



NORTHERN PULP NOVA SCOTIA

Wetland Baseline Survey

Focus Report – Replacement Effluent Treatment Facility

Appendix Focus Report Item 5.1: Wetlands along the Re-aligned Pipeline Route

As required by item 5.1 of the Terms of Reference (ToR) for the Focus Report (NSE 2019), a baseline wetland survey program was conducted along the proposed re-aligned effluent pipeline route to reflect the project that is described in Focus Report Project Description Section 2.1. The results of that survey program are presented in this section.

5.1.1 Wetland Survey Program Methodology

The wetlands were surveyed along the proposed re-aligned effluent pipeline route as an update to the existing environment as described in the Environmental Assessment Registration Document (EARD) (NPNS 2019) based on the revised project description. The regional setting with respect to wetlands as it relates to the proposed re-aligned effluent pipeline route has not changed compared to that which was described in the EARD for the previous pipeline route.

Changes that have occurred from the EARD

The following changes to the effluent pipeline route have occurred since the EARD was prepared:

- The re-aligned effluent pipeline route is within the Nova Scotia Transportation and Infrastructure Renewal (NSTIR) Right-of-Way (ROW) for Highway 106, at its eastern edge. Previously, the effluent pipeline was to be constructed in the road shoulder, on the western side of the road. Figure A5.1-1 below illustrates the proposed re-aligned effluent pipeline route.
- The Effluent Treatment Facility location has not changed from that presented in the EARD.

As the pipeline route has been refined and is now proposed to be installed parallel along the eastern side of Highway 106 but within the NSTIR Highway 106 ROW, a number of wetlands previously described in the EARD no longer fall along the pipeline route. These wetlands are: WL-4, WL-12 (A and B), WL-14, WL-15, WL-17, and WL-18. However, as recent wetland field programs conducted in 2019 were able to occur during the 'growing season' (i.e., the time of year when herbaceous plants are actively growing and can be more readily identified), several additional small wetlands were encountered along the re-aligned pipeline route that were previously not observed in prior surveys (i.e., WL13-B, WL5-E, WL-19, and WL-20). As a result, a total of 19 wetlands were documented in the following report for the re-aligned pipeline route.

Lastly, it should be noted that the limit of the NSTIR Highway 106 ROW on its eastern side ranges from approximately 20 m to 25 m from the highway centreline. Consequently, for many of the wetlands within the proposed re-aligned pipeline route, only a small fraction was available for 'on-the-ground' assessment due to property access restrictions. The wetland outside of the NSTIR ROW was examined from satellite imagery and mapping. To further compound this constraint, the influence of the immediately adjacent Highway 106, and associated ditching, served to hinder the description of a wetland's more natural condition, often limiting observations to the disturbed conditions present along

the roadside. However, since the purpose of the field work was to describe the existing environmental conditions and function of the wetland environment (whether natural or previously affected by human activity), the conditions observed during the surveys (such as they are) represent the current condition and function of the wetlands prior to implementing the project.

5.1.1.1 Wetland Determination and Delineation

The methods for wetland determination and field delineation remained the same as were described in the EARD (Section 8.7) and are only briefly summarized in the following section.

Wetland determination and delineation was based on the methods described in the United States Army Corps of Engineers Wetland Delineation Manual (USACE 1987) and the National Wetlands Working Group (1997) and focused on establishing a wetland-upland edge. The wetland-upland edge is based upon the presence of positive indicators for three parameters:

1. Hydric soils;
2. Hydrophytic vegetation, and
3. Wetland hydrology.

Once an area was determined to be a wetland (i.e., positive indicators identified for soils, hydrology, and vegetation), a wetland edge condition was established based on those indicators identified. This edge condition was then used to navigate around the perimeter of the wetland, which was georeferenced using a handheld geographical positioning system (GPS) unit (with a 3 to 5 m accuracy).



Northern Pulp Nova Scotia Corporation
 Replacement Effluent Treatment Facility
 Environmental Assessment - Focus Report

- Approximate Project Footprint Area*
- Wetland Delineated in the Field
- Watercourse
- NS Topographic Database Wetland
- NSDNR Database Wetland

- WL# Wetland ID
- WC# Watercourse ID

Wetlands along the Proposed Project
Figure A5.1-1



MAP DRAWING INFORMATION:
 DATA PROVIDED BY Northern Pulp Nova Scotia,
 NSDNR, GeoNova, NSDNR, ESRI

MAP CREATED BY: SCM
 MAP CHECKED BY: SLD
 MAP PROJECTION: NAD 1983 UTM Zone 20N



*Precise Project Footprint to be determined following completion of detailed design

5.1.1.2 Functional Assessment: Wetland Ecosystem Services Protocol-Atlantic Canada (WESP-AC)

The WESP-AC functional assessment methodology had only previously been applied to two of the wetlands described in the EARD: WL-1 and WL-2. These wetlands were within the ETF property and had been previously visited and surveyed during the summer (i.e., during the ‘growing season’) of 2018 and therefore, a WESP-AC functional assessment was able to be conducted.

As the previous pipeline route had not yet been defined during the summer of 2018, WESP-AC functional assessments for wetlands falling within it could not be completed for the EARD as the growing season was over prior to a route being selected. However, following the refinement of the pipeline alignment in early 2019, WESP-AC functional assessments for those wetlands located within the proposed re-aligned effluent pipeline route were able to be completed during wetland surveys conducted in the summer of 2019.

WESP-AC represents a standardized approach to the way wetland functional assessment data are collected and interpreted, to indirectly yield relative estimates of a wide variety of important wetland functions and their associated benefits.

WESP-AC generates scores (0 to 10 scale) and ratings (“Lower”, “Moderate”, or “Higher”) for a variety of wetland functions using visual assessments of weighted ecological indicators. The number of indicators that were applied to estimate a particular wetland function depends on which function was being assessed. The indicators are then combined in a spreadsheet using logic-based, mathematical models to generate the score and rating for each wetland function and benefit (Adamus 2018 a; 2018b). Together they provide a profile of “what a wetland does”.

For each function, the scores and ratings represent a particular wetland’s standing relative to those in a statistical sample of assessed ‘baseline’ wetlands within the province (i.e., 121 non-tidal and 34 tidal wetlands for Nova Scotia) (Adamus 2018a; 2018b). **Table A5.1-1** provides a list of the various non-tidal wetland functions, their definitions, and potential benefits.

Table A5.1-1 Benefits of Non-Tidal Wetland Functions Scored by WESP-AC

Function	Definition	Potential Benefits
Hydrologic Functions:		
Water Storage and Delay	The effectiveness for storing runoff or delaying the downslope movement of surface water for long or short periods.	Flood control, maintain ecological systems
Stream Flow Support	The effectiveness for contributing water to streams especially during the driest part of a growing season.	Support fish and other aquatic life
Water Quality Maintenance Functions:		
Water Cooling	The effectiveness for maintaining or reducing temperature of downslope waters.	Support cold water fish and other aquatic life
Sediment and Retention	The effectiveness for intercepting and filtering suspended inorganic sediments thus allowing their	Maintain quality of receiving waters. Protect shoreline structures from

Function	Definition	Potential Benefits
Stabilization	deposition, as well as reducing energy of waves and currents, resisting excessive erosion, and stabilizing underlying sediments or soil	erosion.
Phosphorous Retention	The effectiveness for retaining phosphorus for long periods (>1 growing season)	Maintain quality of receiving waters.
Nitrate Removal and Retention	The effectiveness for retaining particulate nitrate and converting soluble nitrate and ammonium to nitrogen gas while generating little or no N ₂ O (a potent GHG).	Maintain quality of receiving waters.
Organic Nutrient Transport	The effectiveness for producing and subsequently exporting organic nutrients (mainly carbon), either particulate or dissolved.	Support food chains in receiving waters.
Ecological (Habitat) Functions:		
Fish Habitat	The capacity to support an abundance and diversity of native fish (both anadromous and resident species)	Support recreational and ecological values.
Aquatic Invertebrate Habitat	The capacity to support or contribute to an abundance or diversity of invertebrate animals which spend all or part of their life cycle underwater or in moist soil. Includes dragonflies, midges, clams, snails, water beetles, shrimp, aquatic worms, and others.	Support salmon and other aquatic life. Maintain regional biodiversity.
Amphibian and Reptile Habitat	The capacity to support or contribute to an abundance or diversity of native frogs, toads, salamanders, and turtles.	Maintain regional biodiversity
Waterbird Feeding Habitat	The capacity to support or contribute to an abundance or diversity of waterbirds that migrate or winter but do not breed in the region.	Support hunting and ecological values. Maintain regional biodiversity.
Waterbird Nesting Habitat	The capacity to support or contribute to an abundance or diversity of waterbirds that nest in the region.	Maintain regional biodiversity.
Songbird, Raptor, and Mammal Habitat	The capacity to support or contribute to an abundance or diversity of native songbird, raptor, and mammal species and functional groups, especially those that are most dependent on wetlands or water	Maintain regional biodiversity.
Native Plant Habitat and Pollinator Habitat	The capacity to support or contribute to a diversity of native, hydrophytic, vascular plant species, communities, and/or functional groups, as well as the pollinating insects linked to them	Maintain regional biodiversity and food chains.
Public Use and Recognition*	Prior designation of the wetland, by a natural resource or environmental agency, as some type of special protected area. Also, the potential and actual use of a wetland for low-intensity outdoor recreation, education, or research.	Commercial and social benefits of recreation. Protection of public investments.

*Considered a benefit rather than a function of wetlands

Source: Adamus (2018a)

Table A5.1-2 provides a list of the various tidal wetland functions, their definitions, and potential benefits.

Table A5.1-2: **Benefits of Tidal Wetland Functions Scored by WESP-AC**

Function	Definition	Potential Benefits
Storm Surge Reduction	The effectiveness for buffering surges of tidal water for short periods before they reach vulnerable uplands.	Flood control, protect shoreline structures from erosion.
Water Purification	The effectiveness for intercepting and filtering suspended inorganic sediments thus allowing their deposition, as well as reducing energy of waves and currents, resisting excessive erosion, and stabilising underlying sediments or soil.	Maintain quality of coastal waters, protect shoreline structures from erosion.
Organic Nutrient Export	The effectiveness for producing and subsequently exporting organic nutrients (mainly carbon), either particulate or dissolved.	Supports food chains in coastal waters.
Fish Habitat	The capacity to support an abundance and diversity of native fish (both anadromous and resident species).	Supports recreational opportunities and ecological values.
Waterbird Habitat	The capacity to support or contribute to an abundance or diversity of waterbirds, mainly those that migrate or winter in the region.	Supports hunting opportunities and ecological values.
Songbird, Raptor, and Mammal Habitat	The capacity to support or contribute to an abundance or diversity of native songbird, raptor, and mammal species and functional groups, especially those that are most dependent on tidal wetlands or water.	Maintain regional biodiversity and food webs.
Biodiversity Support	The capacity to support or contribute to a diversity of native plant and animal species, communities, and/or functional groups.	Maintain food webs and ecosystem stability.
Stability*	The potential for long term persistence of a tidal wetland in the face of direct or indirect effects of sea level rise.	Protection of the above functions and benefits.
Public Use and Recognition*	Prior designation of the wetland, by a natural resource or environmental agency, as some type of special protected area. Also, the potential and actual use of a wetland for low- intensity outdoor recreation, sustainable consumptive uses, education, or research.	Commercial and social benefits of recreation. Protection of prior public investments.

* A tidal wetland attribute that is not considered a function

Source: Adamus (2018b)

5.1.2 Results of Spring/Summer 2019 Field Assessment of Wetlands along the Re-aligned Effluent Pipeline Route

Wetland field surveys along the proposed re-aligned effluent pipeline route were conducted on May 28th, June 4th, June 5th, June 18th and July 30th, 2019. Following the surveys, wetland functions were evaluated upon return to the office using the WESP-AC methods described above.

Wetlands located along the proposed re-aligned effluent pipeline route are identified in Table A5.1-3, below and above in Figure A5.1-1. A list of identified plants for each assessed wetland in 2019 is provided in Table A5.1-4. Wetland delineation data sheets and wetland photos are provided in Appendix A5.1-A and Photo Plate A5.1-1, respectively. The results of the WESP-AC functional assessment are summarized below in Table A5.1-5.

Brief descriptions of each wetland assessed within the project area are provided below, noting that results for WL-1 and WL-2 were presented in the EARD. For scientific plant names and conservation rankings, refer to Table A5.1-4

Wetland 3 (WL-3)

Wetland #3 (WL-3) is located east of Highway 106 and immediately south of the Jitney Trail and borders the Pictou Harbour shoreline. The boundaries of this wetland were delineated in their entirety and the wetland area within the NSTIR ROW is 0.299 ha. WL-3 is a relatively small salt marsh with shrub-swamp characteristics.

WL-3 appears to have been partially filled in from the past construction of adjacent roadways and the Pictou causeway. Most of the wetland area is tidally influenced and dominated by hardstem bulrush (*Schoenoplectus acutus*), reed canary grass (*Phalaris arundinacea*), and both broad-leaved and narrow-leaved cattail (*Typha latifolia* and *Typha angustifolia*, respectively). However, at the landward side of the wetland, furthest from a tidal influence, the land slopes steeply upwards and transitions into a dense thicket dominated by roses, hawthorn and speckled alder (*Alnus incana*). No federally or provincially listed priority species were identified in WL-3; however, two rare (according to the AC CDC) lichens were identified in June 2019. *Leptogium imbricatum* is ranked by the Atlantic Canada Conservation Data Centre (AC CDC) as S2? (rare within Nova Scotia with a degree of uncertainty), and *Leptogium tenuissimum* is ranked as S2S3 (rare to uncommon within Nova Scotia). More information on priority flora species is presented in **Annex 8.1 Section 8.1.3** of the Focus Report and in the EARD (Section 8.8).

Table A5.1-3: Summary of Results of Field Assessment of Wetlands Assessed During the 2019 Wetland Field Program

Wetland	Dominant Wetland Type	Relative Size ¹	Landscape Position	Landform	Flow Path	Water Regime	Disturbance	Priority Plants ²	Total Delineated Area (ha) within NSTIR ROW ³
Wetland #3 (WL-3)	Salt Marsh	Small	Estuarine	Fringe	Through Flow	Irregularly Flooded	Partially infilled by past construction of roads/causeway, freshwater input from ditch-fed culvert and exotic shrubs and herbs present within wetland.	Yes	0.299
Wetland #5A (WL-5A)	Shrub Swamp/ Wet Meadow	Medium	Terrene	Basin	Outflow	Seasonally Flooded	Salt and nutrient inputs from adjacent roads, moderate storm water inputs, regularly mowed vegetation close to the Roundabout, some fill material from road construction in wetland.	No	1.894
Wetland #5B (WL-5B)	Shrub Swamp/ Wet Meadow	Medium	Lotic	Basin	Through Flow	Seasonally Flooded	Salt and nutrient inputs from adjacent roads, edges are regularly mowed close to the Roundabout, some fill material from road construction in wetland, moderate storm water inputs.	No	1.524
Wetland #5C (WL-5C)	Shrub Swamp/ Flood Plain	Medium	Lotic	Basin/Fringe	Through flow	Seasonally flooded	Salt and nutrient inputs from adjacent roads, strong storm water inputs from ditching and catchment, regularly mowed vegetation close to the Roundabout, some fill material from road construction in wetland, evidence of ATV use.	No	0.503
Wetland #5D (WL-5D)	Shrub Swamp/ Marsh	Large	Lotic	Basin/Fringe	Through flow	Semi-permanently flooded	Salt and nutrient inputs from adjacent roads, moderate storm water inputs, regularly mowed vegetation close to the Roundabout, some fill material from road/municipal building construction in wetland, evidence of ATV use.	No	4.341
Wetland #5E (WL-5E)	Shrub Swamp/ Marsh	Small	Terrene	Basin	Outflow	Seasonally flooded	Vegetation disturbed on edges of the Roundabout by regular mowing road	No	0.383

Wetland	Dominant Wetland Type	Relative Size ¹	Landscape Position	Landform	Flow Path	Water Regime	Disturbance	Priority Plants ²	Total Delineated Area (ha) within NSTIR ROW ³
	Wet Meadow						and other fill material observed within wetland, moderate storm water input through ditches and catchment, and salt and nutrient inputs from adjacent roads.		
Wetland #6 (WL-6)	Shrub Swamp	Small	Terrene	Basin	Outflow	Saturated	Infringed by road fill and agricultural fields, salt and nutrient inputs from adjacent Highway 106, storm water influence via ditching.	No	0.096
Wetland #7 (WL-7)	Flood Plain	Large	Lotic	Floodplain	Through flow	Seasonally flooded	Salt and nutrient inputs from adjacent Highway 106 and storm water catchment.	No	0.010
Wetland #8 (WL-8)	Shrub Swamp	Large	Terrene	Basin	Outflow	Saturated	Partially impounded by Highway 106, ATV-rutting, salt and nutrient inputs from adjacent Highway 106 and storm water catchment.	No	0.071
Wetland #9 (WL-9)	Shrub Swamp	Medium	Lotic	Basin	Through flow	Seasonally flooded	Salt and nutrient inputs from adjacent Highway 106, soil disturbed from road fill infringes, impounded water along Highway 106 and storm water catchment.	No	0.035
Wetland #10 (WL-10)	Shrub Swamp/ Marsh	Large	Lotic	Basin/Fringe	Through flow	Permanently flooded	Salt and nutrient inputs from adjacent Highway 106, deep water impounding along Highway 106, and soils are disturbed by road fill.	No	0.179
Wetland #11 (WL-11)	Shrub Swamp	Large	Lotic	Basin/Fringe	Through flow	Permanently flooded	Partially impounded by Highway 106; Salt and nutrient inputs from adjacent Highway 106, road fill materials present in wetland.	No	0.249
Wetland #13 (WL-13)	Fen/Marsh	Large	Lotic	Basin/Fringe	Through flow	Permanently flooded	Partially impounded by Highway 106; Salt and nutrient inputs from adjacent Highway 106, soil disturbed from road fill infringes.	No	0.560

Wetland	Dominant Wetland Type	Relative Size ¹	Landscape Position	Landform	Flow Path	Water Regime	Disturbance	Priority Plants ²	Total Delineated Area (ha) within NSTIR ROW ³
Wetland #13B (WL-13B)	Shrub Swamp	Small	Terrene	Basin	Outflow	Saturated	Soil disturbed from agricultural field runoff which is sediment-laden as well as road fill. Hydrology is disturbed from storm water influence.	No	0.026
Wetland #16 (WL-16)	Treed Swamp	Small	Terrene	Basin	Through flow	Saturated	Partially impounded by Highway 106; Salt and nutrient inputs from adjacent Highway 106, road fill present in wetland.	No	0.107
Wetland #19 (WL-19)	Shrub Swamp/ Marsh	Small	Terrene	Basin	Isolated	Saturated	Soil disturbed from road fill. Hydrology is disturbed from storm water influence.	No	0.007
Wetland #20 (WL-20)	Shrub Swamp	Small	Terrene	Basin	Isolated	Seasonally flooded	Soil disturbance from historic excavations and compaction. Excavated pits and storm water influences alter hydrology.	No	0.008

Notes:

1. Relative size of the wetland is based on the estimated total extent of each wetlands area. For wetlands that extend beyond the NSTIR ROW, total wetland size is estimated based on available aerial imagery and provincial mapping. Relative size classes are: small - less than 0.5 ha; medium - 0.5-2 ha and large - >2 ha.
2. Priority plants are plants listed under the federal *Species at Risk Act (SARA)*, the Nova Scotia *Endangered Species Act (NS ESA)*, or having ratings of S1 to S3 by the Atlantic Canada Conservation Data Centre (AC CDC). See **Focus Report Appendix 8.1**.
3. Total Delineated Area represents the assessment area for each wetland and is limited to the portion of any given wetland within the NSTIR ROW.

Table A5.1-4: Plant Lists by Wetland

Wetland 3		
Species	Common Name	S-Rank
<i>Alisma triviale</i>	Northern Water Plantain	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Angelica sylvestris</i>	Woodland Angelica	SNA
<i>Atriplex</i> sp	<Null>	-
<i>Calystegia sepium</i>	Hedge False Bindweed	S5
<i>Carex paleacea</i>	Chaffy Sedge	S5
<i>Carex scoparia</i>	Broom Sedge	S5
<i>Carex stipata</i>	Awl-fruited Sedge	S5
<i>Epilobium palustre</i>	Marsh Willowherb	S5
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	S5
<i>Galium palustre</i>	Common Marsh Bedstraw	S5
<i>Impatiens capensis</i>	Spotted Jewelweed	S5
<i>Juncus gerardii</i>	Black-Grass Rush	S5
<i>Leersia oryzoides</i>	Rice Cut Grass	S5
<i>Lolium perenne</i>	Perennial Rye Grass	SNA
<i>Mentha</i> sp.	A Mint	-
<i>Myosotis laxa</i>	Small Forget-Me-Not	S5
<i>Onoclea sensibilis</i>	Sensitive Fern	S5
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5
<i>Polygonum sagittatum</i>	Arrow-leaved Smartweed	S5
<i>Rumex crispus</i>	Curled Dock	SNA
<i>Schoenoplectus acutus</i>	Hardstem Bulrush	S4
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	S5
<i>Scirpus microcarpus</i>	Small-fruited Bulrush	S5
<i>Schoenoplectus acutus</i>	Hardstem Bulrush	S4
<i>Scutellaria lateriflora</i>	Mad-dog Skullcap	S5
<i>Solanum dulcamara</i>	Bittersweet Nightshade	SNA
<i>Sonchus arvensis</i>	Field Sow Thistle	SNA
<i>Spartina alterniflora</i>	Smooth Cord Grass	S5
<i>Spartina patens</i>	Saltmeadow Cord Grass	S5
<i>Stachys palustris</i>	Marsh Hedge-Nettle	SNA
<i>Typha angustifolia</i>	Narrow-Leaved Cattail	S5
<i>Typha latifolia</i>	Broad-leaved Cattail	S5
<i>Vicia cracca</i>	Tufted Vetch	SNA

Wetland 5B		
Species	Common Name	S-Rank
<i>Acer rubrum</i>	Red Maple	S5
<i>Alisma triviale</i>	Northern Water Plantain	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Callitriche palustris</i>	Marsh Water-starwort	S5
<i>Calystegia sepium</i>	Hedge False Bindweed	S5
<i>Carex arctata</i>	Black Sedge	S5
<i>Carex nigra</i>	Smooth Black Sedge	S5
<i>Carex scoparia</i>	Broom Sedge	S5
<i>Carex vulpinoidea</i>	Fox Sedge	S4
<i>Carex scoparia</i>	Broom Sedge	S5
<i>Chenopodium</i> sp.	-	-
<i>Equisetum arvense</i>	Field Horsetail	S5
<i>Galeopsis tetrahit</i>	Common Hemp-nettle	SNA
<i>Galium palustre</i>	Common Marsh Bedstraw	S5
<i>Impatiens capensis</i>	Spotted Jewelweed	S5
<i>Juncus filiformis</i>	Thread Rush	S5
<i>Juncus gerardii</i>	Black-Grass Rush	S5
<i>Lathyrus aphaca</i>	Yellow Vetchling	SNA
<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil	SNA
<i>Lysimachia terrestris</i>	Swamp Loosestrife	S5
<i>Myosotis laxa</i>	Small Forget-Me-Not	S5
<i>Onoclea sensibilis</i>	Sensitive Fern	S5
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5
<i>Platanthera lacera</i>	Ragged Fringed Orchid	S4S5
<i>Polygonum hydropiperoides</i>	False Waterpepper	S5
<i>Prunus virginiana</i>	Choke Cherry	S5
<i>Ranunculus repens</i>	Creeping Butter-Cup	SNA
<i>Rhamnus</i> sp.	Buckthorn	-
<i>Rubus allegheniensis</i>	Allegheny Blackberry	S5
<i>Salix bebbiana</i>	Bebb's Willow	S5
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5
<i>Vicia cracca</i>	Tufted Vetch	SNA

Wetland 5A		
Species	Common Name	S-Rank
<i>Acer rubrum</i>	Red Maple	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Amelanchier</i> sp.	serviceberry	-
<i>Athyrium filix-femina</i>	Common Lady Fern	S5
<i>Betula populifolia</i>	Gray Birch	S5
<i>Carex intumescens</i>	Bladder Sedge	S5
<i>Carex lurida</i>	Sallow Sedge	S5
<i>Carex nigra</i>	Smooth Black Sedge	S5
<i>Carex projecta</i>	Necklace Sedge	S5
<i>Carex scoparia</i>	Broom Sedge	S5
<i>Carex stipata</i>	Awl-fruited Sedge	S5
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	S5
<i>Dryopteris intermedia</i>	Evergreen Wood Fern	S5
<i>Equisetum arvense</i>	Field Horsetail	S5
<i>Equisetum sylvaticum</i>	Woodland Horsetail	S5
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	S5
<i>Galium palustre</i>	Common Marsh Bedstraw	S5
<i>Geum aleppicum</i>	Yellow Avens	S5
<i>Glyceria striata</i>	Fowl Manna Grass	S5
<i>Ilex verticillata</i>	Common Winterberry	S5
<i>Iris versicolor</i>	Harlequin Blue Flag	S5
<i>Luzula multiflora</i>	Common Woodrush	S5
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	S5
<i>Malus pumila</i>	Common Apple	SNA
<i>Onoclea sensibilis</i>	Sensitive Fern	S5
<i>Oxalis stricta</i>	European Wood Sorrel	S5
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	SNA
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5
<i>Picea glauca</i>	White Spruce	S5
<i>Picea rubens</i>	Red Spruce	S5
<i>Platanthera psycodes</i>	Small Purple Fringed Orchid	S4
<i>Polygonum hydropiperoides</i>	False Waterpepper	S5
<i>Populus tremuloides</i>	Trembling Aspen	S5
<i>Potentilla simplex</i>	Old Field Cinquefoil	S5
<i>Prunus virginiana</i>	Chokecherry	SNA
<i>Ranunculus acris</i>	Common Buttercup	SNA
<i>Rhamnus cathartica</i>	European Buckthorn	SNA
<i>Rosa</i> sp.	A Rose	-
<i>Rosa virginiana</i>	Virginia Rose	S5
<i>Rubus allegheniensis</i>	Allegheny Blackberry	S5
<i>Rubus idaeus</i>	Red Raspberry	S5
<i>Rubus pubescens</i>	Dwarf Red Raspberry	S5
<i>Rubus pubescens</i>	Dwarf Red Raspberry	S5
<i>Rubus pubescens</i>	Dwarf Red Raspberry	S5
<i>Salix bebbiana</i>	Bebb's Willow	S5
<i>Salix discolor</i>	Pussy Willow	S5
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	S5
<i>Scirpus microcarpus</i>	Small-fruited Bulrush	S5
<i>Solanum dulcamara</i>	Bittersweet Nightshade	SNA
<i>Solidago canadensis</i>	Canada Goldenrod	S4S5
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5
<i>Spiraea alba</i>	White Meadowsweet	S5
<i>Spiraea alba</i>	White Meadowsweet	S5
<i>Symphotrichum lateriflorum</i>	Calico Aster	S5
<i>Symphotrichum novi-belgii</i>	New York Aster	S5
<i>Viburnum nudum</i>	Northern Wild Raisin	S5
<i>Vicia cracca</i>	Tufted Vetch	SNA

Table A5.1-4: Plant Lists by Wetland, Continued.

Wetland 5C		
Species	Common Name	S-Rank
<i>Alnus incana</i>	Speckled Alder	S5
<i>Amelanchier</i> sp.	serviceberry	nar
<i>Carex arctata</i>	Black Sedge	S5
<i>Cicuta maculata</i>	Spotted Water-Hemlock	S5
<i>Crataegus monogyna</i>	English Hawthorn	SNA
<i>Fraxinus americana</i>	White Ash	S5
<i>Geum laciniatum</i>	Rough Avens	S5
<i>Glyceria striata</i>	Fowl Manna Grass	S5
<i>Impatiens capensis</i>	Spotted Jewelweed	S5
<i>Juncus effusus</i>	Soft Rush	S5
<i>Lycopus americanus</i>	American Water Horehound	S5
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	S5
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5
<i>Polygonum sagittatum</i>	Arrow-leaved Smartweed	S5
<i>Populus tremuloides</i>	Quaking Aspen	S5
<i>Prunus virginiana</i>	Chokecherry	S5
<i>Ranunculus acris</i>	Common Buttercup	SNA
<i>Ranunculus repens</i>	Creeping Butter-Cup	SNA
<i>Rosa multiflora</i>	Multiflora Rose	SNA
<i>Rubus pubescens</i>	Dwarf Red Raspberry	S5
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5
<i>Sorbus americana</i>	American Mountain Ash	S5
<i>Spartina alterniflora</i>	Smooth Cord Grass	S5
<i>Typha latifolia</i>	Broad-leaved Cattail	S5

Wetland 5E		
Species	Common Name	S-Rank
<i>Alnus incana</i>	Speckled Alder	S5
<i>Carex scoparia</i>	Broom Sedge	S5
<i>Carex vulpinoidea</i>	Fox Sedge	S4
<i>Crataegus</i> sp.	-	-
<i>Epilobium palustre</i>	Marsh Willowherb	S5
<i>Equisetum arvense</i>	Field Horsetail	S5
<i>Equisetum sylvaticum</i>	Woodland Horsetail	S5
<i>Galium palustre</i>	Common Marsh Bedstraw	S5
<i>Glyceria canadensis</i>	Canada Manna Grass	S5
<i>Glyceria laxa</i>	Northern Mannagrass	S4?
<i>Lathyrus pratensis</i>	Meadow Vetchling	SNA
<i>Lycopus americanus</i>	American Water Horehound	S5
<i>Mentha arvensis</i>	Wild Mint	S5
<i>Myosotis laxa</i>	Small Forget-Me-Not	S5
<i>Oenothera biennis</i>	Common Evening Primrose	S5
<i>Onoclea sensibilis</i>	Sensitive Fern	S5
<i>Oxalis stricta</i>	European Wood Sorrel	S5
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5
<i>Polygonum sagittatum</i>	Arrow-leaved Smartweed	S5
<i>Ranunculus acris</i>	Common Buttercup	SNA
<i>Salix bebbiana</i>	Bebb's Willow	S5
<i>Salix discolor</i>	Pussy Willow	S5
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	S5
<i>Scutellaria galericulata</i>	Marsh Skullcap	S5
<i>Stachys palustris</i>	Marsh Hedge-Nettle	SNA
<i>Typha latifolia</i>	Broad-leaved Cattail	S5

Wetland 5D		
Species	Common Name	S-Rank
<i>Acer rubrum</i>	Red Maple	S5
<i>Alisma triviale</i>	Northern Water Plantain	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Amelanchier</i> sp.	serviceberry	-
<i>Angelica sylvestris</i>	Woodland Angelica	SNA
<i>Athyrium filix-femina</i>	Common Lady Fern	S5
<i>Betula populifolia</i>	Gray Birch	S5
<i>Calamagrostis canadensis</i>	Bluejoint Reed Grass	S5
<i>Callitriche palustris</i>	Marsh Water-starwort	S5
<i>Calystegia sepium</i>	Hedge False Bindweed	S5
<i>Carex intumescens</i>	Bladder Sedge	S5
<i>Carex nigra</i>	Smooth Black Sedge	S5
<i>Carex projecta</i>	Necklace Sedge	S5
<i>Carex scoparia</i>	Broom Sedge	S5
<i>Carex stipata</i>	Awl-fruited Sedge	S5
<i>Carex vulpinoidea</i>	Fox Sedge	S4
<i>Chenopodium</i> sp.	-	-
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	S5
<i>Crataegus monogyna</i>	English Hawthorn	SNA
<i>Dryopteris intermedia</i>	Evergreen Wood Fern	S5
<i>Equisetum arvense</i>	Field Horsetail	S5
<i>Equisetum sylvaticum</i>	Woodland Horsetail	S5
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	S5
<i>Fraxinus americana</i>	White Ash	S5
<i>Galeopsis tetrahit</i>	Common Hemp-nettle	SNA
<i>Galium palustre</i>	Common Marsh Bedstraw	S5
<i>Geum aleppicum</i>	Yellow Avens	S5
<i>Glyceria laxa</i>	Northern Mannagrass	S4?
<i>Glyceria striata</i>	Fowl Manna Grass	S5
<i>Ilex verticillata</i>	Common Winterberry	S5
<i>Impatiens capensis</i>	Spotted Jewelweed	S5
<i>Iris versicolor</i>	Harlequin Blue Flag	S5
<i>Juncus effusus</i>	Soft Rush	S5
<i>Juncus filiformis</i>	Thread Rush	S5
<i>Juncus gerardii</i>	Black-Grass Rush	S5
<i>Lathyrus aphaca</i>	Yellow Vetchling	SNA
<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil	SNA
<i>Luzula multiflora</i>	Common Woodrush	S5
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	S5
<i>Malus pumila</i>	Common Apple	SNA
<i>Mentha</i> sp.	A Mint	-
<i>Myosotis laxa</i>	Small Forget-Me-Not	S5
<i>Onoclea sensibilis</i>	Sensitive Fern	S5
<i>Oxalis stricta</i>	European Wood Sorrel	S5
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	SNA
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5
<i>Picea glauca</i>	White Spruce	S5
<i>Platanthera lacera</i>	Ragged Fringed Orchid	S4S5
<i>Platanthera psychodes</i>	Small Purple Fringed Orchid	S4
<i>Polygonum hydropiperoides</i>	False Waterpepper	S5
<i>Populus tremuloides</i>	Trembling Aspen	S5
<i>Potentilla simplex</i>	Old Field Cinquefoil	S5
<i>Prunus virginiana</i>	Chokecherry	S5
<i>Ranunculus acris</i>	Common Buttercup	SNA
<i>Rhamnus cathartica</i>	European Buckthorn	SNA
<i>Rhamnus</i> sp.	Buckthorn	-
<i>Rosa multiflora</i>	Multiflora Rose	SNA
<i>Rosa</i> sp.	A Rose	-
<i>Rosa virginiana</i>	Virginia Rose	S5
<i>Rubus allegheniensis</i>	Alleghany Blackberry	S5
<i>Rubus idaeus</i>	Red Raspberry	S5
<i>Rubus pubescens</i>	Dwarf Red Raspberry	S5
<i>Rumex crispus</i>	Curled Dock	SNA
<i>Salix bebbiana</i>	Bebb's Willow	S5
<i>Salix discolor</i>	Pussy Willow	S5
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	S5
<i>Scirpus microcarpus</i>	Small-fruited Bulrush	S5
<i>Solanum dulcamara</i>	Bittersweet Nightshade	SNA
<i>Solidago canadensis</i>	Canada Goldenrod	S4S5
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5
<i>Spiraea alba</i>	White Meadowsweet	S5
<i>Symphotrichum lateriflorum</i>	Calico Aster	S5
<i>Symphotrichum novi-belgii</i>	New York Aster	S5
<i>Typha latifolia</i>	Broad-leaved Cattail	S5
<i>Viburnum opulus</i>	Highbush Cranberry	S4
<i>Viburnum nudum</i>	Northern Wild Raisin	S5
<i>Vicia cracca</i>	Tufted Vetch	SNA

Table A5.1-4: Plant Lists by Wetland, Continued.

Wetland 6		
Species	Common Name	S-Rank
<i>Alisma triviale</i>	Northern Water Plantain	\$5
<i>Alnus incana</i>	Speckled Alder	\$5
<i>Athyrium filix-femina</i>	Common Lady Fern	\$5
<i>Betula populifolia</i>	Gray Birch	\$5
<i>Carex scoparia</i>	Broom Sedge	\$5
<i>Carex stipata</i>	Awl-fruited Sedge	\$5
<i>Cicuta maculata</i>	Spotted Water-Hemlock	\$5
<i>Doellingeria umbellata</i>	Hairy Flat-top White Aster	\$5
<i>Dryopteris cristata</i>	Crested Wood Fern	\$5
<i>Dryopteris cristata</i>	Crested Wood Fern	\$5
<i>Equisetum arvense</i>	Field Horsetail	\$5
<i>Equisetum sylvaticum</i>	Woodland Horsetail	\$5
<i>Fragaria virginiana</i>	Wild Strawberry	\$5
<i>Fraxinus americana</i>	White Ash	\$5
<i>Galium palustre</i>	Common Marsh Bedstraw	\$5
<i>Glyceria laxa</i>	Northern Mannagrass	\$4?
<i>Juncus effusus</i>	Soft Rush	\$5
<i>Lycopus americanus</i>	American Water Horehound	\$5
<i>Lysimachia ciliata</i>	Fringed Yellow Loosestrife	\$4
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	\$5
<i>Onoclea sensibilis</i>	Sensitive Fern	\$5
<i>Phalaris arundinacea</i>	Reed Canary Grass	\$5
<i>Potentilla simplex</i>	Old Field Cinquefoil	\$5
<i>Prunella vulgaris</i>	Common Self-heal	\$5
<i>Prunus virginiana</i>	Chokecherry	\$5
<i>Ranunculus acris</i>	Common Buttercup	SNA
<i>Rhamnus cathartica</i>	European Buckthorn	SNA
<i>Salix discolor</i>	Pussy Willow	\$5
<i>Sambucus nigra</i> ssp. <i>canadensis</i>	Black Elderberry	\$5
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	\$5
<i>Solanum dulcamara</i>	Bittersweet Nightshade	SNA
<i>Spiraea alba</i>	White Meadowsweet	\$5
<i>Symphotrichum puniceum</i>	Purple-stemmed Aster	\$5
<i>Triadenum fraseri</i>	Fraser's Marsh St. John's-wort	\$5
<i>Typha latifolia</i>	Broad-leaved Cattail	\$5

Wetland 9		
Species	Common Name	S-Rank
<i>Abies balsamea</i>	Balsam Fir	\$5
<i>Acer rubrum</i>	Red Maple	\$5
<i>Alnus incana</i>	Speckled Alder	\$5
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	\$5
<i>Betula populifolia</i>	Gray Birch	\$5
<i>Calamagrostis canadensis</i>	Blue-Joint Reedgrass	\$5
<i>Chamaedaphne calyculata</i>	Leatherleaf	\$5
<i>Cicuta maculata</i>	Spotted Water-Hemlock	\$5
<i>Dryopteris cristata</i>	Crested Shield-Fern	\$5
<i>Equisetum arvense</i>	Field Horsetail	\$5
<i>Galium palustre</i>	Common Marsh Bedstraw	\$5
<i>Ilex verticillata</i>	Common Winterberry	\$5
<i>Kalmia angustifolia</i>	Sheep-Laurel	\$5
<i>Larix laricina</i>	American Larch	\$5
<i>Lycopus americanus</i>	American Water Horehound	\$5
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	\$5
<i>Maianthemum trifolium</i>	Three-Leaf Solomon's-Plume	\$5
<i>Oclemena acuminata</i>	Whorled Aster	\$5
<i>Onoclea sensibilis</i>	Sensitive Fern	\$5
<i>Osmunda cinnamomea</i>	Cinnamon Fern	\$5
<i>Osmunda regalis</i>	Royal Fern	\$5
<i>Populus tremuloides</i>	Quaking Aspen	\$5
<i>Rhododendron groenlandicum</i>	Common Labrador Tea	\$5
<i>Rubus pubescens</i>	Dwarf Red Raspberry	\$5
<i>Salix bebbiana</i>	Bebb's Willow	\$5
<i>Salix discolor</i>	Pussy Willow	\$5
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	\$5
<i>Spiraea alba</i>	White Meadowsweet	\$5
<i>Symphotrichum novi-belgii</i>	New York Aster	\$5
<i>Symphotrichum puniceum</i>	Purple-stemmed Aster	\$5
<i>Trientalis borealis</i>	Northern Starflower	\$5
<i>Typha latifolia</i>	Broad-leaved Cattail	\$5
<i>Viola blanda</i>	Smooth White Violet	\$5
<i>Viola macloskeyi</i>	Smooth White Violet	\$5

Wetland 7		
Species	Common Name	S-Rank
<i>Acer rubrum</i>	Red Maple	\$5
<i>Alnus incana</i>	Speckled Alder	\$5
<i>Amelanchier</i> sp	serviceberry	-
<i>Athyrium filix-femina</i>	Common Lady Fern	\$5
<i>Calamagrostis canadensis</i>	Blue-Joint Reedgrass	\$5
<i>Carex lurida</i>	Sallow Sedge	\$5
<i>Carex stipata</i>	Awl-fruited Sedge	\$5
<i>Equisetum arvense</i>	Field Horsetail	\$5
<i>Galium palustre</i>	Common Marsh Bedstraw	\$5
<i>Impatiens capensis</i>	Spotted Jewel-Weed	\$5
<i>Lysimachia terrestris</i>	Swamp Loosestrife	\$5
<i>Onoclea sensibilis</i>	Sensitive Fern	\$5
<i>Osmunda cinnamomea</i>	Cinnamon Fern	\$5
<i>Quercus rubra</i>	Northern Red Oak	\$5
<i>Phalaris arundinacea</i>	Reed Canary Grass	\$5
<i>Rubus idaeus</i>	Red Raspberry	\$5
<i>Rumex crispus</i>	Curled Dock	SNA
<i>Salix bebbiana</i>	Bebb's Willow	\$5
<i>Scutellaria lateriflora</i>	Mad Dog Skullcap	\$5
<i>Spiraea alba</i>	White Meadowsweet	\$5
<i>Spiraea tomentosa</i>	Hardhack Spiraea	\$5
<i>Typha latifolia</i>	Broad-leaved Cattail	\$5
<i>Vicia cracca</i>	Tufted Vetch	SNA

Wetland 8		
Species	Common Name	S-Rank
<i>Abies balsamea</i>	Balsam Fir	\$5
<i>Acer rubrum</i>	Red Maple	\$5
<i>Alnus incana</i>	Speckled Alder	\$5
<i>Betula populifolia</i>	Gray Birch	\$5
<i>Calamagrostis canadensis</i>	Blue-Joint Reedgrass	\$5
<i>Chamaedaphne calyculata</i>	Leatherleaf	\$5
<i>Eleocharis acicularis</i>	Needle Spikerush	\$5
<i>Galium palustre</i>	Common Marsh Bedstraw	\$5
<i>Iris versicolor</i>	Blueflag	\$5
<i>Juncus effusus</i>	Soft Rush	\$5
<i>Kalmia angustifolia</i>	Sheep-Laurel	\$5
<i>Larix laricina</i>	American Larch	\$5
<i>Lycopus americanus</i>	American Water Horehound	\$5
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	\$5
<i>Maianthemum trifolium</i>	Three-Leaf Solomon's-Plume	\$5
<i>Myrica gale</i>	Sweet Bayberry	\$5
<i>Nemopanthus mucronatus</i>	Mountain Holly	\$5
<i>Oclemena acuminata</i>	Whorled Aster	\$5
<i>Oclemena nemoralis</i>	Bog Aster	\$5
<i>Onoclea sensibilis</i>	Sensitive Fern	\$5
<i>Osmunda cinnamomea</i>	Cinnamon Fern	\$5
<i>Rubus hispida</i>	Bristly Dewberry	\$5
<i>Salix bebbiana</i>	Bebb's Willow	\$5
<i>Sarracenia purpurea</i>	Northern Pitcher Plant	\$5
<i>Spiraea alba</i>	White Meadowsweet	\$5
<i>Triadenum fraseri</i>	Fraser's Marsh St. John's-wort	\$5
<i>Typha latifolia</i>	Broad-leaved Cattail	\$5
<i>Viburnum nudum</i>	Northern Wild Raisin	\$5
<i>Viola blanda</i>	Smooth White Violet	\$5
<i>Viola macloskeyi</i>	Smooth White Violet	\$5

Table A5.1-4: Plant Lists by Wetland, Continued.

Wetland 10		
Species	Common Name	S-Rank
<i>Acer rubrum</i>	Red Maple	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Betula populifolia</i>	Gray Birch	S5
<i>Calamagrostis canadensis</i>	Blue-Joint Reedgrass	S5
<i>Carex folliculata</i>	Northern Long Sedge	S5
<i>Carex trisperma</i>	Three-seeded Sedge	S5
<i>Galium palustre</i>	Common Marsh Bedstraw	S5
<i>Galium palustre</i>	Common Marsh Bedstraw	S5
<i>Ilex verticillata</i>	Common Winterberry	S5
<i>Iris versicolor</i>	Blueflag	S5
<i>Juncus effusus</i>	Soft Rush	S5
<i>Kalmia angustifolia</i>	Sheep-Laurel	S5
<i>Larix laricina</i>	American Larch	S5
<i>Maianthemum trifolium</i>	Three-Leaf Solomon's-Plume	S5
<i>Onoclea sensibilis</i>	Sensitive Fern	S5
<i>Osmunda cinnamomea</i>	Cinnamon Fern	S5
<i>Osmunda regalis</i>	Royal Fern	S5
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5
<i>Pinus strobus</i>	Eastern White Pine	S5
<i>Rhododendron groenlandicum</i>	Common Labrador Tea	S5
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	S5
<i>Symphotrichum novi-belgii</i>	New York Aster	S5
<i>Typha latifolia</i>	Broad-leaved Cattail	S5
<i>Vaccinium macrocarpon</i>	Large Cranberry	S5
<i>Viola macloskeyi</i>	Smooth White Violet	S5

Wetland 13		
Species	Common Name	S-Rank
<i>Acer rubrum</i>	Red Maple	S5
<i>Betula populifolia</i>	Gray Birch	S5
<i>Calamagrostis canadensis</i>	Blue-Joint Reedgrass	S5
<i>Carex stricta</i>	Tussock Sedge	S5
<i>Chamaedaphne calyculata</i>	Leatherleaf	S5
<i>Eupatorium perfoliatum</i>	Common Boneset	S5
<i>Galium palustre</i>	Common Marsh Bedstraw	S5
<i>Iris versicolor</i>	Harlequin Blue Flag	S5
<i>Juncus canadensis</i>	Canada Rush	S5
<i>Lemna minor</i>	Lesser Duckweed	SNA
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	S5
<i>Myrica gale</i>	Sweet Bayberry	S5
<i>Nuphar lutea</i> ssp. <i>Variegata</i>	Variegated Pond-lily	S5
<i>Polygonum amphibium</i>	Water Smartweed	S4S5
<i>Rubus allegheniensis</i>	Allegheny Blackberry	S5
<i>Salix bebbiana</i>	Bebb's Willow	S5
<i>Sambucus racemosa</i>	Red Elderberry	S5
<i>Spiraea alba</i>	White Meadowsweet	S5
<i>Spiraea tomentosa</i>	Hardhack Spiraea	S5
<i>Triadenum fraseri</i>	Fraser's Marsh St. John's-wort	S5
<i>Typha latifolia</i>	Broad-leaved Cattail	S5

Wetland 11		
Species	Common Name	S-Rank
<i>Acer rubrum</i>	Red Maple	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Betula populifolia</i>	Gray Birch	S5
<i>Calamagrostis canadensis</i>	Blue-Joint Reedgrass	S5
<i>Calamagrostis canadensis</i>	Blue-Joint Reedgrass	S5
<i>Calla palustris</i>	Wild Calla	s5
<i>Carex leptalea</i>	Bristly-Stalk Sedge	S5
<i>Carex lurida</i>	Sallow Sedge	S5
<i>Chrysosplenium americanum</i>	American Golden-Saxifrage	S5
<i>Galium palustre</i>	Common Marsh Bedstraw	S5
<i>Glyceria striata</i>	Fowl Manna Grass	S5
<i>Impatiens capensis</i>	Spotted Jewelweed	S5
<i>Juncus effusus</i>	Soft Rush	S5
<i>Larix laricina</i>	American Larch	S5
<i>Maianthemum trifolium</i>	Three-Leaf Solomon's-Plume	S5
<i>Nemopanthus mucronatus</i>	Mountain Holly	S5
<i>Onoclea sensibilis</i>	Sensitive Fern	S5
<i>Osmunda cinnamomea</i>	Cinnamon Fern	S5
<i>Osmunda regalis</i>	Royal Fern	S5
<i>Picea mariana</i>	Black Spruce	S5
<i>Pontederia cordata</i>	Pickeralweed	S5
<i>Rubus pubescens</i>	Dwarf Red Raspberry	S5
<i>Rumex crispus</i>	Curled Dock	SNA
<i>Salix bebbiana</i>	Bebb's Willow	S5
<i>Spiraea alba</i>	White Meadowsweet	S5
<i>Symphotrichum puniceum</i>	Purple-stemmed Aster	S5
<i>Typha latifolia</i>	Broad-leaved Cattail	S5
<i>Typha latifolia</i>	Broad-leaved Cattail	S5

Wetland 13B		
Species	Common Name	S-Rank
<i>Abies balsamea</i>	Balsam Fir	s5
<i>Acer rubrum</i>	Red Maple	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Betula populifolia</i>	Gray Birch	S5
<i>Calamagrostis canadensis</i>	Blue-Joint Reedgrass	S5
<i>Chrysosplenium americanum</i>	American Golden-Saxifrage	S5
<i>Equisetum sylvaticum</i>	Woodland Horsetail	S5
<i>Fraxinus excelsior</i>	European Ash	SNA
<i>Impatiens capensis</i>	Spotted Jewel-Weed	S5
<i>Onoclea sensibilis</i>	Sensitive Fern	S5
<i>Osmunda regalis</i>	Royal Fern	S5
<i>Oxalis stricta</i>	European Wood Sorrel	S5
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5
<i>Picea glauca</i>	White Spruce	S5
<i>Ranunculus acris</i>	Common Buttercup	SNA
<i>Ranunculus repens</i>	Creeping Butter-Cup	SNA
<i>Rubus hispidus</i>	Bristly Dewberry	S5
<i>Salix bebbiana</i>	Bebb's Willow	S5
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	S5
<i>Spiraea alba</i>	White Meadowsweet	S5
<i>Typha latifolia</i>	Broad-leaved Cattail	S5
<i>Viola macloskeyi</i>	Smooth White Violet	S5

Table A5.1-4: Plant Lists by Wetland, Continued.

Wetland 16		
Species	Common Name	S-Rank
<i>Abies balsamea</i>	Balsam Fir	S5
<i>Acer rubrum</i>	Red Maple	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Betula populifolia</i>	Gray Birch	S5
<i>Calamagrostis canadensis</i>	Bluejoint Reed Grass	S5
<i>Carex gynandra</i>	Nodding Sedge	S5
<i>Cicuta maculata</i>	Spotted Water-Hemlock	S5
<i>Equisetum arvense</i>	Field Horsetail	S5
<i>Eupatorium perfoliatum</i>	Common Boneset	S5
<i>Galium palustre</i>	Common Marsh Bedstraw	S5
<i>Glyceria canadensis</i>	Canada Manna Grass	S5
<i>Glyceria striata</i>	Fowl Manna Grass	S5
<i>Ilex verticillata</i>	Common Winterberry	S5
<i>Juncus effusus</i>	Soft Rush	S5
<i>Larix laricina</i>	American Larch	S5
<i>Lycopus americanus</i>	American Water Horehound	S5
<i>Onoclea sensibilis</i>	Sensitive Fern	S5
<i>Picea rubens</i>	Red Spruce	S5
<i>Polygonum sagittatum</i>	Arrow-leaved Smartweed	S5
<i>Populus tremuloides</i>	Quaking Aspen	S5
<i>Rosa</i> sp.	A Rose	NAR
<i>Salix discolor</i>	Pussy Willow	S5
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	S5
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	S5
<i>Scutellaria galericulata</i>	Marsh Skullcap	S5
<i>Spiraea alba</i>	White Meadowsweet	S5
<i>Typha latifolia</i>	Broad-leaved Cattail	S5

Wetland 19		
Species	Common Name	S-Rank
<i>Abies balsamea</i>	Balsam Fir	S5
<i>Acer rubrum</i>	Red Maple	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Betula populifolia</i>	Gray Birch	S5
<i>Galium palustre</i>	Common Marsh Bedstraw	S5
<i>Ilex verticillata</i>	Common Winterberry	S5
<i>Iris versicolor</i>	Blueflag	S5
<i>Juncus effusus</i>	Soft Rush	S5
<i>Kalmia angustifolia</i>	Sheep-Laurel	S5
<i>Larix laricina</i>	American Larch	S5
<i>Lycopus americanus</i>	American Water Horehound	S5
<i>Maianthemum trifolium</i>	Three-Leaf Solomon's-Plume	S5
<i>Nemopanthus mucronatus</i>	Mountain Holly	S5
<i>Onoclea sensibilis</i>	Sensitive Fern	S5
<i>Osmunda regalis</i>	Royal Fern	S5
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5
<i>Ranunculus repens</i>	Creeping Butter-Cup	SNA
<i>Salix bebbiana</i>	Bebb's Willow	S5
<i>Spiraea alba</i>	White Meadowsweet	S5
<i>Symphotrichum puniceum</i>	Purple-stemmed Aster	S5
<i>Typha latifolia</i>	Broad-leaved Cattail	S5
<i>Viburnum nudum</i>	Poosum-Haw Viburnum	S5

Wetland 20		
Species	Common Name	S-Rank
<i>Abies balsamea</i>	Balsam Fir	S5
<i>Acer rubrum</i>	Red Maple	S5
<i>Alnus incana</i>	Speckled Alder	S5
<i>Equisetum arvense</i>	Field Horsetail	S5
<i>Onoclea sensibilis</i>	Sensitive Fern	S5
<i>Picea rubens</i>	Red Spruce	S5
<i>Solanum dulcamara</i>	Bittersweet Nightshade	SNA
<i>Spiraea alba</i>	White Meadowsweet	S5

Botanist: Tom Neily

S-rank - Ranking by the Conservation Data Centre and NatureServe. Status notes (as of August 2019): S1: Extremely rare in province; S2: Rare in the province; S3: Uncommon in province; S4: Widespread, common and apparently Secure in province; S5: SWidespread, abundant and demonstrably secure in province; SNA: Not applicable. (ACDC 2019).

Wetland #5 (WL-5A to WL-5E)

Wetlands #s 5A, 5B, 5C, 5D and 5E are all associated with the Pictou Roundabout. These wetlands are characterized, in part, by various levels of disturbance from the initial construction and ongoing maintenance of the neighbouring roadways (i.e., infill, road salt in runoff water, mowing, altered hydrology from storm water and culverts)

WL-5A

Wetland #5A (WL-5A) is located immediately northeast of the Pictou Roundabout and its boundaries are completely within the NSTIR Highway 106 ROW, as such it was delineated in its entirety and is 1.894 ha in size. WL-5A is a highly disturbed wetland complex consisting of wet meadow and shrub swamp elements. The shrub swamp areas tended to be drier overall and are likely only temporarily flooded during high flows (i.e., spring melt and heavy rain events). These areas tended to be dominated by a shrub overstory of speckled alder combined with two species of willow, Bebb's willow (*Salix bebbiana*) and pussy willow (*Salix discolor*). A herbaceous understory was dominated by sensitive fern (*Onoclea sensibilis*) and fowl manna grass (*Glyceria striata*).

The wet meadow areas were wetter overall and are likely seasonally flooded, as well as temporarily inundated during high flow events. These areas tended to be dominated by near ubiquitous coverage of reed canary grass with only a handful of other herbaceous species such as field horsetail (*Equisetum arvense*), swamp yellow loosestrife (*Lysimachia terrestris*), and rough-stemmed goldenrod (*Solidago rugosa*) persisting in small quantities. No priority or sensitive species were identified in WL-5A during the wetland assessment nor the plant surveys conducted within the wetland.

The wetland has two channelized inlet flows: Watercourse 8 (WC08), and a short ditch located between Highway 106 and Pine Tree Road, but it also receives some storm water runoff from adjacent roadways (i.e., Pictou Roundabout). Watercourse 8 (WC08) is the wetland's primary hydrological source and enters from the east via a culvert under Pine Tree Road north of the Tourist Office. The short ditch enters

WL-5A from the north near the location Swanee Drive and was once connected to Pine Tree Road. The wetland's outlet flow is via a concrete culvert under the Highway 106 Exit of the Pictou Roundabout and into Wetland WL-5B.

WL-5B

Wetland #5B (WL-5B) is located immediately north of the Pictou Roundabout and its boundaries are completely within the NSTIR Highway 106 ROW, as such it was delineated in its entirety and is 1.524 ha in size. Very similar to WL-5A, WL-5B is also a highly disturbed wetland complex consisting of wet meadow and shrub swamp elements. The shrub swamp areas tended to be drier overall and are likely only temporarily flooded during high flows (i.e., spring melt and heavy rain events). These areas tended to be dominated by a shrub overstory of speckled alder, Bebb's willow, and pussy willow. The herbaceous understory dominated was by sensitive fern and field horsetail.

The wet meadow areas were wetter overall than WL-5A and are likely seasonally flooded, as well as temporarily inundated during high flow events. These areas tended to be dominated by near ubiquitous coverage of reed canary grass, with only a handful of other herbaceous species such as spotted jewel-weed (*Impatiens capensis*), rough-stemmed goldenrod, and creeping butter-cup (*Ranunculus repens*) persisting in small quantities. No priority or sensitive species were identified in WL-5B during the wetland assessment nor the plant surveys conducted within the wetland.

The wetland has two channelized inlet flows: Watercourse 8 (WC08), and a short ditch located on the west side of Highway 106, but it also receives some storm water runoff from adjacent roadways (i.e., Pictou Roundabout). Watercourse 8 (WC08) enters from the east via a concrete culvert under the Highway 106 exit from the outflow of WL-5A. This is WL-5B's primary source of hydrology. The short ditch enters the wetland from the north and confluences with Watercourse 8 (WC08). The wetland's outlet flow is via a concrete culvert under the Route 6 (Sunrise Trail) exit of the Pictou Roundabout and into Wetland WL-5C.

WL-5C

Wetland #5C (WL-5C) is located immediately west of the Route 6 Exit off of the Pictou Roundabout and its boundaries are completely within the NSTIR Highway 106 ROW, as such it was delineated in its entirety and is 0.503 ha in size. WL- 5C is characterized as a treed swamp subject to seasonal flooding, as well as is likely temporarily inundated during high flow events.

This wetland tended to be dominated by a treed overstory of trembling aspen (*Populus tremuloides*) and red maple (*Acer rubrum*), but its northern edge is heavily populated by speckled alder. Dominant herbaceous species included spotted jewel-weed and arrow-leaved smartweed (*Polygonum sagittatum*). No priority or sensitive species were identified in WL-5C during the wetland assessment nor the plant surveys conducted within the wetland.

The wetland has only one channelized inlet flow: Watercourse 8 (WC08), but it also receives some storm water runoff from adjacent roadways (i.e., Pictou Roundabout). As with WL-5A and WL-5B, Watercourse 8 (WC08) is WL-5C's primary source of hydrology. Watercourse 8 (WC08) enters wetland WL-5C from the east via a concrete culvert under the Route 6 exit off the Pictou Roundabout from the outflow of WL-5B. The wetland's outflow is a clearly channelized permanent watercourse that continues flowing westward before joining Haliburton Brook near the tidal reach.

WL-5D

Wetland #5D (WL-5D) is located immediately west of the Pictou Roundabout and its boundaries are largely contained within the NSTIR Highway 106 ROW, as such it was delineated in its entirety and is 4.341 ha in size. WL-5D is characterized as a highly disturbed wetland complex comprising of shrub swamp and shallow marsh elements.

The shrub swamp areas are likely seasonally saturated, but temporarily inundated during high flows (i.e., spring melt and heavy rain events). These areas tended to be dominated by a shrub overstory of

speckled alder and Bebb's willow with a herbaceous understory dominated by spotted jewel-weed, cinnamon fern (*Osmunda cinnamomea*), and sensitive fern.

The shallow marsh areas are likely subject to seasonal or even permanent flooding, giving rise to a dominance of herbaceous species such as broad-leaved cattail as well as reed canary grass, sensitive fern, and harlequin blue flag (*Iris versicolor*).

Watercourse 7 (WC07) is the wetland's only channelized inlet flow, but it also receives some amount of storm water runoff from adjacent roadways (i.e., Pictou Roundabout). Watercourse 7 (WC07) enters the wetland from the east via a concrete culvert under a section of the Pictou Roundabout between the Route 6 (Sunrise Trail) exit and the Highway 376 exit. Two outlet flows were noted for WL-5D: one is via a culvert under the drive to the Pictou Administration Building (Municipal Building); the other is a smaller, less channelized outflow located north of the aforementioned Pictou Administration Building. Both outflows continue flowing westward before joining Haliburton Brook near the tidal reach. No federally or provincially listed priority species were identified in WL-5D in 2019.

WL-5E

Wetland #5E (WL-5E) is located immediately southwest of the Pictou Roundabout and its boundaries are largely contained within the NSTIR Highway 106 ROW, as such it was delineated in its entirety and is 0.383 ha in size. WL-5E is characterized as a highly disturbed wetland complex comprising of a shrub swamp and shallow marsh elements.

Similar to other wetlands in and around the Pictou Roundabout, the shrub swamp areas are likely seasonally saturated, but temporarily inundated during high flows (i.e., spring melt and heavy rain events). These areas tended to be dominated by a shrub overstory of speckled alder and Bebb's willow with a herbaceous understory dominated by sensitive fern and marsh forget-me-not (*Myosotis laxa*).

The shallow marsh area is likely subject to seasonal flooding giving rise to a dominance of herbaceous species including broad-leaved cattail, reed canary grass, and wild mint (*Mentha arvensis*).

No priority or sensitive species were identified in WL-5E during the wetland assessment nor the plant surveys conducted within the wetland.

The wetland has one channelized inlet: a short ditch located south of the wetland along the west side of Highway 106. However, it also receives storm water runoff from other adjacent roadways (i.e., Pictou Roundabout). The wetland's outlet flow is via a concrete culvert under the Pictou Roundabout and into the central pond of the roundabout.

Wetland #6 (WL-6)

Wetland #6 (WL-6) is located on the west side of Highway 106, approximately 750 m by road from the Pictou Roundabout, immediately south of Division Road West. Only a portion of WL-6 (roughly 0.096 ha of an approximate total area of 0.200 ha) falls within the re-aligned effluent pipeline route, as much of the remaining wetland area is located on privately-owned land to the west. WL-6 is classified as a shrub

swamp that is subject to seasonal flooding, but likely also temporarily inundation during high flows (i.e., spring melt and heavy rain events).

The relatively small wetland area assessed within the re-aligned pipeline route was dominated by a shrubby overstory comprised of mostly of speckled alder, but also some black elderberry (*Sambucus nigra* spp. *canadensis*). A low shrub layer comprising of white meadowsweet (*Spiraea alba*) and pussy willow was also present. Dominant herbaceous species included reed canary grass and yellow swamp loosestrife. No priority or sensitive species were identified in WL-6 during the wetland assessment nor the plant surveys conducted within the wetland.

There are two channelized input that provide WL-6 with most of its hydrology and both are ditches that convey storm water. The first ditch runs along the south edge of Division Road west, and the second is the Highway 106 ditching located on its west side. WL-6 does not appear to have a channelized output; instead, it seems that storm water simply is impounded against the roadbeds of Division Road West and Highway 106.

Wetland #7 (WL-7)

Wetland #7 (WL-7) is located on the east side of Highway 106, approximately 1,350 m by road from the Pictou Roundabout. Only a very small portion of WL-7 falls within the re-aligned pipeline route (0.010 ha of an approximate total area of 2.8 ha), as much of the wetland area borders Haliburton Brook, which approaches the highway from private land to the east. Accordingly, WL-7 is classified as a flood plain wetland that is subject to seasonal flooding.

The small wetland area assessed within the re-aligned pipeline route was dominated by graminoids, primarily reed canary grass, but also blue-joint reedgrass (*Calamagrostis canadensis*) and sallow sedge (*Carex lurida*) to a lesser degree. Some shrub species were present including speckled alder and Bebb's willow, but they did not form any continuous shrubby canopy but rather were represented by only a few tall shrubs dotted along the stream's edge. No priority or sensitive species were identified in WL-7 during the wetland assessment nor the plant surveys conducted within the wetland.

There are two channelized input flows that provide the assessed portion of WL-7 with its hydrology: Watercourse 9 (WC09), and a ditch flow originating on the west side of Highway 106 that is delivered via a culvert into WL-7. Watercourse 9 (WC09) is a permanent watercourse and represents the wetlands primary source of hydrology, while the ditch flow delivers intermittent storm water.

The wetland outflows immediately south of the assessed area as the wetland narrows to a point where Watercourse 9 (WC09) continues meandering southward parallel to Highway 106, but lacking a flood plain area fringing the stream.

Wetland #8 (WL-8-2019)

Wetland #8 (WL-8-2019) is located on the east side of Highway 106, approximately 1,750 m by road from the Pictou Roundabout. Only a small portion of WL-8 falls within the re-aligned pipeline route (0.0714 ha of an approximate total area of 64.8 ha), as much of the remaining wetland area is located on

privately-owned land to the east. WL-8-2019 is classified as a shrub swamp that is subject to seasonal flooding.

The relatively small wetland area assessed within the re-aligned pipeline route was dominated by a shrubby overstory comprised of speckled alder; however, some tree species do persist including American larch (*Larix laricina*), gray birch (*Betula populifolia*), and red maple. Dominant herbaceous species included blue-joint reedgrass and broad-leaved cattail. No priority or sensitive species were identified in WL-8-2019 during the wetland assessment nor the plant surveys conducted within the wetland.

There is one primary channelized input that provides WL-8 with most of its hydrology: Watercourse 10 (WC10); however, ditching on either side of the wetland also contributes storm water to the wetland area. Watercourse 10 (WC10) originates in a large bog wetland immediately northwest, and across the highway, from WL-8-2019 and was likely contiguous prior to the construction of Highway 106. Watercourse 10 (WC10) enters WL-8 via a culvert and continues flowing eastward before joining with Haliburton Brook approximately 525 m upstream of the assessed area of WL-7.

Wetland #9 (WL9-2019 and WL9A-2019)

Wetland #9 (WL-9) is located on the east side of Highway 106, approximately 2,200 m by road from the Pictou Roundabout. Only two small portions totalling 0.035 ha of an approximate total area of 1.018 ha of WL-9 fall within the re-aligned pipeline route, as much of the remaining wetland area is located on privately-owned land to the east. WL-9A-2019 is classified as a shrub swamp that is subject to seasonal flooding.

The relatively small wetland area assessed within the re-aligned pipeline route was dominated by a shrubby overstory comprised of speckled alder; however, some tree species do persist including American larch, gray birch, and trembling aspen. Dominant herbaceous species included sensitive fern, blue-joint reedgrass, and field horsetail. No priority or sensitive species were identified in WL-9-2019 during the wetland assessment nor the plant surveys conducted within the wetland.

There does not appear to be any channelized input flows into WL-9-2019 beyond the ditching associated with Highway 106. Instead, the primary source of hydrology for this wetland appears to be sub-grade flow under the roadbed of Highway 106 from the large bog wetland on the opposite (west) side of the roadway, as no apparent culverts exist at these locations. The outflow location(s) for WL-9 are located outside the NSTIR Highway 106 ROW, and therefore the pipeline route, and could not be assessed. However, it is likely that the outflow from WL-9 contributes to hydrology of Haliburton Brook.

Wetland #10 (WL-10)

Wetland #10 (WL-10) is located on the east and west sides of Highway 106, approximately 2,475 m by road from the Pictou Roundabout. A small portion of WL-10 (0.1789 ha of an approximate total area of 2.2 ha) falls within the re-aligned pipeline route, as much of the remaining wetland area is located on

the west side of the ROW and on privately-owned land to the east. WL-10 is classified as a wetland complex comprised of deep marsh and shrub swamp elements.

Located immediately adjacent the highway roadbed, the deep marsh area is contiguous with the existing highway ditching and spreads eastward before developing into a flooded, hummocky shrub swamp. The deep marsh area appears to be primarily the result of the Highway 106 roadbed impounding a prior hydrological connection to the larger portion of the wetland on the west side of Highway 106, and is mostly open water with the exception of a fringe of broad-leaved cattail and some clumps in shallower areas.

The shrub swamp area is likely subject to seasonal flooding and exists along the edges of the marsh area and tended to become the more dominant wetland condition with increasing distance from the impounding roadbed. These areas tended to be dominated by a shrub overstory dominated by speckled alder with a herbaceous understory comprising mostly of sensitive fern, cinnamon fern, and three-leaf Solomon's-plume (*Maianthemum trifolium*). The hummocky shrub swamp condition appears to continue eastward and outside the pipeline route. No priority or sensitive species were identified in WL-10 during the wetland assessment nor the plant surveys conducted within the wetland.

Watercourse 11 (WC11) is the wetland's primary source of hydrology and represents its only channelized input. However, ditching on both sides of the wetland also contributes to its hydrology. Watercourse 11 (WC11) is delivered into WL-10 via a culvert stemming from the larger section of WL-10 located on the opposite (west) side of Highway 106. The outflow location(s) for WL-10 are located outside the NSTIR Highway ROW, and therefore the re-aligned pipeline route, and could not be assessed. However, it is likely that the outflow from WL-10 contributes to hydrology of Haliburton Brook.

Wetland #11 (WL-11-2019)

Wetland #11 (WL-11-2019) is located on the east side of Highway 106, approximately 430 m by road north of the Central Caribou Road overpass. A small portion of WL-11 (0.249 ha of a total area of approximately 17.7 ha) falls within the re-aligned pipeline route, as much of the remaining wetland area is located on privately-owned land to the east. WL-11 is classified as a wetland complex consisting of both shallow marsh and shrub swamp elements. Located immediately adjacent the highway roadbed, a shallow marsh area exists and is contiguous with the existing highway ditching, similar to the situation described for WL-10, but to a lesser extent. This area was mostly shallow, open water interspersed with hummocks populated mostly by sensitive fern, fowl manna-grass and soft rush (*Juncus effusus*). Occasionally patches of emergent vegetation such as pickerelweed (*Pontedaria cordata*) and broad-leaved cattail also were present.

The shrub swamp area is likely subject to seasonal flooding and exists along the upper edges of the shallow marsh and tended to become the dominant wetland condition with increasing distance from the impounding roadbed. These areas tended to be dominated by a shrub overstory of speckled alder and mountain holly (*Nemopanthus mucronatus*), however, some tree species do persist including American

larch, gray birch, and red maple. Dominant herbaceous species included sensitive fern, soft rush, and fowl manna-grass. This shrub swamp condition continues eastward and outside the pipeline route. No priority or sensitive species were identified in WL-11-2019 during the wetland assessment nor the plant surveys conducted within the wetland.

There were no channelized input flows observed flowing into the area of WL-11-2019 that was assessed, however, multi-branched internal channels were noted and suggest a channelized input likely exists off-site and to the east. This hydrological input from the east combined with ditch flows are the wetland's primary sources of hydrology. WL-11-2019 outflows via a concrete culvert flowing north-west and into a larger wetland area on the opposite side of Highway 106 (referred to as WL-12A in EARD).

Wetland #13 (WL-13)

Wetland #13 (WL-13) is located on the east side of Highway 106, approximately 875 m by road north of the Central Caribou Road overpass. Only a small portion of WL-13 (0.560 ha of a total area of 4.3233 ha) falls within the re-aligned pipeline route, as much of the remaining wetland area is located on privately-owned land to the east. WL-13 is classified as a marsh wetland consisting of both shallow and deep marsh elements that are subject to permanent flooding. The deep water marsh areas are largely associated with a multi-branched internal channel (Watercourse WC13) which throughout the wetland area results in open, deep water areas occupied only by submergent vegetation such as variegated pond-lily (*Nuphar lutea* ssp. *variegata*) and water smartweed (*Polygonum amphibium*). The shallow marsh area, while still inundated, was occupied a more diverse vegetative community including emergent vegetation such as broad-leaved cattail, graminoids such as blue-joint reedgrass, as well as low shrub species such as sweet bayberry (*Myrica gale*), white meadowsweet, hardhack spiraea (*Spiraea tomentosa*), and leatherleaf (*Chamaedaphne calyculata*). No priority or sensitive species were identified in WL-13 during the wetland assessment nor the plant surveys conducted within the wetland.

There were no channelized input flows observed flowing into the area of WL -13 that was assessed, however, the aforementioned multi-branched internal channel suggest a channelized input likely exists off-site and to the east. This hydrological input from the east, combined with overland runoff from the surrounding landscape, are the wetland's primary sources of hydrology. WL-13 outflows via a concrete culvert at its most southerly edge and flows westward under Highway 106 and into another large wetland area on the opposite side of Highway 106 (referred to as WL-12B in EARD), before the confluence with Mill Brook.

Wetland #13B (WL-13B)

Wetland #13B (WL-13B) is a very small wetland located on the east side of Highway 106, approximately 1,300 m by road north of the Central Caribou Road overpass. Its boundaries are very nearly contained within the NSTIR Highway 106 ROW, with 0.026 ha falling within the re-aligned pipeline route and only 0.00285 ha falling outside the re-aligned pipeline route and on privately-owned land to the east. WL-13B is classified as a shrub swamp subject to seasonal flooding, as well as is likely temporarily inundated during high flow events.

The wetland area assessed was dominated by a shrubby overstory of speckled alder and low shrubby layer of white meadowsweet. Prominent herbaceous species included spotted jewel-weed, sensitive fern, creeping butter-cup, and common buttercup (*Ranunculus acris*). No priority or sensitive species were identified in WL-13B during the wetland assessment nor the plant surveys conducted within the wetland.

Ditch flow from the north combined with a loosely channelized input flow originating at the toe-of-slope of a nearby mowed agricultural field appear to be the primary sources of hydrology for WL-13B. The outflow location for WL-13B becomes channelized (Watercourse WC13B) and exits via a culvert flowing westward and under Highway 106 into a larger wetland (referred to as WL-12B in EARD) that eventually feeds Mill Brook.

Wetland #16 (WL-16)

Wetland #16 (WL-16) is a very small wetland located on the east side of Highway 106, approximately 2,175 m by road north of the Central Caribou Road overpass. Its boundaries are very nearly contained within the NSTIR Highway 106 ROW, with 0.107 ha falling within the re-aligned pipeline route and only 0.048 ha falling outside the re-aligned pipeline route and on privately-owned land to the east. WL-16 is classified as a shrub swamp subject to seasonal flooding, as well as is likely temporarily inundated during high flow events.

The wetland area assessed was dominated by a shrubby overstory comprised mostly of speckled alder and the occasional red maple sapling; however, some trees are present including gray birch, balsam fir (*Abies balsamea*), and red spruce (*Picea rubens*). Prominent herbaceous species included sensitive fern, common wooly bulrush (*Scirpus cyperinus*), Canada manna grass (*Glyceria canadensis*), and fowl manna grass. No priority or sensitive species were identified in WL-16 during the wetland assessment nor the plant surveys conducted within the wetland.

Storm water derived from ditch flow combined with overland runoff from the surrounding uplands appear to be the primary sources of hydrology for WL-16. The outflow location(s), if any, for WL-16 are located outside the NSTIR Highway ROW, and therefore outside the re-aligned pipeline route, and could not be assessed. However, it appears that WL-16 drains away from Highway 106 and to the south-east, where it may contribute hydrology to another nearby wetland (referred to as WL-14 in EARD) located outside the re-aligned pipeline route.

Wetland #19 (WL-19)

Wetland #19 (WL-19) is another very small wetland located on the east side of Highway 106, approximately 75 m by road south of the Central Caribou Road overpass. Its boundaries nearly avoid the NSTIR Highway 106 ROW, with only 0.007 ha of a total area of 0.030 ha falling outside the re-aligned pipeline route and on privately-owned land to the east. WL-19 is classified as a shrub swamp subject to seasonal flooding, as well as is likely temporarily inundated during high flow events.

The wetland area assessed was dominated by a shrubby overstory comprised of mostly of mountain holly and low shrubby layer of white meadowsweet and sheep-laurel (*Kalmia angustifolia*). Prominent herbaceous species included soft rush, sensitive fern, common marsh bedstraw (*Galium palustre*), and creeping butter-cup. No priority or sensitive species were identified in WL-19 during the wetland assessment nor the plant surveys conducted within the wetland.

A loosely channelized input, originating from the ditch of the elevated section of Central Caribou Road, located to the east of WL-19, appears to be the primary source of hydrology for this wetland. The only apparent outflow location for WL-19 is the Highway 106 ditching flowing southward and joining WL-10, although this likely only occurs during high flow events.

Wetland #20 (WL-20)

Wetland #20 (WL-20) is located on the east side of Highway 106, approximately 190 m by road north of the Central Caribou Road overpass. Its boundaries nearly avoid the NSTIR Highway 106 ROW, with only 0.008 ha of a total area of 0.071 ha falling outside the re-aligned pipeline route and on privately-owned land to the east. WL-20 appears to be the result of former excavations or 'borrow-pits' and is classified as highly disturbed shrub swamp that is likely subject to seasonal flooding, as well as is likely temporarily inundated during high flow events.

The small wetland area assessed was dominated by a shrubby overstory comprised of speckled alder and a low shrub layer comprising white meadowsweet. An exotic vine, bittersweet nightshade, was also present and clinging to much of the shrub cover. Prominent herbaceous species included sensitive fern and field horsetail, although neither was very abundant. No priority or sensitive species were identified in WL-20 during the wetland assessment nor the plant surveys conducted within the wetland.

Storm water derived from ditch flow combined with overland runoff from the surrounding uplands appear to be the primary sources of hydrology for WL-20. WL-20 appears isolated as no outflow location was identified.

Tables A5.1-5A and A5.1-5B, below, provide a preliminary assessment of potential wetland functions for wetlands observed, based on field delineation and functional evaluation conducted in spring and summer of 2019.

Table A5.1-5A: Key Wetland Functions for Non-Tidal Wetlands within or Adjacent to the Re-aligned Pipeline Route^{1,2}

Wetland No.	Water Storage & Delay	Stream Flow Support	Water Cooling	Sediment Retention & Stabilization	Phosphorous Retention	Nitrate Removal and Retention	Carbon Sequestration	Organic Nutrient Export	Anadromous Fish Habitat	Resident Fish Habitat	Aquatic Invertebrate Habitat	Amphibian and Turtle Habitat	Waterbird Feeding Habitat	Waterbird Nesting Habitat	Songbird, Raptor & Mammal Habitat	Pollinator Habitat	Native Plant Habitat	Public Use & Recognition
WL-5A		●	●					●		●	●	●	●	●	●	●		●
WL-5B		●	●					●		●	●	●	●	●	●	●	●	●
WL-5C		●	●					●		●	●	●	●					●
WL-5D		●	●	●		●		●		●	●	●	●	●	●	●		●
WL-5E		●	●					●			●	●	●					●
WL-6		●	●				●	●		●	●	●	●					●
WL-7		●	●			●		●		●	●	●	●	●	●	●		●
WL-8		●	●				●	●		●	●	●	●					●
WL-9		●				●		●		●	●	●	●					●
WL-10		●	●			●		●		●	●	●	●					●
WL-11		●	●			●		●		●	●	●	●		●	●		●
WL-13		●	●	●		●	●	●		●	●	●	●	●	●	●	●	●
WL-13B		●	●			●		●					●					●
WL-16		●				●					●		●					●
WL-19	●			●	●	●							●					●
WL-20				●	●	●						●	●	●	●	●		●

Notes:

1. Key wetland functions were designated as those functions that were scored as 'moderate and/or higher' for both wetland function and benefit rating by the WESP-AC assessment.
2. Key wetland functions are based only the assessed portion of each wetland (i.e., within the NSTIR ROW).
 - Indicates the function is present as per 1.

Table A5.1-5B: Key Wetland Functions for Tidal Wetlands within or Adjacent to the Re-aligned Pipeline Route^{1,2}

Wetland No.	Storm Surge Interception	Water Purification	Organic Nutrient Export	Fish Habitat	Waterbird Habitat	Songbird & Habitat	Biodiversity Maintenance	Wetland Stability	Public Use & Recognition
WL-3	●	●		●	●	●		●	●

Notes:

1. Key wetland functions were designated as those functions that were scored as ‘moderate and/or higher’ for both wetland function and benefit rating by the WESP-AC assessment. The functions available for tidal wetlands are different than for non-tidal wetlands.
2. Key wetland functions are based only the assessed portion of each wetland (i.e., within the NSTIR ROW).
 ● Indicates the function is present as noted in 1.

References:

- Adamus, Paul & New Brunswick Dept. of Environment and Local Government. 2018a. Manual for the Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC): Non-tidal Wetlands. Available at: [https://www.researchgate.net/publication/323993053_Manual_for_Wetland_Ecosystem_Services_Protocol_for_Atlantic_Canada_WESP-AC_Non-tidal_Wetlands] and Accessed: July 2019.
- Adamus, Paul & New Brunswick Dept. of Environment and Local Government. 2018b. Manual for the Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC): Tidal Wetlands. Available at: [https://www.researchgate.net/publication/323992875_Manual_for_Wetland_Ecosystem_Services_Protocol_for_Atlantic_Canada_WESP-AC_Tidal_Wetlands] and Accessed: July 2019.
- Northern Pulp Nova Scotia (NPNS). 2019. Northern Pulp Nova Scotia Replacement Effluent Treatment Facility Project Environmental Assessment Registration Document. https://www.novascotia.ca/nse/ea/Replacement_Effluent_Treatment_Facility_Project/
- Nova Scotia Environment (NSE). 2019. Focus Report Terms of Reference for the Preparation of a Focus Report Regarding the Replacement Effluent Treatment Facility Project. https://www.novascotia.ca/nse/ea/Replacement_Effluent_Treatment_Facility_Project/Focus-Report-Terms-of-Reference.pdf
- United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Waterways Experiment Station Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. NTIS No. AD A176 912.

Photo plate A5.1-1 – Wetlands Assessed in 2019

WL-3 – June 17, 2019



WC05 runs through WL-3



WL-5A – June 18, 2019



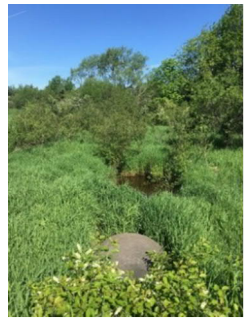
WL-5B – June 18, 2019



48 inch
outflow
culvert



48 inch inflow culvert



24 inch
wooden
culvert
input



WL-5C– June 18, 2019



WC08 outflow:



48 inch input culvert:

WL-5D – June 18, 2019



Culvert input from Roundabout:



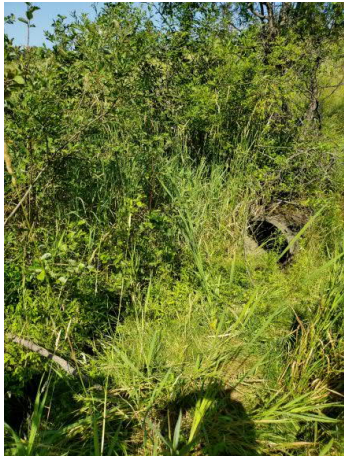
Soil pit



Small outlet stream



WL-5E – July 30, 2019

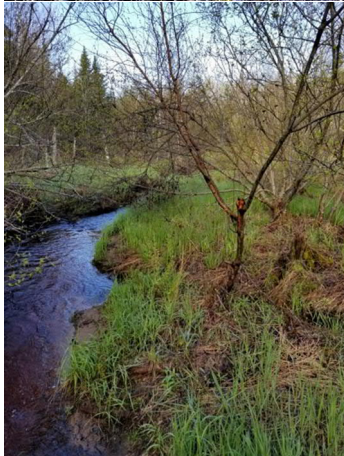


WL-6 – July 30, 2019



WL-7– June 18, 2019

WC09 (Haliburton Brook) flows through WL-7



WL-8-2019 – May 28, 2019



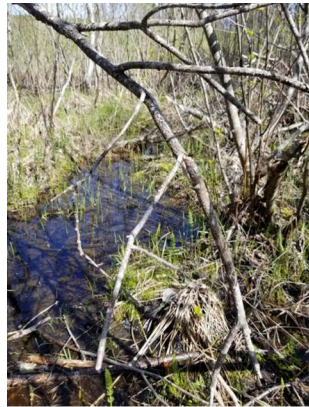
Soil pit in wetland:



WC10



WL-9 – May 28, 2019

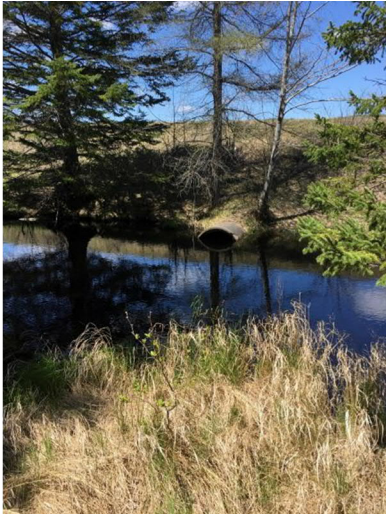


Soil Pit



WL-10 – May 28, 2019

WC11 passes through this wetland



WL-11-2019 – June 4, 2019



WC12 Passes through WL11-2019



Soil Pit



WL-13 – June 4, 2019 (WC13 passes through WL-13)



WL-13B – June 5, 2019



Culvert for WC-13B:

Drainage from agricultural field:



WL-16-2019



WL-19 – May 28, 2019



Soil Pit:



WL-20 – May 28, 2019



Appendix A5.1-A

Wetland Delineation Data Sheets

Note: Plant wetland indicator status ranks are for United States Fish and Wildlife Service (USFWS) Northeast Region and do not always match the Nova Scotia Plant Indicator List.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: WL-3
 Investigator(s): Chris Kennedy Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Footslope Local relief (concave, convex, none): flat
 Slope: 0.0% / 0.0 ° Lat.: 45.670176 Long.: -62.727778 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine 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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Freshwater input from a ditch-fed culvert (hydrology). Road to Jitney trail represents encroachment of fill material (soil). Exotic shrubs and other garden escapees are present along edges and within wetland (Vegetation).	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. _____	0	<input type="checkbox"/> 0.0%	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>4</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>100.0%</u> (A/B)
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>81.5</u> x 1 = <u>81.5</u> FACW species <u>30</u> x 2 = <u>60</u> FAC species <u>7</u> x 3 = <u>21</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>118.5</u> (A) <u>162.5</u> (B) Prevalence Index = B/A = <u>1.371</u>
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Herb Stratum (Plot size: <u>2 m</u>)				
1. <u>Schoenoplectus acutus</u>	25	<input checked="" type="checkbox"/> 21.1%	OBL	
2. <u>Typha latifolia</u>	25	<input checked="" type="checkbox"/> 21.1%	OBL	
3. <u>Typha angustifolia</u>	25	<input checked="" type="checkbox"/> 21.1%	OBL	
4. <u>Phalaris arundinacea</u>	25	<input checked="" type="checkbox"/> 21.1%	FACW	
5. <u>Impatiens capensis</u>	5	<input type="checkbox"/> 4.2%	FACW	
6. <u>Carex stipata</u>	0.5	<input type="checkbox"/> 0.4%	OBL	
7. <u>Spartina alterniflora</u>	5	<input type="checkbox"/> 4.2%	OBL	
8. <u>Galium palustre</u>	1	<input type="checkbox"/> 0.8%	OBL	
9. <u>Solanum dulcamara</u>	2	<input type="checkbox"/> 1.7%	FAC	
10. <u>Calystegia sepium</u>	5	<input type="checkbox"/> 4.2%	FAC	
118.5 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-3

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		
0-30	5YR	3/2					Silty Clay	mixed organics

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

Coast Prairie Redox (A16)
 Dark Surface (S7)
 Iron Manganese Masses (F12)
 Very Shallow Dark Surface (TF12)
 Other (Explain in Remarks)

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

Restrictive Layer (if observed):
 Type: None encountered
 Depth (inches): N/A

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"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" 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 checked="" type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>4</u>	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>0</u>	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>0</u>	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: WL-5A
 Investigator(s): Chris Kennedy Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): concave
 Slope: 0.0% / 0.0 ° Lat.: 45.683817 Long.: -62.727807 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Swamp - shrub

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Wetland is a shrub swamp with wet meadow characteristics and highly disturbed. Edges are regularly mowed on roundabout side (Vegetation), road and other fill material within wetland (soil), and moderate stormwater inputs (hydrology)	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
Tree Stratum (Plot size: 10 m)				Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
1. Salix bebbiana	10	<input checked="" type="checkbox"/> 90.9%	FACW	
2. Picea rubens	0.5	<input type="checkbox"/> 4.5%	FACU	
3. Acer rubrum	0.5	<input type="checkbox"/> 4.5%	FAC	
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	11	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>6</u> x 1 = <u>6</u> FACW species <u>116.5</u> x 2 = <u>233</u> FAC species <u>2.5</u> x 3 = <u>7.5</u> FACU species <u>10.5</u> x 4 = <u>42</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>135.5</u> (A) <u>288.5</u> (B) Prevalence Index = B/A = <u>2.129</u>
1. Prunus virginiana	5	<input type="checkbox"/> 16.1%	FACU	
2. Alnus incana	20	<input checked="" type="checkbox"/> 64.5%	FACW	
3. Rosa multiflora	5	<input type="checkbox"/> 16.1%	FACU	
4. Spiraea alba	0.5	<input type="checkbox"/> 1.6%	FACW	
5. Rubus hispidus	0.5	<input type="checkbox"/> 1.6%	FACW	
	31	= Total Cover		
Herb Stratum (Plot size: 2 m)				Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. Phalaris arundinacea	80	<input checked="" type="checkbox"/> 85.6%	FACW	
2. Solidago rugosa	2	<input type="checkbox"/> 2.1%	FAC	
3. Carex intumescens	0.5	<input type="checkbox"/> 0.5%	FACW	
4. Equisetum sylvaticum	5	<input type="checkbox"/> 5.3%	FACW	
5. Persicaria hydroper	0.5	<input type="checkbox"/> 0.5%	OBL	
6. Carex lurida	0.5	<input type="checkbox"/> 0.5%	OBL	
7. Lysimachia terrestris	5	<input type="checkbox"/> 5.3%	OBL	
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
	93.5	= Total Cover		
Woody Vine Stratum (Plot size: _____)				Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-5A

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							Muck	black	
2-12	7.5YR	4/2	98	7.5YR	5/8	2	C	PL	Loam
12-16	10YR	6/1	95	7.5YR	5/8	5	C		Loam
16-36	5YR	4/2	98	7.5YR	5/8	2	C		Loam

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):
 Type: None encountered
 Depth (inches): N/A

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 type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>26</u>	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>20</u>	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: WL-5B
 Investigator(s): Chris Kennedy Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): concave
 Slope: 0.0% / 0.0 ° Lat.: 45.684747 Long.: -62.730116 Datum: NAD83
 Soil Map Unit Name/Type: _____ Wetland Type: Swamp - shrub

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Wetland is a shrub swamp with wet meadow characteristics and highly disturbed. Edges are regularly mowed on roundabout side (Vegetation), road and other fill material within wetland (soil), and moderate stormwater inputs (hydrology).	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	
Tree Stratum (Plot size: 10 m)				Dominance Test worksheet: Number of Dominant Species That are OBL, FACW, or FAC: <u>5</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>100.0%</u> (A/B)
1. <u>Salix bebbiana</u>	10	<input checked="" type="checkbox"/> 66.7%	FACW	
2. <u>Acer rubrum</u>	5	<input checked="" type="checkbox"/> 33.3%	FAC	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
15 = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>1.5</u> x 1 = <u>1.5</u> FACW species <u>115.5</u> x 2 = <u>231</u> FAC species <u>20</u> x 3 = <u>60</u> FACU species <u>5.5</u> x 4 = <u>22</u> UPL species <u>0.5</u> x 5 = <u>2.5</u> Column Totals: <u>143</u> (A) <u>317</u> (B) Prevalence Index = B/A = <u>2.217</u>
Sapling/Shrub Stratum (Plot size: 5 m)				
1. <u>Alnus incana</u>	60	<input checked="" type="checkbox"/> 91.6%	FACW	
2. <u>Rubus allegheniensis</u>	5	<input type="checkbox"/> 7.6%	FACU	
3. <u>Prunus virginiana</u>	0.5	<input type="checkbox"/> 0.8%	FACU	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
65.5 = Total Cover				
Herb Stratum (Plot size: 2 m)				
1. <u>Solidago rugosa</u>	5	<input type="checkbox"/> 8.0%	FAC	
2. <u>Impatiens capensis</u>	15	<input checked="" type="checkbox"/> 24.0%	FACW	
3. <u>Equisetum arvense</u>	5	<input type="checkbox"/> 8.0%	FAC	
4. <u>Phalaris arundinacea</u>	30	<input checked="" type="checkbox"/> 48.0%	FACW	
5. <u>Ranunculus repens</u>	5	<input type="checkbox"/> 8.0%	FAC	
6. <u>Carex arctata</u>	0.5	<input type="checkbox"/> 0.8%	UPL	
7. <u>Carex scoparia</u>	0.5	<input type="checkbox"/> 0.8%	FACW	
8. <u>Lysimachia terrestris</u>	0.5	<input type="checkbox"/> 0.8%	OBL	
9. <u>Chelone glabra</u>	0.5	<input type="checkbox"/> 0.8%	OBL	
10. <u>Persicaria sagittata</u>	0.5	<input type="checkbox"/> 0.8%	OBL	
62.5 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-5B

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		
0-1							Muck	Black organics
1-3	7.5YR	3/2	100				Silt Loam	
3-13	7.5YR	4/2	100				Silt Loam	
13-15	10YR	7/1	95	7.5YR	5/8	5	Sandy Loam	
15-36	5YR	4/2					Loam	

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

Coast Prairie Redox (A16)
 Dark Surface (S7)
 Iron Manganese Masses (F12)
 Very Shallow Dark Surface (TF12)
 Other (Explain in Remarks)

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

Restrictive Layer (if observed):
 Type: None encountered
 Depth (inches): N/A

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 type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe) Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>22</u>	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: WL-5C
 Investigator(s): Chris Kennedy Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): convex
 Slope: 0.0% / 0.0 ° Lat.: 45.685067 Long.: -62.732702 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Swamp - shrub

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Treed Swamp with flood plain characteristics. Vegetation disturbed due to proximity to roadway, evidence of ATV use and presence of road fill within wetland (soil disturbance) and strong stormwater influence from ditching and catchment (hydrology).	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Populus tremuloides</u>	5	<input checked="" type="checkbox"/> 50.0%	FACU	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>80.0%</u> (A/B)
2. <u>Acer rubrum</u>	5	<input checked="" type="checkbox"/> 50.0%	FAC	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
10 = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>32.5</u> x 1 = <u>32.5</u> FACW species <u>70</u> x 2 = <u>140</u> FAC species <u>18.5</u> x 3 = <u>55.5</u> FACU species <u>16</u> x 4 = <u>64</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>137</u> (A) <u>292</u> (B) Prevalence Index = B/A = <u>2.131</u>
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)				
1. <u>Alnus incana</u>	45	<input checked="" type="checkbox"/> 80.4%	FACW	
2. <u>Rosa multiflora</u>	10	<input type="checkbox"/> 17.9%	FACU	
3. <u>Populus tremuloides</u>	0.5	<input type="checkbox"/> 0.9%	FACU	
4. <u>Crataegus monogyna</u>	0.5	<input type="checkbox"/> 0.9%	FACU	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
56 = Total Cover				
Herb Stratum (Plot size: <u>2 m</u>)				
1. <u>Impatiens capensis</u>	25	<input checked="" type="checkbox"/> 35.2%	FACW	
2. <u>Persicaria sagittata</u>	25	<input checked="" type="checkbox"/> 35.2%	OBL	
3. <u>Ranunculus acris</u>	5	<input type="checkbox"/> 7.0%	FAC	
4. <u>Ranunculus repens</u>	5	<input type="checkbox"/> 7.0%	FAC	
5. <u>Geum aleppicum</u>	3	<input type="checkbox"/> 4.2%	FAC	
6. <u>Carex arcta</u>	1	<input type="checkbox"/> 1.4%	OBL	
7. <u>Lycopus americanus</u>	1	<input type="checkbox"/> 1.4%	OBL	
8. <u>Solidago rugosa</u>	0.5	<input type="checkbox"/> 0.7%	FAC	
9. <u>Glyceria striata</u>	5	<input type="checkbox"/> 7.0%	OBL	
10. <u>Lysimachia terrestris</u>	0.5	<input type="checkbox"/> 0.7%	OBL	
71 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-5C

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		
0-10	7.5YR	4/2	99	7.5YR	5/8	1		Silt Loam
10-18	7.5YR	4/2	97	7.5YR	5/8	3		Sandy Loam
18-21	10YR	7/1	60	7.5YR	5/8	40		Sandy Loam
21-36	5YR	4/2						Silt Loam

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

Coast Prairie Redox (A16)
 Dark Surface (S7)
 Iron Manganese Masses (F12)
 Very Shallow Dark Surface (TF12)
 Other (Explain in Remarks)

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

Restrictive Layer (if observed):
 Type: Not encountered
 Depth (inches): N/A

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 checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input checked="" 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 checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>8</u>	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe) Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>22</u>	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 18-Jun-19
 Applicant/Owner: NPNS Sampling Point: WL-5D
 Investigator(s): Chris Kennedy Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): flat
 Slope: 0.0% / 0.0 ° Lat.: 45.683560 Long.: -62.732972 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Swamp - shrub

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Wetland is a shrub swamp with shallow marsh characteristics. Edges are regularly mowed on roundabout side (Vegetation), road and fill material from the municipal building within wetland as well as evidence of ATV use (soil disturbance), and moderate stormwater inputs (hydrology).	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
<u>Tree Stratum (Plot size: 10 m)</u>				
1. <u>Acer rubrum</u>	<u>0.5</u>	<input type="checkbox"/> 100.0%	<u>FAC</u>	Number of Dominant Species That are OBL, FACW, or FAC: <u>4</u> (A)
2. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
4. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
	<u>0.5</u>	= Total Cover		
<u>Sapling/Shrub Stratum (Plot size: 5 m)</u>				Prevalence Index worksheet:
1. <u>Salix bebbiana</u>	<u>10</u>	<input checked="" type="checkbox"/> 50.0%	<u>FACW</u>	Total % Cover of: Multiply by:
2. <u>Acer rubrum</u>	<u>5</u>	<input checked="" type="checkbox"/> 25.0%	<u>FAC</u>	OBL species <u>60.5</u> x 1 = <u>60.5</u>
3. <u>Alnus incana</u>	<u>5</u>	<input checked="" type="checkbox"/> 25.0%	<u>FACW</u>	FACW species <u>55</u> x 2 = <u>110</u>
4. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	FAC species <u>20.5</u> x 3 = <u>61.5</u>
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	FACU species <u>0</u> x 4 = <u>0</u>
	<u>20</u>	= Total Cover		UPL species <u>0</u> x 5 = <u>0</u>
<u>Herb Stratum (Plot size: 2 m)</u>				Column Totals: <u>136</u> (A) <u>232</u> (B)
1. <u>Typha latifolia</u>	<u>60</u>	<input checked="" type="checkbox"/> 51.9%	<u>OBL</u>	Prevalence Index = B/A = <u>1.706</u>
2. <u>Phalaris arundinacea</u>	<u>20</u>	<input type="checkbox"/> 17.3%	<u>FACW</u>	
3. <u>Onoclea sensibilis</u>	<u>20</u>	<input type="checkbox"/> 17.3%	<u>FACW</u>	
4. <u>Rumex crispus</u>	<u>5</u>	<input type="checkbox"/> 4.3%	<u>FAC</u>	
5. <u>Solanum dulcamara</u>	<u>10</u>	<input type="checkbox"/> 8.7%	<u>FAC</u>	
6. <u>Iris versicolor</u>	<u>0.5</u>	<input type="checkbox"/> 0.4%	<u>OBL</u>	
7. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
8. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
9. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
10. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
	<u>115.5</u>	= Total Cover		
<u>Woody Vine Stratum (Plot size: _____)</u>				
1. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
2. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
	<u>0</u>	= Total Cover		

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is > 50%
 3 - Prevalence Index is ≤ 3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

SOIL

Sampling Point: **WL-5D**

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		
0-16								Muck	
16-26	7.5YR	2.5/1	100					Silt Loam	
26-31	7.5YR	6/1	99	7.5YR	6/8	1		Loam	

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 type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):
 Type: _____
 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 checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>8</u>	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>0</u>	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>0</u>	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: WL-5E
 Investigator(s): Vanessa Graves, Tom Neily Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): concave
 Slope: 0.0% / 0.0 ° Lat.: 45.681052 Long.: -62.732498 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Swamp - shrub

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Wetland is a shrub swamp with wet meadow characteristics and highly disturbed. Edges are regularly mowed on roundabout side (Vegetation), road and other fill material within wetland (soil), and moderate stormwater inputs (hydrology).	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. _____	0	<input type="checkbox"/> 0.0%	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>4</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>100.0%</u> (A/B)
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>30</u> x 1 = <u>30</u> FACW species <u>90</u> x 2 = <u>180</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>120</u> (A) <u>210</u> (B) Prevalence Index = B/A = <u>1.750</u>
<u>Sapling/Shrub Stratum (Plot size: <u>5 m</u>)</u>				
1. <u>Alnus incana</u>	10	<input checked="" type="checkbox"/> 50.0%	FACW	
2. <u>Salix bebbiana</u>	10	<input checked="" type="checkbox"/> 50.0%	FACW	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
20 = Total Cover				
<u>Herb Stratum (Plot size: <u>2 m</u>)</u>				
1. <u>Typha latifolia</u>	10	<input type="checkbox"/> 10.0%	OBL	
2. <u>Phalaris arundinacea</u>	40	<input checked="" type="checkbox"/> 40.0%	FACW	
3. <u>Mentha arvensis</u>	30	<input checked="" type="checkbox"/> 30.0%	FACW	
4. _____	10	<input type="checkbox"/> 10.0%	OBL	
5. _____	10	<input type="checkbox"/> 10.0%	OBL	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
100 = Total Cover				
<u>Woody Vine Stratum (Plot size: _____)</u>				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-5E

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		
0-6	2.5YR	3/2						loose with roots
6-18	5YR	4/2						saturated
18-25	10Y	6/1						with rust and black flecks

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):

Type: Not encountered

Depth (inches): N/A

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"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): 6

Water Table Present? Yes No Depth (inches): 13

Saturation Present? Yes No Depth (inches): 6

(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. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: WL-6
 Investigator(s): Vanessa Graves, Tom Neily Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): flat
 Slope: 0.0% / 0.0 ° Lat.: 45.689875 Long.: -62.729399 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Swamp - shrub

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Soil disturbed from road fill and agricultural field intringes, hydrology disturbed from stormwater influence.	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. _____	_____	<input type="checkbox"/> 0.0%	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. _____	_____	<input type="checkbox"/> 0.0%	_____	
3. _____	_____	<input type="checkbox"/> 0.0%	_____	
4. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
<u>0</u> = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>20</u> x 1 = <u>20</u> FACW species <u>150</u> x 2 = <u>300</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>170</u> (A) <u>320</u> (B) Prevalence Index = B/A = <u>1.882</u>
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)				
1. <u>Alnus incana</u>	<u>70</u>	<input checked="" type="checkbox"/> 70.0%	<u>FACW</u>	
2. <u>Salix discolor</u>	<u>10</u>	<input type="checkbox"/> 10.0%	<u>FACW</u>	
3. <u>Sambucus nigra ssp. canadensis</u>	<u>5</u>	<input type="checkbox"/> 5.0%	<u>FACW</u>	
4. <u>Spiraea alba</u>	<u>15</u>	<input type="checkbox"/> 15.0%	<u>FACW</u>	
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
<u>100</u> = Total Cover				
Herb Stratum (Plot size: <u>2 m</u>)				
1. <u>Equisetum sylvaticum</u>	<u>10</u>	<input type="checkbox"/> 12.5%	<u>FACW</u>	
2. <u>Phalaris arundinacea</u>	<u>30</u>	<input checked="" type="checkbox"/> 37.5%	<u>FACW</u>	
3. <u>Lysimachia terrestris</u>	<u>20</u>	<input checked="" type="checkbox"/> 25.0%	<u>OBL</u>	
4. <u>Onoclea sensibilis</u>	<u>10</u>	<input type="checkbox"/> 12.5%	<u>FACW</u>	
5. _____	<u>10</u>	<input type="checkbox"/> 12.5%	_____	
6. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
7. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
8. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
9. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
10. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
<u>80</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
2. _____	<u>0</u>	<input type="checkbox"/> 0.0%	_____	
<u>0</u> = Total Cover				
Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-6

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		
0-5	5YR	3/3						organics and roots
5-7	7.5YR	5/2						saturation at 5 inches
7-20	7.5YR	4/3						

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):
 Type: Not encountered
 Depth (inches): N/A

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 checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input checked="" 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 checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>2</u>	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe) Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>5</u>	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: WL-7
 Investigator(s): Chris Kennedy Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): flat
 Slope: 0.0% / 0.0 ° Lat.: 45.695260 Long.: -62.726775 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Floodplain

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Hydrology disturbed by stormwater influence.	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. _____	0	<input type="checkbox"/> 0.0%	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>10.5</u> x 1 = <u>10.5</u> FACW species <u>110.5</u> x 2 = <u>221</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>1</u> x 4 = <u>4</u> UPL species <u>1</u> x 5 = <u>5</u> Column Totals: <u>123</u> (A) <u>240.5</u> (B) Prevalence Index = B/A = <u>1.955</u>
1. <u>Salix bebbiana</u>	5	<input checked="" type="checkbox"/> 30.3%	FACW	
2. <u>Alnus incana</u>	10	<input checked="" type="checkbox"/> 60.6%	FACW	
3. <u>Quercus rubra</u>	0.5	<input type="checkbox"/> 3.0%	FACU	
4. <u>Spiraea tomentosa</u>	0.5	<input type="checkbox"/> 3.0%	FACW	
5. <u>Rubus idaeus</u>	0.5	<input type="checkbox"/> 3.0%	FACU	
	16.5	= Total Cover		
Herb Stratum (Plot size: <u>2 m</u>)				
1. <u>Onoclea sensibilis</u>	5	<input type="checkbox"/> 4.7%	FACW	
2. <u>Phalaris arundinacea</u>	90	<input checked="" type="checkbox"/> 84.5%	FACW	
3. <u>Carex lurida</u>	4	<input type="checkbox"/> 3.8%	OBL	
4. <u>Vicia cracca</u>	1	<input type="checkbox"/> 0.9%	UPL	
5. <u>Lysimachia terrestris</u>	0.5	<input type="checkbox"/> 0.5%	OBL	
6. <u>Typha latifolia</u>	0.5	<input type="checkbox"/> 0.5%	OBL	
7. <u>Carex stipata</u>	0.5	<input type="checkbox"/> 0.5%	OBL	
8. <u>Calamagrostis canadensis</u>	5	<input type="checkbox"/> 4.7%	OBL	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
	106.5	= Total Cover		
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
	0	= Total Cover		

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is > 50%

3 - Prevalence Index is ≤ 3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

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

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-7

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		
0-4	7.5YR	3/2	100				Silt Loam	with organics
4-10	7.5YR	4/1	98	5YR	4/7	2	Silt	
10-36	7.5YR	3/1	98	5YR	4/7	2	Sandy Loam	

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

Coast Prairie Redox (A16)
 Dark Surface (S7)
 Iron Manganese Masses (F12)
 Very Shallow Dark Surface (TF12)
 Other (Explain in Remarks)

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

Restrictive Layer (if observed):
 Type: Not encountered
 Depth (inches): N/A

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"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input checked="" 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 checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>6</u>	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>13</u>	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>8</u>	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 28-May-19
 Applicant/Owner: NPNS Sampling Point: WL-8-2019
 Investigator(s): Chris Kennedy, Kelly Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): concave
 Slope: 0.0% / 0.0 ° Lat.: 45.697830 Long.: -62.724630 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Swamp - shrub

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Soil disturbed from road fill intringes, hydrology disturbed due to impounding by roadway and stormwater influence.	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
<u>Tree Stratum (Plot size: 10 m)</u>				
1. <u>Larix laricina</u>	15	<input checked="" type="checkbox"/> 60.0%	FACW	Number of Dominant Species That are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. <u>Betula populifolia</u>	5	<input checked="" type="checkbox"/> 20.0%	FAC	
3. <u>Acer rubrum</u>	5	<input checked="" type="checkbox"/> 20.0%	FAC	
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	25	= Total Cover		
<u>Sapling/Shrub Stratum (Plot size: 5 m)</u>				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>57.5</u> x 1 = <u>57.5</u> FACW species <u>105.5</u> x 2 = <u>211</u> FAC species <u>10.5</u> x 3 = <u>31.5</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>173.5</u> (A) <u>300</u> (B) Prevalence Index = B/A = <u>1.729</u>
1. <u>Alnus incana</u>	80	<input checked="" type="checkbox"/> 83.8%	FACW	
2. <u>Spiraea alba</u>	10	<input type="checkbox"/> 10.5%	FACW	
3. <u>Myrica gale</u>	5	<input type="checkbox"/> 5.2%	OBL	
4. <u>Acer rubrum</u>	0.5	<input type="checkbox"/> 0.5%	FAC	
5. _____	0	<input type="checkbox"/> 0.0%		
	95.5	= Total Cover		
<u>Herb Stratum (Plot size: 2 m)</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Sarracenia purpurea</u>	10	<input type="checkbox"/> 18.9%	OBL	
2. <u>Iris versicolor</u>	2	<input type="checkbox"/> 3.8%	OBL	
3. <u>Calamagrostis canadensis</u>	25	<input checked="" type="checkbox"/> 47.2%	OBL	
4. <u>Rubus hispida</u>	0.5	<input type="checkbox"/> 0.9%	FACW	
5. <u>Viola macloskeyi</u>	0.5	<input type="checkbox"/> 0.9%	OBL	
6. <u>Typha latifolia</u>	15	<input checked="" type="checkbox"/> 28.3%	OBL	
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
	53	= Total Cover		
<u>Woody Vine Stratum (Plot size: _____)</u>				Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **WL-8-2019**

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		
0-10							Peat	Peat with mixed organics
10-18	10YR	4/2	100				Sandy Clay Loam	hard packed, refusal at 18 inches.

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :	
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Dark Surface (S7)
<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"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

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

Restrictive Layer (if observed):
 Type: Hard packed soil
 Depth (inches): 18

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 checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" 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 checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>12</u>	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>0</u>	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>0</u>	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 28-May-19
 Applicant/Owner: NPNS Sampling Point: WL-9-2019
 Investigator(s): Chris Kennedy, Kelly Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): concave
 Slope: 0.0% / 0.0 ° Lat.: 45.701121 Long.: -62.721264 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Swamp - shrub

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Soil disturbed from road fill infringement, hydrology disturbed due to impounding by roadway and stormwater influence.	

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	
<u>Tree Stratum (Plot size: 10 m)</u>				Dominance Test worksheet: Number of Dominant Species That are OBL, FACW, or FAC: <u>5</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>100.0%</u> (A/B)
1. <u>Larix laricina</u>	<u>20</u>	<input checked="" type="checkbox"/> 65.6%	FACW	
2. <u>Betula populifolia</u>	<u>5</u>	<input type="checkbox"/> 16.4%	FAC	
3. <u>Acer rubrum</u>	<u>0.5</u>	<input type="checkbox"/> 1.6%	FAC	
4. <u>Populus tremuloides</u>	<u>5</u>	<input type="checkbox"/> 16.4%	FACU	
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
<u>30.5</u> = Total Cover				
<u>Sapling/Shrub Stratum (Plot size: 5 m)</u>				
1. <u>Abies balsamea</u>	<u>0.5</u>	<input type="checkbox"/> 0.6%	FAC	
2. <u>Alnus incana</u>	<u>80</u>	<input checked="" type="checkbox"/> 93.0%	FACW	
3. <u>Salix bebbiana</u>	<u>5</u>	<input type="checkbox"/> 5.8%	FACW	
4. <u>Spiraea alba</u>	<u>0.5</u>	<input type="checkbox"/> 0.6%	FACW	
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
<u>86</u> = Total Cover				
<u>Herb Stratum (Plot size: 2 m)</u>				
1. <u>Equisetum arvense</u>	<u>10</u>	<input checked="" type="checkbox"/> 21.7%	FAC	
2. <u>Onoclea sensibilis</u>	<u>15</u>	<input checked="" type="checkbox"/> 32.6%	FACW	
3. <u>Calamagrostis canadensis</u>	<u>15</u>	<input checked="" type="checkbox"/> 32.6%	OBL	
4. <u>Viola macloskeyi</u>	<u>5</u>	<input type="checkbox"/> 10.9%	OBL	
5. <u>Scirpus cyperinus</u>	<u>1</u>	<input type="checkbox"/> 2.2%	OBL	
6. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
7. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
8. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
9. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
10. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
<u>46</u> = Total Cover				
<u>Woody Vine Stratum (Plot size: _____)</u>				
1. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
2. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
<u>0</u> = Total Cover				
Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>21</u> x 1 = <u>21</u> FACW species <u>120.5</u> x 2 = <u>241</u> FAC species <u>16</u> x 3 = <u>48</u> FACU species <u>5</u> x 4 = <u>20</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>162.5</u> (A) <u>330</u> (B) Prevalence Index = B/A = <u>2.031</u>				
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)				
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **WL-9-2019**

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		
0-5							Mucky Peat	
5-14	5YR	4/4	90	5YR	4/2	10	Sandy Loam	with gravel, possible road fill, refusal 14 in.

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

Coast Prairie Redox (A16)
 Dark Surface (S7)
 Iron Manganese Masses (F12)
 Very Shallow Dark Surface (TF12)
 Other (Explain in Remarks)

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

Restrictive Layer (if observed):
 Type: Gravel
 Depth (inches): 14

Hydric Soil Present? Yes No

Remarks:
 Histic epipedon with red parent material. Fill from roadway present in soil pit.

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 checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input checked="" 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 checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>3</u>	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>0</u>	
Saturation Present? (includes capillary fringe) Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>0</u>	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 28-May-19
 Applicant/Owner: NPNS Sampling Point: WL-10
 Investigator(s): Chris Kennedy, Kelly Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): _____
 Slope: 0.0% / 0.0 ° Lat.: 45.703278 Long.: -62.719240 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Marsh/Swamp

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Swamp with marsh characteristics due to impounding of deep water in the ditch along Hwy 106. Soil is disturbed by roadfill.	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Larix laricina</u>	5	<input type="checkbox"/> 19.6%	FACW	Number of Dominant Species That are OBL, FACW, or FAC: <u>5</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>100.0%</u> (A/B)
2. <u>Acer rubrum</u>	20	<input checked="" type="checkbox"/> 78.4%	FAC	
3. <u>Pinus strobus</u>	0.5	<input type="checkbox"/> 2.0%	FACU	
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	25.5	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)				Prevalence Index worksheet:
1. <u>Alnus incana</u>	80	<input checked="" type="checkbox"/> 98.2%	FACW	Total % Cover of: Multiply by: OBL species <u>18</u> x 1 = <u>18</u> FACW species <u>110</u> x 2 = <u>220</u> FAC species <u>21</u> x 3 = <u>63</u> FACU species <u>0.5</u> x 4 = <u>2</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>149.5</u> (A) <u>303</u> (B) Prevalence Index = B/A = <u>2.027</u>
2. <u>Acer rubrum</u>	0.5	<input type="checkbox"/> 0.6%	FAC	
3. <u>Ledum groenlandicum</u>	0.5	<input type="checkbox"/> 0.6%	OBL	
4. <u>Kalmia angustifolia</u>	0.5	<input type="checkbox"/> 0.6%	FAC	
5. _____	0	<input type="checkbox"/> 0.0%		
	81.5	= Total Cover		
Herb Stratum (Plot size: <u>2 m</u>)				
1. <u>Osmundastrum cinnamomeum</u>	10	<input checked="" type="checkbox"/> 23.5%	FACW	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Viola macloskeyi</u>	5	<input type="checkbox"/> 11.8%	OBL	
3. <u>Iris versicolor</u>	0.5	<input type="checkbox"/> 1.2%	OBL	
4. <u>Onoclea sensibilis</u>	15	<input checked="" type="checkbox"/> 35.3%	FACW	
5. <u>Carex folliculata</u>	0.5	<input type="checkbox"/> 1.2%	OBL	
6. <u>Typha latifolia</u>	0.5	<input type="checkbox"/> 1.2%	OBL	
7. <u>Maianthemum trifolium</u>	10	<input checked="" type="checkbox"/> 23.5%	OBL	
8. <u>Vaccinium macrocarpon</u>	0.5	<input type="checkbox"/> 1.2%	OBL	
9. <u>Carex trisperma</u>	0.5	<input type="checkbox"/> 1.2%	OBL	
10. _____	0	<input type="checkbox"/> 0.0%		
	42.5	= Total Cover		
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%		Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
2. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-10

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		
0-4							Muck	
4-14	7.5YR	4/1	95	5YR	4/1	5	Sandy Clay	

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input checked="" type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):

Type: Not encountered

Depth (inches): N/A

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 checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" 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 checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): 40

Water Table Present? Yes No Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes No Depth (inches): 0

Wetland Hydrology Present? Yes No

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 04-Jun-19
 Applicant/Owner: NPNS Sampling Point: WL-11-2019
 Investigator(s): Chris Kennedy, Kelly Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): concave
 Slope: 0.0% / 0.0 ° Lat.: 45.708870 Long.: -62.713570 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Swamp - shrub

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Soil disturbed from road fill, hydrology disturbed from stormwater influences and impounding by roadway.	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
<u>Tree Stratum (Plot size: 10 m)</u>				
1. <u>Acer rubrum</u>	15	<input checked="" type="checkbox"/> 49.2%	FAC	Number of Dominant Species That are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. <u>Picea mariana</u>	5	<input type="checkbox"/> 16.4%	FACW	
3. <u>Betula populifolia</u>	10	<input checked="" type="checkbox"/> 32.8%	FAC	
4. <u>Larix laricina</u>	0.5	<input type="checkbox"/> 1.6%	FACW	
5. _____	0	<input type="checkbox"/> 0.0%		
	30.5	= Total Cover		
<u>Sapling/Shrub Stratum (Plot size: 5 m)</u>				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>51</u> x 1 = <u>51</u> FACW species <u>71.5</u> x 2 = <u>143</u> FAC species <u>35</u> x 3 = <u>105</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>157.5</u> (A) <u>299</u> (B) Prevalence Index = B/A = <u>1.898</u>
1. <u>Alnus incana</u>	40	<input checked="" type="checkbox"/> 50.0%	FACW	
2. <u>Spiraea alba</u>	10	<input type="checkbox"/> 12.5%	FACW	
3. <u>Nemopanthus mucronatus</u>	20	<input checked="" type="checkbox"/> 25.0%	OBL	
4. <u>Betula populifolia</u>	5	<input type="checkbox"/> 6.3%	FAC	
5. <u>Acer rubrum</u>	5	<input type="checkbox"/> 6.3%	FAC	
	80	= Total Cover		
<u>Herb Stratum (Plot size: 2 m)</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Pontederia cordata</u>	15	<input checked="" type="checkbox"/> 31.9%	OBL	
2. <u>Onoclea sensibilis</u>	15	<input checked="" type="checkbox"/> 31.9%	FACW	
3. <u>Juncus effusus</u>	5	<input type="checkbox"/> 10.6%	OBL	
4. <u>Glyceria striata</u>	10	<input checked="" type="checkbox"/> 21.3%	OBL	
5. <u>Carex lurida</u>	0.5	<input type="checkbox"/> 1.1%	OBL	
6. <u>Maianthemum trifolium</u>	0.5	<input type="checkbox"/> 1.1%	OBL	
7. <u>Impatiens capensis</u>	0.5	<input type="checkbox"/> 1.1%	FACW	
8. <u>Osmundastrum cinnamomeum</u>	0.5	<input type="checkbox"/> 1.1%	FACW	
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
	47	= Total Cover		
<u>Woody Vine Stratum (Plot size: _____)</u>				Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **WL-11-2019**

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		
0-13							Muck	Black with high organics content
13-15	7.5YR	3/1	100				Loamy Sand	
15-25	7.5YR	6/1	99	5YR	4/6	1	Loamy Sand	

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :	
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Dark Surface (S7)
<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"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

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

Restrictive Layer (if observed):

Type: Not encountered

Depth (inches): N/A

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 checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" 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 checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): 8

Water Table Present? Yes No Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes No Depth (inches): 0

Wetland Hydrology Present? Yes No

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 04-Jun-19
 Applicant/Owner: NPNS Sampling Point: WL-13
 Investigator(s): Chris Kennedy, Kelly Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): flat
 Slope: 0.0% / 0.0 ° Lat.: 45.714652 Long.: -62.707846 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: 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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: soil disturbed from roadfill infringes and hydrology disturbed from stormwater influence and impounding by roadway.	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. _____	0	<input type="checkbox"/> 0.0%	_____	Number of Dominant Species That are OBL, FACW, or FAC: <u>4</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>100.0%</u> (A/B)
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>105</u> x 1 = <u>105</u> FACW species <u>20</u> x 2 = <u>40</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>125</u> (A) <u>145</u> (B) Prevalence Index = B/A = <u>1.160</u>
1. <u>Myrica gale</u>	40	<input checked="" type="checkbox"/> 57.1%	OBL	
2. <u>Spiraea alba</u>	15	<input checked="" type="checkbox"/> 21.4%	FACW	
3. <u>Spiraea tomentosa</u>	5	<input type="checkbox"/> 7.1%	FACW	
4. <u>Chamaedaphne calyculata</u>	10	<input type="checkbox"/> 14.3%	OBL	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
70 = Total Cover				
Herb Stratum (Plot size: <u>2 m</u>)				
1. <u>Typha latifolia</u>	20	<input checked="" type="checkbox"/> 36.4%	OBL	
2. <u>Calamagrostis canadensis</u>	30	<input checked="" type="checkbox"/> 54.5%	OBL	
3. <u>Nuphar lutea</u>	5	<input type="checkbox"/> 9.1%	OBL	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
55 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-13

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		
0-29							Muck	
29-36	7.5R	2.5/2	100				Silt Loam	With decayed wood

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 type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):
 Type: Not encountered
 Depth (inches): N/A

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"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" 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 checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>40</u>	Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
Water Table Present?	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>0</u>	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="radio"/> No <input type="radio"/>	Depth (inches): <u>0</u>	

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

Remarks:

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 05-Jun-19
 Applicant/Owner: NPNS Sampling Point: WL-13B
 Investigator(s): Chris Kennedy, Kelly Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): convex
 Slope: 0.0% / 0.0 ° Lat.: 45.716135 Long.: -62.706302 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Swamp - shrub

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Soil disturbed from agricultural field runoff which is sediment-laden (red deposits) and roadfill, hydrology disturbed from stormwater influence.	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Abies balsamea</u>	0.5	<input type="checkbox"/> 50.0%	FAC	Number of Dominant Species That are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
2. <u>Picea glauca</u>	0.5	<input type="checkbox"/> 50.0%	FACU	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
1 = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>3</u> x 1 = <u>3</u> FACW species <u>120.5</u> x 2 = <u>241</u> FAC species <u>7.5</u> x 3 = <u>22.5</u> FACU species <u>1</u> x 4 = <u>4</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>132</u> (A) <u>270.5</u> (B) Prevalence Index = B/A = <u>2.049</u>
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)				
1. <u>Alnus incana</u>	60	<input checked="" type="checkbox"/> 92.3%	FACW	
2. <u>Spiraea alba</u>	5	<input type="checkbox"/> 7.7%	FACW	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
65 = Total Cover				
Herb Stratum (Plot size: <u>2 m</u>)				
1. <u>Impatiens capensis</u>	40	<input checked="" type="checkbox"/> 60.6%	FACW	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Solidago rugosa</u>	5	<input type="checkbox"/> 7.6%	FAC	
3. <u>Viola macloskeyi</u>	3	<input type="checkbox"/> 4.5%	OBL	
4. <u>Oxalis stricta</u>	0.5	<input type="checkbox"/> 0.8%	FACU	
5. <u>Ranunculus acris</u>	1	<input type="checkbox"/> 1.5%	FAC	
6. <u>Ranunculus repens</u>	1	<input type="checkbox"/> 1.5%	FAC	
7. <u>Rubus hispidus</u>	5	<input type="checkbox"/> 7.6%	FACW	
8. <u>Onoclea sensibilis</u>	10	<input type="checkbox"/> 15.2%	FACW	
9. <u>Phalaris arundinacea</u>	0.5	<input type="checkbox"/> 0.8%	FACW	
10. _____	_____	<input type="checkbox"/> 0.0%	_____	
66 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
2. _____	0	<input type="checkbox"/> 0.0%	_____	
_____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **WL-13B**

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		
0-8	7.5YR	3/3	100				Silt Loam	
8-16	7.5YR	3/4	100				Silty Clay	
16-24	7.5YR	3/4	95	7.5YR	5/8	5	C	

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Dark Surface (S7)
<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"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)		<input checked="" type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

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

Restrictive Layer (if observed):

Type: gravel

Depth (inches): 24

Hydric Soil Present? Yes No

Remarks:

Red parent material present, possible fill from histoic agricultural of highway construction activities.

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 checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input checked="" 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 checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): 4

Water Table Present? Yes No Depth (inches): 8

Saturation Present? Yes No Depth (inches): 0

(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. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 05-Jun-19
 Applicant/Owner: NPNS Sampling Point: WL-16
 Investigator(s): Chris Kennedy, Kelly Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Hillside Local relief (concave, convex, none): convex
 Slope: 0.0% / 0.0 ° Lat.: 45.722537 Long.: -62.699933 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Swamp - treed

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Soil disturbed from roadfill, hydrology disturbed from stormwater influence.	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
Tree Stratum (Plot size: <u>10 m</u>)				
1. <u>Betula populifolia</u>	<u>20</u>	<input checked="" type="checkbox"/> 44.4%	FAC	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>80.0%</u> (A/B)
2. <u>Populus tremuloides</u>	<u>5</u>	<input type="checkbox"/> 11.1%	FACU	
3. <u>Abies balsamea</u>	<u>10</u>	<input checked="" type="checkbox"/> 22.2%	FAC	
4. <u>Picea rubens</u>	<u>10</u>	<input checked="" type="checkbox"/> 22.2%	FACU	
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
	<u>45</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>80</u> x 2 = <u>160</u> FAC species <u>40</u> x 3 = <u>120</u> FACU species <u>15</u> x 4 = <u>60</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>135</u> (A) <u>340</u> (B) Prevalence Index = B/A = <u>2.519</u>
1. <u>Alnus incana</u>	<u>55</u>	<input checked="" type="checkbox"/> 84.6%	FACW	
2. <u>Acer rubrum</u>	<u>10</u>	<input type="checkbox"/> 15.4%	FAC	
3. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
4. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
	<u>65</u>	= Total Cover		
Herb Stratum (Plot size: <u>2 m</u>)				
1. <u>Onoclea sensibilis</u>	<u>25</u>	<input checked="" type="checkbox"/> 100.0%	FACW	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
3. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
4. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
6. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
7. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
8. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
9. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
10. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
	<u>25</u>	= Total Cover		
Woody Vine Stratum (Plot size: _____)				
1. _____	<u>0</u>	<input type="checkbox"/> 0.0%		Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
2. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
	<u>0</u>	= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **WL-16**

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		
0-5							Mucky Peat	
5-7	7.5YR	4/1	100				Muck	silty organics
7-11	7.5YR	6/1	100				Sandy Clay	
11-15	7.5YR	5/4	100				Sandy Clay	
15-21	2.5YR	5/3	100				Sandy Clay	possible road fill

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :	
<input checked="" type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Dark Surface (S7)
<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"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

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

Restrictive Layer (if observed):

Type: Not encountered

Depth (inches): N/A

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 checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): 20

Water Table Present? Yes No Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes No Depth (inches): 0

Wetland Hydrology Present? Yes No

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 28-May-19
 Applicant/Owner: NPNS Sampling Point: WL-19
 Investigator(s): Chris Kennedy, Kelly Regan Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): flat
 Slope: 0.0% / 0.0 ° Lat.: 45.706188 Long.: -62.716295 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Swamp - shrub

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks: Soil disturbed from roadfill and hydrology disturbed from stormwater influences.	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
<u>Tree Stratum (Plot size: 10 m)</u>				Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A)
1. <u>Larix laricina</u>	<u>5</u>	<input type="checkbox"/> 19.6%	FACW	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
2. <u>Acer rubrum</u>	<u>15</u>	<input checked="" type="checkbox"/> 58.8%	FAC	Percent of dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
3. <u>Picea mariana</u>	<u>0.5</u>	<input type="checkbox"/> 2.0%	FACW	
4. <u>Abies balsamea</u>	<u>5</u>	<input type="checkbox"/> 19.6%	FAC	
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
	<u>25.5</u>	= Total Cover		
<u>Sapling/Shrub Stratum (Plot size: 5 m)</u>				Prevalence Index worksheet:
1. <u>Spiraea alba</u>	<u>5</u>	<input type="checkbox"/> 7.5%	FACW	Total % Cover of: Multiply by:
2. <u>Nemopanthus mucronatus</u>	<u>60</u>	<input checked="" type="checkbox"/> 90.2%	OBL	OBL species <u>65.5</u> x 1 = <u>65.5</u>
3. <u>Viburnum nudum</u>	<u>0.5</u>	<input type="checkbox"/> 0.8%	FACW	FACW species <u>41</u> x 2 = <u>82</u>
4. <u>Abies balsamea</u>	<u>0.5</u>	<input type="checkbox"/> 0.8%	FAC	FAC species <u>21.5</u> x 3 = <u>64.5</u>
5. <u>Kalmia angustifolia</u>	<u>0.5</u>	<input type="checkbox"/> 0.8%	FAC	FACU species <u>0</u> x 4 = <u>0</u>
	<u>66.5</u>	= Total Cover		UPL species <u>0</u> x 5 = <u>0</u>
<u>Herb Stratum (Plot size: 2 m)</u>				Column Totals: <u>128</u> (A) <u>212</u> (B)
1. <u>Maianthemum trifolium</u>	<u>5</u>	<input type="checkbox"/> 13.9%	OBL	Prevalence Index = B/A = <u>1.656</u>
2. <u>Onoclea sensibilis</u>	<u>30</u>	<input checked="" type="checkbox"/> 83.3%	FACW	
3. <u>Iris versicolor</u>	<u>0.5</u>	<input type="checkbox"/> 1.4%	OBL	
4. <u>Ranunculus repens</u>	<u>0.5</u>	<input type="checkbox"/> 1.4%	FAC	
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
6. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
7. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
8. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
9. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
10. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
	<u>36</u>	= Total Cover		
<u>Woody Vine Stratum (Plot size: _____)</u>				
1. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
2. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
	<u>0</u>	= Total Cover		

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is > 50%
 3 - Prevalence Index is ≤ 3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

SOIL

Sampling Point: WL-19

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		
0-5	7.5YR	2.5/1	100				Silt Loam	
5-11	7.5YR	5/2	100				Sandy Loam	underlain by restrictive clay layer at 11 in.

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):

Type: clay

Depth (inches): 11

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 checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<input checked="" 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 checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): 6

Water Table Present? Yes No Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes No Depth (inches): 0

Wetland Hydrology Present? Yes No

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: WL-20
 Investigator(s): Chris Kennedy Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Basin Local relief (concave, convex, none): flat
 Slope: 0.0% / 0.0 ° Lat.: 45.707936 Long.: -62.714413 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: Swamp - shrub

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks: Excavation and compaction caused disturbances to soil as well as hydrology due to ponding. Additional hydrology disturbance due to ditching.	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Acer rubrum</u>	5	<input checked="" type="checkbox"/> 33.3%	FAC	Number of Dominant Species That are OBL, FACW, or FAC: <u>7</u> (A) Total Number of Dominant Species Across All Strata: <u>8</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>87.5%</u> (A/B)
2. <u>Picea rubens</u>	5	<input checked="" type="checkbox"/> 33.3%	FACU	
3. <u>Abies balsamea</u>	5	<input checked="" type="checkbox"/> 33.3%	FAC	
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
15 = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Prevalence Index worksheet:
1. <u>Alnus incana</u>	30	<input checked="" type="checkbox"/> 75.0%	FACW	Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>55</u> x 2 = <u>110</u> FAC species <u>20</u> x 3 = <u>60</u> FACU species <u>5</u> x 4 = <u>20</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>80</u> (A) <u>190</u> (B) Prevalence Index = B/A = <u>2.375</u>
2. <u>Spiraea alba</u>	10	<input checked="" type="checkbox"/> 25.0%	FACW	
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
40 = Total Cover				
Herb Stratum (Plot size: <u>2 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Hydrophytic Vegetation Indicators:
1. <u>Onoclea sensibilis</u>	15	<input checked="" type="checkbox"/> 60.0%	FACW	<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Equisetum arvense</u>	5	<input checked="" type="checkbox"/> 20.0%	FAC	
3. <u>Solanum dulcamara</u>	5	<input checked="" type="checkbox"/> 20.0%	FAC	
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
25 = Total Cover				
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
0 = Total Cover				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-20

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		
0-4	5YR	3/1	100				Muck	Black Muck with Organics
4-9	5YR	3/1	100				Silt Loam	
9-13	2.5YR	4/3	100				Sandy Loam	Possible Roadfill

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

Coast Prairie Redox (A16)
 Dark Surface (S7)
 Iron Manganese Masses (F12)
 Very Shallow Dark Surface (TF12)
 Other (Explain in Remarks)

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

Restrictive Layer (if observed):
 Type: Gravels and Rock
 Depth (inches): 13

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 checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" 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 checked="" type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes No Depth (inches): 5

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:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: Up Pit 1
 Investigator(s): Chris Kennedy Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): flat
 Slope: 0.0% / 0.0 ° Lat.: 45.684987 Long.: -62.729257 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: UPLAND

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? 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="radio"/> No <input checked="" type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	
Tree Stratum (Plot size: 10 _____)				
1. <u>Fraxinus americana</u>	5	<input type="checkbox"/> 12.2%	FACU	Dominance Test worksheet: Number of Dominant Species That are OBL, FACW, or FAC: <u>0</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>0.0%</u> (A/B)
2. <u>Populus tremuloides</u>	25	<input checked="" type="checkbox"/> 61.0%	FACU	
3. <u>Prunus virginiana</u>	10	<input checked="" type="checkbox"/> 24.4%	FACU	
4. <u>Crataegus monogyna</u>	0.5	<input type="checkbox"/> 1.2%	FACU	
5. <u>Sorbus aucuparia</u>	0.5	<input type="checkbox"/> 1.2%	UPL	
	41	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m _____)				
1. <u>Prunus virginiana</u>	15	<input checked="" type="checkbox"/> 71.4%	FACU	Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>61</u> x 4 = <u>244</u> UPL species <u>1</u> x 5 = <u>5</u> Column Totals: <u>62</u> (A) <u>249</u> (B) Prevalence Index = B/A = <u>4.016</u>
2. <u>Populus tremuloides</u>	0.5	<input type="checkbox"/> 2.4%	FACU	
3. <u>Sorbus aucuparia</u>	0.5	<input type="checkbox"/> 2.4%	UPL	
4. <u>Fraxinus americana</u>	5	<input checked="" type="checkbox"/> 23.8%	FACU	
5. _____	0	<input type="checkbox"/> 0.0%		
	21	= Total Cover		
Herb Stratum (Plot size: 2 m _____)				
1. _____	0	<input type="checkbox"/> 0.0%		Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is > 50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%		Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
2. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Uo Pit 1

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		
0-9	7.5YR	3/1	100				Loam	with gravels
9-16	5YR	4/4	100				Silt Loam	with gravels
16-21	10YR	6/2	98	7.5YR	5/8	2	Sandy Loam	with gravels

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):
 Type: gravels
 Depth (inches): 21

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 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"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe) Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: Up Pit 2
 Investigator(s): Chris Kennedy Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): convex
 Slope: 0.0% / 0.0 ° Lat.: 45.646878 Long.: -62.709329 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: UPLAND

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? 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="radio"/> No <input checked="" type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Acer rubrum</u>	35	<input checked="" type="checkbox"/> 43.5%	FAC	Number of Dominant Species That are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>50.0%</u> (A/B)
2. <u>Populus tremuloides</u>	5	<input type="checkbox"/> 6.2%	FACU	
3. <u>Abies balsamea</u>	35	<input checked="" type="checkbox"/> 43.5%	FAC	
4. <u>Betula populifolia</u>	5	<input type="checkbox"/> 6.2%	FAC	
5. <u>Betula papyrifera</u>	0.5	<input type="checkbox"/> 0.6%	FACU	
80.5 = Total Cover				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0.5</u> x 2 = <u>1</u> FAC species <u>81</u> x 3 = <u>243</u> FACU species <u>16</u> x 4 = <u>64</u> UPL species <u>4</u> x 5 = <u>20</u> Column Totals: <u>101.5</u> (A) <u>328</u> (B) Prevalence Index = B/A = <u>3.232</u>
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)				
1. <u>Abies balsamea</u>	5	<input checked="" type="checkbox"/> 90.9%	FAC	
2. <u>Viburnum nudum</u>	0.5	<input type="checkbox"/> 9.1%	FACW	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
5.5 = Total Cover				
Herb Stratum (Plot size: <u>2 m</u>)				
1. <u>Veronica officinalis</u>	5	<input checked="" type="checkbox"/> 32.3%	FACU	
2. <u>Maianthemum canadense</u>	5	<input checked="" type="checkbox"/> 32.3%	FACU	
3. <u>Hieracium alleghaniense</u>	4	<input checked="" type="checkbox"/> 25.8%	UPL	
4. <u>Ranunculus acris</u>	1	<input type="checkbox"/> 6.5%	FAC	
5. <u>Luzula acuminata</u>	0.5	<input type="checkbox"/> 3.2%	FACU	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
15.5 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
0 = Total Cover				
Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is > 50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Uo Pit 2

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		
0-24	5YR	3/3					Sandy Loam	

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):
 Type: _____
 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 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"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
Water Table Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: Up Pit 3
 Investigator(s): Chris Kennedy Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): convex
 Slope: 0.0% / 0.0 ° Lat.: 45.705717 Long.: -62.716690 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: UPLAND

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? 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="radio"/> No <input checked="" type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	
Tree Stratum (Plot size: 10 m)				
1. <u>Abies balsamea</u>	10	<input type="checkbox"/> 14.3%	FAC	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>50.0%</u> (A/B)
2. <u>Acer rubrum</u>	15	<input checked="" type="checkbox"/> 21.4%	FAC	
3. <u>Picea rubens</u>	35	<input checked="" type="checkbox"/> 50.0%	FACU	
4. <u>Pinus strobus</u>	5	<input type="checkbox"/> 7.1%	FACU	
5. <u>Populus tremuloides</u>	5	<input type="checkbox"/> 7.1%	FACU	
	70	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5 m)				
1. <u>Abies balsamea</u>	4	<input checked="" type="checkbox"/> 80.0%	FAC	Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>29</u> x 3 = <u>87</u> FACU species <u>46</u> x 4 = <u>184</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>75</u> (A) <u>271</u> (B) Prevalence Index = B/A = <u>3.613</u>
2. <u>Picea rubens</u>	1	<input checked="" type="checkbox"/> 20.0%	FACU	
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	5	= Total Cover		
Herb Stratum (Plot size: 2 m)				
1. _____	0	<input type="checkbox"/> 0.0%		Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is > 50% <input type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%		Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
2. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Uo Pit 3

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								leaf litter/duff
2-8	7.5YR	4/4	100				Loam	
8-18	5YR	4/4	100				Loam	refusal at 18 inches due to gravel

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)		<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)		<input type="checkbox"/> Dark Surface (S7)
<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"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)		<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

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

Restrictive Layer (if observed):
 Type: loam with gravels
 Depth (inches): 18

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 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"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe) Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: Up pit 4
 Investigator(s): Chris Kennedy Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): convex
 Slope: 0.0% / 0.0 ° Lat.: 45.711163 Long.: -62.7211307 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: UPLAND

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? 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="radio"/> No <input checked="" type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	
<u>Tree Stratum (Plot size: 10 m)</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>5</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>40.0%</u> (A/B)
1. <u>Picea rubens</u>	20	<input checked="" type="checkbox"/> 25.0%	FACU	
2. <u>Betula papyrifera</u>	30	<input checked="" type="checkbox"/> 37.5%	FACU	
3. <u>Betula populifolia</u>	20	<input checked="" type="checkbox"/> 25.0%	FAC	
4. <u>Abies balsamea</u>	10	<input type="checkbox"/> 12.5%	FAC	
5. _____	0	<input type="checkbox"/> 0.0%		
	80	= Total Cover		
<u>Sapling/Shrub Stratum (Plot size: 5 m)</u>				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>55</u> x 3 = <u>165</u> FACU species <u>76</u> x 4 = <u>304</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>131</u> (A) <u>469</u> (B) Prevalence Index = B/A = <u>3.580</u>
1. <u>Picea rubens</u>	25	<input checked="" type="checkbox"/> 49.0%	FACU	
2. <u>Abies balsamea</u>	25	<input checked="" type="checkbox"/> 49.0%	FAC	
3. <u>Populus tremuloides</u>	1	<input type="checkbox"/> 2.0%	FACU	
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	51	= Total Cover		
<u>Herb Stratum (Plot size: 2 m)</u>				
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		
<u>Woody Vine Stratum (Plot size: _____)</u>				
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is > 50%
 3 - Prevalence Index is ≤ 3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: (Include photo numbers here or on a separate sheet.)

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

SOIL

Sampling Point: Unit 4

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		
0-1								organic layer
1-26	7.5YR	4/4	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:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):
 Type: _____
 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 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"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
Water Table Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: Up Pit 5
 Investigator(s): Chris Kennedy Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): convex
 Slope: 0.0% / 0.0 ° Lat.: 45.718141 Long.: -62.704326 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: UPLAND

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? 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="radio"/> No <input checked="" type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	
<u>Tree Stratum (Plot size: 10 m)</u>				Dominance Test worksheet:
1. <u>Picea rubens</u>	<u>30</u>	<input checked="" type="checkbox"/> 35.1%	<u>FACU</u>	Number of Dominant Species That are OBL, FACW, or FAC: <u>1</u> (A)
2. <u>Pinus strobus</u>	<u>15</u>	<input type="checkbox"/> 17.5%	<u>FACU</u>	Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. <u>Abies balsamea</u>	<u>25</u>	<input checked="" type="checkbox"/> 29.2%	<u>FAC</u>	Percent of dominant Species That Are OBL, FACW, or FAC: <u>33.3%</u> (A/B)
4. <u>Acer rubrum</u>	<u>15</u>	<input type="checkbox"/> 17.5%	<u>FAC</u>	
5. <u>Betula populifolia</u>	<u>0.5</u>	<input type="checkbox"/> 0.6%	<u>FAC</u>	
	<u>85.5</u>	= Total Cover		
<u>Sapling/Shrub Stratum (Plot size: 5 m)</u>				Prevalence Index worksheet:
1. <u>Picea rubens</u>	<u>10</u>	<input checked="" type="checkbox"/> 95.2%	<u>FACU</u>	Total % Cover of: Multiply by:
2. <u>Abies balsamea</u>	<u>0.5</u>	<input type="checkbox"/> 4.8%	<u>FAC</u>	OBL species <u>0</u> x 1 = <u>0</u>
3. _____	<u>0</u>	<input type="checkbox"/> 0.0%		FACW species <u>0</u> x 2 = <u>0</u>
4. _____	<u>0</u>	<input type="checkbox"/> 0.0%		FAC species <u>41</u> x 3 = <u>123</u>
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%		FACU species <u>55.5</u> x 4 = <u>222</u>
	<u>10.5</u>	= Total Cover		UPL species <u>0</u> x 5 = <u>0</u>
<u>Herb Stratum (Plot size: 2 m)</u>				Column Totals: <u>96.5</u> (A) <u>345</u> (B)
1. <u>Pteridium aquilinum</u>	<u>0.5</u>	<input type="checkbox"/> 100.0%	<u>FACU</u>	Prevalence Index = B/A = <u>3.575</u>
2. _____	<u>0</u>	<input type="checkbox"/> 0.0%		Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is > 50% <input type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
3. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
4. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
5. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
6. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
7. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
8. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
9. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
10. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
	<u>0.5</u>	= Total Cover		
<u>Woody Vine Stratum (Plot size: _____)</u>				Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
1. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
2. _____	<u>0</u>	<input type="checkbox"/> 0.0%		
	<u>0</u>	= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **Uo Pit 5**

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		
0-1								organic litter
1-3	7.5YR	4/4	100					Sandy Loam
3-10	7.5YR	6/2	100					Loam
10-21	7.5YR	4/4	100					Sandy Loam

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):

Type: _____

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 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"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

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:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: WL5E Up
 Investigator(s): Vanessa Graves, Tom Neily Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): convex
 Slope: 0.0% / 0.0 ° Lat.: 45.6811174 Long.: -62.732112 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: UPLAND

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Stratum (Plot size: _____)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	
Tree Stratum (Plot size: 10 m)				
1. <u>Populus tremuloides</u>	80	<input checked="" type="checkbox"/> 100.0%	FACU	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>80.0%</u> (A/B)
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
80 = Total Cover				
Sapling/Shrub Stratum (Plot size: 5 m)				
1. <u>Rhamnus cathartica</u>	30	<input checked="" type="checkbox"/> 75.0%	FAC	Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>10</u> x 1 = <u>10</u> FACW species <u>30</u> x 2 = <u>60</u> FAC species <u>70</u> x 3 = <u>210</u> FACU species <u>80</u> x 4 = <u>320</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>190</u> (A) <u>600</u> (B) Prevalence Index = B/A = <u>3.158</u>
2. <u>Alnus incana</u>	10	<input checked="" type="checkbox"/> 25.0%	FACW	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
40 = Total Cover				
Herb Stratum (Plot size: 2 m)				
1. <u>Doellingeria umbellata</u>	20	<input checked="" type="checkbox"/> 28.6%	FACW	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Equisetum arvense</u>	40	<input checked="" type="checkbox"/> 57.1%	FAC	
3. <u>Carex aquatilis</u>	10	<input type="checkbox"/> 14.3%	OBL	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
70 = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
2. _____	0	<input type="checkbox"/> 0.0%	_____	
_____	0	= Total Cover	_____	

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **WL5E Up**

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		
0-4	5YR	3/2						organics with roots
4-18	5YR	4/2					Silt Loam	
18-21	7.5YR	3/1						
21-23	5YR	4/2						

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):
 Type: _____
 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 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"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
Water Table Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.

WETLAND DETERMINATION DATA FORM - MARITIMES

Project/Site: Northern Pulp Plant - Pipeline PFA Municipality/County: Pictou Sampling Date: 30-Jul-19
 Applicant/Owner: NPNS Sampling Point: WL6 Up
 Investigator(s): Vanessa Graves, Tom Neily Affiliation: Dillon Consulting
 Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): flat
 Slope: 0.0% / 0.0 ° Lat.: 45.689866 Long.: -62.729489 Datum: NAD83
 Soil Map Unit Name/Type: Tormentine Wetland Type: UPLAND

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? 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="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: <u>10 m</u>)	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status	Dominance Test worksheet:
1. <u>Salix bebbiana</u>	10	<input type="checkbox"/> 14.3%	FACW	Number of Dominant Species That are OBL, FACW, or FAC: <u>5</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of dominant Species That Are OBL, FACW, or FAC: <u>83.3%</u> (A/B)
2. <u>Populus tremuloides</u>	50	<input checked="" type="checkbox"/> 71.4%	FACU	
3. <u>Quercus rubra</u>	10	<input type="checkbox"/> 14.3%	FACU	
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	70	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>5 m</u>)				Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>75</u> x 2 = <u>150</u> FAC species <u>20</u> x 3 = <u>60</u> FACU species <u>65</u> x 4 = <u>260</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>160</u> (A) <u>470</u> (B) Prevalence Index = B/A = <u>2.938</u>
1. <u>Alnus incana</u>	10	<input checked="" type="checkbox"/> 40.0%	FACW	
2. <u>Amelanchier canadensis</u>	5	<input checked="" type="checkbox"/> 20.0%	FAC	
3. <u>Rosa virginiana</u>	10	<input checked="" type="checkbox"/> 40.0%	FAC	
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	25	= Total Cover		
Herb Stratum (Plot size: <u>2 m</u>)				
1. <u>Spiraea alba</u>	30	<input checked="" type="checkbox"/> 46.2%	FACW	Hydrophytic Vegetation Indicators: <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is > 50% <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Doellingeria umbellata</u>	20	<input checked="" type="checkbox"/> 30.8%	FACW	
3. <u>Maianthemum canadense</u>	5	<input type="checkbox"/> 7.7%	FACU	
4. <u>Equisetum sylvaticum</u>	5	<input type="checkbox"/> 7.7%	FACW	
5. <u>Solidago rugosa</u>	5	<input type="checkbox"/> 7.7%	FAC	
6. _____	0	<input type="checkbox"/> 0.0%		
7. _____	0	<input type="checkbox"/> 0.0%		
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
	65	= Total Cover		
Woody Vine Stratum (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%		Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>
2. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL6 Ub

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		
0-4	5YR	3/2						organics
4-12	5YR	4/3						refusal at 12 inches

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 Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	
<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"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Muck Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

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

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): 12

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 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"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)
<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 checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:

Surface Water Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>
Water Table Present?	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes <input type="radio"/> No <input checked="" type="radio"/>	Depth (inches): _____	

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

Remarks:

Adapted from U.S. Corps of Engineers form for Northeast-North Central Supplement for use in Maritimes.