

Environmental Impact Assessment

Registration Document – 2009 08 12

1.0 THE PROPONENT

(i) Name of proponent:

Ocean Surf Ltd.

(ii) Address of proponent

Ocean Surf Ltd.
P.O. Box 5132
Shediac, NB
E4P 8T8
Phone: 506 532 5480

Physical Address

73 Belliveau Beach Rd.
Pointe-du-chêne, NB
E4P 3W2

(iii) Chief executive officer

Mr. Jean-Claude Belliveau

(iv) Principal contact for purposes of Environmental Impact Assessment

Mr. Vincent Balland, P.Eng.
NATECH Environmental Services Inc.
109 Patterson Rd.
Harvey Station, N.B.
E6K 1L9
Phone: 506 366 1080
Fax: 506 366 1090
E-mail: natech.vb@nb.aibn.com

(v) Property ownership

The proponent does not own the property yet. The property currently belongs to:

[REDACTED]

2.0 THE UNDERTAKING

(i) Name of the undertaking

Ocean Surf Campground Extension, Pointe-du-chêne, N.B.

(ii) Project overview

200 new serviced campsites will be added to the existing Ocean Surf Campground. The construction will take place over a four year period approximately. The property that will be developed is adjacent to the current campground. Historically, the property was used for agricultural purposes. Regular access for customers will be via the existing entrance of the Ocean Surf Campground on Belliveau Beach Rd. An emergency entrance connected to Route 133 will be built as well. The operation of the facility will be seasonal, from May 1st to Oct 10th. The peak season is from July 5th to August 15th (five weeks). For the majority of the year, the property will be vacant, without any activities taking place. The attached Drawing C-01 (in Appendix A) shows an overview of the project.

(iii) Purpose/Rationale/Need for the undertaking

Demand from seasonal campers and daily tourists. The clientele is mainly from New Brunswick, but campers from other places within Canada and the United States are expected as well. The economy of the region depends to a large extent on tourism.

(iv) Project location

The planned project is located within walking distance from Parlee Beach in Shediac.

PID: 70086335 for the new property (70262738 for the existing Ocean Surf campground)

Address: 73 Belliveau Beach Rd.
Pointe-du-chêne, NB
E4P 3W2

Parish: Shediac

County: Westmorland

Latitude: 46-13-46.8N, Longitude: 64-29-48.07W

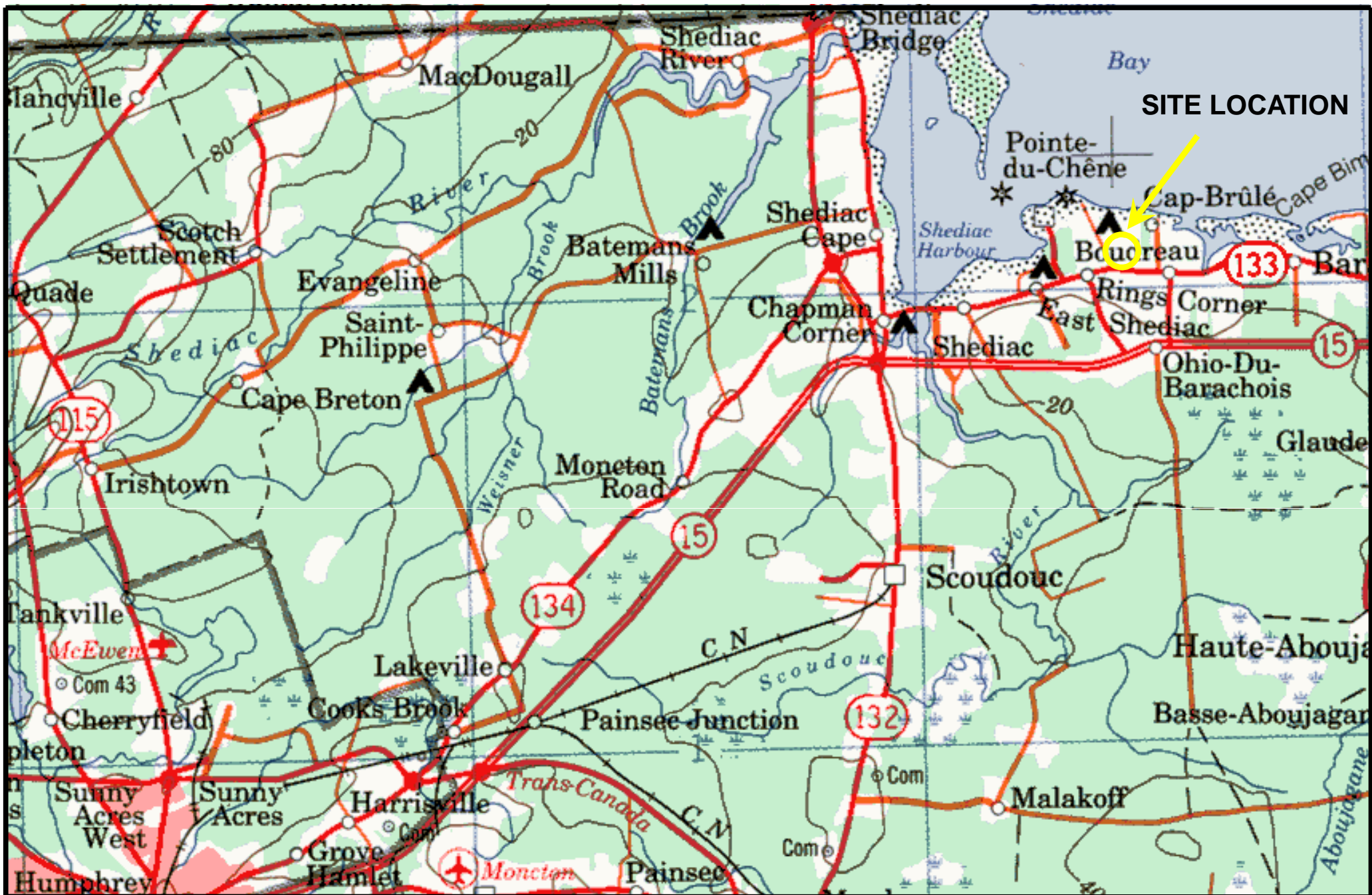
Figure 2-1 shows the location of the site using a topographic map of the area as a background. A project layout is shown on the attached Drawing C-01 (in Appendix A).

(v) Siting considerations

Specific siting requirements for the development included well-drained land, in close proximity to the existing campground and other tourist infrastructure. The property chosen consists of farmland, used as a pasture. The zoning type is currently “coastline residential” for this property.

No practical alternative locations were available, the site chosen is the only large enough property adjacent to the existing campground.

Ecological considerations included: a coastal marsh borders part of the property. A wetland delineation was carried out on July 3, 2009. The development is planned outside of areas that are considered wetland or wetland buffer. Only a road and a bridge to connect the two campgrounds will need to be installed through the buffer area, and a permit will be obtained. The edge of the wetland, watercourses, and the related buffers are shown on the attached Drawing C-01.



Ocean Surf Campground
Location Map



Environmental Services Inc.
Patterson Rd., Harvey Stn., N.B., E6K 1L9
ph: (506) 366 1080, fax (506) 366 1090

DATE: 2009/07/27

FILE: SC-09-01

SCALE: 1 km grid

FIGURE: 2-1

The Beaubassin Rural Planning Commission was contacted by the proponent: the zoning will need to be changed to “commercial”, after the EIA is finished, and before construction can take place.

The Town of Shediac receives its drinking water from aquifers and has a Well field Protection Program in place. The well field does not extend to the vicinity of this property. There is no Watershed Protected Area in the vicinity either.

Any wastewater at the proposed site will be disposed of into the municipal sewage collector that crosses the property.

Flooding: The majority of the camp sites will be at an elevation greater than 3 m above mean sea level. Sea level rise and extreme storm surges may affect one edge of the property in the future. Long-term sea-level rise is estimated to be 0.5 m per century in this area. The water level rose to 2.55 m during the January 21, 2000 storm surge event (source: Environment Canada). However such events occur predominantly in the fall and winter, when the property is unoccupied. No damage due to flooding is anticipated in the areas that will be developed, and the construction of flood protection measures is not envisioned.

(vi) Physical components and dimensions of the project

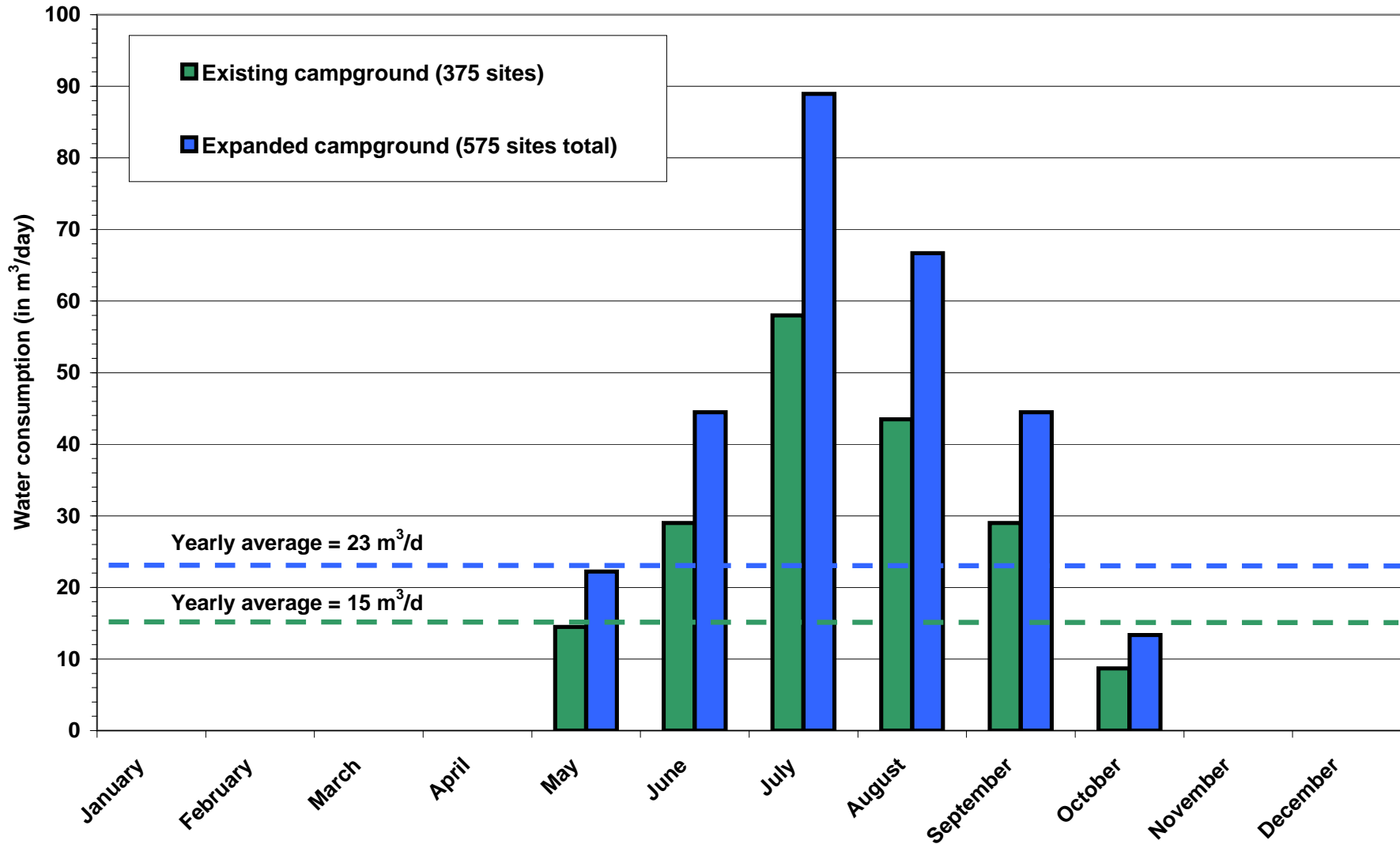
The components of the proposed development are shown on the attached preliminary Drawing C-01, including four existing wells at the current Ocean Surf Campground, and the municipal sewer line that crosses the project property.

Property dimensions: the shape is irregular. The total area of the property that the proponent is planning to purchase is approximately 16 ha. The area that will be developed (roads, buildings, parking-lots) is in the order of 11 ha. The land required for the project will be purchased once the EIA is completed.

The various components of the project include 200 fully serviced campsites (with water, sewer, and power). A small office building and washrooms may be added later.

Water supply: four wells currently supply the existing campground. Water meters were installed in June of 2009, and it was found that only three of the wells are actually being used (wells A, H and M). The consumption of the existing campground (375 fully serviced sites) was measured to be 58 m³/day in the busiest week of the year (at 100% occupancy), and is estimated to be 15 m³/day on average over the year, based on the seasonal site occupancy. The design peak demand for the new 200 sites is estimated to be 31 m³/day during the peak season (8 m³/day yearly average). Figure 2-2 illustrates the water consumption pattern. A Water Supply Source Assessment including a pump test is planned for mid-September of 2009, as part of the EIA process, to determine whether the existing wells will be sufficient to provide water for the expansion (the application form is attached in Appendix D).

Estimated Water Consumption - Ocean Surf Campground



Wastewater: the municipal sewer line crosses the property where the new development will take place. The Greater Shediac Sewage Commission is in the process of upgrading the line. One or two connections will be made to that line.

External facility lighting: low-intensity, all night street lighting will be provided for security reasons.

Setbacks or buffers incorporated in the site design: construction in the wetland buffer will be minimised. Evergreen trees will be planted on the western and southern edges of the property to provide privacy for adjacent residents.

Neighbouring wells: residences north of the existing campground are supplied by wells, as well as the trailer park to the west and the farm to the south.

Type of activities that will occur due to the undertaking: there will be a modest increase in traffic (cars and trailers) during the tourist season.

(vii) Construction details

Duration of construction: construction will take place over approximately four years, in the spring and fall when the occupancy of the park is low.

Clearing and grubbing are not needed at this site.

Estimated hours of construction: sunrise to sunset.

Equipment to be used: trucks, excavators, bulldozers, loaders, and other heavy equipment.

Potential sources of pollutants during the construction period: dust during road construction, accidental release of hydrocarbons from machinery.

Access to the site: an access road connecting to Route 133 will be used during construction, and will become the emergency access later.

Details concerning the installation of infrastructure:

- Access roads will consist of gravel roads.
- Electrical distribution system: the connection is to be provided by NB Power.
- Water mains and sewer lines will be parallel to the main roads.

Origin of required fill material (rock fill topsoil, granular materials, etc.): materials will be obtained from a local pit.

Description of construction/excavation/grading: standard environmental protection measures will be employed during construction (silt fences, hay bales, check dams, etc.).

(viii) Operation and maintenance details:

When construction is completed, routine maintenance activities will consist of mowing grass and trimming bushes.

The proponent/owner will be responsible for operating and maintaining the water supply and waste water collection systems. The water supply system consists of water tanks, UV lights, and shock chlorination of the water distribution system once a year, before the opening of the park.

Design capacity of pumps and pipelines for conveying the water: a standard well pump is sufficient to provide operating pressures at the extremities of the camp ground. A well house with pressure tanks will be installed.

Number of employees: there are ten employees in July and August, and five during the off-season at the existing campground. Once the new development is completed, five more employees will be needed in July and August, and two in the off season.

Estimated period of operation: the operation of the facility will be seasonal, from May 1st to Oct 10th. The peak season is from July 5th to August 15th (five weeks).

Life span of the project: long-term, 30 years or more.

Description of type and quantity of waste products and their handling: five 8 cubic yard bins are used at the existing campground. They are emptied twice a week, and cleaned to remove odour from residential waste. Recycling, reduction and reuse will be encouraged. All solid waste will be collected into a few additional bins, in locations easily accessible by garbage collection trucks. The new bins will also be emptied twice a week.

Sources of raw materials during routine operation: as local as possible.

(ix) Future modifications, extensions, or abandonment

Washroom facilities and an office building may be built later on if necessary.

(x) Project-related documents (attached)

Appendix A – Conceptual Site Layout (Drawing C-01)

Appendix B – Wetland Delineation Report

Appendix C – Report from the Atlantic Canada Conservation Data Centre

Appendix D – Water Supply Source Assessment Application

3.0 DESCRIPTION OF THE EXISTING ENVIRONMENT

(i) Physical and natural features

Site topography: minimum elevation: 0 m, maximum: 10 m. Minimum gradient: 0%, maximum: 7%.

General surface drainage: toward the North-East, as shown on Drawing C-01.

There are watercourses or wetlands on the property. The results of the wetland delineation are detailed in Appendix B.

Site specific geology and hydrogeology: the surficial overburden at the site is red sandy till of approximately 0 to 35 meters (0 to 115 feet) in thickness. The overburden is not used for ground water supplies in the area. The bedrock in the area is mapped as Pennsylvanian age sedimentary rocks composed of red and grey conglomerate, sandstone, siltstone, and shale, which also forms the local bedrock aquifer. The bedrock is known to be relatively transmissive (readily conducts the flow of ground water). The bedrock units or layers tend to be lenticular (i.e. of variable lateral extent and thickness) and are thought to have formed as a result of sedimentary particles deposited from flowing water (alluvial deposition). The individual beds average less than 1 meter in thickness; however, the total bedrock unit can be several hundred meters thick. This bedrock aquifer covers a large portion of New Brunswick, stretching from the Fredericton area northeast to Shippigan and southeast to the Shediac area.

Distances to other septic systems and wells on other properties: well M that is intended to be used as the main production well is 100 m away from neighbouring wells.

Private and municipal wells present within 500 m of the subject property: this information was not readily available. It can be assumed that most houses and

cottages in the neighbourhood have their own well, as the Shediac municipal water supply end at least 400 m away from the property.

Adverse environmental conditions that could impact the project: none anticipated. The majority of the camp sites will be at an elevation greater than 3 m above mean sea level. Long-term sea-level rise is estimated to be 0.5 m per century in this area. The water level rose to 2.55 m during the January 21, 2000 storm surge event (source: Environment Canada).

Variety, extent and species of the existing vegetation: The part of the property that will be developed is currently a pasture. No rare species of flora were found on the property during the wetland delineation.

Environmentally significant areas within 500 m of the subject property: According to the information from the ACCDC database (Gerriets, 2009), there is no environmentally significant area within 500 m of the property. The closest one is 1 km away (Parlee Beach). A map of environmentally significant areas within a 5 km radius is included in the ACCDC report in Appendix C.

Rare and endangered taxa: according to the information from the ACCDC database (Gerriets, 2009) “a 5km buffer around the study area contains a relatively moderate-to-large (quintile 4) density of taxa records: 138 records of 34 taxa from 20 sources. (Data Density: 1.75 rec/km²)”.

- Flora: “a 5 km buffer around the study area contains 20 records of 10 vascular, 0 records of nonvascular flora” (see attached maps in the ACCDC report, in Appendix C).

- Fauna: “a 5 km buffer around the study area contains 109 records of 21 vertebrate, 9 records of 3 invertebrate fauna” (See the maps in the ACCDC report, in Appendix C).

Sensitive species: Wood Turtles are POTENTIALLY present in the study area.

NBDNR reported (results from Species at Risk Program database; Lusk, 2009):

“According to the DNR Species at Risk Database, there are no records of NB listed species in the immediate vicinity of this site [PID 70086335]. The nearest record of an NB listed species is for Piping Plover, along the beaches approximately 1km eastward. However, this record is from 1931, and there has been no activity recorded recently. Piping Plover is listed as endangered under the NB Endangered Species Act, and the federal Species at Risk Act (SARA). A little further to the east (~ 4km), at Petit Barachois, one pair of plovers was recorded in 1991, but none since.”

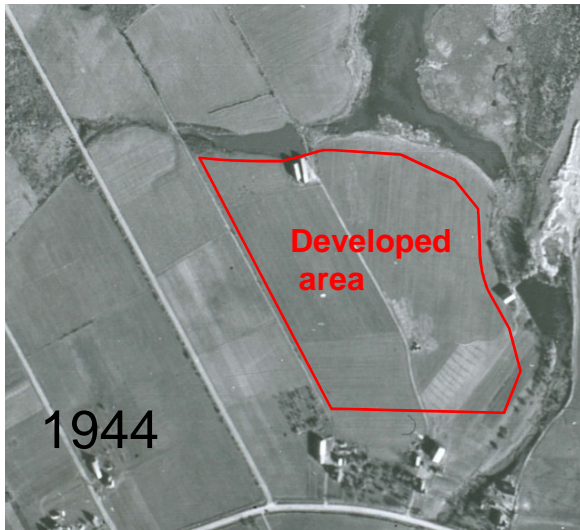
(ii) Cultural features

Federally, provincially or locally recognized recreational sites attractions and activities in the on or near the property:

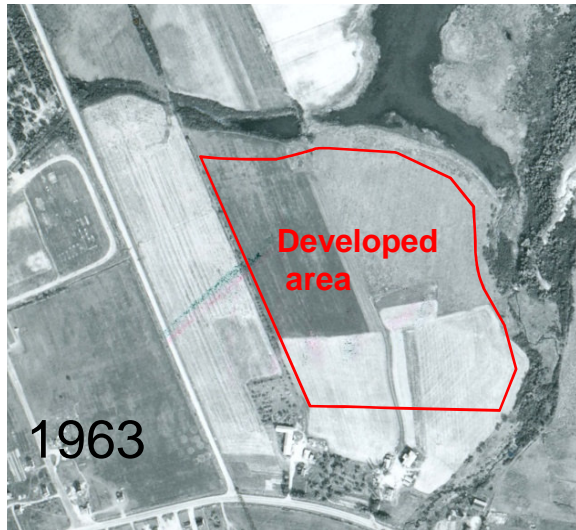
- Parlee Beach Provincial Park in Shediac, 1 km to the North-West.
- Maison Historique Pascal-Poirier Art Gallery and Museum in Shediac, 3 km to the West.
- Pointe-du-chêne Historic Warf, 3 km to the North-West.

(iii) Existing and historic land uses

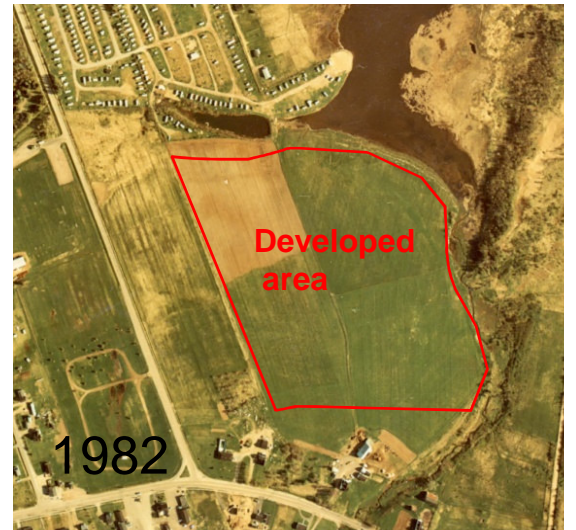
According to available aerial photographs, the property has been used for farming for the last 50 years. Currently, it is used as a pasture for horses. Historical aerial photographs are presented in Figure 3-1.



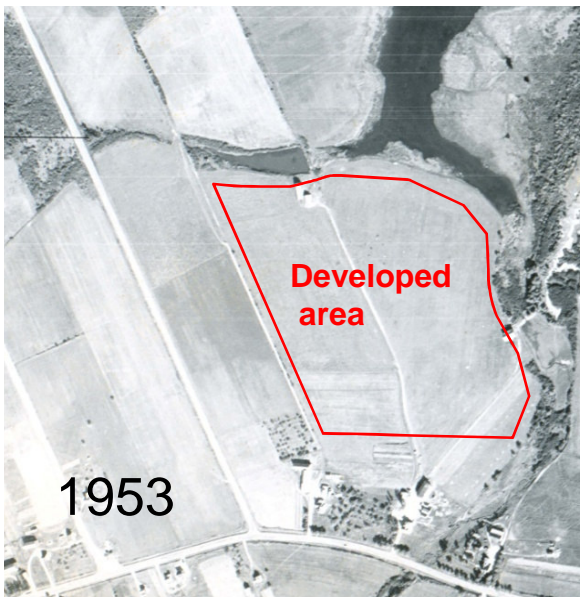
1944



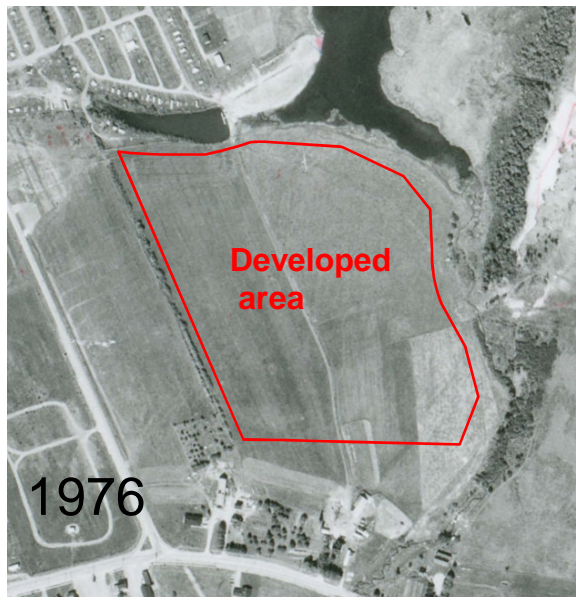
1963



1982



1953



1976



2001

Ocean Surf Campground
Historical Aerial Photos



Environmental Services Inc.
Patterson Rd., Harvey Stn., N.B., E6K 1L9
ph: (506) 366 1080, fax (506) 366 1090

DATE: 2009/07/23

FILE: SC-09-01

SCALE: NTS

FIGURE: 3-1

Neighbouring properties: the PIDs and owner listings, starting from the southern corner, and proceeding clockwise around the property, include the following:

00860049 - [REDACTED]

70172713 - [REDACTED]

70442801 - [REDACTED]

70442785 - Vacation Village Inc

70262738 - Ocean Surf Ltd.

70429899 - Natural Resources

00861443 - [REDACTED]

00861450 - [REDACTED]

Known contamination resulting from previous uses of the property or adjacent property:

The search of the property resulted in the following statements provided by the Department of Environment:

- There is no record of Ministerial Orders or Remediation Orders related to this property.
- There are no petroleum storage tanks registered with the Department.
- There are no records of any remedial activity or contamination.
- The property is not registered with the Department as a PCB storage site.
- There are no records of landfill sites located near this property.

NB ENV does provide the following disclaimer with their records search: "The absence of departmental records in this search does not necessarily indicate that the site has not been subject to environmental incidents."

4.0 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

During the construction phase:

- Potential runoff of silt
- Accidental release of hydrocarbons.

During operation and maintenance:

- Slightly increased traffic.

5.0 SUMMARY OF PROPOSED MITIGATION

During the construction phase:

- Best environmental management practices will be implemented. Silt fences and hay bales will be placed wherever necessary to prevent silt export from areas being worked on. Particular care will be taken to build the road (including a bridge or culvert) across an existing ditch that drains into the coastal marsh, and through the 30 m buffer from the ditch and the marsh.
- Hazardous materials (fuels, lubricants, hydraulic oil, etc.) and wastes (waste oil, etc.) will be managed so as to minimize the risk of chronic and/or accidental releases. In particular, refuelling and maintenance activities will be carried out on level terrain, at a suitable distance from environmentally sensitive areas (including watercourses and wetlands). All spills and leaks will be promptly contained and cleaned up, as per standard environmental protection procedures.

During operation and maintenance:

- The traffic on the site will be limited.
- Vegetation will be planted to provide visual barriers with neighbouring developed properties.
- Pesticides will not be used. Lawns will be simply mowed.

6.0 PUBLIC INVOLVEMENT

As part of this EIA, all neighbours within a 500 m radius of the property will be notified by mail out, in both English and French. The mail out will occur in August of this year. Once the EIA study is completed, a public meeting will be organized by the Beaubassin Planning Commission as part of the re-zoning process. A project description will be provided to them, and they will be encouraged to provide comments. A list of concerns from citizens will be compiled and submitted within 60 days of the EIA registration.

7.0 APPROVAL OF THE UNDERTAKING

Permits, licenses and other authorizations required for the undertaking include:


- Re-zoning by the Rural Planning Commission.
- A Watercourse and Wetland Alteration Permit from NB ENV for crossing the ditch between the existing and the new campground.
- An Approval to Construct and Operate from NB ENV.
- A Building Permit from the Rural Planning Commission.

8.0 FUNDING

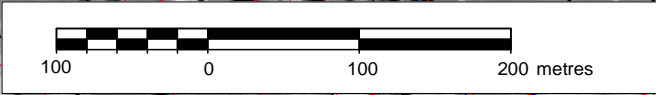
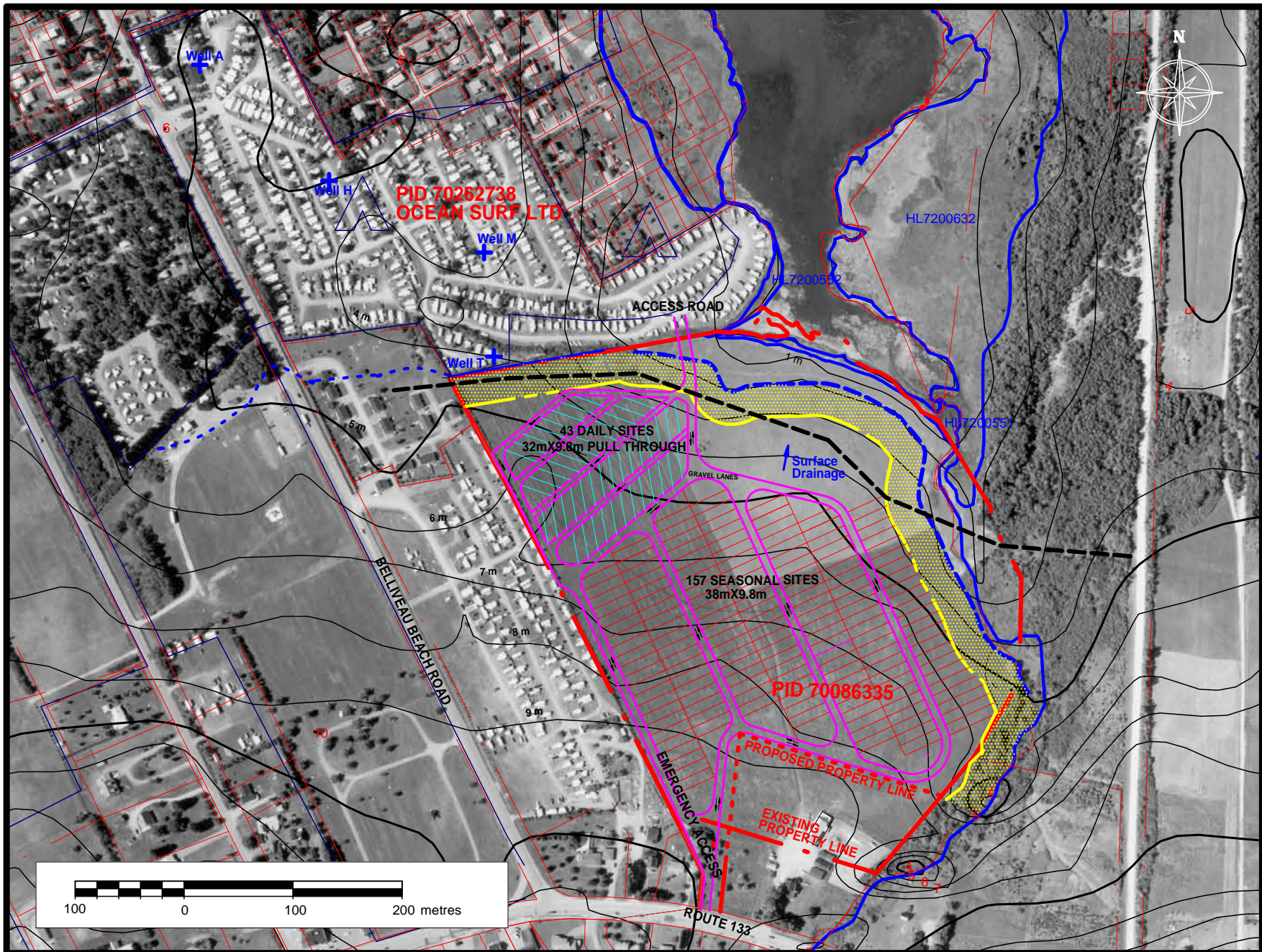
The estimated cost for the project is not known at this stage. The project is privately funded.

9.0 SIGNATURE

August 12, 2009
Date


for J-C. Belliveau
Signature of Chief Executive Officer

Appendix A – Conceptual Site Layout



NATECH
 Environmental Services Inc.
 Patterson Rd., Harvey Stn., N.S., B1C 1J9
 ph: (506) 896 1280, fax: (506) 896 1290

General notes / Notes générales

- Property lines
- Water line from Service New Brunswick
- - - Approximate ditch location
- Edge of wetland
- 30m buffer from wetland and watercourses
- - - Municipal sewer line
- + Well M Existing well

FOR INFORMATION	01	09/08/06
	NatCo	Date

Project title / Titre du projet
**OCEAN SURF
 CAMPGROUND**

Sheet title / Titre de la feuille
**PRELIMINARY
 SITE LAYOUT**

2009 08 06	Stamp	Seau
AS SHOWN		
T. FLEIGHORN		
V. BALLAND		

Sheet No.	N° de projet	Sheet No.	N° de feuille
			C-01

Appendix B – Wetland Delineation Report

Standard Delineation of

PID # 70086335

for

Natech Environmental Services Inc.

109 Patterson Cross Road

Harvey Station, NB

E6K 1L9

(506) 366-1080

14 July 2009

Delineation done by and submitted by:

G. Bishop

B&B Botanical

16 Pitt St.

Sussex, NB E4E 1J1



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Introduction

Natech Environmental Services Inc. asked for the delineation of wetlands on an agricultural property (PID #70086335) on behalf of its client, J.C. Belliveau, who is considering purchasing the property to add to the adjacent campground he currently owns and is operating. Boundaries of the property investigated are indicated on Map 1.

A wetland is defined (DNRE & DELG. 2002) as: “Land that has the water table at, near, or above the land’s surface, or which is saturated, for a long enough period to promote wetland or aquatic processes as indicated by hydric soils, hydrophytic vegetation and various kinds of biological activities adapted to the wet environment.”

A watercourse is defined in the Watercourse of Wetland Alteration package (DE 2006) as: the full width and length, including the bed, banks, sides and shoreline, or any part of a river, creek, stream, spring, brook, lake, pond, reservoir, canal, ditch or other natural or artificial channel open to the atmosphere, the primary function of which is the conveyance or containment of water whether the flow be continuous or not.”

Any development within 30m of either a wetland or a watercourse requires a Watercourse and Wetland Alteration Permit (WAWA).



Site Description

Location: The property is located 2 km east of Shediac, immediately north of Hwy 133 and just west of Cap Brûlé. The property is around 17 ha in area. Along the east property border is a small brook (Watercourse 1) which flows into a saltwater lagoon which makes up much of the northern boundary. To the west the property is bounded by Belliveau Beach Road. The southern boundary is an active farm (current property owner), having at least five horses.

Bedrock/Soils: The area is underlain by Pennsylvanian-Permian aged sandstones and conglomerates (AGS 1985). The overlying forest soils belong to the unit of Barribeau-Buctouche unit (glaciomarine or compact till) which consist of well drained, fine to medium loams.

Vegetation Cover: The entire property is currently being used as a high quality horse pasture, and from the trees found in the fence line and old air photos, it is obvious that land use has not changed in the past 20 years. The perimeter is fenced and there is one interior fence dividing up the property. There is no undisturbed or naturally regenerating vegetation in the upland area. Along the northeast boundary the property does take in a small portion of a freshwater wetland that grades into a salt marsh to the north.

Water Courses: Two watercourses are present (see Map 1), both flowing into the salt marsh lagoon north of the property. Watercourse 1 is about 1 m wide and runs more or less just east of the eastern property line. It passes beneath Hwy 133 in 2 m culvert. Watercourse 2 is located along a portion of the northern property line. It is a small ditch

(< 1 m in width) which does widen out to a 15 m wide emergent marsh along an 80 m stretch. The brook follows the property boundary from its mouth for about 180 m to the west, after which the brook turns to the north away from the property line.

Topography: The 1:50,000 Topo map (Map 4) indicates that this is a flat area with less than one contour interval (15 m) indicated.

Depth to Water Table Map: (Map 3) This map indicates wetland along the northern fringe of the property. A potential drainage/depression in the northwest corner of the property is suggested by a line running SW to NE. This was not evident in the field.

Methodology

Equipment: All location readings were taken with a Garmin GPSmap 60CSx receiver using a WGS 84 datum. Soil sampling was done using a Eijkelkamp one-piece hand auger, having a 17 cm sampling point. Soil colours were determined using Munsell Soil Color Chart (2000). Photographs were taken with a Canon PowerShot S5IS.

Procedure: Following NBENV’s Wetland Delineation Minimum Requirements, field work was conducted. Method is based on the US Army Corps of Engineer Wetland Delineation Manual (Environmental Laboratory 1987) where determination is dependant on the field examination of the vegetation, soil and hydrology. All three parameters must have a hydric nature before an area can be classified as a wetland. The more recent Draft Interim Regional Supplement (2008) lists and describes the various indicators to be used when delineating wetlands. The U.S. Fish and Wildlife Services’ National List of Vascular Plant Species that Occur in Wetlands: NE Region (USDA, NRCS. 2009) was used in assigning wetland indicator status to a species.

Indicator categories

Indicator Code	Wetland Type	Comment
OBL	Obligate Wetland	Occurs almost always (estimated probability 99%) under natural conditions in wetlands.
FACW	Facultative Wetland	Usually occurs in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands.
FAC	Facultative	Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
FACU	Facultative Upland	Usually occurs in non-wetlands (estimated probability 67%-99%), but occasionally found on wetlands (estimated probability 1%-33%).
UPL	Obligate Upland	Occurs in wetlands in another region, but occurs almost always (estimated probability 99%) under natural conditions in non-

		wetlands in the regions specified. If a species does not occur in wetlands in any region, it is not on the National List.
-	Unknown	Plant's status in New Brunswick has not been determined

The Flora of New Brunswick (Hinds 2000) was used for species identification and nomenclature.

Each different type of wetland requires paired data point surveys. The paired points are situated on opposite sides of the delineated wetland boundary; one point should reflect upland conditions, the other wetland conditions. At each point a vegetation survey is conducted, a soil pit dug and hydrology conditions evaluated. Data is recorded on New Brunswick Department of the Environment field sheets (June 1, 2009). Each point (plots) is marked with a pink pin flag identifying the plot and date surveyed. The delineation line separating the wetland from upland is flagged at regular intervals with sequentially numbered pink wetland delineation tape.

Results

With the presence of a salt marsh and a freshwater marsh, two sets of paired points were undertaken; the data sheets are included in Appendix 3. Only one delineation line was required to separate the wetlands from upland pasture (see Map 1, data points in Appendix 1)

Wetland: Property area is approximately 17 ha, having about 1.2 ha of salt water and freshwater wetland within its boundaries. (see Map 1) The salt water wetland extends to the north into a salt marsh/lagoon. Horses currently have access to the brook as it flows through the salt water marsh, and it is evident that some grazing does occur. Typical plants occurring here are *Juncus gerardii*, *Eleocharis halophila* and *Glaux maritima*. From point 'A' south, the wetland is predominately a freshwater emergent marsh, although there is likely occasional invading of salt water during particularly high tides. Growing here are bulrushes *Scirpus microcarpus*, *Scirpus cyperinus* and grasses such as *Glyceria grandis* and *Phalaris arundinacea*. Around the wetland margin were found *Lysimachia terrestris* and *Impatiens capensis*.

The north boundary was difficult to define as soil and vegetation disturbance prevented accurate determination. A tide line of flotsam indicated the tide encroached on the pasture between points B and C (Map 1). This flotsam line would not represent the highest tide mark, but rather only the highest recent tide that had a wind blowing inshore. July tide charts for Shediac Bay indicate monthly range of high tide from 1.23 m to 1.63 m, — a difference of 40 cm. To achieve a delineation line which would be above the normal expected high tide level (excluding extreme high tides and storm surges) the delineation line was placed upslope of the flotsam approx 10 m (a vertical rise of 20-30 cm) where the pasture levelled off. This portion of the delineation line principally follows the contour line.



Photo 1 - Looking north from pasture onto the salt marsh

As Watercourse 2 flows in from the northwest, it widens out to a maximum of 15 m along an 80 m stretch wide where it is filled with *Typha latifolia*, *Glyceria striata* and other emergent, freshwater wetland vegetation. This was not delineated as a wetland as the 30 m buffer required for all watercourses would adequately cover this area. This portion of the watercourse is also along the property boundary. On the Wetland map received from Service New Brunswick (see Map 5 for a inset of this area), this area is marked as having 2 adjacent wetlands, HL 7200531 and HI HL 6600479. As can be seen from the map, much of what was marked as a wetland, has been filled in from the neighbouring property's side and now has trailers on it.

Vegetation: A total of 73 species were observed (see Appendix 4). The majority of upland species were seen along the fence line marking the eastern property boundary.



Photo 2 - Looking south from salt marsh across pasture



One rare species (*Persicaria amphibian var. emersa*, Water Smartweed) was observed (see Map 1), on the banks of Watercourse 1, just north of Hwy 133, and just outside the property boundary. The plant was not in flower. Typically found in water or on moist soil, this variety of Water Smartweed is found in less than 20 sites in New Brunswick (ranked S2 by the ACCDC, ranked sensitive by DNR) in the province, mostly along the lower St. John River from Fredericton to just below Jemseg. This is the first record east of the St. John River.

Five specimens of different species were collected (see Appendix 5) and will be deposited at the herbarium at the New Brunswick Museum in Saint John at the end of the field season.

Photo 3 – *Persicaria amphibian var. emersa*
(from pressed, collected specimen # GB 09-003)

Soils:



Plot 1
Upland



Plot 1
Wetland



Plot 2
Upland



Plot 2
Wetland

The upland soils showed no variation in stratigraphy, being composed of a sandy loam/silt ranging in colour from 5 yr 3/4 to 5yr 4/4. This would be in keeping with the regular disturbance resulting from ploughing. No redox (mottling) was observed in either upland pit, helping to confirm that soils are not regularly flooded.

The wetland soils also showed little variation over the depths sampled. The low chroma sandy to silty sediments ranged from 7.5 yr 2.4/1 to 5 yr 2.5/1.

Conclusions

The Map 2 (DNR Wetlands) indicates coastal marshes off to the northeast, and a shrub wetland following Watercourse 1 which is just to the east of the property. The wetland within the PID is quite small (1.2 ha), however it does extend (at least 1 ha) northward into salt marsh and lagoon as indicated on Map 1.

The upland portion of this property has been in its present form for at least 20 years, with the northern portion having had some fill added long ago.

As this property involves a coastal wetland the following from the New Brunswick Wetlands Conservation Policy (NDRE & DELG 2002) will apply: "All coastal marshes are considered to be Provincially Significant Wetlands. Government will not support proposed activities in a Provincially Significant Wetland, within 30 meters of the perimeter of a Provincially Significant Wetland or any activity that poses substantial risk to a Provincially Significant Wetland".







"These identified wetlands are subject to the *Watercourse and Wetland Alteration Regulation* (REG # 90-80), of the New Brunswick *Clean Water Act*. Any proposed alteration within these areas or within the 30 metre regulated upland buffer requires permitting through the Department of Environment, Watercourse and Wetlands Alteration Program. These areas may also be subject to *Environmental Impact Assessment* (REG 87-83) of the New Brunswick *Clean Environment Act* and other Acts and Regulations. It is the responsibility of the proponent to ensure that all regulatory requirements are met prior to development within these areas".

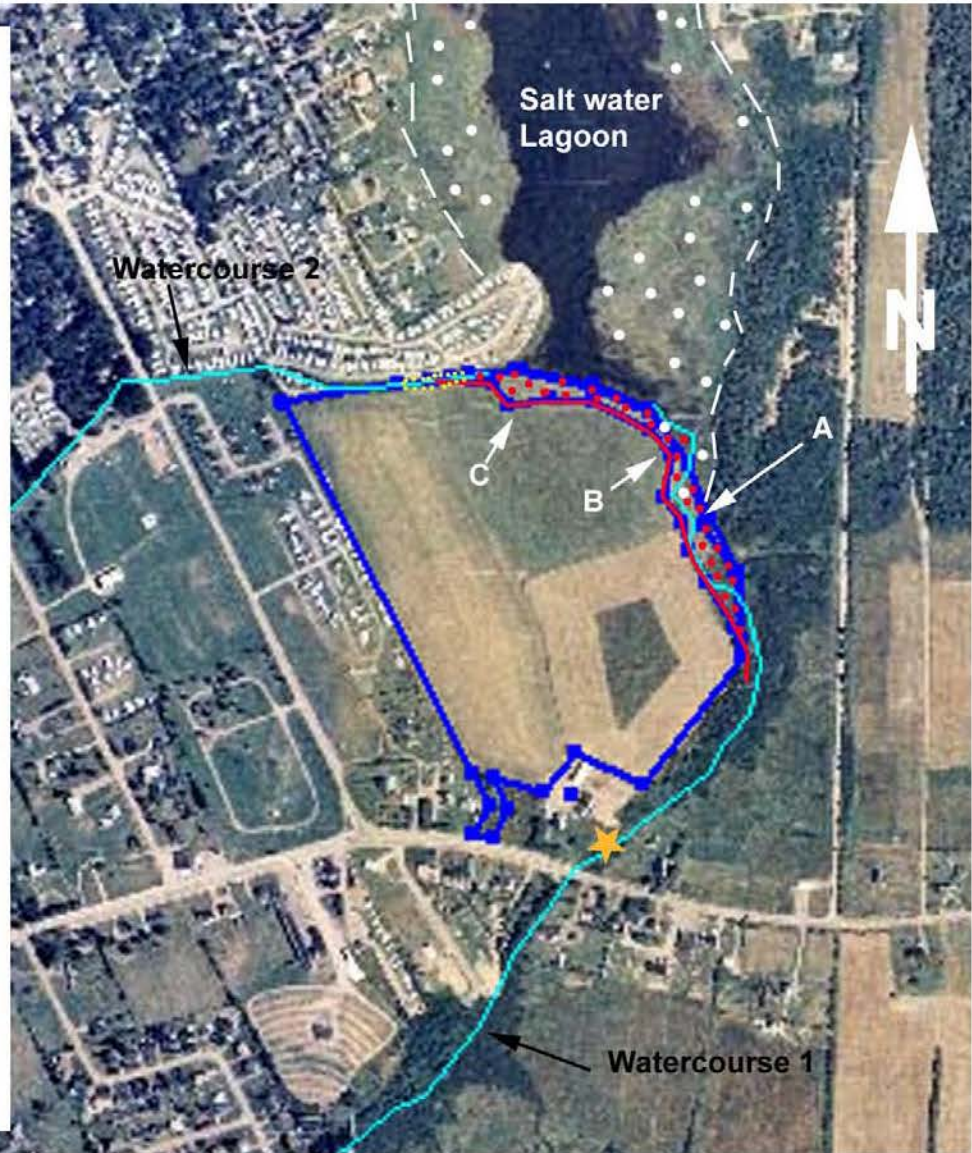
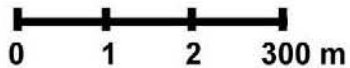
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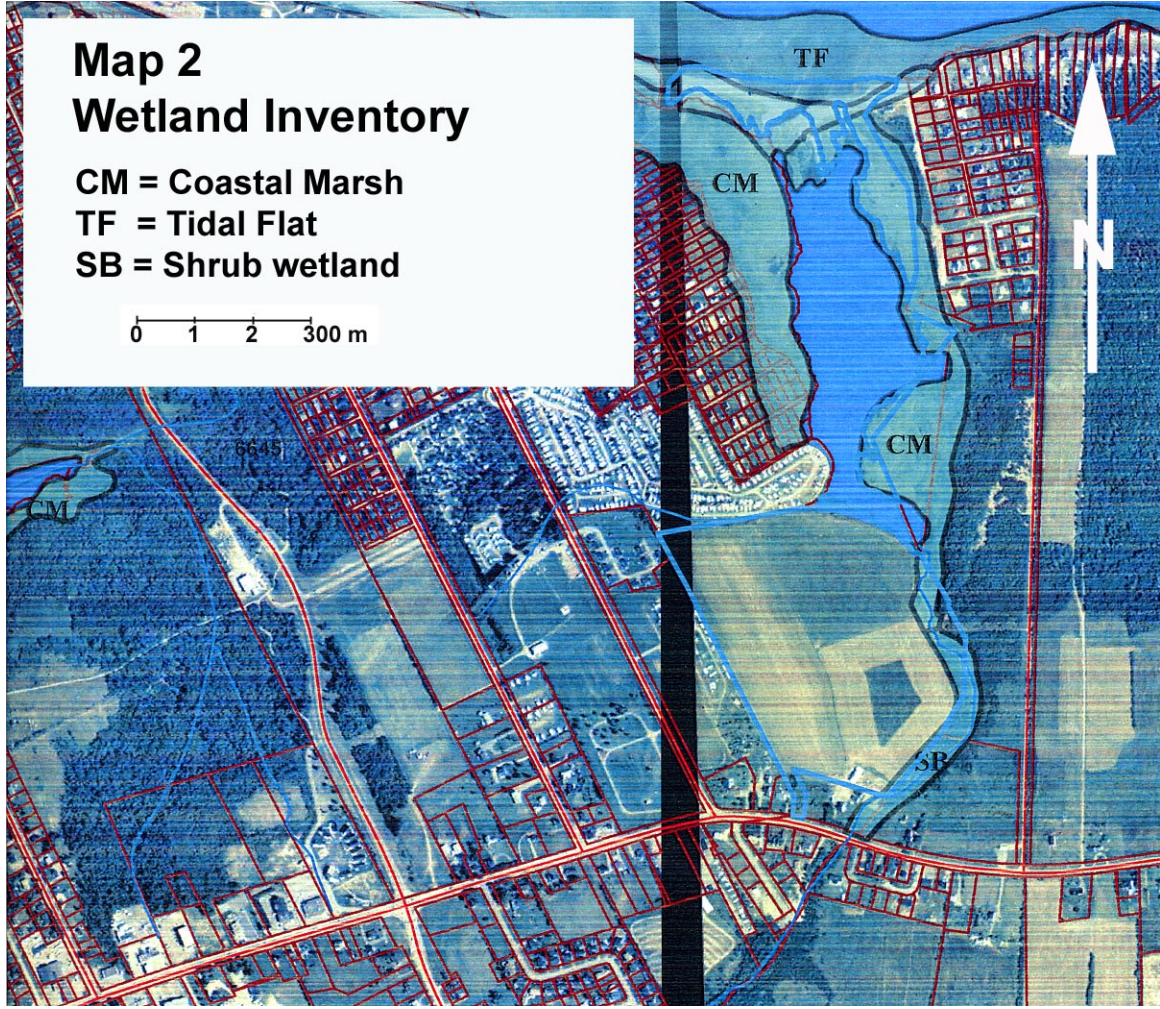
- ACCDC (Atlantic Canada Conservation Data Centre) 2007.
<http://www.accdc.com/products/NBCounties.htm>
- AGS (Atlantic Geoscience Society). 1985. **Geological Highway Map of New Brunswick and Prince Edward Island**, Special Publication Number 2. NB Dept. of Natural Resources, Fredericton, NB.
- Colpitts, M.C, SH Fahmy, J.E. MacDougall, T.T.M. Ng, B.G. McInnis & V.F. Zelazny. 1995. **Forest Soils of New Brunswick**, CLBRR Contribution No. 95-38. Timber Management Branch, NB Dept. of Natural Resources and Energy, Fredericton NB.
- Department of Environment (DE). 2006. **Watercourse and Wetland Alteration Package**. Fredericton NB.
- DNR Depth to Watertable. **Depth to Watertable Maps** produced by New Brunswick Department of Natural Resources, Fredericton NB.
- DNR Wetland. **Provincially Recognized Wetlands Maps** produced by New Brunswick Department of Natural Resources, Fredericton NB.

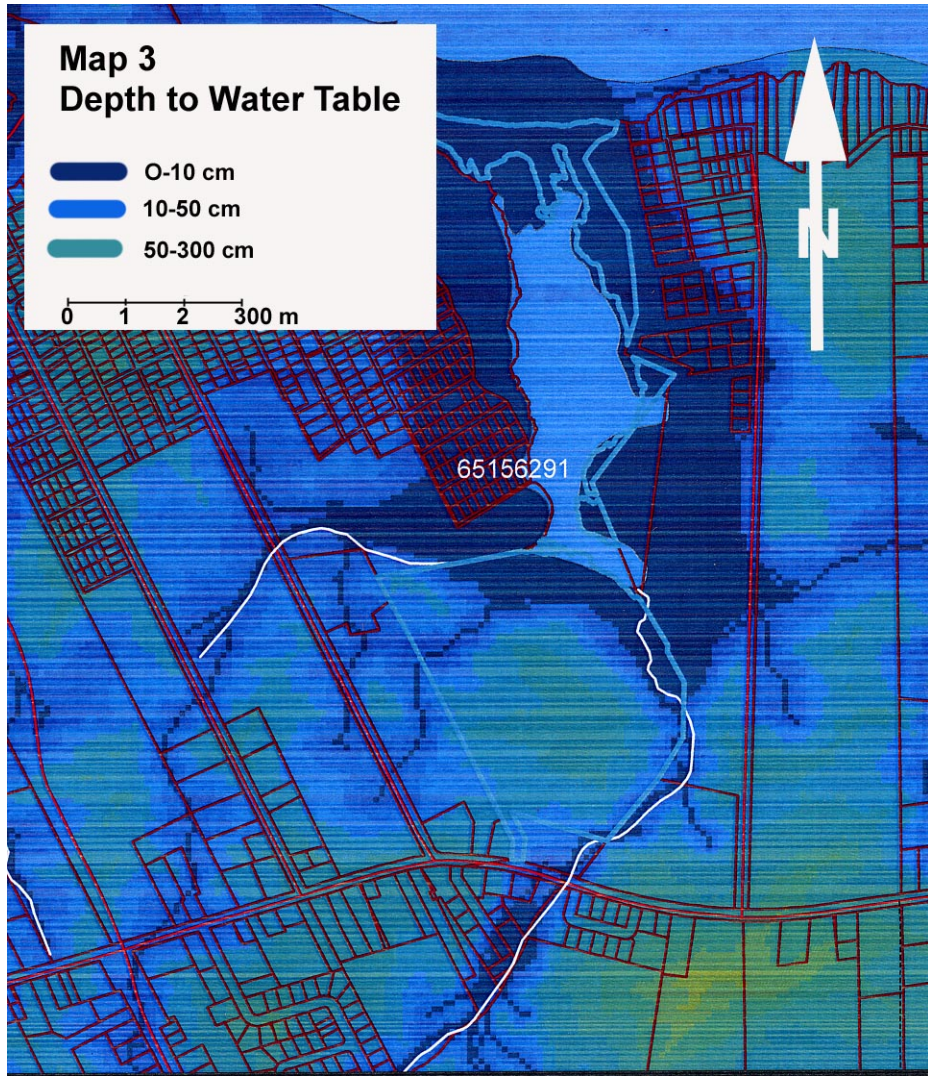
- DNR 2008. General Status of Wildlife in New Brunswick: Provisional Report: Vascular Plants. April 15, 2008
- DNRE & DELG. 2002. New Brunswick Wetlands Conservation Policy.
<http://www.gnb.ca/0078/publications/wetlands.pdf>
- Environmental Laboratory. 1987. Wetlands Research Program Technical Report Y-87-1 (on-line edition) Corps of Engineers, Wetlands Delineation Manual. U.S. Army Corps of Engineers, Vicksburg MS 39180-6199.
[<http://www.wetlands.com/regs/tlpge02e.htm>]
- Hinds, H.R. 2000. **Second Edition Flora of New Brunswick**. Department of Biology, University of New Brunswick, Fredericton NB.
- Munsell Soil Color Charts** 2000. Munsell Color, Grand Rapids, MI.
- U.S. Army Corps of Engineers. 2008. Wetlands Regulatory Assistance Program, **Draft Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region**; Draft for Peer Review and Field Testing 7-3-2008. U.S. Army Engineer Research and Development Center, Vicksburg, MS.
- USDA, NRCS. 2009. **U.S. Fish and Wildlife Services. National List of Vascular Plant Species that Occur in Wetlands: NE Region**
<http://plants.usda.gov/wetland.html> National Plant Data Center, Baton Rouge, LA.

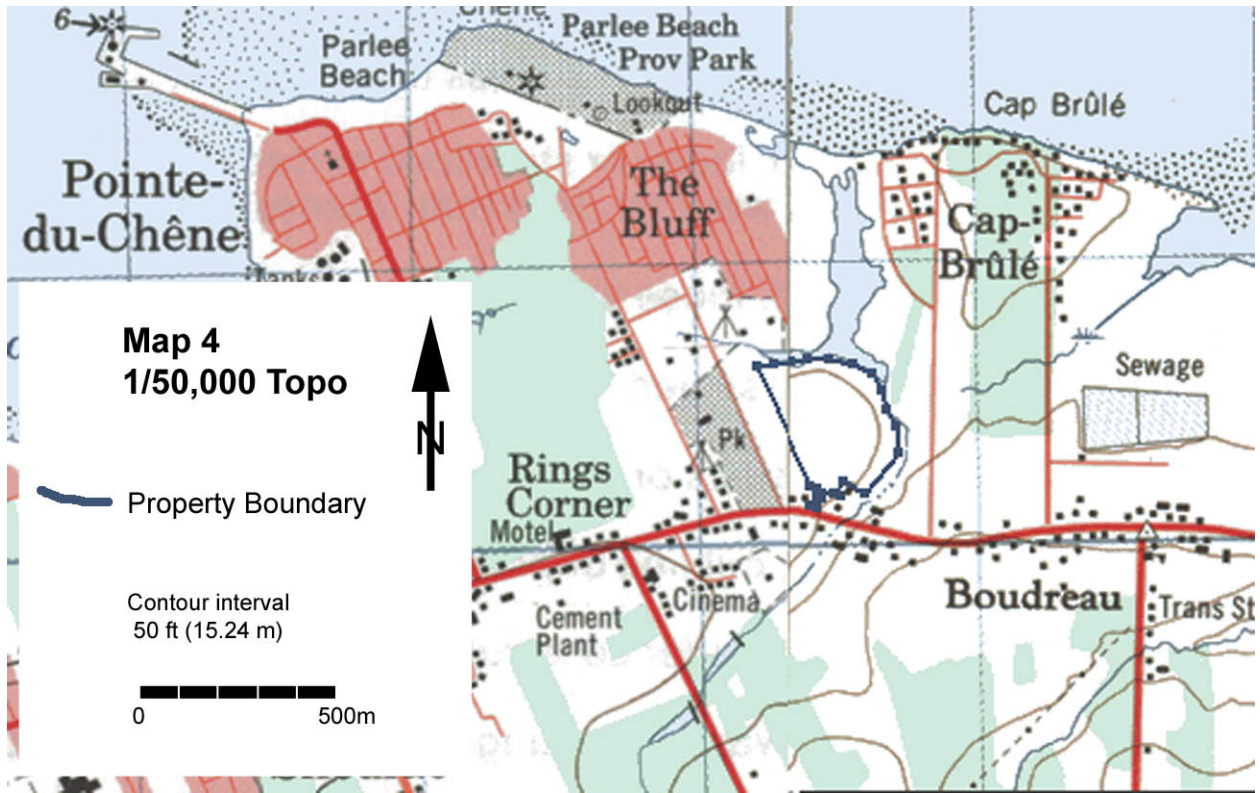
Map 1 Wetlands and Boundaries

-  Watercourse
-  Property boundary
-  Wetland delineation line
-  Wetland
-  Coastal Marsh
- 'A' Transition between salt marsh and freshwater marsh
- 'B', 'C' Between these points tidal flotsam was observed on the 'upland' pasture
-  Widened portion of Watercourse 2 having emergent vegetation
-  Location of rare plant (S2) (*Persicaria amphibia* var. *emersum*)









Appendix 1 Waypoints for delineation boundary

Shediac Campground - Natech Environmental Services Inc Project #60918

Wetland Delineation by B&B Botanical - 3 July 2009

Flag #	GPS wpt	Date and time	Latitude	Longitude	Comments
Delineation Points					
1	wpt 88	03-JUL-09 1:21:31PM	46.2286849	-64.4940166	
2	wpt 89	03-JUL-09 1:23:36PM	46.2287343	-64.4939923	
3	wpt 90	03-JUL-09 1:24:18PM	46.2287834	-64.4940174	fenceline (property boundary)
4	wpt 91	03-JUL-09 1:28:10PM	46.228803	-64.4940488	
5	wpt 92	03-JUL-09 1:30:09PM	46.2289688	-64.4942549	
6	wpt 93	03-JUL-09 1:31:24PM	46.2291078	-64.4944095	
7	wpt 94	03-JUL-09 1:32:29PM	46.2293872	-64.4945514	Brook (water course 1) 3 m north
8	wpt 95	03-JUL-09 1:33:11PM	46.2293829	-64.4944933	salt marsh boundary
9	wpt 96	03-JUL-09 1:35:42PM	46.2295916	-64.4947204	corner bend of fence line
10	wpt 97	03-JUL-09 1:38:15PM	46.2297495	-64.4948207	
11	wpt 98	03-JUL-09 1:42:28PM	46.2299287	-64.4948959	
12	wpt 99	03-JUL-09 1:47:04PM	46.2300696	-64.4950375	
13	wpt 100	03-JUL-09 1:48:18PM	46.2302741	-64.4951615	
14	wpt 101	03-JUL-09 1:49:48PM	46.2305623	-64.4951038	
15	wpt 102	03-JUL-09 1:52:32PM	46.230683	-64.4950746	corner of horse pasture
16	wpt 103	03-JUL-09 1:57:26PM	46.2309186	-64.4953585	
17	wpt 104	03-JUL-09 2:00:25PM	46.2311023	-64.4957414	
18	wpt 105	03-JUL-09 2:02:45PM	46.2312266	-64.4961813	
19	wpt 106	03-JUL-09 2:06:56PM	46.2312406	-64.4966157	
20	wpt 107	03-JUL-09 2:44:51PM	46.2311802	-64.497412	
21	wpt 108	03-JUL-09 2:47:26PM	46.2314073	-64.4975926	
22	wpt 114	03-JUL-09 3:26:24PM	46.2315157	-64.4977827	
23	wpt 109	03-JUL-09 2:52:00PM	46.2315206	-64.4982301	
24	wpt 110	03-JUL-09 2:53:17PM	46.2315093	-64.4984904	
Orientation Points					
	wpt 111	03-JUL-09 3:04:11PM	46.2315077	-64.4992821	middle of ditch/wetland of Watercourse 2
	wpt 112	03-JUL-09 3:09:07PM	46.2314523	-64.499798	along chainlink fence
	wpt 113	03-JUL-09 3:11:26PM	46.2313459	-64.5006689	corner of chain fence and N/S line
	wpt 85	03-JUL-09 9:40:47AM	46.2265965	-64.4965502	Watercourse 1 at Hwy 133

	wpt 86	03-JUL-09 10:34:50AM	46.2275348	-64.495766	pasture
	GPS wpt	Date and time	Latitude	Longitude	Comments
Plot Points					
			46.22886	-64.49415	Plot 1upland
	wpt 87	03-JUL-09 1:14:00PM	46.2289671	-64.4941552	Plot 1 wetland
	wpt 115	03-JUL-09 3:56:48PM	46.2305392	-64.4948147	Plot 2 wetland
	wpt 116	03-JUL-09 4:31:48PM	46.2305487	-64.4951072	Plot 2 upland

Appendix 2 – GPS Tracks

Shediac Campground - Natech Environmental Services Inc Project #60918
GPS Tracks related to Wetland Delineation by B&B Botanical - 3 July 2009

Sequence Number	Latitude	Longitude	Leg bearing to point	Distance (m)	Total Distance to Point (m)	Comments
Watercourse 1 by Hwy 133						
6	46.2265925	-64.4965679	116.9	12.1	86	Along Watercourse 1, SE corner of property
7	46.2266298	-64.4965437	24.2	4.5	90.6	Along Watercourse 1, SE corner of property
8	46.2266018	-64.4965276	158.2	3.4	93.9	Along Watercourse 1, SE corner of property
9	46.2266829	-64.4965141	6.6	9.1	103	Along Watercourse 1, SE corner of property
10	46.2266983	-64.4965043	23.7	1.9	104.9	Along Watercourse 1, SE corner of property
11	46.226703	-64.4964848	70.9	1.6	106.5	Along Watercourse 1, SE corner of property
12	46.2267085	-64.496458	73.4	2.2	108.6	Along Watercourse 1, SE corner of property
13	46.2267406	-64.4963618	64.4	8.2	116.9	Along Watercourse 1, SE corner of property
14	46.22675	-64.496336	62.3	2.2	119.1	Along Watercourse 1, SE corner of property
15	46.2267546	-64.4962771	83.5	4.6	123.7	Along Watercourse 1, SE corner of property
16	46.2267914	-64.4962508	26.3	4.6	128.3	Along Watercourse 1, SE corner of property
17	46.2267923	-64.4962329	86.2	1.4	129.6	Along Watercourse 1, SE corner of property
18	46.2270126	-64.4960651	27.8	27.7	157.3	Along Watercourse 1, SE corner of property
Eastern Boundary (parallel to Watercourse 1)						
31	46.2273939	-64.4955132	141.8	12.2	338.5	Following along pasture side of fenceline
32	46.2274275	-64.4954895	26	4.2	342.7	Following along pasture side of fenceline
33	46.2275143	-64.4953693	43.9	13.4	356	Following along pasture side of fenceline
34	46.2275746	-64.4952808	45.5	9.6	365.6	Following along pasture side of fenceline
35	46.2276278	-64.4951935	48.7	9	374.6	Following along pasture side of fenceline
36	46.227699	-64.4950813	47.5	11.7	386.3	Following along pasture side of fenceline
37	46.2280383	-64.4946654	40.4	49.5	435.8	Following along pasture side of fenceline

Sequence Number	Latitude	Longitude	Leg bearing to point	Distance (m)	Total Distance to Point (m)	Comments
38	46.2280617	-64.49463	46.4	3.8	439.6	Following along pasture side of fenceline
39	46.2281284	-64.4945808	27.1	8.3	447.9	Following along pasture side of fenceline
40	46.228195	-64.4944867	44.4	10.4	458.3	Following along pasture side of fenceline
41	46.2282932	-64.494383	36.2	13.5	471.8	Following along pasture side of fenceline
Delineation Line						
49	46.2286762	-64.4939956	333.3	3.2	556.5	Track following delineation line
50	46.2287109	-64.4939979	357.3	3.9	560.4	Track following delineation line
51	46.2287333	-64.4939904	13	2.6	562.9	Track following delineation line
52	46.2287757	-64.4940214	333.2	5.3	568.2	Track following delineation line
53	46.2288114	-64.4940857	308.7	6.4	574.6	Track following delineation line
54	46.2288555	-64.4940935	353	4.9	579.5	Track following delineation line
55	46.2288894	-64.4941402	316.3	5.2	584.7	Track following delineation line
56	46.228954	-64.4942611	307.6	11.8	596.5	Track following delineation line
57	46.2289679	-64.494257	11.6	1.6	598.1	Track following delineation line
58	46.2290655	-64.4943918	316.2	15	613.1	Track following delineation line
59	46.2291079	-64.4944079	345.2	4.9	618	Track following delineation line
60	46.2292633	-64.4945389	329.7	20	638	Track following delineation line
61	46.2293743	-64.494561	352.1	12.5	650.5	Track following delineation line
62	46.2293861	-64.4945444	44.3	1.8	652.3	Track following delineation line
63	46.2295401	-64.4946917	326.4	20.5	672.8	Track following delineation line
64	46.2296066	-64.4947107	348.8	7.5	680.4	Track following delineation line
65	46.2297214	-64.4948089	329.3	14.8	695.2	Track following delineation line
66	46.2297516	-64.4948202	345.4	3.5	698.7	Track following delineation line
67	46.2298207	-64.4948637	336.4	8.4	707.1	Track following delineation line
68	46.2299569	-64.4949119	346.2	15.6	722.6	Track following delineation line
69	46.2300077	-64.4949648	324.2	7	729.6	Track following delineation line
70	46.230027	-64.4949806	330.4	2.5	732.1	Track following delineation line
71	46.2300731	-64.4950327	321.9	6.5	738.6	Track following delineation line
72	46.2301667	-64.4951366	322.4	13.1	751.7	Track following delineation line
73	46.2302599	-64.4951482	355.1	10.4	762.1	Track following delineation line
74	46.2304444	-64.4951336	3.1	20.5	782.7	Track following delineation line
75	46.2306257	-64.495078	12	20.6	803.3	Track following delineation line
76	46.2306851	-64.4950549	15.1	6.8	810.1	Track following delineation line

Sequence Number	Latitude	Longitude	Leg bearing to point	Distance (m)	Total Distanceto Point (m)	Comments
77	46.2308603	-64.4952645	320.3	25.3	835.4	Track following delineation line
78	46.2309193	-64.4953516	314.3	9.4	844.8	Track following delineation line
79	46.2309335	-64.4953642	328.5	1.9	846.7	Track following delineation line
80	46.2311021	-64.4957061	305.4	32.4	879	Track following delineation line
81	46.2310976	-64.4957359	257.6	2.3	881.4	Track following delineation line
82	46.2312328	-64.4961743	294	37	918.4	Track following delineation line
83	46.2312406	-64.4964198	272.6	19	937.3	Track following delineation line
84	46.2312597	-64.4966658	276.4	19.1	956.4	Track following delineation line
85	46.2312453	-64.4968589	263.9	15	971.4	Track following delineation line
86	46.2312296	-64.4971227	265.1	20.4	991.8	Track following delineation line
87	46.2312053	-64.4974173	263.2	22.9	1014.7	Track following delineation line
88	46.2312815	-64.4974522	342.4	8.9	1023.6	Track following delineation line
89	46.231402	-64.4976045	318.8	17.8	1041.4	Track following delineation line
90	46.2314555	-64.4977043	307.7	9.7	1051.1	Track following delineation line
91	46.2315043	-64.4979475	286.2	19.5	1070.7	Track following delineation line
92	46.2315131	-64.4982926	272.1	26.6	1097.3	Track following delineation line
93	46.2315214	-64.4984969	273.4	15.8	1113.1	Track following delineation line
Watercourse 2 Wetland						
93	46.2315214	-64.4984969	273.4	15.8	1113.1	outline of wetland / watercourse
94	46.231499	-64.4984945	175.7	2.5	1115.6	outline of wetland / watercourse
95	46.2314804	-64.498736	263.7	18.7	1134.4	outline of wetland / watercourse
96	46.2314365	-64.4987878	219.3	6.3	1140.7	outline of wetland / watercourse
97	46.2314308	-64.4989331	266.8	11.2	1151.9	outline of wetland / watercourse
98	46.2314355	-64.4991228	272	14.6	1166.5	outline of wetland / watercourse
99	46.2314432	-64.4993266	273.1	15.7	1182.3	outline of wetland / watercourse
100	46.2314447	-64.4994694	270.9	11	1193.3	outline of wetland / watercourse
101	46.2314442	-64.4995902	269.7	9.3	1202.6	outline of wetland / watercourse
109	46.2314815	-64.4995619	44.2	6.3	1377.3	outline of wetland / watercourse
110	46.2314992	-64.4995361	45.5	2.8	1380.1	outline of wetland / watercourse
111	46.2315484	-64.4995377	358.7	5.5	1385.6	outline of wetland / watercourse
112	46.231576	-64.4994952	46.9	4.5	1390	outline of wetland / watercourse
113	46.2315807	-64.4984861	89.6	77.8	1467.9	outline of wetland / watercourse
114	46.2315638	-64.4984753	156.3	2.1	1469.9	outline of wetland / watercourse
115	46.2315083	-64.4984981	195.9	6.4	1476.4	outline of wetland / watercourse

Sequence Number	Latitude	Longitude	Leg bearing to point	Distance (m)	Total Distanceto Point (m)	Comments
Watercourse 1 (track from Depth to Watertable Map)						
1	46.2253988	-64.4977852		0	0	Big Brook
2	46.2256191	-64.4975896		28.8	28.8	Big Brook
3	46.2264236	-64.4967056		112.5	141.2	Big Brook
4	46.2266729	-64.4964673		33.3	174.5	Big Brook
5	46.2269536	-64.4963115		33.4	207.9	Big Brook
6	46.2271115	-64.4959719		31.5	239.5	Big Brook
7	46.2271623	-64.4954897		37.6	277.1	Big Brook
8	46.2273638	-64.495086		38.4	315.4	Big Brook
9	46.2276839	-64.4946364		49.7	365.1	Big Brook
10	46.2278697	-64.4941914		40.1	405.2	Big Brook
11	46.2281037	-64.4939327		32.8	438	Big Brook
12	46.2285637	-64.4937916		52.3	490.3	Big Brook
13	46.2287878	-64.4938048		24.9	515.2	Big Brook
14	46.2292701	-64.4940597		57.1	572.3	Big Brook
15	46.2293967	-64.4944522		33.4	605.7	Big Brook
16	46.2294732	-64.494554		11.6	617.3	Big Brook
17	46.2296534	-64.4946105		20.5	637.7	Big Brook
18	46.2297456	-64.4947535		15.1	652.8	Big Brook
19	46.2299234	-64.4946848		20.5	673.3	Big Brook
20	46.2303762	-64.4949616		54.7	727.9	Big Brook
21	46.2307597	-64.4947187		46.6	774.5	Big Brook
22	46.230879	-64.4947146		13.3	787.8	Big Brook
23	46.2310179	-64.4949605		24.5	812.2	Big Brook

Watercourse 2 (track from Depth to Watertable Map)

1	46.2301193	-64.5044946		0	0	Small Brook
2	46.2306443	-64.5038291		77.7	77.7	Small Brook
3	46.2310687	-64.5033759		58.7	136.4	Small Brook
4	46.2315692	-64.5030036		62.6	199.1	Small Brook
5	46.2319045	-64.5025744		49.9	248.9	Small Brook
6	46.2320181	-64.5022572		27.5	276.4	Small Brook
7	46.2320677	-64.5017125		42.4	318.8	Small Brook
8	46.231985	-64.5012767		34.8	353.7	Small Brook
9	46.2317242	-64.5008888		41.7	395.3	Small Brook
10	46.2314828	-64.4999363		78.2	473.6	Small Brook

11	46.231454	-64.4991854	58	531.6	Small Brook
12	46.2315044	-64.4986824	39.2	570.8	Small Brook
13	46.2315835	-64.4981158	44.6	615.4	Small Brook

Appendix 3 Data Sheets

New Brunswick Department of Environment Wetland Delineation Data Sheet

Project Site Campground - Steadic Date 3 July 2009 Sample Point Plot 1 - Upland
 Applicant/Owner NATECH / J.C. Belliveau Field Investigator(s) Gart Bishop, Jacquelin Marceux
 County Westmorland Coordinates 46.27886 64.49415
 PID 70086335 Do normal environmental conditions exist on-site? Yes No
 if no explain: Agricultural land - active hay field
 Atypical Situation? Yes No Explain _____
 Is this a potential Problem Area? Yes No Explain _____

Wetland Determination
 (Check One Only For Each Criteria)
 Dominant Hydrophytic Vegetation (50/20 rule) Yes No
 Wetland Hydrology Yes No
 Hydric Soils Yes No
 Wetland Type: _____
 Rational for Determination: no wetland indicators present.

Wetland Determination
 YES NO

Vegetation

Tree Stratum: (Plot size: <u>10m</u>)	%Cover	Dominant Species	Indicator Status
1. <u>Acer rubrum</u>	<u>15</u>	<u>UFS</u>	<u>F-AC</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
= Total Cover			

Shrub Stratum: (Plot size: 5m)

1.	2.	3.	4.	5.
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
= Total Cover				

Herb Stratum: (Plot size: 3m)

1.	2.	3.	4.	5.
<u>Phleum pratense</u>	<u>60</u>	<u>UFS</u>	<u>FACU</u>	
<u>Trifolium pratense</u>	<u>5</u>	<u>no</u>	<u>FACU</u>	
<u>Galium mollugo</u>	<u>10</u>	<u>no</u>	<u>-</u>	
<u>Artemisia vulgaris</u>	<u>5</u>	<u>no</u>	<u>-</u>	
<u>Asterium minus</u>	<u>5</u>	<u>no</u>	<u>-</u>	
= Total Cover				
<u>Vicia cracca</u>	<u>5</u>	<u>no</u>	<u>-</u>	
<u>Trifolium pratense</u>	<u>5</u>	<u>no</u>	<u>FACU</u>	
<u>Valeriana officinalis</u>	<u>5</u>	<u>no</u>	<u>-</u>	
<u>Elytrigia repens</u>	<u>2</u>	<u>no</u>	<u>FACU</u>	
<u>102 50/20 = 50/20</u>				

Comments: An active, currently used hay field.

Dominance Test Worksheet:
 # of Dominant Species that are OBL,FACW,FAC: 1 (A)
 Total # of Dominant Species across all strata: 2 (B)
 % of Dominant Species that are OBL,FACW,FAC: 50 (A/B)

Prevalence Index Worksheet:
 Total % Cover of: _____ Multiply by:
 OBL Species 0 x1 = -
 FACW Species 0 x2 = -
 FAC Species 15 x3 = 45
 FACU Species 102 x4 = 408
 UPL Species 0 x5 = -
 Column Totals: 117 x1 = 453
 Prevalence Index = B/A = 3.27

Hydrophytic Vegetation Indicators:
no Rapid Test for Hydrophytic Vegetation
no Dominance Test is >50%
no Prevalence Index is ≤3.0'
 Morphological Adaptations¹ (explain) _____
 Problematic Hydrophytic Vegetation¹ (explain) _____
 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes No

Appendix 3 Data Sheets

New Brunswick Department of Environment Wetland Delineation Data Sheet

Plot 1 Upland

Hydrology

Primary Hydrological Indicators: (minimum of one is required; check all that apply)

<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water Stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron reduction in tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

Secondary Indicators: (minimum of two required)

<input checked="" type="checkbox"/> Surface Soil Cracks (B6)	<input checked="" type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	

Field Observations:

Surface Water Present? Yes No Depth _____

Water Table Present? Yes No Depth _____

Saturation Present? Yes No Depth _____

Wetland Hydrology Present? Yes No

Comments: *dry, solid ground*

Soil Profile

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth(cm)	Matrix		Redox Features				Texture	Remarks
	Color(moist)	%	Color(moist)	%	Type ¹	Loc ²		
<i>0-1cm</i>								<i>organic (last year's leaves)</i>
<i>1-50cm</i>	<i>5yr 3/4</i>							<i>sandy brown</i>

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol (A1)	<input checked="" type="checkbox"/> Sandy Redox (S5)
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Dark Surfaces (S7)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Polyvalue Below Surface (S8)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Thin Dark Surface (S9)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> 5cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)

Restrictive Layer (if observed): Type _____ Depth: _____

Hydric Soil Present? Yes No

Comments: _____

Appendix 3 Data Sheets

New Brunswick Department of Environment Wetland Delineation Data Sheet

Project Site Campground - Shadnac Date 3 July 2009 Sample Point Plot 1 - Wetland
 Applicant/Owner NATECH 19.C. Belliveau Field Investigator(s) Gart Bishop, Jacqueline Marcoux
 County Westmorland Coordinates _____
 PID 70086335 Do normal environmental conditions exist on-site? Yes No
 if no explain: Agricultural land
 Atypical Situation? Yes No Explain _____
 Is this a potential Problem Area? Yes No Explain _____

Wetland Determination
 (Check One Only For Each Criteria)
 Dominant Hydrophytic Vegetation (50/20 rule) _____ Yes No
 Wetland Hydrology _____ Yes No
 Hydric Soils _____ Yes No
 Wetland Type: Alfalfa sump, flood plain
 Rational for Determination: _____

Wetland Determination

YES NO

Vegetation

Tree Stratum: (Plot size: _____)	%Cover	Dominant Species	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
= Total Cover _____			

Shrub Stratum: (Plot size: _____)	%Cover	Dominant Species	Indicator Status
1. <u>ALNUS INCANA</u>	<u>25</u>	<u>Dominant</u>	<u>FACW</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
= Total Cover _____			

Herb Stratum: (Plot size: _____)	%Cover	Dominant Species	Indicator Status
1. <u>Glyceria gracilis</u>	<u>20</u>	<u>dominate</u>	<u>OBL</u>
2. <u>Sagittaria arifolia</u>	<u>15</u>	<u>nc</u>	<u>OBL</u>
3. <u>Pectisacchara pallida</u>	<u>10</u>	<u>nc</u>	<u>OBL</u>
4. <u>Carex crinita</u>	<u>5</u>	<u>nc</u>	<u>OBL</u>
5. <u>Dactylis glomerata</u>	<u>1</u>	<u>nc</u>	<u>FACU</u>
= Total Cover _____			

<u>Phalaris arundinacea</u>	<u>5</u>	<u>FACU</u>	<u>Juncus bufonius</u>	<u>5</u>	<u>FACU</u>
<u>Poa palustris</u>	<u>5</u>	<u>FACU</u>	<u>Epilobium ciliatum</u>	<u>2</u>	<u>FAC</u>
<u>Lysimachia terrestris</u>	<u>5</u>	<u>OBL</u>	<u>Equisetum arvense</u>	<u>2</u>	<u>FAC</u>
<u>Impatiens capensis</u>	<u>5</u>	<u>FACU</u>			

80% total cover - 50/20 = 40/16

Comments _____

Dominance Test Worksheet:

of Dominant Species that are OBL,FACW,FAC: 2 (A)
 Total # of Dominant Species across all strata: 2 (B)
 % of Dominant Species that are OBL,FACW,FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL Species <u>55</u>	x1 = <u>55</u>
FACW Species <u>15</u>	x2 = <u>30</u>
FAC Species <u>2</u>	x3 = <u>12</u>
FACU Species <u>1</u>	x4 = <u>4</u>
UPL Species _____	x5 = _____
Column Totals: <u>105</u>	x1 = <u>169</u>
<u>A</u>	<u>B</u>

Prevalence Index = B/A = 1.53

Hydrophytic Vegetation Indicators:

Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≥3.0¹
 Morphological Adaptations¹ (explain)
 Problematic Hydrophytic Vegetation¹ (explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes No

Appendix 3 Data Sheets

New Brunswick Department of Environment Wetland Delineation Data Sheet

Plot 1 wetland

Hydrology

Primary Hydrological Indicators: (minimum of one is required; check all that apply)

<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water Stained Leaves (B9)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron reduction in tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

Secondary Indicators: (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Crayfish Burrows (C8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	

Field Observations:

Surface Water Present? Yes No Depth _____

Water Table Present? Yes No Depth _____

Saturation Present? Yes No Depth _____

Wetland Hydrology Present? Yes No

Comments: _____

Soil Profile

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth(cm)	Matrix		Redox Features				Texture	Remarks
	Color(moist)	%	Color(moist)	%	Type ¹	Loc ²		
0-50	2.5yr 2.5/1							sandy to silty

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input checked="" type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Dark Surfaces (S7)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Polyvalue Below Surface (S8)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Thin Dark Surface (S9)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> 5cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)

Restrictive Layer (if observed): Type _____ Depth: _____

Hydric Soil Present? Yes No

Comments: *plot on a sandy gravel bar on the flood plain of a small brook. in soil pit, 7cm to water*

Appendix 3 Data Sheets

New Brunswick Department of Environment Wetland Delineation Data Sheet

Project Site Campground - Shediac Date 3 July 2009 Sample Point Plot 2 - upland
 Applicant/Owner Nature / G.C. Belliveau Field Investigator(s) Gary Bisley, Jocquelin Whelan
 County Westmorland Coordinates 46.23055 64.49511
 PID 70086335 Do normal environmental conditions exist on-site? Yes No
 If no explain: Agricultural land.
 Atypical Situation? Yes No Explain _____
 Is this a potential Problem Area? Yes No Explain _____

Wetland Determination
 (Check One Only For Each Criteria)
 Dominant Hydrophytic Vegetation (50/20 rule) Yes No
 Wetland Hydrology Yes No
 Hydric Soils Yes No
 Wetland Type: _____
 Rational for Determination: _____

Wetland Determination

YES NO

Vegetation

Tree Stratum: (Plot size: _____)	%Cover	Dominant Species	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
= Total Cover			

Shrub Stratum: (Plot size: _____)	%Cover	Dominant Species	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
= Total Cover			

Herb Stratum: (Plot size: _____)	%Cover	Dominant Species	Indicator Status
1. <u>Triticum repens</u>	<u>50</u>	<u>dominate</u>	<u>FACU</u>
2. <u>Festuca rubra</u>	<u>10</u>	<u>no</u>	<u>FACU</u>
3. <u>Pranella vulgaris</u>	<u>15</u>	<u>no</u>	<u>FACU</u>
4. <u>Taraxacum officinale</u>	<u>15</u>	<u>no</u>	<u>FACU</u>
5. <u>Phleum pratense</u>	<u>5</u>	<u>no</u>	<u>FACU</u>
<u>95 = Total Cover</u>			

50/20 = 48/19

Comments Also in plots but in amounts less than 1%: Plantago major; Horsetail sp.

Hydrophytic Vegetation Present? Yes No

Dominance Test Worksheet:

of Dominant Species that are OBL, FACW, FAC: 0 (A)
 Total # of Dominant Species across all strata: 1 (B)
 % of Dominant Species that are OBL, FACW, FAC: 0 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL Species <u>0</u>	x1 = _____
FACW Species <u>0</u>	x2 = _____
FAC Species <u>0</u>	x3 = _____
FACU Species <u>95</u>	x4 = <u>380</u>
UPL Species <u>0</u>	x5 = _____
Column Totals: <u>95</u>	x1 = <u>380</u>
<u>A</u>	<u>B</u>

Prevalence Index = B/A = 4

- Hydrophytic Vegetation Indicators:**
- Rapid Test for Hydrophytic Vegetation
 - Dominance Test is >50%
 - Prevalence Index is ≤3.0¹
 - Morphological Adaptations¹ (explain)
 - Problematic Hydrophytic Vegetation¹ (explain)
- ¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Appendix 3 Data Sheets

New Brunswick Department of Environment Wetland Delineation Data Sheet

Plot 2 upland

Hydrology

Primary Hydrological Indicators: (minimum of one is required; check all that apply)

<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water Stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron reduction in tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

Secondary Indicators: (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Crayfish Burrows (C8)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	

Field Observations:

Surface Water Present? Yes ___ No Depth ___

Water Table Present? Yes ___ No Depth ___

Saturation Present? Yes ___ No Depth ___

Wetland Hydrology Present? Yes ___ No

Comments: _____

Soil Profile

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth(cm)	Matrix		Redox Features				Texture	Remarks
	Color(moist)	%	Color(moist)	%	Type ¹	Loc ²		
0-1								<i>organic</i>
1-45	<i>5yr 4/4</i>							<i>sandy silt</i>

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Dark Surfaces (S7)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Polyvalue Below Surface (S8)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Thin Dark Surface (S9)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> 5cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)

Restrictive Layer (if observed): Type _____ Depth: _____

Hydric Soil Present? Yes ___ No

Comments: *Pasture has been plowed and planted.*

Appendix 3 Data Sheets

New Brunswick Department of Environment Wetland Delineation Data Sheet

Project Site Campground - Madiac Date 3 July 2009 Sample Point PLOT 2 - Wetland
 Applicant/Owner NAT BCH / J.C. Belliveau Field Investigator(s) Sgt Bishop, Jacqueline Morneau
 County Westmorland Coordinates N6-23054 64.49481
 PID 70086335 Do normal environmental conditions exist on-site? Yes No
 if no explain: Agricultural land.
 Atypical Situation? Yes No Explain wetland surrounds a small brook (1m wide) from which
 Is this a potential Problem Area? Yes No Explain horses roam, and they graze in the
wetland.

Wetland Determination
 (Check One Only For Each Criteria)

Dominant Hydrophytic Vegetation (50/20 rule) _____ Yes No
 Wetland Hydrology _____ Yes No
 Hydric Soils _____ Yes No
 Wetland Type: _____
 Rational for Determination: _____

Wetland Determination

YES NO

Vegetation

Tree Stratum: (Plot size: _____)	%Cover	Dominant Species	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
= Total Cover			

Shrub Stratum: (Plot size: _____)	%Cover	Dominant Species	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
= Total Cover			

Herb Stratum: (Plot size: _____)	%Cover	Dominant Species	Indicator Status
1. <i>Eleocharis palophila</i> 35	48	OBL	
2. <i>Sagittaria arifolia</i> 20	48	OBL	
3. <i>Spartina alterniflora</i> 30	48	OBL	
4. <i>Juncus gerardi</i> 5	nc	FACW	
5. <i>Spergularia canadensis</i> 5	nc	OBL	
95 = Total Cover			

$50/20 = 48/19$

Comments: * This is a guess as the plant has not yet flowered, but based on the large pointed leaves (>30cm) and the habitat.

Hydrophytic Vegetation Present? Yes No

Dominance Test Worksheet:

of Dominant Species that are OBL,FACW,FAC: 3 (A)
 Total # of Dominant Species across all strata: 3 (B)
 % of Dominant Species that are OBL,FACW,FAC: 100 (A/B)

Prevalence Index Worksheet:

Total % Cover of:	Multiply by:
OBL Species <u>90</u>	x1 = <u>90</u>
FACW Species <u>5</u>	x2 = <u>10</u>
FAC Species _____	x3 = _____
FACU Specie _____	x4 = _____
UPL Species _____	x5 = _____
Column Totals: <u>95</u>	x1 = <u>100</u>
<u>A</u>	<u>B</u>

Prevalence Index = B/A = 1.05

Hydrophytic Vegetation Indicators:

- Rapid Test for Hydrophytic Vegetation
- Dominance Test is >50%
- Prevalence Index is $\leq 3.0^1$
- ____ Morphological Adaptations¹ (explain)
- ____ Problematic Hydrophytic Vegetation¹ (explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Appendix 3 Data Sheets

New Brunswick Department of Environment Wetland Delineation Data Sheet

Plot 2 Wetland

Hydrology

Primary Hydrological Indicators: (minimum of one is required; check all that apply)

<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water Stained Leaves (B9)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron reduction in tilled Soils (C6)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

Secondary Indicators: (minimum of two required)

<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Drainage Patterns (B10)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Moss Trim Lines (B16)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Dry-Season Water Table (C2)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> Crayfish Burrows (C8)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <i>(tidal)</i>	

Field Observations:

Surface Water Present? Yes ___ No ___ Depth ___

Water Table Present? Yes ___ No ___ Depth ___

Saturation Present? Yes ___ No ___ Depth ___

Wetland Hydrology Present? Yes No ___

Comments: *this is within the daily tidal influence*

Soil Profile

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators)

Depth(cm)	Matrix		Redox Features				Texture	Remarks
	Color(moist)	%	Color(moist)	%	Type ¹	Loc ²		
<i>0-30</i>	<i>5yr 2.5/1</i>							<i>sandy silt no organics present</i>

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Dark Surfaces (S7)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Polyvalue Below Surface (S8)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Thin Dark Surface (S9)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> 6cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input checked="" type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)

Restrictive Layer (if observed): Type _____ Depth: _____

Hydric Soil Present? Yes No ___

Comments: *below 30 cm, soil too loose (liquid) to stay in sampling point.
- water at (or within 2 cm) of surface at time of sampling.
(tidal)*

version 1.8 June 1, 2009

Appendix 4 – Species Observed

Botanical Name	Common Name	S Rank	Wetland Indicator Status	Wetland Species	Upland Species
<i>Acer platanoides</i>	Norway Maple	SE	-		x
<i>Acer rubrum</i>	Red Maple	S5	FAC		x
<i>Alnus incana ssp. rugosa</i>	Speckled Alder	S5	FACW+	x	
<i>Ambrosia artemisiifolia var. elatior</i>	Common Ragweed	S5	FACU		x
<i>Amelanchier sanguinea</i>	Serviceberry	S4S5	-		x
<i>Arctium minus</i>	Common Burdock	SE	-		x
<i>Artemisia vulgaris</i>	Mugwort	SE	-		x
<i>Aster puniceus</i>	Purple-stemmed Aster	S5	OBL	x	
<i>Betula papyrifera</i>	White Birch	S5	FACU		x
<i>Calystegia sepium ssp. americana</i>	Hedge Bindweed	S5	FAC-	x	
<i>Carex crinita</i>	Fringed Sedge	S5	OBL	x	
<i>Carex gynandra</i>	Gynandrous Sedge	S5	NL	x	
<i>Carex mackenziei</i>	Mackenzie's Sedge	S4	-	x	
<i>Chenopodium glaucum</i>	Oak-leaved Goosefoot	SE	FACW-	x	
<i>Cirsium arvense</i>	Canada Thistle	SE	FACU		x
<i>Cirsium vulgare</i>	Bull Thistle	SE	FACU-		x
<i>Crataegus sp.</i>	Hawthorns	-	-		x
<i>Dactylis glomerata</i>	Orchard-grass	SE	FACU		x
<i>Eleocharis halophila</i>	Saltmarsh Spike-rush	S4?	OBL	x	
<i>Elytrigia repens</i>	Couch-grass	SE	FACU-		x
<i>Epilobium ciliatum subsp. ciliatum</i>	Glandular Willow-herb	S5	FAC-	x	
<i>Equisetum arvense</i>	Common Field Horsetail	S5	FAC	x	
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	S5	FAC		x
<i>Festuca rubra</i>	Red Fescue	S5	FACU		x
<i>Galium mollugo</i>	Wild Madder	SE	-		x
<i>Glaux maritima</i>	Sea Milkwort	S5	OBL	x	
<i>Glyceria grandis</i>	Reed Meadow Grass	S5	NL	x	
<i>Glyceria striata</i>	Fowl Manna Grass	S5	OBL	x	
<i>Hieracium caespitosum</i>	King Devil	SE	-		x
<i>Impatiens capensis</i>	Spotted Touch-me-not	S5	FACW	x	
<i>Juncus bufonius</i>	Toad Rush	S5	FACW	x	
<i>Juncus gerardii</i>	Black Grass	S5	FACW+	x	
<i>Larix laricina</i>	Tamarack	S5	FACW	x	
<i>Leucanthemum vulgare</i>	Ox-eye Daisy	SE	-		x
<i>Lysimachia terrestris</i>	Swamp candles	S5	OBL	x	
<i>Malus pumila</i>	Wild Apple	SE	NL		x
<i>Myrica pensylvanica</i>	Bayberry	S5	FAC		x
<i>Onoclea sensibilis</i>	Sensitive Fern	S5	FACW	x	
<i>Oxalis stricta</i>	Yellow Wood Sorrel	S5	-		x
<i>Persicaria amphibian var. emersa</i>	Water Smartweed	S2	OBL	x	
<i>Phalaris arundinacea</i>	Reed Canary-grass	S5	FACW-	x	
<i>Phleum pratense</i>	Common Timothy	SE	FACU		x

Botanical Name	Common Name	S Rank	Wetland Rank	Wetland Species	Upland Species
<i>Pinus resinosa</i>	Red Pine	S4S5	FACU		x
<i>Poa palustris</i>	Fowl Meadow-grass	S5	FACW	x	
<i>Poa pratensis</i>	Kentucky Bluegrass	S5	FACU		x
<i>Populus tremuloides</i>	Trembling Aspen	S5	NL		x
<i>Prunella vulgaris</i>	Self Heal	S5	FACU+		x
<i>Prunus pennsylvanica</i>	Pin Cherry	S5	FACU-		x
<i>Prunus virginiana</i>	Choke-cherry	S5	FACU		x
<i>Ranunculus repens</i>	Creeping Buttercup	SE	FAC	x	
<i>Rhinanthus minor</i>	Common Yellow Rattle	S5	FAC		x
<i>Rumex crispus</i>	Curled Dock	SE	FACU		x
<i>Salix eriocephala</i>	Red-tipped Willow	S5	FACW	x	
<i>Scirpus microcarpus</i>	Red-sheathed Bulrush	S5	OBL	x	
<i>Solanum dulcamara</i>	Deadly Nightshade	SE	FAC-	x	
<i>Solidago canadensis var. canadensis</i>	Canada Goldenrod	S5	FACU		x
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5	FAC	x	
<i>Sorbus decora</i>	Showy Mountain-ash	S4S5	FAC+		x
<i>Sparganium eurycarpum</i>	Broad-fruited Bur-reed	S4/S5	OBL	x	
<i>Spartina alternifolia</i>	Salt-water Cord-grass	S5	OBL	x	
<i>Spergularia canadensis</i>	Canada Sand-spurrey	S4	OBL	x	
<i>Spiraea alba var. latifolia</i>	Meadowsweet	S5	FAC+	x	
<i>Stellaria graminea</i>	Lesser Stitchwort	SE	FACU-		x
<i>Taraxacum officinale</i>	Dandelion	S5	FACU-		x
<i>Thalictrum pubescens</i>	Tall Meadow-rue	S5	FACW+	x	
<i>Torreyochloa pallida var. fernaldii</i>	Fernald's Manna-grass	S5	OBL	x	
<i>Tragopogon pratensis</i>	Goat's-beard	SE	-		x
<i>Trifolium pratense</i>	Red Clover	SE	FACU-		x
<i>Trifolium repens</i>	White Clover	SE	FACU-		x
<i>Typha latifolia</i>	Cat-tail	S5	OBL	x	
<i>Valeriana officinalis</i>	Common Valerian	SE	-	x	
<i>Vicia cracca</i>	Cow Vetch	SE	NL		x
<i>Xanthium strumarium</i>	Cocklebur	S4	FAC		x

Appendix - 5 Specimens Collected

Botanical Name				Habitat/Location	
Sample #	Date	Common Name	French Name		
Carex mackenziei Krecz.					
09-005.3	3 July 2009	Mackenzie's Sedge	Carex de Mackenzie	salt marsh north of horse pasture	Lat 46.23054
Abundance	uncommon	Notes	tentative ID, no flowers	Cape Brule, north of Hwy 133	Long 64.49481
<hr/>					
Chenopodium glaucum					
09-004	3 July 2009	Oak-leaved Goosefoot		sandy floodplain of small brook	Lat 46.23054
Abundance	uncommon	Notes		Cape Brule, north of Hwy 133	Long 64.49414
<hr/>					
Eleocharis halophila (Muhl.) Schultes					
09-005.1	3 July 2009	Saltmarsh Spike-rush		salt marsh north of horse pasture	Lat 46.23054
Abundance	common	Notes		Cape Brule, north of Hwy 133	Long 64.49481
<hr/>					
Persicaria amphibia (L.) S.F. Gray var. <i>emersa</i> (Michx.) Hick					
09-003	3 July 2009	Water Smartweed	Renouée amphibie	along steep sided banks of small brook/ditch	Lat 46.22673
Abundance	abundant along	Notes		Cape Brule, north of Hwy 133	Long 64.49648
<hr/>					
Spartina alternifolia Loisel.					
09-005.2	3 July 2009	Salt-water Cord-grass	Spartine alterniflore	salt marsh north of horse pasture	Lat 46.23054
Abundance	common	Notes	tentative ID, no flowers	Cape Brule, north of Hwy 133	Long 64.49481
<hr/>					

Appendix C – Report from the Atlantic Canada Conservation Data Centre



DATA REPORT 3502: Shediac Camp, NB

Prepared 2 July, 2009
by S.H. Gerriets

CONTENTS OF REPORT

1.0 Preface

- 1.1 Caveats
- 1.2 Additional Information

2.0 Study Area Results

- 2.1 Flora
- 2.2 Fauna
- Map 1: Flora and Fauna

3.0 Special Areas

- 3.1 Managed Areas
- 3.2 Significant Areas
- Map 2: Special Areas

4.0 Taxa List

5.0 Source Bibliography

1.0 PREFACE

The Atlantic Canada Conservation Data Centre (ACCDC) is part of a network of circa 85 NatureServe data centres & heritage programs in 10 provinces, 1 territory, 50 states, plus several Central and South American countries. The NatureServe network is more than 30 years old and shares a common conservation data methodology. The ACCDC was founded in 1997, and maintains data for the jurisdictions of New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador. Although a non-governmental agency, the ACCDC is supported by 6 federal agencies, plus 4 provincial governments, outside grants and data processing fees. URL: www.ACCDC.com.

Upon request, the ACCDC provides known occurrence data for rare and endangered flora and fauna, in and near a specified study area. As a standard supplement to that data, the ACCDC includes locations of managed areas with some level of protection for flora and fauna, and also known sites of ecological interest, e.g. NB DOE Environmentally Significant Areas. Floral, faunal and Special Areas data are attached to our e-mail response as *.dbf files which may be opened from within data software (e.g. Excel, Access) or mapped in GIS (e.g. ArcView, MapInfo, AutoCAD).

1.1 CAVEATS

While the ACCDC makes a strong effort to verify the accuracy of all the data it obtains, generates and manages, it shall not be held responsible for any inaccuracies in any data that it provides. The following CAVEATS apply:

- a.) Data is restricted to use by the specified Data User; any third party requiring data must make its own data request.
- b.) To ensure the currency of data, the ACCDC requires Data Users to cease using data 12 months after receipt; if data is still needed after that term, the ACCDC will supply current data as a replacement.
- c.) ACCDC data responses are restricted to that data in our Data System at the time of the data request.
- d.) Data is qualified as to location (Precision) and time (SurveyDate); cf Data Dictionary for details.
- e.) ACCDC data reports are not to be construed as exhaustive inventories of taxa in an area.
- f.) The non-occurrence of a taxon cannot be inferred by its absence in an ACCDC data report.

1.2 ADDITIONAL INFORMATION

Please direct biological questions about ACCDC data to: Sean Blaney, ACCDC: (506) 364-2658, and technical data queries to: Stefen Gerriets, ACCDC: (506) 364-2657.

For provincial information on rare taxa and protected areas, or information on game animals, deer yards, old growth forest, archeological sites, fish habitat etc, please contact Stewart Lusk, NBDNR: (506) 453-2440.

For more specific information about Peregrine Falcon locations, please contact: Diane Amirault, CWS: (506) 364-5060.

2.0 RARE AND ENDANGERED TAXA

A 5km buffer around the study area contains a relatively moderate-to-large (quintile 4) density of taxa records: 138 records of 34 taxa from 20 sources. (Data Density: 1.75 rec/km²).

2.1 FLORA

A 5km buffer around the study area contains 20 records of 10 vascular, 0 records of nonvascular flora (see attached *eo.dbf).

2.2 FAUNA

A 5km buffer around the study area contains 109 records of 21 vertebrate, 9 records of 3 invertebrate fauna (cf attached *eo.dbf). Sensitive data: Wood Turtles are POTENTIALLY present in the study area (cf attached WOTU.rtf).

Map 1: Known observations of rare and/or protected flora and fauna within buffered study area.



3.0 SPECIAL AREAS

3.1 MANAGED AREAS

The GIS scan identified 1 Managed Area with some degree of protected status, in the vicinity of the study area (see attached *ma.dbf).

3.2 SIGNIFICANT AREAS

The GIS scan also identified 2 biologically significant areas in the vicinity of the study area; such sites are known for exceptional biotic richness but may or may not have legal status (see attached *sa.dbf).

Map 2: Boundaries and/or locations of known Managed and Significant Areas within 5km of study area.



4.0 TAXON LIST

Flora and fauna within the buffered area listed in order of concern, beginning with any legally listed taxa, including the number of observations per taxon and the distance in kilometers to the closest point-data observation.

Scientific name	Common name	COSEWIC	Provincial	Srank	obs	dist.km
<i>Charadrius melodus melodus</i>	Piping Plover	E	Endangered	S2B	23	1 ±0.5
<i>Calidris canutus rufa</i>	Red Knot (<i>rufa</i> ssp)	E		S3M	1	1 ±0.5
<i>Haliaeetus leucocephalus</i>	Bald Eagle	NAR	Reg.Endangered	S3B	1	4 ±5
<i>Ammodramus nelsoni</i>	Nelson's Sharp-tailed Sparrow	NAR		S3B	2	4 ±5
<i>Sialia sialis</i>	Eastern Bluebird	NAR		S3B	1	4 ±5
<i>Sterna hirundo</i>	Common Tern	NAR		S3B	5	2 ±1
<i>Bucephala islandica</i> (Eastern pop.)	Barrow's Goldeneye - Eastern pop.	SC		S2N	1	4 ±0.1
<i>Danaus plexippus</i>	Monarch Butterfly	SC		S3B	1	1 ±1
<i>Wilsonia canadensis</i>	Canada Warbler	T		S4B	1	4 ±5
<i>Stellaria crassifolia</i>	Fleshy Stitchwort			S1	2	3 ±5
<i>Carex albicans</i> var. <i>emmonsii</i>	Emmons Sedge			S2	1	5 ±0
<i>Anas strepera</i>	Gadwall			S2B	2	4 ±5
<i>Anas clypeata</i>	Northern Shoveler			S2B	1	4 ±5
<i>Larus ridibundus</i>	Black-headed Gull			S2M,S1N	1	1 ±0.1
<i>Tringa semipalmata</i>	Willet			S2S3B	42	1 ±0.5
<i>Comandra umbellata</i>	Umbellate Bastard Toad-Flax			S3	5	4 ±0
<i>Amelanchier canadensis</i>	Oblong-Leaf Serviceberry			S3	1	1 ±0.1
<i>Rumex maritimus</i>	Sea-Side Dock			S3	1	5 ±0.1
<i>Stellaria humifusa</i>	Creeping Sandwort			S3	1	3 ±5
<i>Arabis hirsuta</i> var. <i>pyncocarpa</i>	Hairy Rock-Cress			S3	1	5 ±0.1
<i>Lycaena dospassosi</i>	Salt Marsh Copper			S3	7	1 ±0
<i>Papilio brevicauda bretonensis</i>	Short-tailed Swallowtail			S3	1	3 ±0.1
<i>Hirundo rustica</i>	Barn Swallow			S3B	1	4 ±5
<i>Riparia riparia</i>	Bank Swallow			S3B	1	3 ±0.1
<i>Progne subis</i>	Purple Martin			S3B	6	2 ±5
<i>Anas americana</i>	American Wigeon			S3B	2	4 ±5
<i>Anas acuta</i>	Northern Pintail			S3B	1	5 ±10
<i>Pluvialis dominica</i>	American Golden-Plover			S3M	12	1 ±0.5
<i>Calidris maritima</i>	Purple Sandpiper			S3M,S3N	3	3 ±0.5
<i>Distichlis spicata</i>	Seashore Saltgrass			S3S4	5	1 ±0.1
<i>Suaeda calceoliformis</i>	American Sea-Blite			S3S4	2	2 ±0
<i>Dolichonyx oryzivorus</i>	Bobolink			S3S4B	1	4 ±5
<i>Mergus serrator</i>	Red-breasted Merganser			S3S4B,S4S5M,S4	1	4 ±5
<i>Montia fontana</i>	Fountain Miner's-Lettuce			SH	1	3 ±1

5.0 SOURCE BIBLIOGRAPHY

The recipient of this data shall acknowledge the ACCDC and the data sources of the dataset in any documents, reports, publications or presentations, in which this dataset makes a major contribution. The sources listed below contributed data contained in this report:

recs	source
57	Morrison, Guy 2006. Maritime Shorebird Survey (MSS) database. Canadian Wildlife Service, Environment Canada, 52 taxa, 570 sites, 11496 surveys.
19	Amirault, D.L. & Stewart, J. 2007. Piping Plover Database 1894-2006. Canadian Wildlife Service, Sackville NB, 3344 recs, 1228 new.
17	Lepage, D. 2009. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 143,180 recs.
8	Mazerolle, D.M. 2005. Bouctouche Irving Eco-Centre rare coastal plant fieldwork results 2004-05. Irving Eco-centre, la Dune du Bouctouche,
7	Blaney, C.S.; Mazerolle, D.M.; Klymko, J; Spicer, C.D. 2005. AC CDC Fieldwork 2006. Atlantic Canada Conservation Data Centre. Sackville NB,
6	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax. 82,125 recs.
5	Tingley, S. (compiler) 2001. Butterflies of New Brunswick [website]. www.geocities.com/Yosemite/8425/buttrfly ,
3	Clayden, S.R. 1998. NBM Science Collections databases to 1998. New Brunswick Museum, Saint John NB.
3	Chardine, J.W. & et al. 2008. Colonial Waterbird Database. Canadian Wildlife Service, Sackville NB, 2699 sites, 9623 recs (7882 obs).
2	Edsall, J. 2001. Pers. comm. to K.A. Bredin, ACCDC.
2	Connell Herbarium Specimens. University New Brunswick, Fredericton. 2003.
1	Tims, J. & Craig, N. 1995. Environmentally Significant Areas in New Brunswick (NBESA). NB Dept of Environment & Nature Trust of New Brunswick Inc.
1	Pike, E., Tingley, S. & Christie, D.S. 2000. Nature NB Listserve. University of New Brunswick. listserv.unb.ca/archives/naturenb .
1	Hinds, H.R. 1986. Notes on New Brunswick plant collections. Connell Memorial Herbarium, unpubl.
1	Erskine, A.J. 1999. Maritime Nest Records Scheme (MNRS) 1937-1999. Canadian Wildlife Service, Sackville NB.
1	Doucet, D.A. 2007. Lepidopteran Records, 1988-2006. ACCDC Staff,
1	Daury, R.W. & Bateman, M.C. 1996. The Barrow's Goldeneye (<i>Bucephala islandica</i>) in the Atlantic Provinces and Maine. Canadian Wildlife Service, Sackville NB. 47pp.
1	Boyne, A.W. 2000. Tern Surveys. Canadian Wildlife Service, Sackville NB. unpublished data.
1	Bateman, M.C. 2001. Coastal Waterfowl Surveys Database, 1965-2001. Canadian Wildlife Service, Sackville NB. unpublished data.
1	Amirault, D.L. & McKnight, J. 2003. Piping Plover Database 1991-2003. Canadian Wildlife Service, Sackville NB. unpublished data.

Appendix D – Water Supply Source Assessment Application

Water Supply Source Assessment

Step One Application

- 1) Name of proponent: **Ocean Surf Trailer Park C.P. / P.O. Box 5132 Shediac, New Brunswick, Canada, E4P 8T8. Physical Address: 73 Chemin Belliveau Beach Road, Pointe-du-chêne, NB, New Brunswick, Canada E4P 3W2.**

- 2) The proposed water supply is to be used for what purpose? **Ocean Surf Trailer Park is a seasonal trailer park/campground at Parlee Beach, NB. The water supply will provide water for drinking, cooking, washing laundry and other normal residential activities. The park currently has 375 sites and uses 58 m³/day (8.9 igpm) when the park is full during the five busiest weeks of the summer. The average annual consumption is approximately 15 m³/day.**

- 3) Required water quantity (in m³/day): **It is proposed that the park be expanded by 200 new campsites. The additional peak water demand for the expansion is estimated to be approximately 31 m³/day (4.7 igpm), and 8 m³/day on average annually. After the expansion is complete, the total peak demand for the entire park will be approximately 90 m³/day (13.6 igpm), and the total average annual consumption will be approximately 23 m³/d.**

- 4) List alternate water supply sources in area (including municipal systems): **There are no practical alternatives to the proposed groundwater supply. The existing Shediac municipal supply distribution system stops approximately 400 meters away from the**

proposed site. A surface water supply would be unsuitable due to potential contamination issues and in any event, the closest potential source is salt water.

- 5) Outline proposed work schedule: It is proposed that an existing production well (Well M, 119 feet in depth, total water bearing horizon production 50 igpm) which is currently used only to a minor degree would be tested in order to get approval for the expanded water requirements due to the proposed park expansion. An existing well (Well T) will be used as an observation well when the proposed production well is tested, and as backup water supply. Pump testing of the production well would be carried out mid to late September, 2009, contingent on acceptable environmental conditions. During this period usage of the park drops off dramatically. The well (Well M) would be pump tested using the existing pump which has a rated capacity of 75 igpm. The target pump test rate would be determined following step testing of the well. The report would be submitted to New Brunswick Department of the Environment within two weeks of the completion of the pump test. The goal is to obtain project approval prior to the start of the spring construction season, 2010.**

- 6) Discuss area hydrogeology as it relates to the project requirements. The surficial overburden at the site is red sandy till of approximately 0 to 35 meters (0 to 115 feet) in thickness. The overburden is not used for ground water supplies in the area.**

The bedrock in the area is mapped as Pennsylvanian age sedimentary rocks composed of red and grey conglomerate, sandstone, siltstone, and shale, which also forms the local

bedrock aquifer. The bedrock is known to be relatively transmissive (readily conducts the flow of ground water). The bedrock units or layers tend to be lenticular (i.e. of variable lateral extent and thickness) and are thought to have formed as a result of sedimentary particles deposited from flowing water (alluvial deposition). The individual beds average less than 1 meter in thickness; however, the total bedrock unit can be several hundred meters thick. This bedrock aquifer covers a large portion of New Brunswick, stretching from the Fredericton area northeast to Shippigan and southeast to the Shediac area.

Based on common knowledge of the area, the bedrock aquifer has been successfully developed for private residential wells by a number of individuals over the general area. The general conditions found in the aquifer are suitable for water supply development. Local well drillers with knowledge of the area confirmed the potential for water supply development in terms of private wells. The near surface layers of sandstone may be soft and prone to caving in the well annulus resulting in the need for greater casing lengths than might normally be used.

A search of the NBDOE well log database for records located within a 500 meter radius around the proposed development was carried out May 7, 2009 and the search yielded 80 well logs. A summary of the information contained in the well logs is provided in Table 1, immediately below.

Table 1: Summary of hydrogeologic information derived from search of NBDOE well log database.

Well Depth (feet)	Estimated Yield (Igpm)	Depth to Bedrock (feet)	Casing Length (feet)
Average: 98.3	Average: 27.5	Average: 9.1	Average: 59.5
Minimum: 60	Minimum: 5.0	Minimum: 0	Minimum: 20
Maximum: 221	Maximum: 100	Maximum: 115	Maximum: 152

As can be seen from the above information the average well in the area is approximately 100 feet deep with an estimated yield of approximate 27.5 Igpm. As expected in any rock unit the yields are variable with a minimum yield of 5 Igpm being estimated.

A search of the NBDOE well chemistry database for locations in a 500 meter radius around the proposed development was carried out May 7, 2009 and the search yielded 62 chemistry records. The precise locations of the wells from which the ground water chemistry was obtained are not available due to right to privacy considerations for the property owners. These well chemistry analytical results are provided in Table 2, which follows. The average value of the measured result and the Canadian Drinking Water Quality Guideline (CDWQG) are included in the table for the purpose of

comparison. Any parameter which exceeds the Canadian Drinking Water Quality Guideline concentration is bolded and shaded for ease of recognition in the data table.

Out of the 62 chemistry records only two exceeded the CDWQG for chloride and two exceeded the CDWQG for sodium. This is a relatively low percentage for a site adjacent to the ocean and the probability of salt water interference is low.

Out of the 62 chemistry records available, 20 wells had an exceedence of the CDWQG for iron of 0.3 mg/L and 17 wells exceeded the CDWQG concentration for manganese of 0.05 mg/L. The guidelines for iron and/or manganese are based on esthetic considerations, not health. Iron and/or manganese can cause staining of plumbing fixtures and laundry. Iron and/or manganese can usually be readily removed by commercial water softeners at the hardness observed in this water or by filters. The presence of Iron and/or manganese in the groundwater from this aquifer is not uncommon and is commonly the result of natural conditions.

Out of the 62 chemistry results provided, a total of 6 have pH values elevated above the upper bound of 8.5 for the CDWQG. Elevated pH values may lead to encrustation in plumbing systems. The criterion is not related to health.

A total of 38 out of the 62 chemistry records available had elevated turbidity present in the samples. The elevated levels of turbidity may be related to the relative newness of the wells and they may not have had sufficient time, or use, to clear naturally. Most

new wells clear naturally with time and use. At levels in excess of 5 NTUs turbidity may become noticeable to consumers and therefore, objectionable. The turbidity may be the result of elevated concentrations of iron and or manganese or the presence of particulate in the water. In either case, turbidity can be treated by particulate filters.

The observed water chemistries are of acceptable drinking water quality and can be considered to be typical of this bedrock unit. Overall, the review of the inorganic ground water chemistry provided in the NBDOE water quality database for the area did not reveal or indicate significant problems with other water quality parameters.

- 7) Identify any existing pollution or contamination hazards within a (minimum) 500 m radius of the proposed drill targets. If groundwater use problems (quantity or quality) have occurred in the past, then these should be identified. Historical land use that might pose a contamination hazard (i.e. tannery, industrial, disposal, etc.) should also be flagged. A large sewer line crosses the property going to the Shediac Lagoon. The Greater Shediac Sewage Commission is in the process of upgrading the line. Based on a site visit and the existing land use in the area, the potential contamination of ground water resources by previous land uses does not appear to be an issue for the proposed development.**

- 8) Identify any watercourse(s) (stream, brook, river, wetland, etc.) within 30 m of the proposed drill targets. There are no watercourses within 30 m of the proposed test well.**

9) Identify site supervisory personnel involved in the source development (municipal officials, consultants and drillers: **Mr. Doug Craig (Craig Hydrogeologic Inc., 506-659-3064) and Mr. Val LeBlanc, (Eastern Well Drillers, 506 532 9797).**

10) Figure 1 (site plan): **Please See Attached.**

11) Figure 2 (land use/zoning map): **Not Available**

Parameter	ALK_T (mg/L)	Al (mg/L)	As (µg/L)	B (mg/L)	Ba (mg/L)	Br (mg/L)	COND (µSIE/cm)	Ca (mg/L)	Cd (µg/L)	Cl (mg/L)	Cr (µg/L)	Cu (µg/L)	E_coli P/A (P/A)	F (mg/L)	Fe (mg/L)	HARD (mg/L)	K (mg/L)
	139	0.025	1.5	0.01	0.366	0.1	508	62.4	0.5	64.9	19	10	Ab	0.1	0.075	180	1.43
	94.9	0.025	1.5	0.011	0.14	0.1	214	19.3	0.5	9.11	10	10	Ab	0.1	0.123	67.4	1.05
	95.5	0.025	1.5	0.014	0.174	0.1	215	18.5	0.5	6.21	10	10	Ab	0.105	0.026	58.9	1
	68.6	0.025	1.5	0.01	0.196	0.1	183	23.9	0.5	13.5	10	10	Ab	0.1	0.242	68.2	0.74
	77.6	0.025	1.5	0.01	0.265	0.1	3510	6.3	0.5	1070	10	44	Ab	0.1	0.198	26.7	3.08
	72.7	0.025	1.5	0.01	0.435	0.1	256	29.1	0.5	29.3	10	10	Ab	0.1	0.272	87.6	1.77
	98.2	0.025	1.5	0.01	0.204	0.1	213	26.6	0.5	8.92	10	10	Ab	0.157	0.179	95.9	0.9
	83.2	0.025	1.5	0.011	0.169	0.1	240	32.5	0.5	16	10	10	Ab	0.1	0.07	97.1	0.8
	89.6	0.025	2.7	0.01	0.358	0.1	279	29	0.5	28.8	10	10	Ab	0.12	0.034	105	1.4
	36.4	0.025	1.9	0.018	0.059	0.1	118	11	0.5	9	10	78	Ab	0.1	0.016	33.8	0.6
	81.4	0.025	2.1	0.015	0.114	0.1	303	4.55	0.5	43.1	10	10	Ab	0.1	0.119	14.7	0.9
	71.6	0.027	1.5	0.01	0.277	0.1	263	27.9	0.5	26.3	10	10	Ab	0.1	0.147	85.4	1.2
	86.5	0.025	1.5	0.012	0.224	0.148	242	24	0.5	18.7	10	10	Ab	0.155	0.013	83.7	1.1
	67.2	0.025	1.5	0.01	0.263	0.1	240	29.6	0.5	25.1	10	10	Ab	0.107	0.323	84.3	0.6
	93.8	0.025	1.9	0.01	0.265	0.1	235	25.3	0.5	13.1	10	10	Ab	0.141	0.046	91.8	1.2
	38.6	0.025	1.5	0.118	0.068	0.1	193	15.9	0.5	25.6	10	10	Ab	0.1	0.357	55.8	1
	70.6	0.025	1.5	0.013	0.325	0.1	258	29.8	0.5	28.3	10	10	Ab	0.1	0.01	89.1	1
	91	0.025	4	0.01	0.287	0.1	240	28.1	0.5	14.8	10	10	Ab	0.147	0.163	101	1.2
	107	0.025	1.5	0.026	0.516	0.101	480	48.1	0.5	71.2	20	13	Ab	0.1	0.829	165	1.5
	83.2	0.025	1.5	0.01	0.258	0.1	206	23.8	0.5	9.81	10	10	Ab	0.205	0.501	85.8	1.1
	64	0.025	1.9	0.01	0.506	0.1	194	19.9	0.5	13.7	10	10	Ab	0.1	0.695	74.2	2.5
	68.4	0.025	1.5	0.01	0.245	0.1	256	35.2	0.5	30.5	10	10	Ab	0.1	0.19	104	0.9
	67.6	0.025	1.5	0.016	0.245	0.1	251	31.8	0.5	23.5	10	10	Ab	0.1	0.019	98.9	0.7
	97.7	0.025	1.5	0.035	0.393	0.1	566	60.4	0.5	100	10	24	Ab	0.1	0.192	185	1.2
	101	0.025	1.5	0.015	0.094	0.1	1630	9.28	0.5	429	10	10	Ab	0.1	0.344	32.9	1.2
	103	0.025	1.5	0.029	0.401	0.1	463	49.6	0.5	66.9	10	10	Ab	0.1	0.722	153	1.2
	90.5	0.025	1.5	0.012	0.302	0.1	297	42.1	0.5	34.4	10	10	Ab	0.1	0.185	129	0.9
	65.3	0.025	1.5	0.01	0.248	0.1	235	22.4	0.5	24.4	12	10	Ab	0.1	0.223	73	1.6
	101	0.025	1.5	0.038	0.569	0.12	522	53	0.5	88.9	10	10	Ab	0.1	0.065	182	1.4
	107	0.025	1.5	0.012	0.242	0.1	326	42.3	0.5	34.6	10	21	Ab	0.1	0.119	121	1
	94.8	0.025	2.6	0.013	0.295	0.1	439	25.6	0.5	76.8	10	10	Ab	0.136	0.206	90.3	1.4
	84.2	0.061	1.5	0.017	0.144	0.1	251	22	0.5	19.3	10	10	Ab	0.113	0.462	66	1.2
	98.9	0.03	2.5	0.2	0.195	0.1	517	24.7	0.5	99.3	10	10		0.1	0.584	76.9	1.74
	67.6	0.025	1.5	0.01	0.255	0.1	250	33.4	0.5	22.6	10	10	Ab	0.1	0.01	98	0.708
	59.6	0.025	1	0.2	0.121	0.1	253	28.5	0.1	36.2	20	10	Ab	0.1	0.047	82	0.49
	67.6	0.036	2	0.01	0.297		344	13.7	0	56.9	0	0	Ab	0.114	0.855	41.6	1.06
	106	0.025	1	0.01	0.346		248	30	0	10.9	0	0	Ab	0.203	0.04	107.8	1.33
	74.8	0.025	2.7	0.01	0.18	0.1	242	27.5	0.5	24.6	10	11	Ab	0.1	0.212	97.3	1.13
	58.4	0.025	1	0.2	0.079	0.1	198	24.6	0.5	17.4	20	13	Ab	0.1	0.069	72.3	0.68
	64	0.025	1	0.2	0.128	0.1	175	23.7	2.6	12.9	20	13	Ab	0.1	0.031	67.6	0.78
	87.4	0.025	1	0.2	0.222	0.1	217	14.1	0.5	13	10	10	Ab	0.1	0.352	48.8	1.14
	47.3	0.025	1	0.2	0.03	0.1	147	15.7	0.5	8.18	10	18	Ab	0.1	0.05	45.8	0.556
	80.7	0.025	1.7	0.2	0.215	0.1	182	18.5	0.5	5.63	10	10	Ab	0.1	0.247	65.5	0.999
	104	0.025	1	0.2	0.086	0.1	284	40.3	0.5	23.5	10	12	Ab	0.1	0.05	111.7	0.39
	74.2	0.045	1.3	0.2	0.194	0.1	344	13.3	0.5	57.1	10	10	Ab	0.106	0.513	43.1	1.41
	106	0.025	1	0.2	0.079	0.1	1470	10.4	0.5	391	10	10	Ab	0.1	9.82	34.2	1.5
	68.1	0.025	3.87	0.013	0.062	0.174	247	1.49	0.5	30.4	10	10	Ab	0.1	0.371	4.94	0.537
	103	0.025	1.5	0.2	0.442	0.1	313	37.6	0.5	39.5	10	10	Ab	0.109	0.11	129	1.48
	78.6	0.025	4.5	0.01	0.251	0.14	248	27.7	0.5	29.3	10	10	Ab	0.1	0.242	98.9	1.26
	94.3	0.025	2.3	0.01	0.121	0.129	275	17.3	0.5	27.5	10	10	Ab	0.1	0.133	54.8	0.891
	92.7	0.025	1.5	0.011	0.168	0.1	198	21.8	0.5	4.92	10	10	Ab	0.1	0.609	72.3	1.12
	58.4	0.025	1.5	0.01	0.216	0.149	208	25.1	0.5	21.9	10	10	Ab	0.1	0.616	77.1	0.6
	62.7	0.025	1.5	0.01	0.238	0.116	240	25.1	0.5	27.7	10	10	Ab	0.1	0.051	76.6	0.909
	74.5	0.025	1.5	0.01	0.425	0.18	237	25.6	0.5	25.1	10	10	Ab	0.1	0.01	81	2.1
	68.1	0.025	1.5	0.01	0.342	0.1	292	17.7	0.5	42.9	10	10	Ab	0.1	1.07	67.2	2.2
	75.1	0.025	1.5	0.01	0.404	0.1	219	23.3	0.5	16.7	10	10	Ab	0.1	0.248	87.5	1.56
	76.6	0.025	1.5	0.01	0.612	0.159	232	25.4	0.5	20.5	10	10	Ab	0.1	0.1	91	1.68
	66.2	0.025	1.5	0.01	0.117	0.1	224	24.9	0.5	21	10	12	Ab	0.1	0.601	78.9	0.842
	62.8	0.025	1.5	0.01	0.324	0.1	383	43.5	0.5	75.4	10	296	Ab	0.1	6.42	127.1	0.689
	76.6	0.025	1.5	0.01	0.08	0.534	412	7.18	0.5	69.4	10	10	Ab	0.1	1.33	24.3	1.15
	85.5	0.025	1.5	0.01	0.171	1.19	368	20.8	0.5	59.3	10	10	Ab	0.117	3.79	78.2	1.17
	88.7	0.025	1.5	0.017	0.098	0.563	338	7.6	0.5	45.2	10	10	Ab	0.1	0.147	26.8	1.32
Mean	75.8	0.0	1.8	0.011	0.255	0.3	277	22.4	0.5	34.8	10	31		0.1	1.098	74.4	1.25
CDWQG			<10	<5.0	<1.0				<5.0	<250	<50	<1000		<1.5	<0.3		

Parameter	Mg (mg/L)	Mn (mg/L)	NO2 (mg/L)	NO3 (mg/L)	NOX (mg/L)	Na (mg/L)	PH (pH)	Pb (µg/L)	SO4 (mg/L)	Sb (µg/L)	Se (µg/L)	TC-P/A (P/A)	TURB (NTU)	TI (µg/L)	U (µg/L)	Zn (µg/L)	TDS (mg/L)
	5.85	0.02	0.05	3.85	3.9	37.1	7.37	1	10	1	1.8	Ab	0.43	1	0.5	43	283
	4.66	0.048	0.05	0.05	0.05	22.1	8.15	1	7.85	1	1.5	Ab	1.03	1	0.5	7	122
	3.09	0.044	0.05	0.05	0.05	23.7	8.3	1	6.97	1	1.5	Ab	0.13	1	0.5	5	117
	2.09	0.01	0.05	0.29	0.34	9.23	8.02	1	4.98	1	1.5	Pr	6.18	1	0.5	5	97
	2.67	0.018	0.05	0.45	0.5	671	10.1	4.9	10.6	1	3.7	Ab	2.4	1	4.5	68	1813
	3.65	0.026	0.05	1.35	1.4	14.1	8	1.9	8.5	1	1.5	Ab	7.1	1	0.9	6	137
	7.17	0.074	0.05	0.05	0.05	9.11	7.95	1	6.79	1	1.5	Ab	1.47	1	0.5	5	119
	3.89	0.005	0.05	1.7	1.7	8.61	8.12	1	7.56	1	1.5	Ab	0.32	1	0.5	7	127
	8.02	0.005	0.05	0.35	0.4	13.4	8.17	1	8.34	1	1.5	Ab	1.5	1	1.1	5	145
	1.53	0.005	0.05	0.51	0.56	7.93	7.32	6.4	5.92	1	1.5	Ab	1.48	1	0.5	18	61
	0.81	0.005	0.05	0.53	0.58	61.1	8.77	1	9.19	1	1.5	Ab	2.11	1	2.8	5	171
	3.83	0.013	0.05	1.9	2	19.1	8.29	1	7.27	1	2.6	Ab	6.83	1	0.5	6	138
	5.8	0.057	0.05	0.05	0.09	13.3	8.22	1	7.6	1	1.5	Ab	0.27	1	1.1	5	123
	2.51	0.02	0.05	1.2	1.2	10.9	8.13	1	8	1	1.5	Pr	4.67	1	0.5	5	123
	6.98	0.007	0.05	0.05	0.05	11.7	8.17	1	6.68	1	1.5	Ab	0.22	1	0.5	5	122
	3.9	0.049	0.05	0.88	0.93	10.1	7.05	1.2	8.96	1	1.5	Ab	3.1	1	0.5	5	93
	3.58	0.005	0.05	1.5	1.5	15.5	8.15	1	8.7	1	1.5	Ab	0.2	1	0.6	5	136
	7.4	0.057	0.05	0.05	0.05	10.3	8.25	1	7.25	1	1.5	Ab	1.8	1	0.5	5	124
	11	0.063	0.05	2	2	29	8.04	5.3	8.11	1	1.5	Ab	7.5	1	1	33	243
	6.42	0.055	0.05	0.05	0.05	10.2	8.19	3.6	6	1	1.5	Ab	4.3	1	0.5	12	108
	5.94	0.012	0.05	0.6	0.65	9.17	8.2	1	6.98	1	1.5	P	5.2	1	3.8	14	100
	3.97	0.005	0.05	1.4	1.5	10.4	7.92	1	7.47	1	1.5	Ab	1	1.1	0.5	5	137
	4.73	0.005	0.05	0.8	0.85	10	7.75	1	10.6	1	1.5	P	0.2	1	0.5	8	126
	8.22	0.005	0.05	2.8	2.9	35.8	8.09	4.3	9.78	1	1.5	Ab	1.4	1	0.5	74	287
	2.36	0.023	0.05	0.05	0.05	312	9.38	1	7.43	1	1.5	Ab	2.1	1	0.5	5	823
	7.03	0.005	0.05	2.2	2.3	30	8.06	1	8.67	1	1.5	Ab	4.4	1	0.7	8	236
	5.74	0.005	0.05	0.91	0.96	10.9	8.06	1	8.4	1	1.5	Ab	1.5	1	0.5	6	161
	4.13	0.012	0.05	0.56	0.61	17.7	8.28	1	6.65	1	1.5	Ab	0.91	1	1.4	5	119
	12	0.022	0.05	1.7	1.8	32.1	8.01	1	9.88	1	1.5	Ab	0.65	1	1.5	6	266
	3.68	0.061	0.05	0.4	0.45	21.3	8.14	2.2	0.05	1	1.5	Ab	0.55	1	0.5	31	170
	6.4	0.032	0.05	0.05	0.1	63.8	8.25	1	8	1	1.5	Ab	1	1	0.7	7	240
	2.7	0.007	0.05	0.95	1	28.5	8.15	3.6	9.17	1	1.5	Ab	8.6	1	0.8	6	139
	3.7	0.01	0.05	0.66	0.71	76.1	8.34	1.5	7.48	1.8	43.5		6.3	1		26	
	3.57	0.005	0.05	1.49	1.54	10.3	8.12	1	7.41	1	1.5	Ab	0.3	1	0.5	12	126
	2.64	0.01	0.05	0.63	0.68	13.3	6.98	1.1	8.05	1	1	Ab	0.4	1		10	
	1.8	0.016	0.04	2.56	2.6	58.4	8.36	7.1	7.96	0.1		Pr	3.8	0.6		0	
	8	0.106	0	0	0	8.9	8.07	0.9	6.9	0.1		Pr	0.2	0.4		0	
	6.96	0.06	0.05	0.05	0.05	13	7.98	1.1	9.9	1	1.5	Ab	1.11	1	1.1	11	129
	2.63	0.01	0.05	1.65	1.7	9.29	7.96	3.6	6.2	1	1	Ab	0.5	1		10	
	2.05	0.01	0.05	0.17	0.22	8.18	7.05	3.9	4.99	1	1	Ab	0.1	1		10	
	3.3	0.026	0.05	0	0.05	25.8	8.32	1	6.74	1	1	Ab	1.6	1		10	
	1.6	0.01	0.05	0.98	1.03	8.4	7.39	2.2	7.9	1	1.7	Ab	0.3	1		11	
	4.7	0.087	0.05	0	0.05	11.7	8.12	1	6.8	1	1	Ab	1.3	1		13	
	2.7	0.01	0.05	0.16	0.21	11.5	8.11	25.5	7.34	1	1	Ab	0	1		10	
	2.4	0.046	0.05	0	0.05	53.5	8.74	1	10.5	1	1	Pr	4.8	1		70	
	2	0.061	0.05	0	0.05	292	9.29	1	10.1	1	1.7	Pr	7.4	1		10	
	0.293	0.03	0.05	0.36	0.39	56.5	9.12	1	9.94	1	1.52	Ab	7.4	1	0.783	5	142
	8.59	0.443	0.05	0.05	0.05	11.3	7.84	1	6.91	1	1.5	Ab	1.1	1	0.5	20	168
	7.22	0.067	0.05	0.05	0.05	12.1	8.23	1	15.3	1	1.5	Ab	1.1	1	1.34	7.8	141
	2.83	0.034	0.05	0.05	0.05	38.7	8.37	1	8.1	1	4.67	Ab	0.6	1	0.5	11	152
	4.34	0.056	0.05	0.05	0.05	17.7	8.14	1.29	7.15	1	1.5	Ab	3.1	1	0.5	12	114
	3.48	0.029	0.05	0.78	0.78	8.81	8.15	2.48	4.98	1	1.5	Ab	4.7	1	0.5	10	104
	3.39	0.005	0.05	0.94	0.94	15.9	8.14	1.28	11	1	1.5	Ab	0.3	1	0.5	8.4	126
	8.99	0.006	0.05	0.13	0.13	9.3	8.32	1	6.95	1	1.5	Ab	0	1	6.05	19	123
	6.49	0.032	0.05	0.05	0.3	31.1	8.64	1	6.8	1	1.5	Ab	4.7	1	14.4	33	151
	7.11	0.027	0.05	0.81	0.86	7.68	8.3	4.41	7.52	1	1.5	Ab	3.2	1	2.82	56	113
	6.7	0.011	0.05	0.62	0.62	8.65	8.3	1	6.69	1	1.5	Pr	0.7	1	3.87	28	119
	4.06	0.056	0.05	0.6	0.65	11.3	7.96	2.11	7.04	1	1.5	Ab	5	1	0.5	15	113
	4.49	0.083	0.05	1.25	1.3	28.2	8.06	25.4	9.76	1	1.5	Ab	1.6	1	0.5	142	213
	1.54	0.118	0.05	0.05	0.05	72.2	8.54	1	13	1	1.5	Pr	11.2	1	0.5	5.2	212
	6.37	0.179	0.05	0.05	0.05	54.2	8.3	3	6.81	1	1.5	Ab	30.1	1	2	8	204
	1.9	0.03	0.05	0.05	0.05	63.2	8.25	1	12.4	1	1.5	Ab	0.31	1	0.5	12	185
Mean	4.92	0.053	0.05	0.45	0.48	27.35	8.26	3.7	8.32	1.0	1.7		5.0	1	2.5	28	197
CDWQG		<0.05	<10	<10	<10	<200	6.5-8.5	<10	<500				<1.0		<20	<5000	<500

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Work Completed	EstimatedSafe Yield (igpm)	Overall Well Depth (ft)	Bedrock Level (ft)	Casing (ft)
05/21/2003	15	72	0	29.6
08/15/2002	30	115	0	80
07/14/2003	12	110	65	69
09/03/2003	30	160	115	118
08/12/2003	25	81	0	60
09/01/2003	12	80	0	80
10/01/2003	28	120	71	62
10/07/2003	20	81	58	41
05/12/2004	15	81	0	152
05/05/2004	25	201	0	33
06/29/2004	10	81	0	60
07/06/2004	50	81	0	26
07/27/2004	15	81	0	20
11/10/2004	11.5	100	0	40
11/23/2004	15	140	0	102
08/12/2004	12	101	40	40
08/12/2004	10	81	0	25
11/04/2005	35	221	0	116
05/18/2005	25	101	2	40
05/27/2005	25	90	20	60
07/18/2005	11	60	0	27
07/27/2005	7	81	0	40
12/21/2005	9	81	60	30
04/10/2006	35	100	0	44
06/28/2007	70	100	48	63
07/11/2007	60	80	17	50
07/17/2007	17	120	50	60
07/18/2007	17	120	0	63
05/24/2006	40	160	0	120
05/31/2006	20	101	0	40
06/07/2007	10	60	6	2
06/06/2007	5	75	0	20
11/01/2006	5	80	0	20
07/03/2008	40	0	0	120
08/26/2008	14	0	0	104
09/03/2008	70	0	0	40
10/02/2008	35	160	0	40
10/03/2008	35	140	0	100
10/15/2008	15	85	0	80
09/11/2006	15	100	0	60
11/02/2006	50	130	8	40
11/21/2006	40	101	0	60
08/01/2007	70	80	26	66
09/13/2007	10	80	0	34
09/25/2007	50	100	20	80
09/17/2007	60	100	0	20
11/14/2007	20	80	0	33
11/28/2007	60	101	0	40
11/14/2008	70	100	37	20
11/17/2008	13	70	0	55

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06/17/2008	73	130	0	92
05/25/2000	10	105	0	31
09/07/1994	12	80	14	20
01/18/1995	7	120	0	45
09/15/1994	15	85	16	30
11/03/1994	10	105	0	90
08/09/1995	20	140	0	20
05/24/1996	30	65	6	100
06/17/1996	8	65	16	84
09/26/1996	100	85	0	60
11/06/1996	15	65	0	36
11/26/1996	10	120	0	100
06/21/1997	20	65	3	120
10/31/1997	50	140	0	92
06/12/1998	12	125	0	48
05/20/1999	12	85	0	32
05/20/1999	40	64	6	55
06/01/1999	75	120	0	60
06/02/1999	25	160	22	65
04/29/2000	25	120	0	60
05/22/2000	25	65	0	31
05/22/2000	60	80	0	39
05/24/2000	35	104	8	137
10/12/2000	12	100	0	62
10/12/2000	15	100	0	126
10/26/2000	12	100	0	
06/27/2000	8	60	0	
05/18/2001	20	81	0	
06/20/2001	10	160	0	
07/20/2001	12	102	0	
08/16/2001	60	142	0	
AVERAGE (ft)	27.5	98.3	9.1	59.5
MINIMUM (ft)	5.0	60.0	0.0	2.0
MAXIMUM (ft)	100.0	221.0	115.0	152.0