

Wetland Delineation
FOR
Fundy Tidal Power Demonstration Site—
Shore Facility

Cape Sharp
Cumberland County, Nova Scotia

February 23, 2010

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Cape Sharp, Nova Scotia

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INTRODUCTION

Initial botanical assessments were performed on October 2, 2008, June 11, 2009 and August 26, 2009 on a property located on the north shore of the Bay of Fundy, about 7 km southwest of Parrsboro. The site was located at approximately 45° 22' 19" N and 64° 24' 21" W located on the "Parrsboro, Nova Scotia" 21H08, 1:50,000 topographic map. Figure 1 is an aerial view of the study area.

A wetland delineation was subsequently performed on September 20, 2009. The wetland boundaries depicted in this report represent a calculated estimation of the jurisdictional limits within the site, and are subject to modification following a detailed survey. The site is about 2.25 hectares.

The property includes a variety of habitats, including upland softwood forest just south of West Bay Road, leading to an escarpment that drops to a salt marsh (Figure 2) behind a barrier beach. Part of the upland includes cleared fields. There are at least three gullies from the upland that flow into the salt marsh, each braiding out into a high shrub zone (mostly chokecherries (*Prunus virginiana*) and alders (*Alnus spp.*). The first two gullies (on the west side of the site, see Figure 3) are sharply defined with steep walls, much of which are bare of vegetation. The gully to the east is broader, more like a ravine, and the surrounding slopes are less steep, allowing forest cover down to the stream banks.

Existing Site Conditions

The upland softwood forest (Figure 4) was a fairly dense growth of balsam fir (*Abies balsamea*) and white spruce (*Picea glauca*). Below the escarpment, the forest transitioned into an open deciduous/mixed forest with white and yellow birches (*Betula papyrifera* and *Betula Allegheniensis*) and shrubs such as speckled alder (*Alnus incana*) and chokecherry (*Prunus virginiana*).

The two gullies to the west had a similar structure and a similar floristic composition to each other. The sides of these gullies tended to be rocky with occasional cover such as creeping buttercup (*Ranunculus repens*), various ferns, and red raspberry (*Rubus idaeus*). Solitary roseroot plants (*Sedum rosea*) occasionally grew along the banks. The stream in the ravine on the east side was a woodland stream, albeit joining the salt marsh in a similar fashion to the two gullies, through a high shrub zone dominated by speckled alders and occasional chokecherries. The shrub zone for this stream was not

contiguous to that of the two western gullies, but the botanical structure was similar. A small pond (appearing to be man-made) exists on the west side of the ravine, at the end of a woods road.

All water flow on the study site was south to the salt marsh. The salt marsh lies between the upland areas and an exposed barrier stony/gravel beach (Figure 4), and contains a small pond that then exits through a stream to the Bay of Fundy. Typical salt marsh plants such as cord-grasses (*Spartina spp.*) were close to the pond, and above the drift line freshwater species such as cat-tails (*Typha latifolia*) became abundant. The dominant graminoid between the pond and the cat-tails was Chaffy sedge (*Carex palacea*).

According to the *Soils of Cumberland County Nova Scotia* (Report number 17, Nova Scotia Soil Survey 1973), the soil on site is an undulating moderately stony Hebert Series. These soils have “a loose open structure, coarse texture, rapid natural drainage, and consequent problems of droughtiness”. The salt marsh on the site is not identified in this soil survey, but salt marshes are described as “containing fine-textured reddish brown deposits of silty clay loam (are) distributed around the coastline, chiefly in the mouths of creeks and rivers”.

Figure 1. Site and Vicinity. (see Appendix C for the wetland overlay).
The salt marsh pond is left of centre, behind the barrier beach
The image is taken from an aerial photo #04311 125 L-20B (04-06-29).

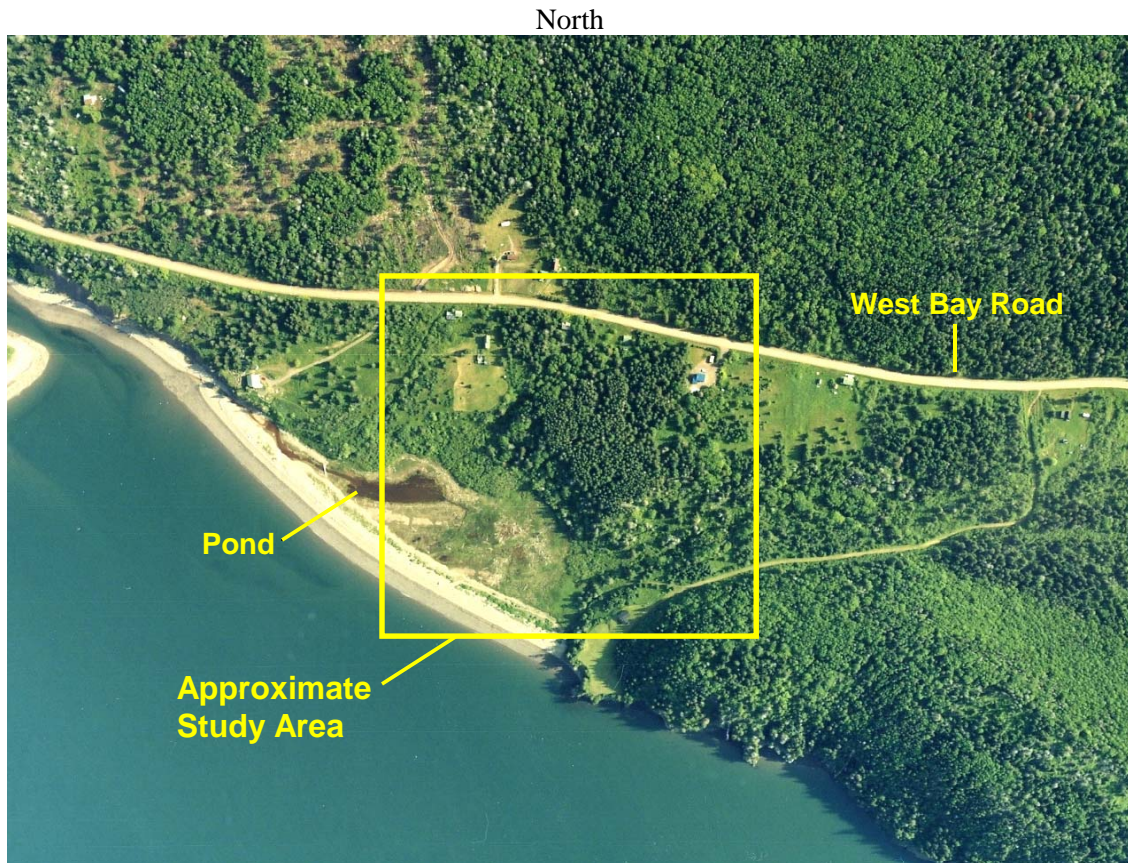


Figure 2: Pond/saltmarsh complex behind the barrier beach. The upland sample site is in the forest above the saltmarsh east of the shrubs.



Figure 3. The central gully, showing the flowing water, the rocky sides, and occasional patches of vegetation. The stream meanders through a shrub zone before joining the salt marsh.



Figure 4. The upland conifer forest between West Bay Road and the escarpment.



Figure 5. The forest below the escarpment becomes mixed, with several hardwood species.



Methods

This wetland delineation was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). Jurisdictional wetland boundaries were delineated through aerial photograph interpretation and single point wetland analysis. Wetland data were recorded on Sample Wetland Delineation Data Sheets (Appendix A). *Munsell Soil Color Charts* (X-Rite Inc. 2000) were used to aid in identifying hydric soils in the field. The *Flora of Nova Scotia* (Zinck 1998) aided with plant nomenclature and identification.

Field wetland botanical surveys were conducted on October 2, 2008 and June 11, 2009 by Marbicon Inc. Botanist Jim Jotcham. This delineation was performed on September 20, 2009. Heather Levy of Envirosphere Inc. assisted. Mr. Jotcham walked throughout the site to determine the location of potentially jurisdictional boundaries within the property. Four single data point locations were sampled to evaluate whether or not the vegetation, hydrology, and soils data supported a determination of wetland or non-wetland status. The location of these data points was recorded with a Garmin XL12 gps receiver capable of sub 5 metre accuracy. Points were averaged to achieve the most accurate reading possible. The estimated boundary was flagged with pink “wetland delineation” tape, each visible from the other, and marked with the gps. These flags and gps locations are listed in Appendix D. The area of wetland was estimated using MapInfo using all marked points.

Jurisdictional Wetlands of Nova Scotia

This report describes wetlands of Nova Scotia that may be regulated by the Nova Scotia Department of Environment in the *Environmental Assessment Regulations, Activities Designation Regulations*, and *Approvals Procedures Regulations*. Specific information is further described in the *Operational Bulletin Respecting Alteration of Wetlands (March 2006)*

“Wetland means land commonly referred to as a marsh, swamp, fen or bog that either periodically or permanently has a water table at, near or above the land’s surface or that is saturated with water, and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation and biological activities adapted to wet conditions.”

This definition for wetlands applies to freshwater environments and salt marshes and is used by the Nova Scotia Department of Environment in delivery of all programs.

Water approvals are required to alter a wetland of any size. Sites larger than 2 ha require an environmental assessment.

The Nova Scotia *Environmental Goals and Sustainable Prosperity Act* specifies that “A policy of preventing net loss of wetlands will be established in the year 2009”. Net loss of wetlands means “net loss of wetland area and function, including habitat”.

Routine Determinations

To be determined a wetland; the following three criteria should be met:

- A majority of dominant vegetation species are wetland associated species;
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season; and
- Hydric soils are present.

Vegetation

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanent or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory 1987). The definition of wetlands includes the phrase " sustains aquatic processes as indicated by the presence of hydric soils, hydrophytic vegetation and biological activities adapted to wet conditions " Hydrophytic vegetation should be the dominant plant type and is characterized by the dominant plant species comprising the plant community (Environmental Laboratory 1987). The "50/20 rule" was used to determine the dominant plant species at each data point location. The rule states that for each stratum in the plant community, dominant species are the most abundant plant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50 percent of the total dominance measure for the stratum, plus any additional species that

individually comprise 20 percent or more of the total dominance measure for the stratum (HQUSACE 1992).

Dominant plant species observed at each data point were then classified according to their indicator status (probability of occurrence in wetlands) (Table 1), in accordance with the U.S. Fish and Wildlife Service's (USFWS) National List of Vascular Plant Species That Occur in Wetlands: NE Region (Region 1) (1996). These indicators are used as this area most closely resembles the flora of Nova Scotia and climate regime. Further relevant information was reviewed in the Flora of Nova Scotia (Zinck 1998). If the majority (greater than 50 percent) of the dominant vegetation on a site are classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC) (excluding FAC-), then the site is considered to be dominated by hydrophytic vegetation.

Table 1. Classification of Wetland-Associated Plant Species¹

<u>Plant Species Classification</u>	<u>Abbreviation²</u>	<u>Probability of Occurring in Wetland</u>
Obligate	OBL	>99%
Facultative Wetland	FACW	66-99%
Facultative	FAC	33-66%
Facultative Upland	FACU	1-33%
Upland	UPL	<1%
No indicator status	NI	Insufficient information to determine status
Plants That Are Not Listed (assumed upland species)	NL	Does not occur in wetlands in any region.

¹ Source: Reed 1988

² A '+' or '-' symbol can be added to the classification to indicate greater or lesser probability, respectively, of occurrence in a wetland.

Soils

A hydric soil is defined as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA-NRCS 2003). Indicators that a hydric soil is present include soil color (gleyed soils and soils with bright mottles and/or low matrix chroma), aquic or preaquic moisture regime, reducing soil conditions, sulfidic material (odor), soils listed on hydric soils list, iron and manganese concretions, organic soils (Histosols), histic epipedon, high organic content in surface layer in sandy soils, and organic streaking in sandy soils.

A soil pit was excavated to a minimum depth of 50 centimeters or depth of refusal at each data point. The soil was then examined for hydric soil indicators. The matrix color and mottle color (if present) of the soil was determined using the *Munsell Soil Color Charts*.

Hydrology

Wetlands, by definition, either periodically or permanently, has a water table at, near or above the land's surface or that is saturated with water. To be classified as a wetland, a site should have at least one primary indicator or two secondary indicators of wetland hydrology. Primary indicators of wetland hydrology may include, but are not limited to: water marks, drift lines, sediment deposition, drainage patterns, visual observation of saturated soils, and visual observation of inundation. In addition to the primary indicators, there is a variety of secondary wetland hydrology indicators. Secondary indicators include, but are not limited to: oxidized root channels in the upper 12 inches, water-stained leaves, and local soil survey data. When no primary indicators of wetland hydrology are observed at a data point, two or more secondary indicators are required to confirm wetland hydrology.

RESULTS

Approximately 2.25 hectares of potentially jurisdictional waters of Nova Scotia have been mapped for this site. This only includes that portion of the salt marsh and steams/gullies within the property boundaries. The routine wetland determination forms are included in Appendix A. A list of plant species observed at the data points is included in Appendix B. Also attached is a complete list of plants observed on the property. A discussion of the wetlands and other waters is presented below, and a wetland delineation map is presented in Appendix C. The delineation GPS points are shown in Appendix D.

Wetlands

The site has 3 wetland habitats, including the salt marsh, the stream flood plains including the outflow through the high shrub zones leading to the salt marsh, and a seepage area behind a cabin by West Bay Road draining westerly into the central gully. A small pond (an aquatic habitat) was noted just west of the eastern stream beside the woodland, at the end of a woods road.

Salt Marsh

A complete list of species observed in the salt marsh is presented in Appendix B. The species within the sample are also presented in Appendix B. The species composition gradually changed from halophytic vegetation by the pond to fresh water species at the upper reaches of the marsh. Hydrophytic vegetation dominated the site.

Wetland hydrology indicators observed on site included water saturation and surface water. The wetland is a depression receiving runoff from adjacent slopes.

The mineral soil matrix color within the wetland soil sample was 10Y 6/1 (greenish grey) to at least 50 cm. This colour was on the Munsell gley chart 1. There was little or no peat accumulation at the sample point. This soil was determined to be hydric (F3 – Depleted matrix).

Stream floodplain / gully – a shrub fen

A complete list of species observed at this site is presented in Appendix B. Hydrophytic vegetation dominated the site.

Wetland hydrology indicators observed on site included water saturation and surface water.

The point of refusal was at the surface – because of running water having removed the lighter particles, the substrate was too stony to allow soil sampling.

No point samples were located in this system because it was sharply delineated by topography.

Seepage area - a fen

A complete list of species observed on site is presented in Appendix B. Hydrophytic vegetation dominated the site.

There were three secondary indicators of wetland hydrology at this location: drainage patterns, geomorphic position, and microtopographic relief. The area was otherwise dry on September 20, 2009.

The topsoil was a 3-inch (7.5 cm organic layer, with a soil matrix color 5YR 3/1 (very dark grey). The mineral soil matrix colour was a 10YR 5/3 (brown) from 3-6 inches (7.5-15 cm), and 10Y 5/1 (greenish grey) at 6-18 inches (15-50 cm). This last colour was on the Munsell gley chart 1. Redox features in this layer were about 10% of the matrix, and these were 5YR 5/8 (yellowish red). This soil was determined to be hydric (F2 – loamy gleyed matrix).

CONCLUSION

Three interconnected wetlands have been identified on the subject property. It is the proponent's responsibility to ensure that all regulatory requirements are met prior to development within this area.

A handwritten signature in cursive script that reads "Jim Jotcham".

Jim Jotcham, February 23, 2010

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LIST OF APPENDICES

Appendix A. Routine Wetland Determination Forms

Appendix B. Vegetation Inventory

Appendix C. Wetland Delineation

Appendix D. Data Point and Boundary Point Locations.

APPENDIX A

Routine Wetland Determination Forms

WETLAND DETERMINATION DATA FORM – NOVA SCOTIA

Project/Site: Cape Sharp Municipality/County: Cumberland Co. Sampling Date: Sep 20/08
 Applicant/Owner: Fundy Ocean Research Centre for Energy Sampling Point: BR-W1
 Investigator(s): Jim Tetcham / Heather Levy Affiliation: Marlucon / EnviroSphere
 Landform (hillslope, terrace, etc.): Salt Marsh Local relief (concave, convex, none): none
 Slope (%): 0 Lat: 45° 22, 271' Long: 64° 24, 216' Datum: NAD 83
 Soil Map Unit Name/Type: _____ Wetland Type: Salt Marsh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _____ (If no, explain in Remarks.)
 Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? NO Are "Normal Circumstances" present? Yes No _____
 Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? NO (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks: (Explain alternative procedures here or in a separate report.)	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>NONE</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>80%</u> (A/B)
1. _____				
2. _____				
3. _____				
4. _____				
5. _____	<u>0</u> = Total Cover			Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
Sapling/Shrub Stratum (Plot size: <u>5 M radius</u>)				
1. <u>White Spruce</u>	<u>5</u>	<u>Y</u>	<u>FACU</u>	
2. _____				
3. _____				
4. _____				
5. _____				
Herb Stratum (Plot size: <u>5 M radius</u>)				
1. <u>Spartina Peet.</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Water Duck</u>	<u>5</u>	<u>N</u>	<u>OBL</u>	
3. <u>Zypha Lat.</u>	<u>10</u>	<u>Y</u>	<u>OBL</u>	
4. <u>Aster Nov-belgic</u>	<u>10</u>	<u>Y</u>	<u>FACW+</u>	
5. <u>Poly sagit.</u>	<u>2</u>	<u>N</u>	<u>OBL</u>	
6. <u>Carex palacea</u>	<u>10</u>	<u>Y</u>	<u>OBL</u>	
7. <u>Tris ver.</u>	<u>2</u>	<u>N</u>	<u>OBL</u>	
8. <u>Dead leaves, driftwood, water</u>	<u>50%</u>			
9. _____				
10. _____				
<u>plants = 59</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>NONE</u>)				
1. _____				
2. _____				
_____ = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____				
Remarks: (Include photo numbers here or on a separate sheet.)				
<u>Upper reaches of Salt marsh by the woods</u>				

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

SOIL

(Salt Marsh)

Sampling Point: BR-W1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-50cm	10Y 6/1	100	none				Clayey	Saturated

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"/> Stripped Matrix (S6)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Sandy Redox (S5)	

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)
<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: NONE

Depth (inches):

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Fauna (B13)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Thin Muck Surface (C7)
	<input type="checkbox"/> Other (Explain in Remarks)
	<input type="checkbox"/> Stunted or Stressed Plants (D1)
	<input type="checkbox"/> Geomorphic Position (D2)
	<input type="checkbox"/> Shallow Aquitard (D3)
	<input type="checkbox"/> Microtopographic Relief (D4)
	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No Depth (inches):

Water Table Present? Yes No Depth (inches):

Saturation Present? (includes capillary fringe) Yes No Depth (inches):

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

wet !

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

WETLAND DETERMINATION DATA FORM – NOVA SCOTIA

Project/Site: Cape Sharp Municipality/County: Cumberland Co. Sampling Date: Sept 20/
 Applicant/Owner: Fundy Ocean Research Centre for Energy Sampling Point: BR-441
 Investigator(s): Jim Totchan / Heather Levy Affiliation: Marbicon / Envirospere
 Landform (hillslope, terrace, etc.): hillslope / terrace Local relief (concave, convex, none): slope
 Slope (%): 5-10 Lat: 45° 22.277' Long: 64° 24.212 Datum: NAD 83
 Soil Map Unit Name/Type: (TBD) Wetland Type: NONE

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? } NO Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? } (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <p align="center"><u>(above salt marsh.)</u></p>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m mdia</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>FIR</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B)
2. <u>Mtu Ash</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
3. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>—</u> x 1 = <u>—</u> FACW species <u>60</u> x 2 = <u>120</u> FAC species <u>34</u> x 3 = <u>102</u> FACU species <u>12</u> x 4 = <u>48</u> UPL species <u>115</u> x 5 = <u>575</u> Column Totals: <u>221</u> (A) <u>845</u> (B) Prevalence Index = B/A = <u>3.8</u>
4. _____				
5. _____				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <u>NO</u> <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <u>NO</u> <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)				
1. <u>W. Spruce</u>	<u>1</u>	<u>N</u>	<u>FACU</u>	¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Spec. Alder</u>	<u>60</u>	<u>Y</u>	<u>FACW</u>	
3. <u>Mtu Ash</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
4. _____				
5. _____				Remarks: (Include photo numbers here or on a separate sheet.)
Herb Stratum (Plot size: <u>5 m</u>)				
1. <u>Hay-scented fern</u>	<u>60</u>	<u>Y</u>	<u>NL</u>	
2. <u>Aster acun.</u>	<u>5</u>	<u>N</u>	<u>NL</u>	
3. <u>Bunchberry</u>	<u>2</u>	<u>N</u>	<u>FAC-</u>	
4. <u>Aralia nud.</u>	<u>1</u>	<u>N</u>	<u>FACU</u>	
5. <u>Sol. megasa</u>	<u>1</u>	<u>N</u>	<u>FAC</u>	
6. <u>Oxalis - yellow</u>	<u>50</u>	<u>Y</u>	<u>UPL</u>	
7. <u>Raspberry</u>	<u>1</u>	<u>N</u>	<u>FAC-</u>	
8. _____				
9. _____				
10. _____				
Woody Vine Stratum (Plot size: <u>NONE</u>)				
1. _____				
2. _____				
_____ = Total Cover				

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

BR-U1

Sampling Point: Sep 20/09

SOIL

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2"	2 YR	2.5/2	none				coarse	(~ talus slope)
2-12"	5 YR	3/3	none				coarse	
12"	Rocky / refusal							

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

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Depleted Dark Surface (F7)
- Sandy Redox (S5)

- Stripped Matrix (S6)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Mucky Mineral (F1)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Redox Depressions (F8)
- Red Parent Material (TF2)

Indicators for Problematic Hydric Soils³:

- Sandy Gleyed Matrix (S4)
- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: stones / talus
 Depth (inches): ~ 3" plus.

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

NONE

Secondary Indicators (minimum of two required)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)
- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? Yes No Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

WETLAND DETERMINATION DATA FORM – NOVA SCOTIA

Project/Site: Cape Sharp Municipality/County: Cumberland Co Sampling Date: Sep 20/09
 Applicant/Owner: Fundy Ocean Research Centre for Energy Sampling Point: BR W2
 Investigator(s): Jim Tetcham/Heather Levy Affiliation: Marbecan / EnviroSphere
 Landform (hillslope, terrace, etc.): linear depression Local relief (concave, convex, none): concave
 Slope (%): 2 Lat: 45° 22.357' Long: 64° 24.196' Datum: NAD 83
 Soil Map Unit Name/Type: (TAB) Wetland Type: Intermittent Stream

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? no Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, optional Wetland Site ID: _____
Remarks: (Explain alternative procedures here or in a separate report.) <u>Seepage area; drains to gully; probably very wet in spring (?). Dry in Sep 20/09.</u>	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10m radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>White Spruce</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>60%</u> (A/B)
2. <u>Balsam Fir</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	
3. <u>White Birch</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				Hydrophytic Vegetation Indicators: ___ Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% ___ Prevalence Index is ≤3.0 ¹ ___ Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				
_____ = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)
Small linear feature surrounded by upland.

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

SOIL

Sep 26/09

Sampling Point: BRW2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3"	5YR 3/1						organic	
3-6"	10YR 5/3						loam	
6-18"	10YR 5/1		5YR 5/8	100			loam	

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

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Depleted Dark Surface (F7)
- Sandy Redox (S5)

- Stripped Matrix (S6)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Mucky Mineral (F1)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Redox Depressions (F8)
- Red Parent Material (TF2)

Indicators for Problematic Hydric Soils³:

- Sandy Gleyed Matrix (S4)
- Coast Prairie Redox (A16)
- 5 cm Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: NONE
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)

- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes No Depth (inches): _____
 Water Table Present? Yes No Depth (inches): _____
 Saturation Present? (includes capillary fringe) Yes No Depth (inches): _____

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

linear depression clearly draining to gully.

WETLAND DETERMINATION DATA FORM – NOVA SCOTIA

Project/Site: Cape Sharp Municipality/County: Cumberland Co. Sampling Date: Sep 20/08
 Applicant/Owner: Fundy Ocean Research Centre for Energy Sampling Point: BR-U2
 Investigator(s): Tina Totcham / Heather Levy Affiliation: Marlucon / EnviroSphere
 Landform (hillslope, terrace, etc.): none Local relief (concave, convex, none): flat/none
 Slope (%): none Lat: 45° 22.347' Long: 64° 24.194' Datum: NAD 83
 Soil Map Unit Name/Type: (TAB) Wetland Type: none
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? No Are "Normal Circumstances" present? Yes No
 Are Vegetation , Soil , or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: (Explain alternative procedures here or in a separate report.)	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>40%</u> (A/B)
1. <u>W. Spruce</u>	<u>50</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Bal. fir</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
3. <u>Paper birch</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
4. _____				
5. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species <u>—</u> x 1 = <u>—</u> FACW species <u>5</u> x 2 = <u>10</u> FAC species <u>42</u> x 3 = <u>126</u> FACU species <u>91</u> x 4 = <u>364</u> UPL species <u>45</u> x 5 = <u>225</u> Column Totals: <u>183</u> (A) <u>725</u> (B) Prevalence Index = B/A = <u>3.96</u>
= Total Cover <u>60</u>				
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Spec. Alder</u>	<u>5</u>	<u>Y</u>	<u>FACW</u>	
2. _____				
3. _____				
4. _____				
5. _____				
= Total Cover <u>5</u>				
Herb Stratum (Plot size: <u>5 m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Spin. Wood fern</u>	<u>35</u>	<u>Y</u>	<u>FAC+</u>	
2. <u>Aralia nud.</u>	<u>35</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Hair grass</u>	<u>35</u>	<u>Y</u>	<u>NL</u>	
4. <u>Aster acu.</u>	<u>10</u>	<u>N</u>	<u>NL</u>	
5. <u>Mtn Ash</u>	<u>1</u>	<u>N</u>	<u>FACU</u>	
6. <u>Sol rug.</u>	<u>2</u>	<u>N</u>	<u>FAC</u>	
7. _____				
8. _____				
9. _____				
10. _____				
= Total Cover <u>118</u>				
Woody Vine Stratum (Plot size: <u>none</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				
2. _____				
= Total Cover <u>0</u>				
Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks: (Include photo numbers here or on a separate sheet.) <u>Adjacent to seepage area.</u>				

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

SOIL

Sep 20/09 Sampling Point: BR-U2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3"	2.5 YR 3/2		NONE				lean	
3"-9"	5 YR 4/6		NONE				"	
9"	refusal / rock / ledge (?)							

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

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9)	<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Red Parent Material (TF2)		
<input type="checkbox"/> Sandy Redox (S5)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
 Type: rocky
 Depth (inches): 9"

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: <u>NONE</u>		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required; check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Marl Deposits (B15)	<input type="checkbox"/> Moss Trim Lines (B16)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Microtopographic Relief (D4)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		<input type="checkbox"/> FAC-Neutral Test (D5)	

Field Observations:

Surface Water Present? Yes No Depth (inches): _____

Water Table Present? Yes No Depth (inches): _____

Saturation Present? Yes No Depth (inches): _____
 (includes capillary fringe)

Wetland Hydrology Present? Yes No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

APPENDIX B

Vegetation Inventory

Wetland Indicator Categories (USAC 1987):

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.
NA	No agreement	The regional panel was not able to reach a unanimous decision on this species.
NI	No indicator	Insufficient information was available to determine an indicator status.
NO	No occurrence	The species does not occur in that region.

(NL = species not listed)

Plant Species Observed at Data Point Locations:

Sample Pair 1 = salt marsh boundary

<u>Scientific Name</u>	<u>Common Name</u>	<u>Wetland Indicator</u>	<u>% Cover</u>	
BR-U1 (= Upland 1, slope above salt marsh)				
<i>Abies balsamea</i>	Balsam Fir	FAC	30%	Tree
<i>Sorbus americana</i>	American mountain ash	FACU	5%	Tree
<i>Alnus incana</i>	Speckled alder	FACW	60%	Shrub
<i>Sorbus americana</i>	American White Ash	FACU	5%	Shrub
<i>Picea glauca</i>	White spruce	FACU	1%	Shrub
<i>Dennstaedtia punctilobula</i>	Hay-scented fern	NL	60%	Herb
<i>Oxalis stricta</i>	Upright yellow wood sorrel	UPL	50%	Herb
<i>Solidago rugosa</i>	Rough-leaf goldenrod	FAC	30%	Herb
<i>Rubus idaeus</i>	Red raspberry	FAC-	20%	Herb
<i>Aster acuminatus</i>	Whorled aster	NL	5%	Herb
<i>Cornus canadensis</i>	Dwarf dogwood	FAC-	2%	Herb
<i>Aralia nudicaulis</i>	Wild sarsaparilla	FACU	1%	Herb

BR-W1 (= Wetland 1, salt marsh)

<i>Picea glauca</i>	White spruce	FACU	5%	Shrub
<i>Spartina pectinata</i>	Cord grass	OBL	20%	Herb
<i>Typha latifolia</i>	Broad-leaved cattail	OBL	10%	Herb
<i>Aster novi-belgii</i>	New Belgium american aster	FACW+	10%	Herb
<i>Carex palacea</i>	Chaffy sedge	OBL	10%	Herb
<i>Rumex orbiculatus</i>	Water dock	OBL	5%	Herb
<i>Polygonum sagittatum</i>	Arrow-leaved tear-thumb	OBL	2 %	Herb
<i>Iris versicolor</i>	Blue flag	OBL	2 %	Herb

Sample Pair 2 = wet seepage area behind cabin draining westerly to the central gully

<u>Scientific Name</u>	<u>Common Name</u>	<u>Wetland Indicator</u>	<u>% Cover</u>	
BR-U2 (= Upland 2, upland forest)				
<i>Abies balsamea</i>	Balsam Fir	FAC	50%	Tree
<i>Betula papyrifera</i>	Paper birch	FACU	5%	Tree
<i>Picea glauca</i>	White spruce	FACU	5%	Tree
<i>Alnus incana</i>	Speckled alder	FACW	5%	Shrub
<i>Dryopteris carthusiana</i>	Spinulose shield fern	FAC+	35%	Herb
<i>Aralia nudicaulis</i>	Wild sarsaparilla	FACU	35%	Herb
<i>Aster acuminatus</i>	Whorled aster	NL	10%	Herb
<i>Sorbus americana</i>	American mountain ash	FACU	1%	Herb
<i>Solidago rugosa</i>	Rough-leaf goldenrod	FAC	2%	Herb
<i>Deschampsia flexuosa</i>	Crinkled hairgrass	NL	35%	Herb

BR-W2 (= Wetland 2, seepage area draining west to gully)

<i>Picea glauca</i>	White spruce	FACU	30%	Tree
<i>Abies balsamea</i>	Balsam Fir	FAC	20%	Tree
<i>Betula papyrifera</i>	Paper birch	FACU	5%	Tree
<i>Sambucus racemosa</i>	Red Elderberry	FACU	5%	Shrub
<i>Osmunda cinnamomea</i>	Cinnamon fern	FACW	20%	Herb
<i>Spinulose shield fern</i>	<i>Dryopteris carthusiana</i>	FAC+	20%	Herb
<i>Solidago rugosa</i>	Rough-leaf goldenrod	FAC	5%	Herb
<i>Maianthemum canadense</i>	Wild Lily-of-the-valley	FAC-	2%	Herb

Site vegetation inventory surveyed October 2, 2008, June 11, 2009, and September 20, 2009.

Scientific names are from Zinck (1998). Synonyms are in brackets.

- S-ranks** are:
- S4 Usually widespread, fairly common throughout its range in the province, and apparently secure with many occurrences, but the Element is of long-term concern (e.g. watch list). (100+ occurrences).
 - S5 Demonstrably widespread, abundant, and secure throughout its range in the province, and essentially ineradicable under present conditions.
 - SE Exotic: An exotic established in the province

NSDNR ranks are restricted to native species:

- Red = known to be, or that is thought to be at risk.
- Yellow = sensitive to human activities or natural events.
- Green = not believed to be sensitive or at risk.

Wetland Indicator status is described above (Appendix B).

Common Name	Binomial	Sub-national		
		Rank (ACCDC)	NSDNR Rank	Wetland Indicator
Plant species found on the exposed gravel barrier beach (and directly behind the crest):				
Pearly everlasting	<i>Anaphalis margaritacea</i>	S5	Green	NL
Small white aster	<i>Aster (Symphyotrichum) lateriflorus</i>	S5	Green	FACW-
Rough aster	<i>Aster (Symphyotrichum) puniceus</i>	S5	Green	OBL
Parasol white-top	<i>Aster (Doellingeria) umbellatus</i>	S5	Green	FACW
American sea-rocket	<i>Cakile edentula</i>	S5	Green	FACU
Wild morning-glory	<i>Calystegia sepium</i>	S5	Green	FAC-
Ox-eye daisy	<i>Chrysanthemum leucanthemum</i>	SE	--	NL
Bull thistle	<i>Cirsium vulgare</i>	SE	--	FACU-
American dune grass	<i>Elymus (Leymus) mollis</i>	S5	Green	FACU-
Common eyebright	<i>Euphrasia officinalis (nemorosa)</i>	S5SE	Green	NL
Strawberry	<i>Fragaria virginiana</i>	S5	Green	FACU
Hemp-nettle	<i>Galeopsis tetrahit</i>	SE	--	NL
Mouse-eared hawkweed	<i>Hieracium pilosella</i>	SE	--	NL
Hawkweed	<i>Hieracium piloselloides</i>	SE	--	NL
Sea-beach sandwort	<i>Honckenya peploides</i>	S5	Green	FACU
Beach pea	<i>Lathyrus maritimus (japonicus)</i>	S5	Green	FACU-
Fall dandelion	<i>Leontodon autumnalis</i>	SE	--	NL
Scotch lovage	<i>Ligusticum scothicum</i>	S5	Green	FAC
Sea lavender	<i>Limonium carolinianum</i>	S5	Green	OBL
Butter-and-eggs	<i>Linaria vulgaris</i>	SE	--	NL
Mayweed	<i>Matricaria maritima</i>	SE	--	UPL
Evening primrose	<i>Oenothera biennis</i>	S5	Green	FACU-

White spruce	<i>Picea glauca</i>	S5	Green	FACU
Seashore plantain	<i>Plantago maritima</i>	S5	Green	FACW
Fowler knotweed	<i>Polygonum fowleri</i>	S5	Green	NL
Chokecherry	<i>Prunus virginiana</i>	S5	Green	FACU
Gooseberry	<i>Ribes hirtellum</i>	S5	Green	FAC
Multiflora rose	<i>Rosa rugosa</i>	SE	--	FACU-
Common wild rose	<i>Rosa virginiana</i>	S5	Green	FAC
Raspberry	<i>Rubus idaeus</i>	S5	Green	FAC-
Common groundsel	<i>Senecio vulgaris</i>	SE	--	FACU
White goldenrod	<i>Solidago bicolor</i>	S5	Green	NL
Perennial sow-thistle	<i>Sonchus arvensis</i>	SE	--	UPL
Cord grass	<i>Spartina alterniflora</i>	S5	Green	OBL
Salt hay	<i>Spartina patens</i>	S5	Green	OBL
Cord grass	<i>Spartina pectinata</i>	S5	Green	OBL

Plant species found in the saltmarsh zone:

Orach	<i>Atriplex prostrata</i>	S5	Green	NL
Chaffy sedge	<i>Carex paleacea</i>	S5	Green	OBL
Spikegrass	<i>Distichlis spicata</i>	S4	Green	FACW+
Soft rush	<i>Juncus effusus</i>	S5	Green	FACW+
Black-grass rush	<i>Juncus gerardii</i>	S5	Green	FACW+
Sea lavender	<i>Limonium carolinianum</i>	S5	Green	OBL
Seashore plantain	<i>Plantago maritima</i>	S5	Green	FACW
American alkali grass	<i>Puccinellia americana</i>	S4S5	Green	OBL
Holy grass	<i>Hierochloe odorata</i>	S4S5	Green	FACW
Water dock	<i>Rumex orbiculatus</i>	S5	Green	OBL
Glasswort	<i>Salicornia europaea</i>	S5	Green	OBL
Saltmarsh bulrush	<i>Schoenoplectus maritimus</i>	S4S5	Green	OBL
Seaside goldenrod	<i>Solidago sempervirens</i>	S5	Green	FACW
Large bur-reed	<i>Sparganium eurycarpum</i>	S4	Green	OBL
Cord grass	<i>Spartina alterniflora</i>	S5	Green	OBL
Salt hay	<i>Spartina patens</i>	S5	Green	OBL
Cord grass	<i>Spartina pectinata</i>	S5	Green	OBL
Sea-blite	<i>Suaeda maritima</i>	S5SE	Green	OBL
Arrow-grass	<i>Triglochin maritima</i>	S5	Green	OBL
Cat-tail, broad-leaved	<i>Typha latifolia</i>	S5	Green	OBL

(found above the drift line)

Plant species found along the forest/saltmarsh edge northeast of the pond:

Balsam fir	<i>Abies balsamea</i>	S5	Green	FAC
Green alder	<i>Alnus viridis</i>	S5	Green	FAC

New Belgium american aster	<i>Aster (Symphyotrichum) novi-belgii</i>	S5	Green	FACW+
Blue-joint reedgrass	<i>Calamagrostis canadensis</i>	S5	Green	FACW+
Rough bedstraw	<i>Galium asprellum</i>	S5	Green	OBL
White spruce	<i>Picea glauca</i>	S5	Green	FACU
Arrow-leaved tear-thumb	<i>Polygonum sagittatum</i>	S5	Green	OBL
Trembling poplar	<i>Populus tremuloides</i>	S5	Green	NL
Creeping buttercup	<i>Ranunculus repens</i>	SE	--	FAC
Raspberry	<i>Rubus idaeus</i>	S5	Green	FAC-
American mountain-ash	<i>Sorbus americana</i>	S5	Green	FACU

Plant species found along the shrub/saltmarsh edge west of the forest edge:

Speckled alder	<i>Alnus incana</i>	S5	Green	FACW
Green alder	<i>Alnus viridis</i>	S5	Green	FAC
Sweet vernal grass	<i>Anthoxanthum odoratum</i>	SE	--	FACU
Sandwort	<i>Arenaria lateriflora</i>	S5	Green	FAC
Fringed sedge	<i>Carex crinita</i>	S4S5	Green	OBL
Shallow sedge	<i>Carex lurida</i>	S5	Green	OBL
Stalk-grain sedge	<i>Carex stipata</i>	S5	Green	NL
Water horsetail	<i>Equisetum fluviatile</i>	S5	Green	OBL
Narrow-leaved goldenrod	<i>Euthamia graminifolia</i>	S5	Green	FAC
Northern manna-grass	<i>Glyceria X laxa</i>	S4?	Green	NL
Blue flag	<i>Iris versicolor</i>	S5	Green	OBL
Japanese knotweed	<i>Polygonum cuspidatum</i>	SE	--	FACU-
Lady's-thumb	<i>Polygonum persicaria</i>	SE	--	FACW
Creeping buttercup	<i>Ranunculus repens</i>	SE	--	FAC
Cottongrass bulrush	<i>Scirpus cyperinus</i>	S5	Green	FACW+
Hemlock water-parsnip	<i>Sium suave</i>	S5	Green	OBL
Canada goldenrod	<i>Solidago canadensis</i>	S5	Green	FACU
Rough-leaf goldenrod	<i>Solidago rugosa</i>	S5	Green	FAC
Meadow-rue	<i>Thalictrum pubescens</i>	S5	Green	FACW+
Coltsfoot	<i>Tussilago farfara</i>	SE	--	FACU
Cat-tail, broad-leaved	<i>Typha latifolia</i>	S5	Green	OBL
Tufted vetch	<i>Vicia cracca</i>	SE	--	NL

Plant species found in the shrub zone (including on the escarpment):

Red maple	<i>Acer rubrum</i>	S5	Green	FAC
Speckled alder	<i>Alnus incana</i>	S5	Green	FACW
Green alder	<i>Alnus viridis</i>	S5	Green	FAC
Meadow foxtail	<i>Alopecurus pratensis</i>	SE	--	FACW
Parasol white-top	<i>Aster (Doellingeria) umbellatus</i>	S5	Green	FACW
Yellow sedge	<i>Carex flava</i>	S5	Green	OBL

Graceful sedge	<i>Carex gracillima</i>	S4S5	Green	FACU
Strawberry	<i>Fragaria virginiana</i>	S5	Green	FACU
Hemp-nettle	<i>Galeopsis tetrahit</i>	SE	--	NL
Apple	<i>Malus pumila</i>	SE	--	NL
Sensitive fern	<i>Onoclea sensibilis</i>	S5	Green	FACW
White spruce	<i>Picea glauca</i>	S5	Green	FACU
Arrow-leaved tearthumb	<i>Polygonum sagittatum</i>	S5	Green	OBL
Chokecherry	<i>Prunus virginiana</i>	S5	Green	FACU
Common wild rose	<i>Rosa virginiana</i>	S5	Green	FAC
Common blackberry	<i>Rubus allegheniensis</i>	S5	Green	FACU-
Red raspberry	<i>Rubus idaeus</i>	S5	Green	FAC-
Sheep sorrel	<i>Rumex acetosella</i>	SE	--	UPL
Rough-leaf goldenrod	<i>Solidago rugosa</i>	S5	Green	FAC
Little starwort	<i>Stellaria graminea</i>	SE	--	FACU-
Meadow-rue	<i>Thalictrum pubescens</i>	S5	Green	FACW+
Red Clover	<i>Trifolium pratense</i>	SE	--	FACU-
Gypsy-weed	<i>Veronica officinalis</i>	S5SE	--	FACU-
Possum-haw viburnum	<i>Viburnum nudum</i>	S5	Green	FACW

Plant species found in the old field above the escarpment):

Yarrow	<i>Achillea millefolium</i>	S5	Green	FACU
Speckled alder	<i>Alnus incana</i>	S5	Green	FACW
Green alder	<i>Alnus viridis</i>	S5	Green	FAC
Meadow foxtail	<i>Alopecurus pratensis</i>	SE	--	FACW
New York aster	<i>Aster (Symphyotrichum) novi-belgii</i>	S5	Green	FACW+
Hedge bindweed	<i>Calystegia sepium</i>	S5	Green	FAC-
Fringed sedge	<i>Carex crinita</i>	S4S5	Green	OBL
Yellow sedge	<i>Carex flava</i>	S5	Green	OBL
Marsh straw sedge	<i>Carex hormathodes</i>	S4S5	Green	OBL
Pale sedge	<i>Carex pallescens</i>	S5	Green	NL
Pointed broom sedge	<i>Carex scoparia</i>	S5	Green	FACW
Poverty oat-grass	<i>Danthonia spicata</i>	S5	Green	NL
Parasol white-top	<i>Doellingeria umbellata</i>	S5	Green	FACW
Quack-grass	<i>Elymus repens</i>	SE	--	FACU-
Wild mock-cucumber	<i>Echinocystis lobata</i>	SE	--	FAC
Fireweed	<i>Epilobium angustifolium</i>	S5	Green	FAC
Hairy willow-herb	<i>Epilobium ciliatum</i>	S5	Green	FAC-
Woodland horsetail	<i>Equisetum sylvaticum</i>	S5	Green	FACW
Narrow-leaved goldenrod	<i>Euthamia graminifolia</i>	S5	Green	FAC
Hair fescue	<i>Festuca filiformis</i>	SE	--	NL
Red fescue	<i>Festuca rubra</i>	S5	Green	FACU

Strawberry	<i>Fragaria virginiana</i>	S5	Green	FACU
Brittle-stem hemp nettle	<i>Galeopsis tetrahit</i>	SE	--	NL
Fowl manna-grass	<i>Glyceria striata</i>	S5	Green	OBL
Orange day-lily	<i>Hemerocallis fulva</i>	SE	--	NL
Mouse-eared hawkweed	<i>Hieracium pilosella</i>	SE	--	NL
Hawkweed	<i>Hieracium piloselloides</i>	SE	--	NL
Common bluets	<i>Houstonia (Hedyotis) caerulea</i>	S5	Green	FACU
Spotted jewel-weed	<i>Impatiens capensis</i>	S5	Green	FACW
Blue flag	<i>Iris versicolor</i>	S5	Green	OBL
Soft rush	<i>Juncus effusus</i>	S5	Green	FACW+
Ground juniper	<i>Juniperus communis</i>	S5	Green	NL
Hairy woodrush	<i>Luzula acuminata</i>	S5	Green	FAC
Apple	<i>Malus pumila</i>	SE	--	NL
Musk cheeseweed	<i>Malva moschata</i>	SE	--	NL
Sensitive fern	<i>Onoclea sensibilis</i>	S5	Green	FACW
Timothy	<i>Phleum pratense</i>	SE	--	FACU
Kentucky bluegrass	<i>Poa pratensis</i>	S5	Green	FACU
Arrow-leaved tearthumb	<i>Polygonum sagittatum</i>	S5	Green	OBL
Tall buttercup	<i>Ranunculus acris</i>	SE	--	FAC+
Creeping buttercup	<i>Ranunculus repens</i>	SE	--	FAC
Smooth gooseberry	<i>Ribes hirtellum</i>	S5	Green	FAC
Common wild rose	<i>Rosa virginiana</i>	S5	Green	FAC
Common blackberry	<i>Rubus allegheniensis</i>	S5	Green	FACU-
Bristly Dewberry	<i>Rubus hispidus</i>	S5	Green	FACW
Raspberry	<i>Rubus idaeus</i>	S5	Green	FAC-
Bulrush	<i>Scirpus atrocinctus</i>	S5	Green	FACW+
Rough-leaf goldenrod	<i>Solidago rugosa</i>	S5	Green	FAC
Narrow-leaved meadowsweet	<i>Spiraea alba</i>	S5	Green	FACW+
Rabbit-foot clover	<i>Trifolium arvense</i>	SE	--	NL
Red Clover	<i>Trifolium pratense</i>	SE	--	FACU-
Possum-haw viburnum	<i>Viburnum nudum</i>	S5	Green	FACW
Tufted vetch	<i>Vicia cracca</i>	SE	--	NL

Plant species found in the east forest zone:

Balsam fir	<i>Abies balsamea</i>	S5	Green	FAC
Red Maple	<i>Acer rubrum</i>	S5	Green	FAC
Speckled alder	<i>Alnus incana</i>	S5	Green	FACW
Green alder	<i>Alnus viridis</i>	S5	Green	FAC
Wild sarsaparilla	<i>Aralia nudicaulis</i>	S5	Green	FACU
Whorled aster	<i>Aster (Oclemena) acuminatus</i>	S5	Green	NL
Yellow birch	<i>Betula allegheniensis</i>	S5	Green	FAC

Paper birch	<i>Betula papyrifera</i>	S5	Green	FACU
Softleaf sedge	<i>Carex disperma</i>	S5	Green	FACW+
Graceful sedge	<i>Carex gracillima</i>	S4S5	Green	FACU
Bladder sedge	<i>Carex intumescens</i>	S5	Green	FACW+
Alternate-leaf dogwood	<i>Cornus alternifolia</i>	S5	Green	NL
Dwarf dogwood	<i>Cornus canadensis</i>	S5	Green	FAC-
Poverty oat-grass	<i>Danthonia spicata</i>	S5	Green	NL
Eastern hay-scented fern	<i>Dennstaedtia punctilobula</i>	S5	Green	NL
Crinkled hairgrass	<i>Deschampsia flexuosa</i>	S5	Green	NL
Spinulose shield fern	<i>Dryopteris carthusiana</i>	S5	Green	FAC+
Strawberry	<i>Fragaria virginiana</i>	S5	Green	FACU
Brittle-stem hempnettle	<i>Galeopsis tetrahit</i>	SE	--	NL
Rough bedstraw	<i>Galium asprellum</i>	S5	Green	OBL
Common bluets	<i>Houstonia (Hedyotis) caerulea</i>	S5	Green	FACU
American fly honeysuckle	<i>Lonicera canadensis</i>	S5	Green	FACU
Wild Lily-of-the-valley	<i>Maianthemum canadense</i>	S5	Green	FAC-
Common apple	<i>Malus pumila</i>	SE	--	NL
Indian-pipe	<i>Monotropa uniflora</i>	S5	Green	FACU-
Interrupted fern	<i>Osmunda claytoniana</i>	S5	Green	FAC
Cinnamon fern	<i>Osmunda cinnamomea</i>	S5	Green	FACW
Upright yellow wood sorrel	<i>Oxalis stricta</i>	S5	Green	UPL
Timothy	<i>Phleum pratense</i>	SE	--	FACU
White spruce	<i>Picea glauca</i>	S5	Green	FACU
Trembling poplar	<i>Populus tremuloides</i>	S5	Green	NL
Old-field cinquefoil	<i>Potentilla simplex</i>	S5	Green	FACU-
Chokecherry	<i>Prunus virginiana</i>	S5	Green	FACU
Bracken fern	<i>Pteridium aquilinum</i>	S5	Green	FACU
Creeping buttercup	<i>Ranunculus repens</i>	SE	--	FAC
Skunk currant	<i>Ribes glandulosum</i>	S5	Green	FACW
Common blackberry	<i>Rubus allegheniensis</i>	S5	Green	FACU-
Raspberry	<i>Rubus idaeus</i>	S5	Green	FAC-
Red Elderberry	<i>Sambucus racemosa</i>	S5	Green	FACU
Rough-leaf goldenrod	<i>Solidago rugosa</i>	S5	Green	FAC
American mountain-ash	<i>Sorbus americana</i>	S5	Green	FACU
Meadow-rue	<i>Thalictrum pubescens</i>	S5	Green	FACW+
Northern starflower	<i>Trientalis borealis</i>	S5	Green	FAC
Velvet-leaf blueberry	<i>Vaccinium myrtilloides</i>	S5	Green	FAC
Gypsy-weed	<i>Veronica officinalis</i>	S5SE	Green	FACU-
Possum-haw viburnum	<i>Viburnum nudum</i>	S5	Green	FACW
Wooly blue violet	<i>Viola sororia</i>	S5	Green	FAC-

Plant species found in the central gully

Balsam fir	<i>Abies balsamea</i>	S5	Green	FAC
Speckled alder	<i>Alnus incana</i>	S5	Green	FACW
Whorled aster	<i>Aster (Oclemena) acuminatus</i>	S5	Green	NL
Parasol white-top	<i>Aster (Doellingeria) umbellatus</i>	S5	Green	FACW
Large-leaved avens	<i>Avens macrophyllum</i>	S5	Green	NL
Paper birch	<i>Betula papyrifera</i>	S5	Green	FACU
Fringed sedge	<i>Carex crinita</i>	S4S5	Green	OBL
Creeping thistle	<i>Cirsium arvense</i>	SE	--	FACU
Alternate-leaf dogwood	<i>Cornus alternifolia</i>	S5	Green	NL
Spinulose shield fern	<i>Dryopteris carthusiana</i>	S5	Green	FAC+
Wild mock-cucumber	<i>Echinocystis lobata</i>	SE	--	FAC
Hairy willow-herb	<i>Epilobium ciliatum</i>	S5	Green	FAC-
Hemp-nettle	<i>Galeopsis tetrahit</i>	SE	--	NL
Rough bedstraw	<i>Galium asprellum</i>	S5	Green	OBL
American fly honey-suckle	<i>Lonicera canadensis</i>	S5	Green	FACU
Common apple	<i>Malus pumila</i>	SE	--	NL
Sensitive fern	<i>Onoclea sensibilis</i>	S5	Green	FACW
White spruce	<i>Picea glauca</i>	S5	Green	FACU
Chokecherry	<i>Prunus virginiana</i>	S5	Green	FACU
Creeping buttercup	<i>Ranunculus repens</i>	SE	--	FAC
Common blackberry	<i>Rubus allegheniensis</i>	S5	Green	FACU-
Red raspberry	<i>Rubus idaeus</i>	S5	Green	FAC-
Dwarf red raspberry	<i>Rubus pubescens</i>	S5	Green	FACW
Water dock	<i>Rumex orbiculatus</i>	S5	Green	OBL
Mad dog skullcap	<i>Scutellaria lateriflora</i>	S5	Green	FACW+
Roseroot	<i>Sedum rosea</i>	SE	--	FACU-
Bulrush	<i>Scirpus atrocinctus</i>	S5	Green	FACW+
Marsh fern	<i>Thelypteris palustris</i>	S5	Green	NL
Colt's-foot	<i>Tussilago farfara</i>	SE	--	FACU
Gypsy-weed	<i>Veronica officinalis</i>	S5SE	Green	FACU
Possum-haw viburnum	<i>Viburnum nudum</i>	S5	Green	FACW

Plant species found in the eastern gully/ravine:

Balsam fir	<i>Abies balsamea</i>	S5	Green	FAC
Red Maple	<i>Acer rubrum</i>	S5	Green	FAC
Mountain maple	<i>Acer spicatum</i>	S5	Green	FACU-
Speckled alder	<i>Alnus incana</i>	S5	Green	FACW
Farewell summer	<i>Aster (Symphyotrichum) lateriflorum</i>	S5	Green	FACW-
Fringed sedge	<i>Carex crinita</i>	S4S5	Green	OBL
Shallow sedge	<i>Carex lurida</i>	S5	Green	OBL

Stalk-grain sedge	<i>Carex stipata</i>	S5	Green	NL
White turtlehead	<i>Chelone glabra</i>	S5	Green	OBL
Spinulose shield fern	<i>Dryopteris carthusiana</i>	S5	Green	FAC+
Hairy willow-herb	<i>Epilobium ciliatum</i>	S5	Green	FAC-
Hemp-nettle	<i>Galeopsis tetrahit</i>	SE	--	NL
Fowl manna-grass	<i>Glyceria striata</i>	S5	Green	OBL
Spotted jewel-weed	<i>Impatiens capensis</i>	S5	Green	FACW
Cinnamon fern	<i>Osmunda cinnamomea</i>	S5	Green	FACW
Arrow-leaved tearthumb	<i>Polygonum sagittatum</i>	S5	Green	OBL
Self-heal	<i>Prunella vulgaris</i>	S5	Green	FACU+
Chokecherry	<i>Prunus virginiana</i>	S5	Green	FACU
Creeping buttercup	<i>Ranunculus repens</i>	SE	--	FAC
Bristly black current	<i>Ribes lacustre</i>	S5	Green	FACW
Dwarf red raspberry	<i>Rubus pubescens</i>	S5	Green	FACW
Meadow-rue	<i>Thalictrum pubescens</i>	S5	Green	FACW+
Northern starflower	<i>Trientalis borealis</i>	S5	Green	FAC
Gypsy-weed	<i>Veronica officinalis</i>	S5SE	Green	FACU-

APPENDIX C

Wetland Delineation

The wetland (within the boundaries shown) covers approximately 2.25 hectares. The yellow dots are the sample point locations.



APPENDIX D

Data point (4) and boundary point (88) GPS locations

Data Point GPS Locations:

<u>Description</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Data sheet code</u>
Wetland site 1:	N 45° 22.278'	W 64° 24.211'	BR-W1
Upland site 1:	N 45° 22.271'	W 64° 24.216'	BR-U1
Wetland site 2:	N 45° 22.357'	W 64° 24.198'	BR-W2
Upland site 2:	N 45° 22.351'	W 64° 24.193'	BR-U2

Boundary point GPS locations:

Latitude	Longitude	GPS Point
45 ° 22.352	64 °24.324	1
45 ° 22.346	64 °24.335	2
45 ° 22.333	64 °24.349	3
45 ° 22.322	64 °24.35	4
45 ° 22.32	64 °24.344	5
45 ° 22.322	64 °24.336	6
45 ° 22.318	64 °24.337	7
45 ° 22.314	64 °24.331	8
45 ° 22.316	64 °24.322	9
45 ° 22.315	64 °24.311	10
45 ° 22.318	64 °24.304	11
45 ° 22.322	64 °24.303	12
45 ° 22.327	64 °24.29	13
45 ° 22.327	64 °24.284	14
45 ° 22.327	64 °24.273	15
45 ° 22.328	64 °24.268	16
45 ° 22.331	64 °24.261	17
45 ° 22.333	64 °24.259	18
45 ° 22.336	64 °24.253	19
45 ° 22.342	64 °24.242	20
45 ° 22.351	64 °24.232	21
45 ° 22.355	64 °24.226	22
45 ° 22.366	64 °24.222	23
45 ° 22.365	64 °24.211	24

45 ° 22.373	64 °24.198	25
45 ° 22.381	64 °24.201	26
45 ° 22.382	64 °24.199	27
45 ° 22.374	64 °24.198	28
45 ° 22.364	64 °24.207	29
45 ° 22.363	64 °24.219	30
45 ° 22.354	64 °24.226	31
45 ° 22.35	64 °24.226	32
45 ° 22.363	64 °24.161	33
45 ° 22.359	64 °24.174	34
45 ° 22.361	64 °24.198	35
45 ° 22.365	64 °24.19	36
45 ° 22.3566	64 °24.212	37
45 ° 22.349	64 °24.215	38
45 ° 22.347	64 °24.223	39
45 ° 22.35	64 °24.227	40
45 ° 22.347	64 °24.236	41
45 ° 22.342	64 °24.238	42
45 ° 22.334	64 °24.253	43
45 ° 22.327	64 °24.265	44
45 ° 22.32	64 °24.273	45
45 ° 22.31	64 °24.267	46
45 ° 22.311	64 °24.258	47
45 ° 22.305	64 °24.252	48
45 ° 22.294	64 °24.237	49
45 ° 22.293	64 °24.24	50
45 ° 22.283	64 °24.223	51
45 ° 22.278	64 °24.219	52
45 ° 22.274	64 °24.213	53
45 ° 22.267	64 °24.205	56
45 ° 22.266	64 °24.198	57
45 ° 22.262	64 °24.196	58
45 ° 22.256	64 °24.193	59
45 ° 22.257	64 °24.187	60
45 ° 22.26	64 °24.169	61
45 ° 22.268	64 °24.156	62
45 ° 22.272	64 °24.15	63
45 ° 22.273	64 °24.135	64
45 ° 22.268	64 °24.141	65
45 ° 22.262	64 °24.139	66

45 ° 22.268	64 °24.129	67
45 ° 22.27	64 °24.108	68
45 ° 22.276	64 °24.093	69
45 ° 22.279	64 °24.084	70
45 ° 22.272	64 °24.093	71
45 ° 22.269	64 °24.108	72
45 ° 22.264	64 °24.129	73
45 ° 22.26	64 °24.137	74
45 ° 22.258	64 °24.151	75
45 ° 22.253	64 °24.164	76
45 ° 22.247	64 °24.183	77
45 ° 22.242	64 °24.195	78
45 ° 22.235	64 °24.202	79
45 ° 22.228	64 °24.205	80
45 ° 22.224	64 °24.206	81
45 ° 22.219	64 °24.216	82
45 ° 22.222	64 °24.223	83
45 ° 22.229	64 °24.245	84
45 ° 22.238	64 °24.268	85
45 ° 22.25	64 °24.299	86
45 ° 22.263	64 °24.329	87
45 ° 22.275	64 ° 24.358	88