

**LORNE STREET RECONSTRUCTION AND  
STORMWATER MITIGATION - PHASE 2  
EIA REGISTRATION DOCUMENT**

Prepared for:

**Sackville**  
NEW BRUNSWICK

**Town of Sackville**  
101 Crescent Street  
Sackville, N.B.  
E4L 1G6

Prepared by:



**Crandall Engineering Ltd.**  
1077 St. George Blvd., Suite 400  
Moncton, N.B.  
E1E 4C9

September 1, 2017  
Project No. 16196-1



Crandall File: 16196-1  
September 11<sup>th</sup>, 2017

**N.B. Department of Environment and Local Government**  
P. O. Box 6000  
Fredericton, NB  
E3B 5H1

**ATTENTION: Ms. Christie Ward - Project Manager, Environmental Assessment Section**

Dear Madam:

**EIA Registration Document  
Lorne Street Reconstruction & Storm Water Mitigation - Phase 2  
Sackville, New Brunswick**

In regard to the above, Crandall Engineering Ltd. is pleased to provide the Department with the following copy of the EIA Registration Document for your review and comments, on behalf of our Client, the Town of Sackville.

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

Yours very truly,

**CRANDALL ENGINEERING LTD.**

Nathan LeBlanc, P. Eng.  
Project Engineer

C. Mr. Pierre Plourde, P. Eng., Partner - Crandall Engineering Ltd.

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**Town of Sackville**

**EIA Registration Document**

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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<b>Appendix A:</b>	<b>1:50,000 Scale Map &amp; Location Plan (Crandall Engineering Ltd. Drawing 16196-3P-C200)</b>
	<b>Phase 2 Project Area Plan (Crandall Engineering Ltd. Drawing 16196-3P-C201)</b>
	<b>Existing Conditions and Drainage Plan (Crandall Engineering Ltd. Drawing 16196-3P-C202)</b>
	<b>Overall Proposed Construction Phasing and Drainage Plan (Crandall Engineering Ltd. Drawing 16196-3P-C203)</b>
	<b>Proposed Aboiteau Site Plan (Crandall Engineering Ltd. Drawing 16196-3P-204)</b>
	<b>Proposed Aboiteau Profile and Section (Crandall Engineering Ltd. Drawing 16196-3P-205)</b>
<b>Appendix B</b>	<b>Environmental Management Plan Crandall Engineering Ltd. - September 1, 2017</b>

**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:** Town of Sackville

**(ii) Address:** 101 Crescent Street  
Sackville, N.B.  
E4L 1G6

**(iii) Chief Executive Office:**

Name: Mr. Dwayne Acton, P. Eng.  
Official Title: Town Engineer  
Telephone: 506-364-4965  
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**(iv) Principal Contact Person for purposes of Environmental Impact Assessment:**

Name: Nathan LeBlanc, P. Eng.  
Official Title: Project Engineer - Crandall Engineering Ltd.  
Telephone: 506-693-5893  
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**(v) Property Ownership:**

As indicated on the Drawings in Appendix A, the proposed project site, which includes new stormwater retention ponds, an aboiteau structure and various ditching operations, is located on a variety of properties in the southeast area of Sackville, N.B. In addition to portions of the work located within the right-of-way, it is anticipated that multiple PIDs will be impacted by the project. The list of PIDs affected is found in Section 2.0 (vi).

These properties are not all currently owned by the Town of Sackville; however, it is noted that the Town intends to purchase the land proposed for construction. The land acquisition process

with the various property owners is currently underway, where the Town has completed all purchase and sale agreements for the required properties.

In order to direct water away from the Town via the new features to be installed through the proposed project, a new discharge channel will be required leaving the new aboiteau structure. It is anticipated that the discharge channel leaving the new aboiteau structure will extend below the ordinary high-water mark (ohwm) of the Tantramar River. Therefore, a Land Use Application will be submitted to the Department of Energy and Resource Development's Crown Lands Branch if required.

## 2.0 THE UNDERTAKING

### (i) Name of the Undertaking:

Lorne Street Reconstruction and Stormwater Mitigation - Phase 2, Town of Sackville.

### (ii) Project Overview:

The Lorne Street area is situated in the flood plan of Sackville, New Brunswick and consists of a relatively flat grade. As a result of the topography in the area, in conjunction with currently inadequate stormwater infrastructure and mitigation strategies, major flooding occurs frequently within the area. Thus, the Town of Sackville has begun rehabilitating the aging infrastructure in the area, and has initiated a stormwater mitigation project. In the last five (5) years, four (4) major flooding events were recorded in which the inadequate open ditches surrounding Lorne Street, undersized and heavily silted aboiteau and dyke system failed to alleviate the stormwater flows. This does not include instances of minor, localized flooding which are also known to occur on a more frequent basis.

The initial phase of the project included the complete road reconstruction of Lorne and Saint James Streets, focusing on upgrading the aged and deteriorated infrastructure. This phase, which did not require EIA Registration, is currently under construction. Phase 2 encompasses stormwater management upgrades to transport the stormwater flows that normally flood the Lorne Street area and redirect them to the Tantramar River. **This document focuses on Phase 2 of the project, the associated potential impacts on the environment, and the mitigation procedures proposed.**

Completing Phase 1 of this project alone will not resolve or reduce the on-going flooding issues in the Lorne Street area of Sackville. Therefore, in order to aid in the prevention of flooding within the area, it is necessary to rehabilitate the stormwater management system and infrastructure.

The project will thus include the following:

- Construction of two (2) new stormwater retention ponds;
- Construction of a new double stacked aboiteau structure, including a new discharge channel and the removal/decommissioning of the existing wooden box culvert (existing aboiteau);
- Raising the elevation of the dyke above the new aboiteau to approximately 10 m, and construction of an access road on top of dyke;
- Ditching upgrades and re-alignment, connecting the Lorne Street area to the ponds and subsequently to the new aboiteau and the Tantramar River;
- Construction of a new sediment basin in the new ditch upstream of the aboiteau;
- New culvert installation underneath Canadian National Railway (via jack and bore method);
- Installation of new culverts at various roadway crossings (via conventional open trenching methods);
- Related work and property restoration where required.

In order to allow for future maintenance activities, the proposed retention ponds and major ditches will be accessed through new access/service roads. In addition, the proposed aboiteau structure will include a service road on top of the newly raised dyke, which will be sloped gradually to tie into the existing dyke system.

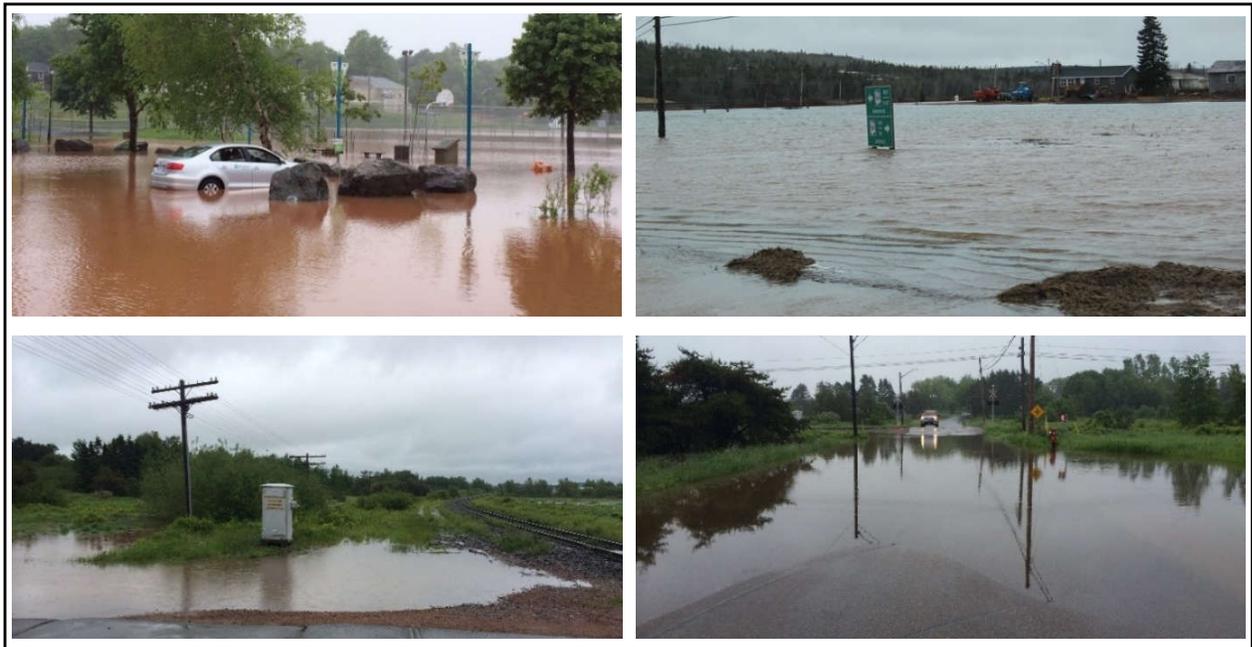
The majority of the project's construction will be located outside of mapped watercourses and wetlands; however, the construction of the new aboiteau, discharge channel, and related work falls within a Provincially Significant Wetland as illustrated on the Drawings in Appendix A. Potential impacts and mitigation measures will be discussed further in Sections 4 and 5 of this document.

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

As previously noted, Lorne Street and the surrounding areas are prone to major flooding due to their location in the floodplain, flat grades, and increasing tides and rainfall events, with four (4) major flooding events over the past five (5) years. In addition, inadequate and silted, partially blocked stormwater infrastructure has only added to this problem.

Flooding in the Lorne Street area has adversely affected businesses and residents in this area and poses a limit for economic growth. Furthermore, flooding in the Lorne Street area leaves this central portion of the Town and the Public Works facilities vulnerable due to accessibility concerns. Emergency services cannot access the area, thus posing a safety hazard for the community. Renewal of this sector will mitigate flooding of both commercial and residential properties in the area and help attract new development within the vicinity. Photos from recent flood events are included in Figure 1 below.

**Figure 1: Examples of Past Flooding - Lorne Street Area, Sackville, N.B.**



Further investigation has also uncovered that there was heavy stormwater infiltration to the sanitary system, which in the past has resulted in sanitary sewer overflows as well as high pumping costs at the lift station on Charles Street. The elimination of combined sewer cross connections currently being completed as part of Phase 1 will directly reduce the amount of infiltration and overflows of the sanitary system. However, the completion of Phase 1 is only the first step, to prepare for the major stormwater upgrades required in Phase 2. Completing Phase 1 alone will not improve the on-going flooding issues in the Lorne Street area.

In order to further reduce the impacts of flooding events, prevent surcharge of the newly constructed stormwater system (under construction as part of Phase 1 Upgrades), adapt to climate change rainfall events, and encourage economic growth and a prosperous community, the proposed stormwater mitigation procedures outlined are necessary.

Consideration has been given to various stormwater management alternatives; however, given the fact that the area in question is at the receiving end of multiple upstream stormwater systems, alternate routes are limited. The past land uses in other undeveloped land in the project area further restricts the viable routing of stormwater, due to concerns about water quality. This is discussed in further detail in Section 2.0 (v).

A “do-nothing” approach is not acceptable in this case due to the inadequacy of the current infrastructure to perform effectively, further prioritized by increases in projected rainfall

occurrences and rising sea levels. Without the construction of both new ponds, as well as the related major ditching, culverts, and aboiteau upgrades, there is no way to effectively drain surface water from the area, and there is a considerable risk of flooding the nearby CN Rail tracks. Therefore, without this project, the Lorne Street area will continue to flood and as a result pose a safety hazard to the downtown public.

**(iv) Project Location:**

The project is located between Lorne Street and the Tantramar River, in Sackville, N.B., as shown on the attached drawings. Because of the geographic scale of the project, comprising two (2) new retention ponds, major ditching upgrades and a new aboiteau structure, the project spans a number of PIDs, as listed in Section 2.0 (vi). At this time, the Town is planning on purchasing the land required for the new permanent structures, and the land transfer process has been initiated.

The enclosed Drawings 16196-3P-C200 to C201 (Appendix A of this document) show a 1:50,000 scale map of the site in reference to the existing features, and the proposed Phase 2 construction details over an aerial photograph. Drawings 16196-3P-C202 and C203 provide a snapshot view of the current stormwater conditions and existing natural features in the Lorne Street area, as well as the larger-scale phasing breakdown of the surface water management planned/implemented in Phase 1 and Phase 2 of the project. Drawing C203 also references current plans for a future stormwater mitigation phase. Also enclosed (Drawings 16196-3P-C204 and C205) are preliminary details relating to the replacement of the existing aboiteau with a new double stacked aboiteau structure.

This stormwater mitigation project is located in Sackville, in south-east New Brunswick, approximately 50 km southeast of Moncton. Sackville is located in the county of Westmorland and is part of the parish of Sackville.

The latitude and longitude of the portion of the site within the wetland 30m buffer are as follows (approximately):

- Latitude: 45.89095726, Longitude: -64.34882924

**(v) Siting Considerations:**

**GENERAL SITING CONSIDERATIONS AND OTHER LOCATIONS CONSIDERED:**

In selecting the proposed design, multiple possibilities were evaluated prior to establishing the feasible options. This exercise identified the selected route proposed herein and one (1) alternate route. However, due to the alternate route requiring extremely deep ditches (excavations over 9.0 m deep) and encroaching on a previously operated landfill/dump, it posed

major financial and environmental concerns, including concerns relating to soil contamination, presence of unknown materials, and debris associated with the past land use and thus was not deemed viable.

Additionally, it is particularly important to direct stormwater through the proposed replacement aboiteau structure into the main channel of the Tantramar River, as opposed to the aboiteau directly south of Lorne Street which discharges to a smaller tributary of the River with lower velocities and siltation problems. The selected route allows for the shortest, most direct path to the River's main channel.

Furthermore, the proposed stormwater network must tie into the newly constructed piping system on Lorne Street and Saint James Street (Phase 1 under construction), as well as other upstream drainage systems, which significantly restricts the location of the ditches and culverts in this phase. Therefore, the proposed configuration of the ponds, culverts, ditches and aboiteau is necessary to ensure the effectiveness of the overall stormwater mitigation system.

Finally, the required retention ponds require a relatively large area of land, located appropriately such that it can receive stormwater during high-flow events. With consideration given to the above restrictions, as well as the availability of suitable land, no other alternative is considered to be feasible.

#### SELECTED PROJECT LOCATION

Due to the topography of the land available in the area and their location within the floodplain, the properties affected by the proposed project are currently undeveloped, with one (1) exception as noted below. The surrounding properties have some development, such as residential and commercial buildings, along the perimeters of some portions of the project area.

In the case of the new aboiteau and major ditching the land is already being used for this purpose, although both the new ditching and aboiteau will be shifted slightly as these will be re-aligned to allow for better flow patterns. The retention ponds will be located on land that is currently undeveloped, with the exception of one existing building, which will be replaced at another location as part of the land purchase agreement. The Town is in the process of purchasing this property, as well as other required properties.

It is noted that the land selected for the new retention ponds and ditching is already within the floodplain and currently holds water during flooding events. The intent of the project is to re-shape the land and add the proper structures to control the rate at which water flows in and out of each pond, to aid in confining flooding to these specific locations during periods of increased surface water. Therefore, the project will not result in a significant change in land use. Furthermore, with the planned re-use of native materials stripped from the site, it is

anticipated that the resulting vegetation and habitats (once established) will be similar to the existing, and that the net loss of current environmental features in the area will be minimized.

### PROTECTION OF THE WATER SUPPLY

Based on GeoNB mapping, there are no *Wellfield Protected Areas* or *Watershed Protected Areas* in the vicinity of the proposed project site.

### ZONING

Based on the November 22, 2015 zoning map obtained from the Southeast Regional Service Commission, the area of the proposed stormwater mitigation project is primarily zoned “Urban Residential”, with small portions of “Agriculture/Conservation” and “Industrial/Business Park”. One (1) of the proposed retention ponds lies within the Agriculture/Conservation and Urban Residential zoning whereas the second proposed pond is located within the Agriculture/Conservation and Industrial/Business Park zones. Additionally, a small portion of the Industrial/Business Park and Urban Residential zones are utilized for the required re-ditching and aboiteau structure.

The Town is in the process of making arrangements to purchase the land utilized for this project, and has purchase and sale agreements in place with all affected landowners. The Town will communicate with the planning commission to confirm if the land will require rezoning, and will take the necessary steps to do so as required.

### WETLANDS

Based on wetland mapping from GeoNB, there is a Provincially Significant and regulated wetland near the project area. Work within 30 m of the wetland will be avoided as much as possible. However, as shown on the attached drawings, the aboiteau structure and a portion of the discharge channel is located within the wetland. The anticipated disturbed area within the wetland is approximately 1,230 sq.m. Photos of the wetland area are included in Figure 2 below:

**Figure 2: Photos of PSW at Existing Aboiteau Structure**



#### SPECIES AT RISK AND WILDLIFE

The proposed location for the new ponds and related stormwater improvements is currently low-lying land, that has been undevelopable in the past due to it being prone to flooding. If required, an evaluation of the area will be carried out by a Biologist, to verify whether the project site and surrounding area contain sufficient vegetation or habitat to support wildlife, to confirm the presence of migratory birds, and/or to evaluate the species at risk of conservation concern.

#### **(vi) Physical Components and Dimensions of the Project:**

##### LAND REQUIREMENTS

As part of the stormwater mitigation project, approximately 1.8km of new stormwater channels will be constructed, including new major ditches, main channels through each new pond, new culverts at roadway and rail crossings, a new aboiteau structure, and a new outlet channel to the Tantramar River. The attached Drawings in Appendix A show the overall location of the project relative to the environmental features of the region, including an aerial photograph view of the project site.

Where the project consists of a number of ponds and lengths of ditching, a variety of properties are affected by the project. The PID's affected and their respective disturbance areas are as noted below. As previously noted, the Town is in the process of acquiring the required land to complete the project.

PID Number	Disturbed Area (sq. m)	PID Number	Disturbed Area (sq. m)
70288295	17,608	00903617	14,515
70185467	1,225	70059910	142
70160353	2,418	70307509	2,046
70238456	1,977	70307525	302
70458203	1,369	70307517	3,260
70257183	342	00966168	273
70210414	742	00971583	5,053
70210406	914	70140108	13,677
70272448	1,293	70270152	2,590
70485966	52,231	00964437	596
70041827	712	70241559	449
70039656	3,958	70241567	12
00000003	333	70403969	149
70127717	2,042	00000002	2,884
70127725	932		

The total project footprint is approximately 134,050 m<sup>2</sup> (13.4 Ha), including ± 3,620 m<sup>2</sup> (0.36 Ha) within the 30m wetland buffer for the renewal of the existing aboiteau structure. Of the work within the wetland buffer area, ± 1,230 m<sup>2</sup> (0.12 Ha) will occur within the wetland itself.

#### PHYSICAL COMPONENTS AND INFRASTRUCTURE

In order to carry out the stormwater mitigation project, the following components and infrastructure will be required:

- a. **Stormwater retention ponds:** The project will include the construction of two (2) new retention ponds. Construction will include stripping and grubbing where required, isolated tree clearing if necessary, excavation and grading of the ponds, installation of new inlet and outlet piping, and construction of an adjacent permanent service road to allow for future maintenance (crushed rock driving surface). It is anticipated that suitable stripped organic materials and/or excavated materials will be re-used on-site where possible, for topsoil and/or fill material.

The sizing of the stormwater retention ponds was based on a PCSWMM stormwater model, in which various inputs were used to appropriately size the ponds. The new ponds were sized based on a 1 in 100 year return period, 24 hour design storm, and consideration was given to tidal impacts which further limit the ability of water to drain from the site. During a rainfall event, the new ponds are designed to retain the water during the high tide, and allow the water to discharge during the ±six (6)-hour window

when the tides are low enough to allow drainage from the site. A summary of the stormwater management strategy is included in the following paragraphs.

The complete stormwater management strategy for the Lorne St. area includes requirements for additional storage volume, to reduce peak flows and provide runoff storage when tide levels are high. This will be accomplished through the provision of two stormwater management control areas. These areas are further described as follows:

### **Pond No. 2**

This Pond, located south of St. James St. and east of Lorne St., will receive flows from the St. James St. crossing and provide peak-flow reduction for downstream infrastructure, in particular the CN rail crossing. The Impacts of this pond are as follow:

- **Reduction in peak flows to downstream infrastructure:** Installation of Pond No.2 will result in a significant reduction in peak flows to both the Charles St. crossing (just north of the CN tracks) and the CN crossing (east of Charles St.). Where the CN crossing will need to be installed using trenchless methods, the cost savings are expected to be significant.
- **Flood Storage:** Though primarily intended for reduction of peak flows to downstream infrastructure, this pond also provides a significant flood storage impact and results in a flood water level reduction of nearly 0.5m when included in the model.

### **Pond No.3**

This proposed pond, north of Fleet St. and south of the CN rail line, will act primarily as “inland storage”, to hold runoff in the event that the downstream aboiteau is closed due to high tide conditions. The Impacts of this pond are as follow:

- **Flood Storage:** Pond No.3 is the lowest pond in elevation and is closest to the proposed aboiteau structure. By including significant storage at this location, there is the greatest potential to reduce the overall flood water elevation. For this reason, this pond location was considered to be required and was therefore included when evaluating all other options considered within the modelling exercise.

The flood management areas shown on the drawings in Appendix A are considered to be the maximum areas required and are expected to be refined as detailed design progresses.

- b. New aboiteau structure:** Part of this project consists of the replacement of an existing wooden aboiteau structure at the East extremity of the project with a new 1200mm and 900mm dia. stacked aboiteau structure with flap gates as shown on the attached drawings. A new discharge channel to the Tantramar River will also be created, to allow the new ditches to drain to the River. A temporary coffer dam and shoring system will be required during construction and decommissioned thereafter.

At the request of the NB Department of Transportation and Infrastructure (NBDTI) and the NB Department of Agriculture, Aquaculture and Fisheries (NBDAAF) in anticipation of future plans to raise the existing dykes, the portion of the dyke over the aboiteau will be raised as part of this project. The raised portion will be sloped back down at roughly 10:1 to tie into the existing dike, and a new permanent service road will be constructed over top of the raised dyke. It is anticipated that suitable materials excavated from the new ponds will be used to raise the dyke, and imported crushed rock will be utilized for the service road's final driving surface.

- c. New ditching:** In order to allow for stormwater to drain from the Lorne Street area of Town, ditching upgrades will be carried out from the intersection of Lorne and Saint James Streets, through the new ponds and easterly to the new aboiteau and ultimately to Tantramar River. The ditching upgrades include the enlargement and re-alignment of the existing ditching system to accommodate current and anticipated future stormwater flows, and the construction of an adjacent permanent service road to allow for future maintenance (crushed rock driving surface).

To minimize sediment flowing through the aboiteau and into the Tantramar River, a sedimentation basin will be constructed within the new ditch footprint, at its lower end prior to the new aboiteau. The basin will be constructed by deepening and widening the ditch in that area to allow sediment to settle prior to discharge.

In addition to improvements related to deepening and re-aligning the existing ditches, the project will also help relieve the loading on a second aboiteau south of Lorne Street, by re-directing some of the water to the aboiteau being upgraded as part of this project. Following discussions with NBDTI and NBDAAF, it was decided to minimize flows toward the second aboiteau due to its location on a minor branch of the Tantramar River which has experienced major siltation and narrowing over the past few years.

- d. Culvert installation:** In order to route the stormwater flows through the upgraded ditches to the aboiteau, upgrades to existing roadway crossings, or new crossings in some cases, are required in various locations. The new and upgraded crossings will consist of new concrete culvert piping, installed via conventional open-trench methods, except for the CN Rail crossing which must be completed using trenchless methods (jack and bore).

The following table indicates the sizing for new concrete culverts:

**Table 1: Culvert Sizing - Phase 2 Crossings**

Location	Selected Option
Charles St.	2 x 600mm dia.
CN Rail	2 x 600mm dia.
Sloan Dr.	2 x 1500mm dia.
Crescent St.	2 x 1500mm dia.

- e. **Service access roads:** As noted in the paragraphs above, approximately 2.3km of new permanent service access roads will be constructed in order to provide access to the new ponds and major ditching, including the new section of service road over the raised dyke.

**Future freshwater marsh:** As part of a future phase (not included as part of the current project), the Town plans to work in conjunction with Ducks Unlimited Canada to create a third pond (Pond No.1 on the attached drawings). Preliminary plans indicate that a new 1.4m high berm will be constructed with 3:1 slopes and a 3.6m wide top, to capture surface water and precipitation in the new wetland site. The average design water level in the project area will be 450mm, with deeper water zones in the pre-existing ditches that span the project area. To control the water level in the pond, a new outlet structure will be installed to maintain the operating water level, and a rock spillway will also be incorporated into the design, as a precautionary measure during high flow events.

This future project will result in the creation of a shallow freshwater marsh environment on a property that has been ditched in the past for agricultural use. This environment will encourage the growth of emergent and submergent plant species and create new habitat for various wildlife species including song birds, waterfowl, and insects. The pond will also be considered as an expansion of the Town's existing Waterfowl Park, encouraging public use and recreation.

#### ADDITIONAL DETAILS

In addition to the new major physical features, the following should be noted:

It is to be noted that the purpose of this project is to mitigate the current stormwater situation, to improve the current flooding problems. Therefore, the project will not result in increased stormwater flows.

- a. **Lighting and impervious surfaces:** There will be no lighting or impervious surfaces on the site.
- b. **Set-backs or buffers:** Construction will require the following:
  - 30 m from watercourses and NBDELG delineated wetlands (as per GeoNB), except as otherwise noted herein;
- c. **Off-site facilities:** Off-site facilities will not be required for this project.
- d. **Construction activities:** Various construction activities will be required as part of this project. During the construction of the new ponds, ditches, elevated dykes, and related works, imported and surplus material may be hauled between work areas on-site, and various materials and equipment will be hauled to and from the site. As a result, an increase of vehicular traffic will be observed during this period. However, except for during the construction of the project, no significant activities should be observed except for occasional maintenance activities.

**(vii) Construction Details:**

The proposed upgrade to the Lorne Street stormwater collection network will consist of the construction of the new retention ponds, major ditches, culverts, aboiteau structure, and related components. Prior to beginning ground-disturbing activities, silt fencing will be installed to protect the surrounding environment, and work carried out within the wetland and buffer area (as indicated on the Drawings) will adhere to the WAWA permit that will be obtained from the NBDELG.

Access to the site is mainly via existing streets in the area; however, permanent service roads will also be constructed to provide the Town with on-going access to the site, and temporary construction access roads may be required for some portions of project. Detours will be necessary for the installation of the new culverts on Charles, Sloan, and Crescent Streets, as portions of these streets will be closed during the culvert installation. However, these are not main streets and alternate routes exist around the culvert sites.

It is estimated that, from the start of the Tender Period to project completion, it will require roughly 19-20 working weeks, pending receipt of approval to proceed under the EIA registration. In order to achieve this, the following schedule is proposed (assuming that the comprehensive EIA Study is not required):

COMPONENT	APPROX. DURATION	START	END
1. EIA Registration and TRC Review	14 weeks	September 1, 2017	December 8, 2017
2. Engineering Design, Geotechnical Investigations, Tender Period and Award	19 weeks	September 1, 2017	January 12, 2018
3. Construction Period	16 weeks	January 15, 2018	May 4, 2018

The estimated hours of construction will be from Monday to Friday from 8:00 AM to 5:00 PM (winter hours) and from 7:00 AM to 7:00 PM (spring/summer hours). Construction is estimated to begin in January 2018.

The following equipment is anticipated to be used for the construction procedures:

- Earthwork and pipe installation: Excavators, dozers, dump trucks, compaction equipment.
- Construction of new aboiteau structure: Excavators, dozers, dump trucks, compaction equipment, and crane equipment for sheet piling.

The actual work will be done by a qualified contractor to be 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 bedding for pipes;
- Imported granular material for service roads, work on dyke, and roadway restoration within the pipe trench for culvert crossings;
- Imported construction materials for culvert installation and pond flow control structures (pipes, rip-rap, etc.).

As previously noted, although the site is not wooded some vegetation is present and isolated tree cutting and grubbing may be required. The material will be disposed off-site by the contractor. The topsoil and organic material will be stock-piled on-site during the construction (and protected with silt fencing) and will be re-used as topsoil where required. In addition, any suitable excavated material will be used to build up the dyke over the aboiteau or in other locations where fill may be required. If the excavated or stripped materials are found to be unsuitable, or in excess of what can be used on-site, they will be disposed of off-site by the Contractor.

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

- Exhaust and other emissions from construction equipment.
- Noise from construction equipment.
- Silt from disturbed surface areas. This will be minimized by the contractor utilizing a temporary coffer dam and shoring as well as requiring the contractor to install silt fences and other erosion protection devices around work area. Any reinstatement required on disturbed areas will be completed 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 follow the EMP. No refueling or maintenance of vehicles will occur within 30 m of a watercourse.

All waste generated during construction will be stored in containers and removed off-site by the Contractor.

The following sequence and procedures are recommended during the construction process. It is anticipated that in order to complete the work during the winter months as planned, multiple crews may be required, working on various portions of the work simultaneously.

1. Mobilization and installation of environmental protection devices;
2. Stripping and excavation of retention pond locations;
3. Ditching, sediment basin construction, and installation of roadway cross culverts;
4. Installation of new culvert under CN Rail line using jack and bore technology;
5. Construction of aboiteau structure, including temporary coffer dam and shoring, and raising dyke;
6. Property restoration and other related activities.

It was noted that some of the work is necessary within 30m of a provincially significant wetland, and within the wetland itself. This includes the construction of the new aboiteau structure, discharge channel, dyke modifications, and related work. Such work will be subject to the conditions of both the EMP and a future WAWA permit to be obtained from the NBDELG, and will be protected from silt run-off by installing silt fencing that will be maintained for the duration of the construction. Furthermore, the work will be carried out during the winter months to minimize impacts of construction activities, and the contractor will be required to utilize heavy-duty mats to travel with construction equipment within the wetland area.

The proposed Environmental Management Plan has been prepared for review, and is included in Appendix "B".

**(viii) Operation and Maintenance Details:**

It is to be noted that, generally, the components of this project (stormwater retention ponds, ditching, culverts, aboiteau, dykes, etc.) do not require significant operation and maintenance on a frequent basis. However, it could be expected that the Town of Sackville's personnel will periodically inspect, maintain and / or repair these components in the future. This could include items such as the removal of sediment accumulated within the new ditches, which is expected to primarily accumulate within the new sedimentation basin portion of the ditching. However, it is noted that service roads will already be in place following construction, so that the Town can access the site to conduct such inspections and maintenance without further disturbing the surrounding environment.

The sizing of the stormwater retention ponds and culverts was based on a PCSWMM stormwater model of the proposed upgrades. Various inputs were used in the model, including rainfall predictions and tidal impacts. A 1 in 100 year return period, 24 hour event was selected as the design storm rainfall, the proposed new infrastructure was sized through an iterative selection in the PCSWMM model, and checked in the CulvertMaster software package. The new infrastructure could be expected to have a useable lifespan of 50 - 100 years or more.

With the exception of the aboiteau structure and dykes which are owned and operated by the NBDTI/NBDAAF, the stormwater system is, and will continue to be, operated and maintained by Town personnel.

**(ix) Future Modification, Extensions, or Abandonment:**

Effective stormwater conveyance is an ongoing requirement; therefore, it is not anticipated that there will be future abandonment of the components installed as part of this project. Modifications to the components installed under this phase are not anticipated, except for routine maintenance of the various components. However it is noted that an additional pond is currently planned for northeast of the Lorne/James Street intersection, which is not considered to be part of the current project.

**(x) Project-Related Documents**

In addition to location plans and drawings, the following project related document is appended:

- Environmental Management Plan. (Appendix B).

Since most of the land has not been previously developed, it does not appear that the project would have been subject to any prior EIA assessments.

### **3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT**

#### **(i) Physical and Natural Features:**

The stormwater mitigation upgrades and their respective locations are shown on the Drawings presented in Appendix A. The site is located in the low-lying flood plains in the Lorne Street area of Sackville.

In general, the site has varying gradients, as it traverses natural undeveloped lands and several existing streets over the course of close to two (2) kilometres. Along the new ditch route, the existing grade ranges from roughly 4.5m to 10.5m in elevation. In general, the site drains toward the Tantramar River to its east. Due to the relatively flat topography in this area, it is anticipated that the ditches will have a grade of roughly 0.15%.

Flood mapping available through GeoNB confirms that the project area is located within the flood plain, and the extents of the GeoNB-predicted 1 in 100 year flood zone are indicated on Drawing 16196-3P-C202. Given the geographical setting of the land, the proposed project activities will not interfere with current or future use of the property. Because the site is located in the flood plain, neither residential or commercial development is currently feasible due to major restrictions on development imposed by the current the Municipal plan and Zoning by-law.

As noted in the previous sections, the proposed stormwater mitigation project is in the vicinity of the Tantramar River, and includes some work within a provincially significant wetland, according to GeoNB's delineation.

The project is located in an area where all lots are connected to the municipal water system; therefore, all nearby properties are expected to be connected to the Town's water distribution network. Thus, no private domestic wells are expected to be within a 500m radius of the project. Furthermore, the project area is not located near the Town's municipal water source or within its protected area.

As previously noted, the land affected is within the floodplain and currently holds water during flooding events. To help restrict flooding to these specific locations, the land will be re-shaped and the proper structures added to control the rate at which water flows in and out of each pond, and native organic materials will be re-used on the ponds' bottom and side slopes. Therefore, the project will not result in a significant change in land use. Therefore, it is anticipated that the resulting vegetation and habitats (once established) will be similar to the existing, and that the net loss of current environmental features in the area will be minimized.

Where the upgrade consists of the enhancement of the existing stormwater network, it is not anticipated that the project will result in significant changes to air quality or noise levels,

although there could be some temporary changes to noise levels and air quality during construction.

If required, an evaluation will be conducted to determine the influence of the proposed project on the fish, wildlife, and species at risk in the area.

**(ii) Cultural Features:**

There are no known major recreational activities or tourism operations within the project area, which is in an industrial area of Town, and no known heritage features.

**(iii) Existing and Historic Land Uses:**

As previously noted, the site is located in the southeast region of Sackville which is located in a flood plain. The site is located in the low-lying portion of the town that is protected by the existing dyke system, and therefore may have been used in the past as agricultural lands. However, due to the ground profile of the land and its location within the flood plain, it is mainly undevelopable land that has been in a natural state for many years.

There are both residences and commercial properties in the surrounding area, although much of the project will occur off-road. The project will enhance the current land use as well as protect the adjacent downtown infrastructure from flooding damage.

There are no signs of contamination or use as a dump site on this land.

## **4.0 SUMMARY OF ENVIRONMENTAL IMPACTS**

The purpose of this project is to protect current infrastructure and properties from flooding as well as to enhance the existing stormwater collection system along the low-lying flood plain of Sackville. This will improve the local environment and provide safe and secure passage through the downtown area. This section will summarize the possible impacts of the proposed work, and Section 5.0 will describe the measures that will be applied to eliminate or mitigate any impacts. The attribute headings as contained in Appendix "B" of the EIA Guide will be used here. Only possible issues will be listed.

In order to expedite the review of information presented in this Registration Document, the proposed mitigation measures 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 soil is exposed and pipelines are being installed.

Mitigation: 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 used.

Mitigation: Work will be limited to within the 8:00 AM to 5:00 PM (winter) and 7:00 AM to 7:00 PM (spring/summer) normal working hours where practical.

#### 4.2 Biology and Ecology:

- a) Vegetative cover: the existing vegetation will be stripped to permit the construction of the new retention ponds and ditching.

Mitigation: Vegetative cover must be removed to permit construction; stripped materials will be stock-piled and re-used on-site for restoration where possible and exposed soils will be seeded to restore growth and prevent soil erosion.

- b) Work is required within a Provincially Significant Wetland. Potential impacts would be damage to wetland vegetation, silt runoff from the site while under construction, and contamination of the soil.

Mitigation: Work within the wetland is to be carried out during the winter months, when the ground is typically frozen, to limit the disturbance in the wetland. Any heavy equipment required for work within the wetland and its 30 m buffer must travel over heavy mats to further minimize impacts on the wetland.

Runoff protection including silt fencing will be placed and maintained during construction. Any soil areas will have cover re-established prior to silt fencing being removed. Material stripped from the site will be re-used where practical to avoid importing invasive plant species to the site, and the contractor will be required to wash equipment prior to it being brought to the site. All environmental mitigation strategies included in the EMP will be adhered to.

#### 4.3 Physical:

- a) Typical construction noise is expected during construction.

Mitigation: Work will be limited to within the 8:00 AM to 5:00 PM (winter) and 7:00 AM to 7:00 PM (spring/summer) normal working hours where practical.

b) Surface water quantity:

Mitigation: Appropriate sedimentation and erosion control will be installed prior to construction. This includes silt fencing and properly managing water resulting from any required site de-watering operations. It is anticipated that pumped water will be directed to a sedimentation basin to allow only the clear water to be discharged to the environment. In addition, TSS levels will be monitored during construction.

c) Soil moisture/drainage: the surface drainage pattern will be modified.

Mitigation: The project will have a positive impact on site drainage, and surface runoff will continue to be directed to its present receiving watercourse, the Tantrammar River.

d) Groundwater quality would be affected in the event of a spill from construction machinery.

Mitigation: The Contractor will be responsible to have on site the proper leak and spill prevention equipment prior to commencement of any work. In the event of a spill, the contaminated soils will be removed from the site and disposed of at an approved decontamination site. No re-fueling will be conducted within the 30m buffer zone and all other precautions necessary, as outlined in the EMP, will be followed.

4.4 Community Structure:

a) Land Use Compatibility: the proposed project is compatible with current land uses since the land has remained undeveloped for many years. The Town will discuss zoning implications with the Planning Commission.

b) Temporary barriers to vehicular/pedestrian movement: Culvert installation may 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) 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 excavated materials. Any traffic delays originating from construction activities will

be temporary in nature and signage and flagging will be in accordance with NB DTI requirements.

- d) Access to other properties will not be impacted by the project except as already noted under 4.4(b), Temporary Barriers. There are no long-term or permanent interruptions to access.

#### 4.5 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 area by maintaining the stormwater system integrity, mitigate flooding and protecting development within the affected area.

## 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. In addition, the following general mitigation measures are presented:

- Disturbed areas will be reinstated as soon as is practical, silt fences and other erosion protection devices around excavations and stockpiles will also be used until the fully grown.
- Stripping activities and construction limits will be limited to the necessary area to complete the work.
- The stipulations of the WAWA permit will be adhered to, for work within the wetland and buffer zone.
- The construction will be inspected by the Town's engineering consultant.
- The Contractor will be responsible to have on site the proper leak and spill prevention equipment prior to commencement of any work. In the event of a spill, the contaminated soils will be removed from the site and disposed of at an approved decontamination site.
- Prior to conducting work on the aboiteau structure, a temporary coffer dam and shoring will be in place to minimize site disturbance.

The net loss of wetland habitat is considered to be minimal since the existing land functions will not be significantly altered following the completion of the project, and the portion of the PSW impacted by the aboiteau construction (total footprint of +/- 0.36 Ha within the 30m wetland buffer) will be restored following construction by re-using native organic materials. However, it is noted that the Town is currently planning to work with Ducks Unlimited Canada to construct a third pond, which will be designed as a freshwater marsh and will result in the reclamation of historical wetland environment. This future pond will be carried out as a future

project and is located as indicated on Drawing 16196-3P-C203 (Storm Water Retention Pond No.1, Future Phase). At present, the intent is to carry out the construction of Pond No.1 in 2018, in conjunction with celebration of the waterfowl park's 30<sup>th</sup> anniversary. This will allow for the new Pond No.1 to be in operation in 2019, when maintenance and upgrades are required on the 30-year old existing waterfowl park, ensuring that there is a portion of the park's wetland environment in operation at all times.

It is proposed that if wetland compensation is required, the construction of this new freshwater marsh environment could be considered as a form of compensation for wetland areas impacted by the Phase 2 stormwater mitigation project.

## **6.0 PUBLIC INVOLVEMENT**

At this time, an initial public meeting has already taken place to present the Phase 1 project to the public, and give an overview of the overall project scope. The intent is to hold two (2) additional meetings prior to proceeding with the Phase 2 construction, as follows:

A public information session will be held in the near future to provide the public with an update on the progress of Phase 1, as well as to present the selected concept for Phase 2 including a summary of the preliminary design process used in selecting the final concept.

An additional meeting is tentatively planned for +/- October 2017, in order to provide the public with further details on Phase 2, specific to the stormwater mitigation plans. The meeting will be publicly advertised in advance and direct communication will be made as required with specific groups and individuals, to enable any interested parties to attend. The public involvement will be done as required under Appendix "C" of the *"Guide to Environmental Impact Assessment in New Brunswick"*.

## **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 NBDELG.
- Watercourse and Wetland Alteration Permit from the NBDELG for the work in the PSW Buffer zone.

## 8.0 FUNDING

Funding has been secured by the Clean Water and Wastewater Fund this project.

## 9.0 SIGNATURE

Sept 8/17  
Date

Dwayne Acton  
Dwayne Acton, P.Eng.  
Town Engineer  
Town of Sackville