

## **Status Review of On-Site Sewage Disposal in the Unserviced Areas near Parlee Beach**

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**Date:** December 15, 2017





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## **1. INTRODUCTION**

Parlee Beach Provincial Park is located along the Northumberland Strait, on the northeastern side of Pointe-du-Chêne, New Brunswick. The Beach was established as a Provincial Park in 1956, encompassing 1.6 acres of land, and is one of the most frequented beaches in the Maritimes. With more than 400,000 people visiting the park seasonally, Parlee Beach is an important economic driver for the region.

The water surrounding Parlee Beach Provincial Park has periodically tested positive for elevated concentrations of faecal bacteria. These bacteria are often associated with human and animal feces, and the improper disposal of wastewater.

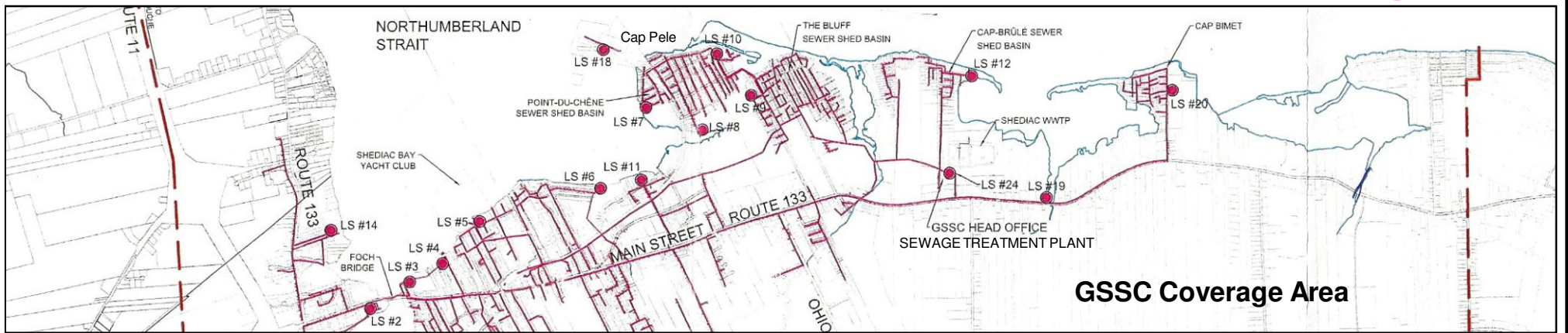
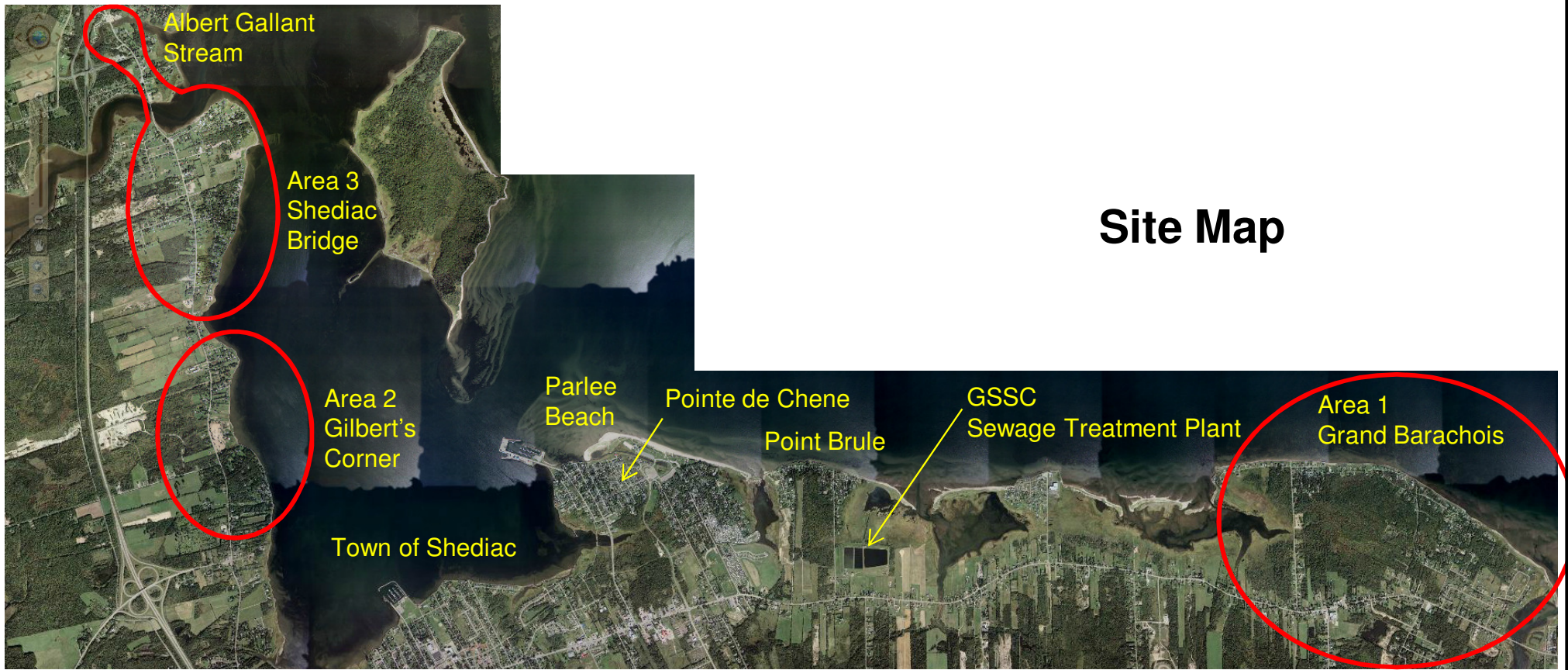
The sources contributing to the observed bacterial contamination have yet to be conclusively identified. Several studies investigating the potential sources of contamination are being conducted. NATECH Environmental Services Inc. was commissioned to assess the state of the privately owned on-site sewage disposal systems (septic systems) surrounding the Parlee Beach area. Specifically, the purpose of this study is to assess whether septic systems may be a contributing factor to the observed water quality degradation at the beach.

The areas immediately surrounding the beach, including the facilities of the Provincial Park, are serviced by the Greater Shediac Sewerage Commission (GSSC). With only a few exceptions, sanitary effluent that is generated within this area is collected through a series of gravity sewers and pump stations and transferred to the aerated lagoons at Point Brule Rd. for effluent treatment, disinfection and disposal.

As an extension of the original scope of work, it was to be investigated whether there is a potential for discharges from residences within the serviced area, and if so, whether there could be effluents within the serviced area that may contribute to bacteria contamination at Parlee Beach.

This sanitary investigation is based on a combination of site observations, water quality testing and interviews with local stakeholders. The study areas with on-site sewage disposal systems are depicted in Figures 1-1 and 1-2. The study area includes Area 1 (Grand Barachois), Area 2 (Gilberts Corner), and Area 3 (Shediac Bridge plus the shore line of Albert Gallant Stream). The study is limited to the investigation of septic systems on surface water. The impacts of septic systems on groundwater and the possible transport of contaminated groundwater into the bay is beyond the scope of this study.

# Site Map



**Parlee Beach**  
**Septic System Inventory Study**  
**General Study Areas**



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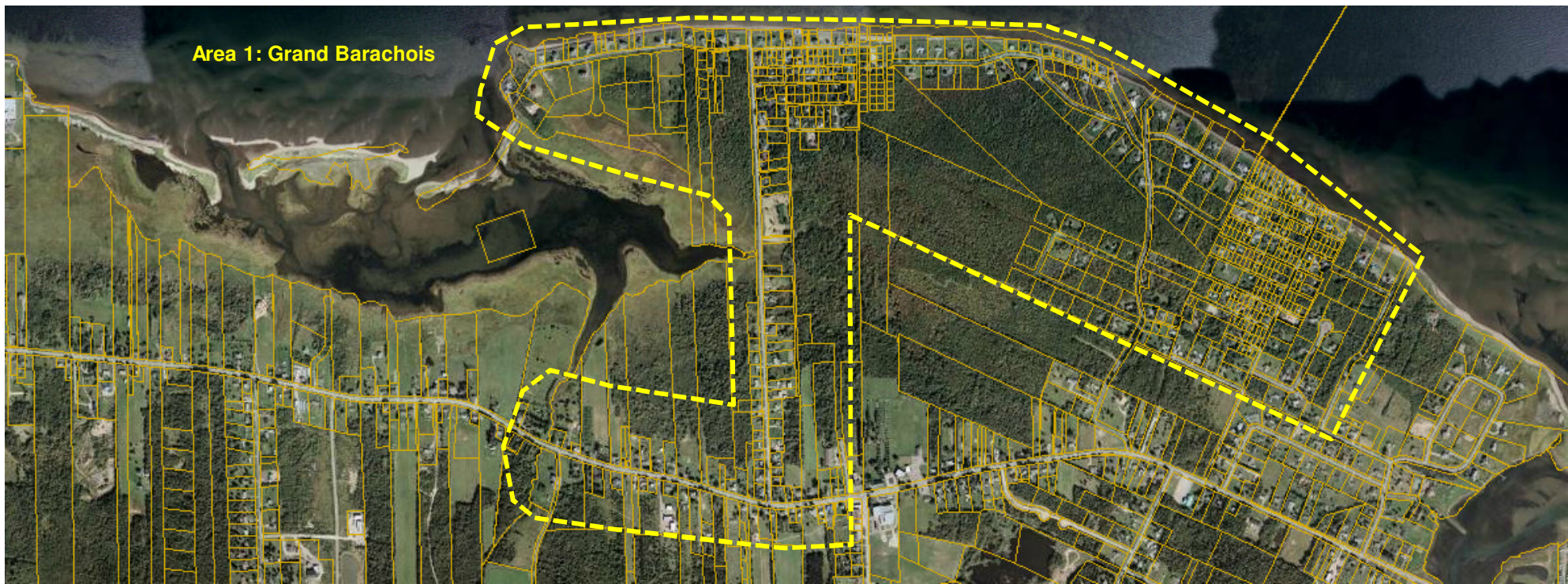
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SCALE:

FIGURE:  
 1-1





**Area 1: Grand Barachois**



**Area 2: Gilbert's Corner**



**Area 3: Shediac Bridge and Albert Gallant Stream**

**Parlee Beach  
Septic System Inventory Study  
General Study Area Aerial Photos**



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FIGURE:  
1-2

## 2. METHODOLOGY

The following methodology was applied for this investigation:

- ❑ Compilation and review of baseline information.
- ❑ Delineation of areas of interest outside of the Greater Shediac Sewerage Commission's sewershed.
- ❑ Completion of several visual site inspections, noting any indication of failing septic systems, which included vegetation, soil moisture and smell. The three areas of interest were visually inspected in early September and again in November of 2017.
- ❑ Water samples were collected in road ditches and streams discharging into the Shediac Bay. The samples were analyzed by RPC for Faecal Coliforms, Total Coliforms and E. Coli. Results were then categorized into three contamination levels with regard to E. Coli bacteria: low, medium and high.
- ❑ Local health inspectors and septic system installers were consulted to gain a clear understanding of past policies, typical failure of septic systems and attempts to rectify the issues in the area.
- ❑ Other local stakeholders were consulted with the objective of obtaining a better understanding of the issues surrounding on-site sewage disposal in the study areas.
- ❑ Findings were summarized in this report.

### 3. RESULTS

#### 3.1 Geography & Land Use

Three distinct areas of interest were delineated during the literature review stage and are shown in Figures 3-1 to 3-3. Each area is subdivided into distinct zones (A, B, C and D). A total of 1,190 lots were identified on relevant property mapping, with 471 buildings counted on these lots during the site inspection. The average residential lot size was approximately 700 m<sup>2</sup>; however, lots were significantly smaller (less than 300 m<sup>2</sup>) in the more densely populated areas. The lot information for each individual area is summarized in Table 3.1.

Table 3.1 Area characteristics

Area ID	Number of Dwellings	Number of Lots	Minimum Lot Size (m <sup>2</sup> )	Maximum Lot Size (m <sup>2</sup> )	Average Lot Size (m <sup>2</sup> ) <sup>1</sup>
1-A	89	198	158	7799	931
1-B	24	100	263	11050	1318
1-C	105	244	225	14521	810
1-D	66	112	1031	85590	880
2-A	29	86	289	26763	682
2-B	37	122	364	67802	771
3-A	63	215	143	50490	1068
3-B	58	114	229	16391	878
Total:	471	1191			

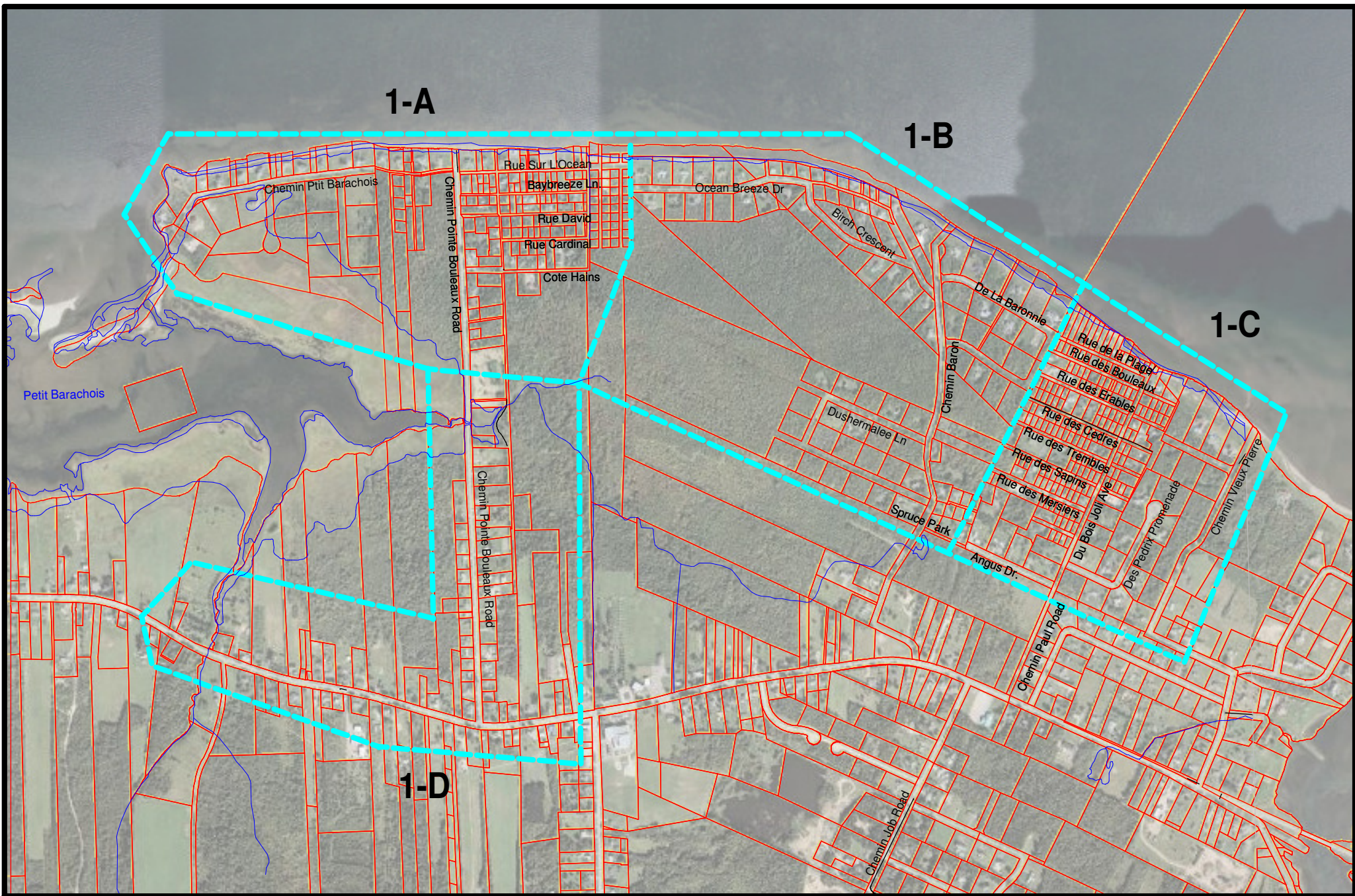
(1) Excluding any lot sizes greater than 4000 m<sup>2</sup>

The land development in the various areas occurred incrementally. Figure 3-4 shows the trends of development since the 1950's, based on historic aerial photography. While the number of developments appears to have levelled off in Areas 2 and 3, Area 1 appears to undergo continuous development at approximately five new dwellings per year.

According to the New Brunswick Technical Guideline for On-Site Sewage Disposal Systems, the minimum lot size for residential building is 4,000 m<sup>2</sup>. The Guideline also specifies a minimum depth from the road frontage of 38 m and a width of 54 m.

Within the study area, more than 85% of the lots cover less than 4,000 m<sup>2</sup>. The average residential lot size, calculated from lots that are smaller than 4,000 m<sup>2</sup>, was less than 1,000 m<sup>2</sup>. The review of lot sizes suggest that most of the effluent disposal systems in the study area are substandard, relative to the regulatory requirements. The regulations do not make a distinction between seasonally and full time occupied lots.





Assessment of On-Site Effluent Disposal Systems  
 in the Unserviced Areas Near Parlee Beach  
 Area 1, Grand Barchois



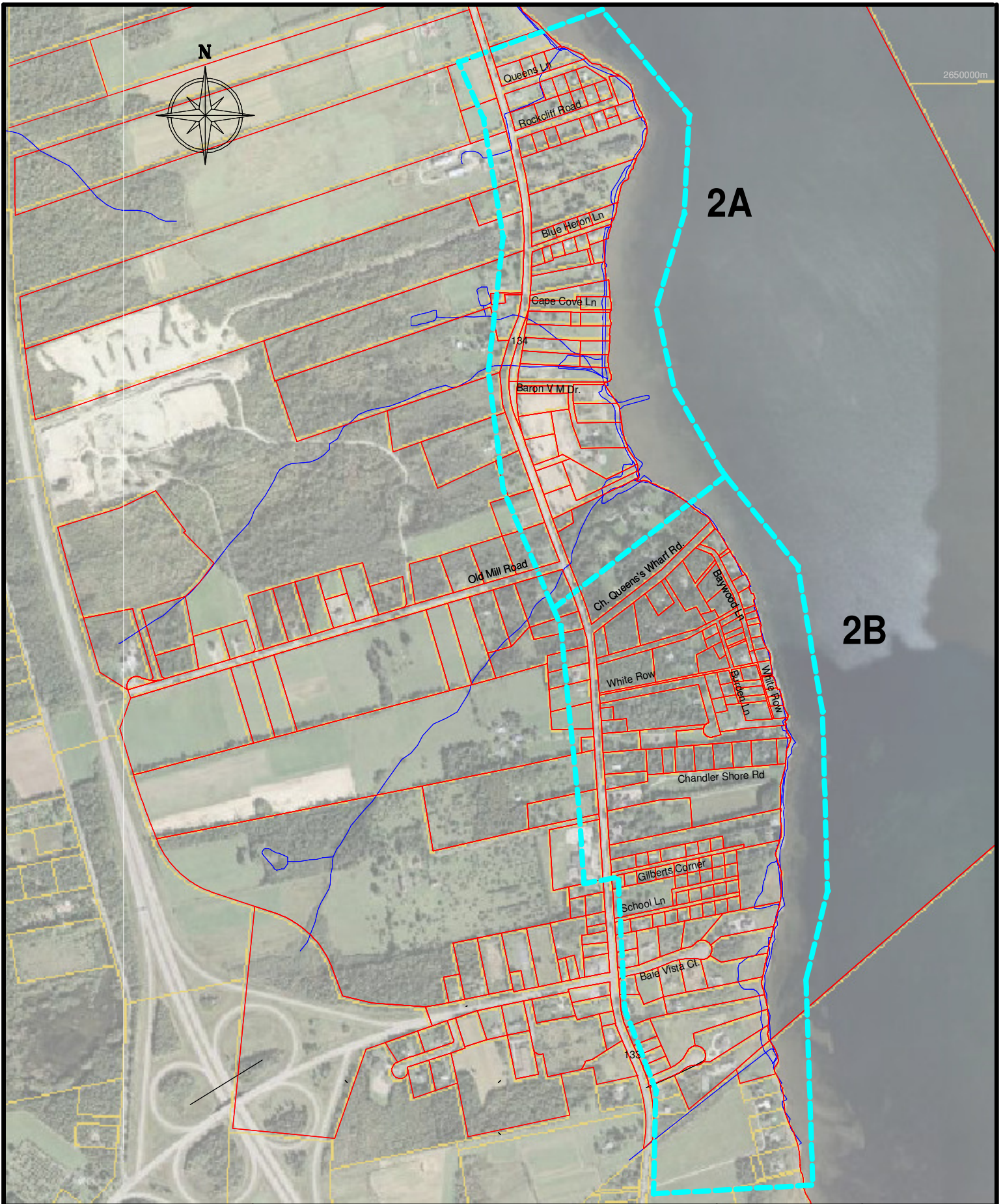
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Figure:	3-1





Assessment of On-Site Effluent Disposal Systems in the Unserviced Areas Near Parlee Beach Area 2, Gilbert's Corner



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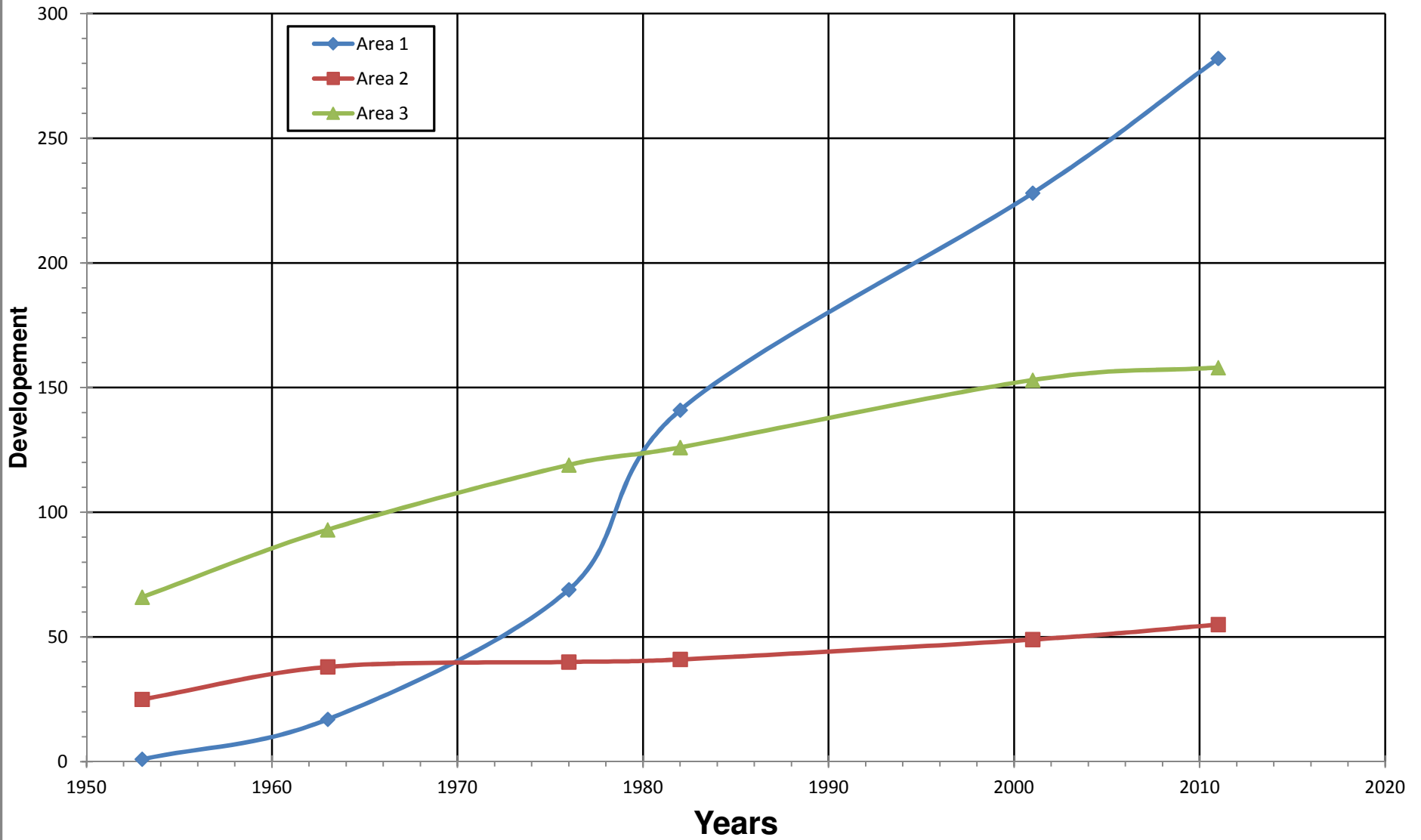
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 Figure: 3-2





Historical Development Chart for Areas Surrounding Parlee Beach  
Using DNR aerial photographs dating from 1953 until 2011



Parlee Sanitary Study  
Historical Development  
From 1953 - 2011



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SCALE: As shown

FIGURE: 3-4

### 3.2 Site Inspection

#### 3.2.1. Visual Observations

The site inspection survey was completed by walking the areas of interest on September 5, 6 and 7, and again on November 16, 2017. Visual observations are summarized by area in Table 3.2, with pertinent photographs with annotations shown in Appendix A.

Table 3.2 Site inspection observations

Location	Observations	Buildings Observed	Samples Taken	Wells Observed	Identifiable Disposal Fields
1-A	The area east of Point Bouleaux Road is more densely populated than the neighbourhood to the west. Culverts are filled with vegetation, mainly cattails. All culverts and a creek at the end of Alle Cote Hains were dry. Two properties had drainage swales and three had surface water grates to divert surface water. West of Pointe Bouleaux Drive, there was a protected wetland area, which was mostly dry. Three properties had French drains or drainage swales. There were no obvious indications of failing septic systems.	89	2	17	8

Status Review of On-Site Sewage Disposal in the Unserviced Areas near Parlee Beach

Location	Observations	Buildings Observed	Samples Taken	Wells Observed	Identifiable Disposal Fields
1-B	A property on Dushermalee Lane had a marshy area in front of their home filled with vegetation, including cattails. On the adjacent property, there was a small pond filled with duckweed, cattails and lily pads. Water sampled at this location had a foul odour. A culvert, located under the dirt road at the Dushermalee Lane / Rc of Beaubassin E connection had a large amount of duckweed present, but was not flowing.	24	1	2	1
1-C	Ditches in this area contained an abundance of vegetation, including <i>Impatiens capensis</i> (spotted touch-me-not or jewelweed) that may be indicative of septic system failure, or wastewater discharge. No standing water was observed. The area is densely populated, with wells in very close proximity of each other. A dry 6-inch pipe was observed coming out of a retaining wall along the beach.	105	0	19	3



Status Review of On-Site Sewage Disposal in the Unserviced Areas near Parlee Beach

Location	Observations	Buildings Observed	Samples Taken	Wells Observed	Identifiable Disposal Fields
1-D	<p>The ditches in front of two properties contained odorous, stagnated water, with an abundance of duckweed. The culverts directly across the road also contained stagnant water, with lush vegetation, but was less odorous. Two properties were observed to have surface drainage. Two additional samples were taken at a creek crossing with lush vegetation and at an outlet to the bay.</p>	66	5	5	1
2-A	<p>Three samples were taken off of Route 134. The first, on Old Mill Road, was a flowing creek. The second sample was retrieved from a stream and was grey in colour and potentially contained runoff from a chicken farm in the vicinity. The third sample was taken from the lagoon discharge from Bona Vista Cottages. Duckweed was observed at this location. A fourth sample was taken in this area at the end of Queen Ln,</p>	29	4	6	4

Status Review of On-Site Sewage Disposal in the Unserviced Areas near Parlee Beach

Location	Observations	Buildings Observed	Samples Taken	Wells Observed	Identifiable Disposal Fields
	where a creek discharges onto the beach.				
2-B	The area contained large lots, one being a children's summer camp. One sample was retrieved from standing water in a ditch. There were no obvious signs of septic system failure.	37	1	14	4
3-A	Three surface water drainage pipes were observed in this area, all of which were dry. The areas were densely populated on smaller lots, with wells being in close proximity of each other. There were no obvious signs of septic system failure in the area.	63	0	24	10
3-B	The area off of Rue James was densely populated. A property on Chemin de l'Aigle had an abundance of vegetation, including duckweed. The sample retrieved at this location was foul smelling and was obtained by digging and allowing water to pool. Water drainage from Arrow Ln. was	58	3	8	5

Location	Observations	Buildings Observed	Samples Taken	Wells Observed	Identifiable Disposal Fields
	observed on the beach. There was no odour, the owner said the drainage was from French drains. Two creeks were observed in the area, a dry creek at the end of Rue James and one sampled at the beach off of Murphy Road. This area also contains a motel that cannot be seen from the road.				

### 3.2.2 Test Results





Water samples were collected during the site inspections within the study area outside of the Greater Shediac Sewerage Commission’s sewershed. At the suggestion of the local watershed association, the location in which the Albert-Gallant stream crosses Route 134 was also sampled and analyzed for potential faecal contamination (Area 3C). The sample results, analyzed for Total Coliforms, E. Coli and Faecal Coliforms, are summarized in Table 3.3. The results were then categorized into three contamination levels in regards to E. Coli: low, medium and high. The sample locations and E. Coli level rankings are displayed in Figures 3-5 to 3-12.

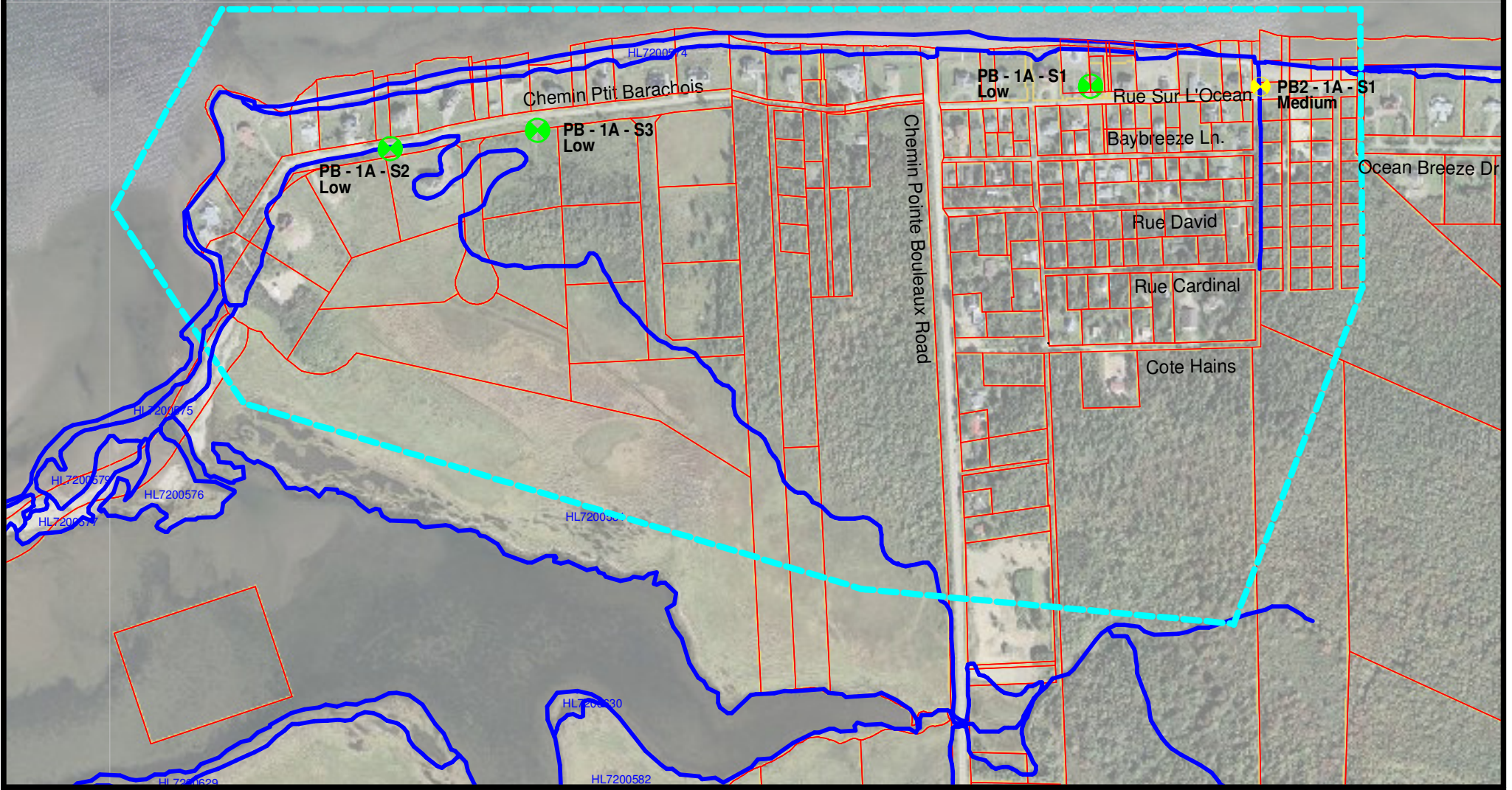




1A

**LEGEND:**

-  SAMPLE LOCATION (0-70 CFU/100 mL)
-  SAMPLE LOCATION (70-1000 CFU/100 mL)
-  SAMPLE LOCATION (>1000 CFU/100 mL)
-  INDICATIONS OF SEPTIC SYSTEM IMPACTS



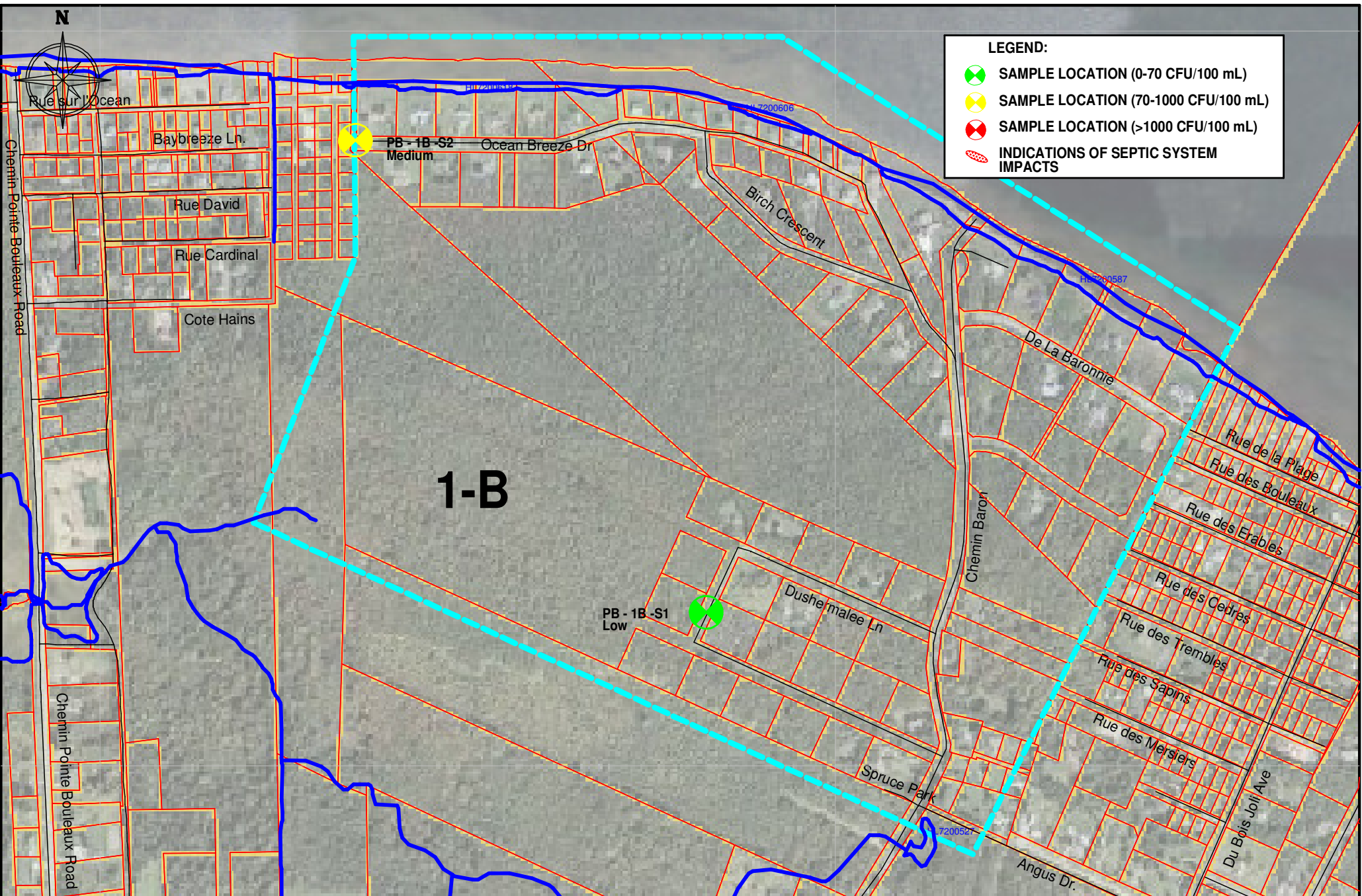
Assessment of On-Site Effluent Disposal Systems  
in the Unserved Areas Near Parlee Beach  
Area 1A Test Results



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Assessment of On-Site Effluent Disposal Systems  
 in the Unserviced Areas Near Parlee Beach  
 Area 1B Test Results

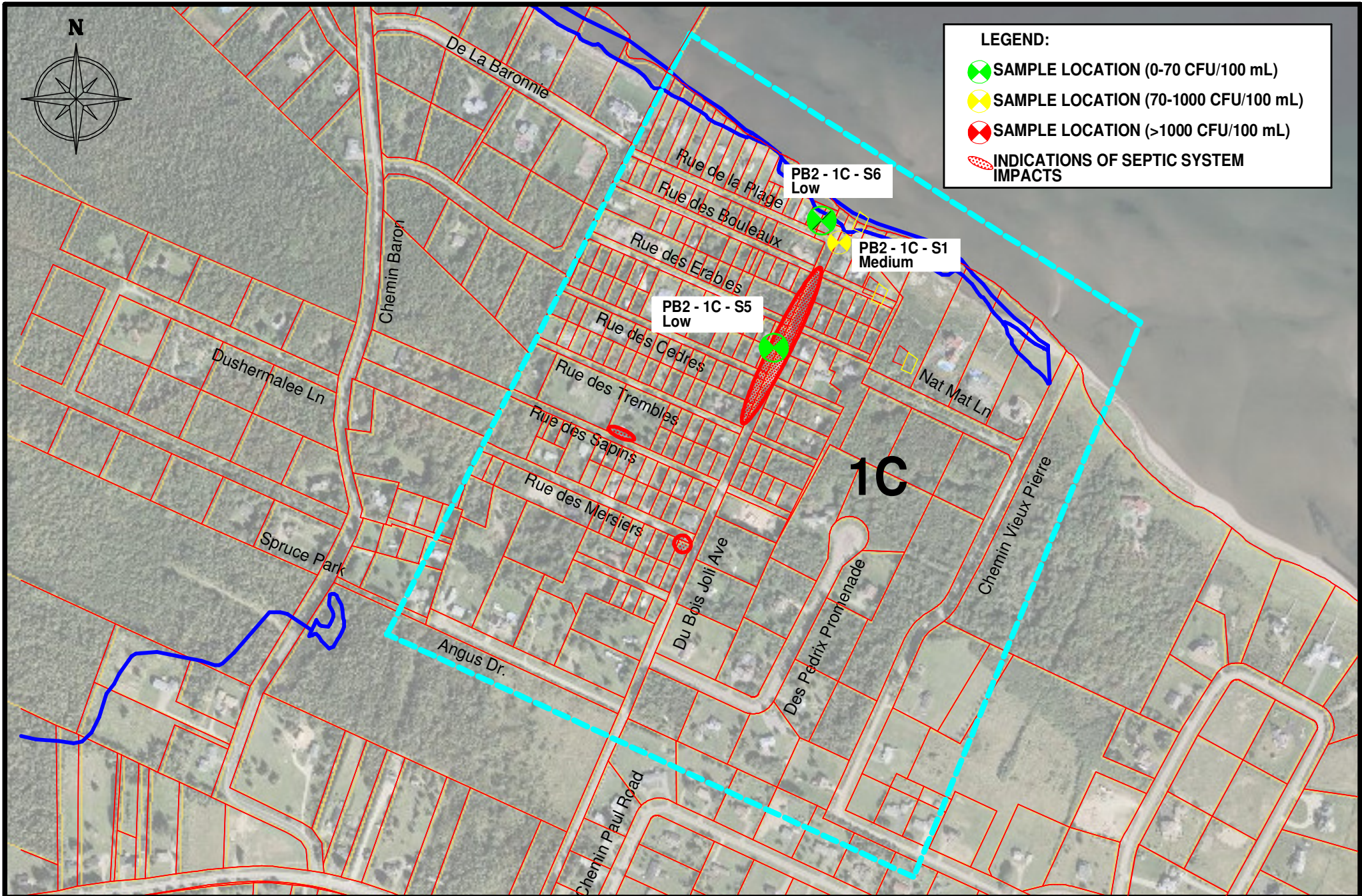


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 3-6





Assessment of On-Site Effluent Disposal Systems  
in the Unserviced Areas Near Parlee Beach  
Area 1C Test Results

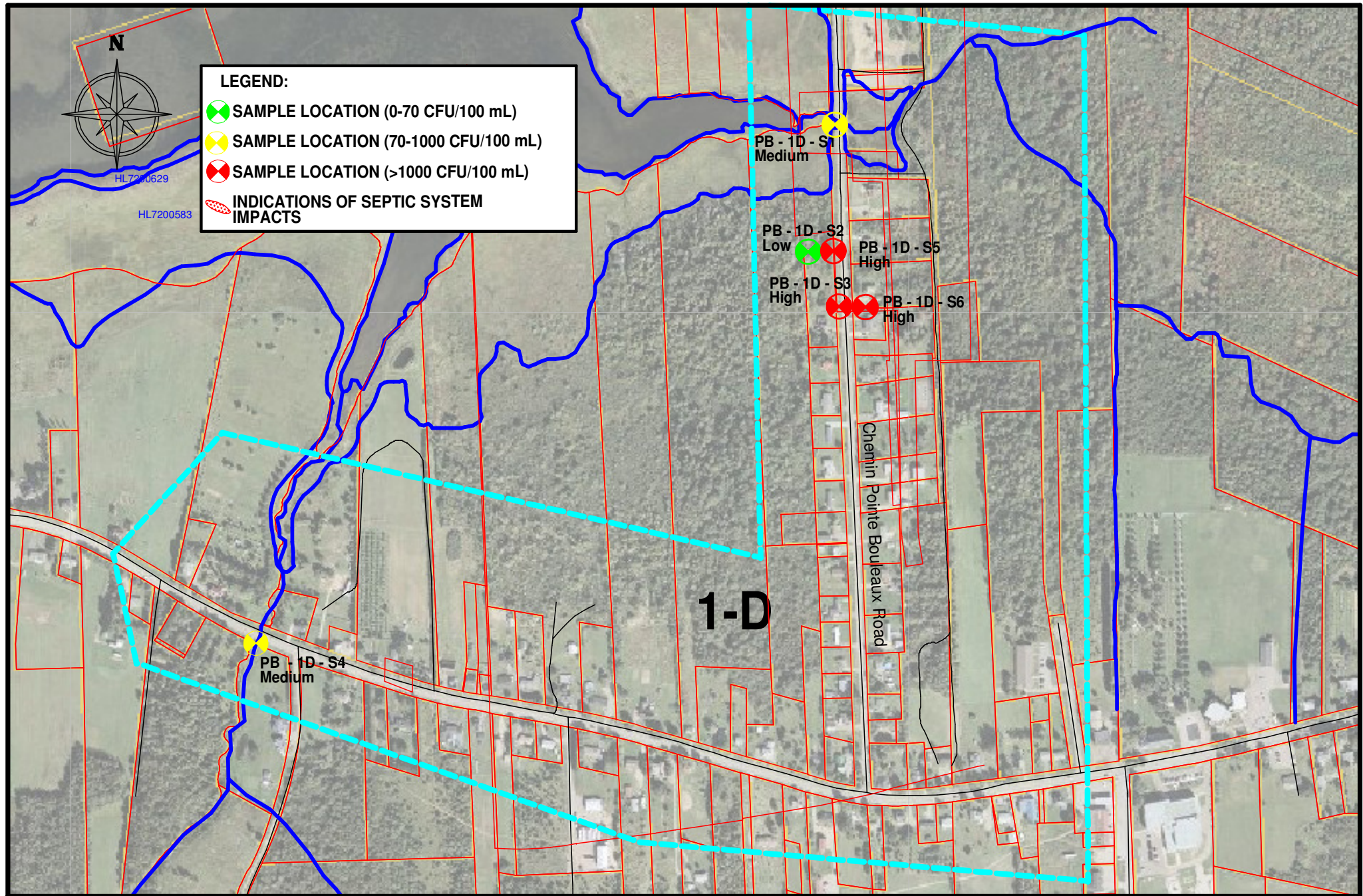


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3-7





**LEGEND:**

-  SAMPLE LOCATION (0-70 CFU/100 mL)
-  SAMPLE LOCATION (70-1000 CFU/100 mL)
-  SAMPLE LOCATION (>1000 CFU/100 mL)
-  INDICATIONS OF SEPTIC SYSTEM IMPACTS

**1-D**

Chemin Pointe Bouleaux Road

PB - 1D - S1  
Medium

PB - 1D - S2  
Low

PB - 1D - S3  
High

PB - 1D - S5  
High

PB - 1D - S6  
High

PB - 1D - S4  
Medium

Assessment of On-Site Effluent Disposal Systems  
in the Unserviced Areas Near Parlee Beach  
Area 1D Test Results



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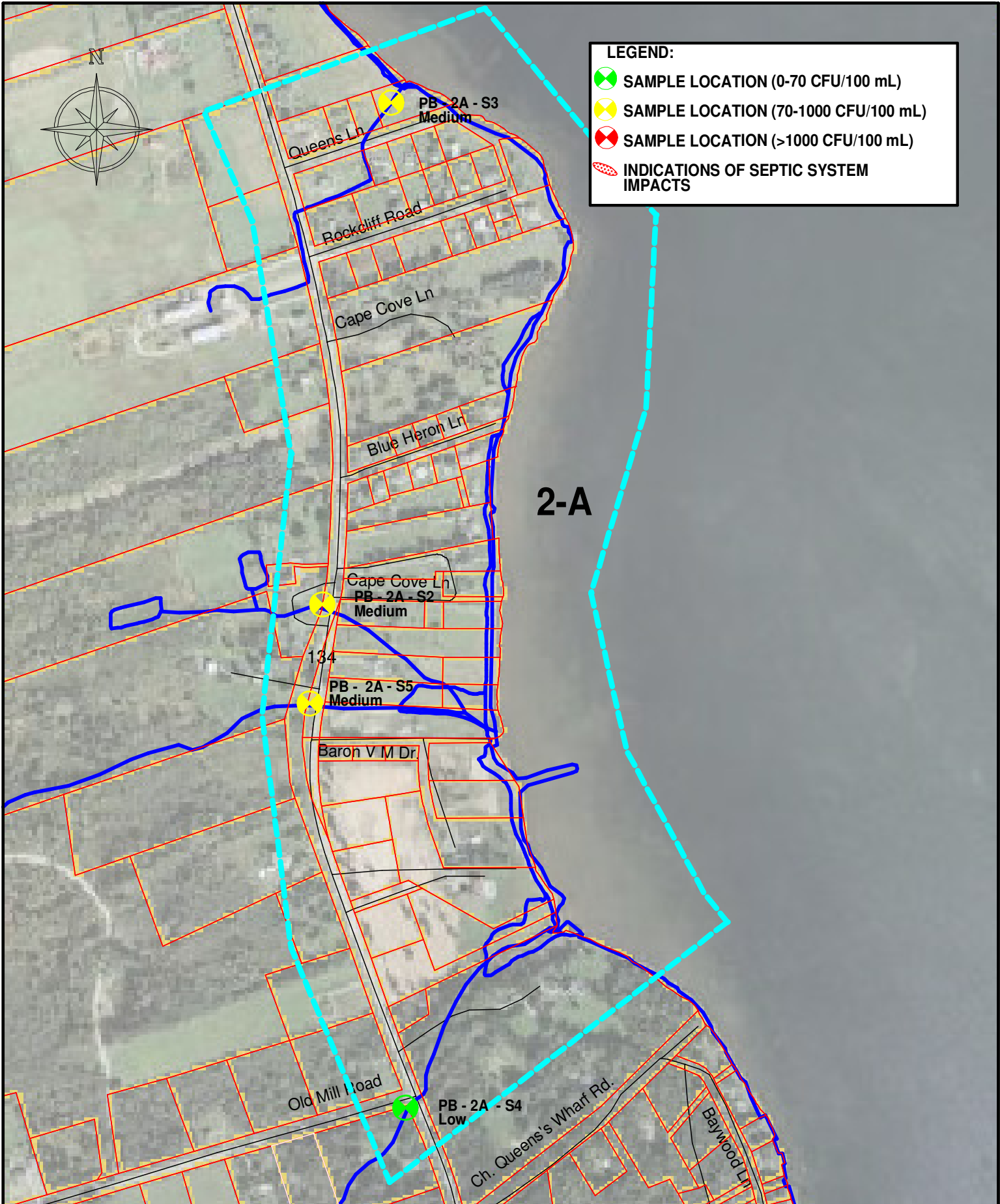
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Figure: 3-8





**LEGEND:**

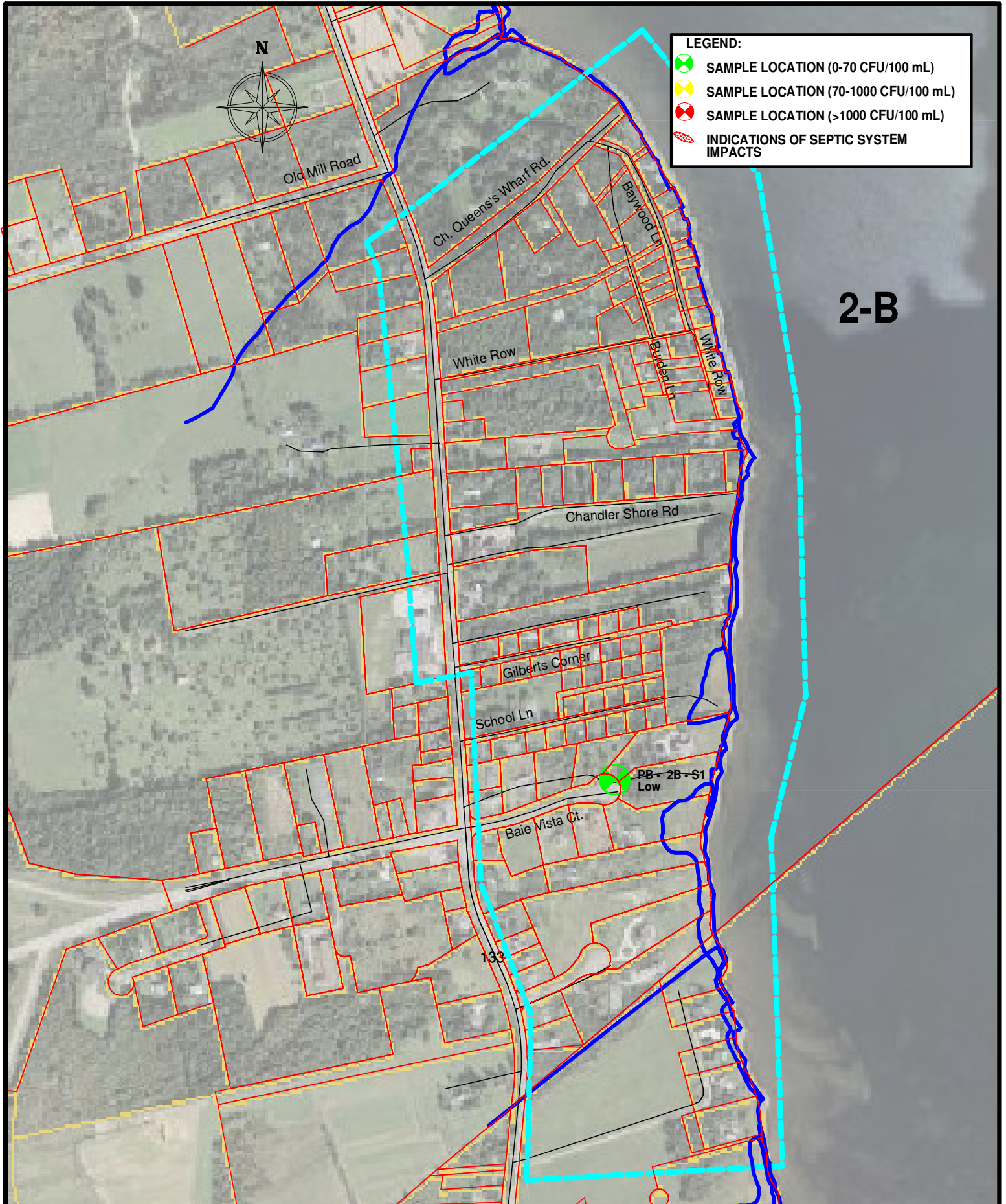
- SAMPLE LOCATION (0-70 CFU/100 mL)
- SAMPLE LOCATION (70-1000 CFU/100 mL)
- SAMPLE LOCATION (>1000 CFU/100 mL)
- INDICATIONS OF SEPTIC SYSTEM IMPACTS

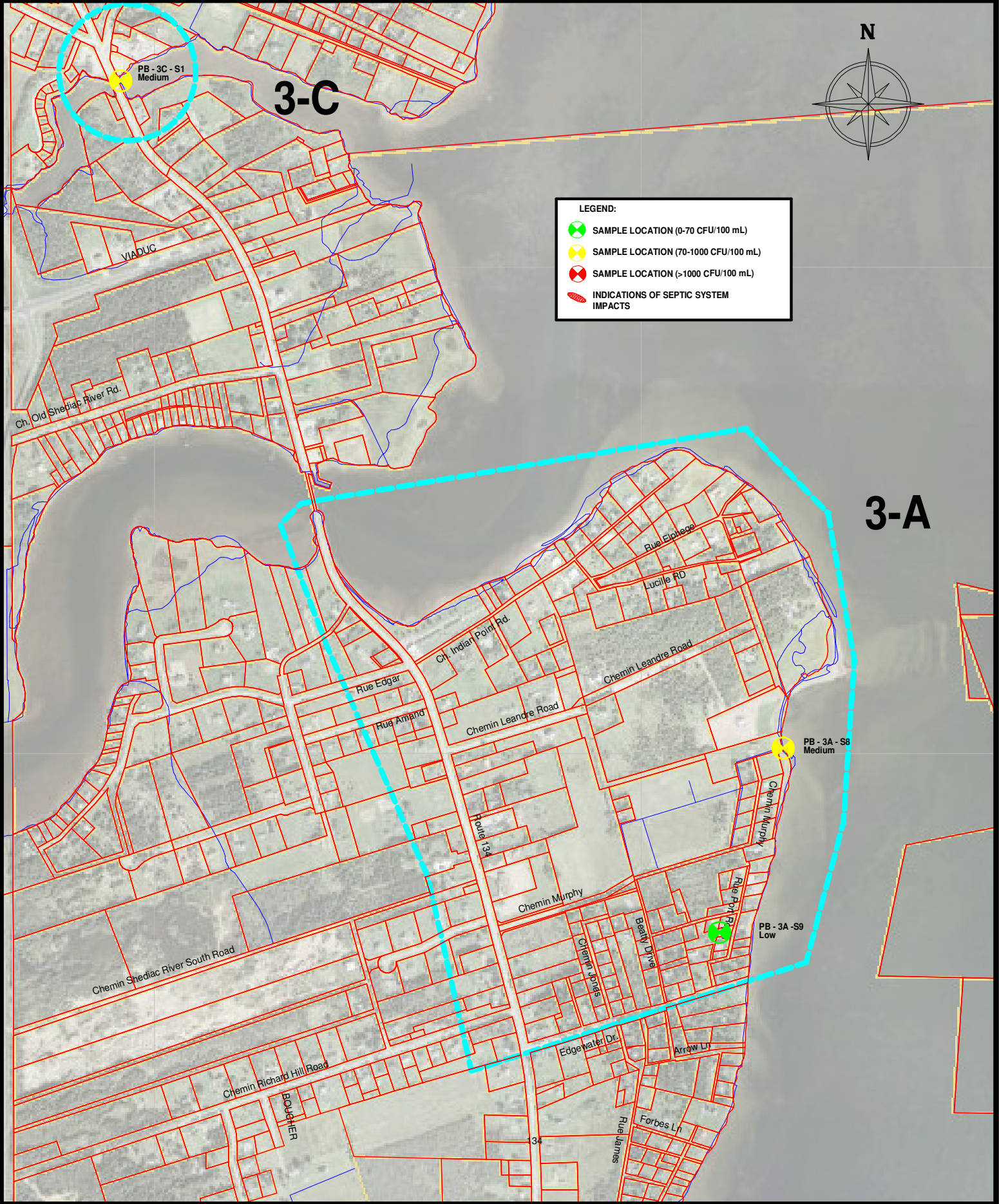
Assessment of On-Site Effluent Disposal Systems in the Unserviced Areas Near Parlee Beach Area 2A Test Results



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Date: 2017/09/15	File: PBS-17-01
Scale: As Shown	Figure: 3-9





**LEGEND:**

- ⊗ SAMPLE LOCATION (0-70 CFU/100 mL)
- ⊗ SAMPLE LOCATION (70-1000 CFU/100 mL)
- ⊗ SAMPLE LOCATION (>1000 CFU/100 mL)
- INDICATIONS OF SEPTIC SYSTEM IMPACTS



Assessment of On-Site Effluent Disposal Systems in the Unserviced Areas Near Parlee Beach Area 3A & 3C Test Results



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 Figure: 3-11





Assessment of On-Site Effluent Disposal Systems in the Unserviced Areas Near Parlee Beach Area 3B Test Results



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File:  
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Scale:  
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Figure:  
3-12



Table 3.3 Analytical results

No.	Area ID	Sample ID	Date	Total Coliforms (cfu/100mL)	Faecal Coliforms (cfu/100 mL)	E. Coli (cfu/100mL)	E. Coli Level Ranking
1	2B	PB - 2B - S1	9/5/2017	56, 000	78	48	Low
2	2A	PB - 2A - S2	9/5/2017	9, 000	280	294	Medium
3	2A	PB - 2A - S3	9/5/2017	1, 100	150	130	Medium
4	2A	PB - 2A - S4	9/5/2017	10, 600	52	28	Low
5	2A	PB - 2A - S5	9/5/2017	2, 900	168	146	Medium
<b>6</b>	<b>3B</b>	<b>PB - 3B - S6</b>	<b>9/5/2017</b>	<b>44, 000</b>	<b>5, 800</b>	<b>4400</b>	<b>High</b>
7	3B	PB - 3B - S7	9/5/2017	14, 000	740	344	Medium
8	3A	PB - 3A - S8	9/5/2017	1, 500	410	260	Medium
9	3A	PB - 3A - S9	9/5/2017	13, 000	220	20	Low
10	1B	PB - 1B - S1	9/6/2017	1, 200	<10	<10	Low
11	1B	PB - 1B - S2	9/6/2017	47, 000	680	520	Medium
12	1D	PB - 1D - S1	9/6/2017	5, 600	690	590	Medium
13	1D	PB - 1D - S2	9/6/2017	36, 000	1, 680	50	Low
<b>14</b>	<b>1D</b>	<b>PB - 1D - S3</b>	<b>9/6/2017</b>	<b>OG</b>	<b>6, 100</b>	<b>5600</b>	<b>High</b>
15	1D	PB - 1D - S4	9/6/2017	3, 100	710	620	Medium
16	1A	PB - 1A - S1	9/7/2017	> 10, 000	55	55	Low
17	3C	PB - 3C - S1	9/7/2017	1, 221	105	105	Medium
18	1A	PB2 - 1A - S1	9/15/2017	16000	60	20	Low
19	1C	PB2 - 1C - S1	9/15/2017	35000	900	500	Medium
20	3B	PB2 - 3B - S1	9/15/2017	1200	60	40	Low
21	1A	PB-1A-S2 Ditch	11/16/2017	4900	20	20	Low
22	1A	PB-1A-S3 Ditch	11/16/2017	14300	30	50	Low
<b>23</b>	<b>1D</b>	<b>PB-1D-S6 Ditch</b>	<b>11/16/2017</b>	<b>&gt; 200,000</b>	<b>2600</b>	<b>&gt; 200,000</b>	<b>High</b>

No.	Area ID	Sample ID	Date	Total Coliforms (cfu/100mL)	Faecal Coliforms (cfu/100 mL)	E. Coli (cfu/100mL)	E. Coli Level Ranking
<b>24</b>	<b>1D</b>	<b>PB-1D-S5 Ditch</b>	11/16/2017	<b>370000</b>	<b>&lt; 1,000</b>	<b>&lt; 1,000</b>	<b>High</b>
25	1C	PB2-1C-S5 Ditch	11/16/2017	5500	10	20	Low
26	1C	PB2-1C-S6 Ditch	11/16/2017	9200	< 10	< 10	Low
27	2A	PB-2A-S12 Ditch	11/16/2017	2900	20	20	Low
28	2B	PB-2B-S10 Ditch	11/16/2017	10600	80	170	Medium
<b>29</b>	<b>3B</b>	<b>PB-3B-S11 Ditch</b>	11/16/2017	<b>29000</b>	<b>6000</b>	<b>1300</b>	<b>High</b>

(1) OG: Overgrowth of Coliform Bacteria, unable to count

The Guidelines for Canadian Recreational Water Quality recommend to use Escherichia Coli (E. Coli) as indicator for contamination of freshwater with sanitary effluent, and to use enterococci bacteria as indicator in marine waters.

For contact activities, the mean concentration of five samples should be less than 200 counts (or colony forming units) of E. Coli per 100 mL.

For this study, a concentration of 100 counts/100 mL was used as the cutoff for the “low” E. Coli ranking. The “medium” E. Coli ranking refers to concentrations ranging from 100 cfu/100 mL to 1,000 cfu/100 mL, while the “high” E. Coli ranking refers to concentrations greater than 1,000 cfu/100 mL. The direct discharge of sanitary effluent could show concentrations of E.Coli of several hundreds of thousands counts per 100 mL.

A ditch across the street from 63 Chemin Pointe aux Bouleaux in Area 1D, was found to have E. Coli concentrations of 5,600 cfu/100 mL. A repeat sample showed even higher concentrations. The ditch was observed to have an abundance of vegetation.

The ditch directly in front of 63 Chemin Pointe aux Bouleaux, was found to have low levels of E. Coli; however, duckweed was observed, as well as a foul odour.

A third location of interest was found in Area 1C. This area was found to have an abundance of *Impatiens capensis* (spotted touch-me-not or jewelweed) that may be indicative of septic system impacts. The ditches in the area were dry during all site visits and samples could not be taken.

A ditch in front of 23 Chemin de l'Aigle in Area 3B, was found to have E. Coli concentrations of 4,400 cfu/100 mL. Duckweed, that may be indicative of on-site sewage disposal system failure, was observed at this location, and a foul odour was detected.

Precipitation can have a significant impact on water quality at Parlee Beach. Heavy rainfall could result in runoff from contaminated soils and stormwater discharge, which would allow for the migration of faecal bacteria to the Parlee Beach Area. The impact of precipitation could not be studied during this investigation, as the 2017 summer season was substantially drier than during previous years. The average rainfall during the 2017 summer season was just 124 mm, compared to an average of 255 mm over the last five years. The lack of precipitation limited the number of samples that could be collected, as there was very little standing water within the study area. Even during the follow up inspection on November 16, 2017 the ditches were mostly dry.

### **3.3 Public Consultation and Input**

#### **3.3.1 Residents' Comments**

While performing the site inspection, some residents provided insights and voiced concerns surrounding water quality in the area. These observations are summarized in Table 3.4.

Table 3.4 Local residents' comments and observations

Area ID	Location	Observations
1-A	■ Rue de la Mer	Owner was worried about the contamination problem and suggests a correlation between nutrient input to the bay and seaweed growth on the beach. They said the abundance of seaweed tends to fluctuate and comes and goes on its own every couple of weeks.
1-C	■ Mersiers	Owner is very pleased the study in being completed and inquired into where the findings would be published. They said the ditch across the road almost always has standing water. They are unaware of any septic problems in the area.
1-C	Du Bois Joli Ave	One resident was apprehensive and called DELG to report our activities and to find out more about the study.
3-B	Arrow Ln. Beach Front	One resident was worried about his neighbour's discharge onto the beach. They had grown up in the area (closer to Parlee Beach) and said that the seaweed problem has gotten significantly worse over the past years.
3-B	Arrow Ln. Beach Front	The neighbour said that the water drainage is from French drains used to divert water from an old creek and that they are using it for thermal energy recovery. They also said they had to dig 6-8 feet deep to reach sandstone during construction.

Area ID	Location	Observations
3-B	[REDACTED]	Resident [REDACTED]. He believed that the digging and displacement of sediment in the area for construction (including in Scoudouc) is the cause of the bacteria fluctuations. The owner [REDACTED] and is sure that boaters are not to blame and that there are typically less than 30 boats in the bay at a time.
Within the SSCW's Sewershed	[REDACTED]	Resident said that the manholes are in the back of the cottage (beach front) and sewer lines run along the cottages as well. They do not know of anyone not connect to the sewer lines. They also said that local residents are performing their own water quality testing. Results indicate that this area is not bad; however, water quality seems to deteriorate closer to the wastewater lagoon outfall.

### 3.3.2 Septic System Installer Interviews

The owners of three local septic system installers were interviewed as part of this study, Gallant Septic Service Ltd., Alphe + Paul Septic Inc., and A&E Septic and Excavating Inc. The installers provided the following information.

#### 3.3.2.1 Site conditions

The installers report the site soil conditions in the different areas as described in Table 3.5

Table 3.5, site conditions

Area ID	Soil Description
Area 1A	soil consists of fine sand and silt, suitable for on-site sewage disposal
Area 1B	mostly sand stone, some clay, difficult to work with, requires often imported sand
Area 1C	mostly very wet clay, especially during the spring and fall, very difficult to work with
Area 1D	sandy silty soil, higher ground with mixed soils
Area 2A	mostly clay, same sand, most systems are above ground. Still better to work with than Casey Cape soil which is mostly clay
Area 2B	mostly clay, some sand, most systems are above ground. Still better to work with than Casey Cape soil which is mostly clay
Area 3A	soft sandstone, bedrock (hard sandstone is close to the surface)
Area 3B	soft sand, bedrock (hard sandstone is close to the surface)

### 3.3.2.2 Experience with failing systems

The area around Avenue Du Bois Joli is the most critical. In this area, soils are very tight and the groundwater table is within 0.6 m from the surface. To remedy failing septic systems, lots are often raised by 1.5 m with imported fill.

Observed problems with septic fields include flattened pipes, growth of roots into the pipes, and entrainment of sand into the pipes as a result of high and fluctuating groundwater tables. When septic tanks have not been pumped frequently enough, disposal fields are plugged with sludge. Typically plugged fields need to be replaced. Also, older septic tanks were too small, leading to sludge accumulation in the fields. Steel septic tanks had

problems with their baffles, which also lead to sludge washout in the past. Steel tanks were replaced in the 1980's. There are hardly any steel tanks left in the ground.

The cost for a new, or remediated septic system is typically in the \$15,000 range, which often exceeds the budgets of seasonal cottage owners.

Systems tend to fail when there is a change of ownership, since new owners often are not used to the water conservation practices of the previous owner.

The installers are not aware of direct discharges of wastewater into road ditches.

Often cottages are upgraded to include washers and dryers and a second storey may be added to the building. Sometimes, part of the disposal field is removed to make room for the house expansion.

There are several holding tanks, some of which are pumped out regularly. Others appear to be pumped out infrequently, leading to the question of what happens with the effluent. Do those tanks have a leak, or are they being pumped to the ditch at night?

Most installers use pipe in-stone systems, which have a larger foot print than infiltrator systems and are more forgiving to being overloaded. The larger systems (i.e. campgrounds) often utilize pressure dosing systems.

Installers do not like to do repairs of failing systems because they tend to be located on sub standard lots and are "impossible systems", i.e. they cannot meet regulatory requirements. The installers do not like to warranty those systems.

### **3.3.2.3 Suggested treatment and disposal technology**

On difficult lots, the installers tend to request design help from engineers. Engineers can obtain permits for systems that might not otherwise get approval from the Department of Public Safety.

Technologies used by installers include contour trenches, sloping sand filters and pressurized mounts. Very few in-ground trench systems are now being installed.

Very few peat filters or mechanical treatment plants are being installed. Similarly, Large Diameter Matted Pipe, another type of septic system, have not yet been tried in the area.

It is important to use proper treatment sand. The practice of crushing sandstone should be discontinued. Suitable treatment sand is available, however, trucking costs are higher than the cost to crush and use sandstone.

Holding tanks are not a good solution. Typically, it takes two weeks to fill a tank and the cost for pumping a tank is \$450. To pump a holding tanks becomes excessively costly over a three month summer period (close to \$3,000 per season).

If holding tanks are used, they should be managed by a regulatory body, not by the home owners.

Holding tanks reportedly work in Ontario, if a commission manages the pump outs. In this scenario, owners are either charged a flat fee per year, or they are charged for the amount of water removed.

There are too many loopholes for non-conventional land uses, such as cottages, RV's, and renovations.

#### **3.3.2.4 Experience with the regulatory system**

The previous regulatory system was superior to the current system. Until 2010, all new installations were inspected twice - once during construction and once after completion. Inspectors responded very quickly to requests for inspections. Between 2011 and 2015, the desk top audit system was introduced and only approximately 30 % of the systems received actual inspections. The rest of the new installations were approved without inspections.



Until 2015 there were two health inspectors working within the study area. Now, there are two Public Safety inspectors who cover a much larger area and who are also looking after plumbing and electrical inspections in new buildings. One of the inspectors is currently on an extended leave of absence.

Public Safety inspectors do not have time to do septic system inspections and hardly any inspections of new installations are being carried out. Once the three day notification period has passed, the installer can legally cover the system. Some installer do not even wait the three days because they know that it is unlikely that there will be an inspection.

The approval process takes too long, now that an application has to be sent to Fredericton. This process delays the procurement of building permits, as well.

The record keeping of the new regulatory system may be better than the old one.

In previous years, the Department of Health had a registry in place in spread sheet format. Whether this registry is still being maintained is unknown. The PID number registry should have permits for septic systems included. If this were the case, it would be possible to see what land usage the septic system was designed for.

#### **3.2.3.4 Other opinions expressed**

Areas 1 A, B and C should receive a centralised effluent collection and treatments system.

The owners of expensive lots near the shore often have the financial means to buy larger lots and to install proper disposal systems. The owners of seasonal lots on secondary tiers further inland often do not have the financial resources to buy more land or to upgrade their disposal systems.

It may be difficult to enforce a communal management system for septic systems because deficiencies will be very obvious and cottage owners may be reluctant to spend money on upgrades.

Also, it may be difficult to implement a communal wastewater collection and treatment system since some cottage owners have already invested significant amounts of money in their system. Those owners will be reluctant to abandon their new systems and pay annual sewer fees.

The Scoudouc River receives municipal and industrial effluent, and the area is densely populated. There could be high loadings of pathogens in that river.

Neighbours in the area are self policing. The community does not want the sight and smell of black water in the ditches. Neighbours are either pressuring each other to get a failing system remediated or they inform the regulators, who then enforce remedial measures.

Ditches and brooks should be inspected for bacteria levels in the spring and fall, after rainfall events.

Regulatory inspection services are necessary. It is easy to make mistakes during the construction of a septic system and this applies especially to new installers.

Handymen are often hired to assist with patching up systems without a permit. It is easy to hire a mini excavator and a pick up truck to do some “emergency repairs”. The lack of regulatory enforcement encourage rogue installers, further contributing to malfunctioning septic systems.

From 2003 to 2007 a government program that offered financial assistance to low income homes for septic system replacements. However, typically the cottage owners in the study area were not considered as having low income. No septic systems under that program were replaced within the study area.

### **3.3.3 Public Health and Safety Inspectors:**

One Public Health inspector and one inspector of the Department of Public Safety were interviewed. Their comments are summarised below. Many of the newer septic systems

are designed by engineers, due to the small lot size and the high groundwater table. Those systems tend to work properly. The engineers have to take responsibility for their work.

Failing septic systems are still being reported to and managed by the Department of Health.

In 2016, the number of failing systems in the study area was small, likely less than five.

Illegally installed systems are difficult to find. Any repair work by the owner is often done in the evenings or on weekends. If the inspector tries to follow up or investigate, he can rarely find a home owner or repair person to speak with. The inspectors do not have the time to follow up leads or to find the home owners or their repair companies.

Travel trailers and Recreational Vehicles (RVs) are a big concern to the inspectors and other stakeholders. Often, a property owner obtains a permit for a garden shed on his property. No septic system is required for such a shed. Sometimes the land owner requests a permit for a small disposal system for the shed or for one seasonal travel trailer. Then, over subsequent years, several ( in the order of ten) more RVs are parked and used on the land. During the summer, reportedly there are several complaints about illegally stored RVs and travel trailers on a number of properties in the study area.

Often, the grey water discharges from RVs are routed directly into a ditch. RV owners claim that they fill the vehicle's holding tanks and then drive to a dump station. It is unlikely that this practise is being followed by all RV owners and operators. It is more likely that RV owners find some other method of disposing the effluent.

The permit for a septic system should spell out how many RVs can be placed on a lot.

There is very little enforcement and there is no easy mechanism to fine a home owner for not meeting the requirements of the approval (of the septic system).

The burden of proof for identifying non-compliance is with the inspector and not with the

home owner. It should be the requirement of the home owner to prove that his system meets the conditions of the approval, rather than the responsibility of the inspector to prove that the system is non-compliant. The NB Department of Justice could assist with the enforcement issues. The enforcement has to be fast and efficient to serve as a deterrent to land owners intent on not abiding by the rules for wastewater disposal and rogue installers.

### **3.3.4 Government Agencies**

#### **3.3.4.1 NB Department of Rural Planning:**

The manager of the NB Department of Rural Planning and some of his staff were interviewed during the study. The following opinions were expressed. There are cottages and houses in the GSSC district that have not been connected to the municipal system, either for technical or other reasons. It is recommended that the Commission investigates whether some of these homes can now be connected. Video inspections of sewer lines might help in determining homes that are not connected.

Coastal erosion may be a concern in the future. With increasing storm surges, some of the systems close to the shore may be in danger of losing the necessary 30m buffer.

Pump stations within the GSSC have overflows. During storm events, the overflows may discharge untreated sewage into streams that lead into the bay. This concern should be investigated further.

There is a concern with infilling of ditches, which may lead to raising the groundwater table. No concise examples were given.

The Nova Scotia system of using trained site Professional Engineers and Qualified Persons might be superior to New Brunswick system of qualifying installers. A review of the NB regulatory framework for on-site sewage disposal should be carried out, in

comparison with the NS system.

A Commission could be established to manage septic systems and holding tanks within Study Area 1. It is recommended that the area of Grand Barachois could be a pilot project area. The land owner would allow the Commission to access the property for servicing, or he could choose to have the system serviced himself, and then provide proof of service. The Commission should also look after the monitoring of drinking water wells.

If the role of the GSSC is expanded, the decommissioning of existing septic systems should be supervised and documented.

The separation of responsibilities between different government departments leads to inefficiencies and time delays for the developer. All development related permits (building, plumbing, electrical, septic, water wells, etc) should be issued in one office. The Department of Rural Planning would be best suited for these tasks.

All relevant property information, including all permits, should be tied to the PID and available and accessible on the NB PLANET geographic information system.

#### **3.3.4.2 Greater Shediac Sewerage Commission:**

The manager of the The Greater Shediac Sewerage Commission was interviewed during a meeting. The following notes were kept:

The cottage area near Parlee Beach received municipal wastewater collection services in the early 1970's. Almost all cottages were connected and the septic systems either abandoned or removed. Municipal water is not supplied to the area.

There are only a handful of septic systems that have not been connected since then. There is usually a good reason for those systems not being serviced. Most likely, the systems are land locked and the owner does not have permission from the adjacent land owner to cross that property with a service lateral.

The following lots were identified as being on un-serviced lots: four lots at the beginning of Gould Beach Rd., three sites on one lot at the end of Euclide Legere Rd. and Joline St. (to be connected in 2018), and one lot each on Carnation Lane, Young Lane, and Royal St.

Video inspection showed that the gravity line (10" concrete) along St. John Street receives a significant amount of infiltration from groundwater. This sewer line will be replaced in 2018. While exfiltration out of a gravity sewer cannot be precluded, it is not likely that the pipe exfiltrates a significant amount of water when the groundwater table is low. Water follows the path of least resistance and significantly more water tends to flow through the pipe toward the lift station, than filtrate through the bedding material around the pipe into the surrounding soil.

Upgrades to the pump station of the provincially owned Parlee Beach restaurant are also planned for 2018. It is unknown whether, how often and to where the pump station overflows.

There is only a small section of the area serviced with a storm sewer. It is not likely that there is a connection between the storm and the sanitary sewer.

The Commission has replaced "leaky" manhole covers in the area with tighter covers over the past years.

The Commission repairs in the order of three to five service connections per year. Sometimes, the Commission becomes aware of improper connections of roof drains or sump pumps to the sanitary sewer during those repairs. Those deficiencies are addressed when discovered. It is unlikely that the few remaining cross connections are an issue related to the sanitary contamination near Parlee Beach.

Neighbours tend to watch the area very closely and report any signs of sanitary contamination. The Commission receives several complaints per year, and these often turn out to be related to odour from decomposing seaweed. Neighbours would notice and

report if somebody pumped septic tanks illegally, or if sanitary effluent was noticed in a ditch.

All pump stations within the sewershed are monitored with a SCADA system. The pump stations near Foche Bridge in Shediac experience periodic overflows. The two pump stations near Parlee Beach overflow very infrequently. No overflows were reported in 2017. The Department of Environment only requires overflows due to mechanical failure to be reported, not overflows due to rainfall. The GSSC reports all overflows. Of the 24 lift stations in the service area, 10 are equipped with stationary emergency generators. Generators will be installed on another five stations in the near future. During overflow events, the Commission brings in portable generators to the other pump stations to provide pump services.

The GSSC does not have the authority to force a property owner to connect to the municipal system. However, sewer fees can be collected and there are mechanisms in place to enforce payment.

The GSSC commission has disinfected the lagoon effluent year round, this year.

## **4. CONCLUSIONS AND RECOMMENDATIONS**

The study intends to determine whether observed bacterial contamination in coastal waters near Parlee Beach might be in part the result of the presence of on-site sewage disposal systems (septic systems) in the surrounding unserviced areas.

The contamination potential is assessed through a combination of site investigations and consultations with individuals who are knowledgeable of the site conditions. The findings are summarized in the following section.

### **4.1 Conclusions**

- ❑ The study area encompasses 1,200 lots with close to 500 dwellings. The average lot size with septic systems is 700 m<sup>2</sup>, compared to the recommended lot size of 4,000 m<sup>2</sup> for unserviced lots. Consequently, most lots do not meet regulatory minimum requirements for onsite effluent disposal.
- ❑ Existing buildings in the area are constantly being expanded and upgraded. These expansions result in increasing wastewater flows, for which the original disposal systems typically have not been designed.
- ❑ New building developments in Areas 2 and 3 have reached capacity and have levelled off. Area 1 however is experiencing continuous growth at approximately five new buildings per year.
- ❑ No obviously failing septic system or discharges of untreated sewage were found during the three 2017 inspections. However, three areas with suspected occasional discharges of partially treated effluent were identified. Those areas are near Bois Juli Avenue in Area 1C, near Point Bouleaux Road in Area 1D and near Aigle Road in Area 3B. In two cases, water with high coliform counts were found in ditches. However, the water was stagnant and the ditches were not discharging toward the



bay at the time of the inspections.

- ❑ There are a few holding tanks in the study area. There are suspicions that the holding tanks are not properly managed. There is no process in place for regulating or monitoring existing holding tanks.
- ❑ The increasing occurrence of seasonally used RVs is viewed by provincial regulators as a problem in the area. The mode in which effluent from the RVs is discharged is often suspect.
- ❑ While a few septic systems exist within the area that is serviced by the GSSC, there is no indication that those systems are failing or that they contribute to the discharge of contaminated surface water into the bay.
- ❑ Similarly, while there is a potential for “leaky” gravity sewer lines in the serviced area, there is no indication that this is the case. The GSSC is planning to replace approximately 500 metres of an old gravity sewer along St. John Street in 2018. This sewer is known to have a significant amount of inflow and infiltration.
- ❑ A significant concern is the lack of inspection and enforcement of regulations pertaining to new septic system installations.
- ❑ Several observers noted that self policing is a factor that works well in the serviced and the un-serviced areas. It is very likely that any unauthorized septic system, or any illegal dumping of effluent would be observed and reported by local residents.

In conclusion, there were no signs that on-site sewage disposal systems are a significant contributor of elevated coliform bacteria to surface water in the bay. There is room for improvement, however, and the following recommendations may assist in enhancing the overall environmental health in the study area.

## 4.2 Recommendations

- ❑ The ditches were mostly dry during the summer and fall of 2017. Sampling should be repeated in the early spring when ditches are flowing full after the snow melt. The samples should be analysed for E. Coli bacteria and entero cocci bacteria. Sampling should focus on the areas identified in this report and the findings should be interpreted with consideration of the existing test results.
- ❑ The areas identified in this study with elevated bacterial concentrations should be reported to the local NBDOH office for further investigation.
- ❑ The option of extending the service area of the GSSC sewershed to the Grand Barachois region (Area 1) should be explored. Approximately 300 lots could be serviced by an expanded sewage collection system.
- ❑ Holding tanks and septic tanks require periodic pump outs. Since holding tanks are often not managed properly by the home owners, the GSSC could be given the mandate to manage the few holding tanks in the area. The program could be extended to septic tanks at a later date. Such a program could become a pilot/demonstration project for the province.
- ❑ All permits related to lot developments should be managed by one government agency, preferably by the Rural Planning Commission. This would provide clarity to the approval process and facilitate the economic development of the region.
- ❑ All permits (and violations of permits) should be recorded and documented with PID numbers in a central data base, most appropriately in New Brunswick's PLANET system. This data base should be publicly accessible. This approach would assist with the transfer of properties, and with self policing.
- ❑ The rules for enforcement of the regulations pertaining to septic systems should be tightened. The proof of compliance with the regulations should be with the home owner, not with the province. This applies to temporarily parked RVs as well.

- ❑ More monitoring of new septic system installations should be carried out. Currently, hardly any new installations are being inspected.
  
- ❑ The impact of densely spaced septic systems and wells on drinking water aquifer water quality may be a public health concern. It may be prudent to investigate whether groundwater quality is compromised within the densely populated areas in the region.





**Appendix A - Photographs**





For sale sign in Area 1C



Drain pipe at beach, retaining wall in Area 2B



Test pit for new septic system in Area 1A



Surface discharge to beach in Area 1B



Excavation near beach in Area 1A

Parlee Beach  
 Septic System Inventory Study  
 Site Photos



**Environmental Services Inc.**  
 2492 Route 640, Hanwell, N.B., E3E 2C2  
 Ph: (506) 455-1085 Fax: (506) 455-1088

DATE:  
 2017/11/30

FILE:  
 PBS-17-01

SCALE:

FIGURE:  
 Appendix A





**Vegetation indicative of organic discharge in Area 1C**



**Holding tank in Area 1A**



**Newly installed septic system in Area 1C**



**Mound system in Area 2**



**Semi permanently placed RV in Area 1D**

**Parlee Beach  
Septic System Inventory Study  
Site Photos**



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Appendix A