, and building heat and lights. The generator will have a rated capacity of 125 kW, and an installed engine horsepower of 197 hp. The diesel fuel tank will also be in the building. In addition to this being a double-walled tank, there will be a spill containment curb around the tank and gen-set.

Normal O & M procedures related to the stand-by generator include:

- Exercise the gen-set on a regular basis, including testing the transfer switch (monthly);
- Check the fuel tank to maintain the desired minimum volume of fuel (monthly);
- Gen-set system lubrication and maintenance (schedule as recommended by equipment manufacturer);
- Check operation and condition of air inlet and exhaust systems (monthly);
- Check around equipment for possible leaks (weekly).

8) Wastewater Design Criteria: Raw wastewater design criteria and anticipated effluent concentrations of these substances, at design (2040) loadings, are projected to be:

TABLE 5 - SUMMARY OF DESIGN INFLUENT AND EFFLUENT CHARACTERISTICS

<u>PARAMETER</u>	<u>INFLUENT</u>	<u>REGULATORY LIMIT</u>	<u>ANTICIPATED EFFLUENT</u>
CBOD ₅ , mg/L	180 mg/L	25.0 mg/L	20 mg/L +/- 5 mg/L
TSS, mg/L	150 mg/L	25.0 mg/L	20 mg/L +/- 5 mg/L
TKN, mg/L	40.0 mg/L	None	25 mg/L +/- 5 mg/L
TP, mg/L	5.0 mg/L	None	3 mg/L +/- 1 mg/L
Fecal coliform, MPN/100 mL	12,000 MPN/100mL	200 MPN/100 mL	<200 MPN/100mL

9) Sampling and Testing: Process sampling and analysis will also be required, both to assist the operators in monitoring the process, and to provide the data required for

ERRIS reporting under the WSER. Some of these tests will be done daily, and others will be done at intervals as specified in the WSER Regulations.

The O & M Procedures that are related to process monitoring and sampling include:

- Sampling and monitoring procedures that will be done by the Operators on-site or other sampling not required under ERRIS and WSER:
 - Influent sampling for CBOD₅, TSS, and fecal coliform (monthly, sent for lab testing); influent sampling will permit WWTF treatment efficiency to be monitored;
 - Influent and effluent temperature, pH, dissolved oxygen (weekly)
- Sampling procedures required for annual ERRIS and WSER reporting:
 - Effluent composite sampling for CBOD₅, TSS, un-ionized ammonia (if required), E. coli (samples taken monthly, sent for lab testing)
 - Wastewater totalized flow volume (determined daily from SCADA data from the effluent flow meter in the UV Building)

It is noted that the list of substances for compliance monitoring is normally based upon the results of the Environmental Risk Assessment. However, the ERA Study was conducted for the existing WWTF which outfalls to the Burnt Church River, while the new facility will discharge to the Inner Miramichi Bay, so conditions will be quite different and that list of Substances of Potential Concern is not appropriate.

Operating and maintenance targets are to monitor the process and make adjustments as required to provide the desired degree of treatment, to protect the environment, to maintain the facility in good operating condition, and to operate the WWTF as a “good neighbor” to the community.

10) Site Maintenance: Periodic general facility and site maintenance will be required. The grassed and landscaped areas will require normal maintenance such as mowing during the growing season. Other site-related items will require the following activities:

- Maintenance of grassed and landscaped areas;
- Checking fencing and gates to keep them in good condition;
- Maintenance of roadway and parking surfaces;
- Building and structures maintenance;
- Snow removal on roadway and parking areas to ensure year-round access.

For the WWTF, the estimated annual O & M costs were provided in the Feasibility Study. They included allowances for electric power for the pumps and blowers at the WWTF, UV lamp replacement costs, equipment replacement costs (pumps, blowers), consumable

supplies, routine maintenance allowances, site maintenance, costs related to sample analyses, and related items. In 2014 costs, the annual costs will range from \$40,000 to \$122,000 annually, depending upon periodic equipment replacement requirements.

The facility will be maintained by Esgenoôpetitj First Nation maintenance personnel.

The project as described herein is intended to meet the First Nation's wastewater treatment requirements to the year 2040.

The energy requirements for the WWTF will be supplied by a new entrance to the WWTF site from Micmac Road to provide the 600v/3p/60c and 120-208v/1p/60c power required by the various pieces of equipment and control systems. The following Table 6 summarizes the main power consuming equipment. Note that this is the "installed" power; the actual power used will be a function of specific demands and length of time of operation. It does not include miscellaneous power demands for buildings such as heating and lighting. The indication of power in the Table is for operating equipment only; it *does not include* stand-by units that may be installed but would not operate at the same time. (This Table is for WWTF power demands only; it does not include any pumping stations on the collection system.)

TABLE 6: SUMMARY OF WWTF MAJOR POWER REQUIREMENTS

LOCATION IN THE WWTF	EQUIPMENT DESCRIPTION	INSTALLED OR EQUIVALENT HP	EXTENT OF OPERATION
AERATION SYSTEM	Blowers	2 x 15 hp	Continuous: Initially, 1 unit at 90% At Design, 2 units @75%
UV DISINFECTION	UV Lamps	Minor	Continuous
EFFLUENT PUMPING STATION	Duplex Submersible Pumps	1 x 7.5 hp	Continuous Average Initial Operation at 60% At Design, Operation at 80%
MISCELLANEOUS	Building heating Building lighting	Minor to Moderate	Periodic, varying with the season and operator visits to the Building

From an inventory of development in the Esgenoôpetitj First Nation done as part of the 2014 "Feasibility Study - Wastewater Collection and Treatment System", the following level of development was identified:

- Total number of residential units: 370
- Number of residential units on the system: 278
- Institutional Information: students 150 (see note in paragraph below)
- Present residential population: 1,110
- Percentage of present population on the system: 75%
- Projected 2040 Design Population: 1,820
- Projected 2040 WWTF Design Population: 1,543*

* - It has been assumed that because of the rural style of development of the existing homes not on the sewer system that they will remain outside of the service area; this accounts for the difference between "Total" and "Design" populations

There is no significant commercial or industrial development within the community. The Esgenoôpetitj School at 626 Bayview Drive has a student population of approximately 150. This has not been shown as an additional loading on the WWTF because the students are residents of the First Nation and are included in the total population.

(ix) Future Modification, Extensions, or Abandonment:

The project is designed to be able to service the ultimate design population, flow and loading described within the Crandall Engineering Ltd. "Feasibility Study - Upgrade of the Wastewater Treatment System, Esgenoôpetitj First Nation" of May 05, 2014. This provides for growth within the potentially serviced area as projected to the year 2040.

There are two designated future growth areas within the Esgenoôpetitj First Nation. The first is within the serviced area south of Burnt Church River toward Micmac Road in the southwest area of the community. It has approximately 40 lots. This is anticipated to develop first due to its proximity to infrastructure. The second area is much larger and is situated north of the existing developed area and is on both sides of Route 11 to the west of the intersection with Micmac Road. A preliminary development plan has been prepared for this area for about 150 lots, which will require installation of water and sewer infrastructure. This second area is also north of the proposed WWTF site. This proposed development area can be collected and flow toward the WWTF by gravity, but will require a wastewater Pumping Station at the WWTF to pump these flows into the treatment facility. The piping design at the WWTF has allowed for this future force main connection. The WWTF does not have to be expanded to meet the projected 2040 wastewater contributions.

It is not anticipated that the proposed WWTF would be abandoned. Effective wastewater treatment is an ongoing requirement.

(x) Project-Related Documents:

Documents that relate to this project include:

- a) "*Feasibility Study - Upgrade of the Wastewater Treatment System, Esgenoôpetitj First Nation*", prepared for the Esgenoôpetitj First Nation by Crandall Engineering Ltd., May 05, 2014.
- b) "*Environmental Risk Assessment Report, Esgenoôpetitj First Nation WWTP*", prepared for the Esgenoôpetitj First Nation by Crandall Engineering Ltd., April 08, 2014.
- c) "*Mixing Zone Field Investigation for the Burnt Church Wastewater Treatment Plant*", prepared for Crandall Engineering Ltd. By NATECH Environmental Services Inc., Hanwell, NB; September 12, 2013.
- d) "*Receiving Water Characterization Study of a Future Outfall of the Burnt Church Wastewater Treatment Plant*", prepared for Crandall Engineering Ltd. by NATECH Environmental Services Inc., Hanwell, NB; June 30, 2014 (Appendix "D")
- e) "*Geotechnical Investigation, New Wastewater Treatment Facility, Esgenoôpetitj First Nation, Burnt Church, NB*", prepared for Crandall Engineering Ltd. by Conquest Engineering, April 06, 2014 (Appendix "E")
- f) "*Supplementary Geotechnical Investigation, New Wastewater Treatment Facility, Esgenoôpetitj First Nation, Burnt Church, NB*", prepared for Crandall Engineering Ltd. by Conquest Engineering, January 23, 2015 (Appendix "E")
- g) "*Geotechnical Investigation for a New Treated Wastewater Outfall, Esgenoôpetitj First Nation, Burnt Church, NB*", prepared for Crandall Engineering Ltd. by Conquest Engineering (Appendix "E") (to follow)
- h) "Report on Wildlife and Rare Species", Stantec (Appendix "G") (to follow)

It does not appear that the existing lagoon treatment system would have been subject to any prior EIA assessments. The legislative requirement for EIA assessments came into effect on June 30, 1987. The initial construction of the Burnt Church lagoon was done around 1965 and the upgrading to a two-cell facility was done in 1980. The addition of five (5) surface aerators was completed in 1987 and presumably pre-dated the Provincial EIA requirement.

3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

(i) Physical and Natural Features:

The location of the WWTF upgrade is shown on Drawing 12145-1P-C105B in Appendix "B". The entire wastewater treatment facility will be located in an undeveloped area which permits the desired 150 m set-back to be met. The land is lightly wooded and drains gently from north to south toward Indian Brook. This Brook flows easterly to Inner Miramichi Bay. There are no present developments or other uses within the limits of the proposed site or the 150 m set-backs that would be affected by this facility's construction.

As part of the evaluation conducted for the Feasibility Study, and for the development of design information for the Client, geotechnical investigations were carried out in various areas for pipeline construction and for the WWTF construction. This resulted in six (6) boreholes being obtained in the vicinity of the WWTF site, with three (3) of these directly on the area to be developed. The BH logs for these, and plans showing their locations, are included in Appendix "E".

The BHs on the WWTF site indicate generally similar conditions throughout. A layer of topsoil from 0.3 - 0.9 m in thickness overlays thicker sand and clay layers. Each BH went about 6 m below the surface and bedrock was not encountered. The water table was found about 0.6 m below the surface (December 22, 2014). The other three BHs in the adjacent area indicated soil with varying thicknesses of sand and clay soils. The two BHs along Micmac Road showed about 0.9 m of fill, while the third had a 0.3 m thick layer of topsoil at the surface. These BHs, done in February 2014, had water table levels from 0.3 to 1.1 m below the surface.

Surface drainage above the site will be intercepted by a drainage ditch system that will carry runoff around the WWTF site. Drainage from within the site will also be directed to this system. The drainage ditch will flow toward Indian Brook, and will direct all flow collected through a siltation pond prior to it reaching the Brook. Except for a small portion of the ditching, none of the WWTF construction will be within 30 m of a watercourse. During construction, silt from the site will be intercepted by silt fencing which will be maintained until vegetative growth is restored on any disturbed surfaces.

The area of the site to be developed is beyond the flood risk lines on GeoNB mapping. In addition, the site is being built up with top of dikes and building floors (except the UV area) at +9.0 m, well above any possible flood level. Structural fill will be imported to the site and compacted as it is placed to create this finished elevation. The slopes to natural/existing ground will typically be 3H:1V. The access road to the site from Micmac Road will also be from +4.4 to +9.0 m (geodetic elevation).

There are no Environmentally Significant Areas as defined by the NB Nature Trust located within 500 m of the WWTF site. A survey of wildlife and rare species is being carried out on

the site of the proposed work. A copy of this Report is to be attached as Appendix "G", and will be submitted as soon as it has been completed and received by Crandall Engineering Ltd.

There is no development in the proposed WWTF site area, so there is no background noise.

(ii) Cultural Features:

The land is part of the Esgenoôpetitj First Nation lands. Based on subject-specific discussions with Band officials, it has not been used for any form of development or settlement previously, and does not have a cultural, heritage, tourism or resource area significance.

There are no formal recreational sites within 500 m of the subject property.

(iii) Existing and Historic Land Uses:

As noted, this project is proposed on an area of vacant land with no current use, and no indication of previous uses. No foundations, ruins, or other possible development features were found. These visual observations were confirmed by discussions with officials of the Esgenoôpetitj First Nation.

Concerning adjacent land use within 150 m of the limits of the proposed WWTF, using the distance as recommended by the "Atlantic Canada Wastewater Design Guidelines", the same observations are made. The set-back area shows no signs of having had any prior development. It is lightly wooded land that slopes gently from north to south. There are no signs of contamination or use as a dump site on this land.

4.0 SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The primary purpose of this project is to enhance the degree of wastewater treatment being provided to the Esgenoôpetitj First Nation in order to protect and improve the local environment. It will do this by being a more efficient treatment process, but also by permitting the removal of the existing lagoon facility that encroaches on developed areas. It will also provide surplus capacity for the treatment of wastewater from additional development/population growth that is expected to occur for at least the next 25 years.

This section will summarize possible impacts of the proposed work, and Section 5.0 will describe the measures that will be applied to eliminate or mitigate impacts. The attribute headings as contained in Appendix "B" of the EIA Guide will be used here. Only possible issues will be listed. Since this project is for a wastewater treatment facility, the Sector-Specific Guidelines have also been recognized in preparing this list.

In order to expedite the review of information presented in this Registration Document, the proposed mitigation measures (i.e., Section 5.0 information) for each of the possible impacts described below will be indicated immediately following.

4.1 Air Quality:

- a) Dust is possible during the construction phase when fill is being placed, when soil is exposed, and when pipelines are being installed.

Mitigation: Although there are no homes within 150 m of the site, construction contracts will require the contractor to apply water to control dust when directed. Regarding local streets affected by construction, the contractor will be required to keep them cleaned.

- b) Odours are possible during the construction phase, primarily exhaust smells from the trucks and equipment that will be used to haul and compact fill, bring concrete to the site for foundations, to excavate for pipe installation, etc. Because the treatment process is an aerobic process and because of the setback areas, no objectionable odours during operation are expected.

Mitigation: Again, there are no residential properties within 150 m of the site, but any odours from truck or equipment exhaust, etc., will be limited to within the 7 am to 7 pm normal working hours. Because of the distance between the work areas and the nearest areas of habitation, it is expected that such odours will be dispersed prior to reaching them. Odours during WWTF operation are not expected to be noticeable because of the setback distances and the aerobic process being used.

- c) None of the other items under this category are applicable to this project.

4.2 Biology and Ecology (Aquatic):

- a) Inshore marine habitat: The only work being done in the Inner Miramichi Bay is the installation of the outfall. The outfall is proposed to be installed by horizontal directional drilling below the floor of the Bay, with only the outfall discharge extending above the bottom.

Mitigation: Disturbance to the Inner Miramichi Bay's environment and habitat will be avoided by installing the pipeline below the marine floor by horizontal directional drilling (HDD). The drilling pit will be located on the shore. The effluent discharge will be at a location which meets CCME Guidelines for adequate dispersion so as to be "protective" of the environment. It was

noted that a proposed "*Environmental Management Plan*" has been prepared and is attached in Appendix "F".

- b) Native (Cultural) Fisheries: The outfall discharge is not located in a primary fisheries area. It is possible that there may be some casual fishing carried out in the area.

Mitigation: The outfall discharge is located at a single point in slightly over 2 m of water depth so is not expected to cause any interference with casual fishing in the Bay. During open water seasons, signage will be placed advising of the presence of the outfall, and indicating it as a "no anchorage" area. Since the effluent will pass through a UV disinfection system prior to discharge, bacteria will be reduced to below the level required for recreational activities.

- c) None of the other items under this category are applicable to this project.

4.3 Biology and Ecology (Terrestrial):

- a) Vegetative cover: the existing vegetation on the WWTF site includes woodland ground vegetation.

Mitigation: Vegetative cover must be removed for the WWTF construction, but any areas which are not treatment cells, building or parking areas will be seeded to restore growth and prevent soil erosion.

- b) Virgin/old growth timber stands: The area is sparsely wooded but does not show any old timber stands.

Mitigation: Trees will be removed only as required for construction of the WWTF. Except for a designated storage area for stripped topsoil, the set-back area will be left in its natural state to act as screening of the facility.

- c) None of the other items under this category are applicable to this project due to the site's utilization as a WWTF.

4.4 Physical (Climate/Atmospheric):

- a) Noise: The facility will include equipment such as blowers and pumps. There will also be a diesel generator to provide stand-by power to WWTF components.

Mitigation: Pumps will be placed in a chamber and will not be placed in an exposed exterior location; this will contain any operating noise from pumps. The blowers that are an essential part of the process aeration system will also be placed inside well-insulated buildings. The intake piping will include residential silencers. The diesel generator, also inside the insulated building, will operate only periodically for "exercising"

or when required by a power outage. The diesel exhaust will have a residential silencer. When operating, the generator will require a ventilation system for cooling air which will generate unavoidable fan noise. However, these events will be of short duration, and exercising will be scheduled to be done during daytime hours. The significant distance from the facility to the nearest habitation will also serve to attenuate any noise from these operations.

- b) None of the other items under this category are applicable to this project.

4.5 Physical (Geology):

- a) The geology of the area will not be impacted by this work. The site will be raised by placing imported fill and except for removal of topsoil and any other (structurally) unsuitable material and site ditching, no significant work will be done below the existing grade of the site. There will be some pipe installation with much of it at the WWTF site near or above the existing ground levels. The effluent Pumping Station wet well does not extend into the existing ground.

4.6 Physical (Geomorphology):

- a) Topography: of the WWTF site will be changed from the fill material being placed for lagoon cell construction and the site for the Blower/UV Building. This will raise the site in the area of the WWTF approximately 4.0 - 4.6 m from its existing elevations. The geotechnical report from Conquest Engineering, dated August 06, 2014, and attached as part of Appendix "E", includes Section 6.2 on "Embankment Construction".

- b) Soil erosion: this is possible during construction.

Mitigation: any soil areas disturbed will be contained by silt fencing and will be reinstated as soon as possible following construction. There will be no extreme slopes which might result in erosion. (Maximum slopes are 3H:1V.)

- c) Soil bearing capacity: this will be improved by the placement and compaction of structural fill.

- d) Soil moisture/drainage: the surface drainage pattern will be modified only slightly due to the WWTF site being built up.

Mitigation: A runoff intercepting ditch will be placed upslope of the WWTF to receive and convey surface runoff around the site. There will be no isolated low areas created by the site development, and surface runoff will continue to be directed to its present receiving watercourse, Indian Brook.

4.7 Physical (Groundwater):

- a) Quality: the project will not negatively impact groundwater conditions or quality. The new WWTF will contain wastewater during the treatment process within water-tight structures with impervious liners. Pipes entering and leaving the treatment Cells will have watertight “boots” installed to prevent leakage at these points.

Mitigation: Wastewater retained in the WWTF will be prevented from affecting the groundwater by being placed in lagoon cells which have impervious 60 mil HDPE liners, and piping systems will be tested for leakage prior to being brought into service.

4.8 Physical (Surface Water):

- a) Surface water quantity: There are no components of this proposed project which would impact the quantity of water flowing in surface water features, including Indian Brook, the watercourse nearest the WWTF site. Indian Brook is being used only as a stand-by emergency receiving water if there were a complete failure of the Effluent Pumping Station.

Mitigation: It was noted under 4.6(d), Drainage, that surface water in the area will continue to flow toward the same receiving watercourse (Indian Brook). Several measures have been incorporated into the design to keep to a minimum the possibility of having to use Indian Brook as a receiving water. Firstly, the Effluent Pumping Station has duplex pumps for 100% stand-by in the event of a pump failure. Secondly, the entire WWTF has stand-by power including the Effluent Pumping Station. If Indian Brook must be used, it will only receive highly treated wastewater.

- b) Quality of water: Water quality would be affected if the wastewater treatment system allowed leakage of untreated or partially treated wastewater, or discharge of partially treated wastewater to the effluent receiving water.

Mitigation: The treatment system, including all cells and piping, will be carefully constructed, tested and inspected to result in a watertight facility. The treatment cells will be lined with an impervious HDPE liner, with any pipe penetrations of the liner also being sealed. The treatment system is designed to exceed the treatment objectives and includes stand-by power to ensure treatment continues un-interrupted in the event of a power outage. The effluent discharge into Inner Miramichi Bay will be at a point where 1:100 dilution will be achieved within 200 m on a falling tide and within 125 m on a rising tide. This will

minimize any possible temperature impacts from the effluent discharge.

- c) None of the other criteria under this category will be negatively impacted by this project.

4.9 Valued Spaces/Locations:

- a) Significant structures, sites, monuments, objects: An on-site evaluation and discussions with Band officials did not reveal any historic or cultural features on the site that might be impacted.
- b) Visual character: because the proposed WWTF would be constructed in an isolated area with a 150 m set-back (buffer zone) on all sides which will remain insofar as possible as a partially wooded area, there will be no negative visual impacts from this project.

Mitigation: Perhaps not mitigation, but more of a benefit to this project will be the decommissioning of the existing treatment lagoon facility. This will remove the existing facility which is highly visible from a developed residential area. Decommissioning will include removal of surface aerators, removal of fencing, draining and filling of the lagoons, and reinstatement of the property for recreational use.

- c) The proposed project will not negatively impact any of the other criteria listed under this category.

4.10 Community Structure (Socio-economic):

- a) Population: part of the reason for this project is to accommodate wastewater flows from future growth within the Esgenoôpetitj First Nation; this is a positive result. This will permit growth without impacting the receiving water environment.
- b) Public health: is also positively benefitted by the project because of the elimination of the non-disinfected effluent (bacteria) discharge to the Burnt Church River. The relocation of the WWTF will also result in the elimination of aerosols in the residential area adjacent to the existing WWTF.
- c) First Nation operating budgets will be impacted by the costs (capital and O & M) of the new facility. It is anticipated that these costs will be recovered by funding assistance from AANDC.

4.11 Community Structure (Physical and Functional):

- a) Land Use Compatibility: the site of the proposed WWTF project is in the process of being re-zoned for this use, and will include the protection from development of the set-back area.

- b) Temporary barriers to vehicular/pedestrian movement: The pipeline installation required related to the WWTF project, including new force main and outfall piping, will result in temporary interruptions to access.
Mitigation: Barriers to vehicular/pedestrian movement will be of short duration, and will be carried out applying appropriate safety, signage and flagging procedures. Residents that may be affected by construction will be notified in writing in advance. Vehicle access to properties will be restored at the end of each work day. Arrangements will be made to accommodate special needs individuals.
- c) Municipal infrastructure: will not be negatively impacted during the construction process; wastewater treatment will continue to be provided in the existing lagoon treatment facility. A construction sequence has been prepared to ensure that wastewater collection will also continue uninterrupted during construction. This is procedure has been identified in the proposed "*Sewage Management Plan*" attached in Appendix "F".
- d) Traffic volumes: They will be periodically increased but will not be significant during the construction period. The most significant increase in traffic will be from trucks providing transportation of fill material. Any traffic delays originating from the new system construction will be temporary in nature and signage and flagging will be in accordance with NB DTI requirements.
- e) Access to other properties will not be impacted by the WWTF project except as already noted under 4.11(b), Temporary Barriers. There are no long-term or permanent interruptions to access.

4.12 Lifestyle and Quality of Life;

- a) Quality of life: the proposed project will have an overall beneficial impact on the quality of life for the residents of and visitors to the Esgenoôpetitj First Nation by improving wastewater treatment efficiency, environmental protection, and water quality.
- b) Where the new WWTF will include decommissioning of the existing treatment facility on Micmac Road, this will improve the character of the adjacent residential area, eliminate a possible source of odours, and will provide new recreational opportunities.
- c) The proposed project will not negatively impact the other criteria under this category.

5.0 SUMMARY OF PROPOSED MITIGATION

Mitigation measures proposed for possible environmental impacts were included in Section 4.0 in order to more conveniently connect the relationship of mitigation with possible impacts.

6.0 PUBLIC INVOLVEMENT

The Esgenoôpetitj First Nation is planning a public meeting in the near future in order to inform the public on the proposed plans to upgrade the wastewater collection and treatment systems. This will be structured as an "Open House" or "Town Hall" type of meeting, which will be informal in nature. The meeting will be publically advertised in advance to enable any interested parties to attend. The public advertisements and direct communication with specific groups and individuals will be done as required under Appendix "C" of the *"Guide to Environmental Impact Assessment in New Brunswick"*.

A copy of the public advertisement will be provided to the Planning and Impact Evaluation Branch of the DELG to place on their web site.

The meeting will be attended by First Nations representatives and by personnel from their consulting engineering firm that has carried out the Preliminary Design Study and Detailed Design which has resulted in this recommended work. The meeting will include several large scale drawings showing the location and scope of the proposed works. The site plan and a rendering of the proposed WWTF will be part of this display. Copies of the *"EIA Registration Document"* will be made available at the meeting, and will be provided in advance to the regional DELG office in Miramichi. Residents will have the opportunity to ask questions and to express any concerns they may have about the project. A record will be kept of inquiries and responses from this meeting.

Following the meeting, and the expiration of the 25-day time period allowed for follow-up, a detailed summary report will be prepared and submitted to the NB DELG in accordance with the requirements of Appendix "C" of the Guide. This will be submitted no later than 60 days following the public meeting.

The anticipated schedule for the Public Involvement component, assuming that the two supporting documents presently being prepared (Wildlife Study, Outfall Geotechnical Study) will be available prior to the Public Meeting, is:

TABLE 7: SUMMARY SCHEDULE OF PROPOSED PUBLIC INVOLVEMENT ACTIVITIES

ITEM	DESCRIPTION	PROPOSED DATE	NOTES
1	Submit EIA Registration Document to NB DELG	June 30, 2015	
2	Owner to Schedule Public Meeting	July 08, 2015	Including Meeting Location
3	Publicly Advertise Public Meeting, Post at Band Office	July 24, 2015	Allow 7 days for Publication
4	Submit Public Meeting Notice to NB DELG for Posting on the GNB Website	July 17, 2015	
5	Send Specific Invitations to Special Interest Groups	July 17, 2015	
6	Make EIA Documents Available at Convenient Location for Public Review (Band Office, etc.)	July 17, 2015	
7	Hold Public Meeting	Aug. 11, 2015	Tentative; to confirm with Band
8	Allow Time Period for Receipt of Public Comments	Sept. 8, 2015	Regulation Requires 25 days
9	Complete Documentation of the Public Involvement Procedure, Questions, etc.; Submit to NB DELG for Review	Sept. 30, 2015	Less than 60 days After the Meeting
10	Allow Time for NB DELG Review, Follow-up, Minister's Decision	Sept. 30, 2015 - Jan. 04, 2016	Minimum 30 days; Maximum 120 days, after Receipt

7.0 APPROVAL OF THE UNDERTAKING

The following technical approvals are anticipated as being required for this project:

- Approval under the EIA Legislation from the NBDENV;
- Approval of Contract Documents by DIAND Canada and Public Works Canada;
- For construction, the contractor will be required to obtain all building permits, electrical permits, etc. necessary for the work to be constructed;

8.0 FUNDING

The Esgenoôpetitj First Nation has obtained funding for the project in the form of annual allocations to their budget to carry out the work in phases over the five-year period from 2015-16 through 2019-20.

Operating and maintenance costs will be covered through the Esgenoôpetitj First Nation's annual operating budget.

9.0 SIGNATURE

June 30, 2015

Date

Chief Alvery Paul

Chief Alvery Paul

Chief, Esgenoôpetitj First Nation