

**Environmental Impact Assessment (EIA)  
Registration and Water Supply Source  
Assessment (WSSA): Irishview Estates  
Subdivision, Irishview Estates Ltd.,  
Irishtown, New Brunswick**



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Project No. 121811426

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## **1.0 INTRODUCTION**

This document is an Environmental Impact Assessment (“EIA”) Registration for the Irishview Estates Subdivision (“the Project”) proposed by Irishview Estates Ltd. (“the Proponent”) in Moncton, New Brunswick.

The Project is an “undertaking” under the New Brunswick *Environmental Impact Assessment (EIA) Regulation–Clean Environment Act*, under item (t) of Schedule “A” (“*all major residential developments outside incorporated areas*”), and therefore must be registered under Section 5(1) of the EIA Regulation. A review of the Project-related information will be coordinated by the New Brunswick Department of Environment and Local Government (NBDELG).

Because of the water requirements for the Project, a Water Supply Source Assessment (WSSA) is required as part of the EIA review of the Project. NBDELG have provided Water Supply Source Assessment (WSSA) guidelines as part of the EIA process and this includes the evaluation of the water use for large subdivision developments. The goal of the WSSA process is to demonstrate that the local aquifer has the capacity to provide the development with a sufficient amount of potable drinking water without adversely affecting the water supplies of existing users. This must include an assessment of the cumulative effects of the entire development. Stantec has prepared a WSSA Initial Application in accordance with the WSSA guidelines (NBDELG 2014) for submission as part of this EIA Registration.

### **1.1 NAME OF THE UNDERTAKING AND PROJECT PROPONENT**

The Project title and details of the Project Proponent are as follows. Additional information requirements are provided in Appendix A.

<b>Project Title:</b>	Irishview Estates Subdivision
<b>Project Proponent:</b>	Irishview Estates Ltd. 31 Cooke Drive, Moncton NB E1E 0J1
<b>Principal Contact Person for the Purposes of Environmental Impact Assessment:</b>	Mr. Reginald Petitpas, President Tel: (506) 381-2226 Email: <a href="mailto:regpetitpas@gmail.com">regpetitpas@gmail.com</a>
<b>Property Ownership:</b>	PID 00931428 – Irishview Estates Ltd. PID 00931402 and 70294921 – Privately owned; a down-payment has been made by Irishview Estates and Closing is scheduled for April 2015.

### **1.2 PURPOSE/RATIONALE/NEED FOR THE PROJECT**

The purpose of the Project is to provide residential development lots in a subdivision for single family dwellings. The amount of economic activity developing in the Moncton area has resulted in a significant growth in population in the Greater Moncton Area since 2001, above the provincial average, with approximately 65% of the population of Westmorland and Albert counties living in the Greater Moncton Area (specifically in the cities of Moncton, Dieppe and Riverview). The Project will help meet

the growing demand for housing in the Greater Moncton Area. This Project is intended to expand on the existing Irishview Farms Subdivision currently under development, which was previously approved under the *Community Planning Act*.

### **1.3 PROJECT OVERVIEW**

The Project involves the construction of the Irishview Estates Subdivision (the "Subdivision") to be carried out in the next 10 years in 10 phases (referred to herein as "Phases", or as "Phase 1" to "Phase 10"). The Project is located off Route 115 (Irishtown Road), approximately 2.2 km north of the Moncton City limits, north of Moncton (Figure 1.1). All components of the Project will be located on land currently owned and/or currently in negotiation for acquisition by the Proponent.

The Project proposed by the Proponent consists of the development of the Subdivision in 10 Phases, including the development of up to 185 residential lots for private sale, with associated roads, electrical and telecommunications transmission lines, and stormwater ditches. The Project will see the construction of 83 residential single detached lots in Phases 1 through 5 of development over the next five years, and up to 102 lots in Phases 5 through 10, to be completed in the following five years. Upon completion, the Subdivision will span an area of approximately 113 hectares.

Each residential lot will be equal or greater than 0.4 hectare (1 acre) in size and will be privately serviced by a groundwater well and conventional septic tank and disposal field. The residential lots will be sold individually to prospective residential customers for development of residential dwellings for private ownership. Thus, once a residential lot has been sold to a private buyer, it ceases to be the responsibility of the Proponent.

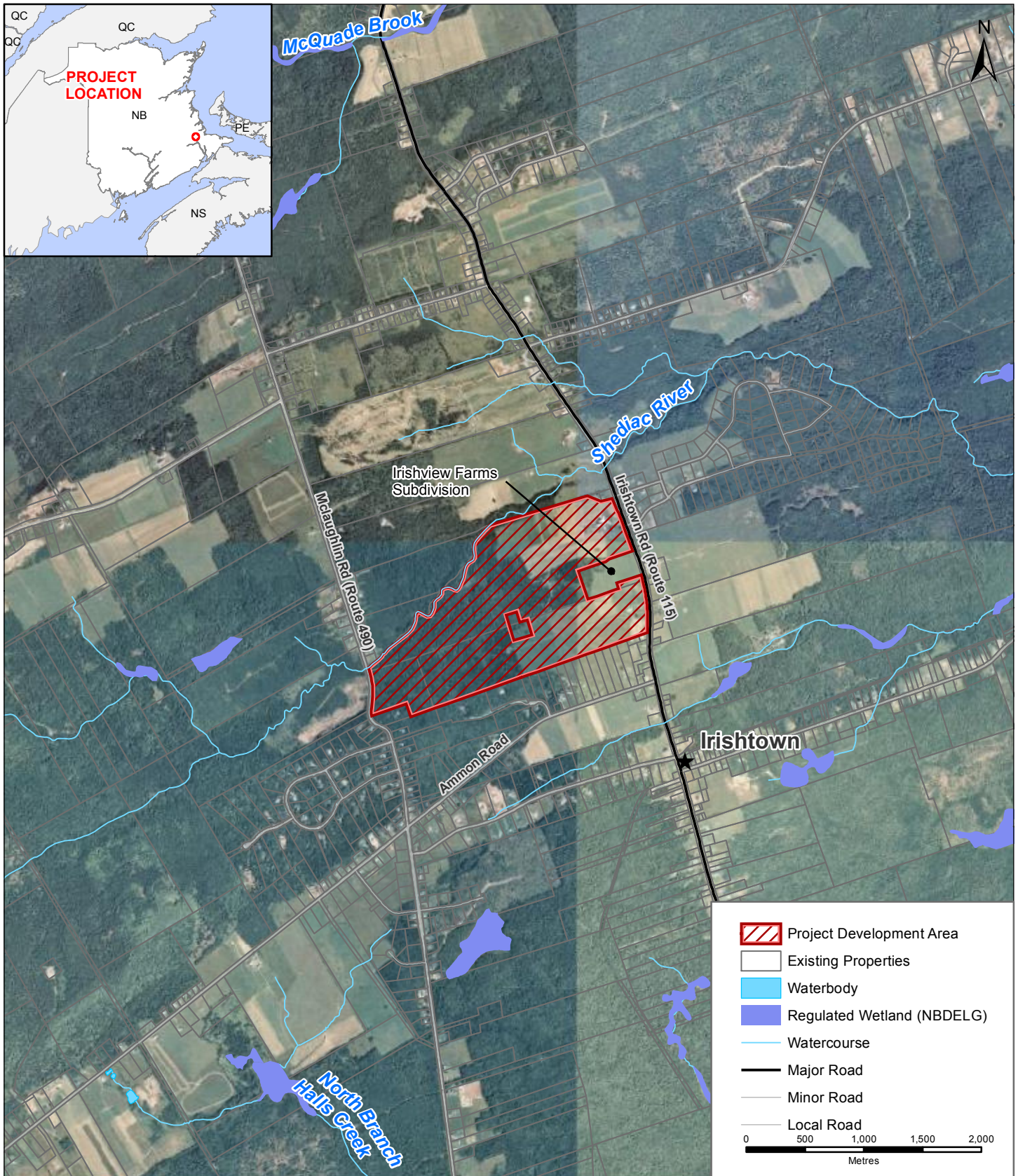
### **1.4 CONTEXT**

#### **1.4.1 Provincial Environmental Assessment**

The Project is an "undertaking" pursuant the New Brunswick *Environmental Impact Assessment Regulation—Clean Environment Act*, under item (t) of Schedule "A" of the Regulation ("all major residential developments outside incorporated areas"). As such, at minimum it requires registration and review ("Determination Review") under the EIA Regulation.

Water to supply the dwellings will be obtained from groundwater wells, as there is no municipal water service in this area. As required by the EIA Regulation, a WSSA is required for major residential developments outside incorporated areas. Stantec has completed a WSSA Initial Application for submission to NBDELG as part of this EIA Registration (Appendix B).





NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<h3>Project Location</h3> <p>Irishview Estates: EIA Registration, Irishtown, N.B.</p>	Scale:	Project No.:	Data Sources:	Fig. No.:	
	1:45,000	121811426	NBDNR SNB	1.1	
Client:	Date:	Dwn. By:	Appd. By:	Imagery:	
Irishview Estates	10/06/2014	MC	DM	SNB	





## **1.4.2 Federal Environmental Assessment**

The Project does not trigger the need for an environmental assessment under the *Canadian Environmental Assessment Act, 2012 (CEAA, 2012)* as there are no aspects of the Project that are listed in the *Regulations Designating Physical Activities* under *CEAA, 2012*, nor is it located on federal land. As such, the requirements of *CEAA, 2012* do not appear to apply to the Project and a federal environmental assessment is therefore not believed to be required.

## **1.5 FUNDING**

The Project will be funded entirely by the Proponent.

## **1.6 REGULATORY PURPOSE, AND ORGANIZATION OF THIS EIA REGISTRATION**

This EIA Registration document has been prepared to meet the requirements of Section 5(1) of the *New Brunswick Environmental Impact Assessment Regulation–Clean Environment Act (“EIA Regulation”)*. The information provided in this document is intended to satisfy the requirements for registration of the Project such that a Determination Review of the Project can be conducted.

This EIA Registration is organized to reflect the process by which the assessment has been conducted. It is organized into seven major sections, as follows.

- Section 1.0 provides background information on the Project including the purpose for the Project and the regulatory context.
- Section 2.0 provides a description of the Project as currently conceived. The location, scope, and schedule of the Project are described.
- Section 3.0 provides an overview of the existing environment in which the Project is located, and discusses the potential environmental effects and proposed mitigation for the Project.
- Section 4.0 discusses potential accidents, malfunctions, and unplanned events.
- Section 5.0 presents the public involvement proposed for the Project.
- Section 6.0 presents closing remarks for the report.
- Section 7.0 provides references cited in the report.

Additional information requirements are provided in Appendix A, and the WSSA Initial Application is provided in Appendix B.

## 2.0 PROJECT DESCRIPTION

A description of the Project as currently conceived at this planning stage is provided in this section.

### 2.1 GEOGRAPHIC LOCATION

The Project is located along Irishtown Road in Irishtown, Westmorland County, New Brunswick, on land identified as Parcel Identifier (PID) Nos. 00931428, 00931402 and a portion of 70294921 (as shown in Figure 1.1). The approximate geographic coordinates of the centre of the Project are 46.1994562 E, -64.7969743 N. This Project is adjacent to the existing Irishview Farms Subdivision, and will serve to expand that existing approved subdivision.

The Project is located 2.2 km north of the Moncton City limits on land zoned as “unincorporated” under the purview of the Southeast Regional Service Commission. Since the Project is located outside of an incorporated municipality, local governance is by the Regional Service Commission–District 7 (Southeast Regional Service Commission), serving the Beaubassin, Tantramar and Westmorland-Albert regions.

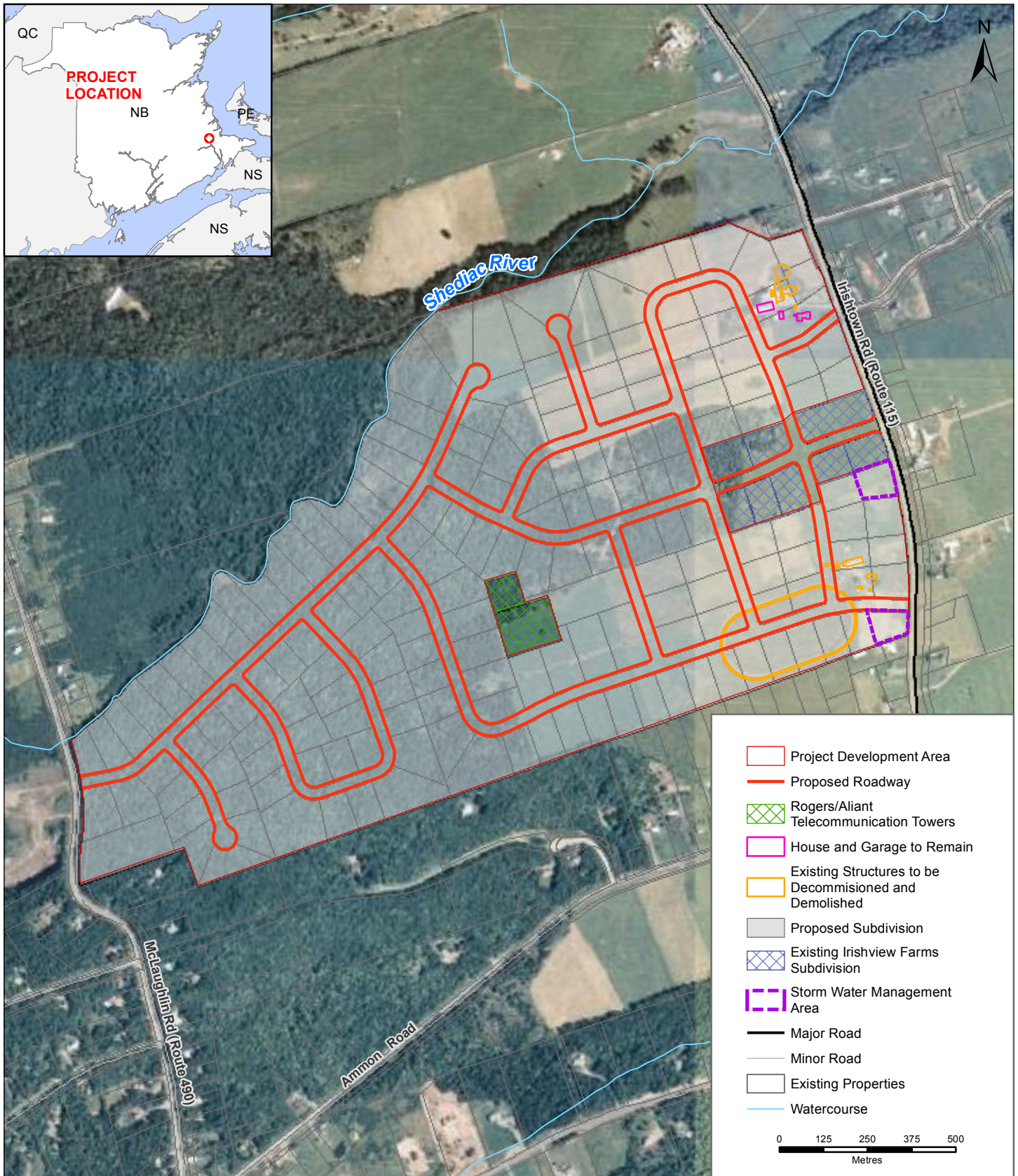
### 2.2 PROJECT SUMMARY

The Project involves the construction of the Irishview Estates Subdivision, to be carried out in phases over the next 10 years. It is an expansion of an existing approved eight-lot subdivision named Irishview Farms, recently approved by the Southeast Regional Service Commission.

The Project Development Area (PDA) is defined as the maximum extent of the physical area of disturbance of the Project, and consists of the 185 subdivision lots that make up Phases 1 through 10 of the expansion, along with the associated roads, stormwater ditches and electrical and telecommunications transmission lines, as shown on Figure 2.1. The total area of the PDA is 113 ha.

Figure 2.2 shows the location of each of the development Phases for the Project. It is anticipated that Phases 1 through 5 will be completed within the next five years, and that Phases 6 through 10 will be completed in the following five years. Further breakdown of the development including the number of subdivision lots and length of road in each Phase is provided below.

- **Phase 1** – consists of 7 lots located along the west side Irishtown Road (on PIDs 00931428 and 00931402) and will not require the construction of any roads.
- **Phase 2** – consists of 27 lots and will include the construction of 989 m of roadways.
- **Phases 3 and 4** – will consist of 9 and 20 lots, respectively, and see the construction of approximately 1,152 m of roads with an entrance to McLaughlin Road. These phases will connect to Phase 2 of the subdivision and the existing Irishview farms subdivision, thereby connecting McLaughlin Road to Irishtown Road.
- **Phase 5** – will consist of 20 lots and see the construction of 625 m of new roads.

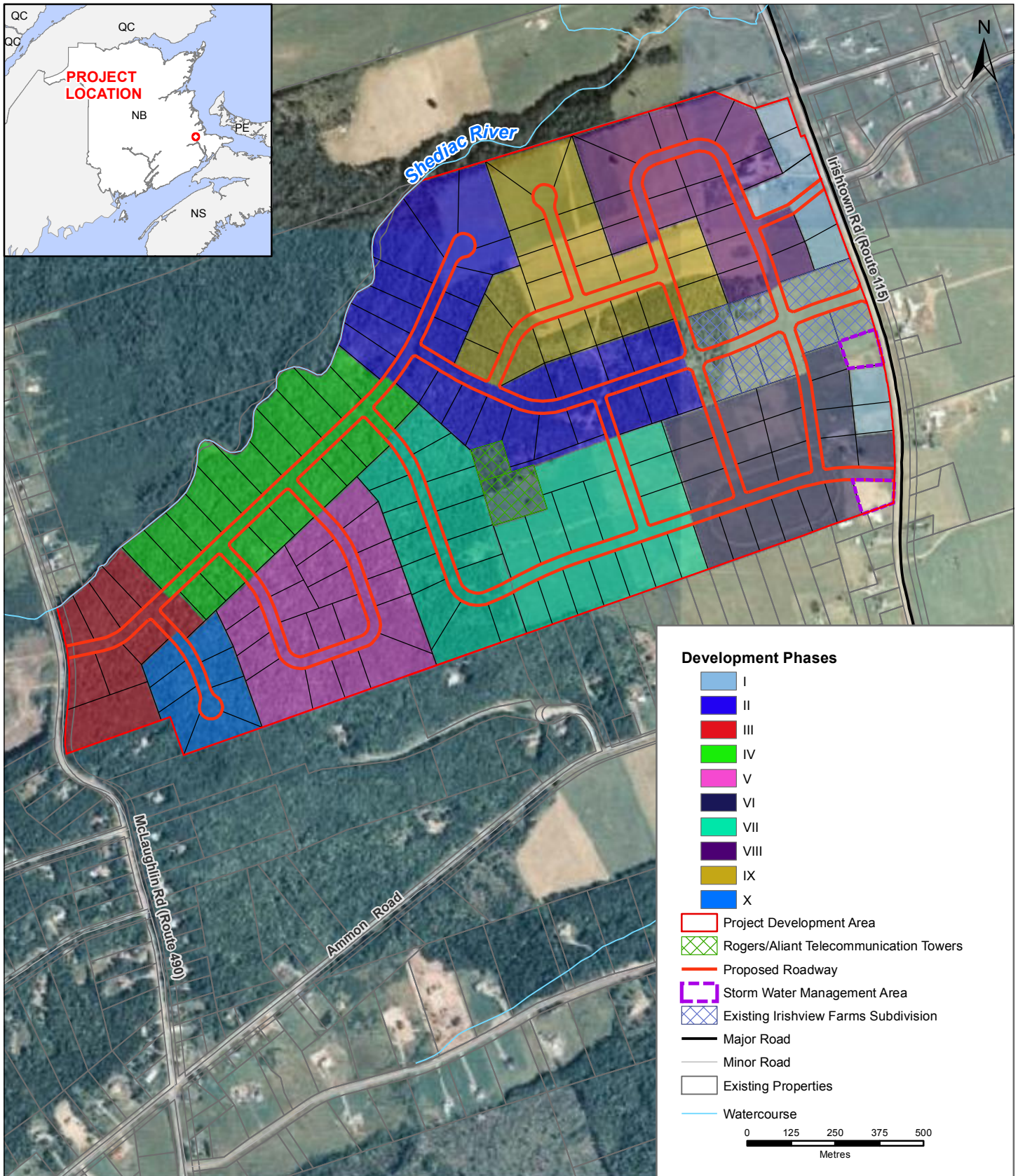


NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<h2>Proposed Subdivision</h2> <p>Irishview Estates: EIA Registration, Irishtown, N.B.</p>	Scale: 1:15,000		Project No.: 121811426		Data Sources: NBDNR SNB		Fig. No.:	
	Date: (dd/mm/yyyy) 10/06/2014	Dwn. By: MC	Appd. By: DM		Imagery: SNB		<h1>2.1</h1>	
Client: Irishview Estates								







NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<h2 style="margin: 0;">Project Phases</h2> <p style="margin: 0;">Irishview Estates: EIA Registration, Irishtown, N.B.</p>	Scale: 1:15,000		Project No.: 121811426		Data Sources: NBDNR SNB		Fig. No.:	
	Date: (dd/mm/yyyy) 08/12/2014		Dwn. By: MC		Appd. By: DM		<h1 style="margin: 0;">2.2</h1>	
Client: Irishview Estates								





- **Phases 6 and 7** – will consist of 19 and 29 lots, respectively, and see the construction of a total of 1,393 m of roads. Phase 6 will include a new road entrance onto Irishtown Road.
- **Phases 8 and 9** – will consist of 17 and 22 lots, respectively, and see the construction of a total of 1,213 m of roads. Phase 8 will include a new road entrance onto Irishtown Road.
- **Phase 10** – will consist of the construction of 7 lots in the southwest corner of the subdivision, and includes the construction of 169 m of roads.

The Proponent is sensitive to the need of environmental protection as part of the Project and will include a restrictive covenant on development within the 30 m buffer to the Shediac River on affected lots in their sales agreement. The lots located along this stream have been planned to be sufficiently large in size to accommodate development (e.g. residence, well and septic) outside of the 30 m buffer zone.

Two existing telecommunications towers, located centrally on the site, will be accessed via easements along the property boundary of two lots from the proposed roadways. The exact location of the new easements has yet to be determined, but will be included on future survey plans.

## **2.3 PROJECT COMPONENTS AND ACTIVITIES**

This section describes the components and activities required for, and associated with, the Project.

The Project components include:

- infrastructure (access roads, ditches, and electrical and telecommunications transmission lines); and
- residential lots.

The Project activities associated with construction of these and other Project Components ("Construction") are described further in Section 2.3.1. Project activities associated with the operation of the subdivision ("Operation") are described further in Section 2.3.2.

Access to the subdivision will be from the existing Irishtown Road and McLaughlin Road. The two entrances onto Irishtown Road and one entrance onto McLaughlin Road are subject to approval from the New Brunswick Department of Transportation and Infrastructure (NBDTI). It is the responsibility of the Proponent to submit and file a tentative subdivision plan to the Regional Service Commission, District 7, and NBDTI to get approval to proceed with the street construction for each Phase of the development. These approvals will be sought in parallel to the EIA review.

### **2.3.1 Construction**

#### **2.3.1.1 Site Preparation**

The activities associated with the site preparation include the following:

- Surveying; and

- clearing and grubbing.

Surveying occurs prior to the clearing and includes the cutting and marking of a centerline and cross-sections offsets wide enough to provide unobstructed sight lines. The Project involves subdivision of land that is forested and/or cleared fields used for agricultural purposes. The average size of the lots will be +/- 0.4 hectares (+/- 1 acre).

Subdivision of lots will require a survey of lot dimensions to meet the minimum required size as set out under the *Community Planning Act* for unserviced water and sewer needs. Each of the unserviced (individual water and sewer systems) lots will have a minimum area of 4000 m<sup>2</sup> for a single family dwelling, with a minimum lot width of 54 m and a depth of 38 m (NBENV 2007). Surveying of lots to meet provincial regulations will be carried out by a qualified surveying firm to demarcate setback distances from roadways and individual lot frontage, width and depth, as well as all other subdivision requirements. Lots adjacent to the Shediac River will be sufficiently large to accommodate the minimum size requirements outside of the 30 m buffer area. On lots where the Shediac River differs from what was originally anticipated, changes to the subdivision plan will be made based on the location of the watercourse, as surveyed in the field.

Street right-of-ways (RoWs) will be a minimum of 24 m wide, accounting for a minimum surface width of 10 m for the roadways which will be designed and built in accordance with NBDTI policies and procedures including "A Guide to the Minimum Standards for the Construction of Subdivision Roads & Streets" (NBDOT 2003).

Clearing and grubbing will be limited to the proposed future roads within the PDA. Clearing and grubbing boundaries will be delineated by visual flagging of the limits of the road RoWs during surveying. The width of the future roads will be determined by the NBDTI policies and procedures including NBDOT (2003). Merchantable timber from clearing activities will be sold.

Grubbing for the construction of the access roads involves the removal of the surficial organic material and unsuitable materials, debris, and soil above the sub-soil layer. Bulldozers will remove the organic materials from the underlying sub-soil and stockpile them for resale. This will include topsoil, which will be managed in accordance with the *Topsoil Preservation Act*. Other grubbed material will be hauled off-site for disposal in accordance with New Brunswick regulations.

Clearing and grubbing activities will be conducted outside of the peak nesting period for migratory birds (*i.e.*, outside of the period of May 1 to August 31) to avoid direct harm to birds during this season. Protected bird species include those protected under the federal *Migratory Birds Convention Act* (MBCA) and/or the *Species at Risk Act* (SARA), and under the New Brunswick *Species at Risk Act* (NB SARA). The Project will comply with the MBCA for all Project-related activities and during all Project Phases.

### **2.3.1.2 Road Construction**

Following grubbing, the sub-base for the access roads will be prepared by levelling the terrain through excavation and placement of fill materials, grading of the roadbed, and installation of culverts and a storm water drainage system (ditches). These construction activities will be accomplished using bulldozers, excavators, graders, loaders and haulers. The sub-base is the stable material upon which the roads will be built to provide the required strength and stability to support site activities. If the exposed soils are a suitable material to be used as a sub-base, these soils will be compacted until firm and stable. Soils that are not suitable for the roadway sub-base will be excavated and replaced with suitable soil fill from existing approved borrow sources, spreading it in layers of specified thickness and compacting each lift to the specified density. Compaction will be accomplished using rollers and/or soil compactors. Borrow material will be free of contaminants and approved for suitability for the Project by the NBDTI prior to use.

Roadways will be designed and built in accordance with NBDTI policies and procedures including NBDOT (2003), and will be chip-sealed.

### **2.3.1.3 Installation of Utility Lines and Other Services**

Electrical and communication (phone, cable, internet) utilities to service each lot will be installed alongside the newly constructed roadways once complete. Electrical and communications lines will extend services from the existing distribution networks located in adjacent to the PDA (e.g. Irishview Farms, Irishtown Road and McLaughlin Road), and will be installed by the utility companies owning the infrastructure (i.e., NB Power, Bell Aliant, etc.). All electrical and telecommunications infrastructure will be above-ground and will consist of conventional utility poles and wires.

There will be no construction of water and sewer service lines for this Subdivision, as each lot will have its own well to supply water and on-site septic system for sewage management. The installation of individual on-site wells and septic systems will be the responsibility of the future landowners who purchase the individual lots. It is anticipated that wells and septic systems will be installed properly by contractors licensed to operate in the Province of New Brunswick.

### **2.3.1.4 Stormwater Management**

Environmental protection procedures and measures will be employed throughout the life of the proposed Project. The Proponent will be responsible for installation, maintenance, inspection and monitoring of environmental protection control measures during Construction. Environmental protection during the development of individual lots will be the responsibility of the future landowners who purchase the lots.

Prior to and during ground disturbance, erosion and sediment control measures such as silt fencing and hay bales will be installed along drainage channels and watercourse buffers for the Project. Appropriate mitigation measures will be employed to minimize the potential for adverse environmental effects to the receiving waters downstream of and outside of the PDA.

As soon as feasible following the construction of the road base and grading activities, vegetation will be established along the roadside RoWs and ditches. Re-vegetation efforts will consider plants and seed mixes that are not invasive to the local plant community. Hydroseeding or other re-vegetation techniques will be used to landscape along roadside RoWs. Landscaping of individual residential lots will be the responsibility of the future landowners that have purchased such lots.

Stormwater planning includes designed stormwater retention ponds, ditches along roadways and culverts for road crossings as required, while respecting natural flow directions. Drainage infrastructure will be sized to accommodate anticipated heavy precipitation events, will be designed to be protective of the receiving environment and in accordance with "A Guide to the Minimum Standards for the Construction of Subdivision Roads & Streets" (NBDOT 2003) as they relate to unincorporated areas. It is the responsibility of the Proponent to submit and file a tentative subdivision plan to NBDTI for approval, which will include drainage infrastructure.

### **2.3.1.5 Construction Waste**

Solid wastes generated from construction activities will be managed by a private solid waste contractor. Construction wastes will be disposed of at an approved disposal site as the responsibility of construction contractors. This arrangement will be in place for all Phases of the subdivision development.

Contractors will bring their own water for drinking and minor hand washing needs. Portable washroom facilities (*i.e.*, "johnny-on-the-spot") will be used to manage sewage generated during subdivision construction activities.

## **2.3.2 Operation**

Operation (including maintenance) of subdivided lots will be the responsibility of the Proponent until such time that the lots are sold to individual landowners. The sale of lots will commence when all subdivision and Construction activities have been completed in each phase, in compliance with appropriate regulations, permits and approvals. Once individual lots have been purchased by private residential landowners, they will cease to be the responsibility of the Proponent.

### **2.3.2.1 Water**

A WSSA Initial Application has been submitted to assess groundwater conditions to determine if the local aquifer has appropriate capacity and quality to sustain the proposed development. This application is provided in Appendix B.

### **2.3.2.2 Waste Management**

#### **2.3.2.2.1 Septic**

Lots will be size in accordance with Project components and will include land surveying of lots to meet minimum size requirements for rural residential development in accordance with applicable provincial health, subdivision and other regulations. The minimum lot size specified by the Province is to allow for

the required separation distances between potable water sources on each lot and its location of septic tanks and septic fields. The *General Regulations 88-200* under the *Health Act* of New Brunswick will be strictly followed.

#### **2.3.2.2 Solid Waste**

Domestic solid waste generated by the residents will be subject to the Greater Moncton weekly curbside pickup program.

#### **2.3.2.3 Stormwater Management**

Stormwater runoff will be managed using a series of drainage ditches and culverts to capture runoff from overland flow, which will be directed to stormwater retention ponds following the natural topography of the site. Drainage ditches will be located along the constructed roadways and will be designed in accordance with "A Guide to the Minimum Standards for the Construction of Subdivision Roads & Streets" (NBDOT 2003) as they relate to unincorporated areas. Upon completion of the construction of stormwater drainage infrastructure for each Phase of development, it is anticipated that NBDTI will subsequently take over the responsibility of operation and maintenance of this infrastructure.

#### **2.3.2.4 Roadway Operation and Maintenance**

Upon completion of road construction for each Phase of development, it is anticipated that NBDTI will subsequently take over the responsibility of operation and maintenance of the Subdivision roadways.

Road maintenance activities in relation to level of service, comfort, and safety for the existing part of the Subdivision is the responsibility of NBDTI since the Subdivision roadways are built to meet the minimum standards required by the Province in accordance to "A Guide to the Minimum Standards for the Construction of Subdivision Roads & Streets" (NBDOT 2003). Maintenance activities for roads typically take place during the summer months. The rate of degradation of the pavement surface will be determined by the volume of traffic, certain vehicle characteristics (e.g., radial tires), structure and quality of pavement. The repair of the asphalt-concrete surface may involve excavation or removal of the existing pavement and subgrade, patching and leveling, grading, localized pavement repair, and line repainting. Disruption to the public from these repairs would be temporary and infrequent in nature.

It is anticipated that NBDTI (or designate) would be responsible for snow removal from roadways during the winter time.

The Operation and Maintenance of other infrastructure (e.g., electrical and telecommunications transmission lines) will be the responsibility of the owning utility companies.

### **2.3.3 Decommissioning and Abandonment**

As residential lots and associated dwellings will be owned by private landowners over the foreseeable future, Decommissioning and Abandonment of the Project is not envisioned. Should individual dwellings or other public infrastructure (e.g., roads, electrical and telecommunications transmission lines) be decommissioned or abandoned in the future, such activities would be the responsibility of those individual landowners, NBDTI, or utility companies



## 3.0 SUMMARY OF EXISTING CONDITIONS AND POTENTIAL ENVIRONMENTAL INTERACTIONS

This Section provides general background information on the physical setting for the Project. Following this, the potential interactions between the Project and environmental components are identified, including a description of the existing environment and mitigation that is planned to avoid or reduce potential interactions between the Project and the environment. For convenience, environmental issues of concern are grouped into “valued environmental components” (abbreviated “VECs”) to facilitate the assessment.

### 3.1 GENERAL ENVIRONMENTAL SETTING

#### 3.1.1 Physical Setting

The Project is located on three parcels of land on Irishtown Road in Irishtown, NB (PIDs 00931428, 00931402 and 70294921) and the PDA measures a total of approximately 113 hectares in size. Irishtown is located in Westmorland County in southeastern New Brunswick, approximately 1.5 km north of the Moncton City limits.

#### 3.1.2 Topography and Drainage

The topographic information, as shown in Figure 3.1 (scale of 1:15,000), indicates that the Project is located down-gradient from land to its southwest. General topographic slope in the area of the existing Irishview Farms Subdivision consists of an elevation at approximately 80 m near the intersection of Irishview Street and Irishtown Road. From this intersection, the ground slopes moderately towards the west-southwest (*i.e.*, land for Phase 1, 2 and 3 of the Project) and then slopes down towards the Shediac River (*i.e.*, land for Phase 4 of the Project).

#### 3.1.3 Surficial Geology

The Project area is located on a local topographic high in the Caledonia Highlands physiographic region. The ground surface elevations range from 75 to 140 metres above sea level (m ASL).

The surficial geology of the Project area consists of morainal sediments and exposed bedrock. The morainal sediments, where present, consist of loamy lodgment till, minor ablation till, silt, sand gravel and rubble from the Late Wisconsin glaciations (Rampton 1984). The sediments are reported to vary in thickness from less than 0.5 m to 3 m, where present. The exposed bedrock, where present at surface, is described below.

#### 3.1.4 Bedrock Geology

The bedrock of the Project area is part of the Stilesville Formation in the south, and the Memramcook Formation in the north (Johnson and St. Peter 2008). The Stilesville Formation is a member of the Sussex Group, and consists of Early Carboniferous aged sedimentary rock: red-brown to grey-green, angular to subrounded polymictic breccia and conglomerate. The Memramcook Formation is a member of the

Horton Group, and consists of Late Devonian to Early Carboniferous grey to reddish grey medium to very coarse-grained arenaceous sandstone, with mirror conglomerate. As with all sedimentary rocks, there is the potential for the presence of fossils in these formations.

The polymictic breccia and conglomerate of the Stilesville Formation are clastic sedimentary rock that are composed of broken fragments of other minerals or rock that are cemented together. Breccia are composed of a fine-grained matrix while conglomerate is composed of a coarse-grained matrix. The Stilesville formation is composed of granite, diorite, schists, feldspar and commonly recycled Carboniferous sandstone.

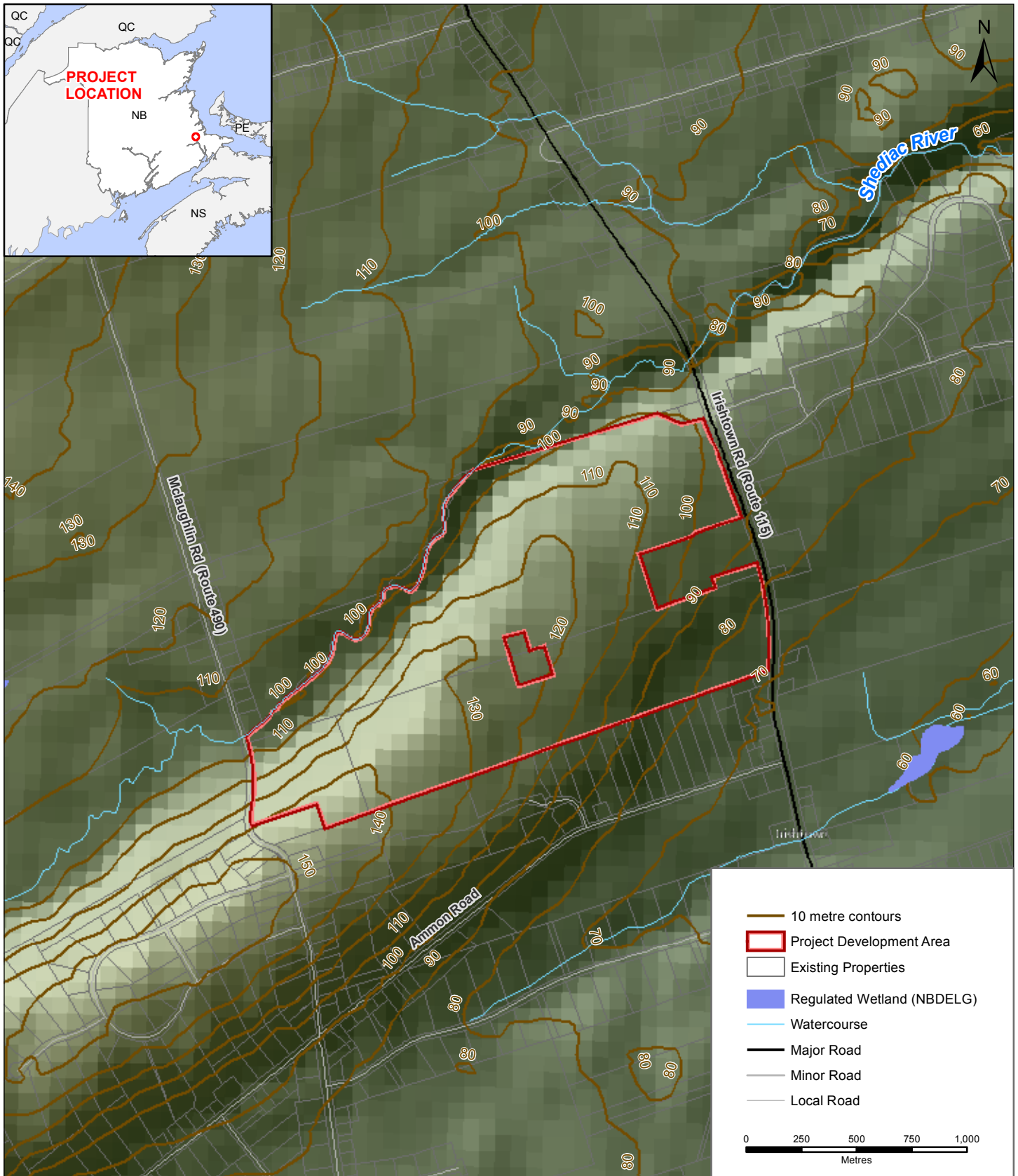
Arenites, including the arenaceous sandstones of the Memramcook Formation are also clastic sedimentary rocks that mainly form by the erosion of other rocks or the re-deposition of turbid sand. Arenites are composed of sand-sized particles are in the range from 0.0625 mm to 2 mm.

Potential environmental effects to the geological environment are not expected to occur. The proposed development will involve minimum excavation and leveling for future roadways with minor filling and grading in preparation for construction. Blasting is not anticipated for street construction. No excavation and leveling will be carried out on future lots by the developer, as excavation and leveling for home building is the responsibility of individual lot owners.

### **3.2 METHODOLOGY FOR ASSESSING POTENTIAL INTERACTIONS BETWEEN THE PROJECT AND THE ENVIRONMENT**

To determine the potential for, and nature of interactions between the Project and the environment, a qualitative rating system is employed. Each interaction between the Project and each Valued Environmental Component (VEC) is rated based on the following ranking system, with a ranking assigned for each interaction based on the professional judgment and experience of the study team, as follows.

- 0 = There is no interaction between the Project and the VEC.
- 1 = Interaction occurs; however, based on past experience and professional judgment the interaction would not result in a significant environmental effect, even without mitigation; or interaction would not be significant due to application of codified environmental protection practices and/or permit conditions. The potential interactions between the Project and the VEC are briefly discussed but are not considered substantively in this report.
- 2 = Interaction may, even with codified mitigation and/or permit conditions, result in a potentially significant environmental effect and/or is important to regulatory and/or public interest. Potential environmental interactions are considered further and in more detail in this report.



NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<h2>Project Topography</h2> <p>Irishview Estates: EIA Registration, Irishtown, N.B.</p>	Scale:	Project No.:	Data Sources:	Fig. No.:	
	1:24,000	121811426	NBDNR SNB ESRI	3.1	
Client:	Irishview Estates	Date: (dd/mm/yyyy)	Dwn. By:	Appd. By:	
		10/06/2014	MC	DM	



Where a potentially significant Project-VEC interaction (*i.e.*, a ranking of 2) may occur, further discussion is provided to evaluate the environmental interaction more thoroughly. Where no interaction or no significant interaction is identified (*i.e.*, a ranking of 0 or 1), the rationale of why no interaction exists, or why a limited interaction can be adequately mitigated without resulting in significant environmental effects, is provided.

The evaluation is tabular for ease in evaluation and communication.

### 3.3 POTENTIAL INTERACTIONS BETWEEN THE ENVIRONMENT AND THE PROJECT

#### 3.3.1 Project-Environment Interactions

Based on the Project Description and the methodology described briefly above, the potential interactions between the Project and the environment are summarized in Table 3.1.

**Table 3.1 Potential Interactions of the Project with the Environment**

Project Phase, or Activities/Physical Works Associated with the Project	Atmospheric Environment	Water Resources	Aquatic Environment	Terrestrial Environment	Heritage Resources	Aboriginal Land and Resource Use	Socio-Economic Environment	Land Use	Road Transportation	Accidents, Malfunctions, and Unplanned Events
Construction	1	0	1	1	1	0	1	1	1	1
Operation	1	1	1	1	0	0	0	0	1	1
<b>KEY</b>										
0 = No interaction. The environmental effects are not considered further in this report.										
1 = Interaction occurs; however, based on past experience and professional judgment the interaction would not result in a significant environmental effect, even without mitigation; or interaction would not be significant due to application of codified environmental protection practices that are known to effectively mitigate the predicted environmental effects. The environmental effects are briefly discussed but are not considered substantively in this report.										
2 = Interaction could result in an environmental effect of concern even with mitigation; the potential environmental effects are considered further in this report.										

Further discussion of these potential interactions between the Project and each applicable VEC is provided in the sub-sections that follow.

#### 3.3.2 Atmospheric Environment

##### 3.3.2.1 Existing Conditions

The existing conditions with respect to the Atmospheric Environment are characterized through a brief overview of existing ambient air and sound quality. An overview of these existing conditions is provided in the following sub-sections.

### 3.3.2.1.1 Air Quality

The Project will be constructed and operated off of Irishtown Road in Irishtown, NB, within a rural residential area, outside the incorporated limits of the City of Moncton. There is no major industry in Greater Moncton Area; however, several smaller facilities such as a brewery, two hospitals, and several asphalt plants include combustion stacks that release measurable amounts of air contaminants. Emissions from consumer products such as home heating systems and motor vehicles, as well as air contaminants transported by prevailing winds from the northeastern United States to New Brunswick are likely to be the predominant contributors to ambient air contaminant concentrations in the Greater Moncton Area.

Air contaminant emissions from New Brunswick sources, and ambient air quality data from the nearest ambient monitoring stations, were reviewed to characterize existing Air Quality conditions in the area. The nearest ambient air quality station to the Project is a station operated by the Province of New Brunswick at the Highfield Street water pumping station, located approximately 14 km from the Project. The air contaminants monitored at this station are carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), and particulate matter less than 2.5 microns in diameter (PM<sub>2.5</sub>). For 2011, the most recent year for which results are publicly available, there were no exceedances of ambient air quality objectives at the Moncton air quality monitoring station (NBDELG 2013). Carbon monoxide and nitrogen dioxide concentrations were well below their respective objectives. PM<sub>2.5</sub> concentrations are generally low (approximately 15 µg/m<sup>3</sup>), but reached a maximum concentration of 23 µg/m<sup>3</sup>; the PM<sub>2.5</sub> objective is 30 µg/m<sup>3</sup>. Ozone concentrations varied throughout the year, and reached a maximum of approximately 62 parts per billion (ppb), compared to the 1-hour objective of 80 ppb (NBDELG 2013). Based on the available data, existing air quality in the Greater Moncton Area is considered good.

### 3.3.2.1.2 Sound Quality

Sound quality in the outdoor environment can be influenced by a variety of natural and anthropogenic factors. Sound quality may be affected by stationary and mobile sources, such as noise from industrial equipment, vehicle traffic, and the operation of heavy equipment. Sound propagation and the resulting potential environmental effects of sound on nearby receptors are influenced by weather conditions such as temperature, humidity, wind direction, and wind speed. Local topographical features such as relatively flat terrain allow sound to propagate, whereas hills and building structures cause sound to attenuate (*i.e.*, a decrease in energy). There may also be sound reflections if the atmospheric mixing height is low (a few hundred metres), or if solid structures are located close to sources of sound emissions.

Sound quality in the Project area is expected to be mainly influenced by vehicle traffic, as Irishtown Road is a moderately travelled roadway. Given that the neighbouring properties are residential properties near Irishtown Road (approximately 30 m from the Project and 15 m from Irishtown Road), the existing sound quality in the area is expected to be typical of a rural residential area. Ambient monitoring of sound quality has not been performed for this assessment, as there are no distinct noise sources in the area and the ambient sound levels should be consistent with typical rural residential noise levels. Although New Brunswick does not have a guideline on typical ambient sound levels, the Alberta



Energy Resources Conservation Board (ERCB) indicates that in rural residential areas with moderate traffic, the typical daytime ambient sound level is 50 dBA (ERCB 2007).

### **3.3.2.1.3 GHG Emissions and Climate**

The total annual greenhouse gas (GHG) emissions for New Brunswick in 2012, the most recent year for which data are available, was 16,400,000 tonnes of carbon dioxide equivalent (Environment Canada 2014a). The majority of the GHG emissions are from stationary fuel combustion, representing 57% of total emissions.

Environment Canada has compiled climate normals and extremes for Canadian climate stations with at least 15 years of data. There is an automated meteorological station at the Greater Moncton International Airport, which is approximately 7 km to the southeast.

Climate normals and extremes recorded at the Moncton weather station for 1981 to 2010 are available on-line at Environment Canada (2014b). A brief summary of the climate data is provided to help describe the general climate in the area (Environment Canada 2014b).

#### **Temperature**

According to the climate normals for Moncton, January is typically the coldest month with a daily mean temperature of -8.9°C. July is typically the hottest month with a mean daily temperature of 18.8°C. The extreme maximum and minimum temperatures recorded are 37.2°C and -32.2°C, recorded during the months of August and January, respectively (Environment Canada 2014b).

#### **Precipitation**

The average annual precipitation in Moncton is 876 mm. On average (1981-2010), October is the rainiest month, with average monthly precipitation of 112.1 mm, and January is the snowiest month on average with an average recorded monthly snowfall of 78 cm (Environment Canada 2014b).

#### **Wind**

The annual average wind speed is 16.8 km/hr, and the most frequent direction is from the southwest. On average, there are 23.6 days per year with winds greater than 52 km/hour (Environment Canada 2014b).

### **3.3.2.2 Potential Project-Environment Interactions**

Interactions between the Project and the Atmospheric Environment have been ranked as 1 in Table 3.1 for all Phases of the Project because of the potential for air contaminant (including dust), greenhouse gas (GHG) and sound emissions. It is expected that these interactions can be mitigated using standard practices as discussed in the following paragraphs.

During Construction, the Project requires the use of heavy equipment and trucks. Air contaminant, GHG and sound emissions will be released to the environment from the operation of heavy equipment associated with the Project (e.g., emissions from the combustion of fuel, dust from vehicle movements and noise from equipment including from movements and engine noise).

During Construction, typically the main concern in relation to air quality is dust. To mitigate dust, dust suppressant (water) will be applied to limit the generation of dust (if required). Further, earth moving activities may be reduced during dry periods with high winds to minimize the generation and off-site transport of dust. In the event that topsoil piles are maintained, the Proponent will re-vegetate the piles as soon as feasible to minimize dust generation. It is also noted that these activities are short term and will occur over a small area at any given time (approximately 113 ha, to be developed over approximately 10 years). Therefore, the potential environmental effects on air quality are not expected to be substantive.

Sound quality may be affected temporarily during Construction from the noise generated by construction equipment. However, this disturbance is expected to be intermittent and short-term for each Phase of development. Construction activities will take place during the daytime only and therefore there will be no effects on sound quality at night from the Project. The nearest residence to the Project may experience elevated noise levels on occasion; however, as the development is short term and moves farther from the nearest existing residences as it proceeds, it is not expected that Project-related sound emissions will cause substantive environmental effects at the nearest residences.

During Operation of the Project, sound levels in the vicinity of the Project are expected to be typical of a low-traffic residential route. The traffic would increase slowly on Irishtown Road (and McLaughlin Road to a lesser extent) as the development grows. Therefore, sound pressure levels from traffic would also increase slowly over time and should not cause substantive annoyance to existing residences.

Some minimal GHG emissions would occur from fossil fuel combustion during Construction. There is no anticipated effect of the Project on climate as GHG emissions from the Project would be very small during Construction and Operation in comparison to GHG releases for the Province of New Brunswick and even emissions from all sources in New Brunswick are not considered substantive enough to measurably contribute to climate change on a global scale.

Overall, Construction and Operation of the Project are not expected to substantially affect the Atmospheric Environment.

### **3.3.3 Water Resources**

Water resources include surface and groundwater sources that can be used as potable water, or for other residential, agricultural, commercial, or industrial purposes.

### **3.3.3.1 Existing Conditions**

Groundwater is used as the primary source of potable water for the current residents in the Irishtown area. The Project is not located within a Wellfield Protected Area, nor is it located in a Watershed Protected Area. The Project is located approximately 2.2 km north of the city limits for the City of Moncton. Municipal water service from the City of Moncton currently ends approximately 4 km south of the Project. No large industrial, agricultural or commercial water takings from groundwater or surface water are identified within 1 km of the Project (Jacques Whitford 2003).

A query of the New Brunswick Online Well Log System (NB OWLS; NBDELG 2014), which includes all water wells constructed beginning in 1994, shows that there are at least 75 water wells within a 1 km radius of the Project. The water wells have an average depth of 60.4 m, and are constructed in the bedrock. The average well yield from drillers' estimates is 73 L/min, ranging from 2.3 to 455 L/min. The average rate is more than sufficient to meet the average daily water demand for a four-person family (estimated to be 1,800 L/d, based on the assumed pumping rate of 450 L/person/d recommended in the WSSA guidelines).

Groundwater quality in the vicinity of the Project was characterized from the water quality data provided in the NB OWLS for water wells within 1 km of the Project. The groundwater is generally hard and alkaline with moderate to high total dissolved solids. A comparison of the water quality in the area to the Guidelines for Canadian Drinking Water Quality (GCDWQ; Health Canada 2012) shows that several wells exceed the GCDWQ for iron, manganese, and total dissolved solids. Other occasional exceedances of the GCDWQ include chloride, fluoride, and sodium. It should be noted that exceedances of iron and manganese are common throughout New Brunswick (NBENV 2008), as are elevated concentrations of chloride, fluoride, sodium and total dissolved solids in the Greater Moncton Area.

### **3.3.3.2 Potential Project-Environment Interactions**

Interactions between the Project and Water Resources have been ranked as 1 in Table 3.1 for all Phases of the Project. During Construction, the ground clearing activities as well as the construction of roads and ditches have the potential to alter drainage and groundwater recharge patterns, potentially altering groundwater availability. During Operation, the extraction of groundwater from individual water wells at each residence may alter groundwater availability to existing users. It is expected that these interactions can be mitigated using standard practices as discussed in the following paragraphs.

Construction activities will alter the drainage pattern in the subdivision, which may result in an increase in surface water runoff to ditches, and potentially reduce the groundwater infiltration under the relatively impervious surfaces of the roads installed for the Project. However, as the roads account for a small portion of the developed area (less than about 5%), this is not anticipated to result in any measurable changes to groundwater availability for existing users. The change in drainage patterns also has the potential to have a minor effect on the streamflow hydrographs in the Shediac River, and a tributary to the Shediac River in the vicinity of the Project. It is anticipated that the peak flow rates may increase slightly, although the average flow rates in these watercourses are expected to remain

unchanged. However, as there are no known surface water users of these features, any changes to the hydrographs would have no effect on the surface water resource for human use.

The Operation of the Project will include the installation of water wells at each lot within the Project developed by the future landowners. The Operation of these wells has the potential to drawdown the water table in the vicinity of the Project and may alter the ability of existing users to withdraw water from their wells. The potential for the interactions to result in decreased well yields depends on several factors including the hydraulic characteristics of the aquifer materials and the location and well construction for existing water well users. To assess this situation, a Hydrogeological Investigation will be conducted under the Provincial WSSA process (NBDELG 2014). An Initial Application to conduct this work is included in Appendix B. The nature of the potential interactions of the Project on existing groundwater users during Operation will be assessed as part of a pending WSSA Hydrogeological Investigation. Until further information is obtained as part of the WSSA process, the Project is assumed to not interact with Water Resources to the extent that surface water and groundwater availability and quality would be adversely affected in a substantive way.

### **3.3.4 Aquatic Environment**

The Aquatic Environment includes considerations of fish (including species at risk and species of conservation concern) and fish habitat (including water quality and habitat quality) in freshwater bodies.

#### **3.3.4.1 Existing Conditions**

Existing conditions in the Aquatic Environment in the area of the Project were determined based on a review of available information from New Brunswick Department of Natural Resources (NBDNR) and Service New Brunswick (SNB) mapping and a 2009 ecosystem overview of the Shediac Bay watershed published by Fisheries and Oceans Canada (DFO)(2009). The Project is located within the Shediac River Watershed, adjacent to the Shediac River, which flows into the Shediac Bay. The Shediac River watershed has a total area of approximately 219 km<sup>2</sup>. There are no other mapped watercourses that interact with the PDA. Further, based on a review of NBDNR depth-to-water-table modelling and aerial imagery, it is unlikely that there are any unmapped watercourses within the PDA.

The Shediac River is a third order watercourse, one of the two main watercourses in the Shediac Bay Watershed, and flows eastward into Shediac Bay. The river is on average 2 m to 4 m wide, with a variation of fine sand to silt substrate and with gravel and small rubble within the riffle areas (DFO 2009). The Shediac River originates approximately 10 km southwest of the PDA. The Project is located along 1.25 km of shoreline on the Shediac River.

An overview of the general water quality characteristics in the Shediac River collected by the Shediac Bay Watershed Association from 1999 to 2002 as part of a Water Classification program is presented in Table 3.2 below (DFO 2009). Water quality is suitable for warm and cold water fish species according to guidelines established by the Canadian Council of Ministers of the Environment (CCME). The lower ranges of dissolved oxygen (DO) are 0.8 mg/L lower than the recommended guideline of 9.5 for early life stages of cold water species and the pH is within the recommended range of 6.5 to 9.0

(CCME 2007). There are no specific guidelines for background levels of Total Suspended Solids (TSS), and response to TSS can vary by species and through acclimation to local conditions (Waters 1995)

**Table 3.2 Overview of the General Water Quality Characteristics of the Shediac River (1999-2002) (DFO 2009)**

	Mean	Range
Dissolved Oxygen (DO) (mg/L ±SD)	13.04 ± 1.81	8.70 – 14.70
Total Suspended Solids (TSS) (mg/L ±SD)	<15.43 ± 4.00	<15.00 – 60.00
pH	7.75 ± 0.37	6.89 – 8.58
<b>Note:</b> SD = standard deviation.		

Particular attention must be paid to species at risk (SAR) and species of conservation concern (SOCC) which are specifically protected by federal and provincial legislation. Generally, these laws prohibit the destruction, disturbance, or other interference with SAR or their critical habitat. The Federal *Species at Risk Act (SARA)* is co-administered by Environment Canada, Parks Canada, and DFO; and the New Brunswick *Species at Risk Act (NB SARA)* is administered by NBDNR. SOCC are often species on the verge of becoming SAR and are therefore 'listed' in federal and provincial legislation as well as in non-regulatory lists maintained by independent assessment agencies and committees, such as the Atlantic Canada Conservation Data Centre (AC CDC) or the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

The AC CDC did not return any records of aquatic SAR or SOCC within 5 km of the Project. The AC CDC uses data and expertise for ranking species rarity or conservation status. Provincial rarity rankings range from S1 ("Extremely Rare"), to S5 ("Abundant"). Species occurrences that are individually tracked due to conservation concern in the context of this EIA Registration are those with rankings of S3 ("Uncommon") or rarer (AC CDC 2014).

The 2009 ecosystem overview of the Shediac Bay Watershed reported the presence of Atlantic salmon, American eel, striped bass, and brook floater (a freshwater mussel species) in the Shediac River (DFO 2009). Atlantic salmon–Gaspé-Southern Gulf of St. Lawrence population (*Salmo salar* pop. 12) is listed as "Special Concern" by COSEWIC and has a provincial rank of S2 ("Rare"). Striped bass (*Morone saxatilis*), which is listed as "Threatened" by COSEWIC, and has a provincial rank of S2 ("Rare"). American eel is listed as "Threatened" by COSEWIC and has a provincial rank of S5. Brook floater (*Alasmidonta varicose*) is listed as "Special Concern" by COSEWIC and has a provincial rank of S1S2 (between "Extremely Rare" and "Rare").

### 3.3.4.2 Potential Project-Environment Interactions

Interactions between the Project and the Aquatic Environment have been ranked as 1 in Table 3.1 for all Phases of the Project because of the potential for interaction between the Project and the Shediac River. It is expected that these interactions can be mitigated using standard practices as discussed in the following paragraphs.



During Construction, a 30 m buffer will be established from the high water mark of the Shediac River. No construction activities will be carried out within this buffer unless acting under the authority of a permit issued under the *Watercourse and Wetland Alteration Regulation—Clean Water Act*. Regardless, no in-water work will be conducted. In addition, no fueling of equipment or fuel storage will occur within this 30 m buffer in accordance with the NBDTI Environmental Management Manual (NBDOT 2010).

Erosion and sedimentation control measures including silt fencing will be installed to prevent sediment from entering the watercourse buffer, or the direct discharge of suspended sediments into the Shediac River. These erosion and sedimentation control mitigation measures will be implemented in accordance with “A Guide to the Minimum Standards for the Construction of Subdivision Roads & Streets” (NBDOT 2003) as they relate to unincorporated areas. It is the responsibility of the Proponent to submit and file a tentative subdivision plan to NBDTI for approval, which will include stormwater management considerations.

Prior to the construction of the surface water drainage system, applicable permits (e.g., Watercourse and Wetland Alteration (WAWA) permit) will be obtained should they be required if drainage to the Shediac River is intended. The surface water drainage system will direct surface water runoff along the natural flow regime to stormwater retention ponds through a series of ditches and culverts, with a portion eventually entering the Shediac River.

The lots adjacent to the Shediac River within the PDA have been sized to incorporate a 30 m buffer from the high water mark of the river, and the buffer will be protected by a restrictive covenant. During Operation any activities carried out within the 30 m buffer by private landowners may require a WAWA permit.

Overall, the Project is not expected to interact in a substantive way with the Aquatic Environment.

### **3.3.5 Terrestrial Environment**

The Terrestrial Environment refers to the existing terrestrial (*i.e.*, land based) wildlife and wildlife habitat, vegetation (*i.e.*, vascular plants), and wetlands located within the PDA of the Project. Wildlife and plant Species of Conservation Concern (SOCC) include SAR, which are those species listed as “Extirpated”, “Endangered”, or “Threatened” by the federal SARA or NB SARA. In addition, SOCC have been defined to include species ranked S1 (“Extremely rare”) or S2 (“Rare”) in New Brunswick by the AC CDC and those ranked “At risk”, “May be at risk” or “Sensitive” in New Brunswick by the Canadian Endangered Species Conservation Council (CESCC).

Wetlands are defined as land with a water table at, near, or above the land's surface, or which is saturated for a long enough time to promote wetland or aquatic processes. These processes result in the occurrence of hydric soils, hydrophytic vegetation, and signs of biological activities adapted to a wet environment.

### 3.3.5.1 Terrestrial Regulatory Requirements

#### 3.3.5.1.1 Wildlife and Wildlife Habitat

Wildlife species of management concern (SOCC) include SAR, as defined above, which are listed under SARA and NB SARA. The purposes of SARA and NB SARA are to prevent indigenous species from becoming extirpated or extinct, to provide for the recovery of endangered or threatened species, and to encourage the management of species to prevent them from becoming at risk. Both SARA and NB SARA prohibit listed wildlife species or their critical habitat from being destroyed, disturbed, or otherwise interfered with. Effects on SAR and their habitats are regulated, though there are no legislated setback distances. Non-SAR SOCC are not afforded direct protection by either federal or provincial legislation, but are included in this VEC as a conservation measure, reflecting observations and trends in their provincial or national population status.

Migratory birds are protected under the federal *Migratory Birds Convention Act* (MBCA). The MCBA and regulations protect birds listed in the Canadian Wildlife Service Occasional Paper No. 1 "Birds Protected in Canada under the *Migratory Birds Convention Act*." The act and regulations state that no person may disturb, destroy, or take/have in their possession a migratory bird (alive or dead), or its nest or eggs, except under authority of a permit.

#### 3.3.5.1.2 Vegetation

Plant SOCC, as described above, include plant SAR, which are listed under SARA or NB SARA, and non-SAR SOCC.

#### 3.3.5.1.3 Wetlands

In New Brunswick, wetland protection is legislated by the *New Brunswick Clean Water Act*, and the associated *Watercourse and Wetland Alteration Regulation* ("WAWA Regulation"), as well as the *New Brunswick Clean Environment Act* and the associated EIA Regulation which are guided by the *New Brunswick Wetlands Conservation Policy* (GNB 2002), and regulated by the NBDELG. The focus of the policy is to protect and maintain the function of wetlands, specifically Provincially Significant Wetlands (PSWs), which are defined as wetlands with provincial, national, or international importance, and are designated by NBDELG. PSWs include coastal marshes and other wetlands that may contain species protected by the federal or provincial SARAs, have important hydrological, social, or ecological functions, or have been designated and are protected by other concerned agencies. In addition, the WAWA Regulation requires a permit for many activities proposed within 30 m of wetlands 1 ha or greater in size, or contiguous with a watercourse. The current approach applies the relevant regulations to those wetlands that are shown on the GeoNB website (GNB 2013; "regulated wetlands", which represent approximately 6 % of the total area of New Brunswick.

Although the above described legislation is currently in place, the application of this legislation is under a process of refinement by NBDELG. In February of 2012, a document entitled *Long-Term Wetland Management Strategy* was released by the New Brunswick Minister of Environment (GNB 2012). The details of how this strategy will be implemented are currently under review by NBDELG.

Proponents must show that they have followed a stepwise set of protective measures for wetlands shown on the GeoNB website (“regulated wetlands”) for their development to be approved by NBDELG. These protective measures are as follows:

- if possible, wetlands must be avoided;
- if avoidance is not possible, mitigation must be attempted to reduce potential Project-wetland interactions; and
- if wetlands must be altered, compensation is typically required at a ratio of 2:1 (*i.e.*, twice the area altered must be restored) for any wetlands mapped by GeoNB and regulated by NBDELG.

These measures are intended primarily for non-PSWs, as alterations to PSWs are not permitted except in special circumstances (GNB 2012).

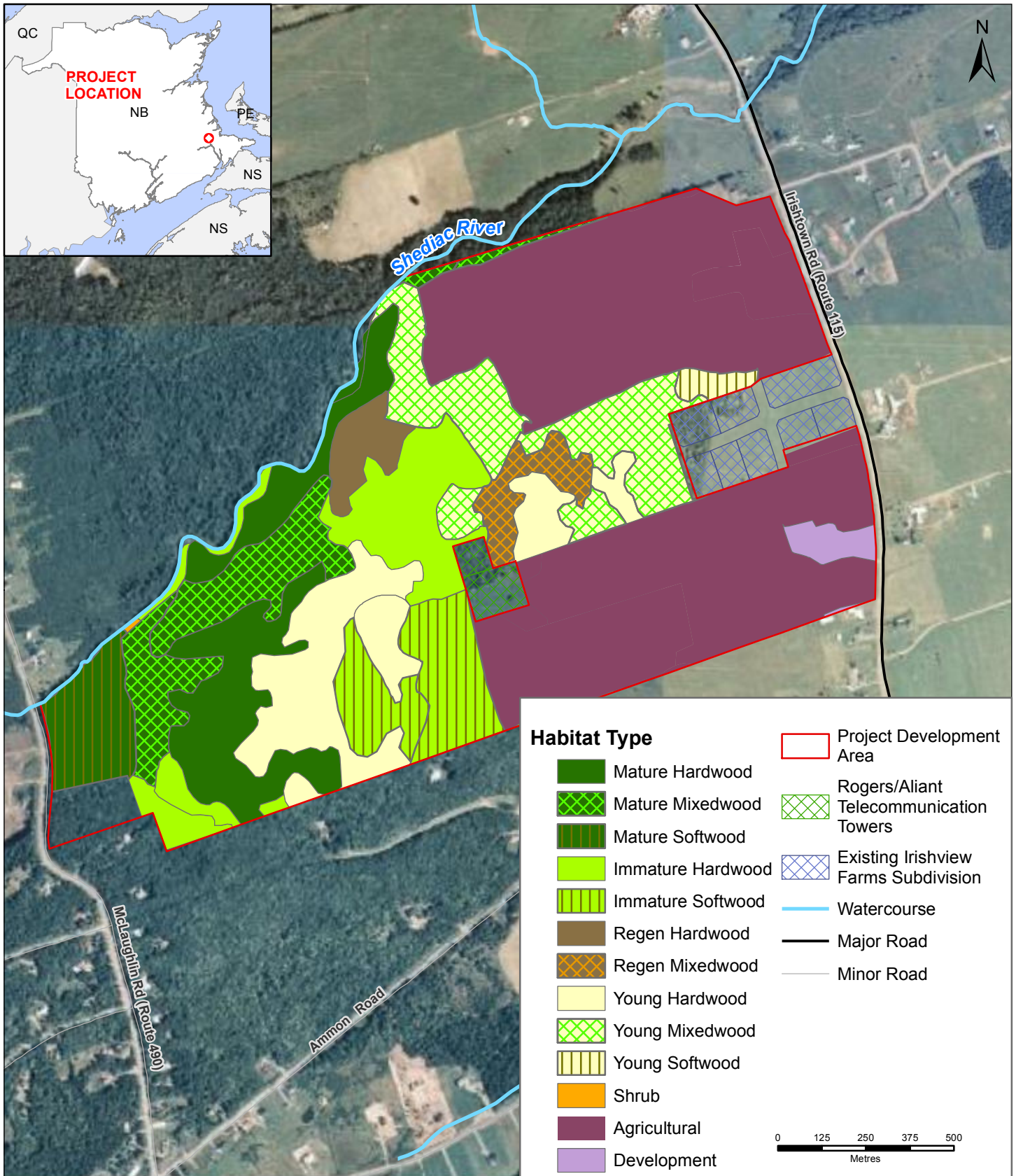
### **3.3.5.2 Existing Conditions**

Existing conditions for the Terrestrial Environment within and surrounding the PDA are determined using data obtained in support of this Project, including the NBDNR forest inventory data, GeoNB wetland data, and AC CDC species observations.

#### **3.3.5.2.1 Habitat**

The Project is located along Shediac River, north of Moncton, and is within the Kouchibouguac Ecodistrict of the Eastern Lowlands Ecoregion (Zelazny 2003). To characterize the habitat within the PDA, NBDNR forest and land use data were used to create habitat categories. Habitat within the PDA is displayed in Figure 3.2 (Habitat), and described in Table 3.3.

The most common habitat type in the PDA is agricultural land, which occupies much of the eastern side of the PDA. Mature hardwood, young hardwood, and young mixedwood stands are also common. The mature forest is concentrated on the western side of the PDA, while the middle portion is in various stages of regeneration. None of the vegetation communities crossed by the PDA are unusual or uncommon in the area surrounding the PDA, with the possible exception of the riparian habitat along the Shediac River, which, while not rare, is less common than the adjacent upland communities. This riparian habitat will be protected by a restrictive covenant on the 30 m buffer along the watercourse. There are no Ecologically Sensitive Areas (ESAs) within the PDA or the surrounding vicinity.



NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<b>Habitat</b>  Irishview Estates: EIA Registration, Irishtown, N.B.	Scale:	Project No.:	Data Sources:	Fig. No.:	
	1:15,000	121811426	NBDNR SNB	3.2	
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**Table 3.3 Habitat within the PDA**

Habitat Type	Description	Area (ha)
Agriculture (AGR)	Fallow pasture and crop land.	47.0
Developed (DEV)	Roadways and housing.	1.2
Shrub (SHR)	Upland areas dominated by shrubs such as speckled alder and grey birch.	0.1
Regenerating Hardwood (RHW)	Recently harvested upland forest dominated by regenerating hardwood species such as white birch and trembling aspen.	2.0
Regenerating Mixedwood (RMW)	Recently harvested upland forest dominated by a mix of regenerating hardwood and softwood species.	2.3
Young Hardwood (YSW)	Upland forest dominated by a mix of young tolerant and intolerant hardwood species, including white birch, sugar maple, red maple, and trembling aspen.	10.6
Young Mixedwood (YSW)	Upland forest dominated by a mix of young hardwood and softwood species, including white spruce, white birch, balsam fir, and tolerant hardwood species.	10.3
Young Softwood (YSW)	Upland forest dominated by young white spruce.	0.9
Immature Hardwood (IHW)	Upland forest dominated by immature hardwood species such as red maple, sugar maple, and trembling aspen.	9.0
Immature Softwood (ISW)	Upland forest dominated by immature softwood species such as white spruce and balsam fir.	6.7
Mature Hardwood (MHW)	Upland forest dominated by mature hardwood species such as red maple, sugar maple, and trembling aspen.	11.3
Mature Mixedwood (MMW)	Upland forest dominated by a mix of mature hardwood and softwood species such as red maple, balsam fir, white spruce, white birch, and eastern hemlock.	7.9
Mature Softwood (MSW)	Upland forest dominated by mature softwood species such as balsam fir and eastern hemlock.	3.9
<b>Total</b>		<b>113.2</b>

### 3.3.5.2.2 Wildlife

There are likely to be a wide variety of wildlife species including resident and migratory birds, large and small mammals, amphibians, reptiles and other species that are common throughout the landscape of the region. However there is no potential for a significant effect on widely abundant species from this proposed development so this review of wildlife potentially occurring within the PDA will focus on SOCC for which there are known records in the vicinity or have reasonable potential to occur on the site. This section summarizes information of known local occurrences SOCC from NBDNR, AC CDC, and the Maritimes Breeding Bird Atlas (MBBA). No SOCC have been recorded within the PDA, but those species that have been recorded within a 5 km radius of the Project are discussed below, by taxonomic group.

#### Invertebrates

While numerous species of invertebrates would occur within the PDA, there are only two records of invertebrate SOCC for the area. Records from AC CDC indicate the possible presence of early hairstreak (*Erora laeta*) and Henry's elfin (*Callophrys henrici*) within 5 km of the PDA.

Early hairstreak (*Erora laeta*, S1/"May be at risk") is a relatively small butterfly with a wingspan of 21-24 mm. The underside of the wings is a jade green colour with a jagged orange line in the centre and the upper side of the wings is dark blue with a black border in the female and dark grey with a blue mark on the hindwing in the male. Early hairstreak is associated with large beech-dominated forests, as the larvae of this species are known to eat the fruit of American beech (*Fagus grandifolia*) and beaked hazelnut (*Corylus cornuta*) (CBIF 2002a). American beech is not reported within the PDA (NBDNR 2014). Beaked hazelnut may occur in the PDA, as it is a common species in the shrub layer of many forest types, but it is equally likely to occur in surrounding areas. Early hairstreak was observed approximately 3.7 km southwest of the PDA, but is unlikely to occur within the PDA.

Henry's elfin (*Callophrys henrici*, S2/"Secure") has colourful wings that are blue near the body, and are yellowish brown, reddish brown, and grey on the outer half. The wingspan is from 20-25 mm. Henry's elfin is typically observed in open hardwood stands, but can occasionally be seen in pine-dominated forests, and their larvae exist on the flowers and fruits of fleshy fruit-bearing plants such as blueberries (*Vaccinium* spp.) (CBIF 2002b). Hardwood forests exist in the PDA, but are not limiting within the surrounding landscape. Henry's elfin was observed on a woods road north of Ammon Road, approximately 2 km southwest of the PDA.

### Herpetiles

There are no AC CDC records of herpetile SOCC within 5 km of the PDA; however, there are records for two SOCC within the Shediac Bay Watershed (DFO 2009) that could occur in or near the PDA associated with the adjacent Shediac River. Common snapping turtle (*Chelydra serpentina*) is listed as S4/"Secure" by AC CDC, but is also listed as "Special Concern" under both SARA and NB SARA, and prefers slow moving freshwater streams with dense vegetation and soft substrate (COSEWIC 2008). The adjacent aquatic habitat in Shediac River may be suitable for this species.

Likewise, the wood turtle (*Glyptemys insculpta*) is listed as S3/"At risk" by AC CDC, is also listed as "Threatened" under both SARA and NB SARA, is known to occur in Shediac River watershed and may use habitat in Shediac River, adjacent to and within the PDA. This species is known to forage for food in terrestrial habitat in the vicinity of watercourses that provide suitable nesting and overwintering habitats.

### Mammals

The habitat within the PDA likely supports a variety of mammal species that are common to the area. However, the AC CDC reports only one mammal SOCC record within 5 km of the PDA, which is for the eastern cougar (*Puma concolor*). This species was previously listed as "Endangered" under the former New Brunswick *Endangered Species Act* (NB ESA), but has no status under NB SARA, which replaced NB ESA. The AC CDC and COSEWIC report that there is insufficient data, and that the status of this species in New Brunswick is unknown. It is generally accepted that there is no native breeding population of eastern cougar in New Brunswick.

While there are no records within 5 km of the PDA, there is some potential for the occurrence of three bat species to occur, which are listed as “Endangered” under COSEWIC and NB SARA. These species are: little brown myotis (also known as little brown bat, *Myotis lucifugus*), northern myotis (*Myotis septentrionalis*), and tri-colored bat (*Perimyotis subflavus*). Their endangered listing is a result of a recent, catastrophic decline in resident populations, resulting from the effects of White-Nose Syndrome, caused by a fungal infection (Forbes 2012a, 2012b).

While it is likely that the two myotis species used the habitat within the PDA prior to 2011, it is less likely now. The tri-colored bat has always been understood to be rare in New Brunswick and may now be extirpated. Because the resident New Brunswick bat population is estimated to have declined by more than 90% since 2011, it is unlikely these species are using the PDA. There are no caves within the vicinity of the PDA suspected of historically supporting overwintering bat populations (McAlpine 1983; Arsenault *et al.* 1997).

### **Avifauna**

No SOCC avifauna species have been recorded within the PDA. Those species with records within 5 km of the PDA are summarized Table 3.4. Thirteen of those species are considered to have moderate potential to be found in the PDA and are discussed below.

**Table 3.4 Avifauna SOCC Recorded in the PDA or Surrounding Area**

Common Name	Scientific Name	SARA/ COSEWIC Status	NB SARA Status	AC CDC S-Rank	CESSC Rank	Likely Present in PDA?	Comment
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Not At Risk	Endangered	S3B	At risk	Moderate for foraging	May nest in tall trees along Shediac River, but no known nests in the area.
Bank Swallow	<i>Riparia riparia</i>	Threatened (COSEWIC only)		S3B	Sensitive	Moderate	May nest and forage along Shediac River.
Barn Swallow	<i>Hirundo rustica</i>	Threatened	Threatened	S3B	Sensitive	Moderate	May nest in barns in PDA and forage in open area and riparian habitat along Shediac River.
Bobolink	<i>Dolichonyx oryzivorus</i>	Threatened	Threatened	S3B	Sensitive	Moderate	May nest and forage in agricultural habitat in PDA.
Canada Warbler	<i>Wilsonia canadensis</i>	Threatened	Threatened	S3S4B	At risk	Moderate	May nest and forage in riparian habitat along Shediac River.
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>			S3S4B	Sensitive	Low	No apparent preferred nesting habitat in PDA, but may use for foraging.
Common Nighthawk	<i>Chordeiles minor</i>	Threatened	Threatened	S3B	At risk	Moderate	May nest and forage in agricultural habitat in PDA.
Eastern Kingbird	<i>Tyrannus tyrannus</i>			S4B	Sensitive	Moderate	May nest and forage in a variety of habitats in PDA, primarily agricultural and riparian.
Eastern Meadowlark	<i>Sturnella magna</i>	Threatened (COSEWIC only)	Threatened	S1S2B	May be at risk	Moderate	May nest and forage in agricultural habitat in PDA.
Eastern Wood-Pewee	<i>Contopus virens</i>	Special Concern (COSEWIC only)	Special Concern	S4B	Secure	Moderate	May nest and forage in immature and mature deciduous and mixedwood forest in PDA.
Evening Grosbeak	<i>Coccothraustes vespertinus</i>			S3S4B,S4S5N	Sensitive	Moderate	May nest in mature softwood and mixedwood stands in western portion of PDA.
Killdeer	<i>Charadrius vociferus</i>			S3B	Sensitive	Moderate	May nest and breed in open agricultural areas in PDA.

**Table 3.4 Avifauna SOCC Recorded in the PDA or Surrounding Area**

Common Name	Scientific Name	SARA/ COSEWIC Status	NB SARA Status	AC CDC S-Rank	CECC Rank	Likely Present in PDA?	Comment
Northern Mockingbird	<i>Mimus polyglottos</i>			S3B	Sensitive	Moderate	May nest in shrub habitat and forage in a variety of habitats in PDA.
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Threatened	Threatened	S3S4B	At risk	Moderate	May nest at edge of mature softwood and riparian habitat along Shediac River.
Purple Martin	<i>Progne subis</i>			S1S2B	May be at risk	Low	Low potential to nest in PDA as records suggest a colony appears to have historically occurred to the southeast, but not since the late 1980s.
Scarlet Tanager	<i>Piranga olivacea</i>			S3S4B	Secure	Low	May nest and forage in a variety of hardwood habitats present in PDA.
Vesper Sparrow	<i>Pooecetes gramineus</i>			S2B	May be at risk	Low	May rarely nest and forage in shrub and agricultural habitats in PDA.



Bald eagle (*Haliaeetus leucocephalus*, listed by AC CDC as S3B/"At risk") is listed as "Not at risk" under SARA and by COSEWIC, and as "Endangered" under NB SARA. There are three suspected breeding records for this species within MBBA survey squares that fall within 5 km of the PDA. This species tends to nest and forage along waterways using large trees for nesting sites, often using the same location for many years. There is some potential for this species to nest along Shediac River, hunting and scavenging along the river and in the surrounding agricultural lands. The majority of the PDA lacks the mature trees preferred by bald eagles for nest building, but there are stands of mature forest on the western end of the PDA that may contain suitable nesting trees.

Two suspected breeding records for bank swallow (*Riparia riparia*, listed by AC CDC as S3B/"Sensitive" and listed as "Threatened" under COSEWIC) are reported within the surrounding MBBA squares. This species nests in sandy, silty, or muddy banks, often along rivers or in gravel pits, and forages for insects over open habitats, often near watercourses. There is potential that this species could nest along the banks of Shediac River and forage over the agricultural land and shrub habitat in the eastern portion of the PDA. The open upland foraging habitat used by this species is abundant in the surrounding landscape.

There are two possible breeding and one confirmed breeding records for barn swallow (*Hirundo rustica*, listed by AC CDC as S3B/"Sensitive" and listed as "Threatened" under SARA and NB SARA) reported within the surrounding MBBA squares. This species builds nests almost exclusively on anthropogenic structures such as barns, sheds, and bridges. There are several barns and other structures within the PDA and on agricultural land in the surrounding area which represent potential nesting habitat for this species.

Bobolink (*Dolichonyx oryzivorus*, listed by AC CDC as S3B/"Sensitive") is listed as "Threatened" under SARA and NB SARA. There are two records for this species occurring within the surrounding MBBA survey squares. Bobolinks breed in grassy meadows, often using agricultural land for nesting sites. The agricultural area in the eastern portion of the PDA presents potential breeding habitat for this species, although similar habitat is abundant in the surrounding area.

There is one record of Canada warbler (*Wilsonia canadensis*, listed by AC CDC as S3S4B/"At risk", and listed as "Threatened" under SARA and NB SARA) within the surrounding MBBA survey squares. This species typically breeds in deciduous forested wetlands and riparian thickets which are present along Shediac River. There is also some lesser potential for this species to breed in the shrub and deciduous forest habitat in the PDA.

There is one record for common nighthawk (*Chordeiles minor*, listed by AC CDC as S3B/"At risk", and listed as "Threatened" under SARA and NB SARA) within the surrounding MBBA survey squares. This species breeds in open areas such as clearcuts, barrens, and grasslands, nesting on the ground in the open. Suitable habitat for common nighthawk is abundant in the eastern portion of the PDA.

There are two records for eastern kingbird (*Tyrannus tyrannus*, S3S4B/"Sensitive") within the surrounding MBBA survey squares. This species breeds in open and semi open agricultural landscapes, often nesting in isolated trees. The PDA provides suitable breeding habitat for this species, particularly on the eastern side.

There is one record for eastern meadowlark (*Sturnella magna*, listed by AC CDC as S1S2B/"May be at risk", and listed as "Threatened" under COSEWIC and NB SARA) within the surrounding MBBA survey squares. This species nests in grasslands, including agricultural fields, which are present in the eastern portion of the PDA and in the surrounding area.

Eastern wood-pewee (*Contopus virens*, listed by AC CDC as S4B/"Secure") is listed as "Special Concern" by NB SARA and COSEWIC. There are two records of this species breeding within the surrounding MBBA survey squares. Their preferred breeding habitat is deciduous-dominated forest, which is present on the western side of the PDA.

There is one record of evening grosbeak (*Coccothraustes vespertinus*, S3S4B, S4S5N/"Sensitive") breeding within the surrounding MBBA survey squares. This species prefers coniferous and coniferous-dominated mixed forest, but can occur in a variety of habitats. The forest habitat on the western side of the PDA represents suitable habitat for this species.

There are three records of breeding killdeer (*Charadrius vociferous*, S3B/"Sensitive") within the surrounding MBBA survey squares. This species breeds in open grasslands and barrens, typically building nests on gravelly, sparsely vegetated ground. The agricultural area may present marginal nesting habitat for this species and suitable foraging habitat.

There is one record of olive-sided flycatcher (listed by AC CDC as S3S4B/"At risk", and listed as "Threatened" under SARA and NB SARA) breeding in the surrounding MBBA survey squares. This species breeds in coniferous dominated woodlands, often in semi-open areas such as boreal wooded barrens or partial cutovers. The coniferous habitat in the western end of the PDA may support breeding olive sided flycatchers, but overall, the PDA is not ideal for this species.

There is one breeding record for vesper sparrow (S2B/"May be at risk") within the surrounding MBBA survey squares. This species is known to breed in a variety of habitat types that are present in the PDA including open scrubland, old field, and forest openings.

### **3.3.5.2.3 Vegetation**

The vegetation communities, as described within the habitat types in Section 3.3.5.3.1 are common within the Kouchibouguac Ecodistrict, and are not limited in the wooded areas surrounding the PDA. There are no rare stand types within the PDA as indicated by the DNR forest cover data, and no Ecologically Sensitive Areas. The vegetation communities in the PDA, most of which are disturbed to varying degrees appear to be abundant within the surrounding landscape.

There is no likelihood of significant interactions of the proposed development with common plant species that occur on the site. Only plant SOCC for which there are local records or that have reasonable potential are assessed in this section as having potential for significant interaction with the proposed project. One plant SOCC has been observed within a 5 km radius of the Project (ACCDC 2014). Spotted coralroot (*Corallrhiza maculata* var. *occidentalis*, S2S3/"Sensitive") was observed approximately 3.7 km northwest of the PDA, in an alder-dominated stand adjacent to an unnamed, unpaved road. This is unusual habitat for this species, as it is typically found in woods, or more specifically dry, older coniferous, deciduous, or mixedwood stands with little other herbaceous cover

(Gleason and Cronquist 1991; Hinds 2000). Mature forested habitat exists within the PDA, and is also present in the surrounding landscape.

Of the vegetation types within the PDA, there is some moderate potential for other plant SOCC to occur within the riparian zone adjacent to Shediac River.

#### **3.3.5.2.4 Wetlands**

There are no wetlands shown by GeoNB within the PDA (GeoNB 2014). A review of available information does not indicate any unmapped wetlands within the PDA. Wetlands are not discussed further in this document.

#### **3.3.5.3 Potential Project-Environment Interactions**

##### **3.3.5.3.1 Wildlife**

The Project activities could interact directly with wildlife in the PDA where Project activities will occur, and indirectly within the area surrounding Project activities. The Project activities that have the potential to affect wildlife and wildlife habitat are clearing and grubbing, road construction, and traffic, which have the potential to interact with wildlife and wildlife habitat primarily through three mechanisms:

- alteration of habitat availability;
- alteration of habitat connectivity; and
- change in mortality risk.

Of particular interest are wildlife SOCC that have been recorded in the vicinity of the PDA. Overall, few species have been recorded and thirteen (including some SAR) are considered to have low to moderate potential to occur within the PDA.

##### **Habitat Availability**

Habitat availability refers to the presence of conditions that meet the life requirements of wildlife. Construction will require clearing of vegetation, grubbing, and other activities which will result in the direct loss of habitat for wildlife. Sensory disturbance attributed to the auditory and visual disruption associated with construction activities could result in habitat avoidance or reduced habitat effectiveness for some wildlife species.

Vegetation clearing and grubbing will be done along the length of planned roads in stages, where habitat loss will be permanent. Once the residential lots are sold and developed by the residence owners, some landscaping of the lots including re-vegetating exposed soils and planting of some species of trees and shrubs is expected, as is normally the case with residential subdivisions.

The loss of habitat could potentially influence the presence of SOCC recorded near the PDA. Although no direct mortality of SOCC resulting from the Project is expected, potential habitat for these species will be removed. This loss of habitat could affect wildlife by removing breeding habitat or altering habitat

such that the abundance of resources are diminished. However, given the location of the PDA in what is largely a rural and agricultural setting, it is not anticipated that there are any resources that are critical to individual SARs or other wildlife populations and may be affected.

While there will be no alterations of Shediac River resulting from the Project, there is potential for wood turtles to use the upland habitat that falls within the study area. Without mitigation to exclude wood turtles from the PDA (e.g. snow fencing), there could be interactions with the Project during and after Construction, although the lack of records in the area suggests that this risk is low.

Although it is unlikely that any bat species are presently using the PDA, an inspection of any abandoned buildings for use as breeding colonies by little brown myotis should be conducted prior to demolition of any such buildings to make way for the Project.

The potential interaction of loss of habitat is discussed below in regard to the thirteen bird SOCC that have moderate potential to breed or forage in the PDA.

The riparian habitat type along the Shediac River has potential to support breeding or foraging bald eagles, bank swallows, Canada warblers, eastern kingbirds, and olive-sided flycatchers. This habitat is expected to be unaffected by the Project, as there will be a restrictive covenant on the 30 m buffer to all watercourses (i.e., Shediac River) within the PDA in the sales agreement of affected lots.

Within the agricultural and shrub land on the eastern side of the property, there is a moderate potential for the occurrence of breeding barn swallows, bobolinks, common nighthawks, eastern kingbirds, eastern meadowlark, and killdeer. These habitat conditions on the property are abundant in the surrounding landscape. The forested habitat on the western side of the PDA has the potential to support the other avian SOCC known to occur in the region (eastern wood pee-wee, northern mockingbird) as well as any number of common migratory birds. The forested habitat is distributed among a variety of age classes (mostly younger) and is comprised of species compositions that are widely available in the surrounding landscape.

Vegetation removal, limited to road clearing only, may occur prior to a bird survey conducted in the breeding season of 2015. The clearing would occur outside the bird breeding season in order to reduce the potential for nesting to occur within the planned construction footprint. As noted above, these habitat conditions in the PDA are abundant in the surrounding landscape so that winter clearing prior to the bird survey is not anticipated to have adverse interactions with populations of these birds provided clearing is conducted outside the breeding bird season. Provided direct interactions with migratory birds are avoided, the development of the property is not anticipated to have adverse interactions with bird populations.

Although some habitat in the PDA will be altered or lost for these species, the PDA does not represent specialized or unique wildlife habitat, and does not contain critical habitat as defined by SARA. The habitat within the PDA is typical widely available in the ecodistrict, and similar habitat will remain in the vicinity of the Project to support wildlife populations.

## Habitat Connectivity

Construction activities also have the potential to result in changes to daily and seasonal movement patterns for wildlife. Open trenches, spoil, topsoil, and other materials stored in piles could act as physical barriers to daily species movement or seasonal migrations for species with limited dispersal abilities, particularly amphibians, reptiles, and small mammals.

Construction features and activities could affect habitat connectivity for a variety of species, including more mobile species including birds. Habitat connectivity refers to the ability of the landscape to maintain local or regional wildlife movements. Habitat fragmentation reduces the measure of habitat connectivity present in a given area.

Habitat fragmentation has negative interactions with many songbirds, including increased predation and nest parasitism, lower breeding success, and decreased ability to colonize new areas (Johnson 2001; Stephens *et al.* 2004; Bayne *et al.* 2005). As such, vegetation clearing could result in a change in habitat connectivity and altered movement patterns for birds, small mammals, and amphibians. Bayne *et al.* (2008) reports that some songbird species crossed seismic lines that were more than 8 m wide less often than expected by chance, possibly because of an increased predation risk associated with moving through gaps. Bélisle and St. Clair (2001) report a variance of the effects of open areas in fragmented landscapes on birds according to species. The presence of traffic within the PDA could also enhance the effectiveness of the roadways as a barrier to wildlife movement through sensory disturbance. Construction of the Project is unlikely to result in a change in habitat connectivity for large mammals.

Although some habitat fragmentation will occur as a result of the Project, the PDA is within a developed landscape, and species currently residing within or otherwise utilizing the PDA are unlikely to be sensitive to this level of habitat fragmentation.

## Mortality Risk

Construction activities, including vegetation clearing and grubbing, have the potential to increase the risk of mortality to wildlife through a number of mechanisms including destruction of hibernacula, dens and nests, and through vehicle collisions.

Increased activity, noise, and illumination at night during construction activities could also cause an increase in indirect mortality risk. Sensory disturbance could result in reduced productivity and nest abandonment for some wildlife species. Additionally, some wildlife including small mammals, reptiles, and amphibians might move out from cover in response to disturbance (noise or vibration) which could increase mortality risk from exposure to predation.

The introduction of traffic to the PDA has the potential to increase the mortality risk of wildlife species through collisions; however, as there are other, higher traffic roads adjacent to the PDA, this does not represent a new interaction with wildlife that are currently utilizing the PDA, and speed limits within the development are expected to be low enough that direct collisions will be minimized.



## **Mitigation**

The following well-established and proven practices to reduce the interaction between the Project and wildlife will be implemented:

- Undertake a breeding bird survey in spring and early summer 2015. The focus will be on the agricultural areas and associated barns in the vicinity of the earliest stages of development. Apply species-specific mitigation such as setbacks to any active nests discovered to protect them from disturbance until the young have fledged:
  - survey all barns for barn swallow nesting use prior to their demolition;
  - include a crepuscular component to assess common nighthawk use of the PDA;
  - assess habitat along Shediac River for bald eagle nests; inspect river banks for bank swallow cavities; and
  - survey to target areas of high potential for SAR.
- Survey all abandoned buildings for active use as bat maternity colonies prior to demolition.
- Design species-specific mitigation based on the results of 2015 breeding bird survey as required, including setbacks for any work conducted within the breeding season.
- During the breeding bird survey, undertake an inspection of riparian habitat for wood turtle habitat suitability:
  - if habitat suitability is high or turtles are found, utilize snow fencing or other exclusion methods to prevent wood turtles from nesting in exposed soil or gravel in construction areas.
- Avoid vegetation removal during the breeding bird season.
- Avoid Construction during the breeding season for migratory birds (May 1 to August 31) where possible.
- Employ qualified wildlife biologists to undertake nest searches to identify and flag active nests within the PDA, when vegetation clearing cannot be avoided during breeding bird season (May 1 to August 31) or when there is potential for construction activities to interact with nesting birds.
- Avoid vegetation removal and grubbing within 30 m of watercourses.

The mitigation described above will limit the reduction of habitat availability and habitat connectivity, and will also reduce wildlife mortality that could be caused by the Project. Some loss of habitat availability and connectivity is still predicted, but the mitigation will minimize potential interactions with wildlife species, particularly SAR. Habitat for wildlife species will remain available in the surrounding landscape.

### 3.3.5.3.2 Vegetation

The Project activities could interact directly with vegetation where Project components are situated, and indirectly within an area surrounding Project components. The construction of rail, pipeline, road, and infrastructure has the potential to interact with vegetation habitat primarily through two mechanisms:

- Change in Vegetation Communities; and
- Change in Vascular Plant Species of Management Concern.

Clearing, grading, and other activities associated with construction will likely result in both temporary and permanent change in vegetation communities; however, vegetation communities evident in the forest cover data are common within the surrounding Ecodistrict. Once the residential lots are sold and developed by the residence owners, some landscaping of the lots including re-vegetating exposed soils and planting of some species of trees and shrubs is expected, as is normally the case with residential subdivisions.

Potential for plant SOCC is estimated to be low in the majority of the PDA, with the exception of the riparian area along Shediac River, which will be protected by a 30 m buffer where no clearing, grubbing, or other Project activities will occur.

Substantive interactions between the Project and vegetation are not anticipated, and no additional mitigation measures beyond protection of the 30 m buffer around Shediac River are warranted.

### Summary

The Project has the potential to interact with various aspects of the Terrestrial Environment, including habitat, wildlife, and vegetation. These Project-environment interactions are expected to occur for wildlife through the alteration of habitat availability, the alteration of habitat connectivity, and a change in mortality risk. For vegetation, Project-environment interactions can occur through changes in vegetation communities or a change in vascular plant SOCC. Given the absence of rare habitat types or vegetation communities within the PDA, the availability of similar habitat within the surrounding area, and the low potential for plant SOCC to occur within the PDA, substantive interactions between the Project and the Terrestrial Environment are not anticipated, provided the proposed mitigation measures are implemented.

### 3.3.6 Heritage Resources

Heritage Resources are defined as any physical remnants found on top of and/or below the surface of the ground, that provides evidences and information about past human use of, and interaction with the physical environment. These resources may be from the earliest times of human occupation to more recent times. Heritage Resources include those resources of archaeological, palaeontological, historic or architectural importance. Heritage Resources are relatively permanent features of the environment; however the integrity of these resources is highly susceptible to construction and ground disturbing activities. Heritage Resources are an important consideration in recognition of First Nations, the general

public, and provincial and federal regulatory agencies who assure the effective management of these resources.

### **3.3.6.1 Existing Conditions**

#### **History of Moncton and Irishtown**

The PDA is located in the community of Irishtown, in the Parish of Moncton, Westmorland County (Figure 1.1). The PDA lies within the traditional territory of the Mi'kmaq First Nations, who inhabited the eastern half of what is now New Brunswick, as well as Nova Scotia and Prince Edward Island, since the retreat of the glaciers from this region. It is anticipated that various locations on the shorelines of all major and most minor watercourses would have seen some level of activity by the Mi'kmaq during this 11,000 year timeframe from very short duration camp sites to long term villages. Palaeo-environmental reconstructions of this region have also indicated significant changes to present day shorelines as ocean levels were much higher at various times since the retreat of the glaciers, and thus it is anticipated that these stranded palaeo-shorelines would also have been used by Pre-Contact Aboriginal people as well. While there are significant gaps in our knowledge as to exactly where these sites are located, there are a number of recordings describing them from the early period of European exploration and settlement in the Maritimes. For example, the location of the City of Moncton was once a Mi'kmaq campsite along the Petitcodiac River. Ganong noted a former camping ground at the "Bend" at Halls Creek (Moncton) (Ganong 1899). As took place throughout this region, this area was eventually settled by Europeans becoming the Township of Moncton, and displacing the Aboriginal population located there. Another camp is recorded at Indian Mountain, 12 km northwest of Moncton and 10 km from the PDA, which was thought by early settlers to be a temporary hunting camp used by Aboriginal peoples (Ganong 1899).

The Petitcodiac River was part of a travel route for the Mi'kmaq between the Atlantic coastline of Acadia and the St. Lawrence River Valley. The name "Petitcodiac" was derived from the Mi'kmaq Epetkutogoyek, meaning "river that bends around back" (Rayburn 1975) and was believed to be called the "petit coude" by Acadians during the early 19th century (Pincombe and Larracey 1990). Moncton is thought to be situated at the southern end of a traditional native portage route between the Petitcodiac River and the Shediac River leading to Shediac Bay on the nearby Northumberland Strait. While the exact location is not known, reference is made to a portage route between the Petitcodiac and Shediac Rivers which was documented on the Montresor map of 1768 and stated to be "six leagues in length" (Ganong 1899). This portage route could be located in proximity to the PDA for the Project.

The first European settlers to this region were French explorers who began settling the area in the early 1600s. These people, called Acadians were known for their efforts to reclaim large floodplains and wetlands along the river shorelines to use for farming. They constructed huge dykes and with gated sluice ways, known as aboiteaux, to control water flow and farmed the tidal marches as far down as the Shepody Bay in Albert County, and as far inland as Salisbury. By the 1750s the area known as Acadia was invaded and conquered by British and New England forces, and the Acadians were eventually expelled, although many eventually returned to the area. Following the Expulsion of the Acadians in 1755, numerous people from New England were encouraged to migrate to this newly available land.

Over the next 80 years, the Moncton Township and the surrounding communities became a stop-over for land-based travelers going between Saint John and Chignecto at the Nova Scotia border (Know Moncton 2010). During the first half of the 19th century, Moncton's main industry was shipbuilding. With the introduction of the European and North American Railway in 1857; however, the shipbuilding industry came to an end, resulting in shipyard workers taking up farming in Irishtown and surrounding communities north of Moncton (Pincombe and Larracey 1990).

The PDA is located within a larger area historically referred to as "Irishtown". Irishtown, which is located along the headwaters of the Shediac River, was settled by Irish immigrants in 1821. Based on the large size of the early land grant petitions, it is anticipated that most of these requests wanted the land for timber harvesting to use in the rapidly growing shipbuilding industry in Moncton (ICCANB 2008). Although there were four unique and separate Irish communities located north of Moncton, these were often combined and referred to as "Irishtown" by the inhabitants of Moncton. What is currently referred to as Irishtown today, originally consisted of Irishtown proper, McQuades, O'Neills and Tankville (ICCANB 2008). This area north of Moncton grew and new settlers came into the community mostly from the southern counties of Ireland. By 1859, the first post-office opened (Scott 2009) and by 1866, "Irishtown" was a farming community with approximately 50 resident families. In 1871 it had a population of 300: in 1898 "Irishtown" became a station on the Moncton and Buctouche Railway (Provincial Archives of New Brunswick 2014), although this railway station was actually located in Tankville. This station was located on Irishtown Road and had a large water tank where the train would take on the water needed to run its steam engine (ICCANB 2008). Tankville is located approximately 2 km south of the PDA.

The northern portion of the PDA was purchased by Thomas Hennesey in 1858 (SNB 2014) which consisted of 150 acres which was likely used for subsistence farming as the land in the general area north of Moncton was considered poor or non-arable (IAANB 2008). Although there are some standing structures in the PDA, none are listed as historic places on the Canadian Register of Historic Places (CRHP 2014). An abandoned horse track is located on the southern section of the PDA. While the date of the construction of the horse track is unknown, it appears that the track may have been built for a harness racer who is still racing and thus, this is not considered a heritage resource (The Fredericton Scene 2013). The arrival and settlement of the Irishtown area is commemorated by three monuments in the Moncton area. The closest of these is the First Settlers Families Monument, erected in 2003, which commemorates the pioneer families of Irishtown and the nearby settlements of McQuades and O'Neills (ICCANB 2008). The monument is located along Irishtown Road beside the St Lawrence O'Toole Roman Catholic Church, 500 m outside of the PDA.

### **3.3.6.2 Potential Project-Environment Interactions**

Heritage Resources include built heritage (structures, buildings), archaeological resources, and palaeontological resources (fossils). Where present, these are located on the surface or in the upper soil layers of the earth. Therefore, Construction activities that interact with these resources have the potential to result in the destruction or alteration of such resources as it is during Construction that ground breaking and earth moving activities will take place.

#### **Built Heritage**

None of the standing buildings within the PDA are registered on the list of Canada's Historic Places (CRHP 2014). The nearest registered Historic Place is the Tankville School, a nineteenth century one-room school house in use until 1967, located adjacent to the Irishtown Nature Park approximately 2 km south of the PDA. A review of recent aerial photographs did not identify any remnants of existing structures existing in the PDA that would be anticipated to be considered a built heritage resource. As part of the overall Heritage Assessment for the Project, a review of 1930s and 1940s aerial photographs will be conducted, and a visual survey of the PDA will take place. Should any built heritage sites or resources be identified during these activities they will be reported to the provincial heritage regulators and any required mitigation will be developed in consultation with the Historic Places Section, of the provincial Department of Tourism, Heritage and Culture as appropriate.

#### **Archaeological Resources**

As stated in the "Guidelines and Procedures for Conducting Professional Archaeological Assessments in New Brunswick" (Archaeological Services 2012), all areas within 80 m of a watercourse (and within 100 m at watercourse confluences) are considered to have elevated potential for archaeological resources. As a section of the Shediac River runs along the northern portion of the PDA, it is anticipated that all areas within 80 m of the south shoreline of this river will be considered to have elevated potential for archaeological resources based on the Province's GIS-based archaeological model, pending a field survey by a permitted archaeologist to confirm the findings of the GIS-based model. In addition, the Archaeological Potential Model Map contains information on the location of any known, registered archaeological sites and provide information on potential palaeo-shorelines within the PDA. Prior to any ground-breaking activities related to Construction, the Archaeological Potential Model Map that will be requested from Archaeological Services will be reviewed prior to conducting an Archaeological Assessment for the Project. In addition, the Archaeological Potential Predictive Modeling Map will identify any registered archaeological sites and potential palaeo-shorelines within the PDA.

To determine the presence of any heritage resources in the PDA, an Archaeological Assessment will be conducted within the PDA in accordance with the Guidelines and in consultation with the Provincial Regulating agency for archaeology, Archaeological Services. This will include a field survey of the PDA, followed by recommendations for any additional investigation as warranted. The findings of the field survey and the resultant recommendations will be presented to the Province in a report for review and evaluation prior to the implementation of any construction activities. If any additional mitigation is warranted, this will also be implemented prior to Construction.

### Palaeontological Resources

During Construction, rock ripping or blasting could occur which has the potential to disturb palaeontological resources. The PDA contains rock from the Carboniferous period, which has the potential to contain fossils. While at this time it is not known if construction activities are anticipated to encounter bedrock, the New Brunswick Museum will be contacted to determine if there are any known fossil locations within the PDA.

### Summary

Heritage Resources provide valuable contextual information pertaining to past human cultures and their interactions with the surrounding physical environment. Loss of this information hinders our collective understanding of the past. With the application of the mitigation described herein and as required by the provincial regulators, the Project is not likely to substantively interact with Heritage Resources.

### 3.3.7 ABORIGINAL LAND AND RESOURCE USE

There are many areas in New Brunswick which have historical and cultural significance to First Nations. These areas include locations where First Nations continue to exercise Aboriginal rights, particularly on publicly-owned (Crown) land.

Aboriginal Land and Resource Use (also sometimes referred to as “Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons”) is defined as the known current use of lands, and resources within those lands, by First Nations for practicing their traditional activities that are within the footprint of the Project or on adjacent lands where those current uses or the resources are potentially affected by the Project. “Use” refers to traditional activities such as contemporary hunting, fishing, and gathering for “traditional purposes” such as subsistence, social, and/or ceremonial purposes.

There are no known current uses of land or resource for traditional purposes by Aboriginal Persons within the PDA or lands adjacent to the PDA at this time. Although the Project lies within the traditional territory of the Mi'kmaq First Nations, the PDA is completely located on private land that was granted to Irish settlers in the mid-19th century. The closest First Nations communities to the Project Site are the Buctouche First Nation and Elsipogtog First Nation, which are approximately 35 km and 45 km away from the PDA, respectively. During the EIA review, the Proponent will inform these communities of the location, details and schedule of the Project via a letter to determine if these communities have any questions or concerns about the Project. Should any information regarding First Nations current use of the Project Site be identified during the regulatory approval process for the Project, this information will be presented to NBDELG for consideration for this application.

Given that the Project is located entirely on private land, the Project is not expected to substantially affect Aboriginal Land and Resource Use.

### 3.3.8 Socio-economic Environment

The Socio-economic Environment is characterized by a combination of social and economic factors, including population demographics and employment.



### **3.3.8.1 Existing Conditions**

The area of interest with respect to characterizing existing conditions for the Socio-economic Environment encompasses the community of Irishtown, with a particular focus on the City of Moncton, for its proximity to the Project Site. A demographic profile for the City of Moncton and the Province of New Brunswick is provided below.

The City of Moncton is situated at the geographic centre of the Maritime Provinces, and is considered the transportation, communication and retail hub of the region (City of Moncton 2005). It is believed that Moncton was first settled by the Acadian people in 1735, growing first, as a shipbuilding centre and then as a railway headquarters, eventually earning its designation as a city in April, 1890 (City of Moncton 2013). The population of the City of Moncton has increased in recent years, to 69,074, making it the second-largest city in New Brunswick (Statistics Canada 2011). The Moncton Census Metropolitan Area (CMA), which includes the Cities of Moncton and Dieppe, as well as the Town of Riverview has a population of approximately 138,644 (City of Moncton 2011), representing 18 percent of New Brunswick's population. The Moncton CMA has grown in population (9.7 percent) from 2006 to 2011, compared to the provincial growth rate of 2.9 percent, and average growth rate among all CMA's of 7.4 percent (Statistics Canada 2011).

The population of both the City of Moncton and the Province of New Brunswick are aging. The median age for the City of Moncton is 40.4 years of age, slightly lower than the provincial average of 43.7 years. Similarly, the national average has also experienced an increase from 2006 to 2011 to 40.6 years. In 2011, the percentage of the working age population (15-64 years of age) was 69.9 percent, slightly higher than the national percentage of 68.5 percent.

In 2012, the labour force of the province was 391,400 (Government of New Brunswick, 2013). The Moncton CMA is one of the largest population centres in New Brunswick, comprising approximately 20 percent of the New Brunswick labour force, 21 percent of all employment in the province, and 14 percent of all unemployment in the province. The participation rate in the Moncton CMA (*i.e.*, the percentage of the working age population employed or actively looking for employment) was 68.0 percent, higher than the provincial rate of 63.1 percent (Government of New Brunswick 2013).

In 2011, the main sources of employment by industry for the City of Moncton were business services, which employed 22 percent of the labour force, health care and social services (12 percent), retail trade (12 percent), and other services (22 percent). Industries that employed the fewest people were agricultural and other resource-based industries, which employed 2 percent of the labour force, wholesale trade (5 percent), and construction (5 percent).

### **3.3.8.2 Potential Project-Environment Interactions**

Development of the Project will bring employment opportunities during Construction of the Project, with the initial Phases (Phases 1 to 5) being carried out in the next five years, with additional employment from the development of subsequent residential lots Phases 6 to 10 to extend over the following five years. It is expected that labour requirements for the Project will draw from the existing labour supply in the surrounding communities. Construction of the Project will also stimulate economic spin-offs in the region. Economic spin-offs could provide opportunities for various business sectors such as consumer

goods and supply industries, manufacturing industries, and food and beverage sectors within Greater Moncton area. An increase in occupied housing units as a result of the Project could lead to an increase in local jobs, income and taxes. An increase in the property tax base for the area can also be anticipated as a result of new housing activity, in addition to an increase in value of surrounding property.

Given this, the Project is expected to contribute positively to the Socio-economic Environment.

### **3.3.9 LAND USE**

#### **3.3.9.1 Existing Conditions**

The Project Site located in the community of Irishtown, in the Parish of Moncton, Westmorland County; a rural area approximately 2.2 km north of city of Moncton's municipal boundary (see Figure 3.3).

The Project Site is comprised of three amalgamated properties (Property Identification Numbers (PIDs), PID 00931428, PID 00931402, and a portion of PID 70294921), owned by the Proponent and its investors (or for which a process of acquiring land from current owners is in progress).

Property 1 (PID 00931428) is wholly owned by Irishview Estates and is approximately 68.8 hectares extending west to east from McLaughlin Road northeast along the Shediac River to Irishtown Road (see Figure 2.1). The property has historically been used for farming and harvesting, and is zoned by Service New Brunswick as Mixed Type Farm. Property 1 is a mix of mixed-wood forest and cultivated field. Property access is currently available from Irishtown Road via a private driveway. The existing private driveway continues beyond the residential dwelling, and becomes a private resource road used to access the interior of the former farmland, as well as PID 40469333 located at the centre of the Project Site. PID 40469333 is not included in the Project Site. A review of Service New Brunswick's PLANET database identifies this property as Tower/Satellite Sites owned by Rogers Communications Inc.

Property 2 (PID 00931402) is privately owned and is approximately 40.4 hectares, extending 1.4 km parallel to the southern boundary of the Property 1 (see Figure 2.1). Property 2 is currently zoned Mixed Type Farm by Service New Brunswick and is predominately mixed-wood forest on the western half of the property, and grassland/cultivated farmland to the east. The property contains a residential dwelling, several farm-related out buildings as well as an oval track. Access to the property is provided by a private driveway off Irishtown Road, which extends beyond the residential dwelling to PID 70434782 which is not included in the Project Site. PID 70434782 is zoned Tower/Satellite Sites by Service New Brunswick, is privately owned by the same owner as the Property, and is leased by Bell Aliant.

Property 3 (PID 70294921) is privately owned and is approximately 10.5 hectares in area. The Property is bound by the southwestern boundary of Property 1 and the western boundary of Property 2. 7.5 ha of the Property will be acquired by the proponent and the remaining 3 ha at the southwest corner of the Property will be retained by the current owner. A single family residential dwelling is located in the southwestern extent of the Property (see Figure 2.1) and this house and property are not part of the PDA. Access to the residential dwelling is a private driveway from McLaughlin Road. Based on review

of aerial photos, and maps available of the Project Site, there are no additional roads or trails within this PID.

Directly north of the PDA are two large private properties which extend the length between McLaughlin Road and Irishtown Road. Both properties are zoned Mixed Type Farm by Service New Brunswick. A review of available aerial photos identifies the eastern extent of both properties as cultivated farmland, with the more western portions as mixed-wood forest. Several smaller properties have border the farmland properties along McLaughlin and Irishtown Roads and contain single-family residential dwellings (see Figure 3.3).

Approximately 800 m north of the PDA, on Irishtown Road, is a convenience store with a gas station, the Maplewood Golf and Country Club, and Mountain View School. A residential community as well as several home-based business, and some small commercial business, including a dog boarding facility, a plumbing and heating shop, a floor care systems business as well as a MacDonal Paving and Construction (registered as a salvage dealer with Service New Brunswick) are also located north of the PDA along McLaughlin Road, Indian Mountain Road, Communication Road and Scotch Settlement Road. The commercial business community to the south of the Project Site, is found mainly along McLaughlin and Irishtown Roads, and includes businesses such as machine shop, a barn and garage door shop, an outfitter, a motel, and a commercial electrical shop.

The east side of Irishtown Road, south of the Shediac River, there is a large residential subdivision as well as several individual residential and Mixed Farm Type properties. The largest property directly east of the PDA, on the east side of Irishtown Road (PID 70549928) is currently planned to be subdivided.

South of the PDA, along Ammon Road and south along Irishtown Road towards the City of Moncton municipal limits are several large rural residential communities, and several small commercial properties. Approximately 4 km south of the PDA, within the city limits of Moncton is the Royal Oaks Golf Club, the Irishtown Nature Park, Tankville Station Community Centre and the Moncton/McEwen Airport.

Although there are no formal recreational trails or facilities exist within the PDA, some recreational land use such as snowmobiling, all-terrain vehicle use, hunting and fishing may take place within the PDA at the current land owner's discretion. Both the New Brunswick Federation of Snowmobile Clubs and the New Brunswick All-terrain Vehicle Federation have designated trail systems east of the Project site, outside of the existing residential developments surrounding the PDA.

### **3.3.9.2 Potential Project-Environment Interactions**

Because the *Greater Moncton Community Planning Act* allows single family residential lots to be built on property zoned as Mixed Type Farm, no rezoning will be required for the Project. Overall, the change in Land Use associated with the Project as planned is consistent with the existing Land Use in the surrounding area.

Negotiations with the private landowners who's land is alongside the PDA, have been initiated, and agreements will be reached prior to Construction, regarding the establishment of property boundaries, easements for access to structures (e.g., Rogers Communications and Bell Aliant towers) and the

decommissioning of existing buildings and infrastructure (e.g., removal of farm-related outbuildings, identification of soil stockpiles).

The land acquisition agreements will include a requirement to maintain access to existing properties (e.g., residential dwellings, Rogers Communications and leased Bell Aliant) during Construction and Operation of the Project, as well as requirements for road construction, lighting, lot sizes and buffer zones, easements for utilities, and permitted building types. These conditions will be conveyed to private land owners where applicable to at the time a subdivision lot purchase is negotiated. Compliance with the conditions of approval will reduce the potential for environmental effects on important natural areas (e.g., mandatory setbacks from the Shediac River) as well as convey the standards for development within the Project Site of a sustainable community within zoning restrictions (e.g., easements for ditches, utilities, lot size, and access).

Recreational land use within the Project Site may include fishing, hunting, trapping, as well as seasonal use such as all-terrain vehicle use and snowmobiling. These recreational activities are undertaken within the Project Site at the discretion of the existing landowner, and will be restricted and excluded as subdivision lots, roads and infrastructure are built, and land ownership changes (e.g., lots are sold). Private land owners may choose to erect "no trespass" signage on personal property or engage law enforcement services should unsanctioned recreational land use take place on their lands. There are no formal green spaces (e.g., parks or public spaces) planned for development within the Project Site.

Within a 5 km radius of the Project Site are several small parks, two golf courses, the Irishtown Community Centre and the Irishtown Nature Reserve. These areas are proximal to the Project Site, and support a wide range of formal recreational activities. The change in land use of the Project Site will likely increase patronage to these sites during as the number residential dwellings are developed.

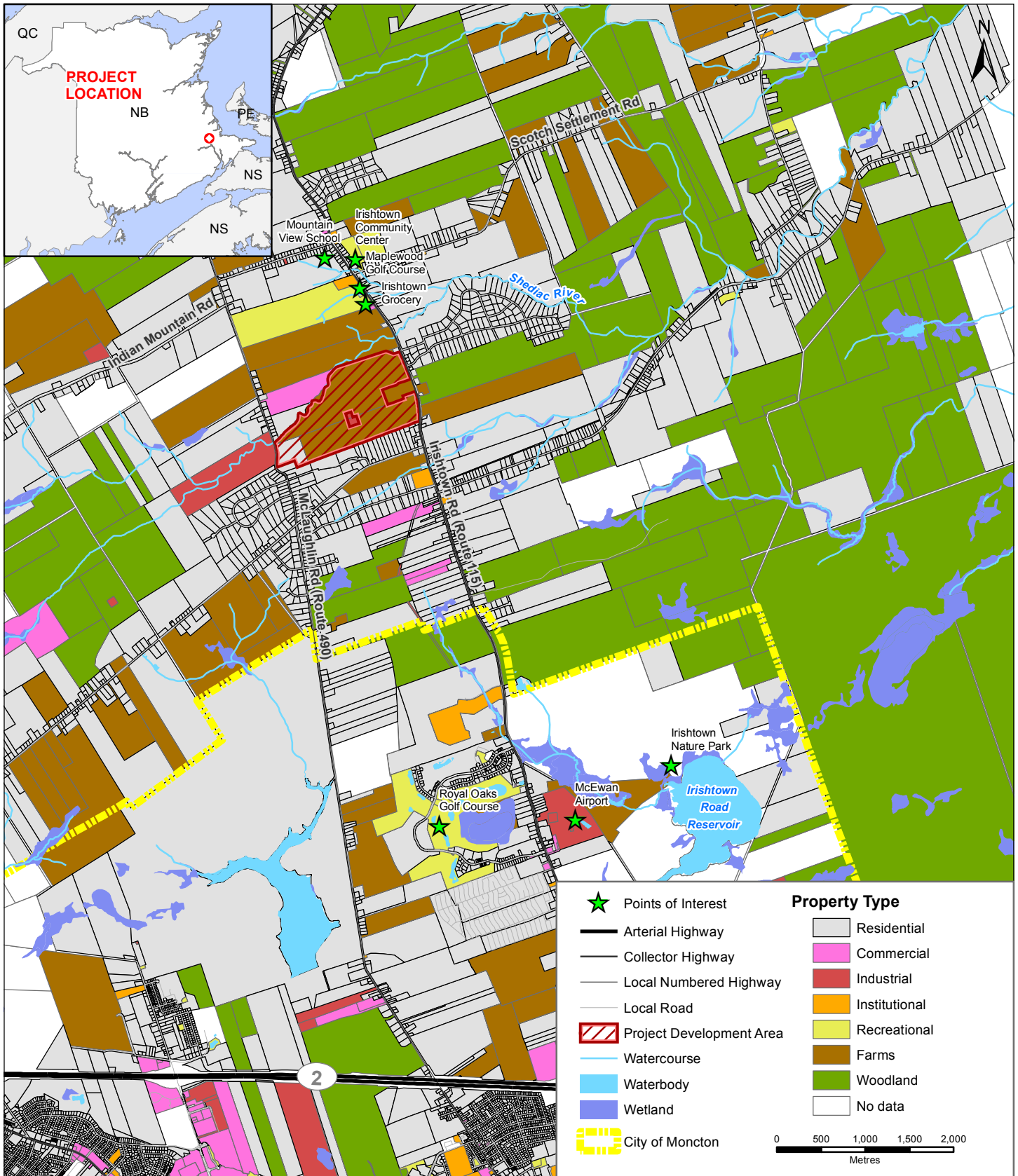
## Summary

The PDA is located solely on private lands in an existing rural residential community where farming activities on the PDA have ceased. No re-zoning is required for the Project under the *Community Planning Act*.

There are no formal recreational activities undertaken within the Project Site. Although the increase in residential development will restrict current recreational land use on the Project Site, this use is currently undertaken at the discretion of the existing land owner. Loss of recreational land use within the Project Site is not anticipated to affect recreational activities on the existing formal trail system.

Although there are no formal green spaces planned as part of the Project, there are several recreational developments and park spaces within the community of Irishtown, and the City of Moncton to sustain the planned community.

Overall, the Project is expected to be compatible with other nearby land uses in the area, and therefore the Project will not substantively interact with Land Use.



NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<b>Land Use</b> Irishview Estates: EIA Registration, Irishtown, N.B.	Scale: 1:60,000	Project No.: 121811426	Data Sources: NBDNR SNB ESRI	Fig. No.: <b>3.3</b>	
	Date: (dd/mm/yyyy) 10/06/2014	Dwn. By: MC	Appd. By: DM		
Client: Irishview Estates					





### 3.3.10 ROAD TRANSPORTATION

#### 3.3.10.1 Existing Conditions

The community of Irishtown is connected to the provincial highway network via Irishtown Road (Route 115) to the east and via McLaughlin Road (Route 490, a local highway) to the west (see Figure 3.4).

Irishtown Road, designated as Route 115 by NBDTI, is a provincial collector highway which connects to Route 11 (Arterial Highway) and the town of Bouctouche approximately 30 km northeast of the Project Site. Route 115 also connects to the TransCanada Highway (Route 2) and to collector highway Route 134 within the City of Moncton city limits, approximately 7.5 km south of the PDA.

McLaughlin Road, designated as Route 490 by NBDTI, is a local highway that runs north-south and connects the community of McLean Settlement approximately 25 km north of the Project Site to the City of Moncton south of the PDA.

There are no intersections connecting the Project Site to either Irishtown Road or McLaughlin Road.

There are two residential driveways located on west side of Irishtown Road; one of which is within the PDA. There are no residential driveways located on McLaughlin Road within the PDA.

There are several existing resource development roads within the PDA that facilitated former farming and resource harvesting within the PDA. At the convenience of the current landowners, these resource roads also provide access to the Rogers Communications cellular tower located on PID 70469333 at the centre of the PDA and the Bell Aliant tower located on PID 70434782.

#### 3.3.10.2 Potential Project-Environment Interactions

The Project will require the transportation of materials, machinery and equipment on the provincial highway network, thus resulting in an increase in traffic on the existing highway network. During Construction the transportation of materials, equipment, goods and personnel will access the Project Site via Irishtown Road or McLaughlin Road. Both designated highways have been designed and built to accommodate passenger and commercial vehicle traffic as well as heavy truck traffic (e.g., dump trucks, transport trucks).

During Construction, signage alerting motorists to construction activities or temporary traffic pattern changes will be posted on Irishtown and McLaughlin Roads. Signage will comply with NBDTI Standard Specifications (2011), NBDTI's Environmental Management Plan (2010) and best management practices for roadway construction.

Contractors having to facilitate the movement of oversized or overweight loads will obtain the necessary permits from NBDTI prior to undertaking Project-related activities on the provincial highway network. Contractor personnel will adhere to the conditions of permits issued by regulatory authorities, and will comply with the acts and regulations of the *Motor Vehicle Act* (e.g., speed limits).

Four new intersections will be developed as part of the Project; three on Irishtown Road and one on McLaughlin Road. The intersections will be designed in accordance with NBDTI Standard Specifications 2011 for local and collector highways, and NBDTI's "A Guide to the Minimum Standards for the Construction of Subdivision Roads & Streets" (NBDOT 2003) and be subject to approval by NBDTI and the planning commission

New roads within the PDA will be designed in accordance with NBDTI's "A Guide to the Minimum Standards for the Construction of Subdivision Roads & Streets" (NBDOT 2003) and will be able to accommodate the safe passage of passenger vehicle, light commercial (e.g., delivery services) and heavy truck traffic required for the transfer of materials and equipment within the subdivision during periods of Construction.

During Construction, sight lines will be created during development of access roads within the Project Site. These sight lines will be maintained through regular vegetation management activities (e.g., tree trimming, vegetation cleaning in ditches, and restrictions on planting on property boundaries by landowners) to facilitate the safe movement of traffic within the subdivision.

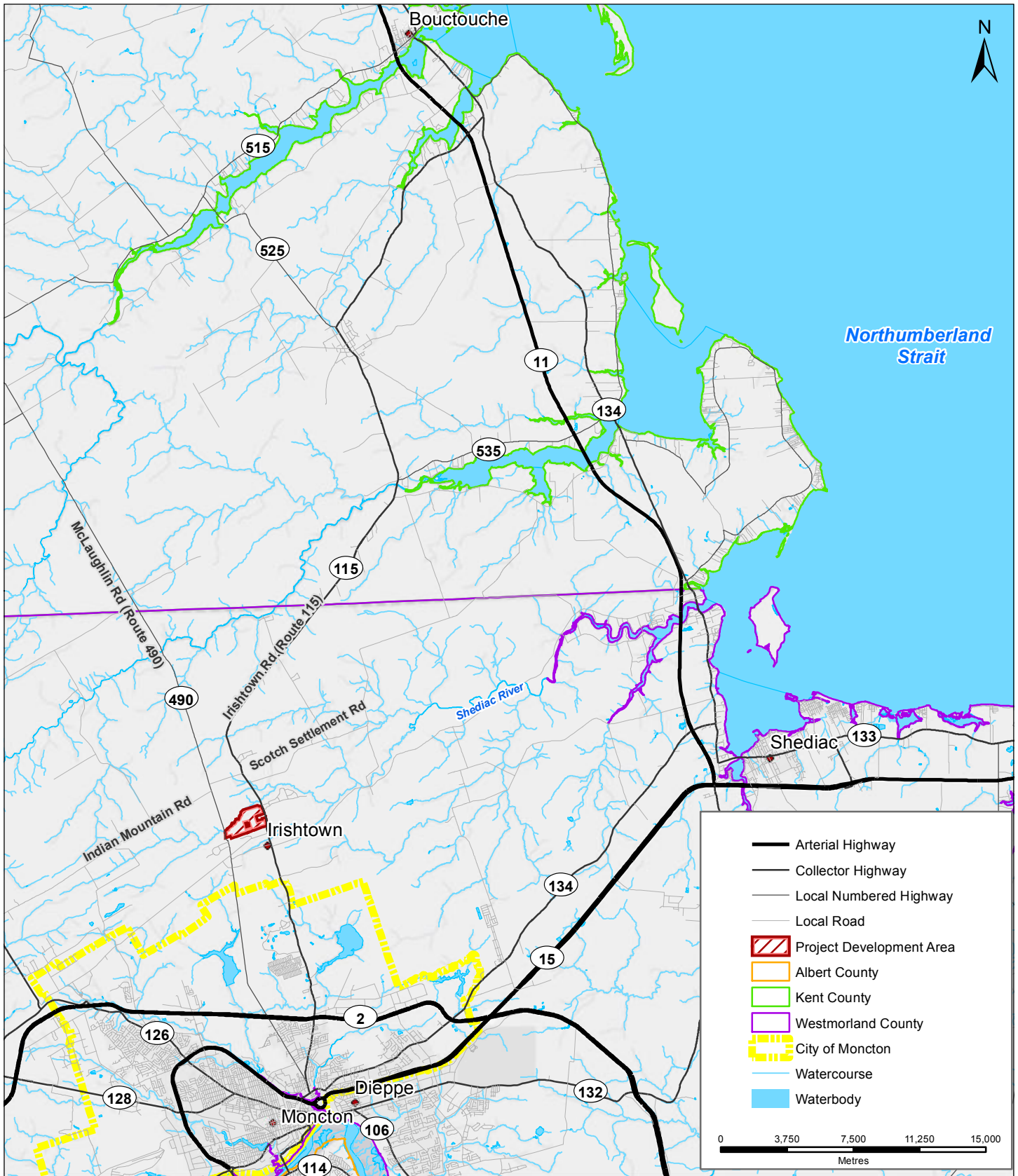
During Construction, some traffic interruptions will occur as materials, equipment and personnel move to and from the Project Site; these interruptions will be intermittent and temporary. Work progression for Construction activities at the site will be scheduled in consideration of peak commuting times to reduce the potential for unnecessary delays on either Irishtown or McLaughlin Roads.

Construction related traffic will be managed within the PDA, as well as on McLaughlin and Irishtown Roads in accordance with Work Area Traffic Control Manual 2009 and NBDTI's Environmental Management Manual which provides for the safe movement of vehicles and equipment within a construction zone, as well as the for the movement of pedestrians and through traffic (*i.e.*, passenger vehicles, commercial or heavy truck traffic). These practices include posting of signage, speed control and traffic control as necessary.

As Project development occurs, a gradual increase in passenger vehicle traffic will occur, thus adding additional traffic to both Irishtown and McLaughlin Roads. Although no one-time significant increase is anticipated as a result of Project Construction or Operation, the Proponent, in consultation with NBDTI, will monitor traffic patterns on Irishtown and McLaughlin Roads to verify that the level of service on Irishtown or McLaughlin Roads is not degraded below an acceptable level as a result of increased passenger vehicle traffic.

## **Summary**

The Project will slightly increase vehicle and heavy truck traffic on the existing highway network in the Project Area during Construction and to a lesser extent during Operation which has the potential to reduce the level of service on the road transportation network and degrade the existing infrastructure. Both McLaughlin and Irishtown Roads are rural highways designed to accommodate the movement of passenger, commercial and heavy truck traffic, and are designated truck routes within Westmorland County. Through adaptive management with NBDTI, the increase as a result of the Project is not anticipated to reduce the level of service on these roadways, nor degrade the existing infrastructure of the transportation network within the area.



NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<h2>Transportation</h2> <p>Irishview Estates: EIA Registration, Irishtown, N.B.</p>	Scale:	Project No.:	Data Sources:	Fig. No.:	
	1:300,000	121811426	NBDNR SNB	3.4	
Client:	Date:	Dwn. By:	Appd. By:	Imagery:	
Irishview Estates	(dd/mm/yyyy) 10/06/2014	MC	DM	SNB	



## **4.0 ACCIDENTS, MALFUNCTIONS, AND UNPLANNED EVENTS**

All aspects of the Project will be designed with best practices and safety as a primary consideration. Mitigation measures, control mechanisms and response procedures will be put in place to minimize the potential for accidents and to reduce potential environmental effects in the unlikely event that one should occur.

Accidents, malfunctions and unplanned events will be prevented and mitigated by taking a systematic approach to safeguarding worker health and safety. The Proponent will ensure that its contractors use staff that are trained in workplace accident prevention, including handling of hazardous materials (WHMIS), first aid, and other training programs. Contractors who are involved in construction activities will be responsible for their own health and safety practices and the contracting companies will be required to demonstrate such safety knowledge before jobs are awarded to them.

All necessary precautions will be taken to prevent the occurrence of malfunctions and accidental events that may occur throughout all Phases of the Project and to minimize any environmental effects should they occur. Accidental events with the greatest potential for environmental effects include:

- spills of hydrocarbons or other hazardous materials;
- failure of erosion and sediment control measures;
- fire;
- vehicular accidents; and
- wildlife encounters.

It is difficult to predict the precise nature and severity of these events. However, the probability of serious accidental events or those causing significant adverse environmental effects is extremely low, particularly as Project procedures incorporate contingency and emergency response planning. Nevertheless, the potential environmental effects of these unlikely events are discussed briefly below.

### **4.1 HAZARDOUS MATERIAL SPILL**

During Construction, silt fencing will be secured in place to prevent discharge of suspended sediments directly into drainage channels, or watercourses in or adjacent to the PDA. Slopes will be stabilized and monitored on a daily basis by the construction staff. Particular attention will be given to erosion and sediment control prevention measures prior to and during storm events. Any failure or potential failure of these structures would be corrected immediately upon discovery.

Spills of petroleum, oils, or lubricants (POLs) may occur during road construction activities, such as during refueling of machinery or through breaks in hydraulic lines. These spills are usually highly localized and easily cleaned up by onsite crews using standard equipment. In the unlikely event of a large spill, soil, groundwater, and surface water contamination could occur, thereby has a potential to adversely affect the quality of groundwater, wetland habitat, and fish and fish habitat downstream, thus resulting

in the ingestion/uptake of contaminants by wildlife. Depending on the nature of the spill, it could also potentially affect other land uses.

Construction equipment will be frequently inspected to detect possible fuel and hydraulic system leaks. Any leaks will be repaired immediately. As a precautionary measure to such an event from happening, fueling and maintenance of any construction vehicles or equipment will not be permitted within 30 m of a wetland or watercourse.

In the unlikely event of larger contaminant spills, local and provincial emergency response procedures will be invoked to minimize potential environmental effects.

## **4.2 EROSION AND SEDIMENT CONTROL FAILURE**

A potential exists for failure of erosion and sediment control structures due to precipitation events, particularly during construction activities. Such a failure could result in the release of sediment-laden runoff to the receiving watercourse, with potential adverse environmental effects on fish and fish habitat. Erosion and sediment control structures will be inspected and monitored during construction by the Proponent and its contractors, particularly after a heavy precipitation event or snowmelt that results in the visible overland flow of water. Remedial action will be taken as necessary.

## **4.3 FIRE**

Fires at the proposed Project could result from various incidents. The immediate concern would be forest fire which could have an impact on human health and safety. Fires may also result in habitat loss, direct mortality to wildlife, loss or damage of property. The emissions from a fire would likely consist mainly of smoke (particulate matter) and CO<sub>2</sub> but could also include other products of incomplete combustion.

Material management of fuel and other hazardous materials, and operational procedures (*i.e.*, storage, handling, and transfer) will reduce the potential for and extent of accidental fires related to the Project. In the unlikely event of a fire, local emergency response and fire fighting capability will be able to reduce the severity and extent of damage.

As useful resources and guidance materials, the NBDOT Environmental Protection Plan (1998) provides a Fire Contingency Plan and fire prevention procedures (Section 8.4 and 7.4 respectively) for public reference. Construction crew learning from these resources and guidance materials can reduce the potential for fires. If a fire is to occur, it may be expected to be brought under control relatively quickly given the training of the construction crew and the close proximity of the Fire Station No. 1 in Moncton (located at 162 McLaughlin Road) who is ultimately responsible for the unincorporated area along Irishtown and McLaughlin Roads.



#### **4.4 VEHICLE COLLISION**

The potential for vehicle accidents exists for all Phases of the Project. In addition to the worker traffic to and from the site during construction and operation, the movement of heavy trucks and equipment on-site during construction has the potential to result in vehicle accidents.

Although there will be increased truck traffic resulting from the Project construction activities, the potential for vehicle accidents is not expected to be increased by the construction of the proposed Project.

#### **4.5 WILDLIFE ENCOUNTERS**

There is the potential for workers to come into contact with wildlife during the construction and maintenance stages of the Project. This could have adverse environmental effects on both workers (e.g., disruption of work activity or bodily harm) and wildlife (e.g., disturbance of critical life cycles). In the event of persistent wildlife encounters, construction personnel shall notify NBDNR of the situation.

## **5.0 PUBLIC INVOLVEMENT**

### **5.1 PUBLIC AND STAKEHOLDER ENGAGEMENT**

The Proponent proposes a modest public involvement program in respect of the Project. Upon registration, the Proponent will provide written notification to elected officials about the Project, and will make a copy of the EIA Registration document available at the regional office of the New Brunswick Department of Environment and Local Government for public viewing, in accordance with the requirements of the NBDELG's "Guide to Environmental Impact Assessment in New Brunswick" (NBDELG 2012). A 25-day public comment period will be initiated upon registration. Valid comments or questions from the public on the EIA registration will be responded to, and a summary of public involvement activities conducted, issues raised, and responses provided will be prepared and submitted to NBDELG within 60 days of registration, or earlier.

The Proponent will inform all property owners within 500 m of the PDA that the Project has been registered under the EIA Regulation and provide summary details as to the undertaking. This will take the form of a direct mail out to property owners within 500 m of the PDA.

### **5.2 ABORIGINAL INVOLVEMENT**

Although the Project lies within the traditional territory of the Mi'kmaq First Nation, the PDA is completely located on private land. The closest First Nations communities to the PDA are the Buctouche First Nation and Elsipogtog First Nation, which are approximately 35 km and 45 km away from the PDA, respectively. During the EIA review, the Proponent will inform these communities of the location, details and schedule of the Project via a letter to determine if these communities have any questions or concerns about the Project.

## **6.0 CLOSING REMARKS**

This report has been prepared by Stantec Consulting Ltd. (Stantec) for the sole benefit of Irishview Estates Ltd. The report may not be relied upon by any other person or entity, other than for its intended purposes, without the express written consent of Stantec and Irishview Estates Ltd.

This report was undertaken exclusively for the purpose outlined herein and was limited to the scope and purpose specifically expressed in this report. This report cannot be used or applied under any circumstances to another location or situation or for any other purpose without further evaluation of the data and related limitations. Any use of this report by a third party, or any reliance on decisions made based upon it, are the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

Stantec makes no representation or warranty with respect to this report, other than the work was undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. Any information or facts provided by others and referred to or used in the preparation of this report were assumed by Stantec to be accurate. Conclusions presented in this report should not be construed as legal advice.

The information provided in this report was compiled from existing documents and data provided by Irishview Estates Ltd. and by applying currently accepted industry standard mitigation and prevention principles. This report represents the best professional judgment of Stantec personnel available at the time of its preparation. Stantec reserves the right to modify the contents of this report, in whole or in part, to reflect any new information that becomes available. If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

### **STANTEC CONSULTING LTD.**



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Environmental Services  
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# Appendix A

## Additional Information Requirements



**ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGISTRATION AND WATER SUPPLY SOURCE  
ASSESSMENT (WSSA): IRISHVIEW ESTATES SUBDIVISION, IRISHVIEW ESTATES LTD., IRISHTOWN,  
NEW BRUNSWICK**

## General Information Requirements

The following is intended to fulfill the additional information required for registration of the Project, as outlined in the New Brunswick EIA Guide, entitled "A Guide to Environmental Impact Assessment in New Brunswick, November 2012" (NBDELG 2012) and in the Sector Guidelines for the decommissioning of a facility.

### 1.0 THE PROPONENT

- |      |   |   |
|------|---|---|
| i)   | Name of Proponent   | Irishview Estates Ltd.  |
| ii)  | Address of Proponent  | 31 Cooke Road, Moncton, NB  |
| iii) | Chief Executive Officer<br>(or designate)   | Reginald Petitpas<br>President  |
| iv)  | Principal Contact Person<br>for the purposes of<br>Environmental Impact<br>Assessment | Mr. Reginald Petitpas, President, Irishview Estates<br>Tel: (506) 381-2226<br>Email: <a href="mailto:regpetitpas@gmail.com">regpetitpas@gmail.com</a>                                   |
| v)   | Property Ownership  | PID 00931428 – Irishview Estates Ltd.<br>PID 00931402 and 70294921 – Privately owned; a down-<br>payment has been made by Irishview Estates and Closing is<br>scheduled for April 2015. |

### 2.0 THE PROJECT

- |       |   |   |
|-------|---|---|
| i)    | Name of the<br>Undertaking                              | Irishview Estates Subdivision   |
| ii)   | Project Overview  | New major residential subdivision located approximately 2.2<br>km north of the City of Moncton municipal boundary, along<br>Irishtown Road, Irishtown, New Brunswick. |
| iii)  | Purpose / Rationale /<br>Need for Undertaking           | See Section 1.2 of the EIA Registration document.   |
| iv)   | Project Location  | For more information, see Section 2.1 of the EIA Registration<br>document.  |
| v)    | Siting Considerations                                   | Not applicable.   |
| vi)   | Physical Components<br>and Dimensions of the<br>Project | 113 ha  |
| vii)  | Construction Details                                    | See Section 2.3.1 of the EIA Registration document.   |
| viii) | Operation and<br>Maintenance Details                    | See Section 2.3.2 of the EIA Registration document.   |

- ix) Future Modifications, Extensions, or Abandonment See Section 2.3.3 of the EIA Registration document.
- x) Project-Related Documents None.

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

The descriptions of all relevant features that are found within the Project location and surrounding areas that could be potentially affected by the Project are provided in Chapter 3 of the EIA Registration document.

### **4.0 SUMMARY OF ENVIRONMENTAL IMPACTS**

Potential environmental effects, or "impacts", of the various Project Phases are provided in Section 3 of the EIA Registration document.

### **5.0 SUMMARY OF PROPOSED MITIGATION**

A summary of proposed mitigation is provided in Section 3 of the EIA Registration document.

### **6.0 PUBLIC INVOLVEMENT**

A brief summary of the planned public involvement activities planned as part of the Project is provided in Section 5 of the EIA Registration document.


### **7.0 APPROVAL OF THE UNDERTAKING**

Following the completion of this EIA review, it is anticipated that a Watercourse and Wetland Alteration permit would be required for any work within 30 m of a watercourse or wetland, or if directing stormwater drainage to the Shediac River.

### **8.0 FUNDING**

Funding for the Project is being provided entirely by the Proponent and its investors, and no provincial or federal funding is anticipated.

### **9.0 SIGNATURE**

  
\_\_\_\_\_  
Reginald Petitpas, President  
Irishview Estates Ltd.

  
\_\_\_\_\_  
Date:



# Appendix B

## Step One – WSSA Application



**ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGISTRATION AND WATER SUPPLY SOURCE  
ASSESSMENT (WSSA): IRISHVIEW ESTATES SUBDIVISION, IRISHVIEW ESTATES LTD., IRISHTOWN,  
NEW BRUNSWICK**

## WATER SUPPLY SOURCE ASSESSMENT INITIAL APPLICATION FORM

### 1. Name of proponent

Irishview Estates Ltd.

### 2. Location of drill targets (including property PID) and purpose of the proposed water supply

The proposed water supply will consist of individual water supply wells installed on each lot of the Irishview Estates subdivision, to supply the individual homeowners with water for domestic use.

The location of the six proposed drill targets (TW2014-01 to TW2014-06) is shown on Figure B1. The wells are clustered in two groups, one at the eastern limits of the Project, and the other at the western limits. The eastern well group consisting of targets TW2014-01 to TW2014-03 is located within PID 00931428. The western well group consisting of targets TW2014-04 to TW2014-06 is located within PID 70294921. All drill targets are proposed to be located such that the well may be suitable for use as a domestic water supply well by the future landowners.

### 3. Required water quantity (in m<sup>3</sup>/day) and/or required pumping rate.

The required pumping rate from each individual water wells is estimated to be at minimum of 1.8 m<sup>3</sup>/d, based on supplying a single family, three bedroom residence (*i.e.*, 4 persons per residence). As per the WSSA guidelines, the water requirements are 450 L/d per person, with a peak demand of 3.75 L/min/person.

### 4. List alternate water supply sources in area (including municipal systems).

Existing residential developments in the Irishtown area are serviced by private wells and septic systems. The Project is located approximately 4 km north of the current extent of the municipal water distribution system for the City of Moncton, which currently ends at Tankville along Elmwood Drive.

### 5. Discuss area hydrogeology as it relates to the project requirements.

As discussed in the EIA Registration document, the Project is situated in the Caledonia Highlands physiographic region. The bedrock of the Project area is part of the Stilesville Formation in the south, and the Memramcook Formation in the north (Johnson and St. Peter 2008). The Stilesville Formation is a member of the Sussex Group, and consists of Early Carboniferous aged sedimentary rock: red-brown to grey-green, angular to subrounded polymictic breccia and conglomerate. The Memramcook Formation is a member of the Horton Group, and consists of Late Devonian to Early Carboniferous grey to reddish grey medium to very coarse-grained arenaceous sandstone, with mirror conglomerate.

Based on the coarse-grained nature of the bedrock, it is assumed the bedrock will have a relatively high permeability, and be able to transmit water at rates sufficient for the Project. Water well records obtained from the NB OWLS support this assertion, with average well yields for wells within 1 km of the Project of 70 L/min (ranging from 2.5 to 455 L/min). These rates are capable of supporting the average daily water requirements, but in some rare instances may not be able to support the peak demand.

However, the peak demand may be satisfied by incorporating a water reservoir as part of the water supply system at a residence, if necessary.

#### **6. Outline the proposed hydrogeological testing and work schedule.**

It is understood that the hydrogeological testing may not be started until after approval of this Initial Application has been received by the Proponent. It is the intent of the Proponent to drill the well targets in the fall of 2014, prior to the accumulation of snow on the ground, in order to facilitate the access of a water well rig. Hydraulic testing of the wells is proposed to occur in January to February of 2015, in order to avoid the fall and spring groundwater recharge seasons. The actual dates of the testing will be weather dependent.

Two of the six test wells (one from each well group) will be used as a pumping well, with the remaining wells used as observation wells. The selection of wells to use as pumping and observation wells will be selected based on the driller-estimated well yields, with the highest yield wells selected for testing. A 24-hour pumping test will be conducted at the selected wells, at as high a rate as possible from the well, to maximize the potential drawdown effects in nearby observation wells, thereby allowing better estimation of potential effects on existing groundwater users.

In addition to the information collected from drilled water wells, water level data from existing nearby water wells may be collected, if applicable. This data would be used to assess potential interactions with existing users. The collection of this data will require homeowner approval to monitor the water level during the pumping tests.

A water quality sample will be collected from the pumped wells prior to the termination of pumping of each pumping test.

Upon completion of the hydraulic testing, a report will be prepared outlining the methods used, field data, and relevant information used to provide the conclusions and recommendations. This report will also include a discussion of long-term sustainable yields of the well and impacts on existing water supplies, if any.

#### **7. Identify any existing pollution or contamination hazards within a minimum radius of 500 m from the proposed drill targets. Historical land use that might pose a contamination hazard (i.e. tannery, industrial, waste disposal, etc.) should also be discussed.**

A search of the SNB database for properties within 500 m of the limits of the Project revealed the presence of one property with a Petroleum Storage Site report as well as a Remediation Sites Management Program report -- PID 00931329 (Figure B2 attached). A gas station at this location is a potential source of contamination. Identify any groundwater use problems (quantity or quality) that have occurred in the area.

**8. Identify any watercourse(s) (stream, brook, river, wetland, etc.) within 60 m of the proposed drill targets.**

No watercourses, water bodies or wetlands have been identified within 60 m of the proposed drill targets.

**9. Identify site supervisory personnel involved in the source development (municipal officials, consultants and drillers).**

**Consultant:** Stantec Consulting Ltd.

- Senior Hydrogeologist: Jonathan Keizer, M.Sc.E., P.Eng.
- Project Hydrogeologist: Abigail Garnett, M.A.Sc., P.Eng.

**Well Driller:** Caissie Well Drilling

**10. Attach a 1:1000 map and/or recent air photo clearly identifying the following:**

- Proposed location of drill targets and property PID
- Domestic or production wells with a 500 m radius from the drill target(s)
- Any potential hazards identified in question 7.

Figure B1 (attached) shows the available property information overlain on aerial photography taken in 1996. Domestic water well locations, as reported in the NB Online Well Log System are shown on Figure B1.

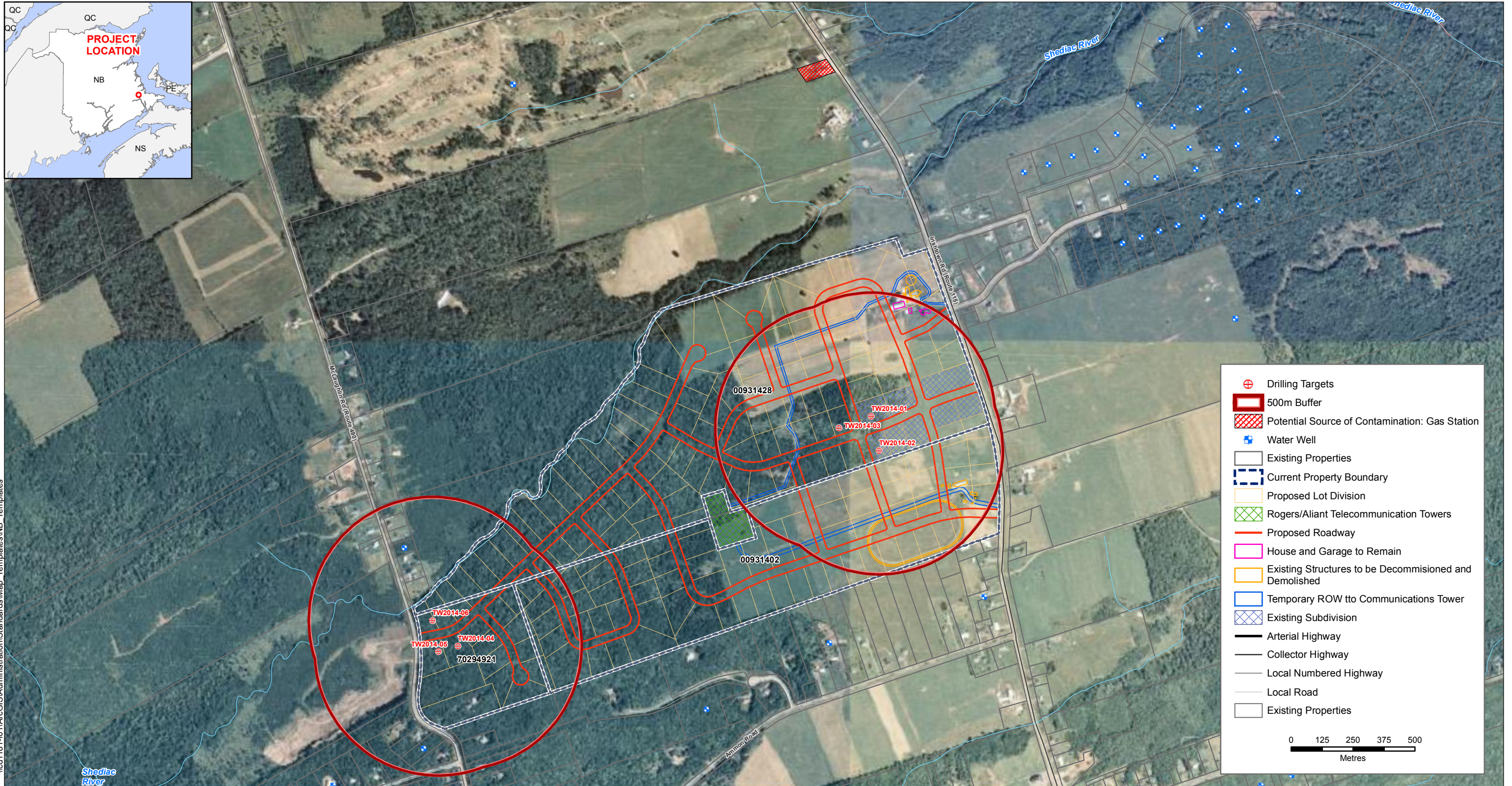
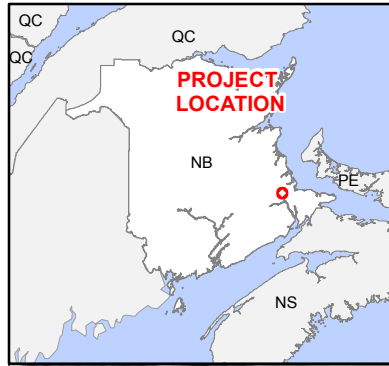
**11. Attach a land use/zone map of the area (if any). Superimpose drill targets on this map.**

Figure B2 (attached) shows the land use/zone map of the area.



**ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGISTRATION AND WATER SUPPLY SOURCE  
ASSESSMENT (WSSA): IRISHVIEW ESTATES SUBDIVISION, IRISHVIEW ESTATES LTD., IRISHTOWN,  
NEW BRUNSWICK**





	Drilling Targets
	500m Buffer
	Potential Source of Contamination: Gas Station
	Water Well
	Existing Properties
	Current Property Boundary
	Proposed Lot Division
	Rogers/Aliant Telecommunication Towers
	Proposed Roadway
	House and Garage to Remain
	Existing Structures to be Decommissioned and Demolished
	Temporary ROW to Communications Tower
	Existing Subdivision
	Arterial Highway
	Collector Highway
	Local Numbered Highway
	Local Road
	Existing Properties

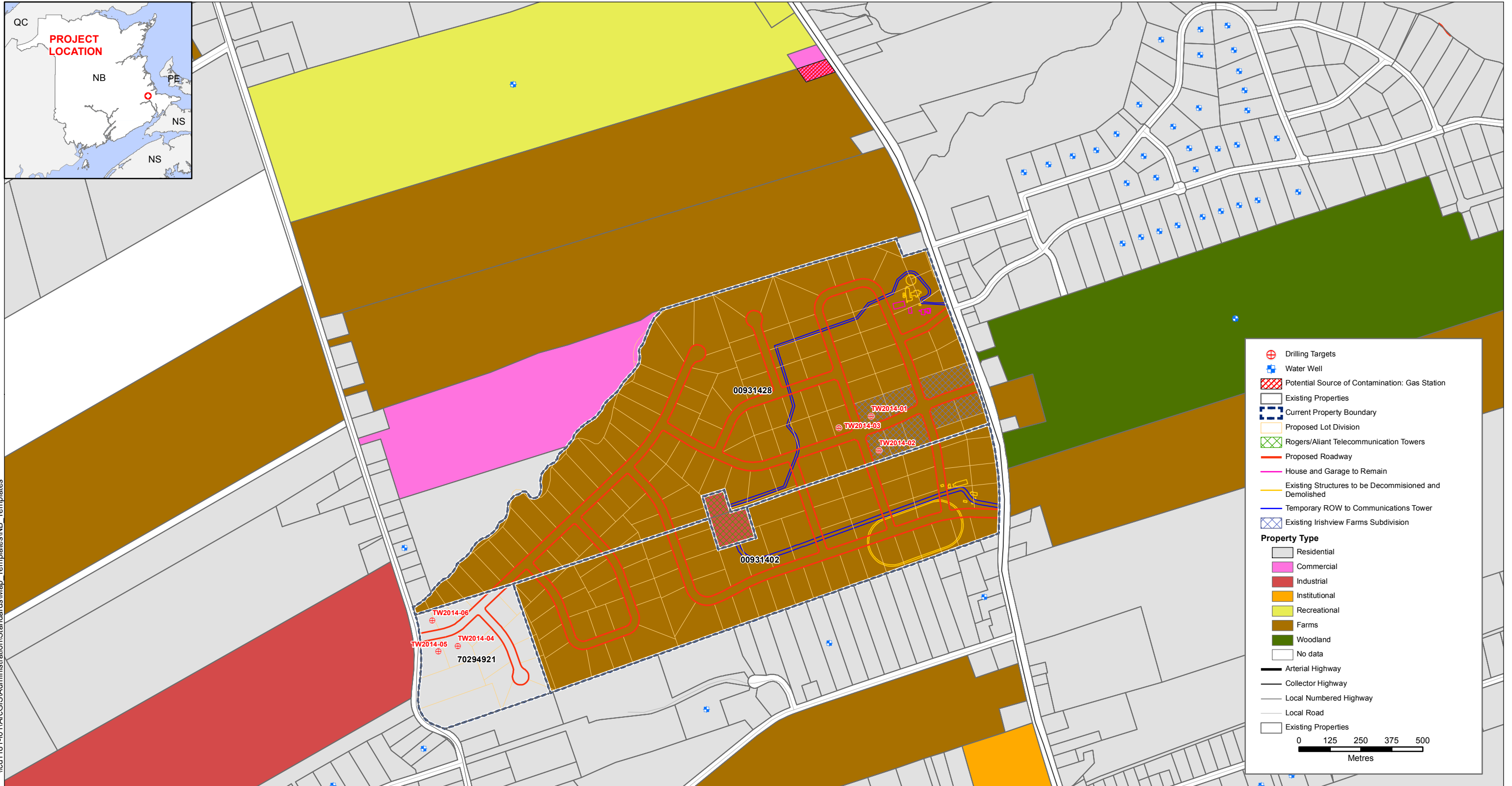
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NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<h2>Proposed Location of Drilling Targets</h2> <p>Irishview Estates: EIA Registration</p> <p>Irishtown, N.B.</p>				Scale: <b>1:15,000</b>		Project No.: <b>121811426</b>		Data Sources: NBDNR SNB ESRI		Fig. No.:  <b>B1</b>		
				Date: (dd/mm/yyyy): Nov 19, 2010		Fig. By: <b>MC</b>		Appd. By: <b>JK</b>		Imagery: SNB		
Client: <b>Irishview Estates Ltd.</b>												





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NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC PROJECT AND SHOULD NOT BE USED FOR OTHER PURPOSES.

<p><b>Drilling Targets and Land Use</b> Irishview Estates: EIA Registration Irishtown, N.B.</p>		Scale: 1:15,000	Project No.: 121811426	Data Sources: NBDNR SNB ESRI	Fig. No.:	
		Date: (dd/mm/yyyy): Oct 10, 2014	Fig. By: MC	Appd. By: JK	Imagery: SNB	
Client: Irishview Estates Ltd.						