

## 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 realigned 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

**Wetlands along the Proposed Project** Figure A5.1-1



**DILLON** 

Watercourse

Approximate Project Footprint Area\* Wetland Delineated in the Field

NSDNR Database Wetland

NS Topographic Database Wetland

WL#

Wetland ID

WC#

Watercourse ID

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

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

2,000 Meters



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

PROJECT: 17-6461 Date: 2019-09-26

# 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 Ma	intenance 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 <sub>2</sub> 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 (Habita	t) 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.

<sup>\*</sup>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

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.

<sup>\*</sup> 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 28<sup>th</sup>, June 4<sup>th</sup>, June 5<sup>th</sup>, June 18<sup>th</sup> and July 30<sup>th</sup>, 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 of 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 <sup>1</sup>	Landscape Position	Landform	Flow Path	Water Regime	Disturbance	Priority Plants <sup>2</sup>	Total Delineated Area (ha) within NSTIR ROW <sup>3</sup>
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/	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 <sup>1</sup>	Landscape Position	Landform	Flow Path	Water Regime	Disturbance	Priority Plants <sup>2</sup>	Total Delineated Area (ha) within NSTIR ROW <sup>3</sup>
	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

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Wetland	Dominant Wetland Type	Relative Size <sup>1</sup>	Landscape Position	Landform	Flow Path	Water Regime	Disturbance	Priority Plants <sup>2</sup>	Total Delineated Area (ha) within NSTIR ROW <sup>3</sup>
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

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

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

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

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

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

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

Wetland 5D	Common Name	S-Rank
Species Acer rubrum	Red Maple	S5
Alisma triviale	Northern Water Plantain	S5
Alnus incana	Speckled Alder	S5
Amelanchier sp.	serviceberry	-
Angelica sylvestris	Woodland Angelica	SNA
Athyrium filix-femina	Common Lady Fern	S5
Betula populifolia	Gray Birch	S5
Calamagrostis canadensis	Bluejoint Reed Grass	S5
Callitriche palustris Calystegia sepium	Marsh Water-starwort Hedge False Bindweed	S5 S5
Carex intumescens	Bladder Sedge	S5
Carex nigra	Smooth Black Sedge	S5
Carex projecta	Necklace Sedge	S5
Carex scoparia	Broom Sedge	S5
Carex stipata	Awl-fruited Sedge	S5
Carex vulpinoidea	Fox Sedge	S4
Chenopodium sp.		-
Cornus alternifolia	Alternate-leaved Dogwood English Hawthorn	S5 SNA
Crataegus monogyna Dryopteris intermedia	Evergreen Wood Fern	S5
Equisetum arvense	Field Horsetail	S5
Equisetum sylvaticum	Woodland Horsetail	S5
Euthamia graminifolia	Grass-leaved Goldenrod	S5
Fraxinus americana	White Ash	S5
Galeopsis tetrahit	Common Hemp-nettle	SNA
Galium palustre	Common Marsh Bedstraw	S5
Geum aleppicum	Yellow Avens	S5
Glyceria laxa	Northern Mannagrass	S4?
Glyceria striata	Fowl Manna Grass	S5 SE
llex verticillata Impatiens capensis	Common Winterberry Spotted Jewelweed	S5 S5
Iris versicolor	Harlequin Blue Flag	S5
Juncus effusus	Soft Rush	S5
Juncus filiformis	Thread Rush	S5
Juncus gerardii	Black-Grass Rush	S5
Lathyrus aphaca	Yellow Vetchling	SNA
Lotus corniculatus	Garden Bird's-foot Trefoil	SNA
Luzula multiflora	Common Woodrush	S5
Lysimachia terrestris	Swamp Yellow Loosestrife	S5
Malus pumila Mentha sp.	Common Apple A Mint	SNA
Myosotis laxa	Small Forget-Me-Not	S5
Onoclea sensibilis	Sensitive Fern	S5
Oxalis stricta	European Wood Sorrel	S5
Parthenocissus quinquefolia	Virginia Creeper	SNA
Phalaris arundinacea	Reed Canary Grass	S5
Picea glauca	White Spruce	S5
Platanthera lacera	Ragged Fringed Orchid	S4S5
Platanthera psycodes	Small Purple Fringed Orchid	S4
Polygonum hydropiperoides Populus tremuloides	False Waterpepper Trembling Aspen	S5 S5
Potentilla simplex	Old Field Cinquefoil	S5
Prunus virginiana	Chokecherry	S5
Ranunculus acris	Common Buttercup	SNA
Rhamnus cathartica	European Buckthorn	SNA
Rhamnus sp.	Buckthorn	-
Rosa multiflora	Multiflora Rose	SNA
Rosa sp.	A Rose	-
Rosa virginiana	Virginia Rose	S5
Rubus allegheniensis	Alleghaney Blackberry	S5
Rubus idaeus Rubus pubescens	Red Raspberry Dwarf Red Raspberry	S5 S5
Rumex crispus	Curled Dock	SNA
Salix bebbiana	Bebb's Willow	S5
Salix discolor	Pussy Willow	S5
Scirpus cyperinus	Common Woolly Bulrush	S5
Scirpus microcarpus	Small-fruited Bulrush	S5
Solanum dulcamara	Bittersweet Nightshade	SNA
Solidago canadensis	Canada Goldenrod	S4S5
Solidago rugosa	Rough-stemmed Goldenrod	S5
Spiraea alba	White Meadowsweet	S5
	0.11. 4.1	
Symphyotrichum lateriflorum	Calico Aster	\$5 \$5
Symphyotrichum lateriflorum Symphyotrichum novi-belgii	New York Aster	S5
Symphyotrichum lateriflorum Symphyotrichum novi-belgii Typha latifolia	New York Aster Broad-leaved Cattail	S5 S5
Symphyotrichum lateriflorum Symphyotrichum novi-belgii	New York Aster	S5

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

Wetland 6 Species	Common Name	S-Rank
Alisma triviale	Northern Water Plantain	S5
Alnus incana		S5
	Speckled Alder	S5
Athyrium filix-femina	Common Lady Fern	S5
Betula populifolia	Gray Birch	
Carex scoparia	Broom Sedge	S5
Carex stipata	Awl-fruited Sedge	S5
Cicuta maculata	Spotted Water-Hemlock	S5
Doellingeria umbellata	Hairy Flat-top White Aster	S5
Dryopteris cristata	Crested Wood Fern	S5
Dryopteris cristata	Crested Wood Fern	S5
Equisetum arvense	Field Horsetail	S5
Equisetum sylvaticum	Woodland Horsetail	S5
Fragaria virginiana	Wild Strawberry	S5
Fraxinus americana	White Ash	S5
Galium palustre	Common Marsh Bedstraw	S5
Glyceria laxa	Northern Mannagrass	S4?
Juncus effusus	Soft Rush	S5
Lycopus americanus	American Water Horehound	S5
Lysimachia ciliata	Fringed Yellow Loosestrife	S4
Lysimachia terrestris	Swamp Yellow Loosestrife	S5
Onoclea sensibilis	Sensitive Fern	S5
Phalaris arundinacea	Reed Canary Grass	S5
Potentilla simplex	Old Field Cinquefoil	S5
Prunella vulgaris	Common Self-heal	S5
Prunus virginiana	Chokecherry	S5
Ranunculus acris	Common Buttercup	SNA
Rhamnus cathartica	European Buckthorn	SNA
Salix discolor	Pussy Willow	S5
Sambucus nigra ssp. canadensis	Black Elderberry	S5
Scirpus cyperinus	Common Woolly Bulrush	S5
Solanum dulcamara	Bittersweet Nightshade	SNA
Spiraea alba	White Meadowsweet	S5
Symphyotrichum puniceum	Purple-stemmed Aster	S5
Triadenum fraseri	Fraser's Marsh St John's-wort	S5
Typha latifolia	Broad-leaved Cattail	S5

Wetland 9		
Species	Common Name	S-Rank
Abies balsamea	Balsam Fir	S5
Acer rubrum	Red Maple	S5
Alnus incana	Speckled Alder	S5
Aralia nudicaulis	Wild Sarsaparilla	s5
Betula populifolia	Gray Birch	S5
Calamagrostis canadensis	Blue-Joint Reedgrass	S5
Chamaedaphne calyculata	Leatherleaf	S5
Cicuta maculata	Spotted Water-Hemlock	S5
Dryopteris cristata	Crested Shield-Fern	S5
Equisetum arvense	Field Horsetail	S5
Galium palustre	Common Marsh Bedstraw	S5
llex verticillata	Common Winterberry	S5
Kalmia angustifolia	Sheep-Laurel	S5
Larix laricina	American Larch	S5
Lycopus americanus	American Water Horehound	S5
Lysimachia terrestris	Swamp Yellow Loosestrife	S5
Maianthemum trifolium	Three-Leaf Solomon's-Plume	S5
Oclemena acuminata	Whorled Aster	S5
Onoclea sensibilis	Sensitive Fern	S5
Osmunda cinnamomea	Cinnamon Fern	S5
Osmunda regalis	Royal Fern	S5
Populus tremuloides	Quaking Aspen	S5
Rhododendron groenlandicum	Common Labrador Tea	S5
Rubus pubescens	Dwarf Red Raspberry	S5
Salix bebbiana	Bebb's Willow	S5
Salix discolor	Pussy Willow	S5
Scirpus cyperinus	Common Woolly Bulrush	S5
Spiraea alba	White Meadowsweet	S5
Symphyotrichum novi-belgii	New York Aster	S5
Symphyotrichum puniceum	Purple-stemmed Aster	S5
Trientalis borealis	Northern Starflower	S5
Typha latifolia	Broad-leaved Cattail	S5
Viola blanda	Smooth White Violet	S5
Viola macloskeyi	Smooth White Violet	S5

Wetland 7		
Species	Common Name	S-Rank
Acer rubrum	Red Maple	S5
Alnus incana	Speckled Alder	S5
Amelanchier sp	serviceberry	-
Athyrium filix-femina	Common Lady Fern	S5
Calamagrostis canadensis	Blue-Joint Reedgrass	S5
Carex Iurida	Sallow Sedge	S5
Carex stipata	Awl-fruited Sedge	S5
Equisetum arvense	Field Horsetail	S5
Galium palustre	Common Marsh Bedstraw	S5
Impatiens capensis	Spotted Jewel-Weed	S5
Lysimachia terrestris	Swamp Loosestrife	S5
Onoclea sensibilis	Sensitive Fern	S5
Osmunda cinnamomea	Cinnamon Fern	S5
Quercus rubra	Northern Red Oak	S5
Phalaris arundinacea	Reed Canary Grass	S5
Rubus idaeus	Red Raspberry	S5
Rumex crispus	Curled Dock	SNA
Salix bebbiana	Bebb's Willow	S5
Scutellaria lateriflora	Mad Dog Skullcap	S5
Spiraea alba	White Meadowsweet	S5
Spiraea tomentosa	Hardhack Spiraea	S5
Typha latifolia	Broad-leaved Cattail	S5
Vicia cracca	Tufted Vetch	SNA

Wetland 8		
Species	Common Name	S-Rank
Abies balsamea	Balsam Fir	s5
Acer rubrum	Red Maple	S5
Alnus incana	Speckled Alder	S5
Betula populifolia	Gray Birch	S5
Calamagrostis canadensis	Blue-Joint Reedgrass	S5
Chamaedaphne calyculata	Leatherleaf	S5
Eleocharis acicularis	Needle Spikerush	S5
Galium palustre	Common Marsh Bedstraw	S5
Iris versicolor	Blueflag	S5
Juncus effusus	Soft Rush	S5
Kalmia angustifolia	Sheep-Laurel	S5
Larix laricina	American Larch	S5
Lycopus americanus	American Water Horehound	S5
Lysimachia terrestris	Swamp Yellow Loosestrife	S5
Maianthemum trifolium	Three-Leaf Solomon's-Plume	S5
Myrica gale	Sweet Bayberry	S5
Nemopanthus mucronatus	Mountain Holly	S5
Oclemena acuminata	Whorled Aster	S5
Oclemena nemoralis	Bog Aster	S5
Onoclea sensibilis	Sensitive Fern	S5
Osmunda cinnamomea	Cinnamon Fern	S5
Rubus hispidus	Bristly Dewberry	S5
Salix bebbiana	Bebb's Willow	S5
Sarracenia purpurea	Northern Pitcher Plant	S5
Spiraea alba	White Meadowsweet	S5
Triadenum fraseri	Fraser's Marsh St John's-wort	S5
Typha latifolia	Broad-leaved Cattail	S5
Viburnum nudum	Northern Wild Raisin	S5
Viola blanda	Smooth White Violet	S5
Viola macloskeyi	Smooth White Violet	S5

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

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

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

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

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

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

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

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

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

#### WI -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 of 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 broadleaved 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 offsite 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 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<sup>1,2</sup>

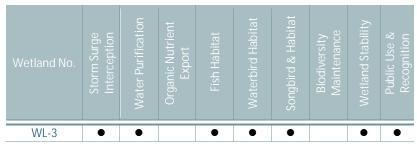
Wetlar No.	PP Water Storage & Delay	Stream Flow Support	Water Cooling	Sediment Retention & Stabilization	Phosphorous Retention	Nitrate Removal and Retention	Carbon Sequestration	Organic Nutrient Export	Anadromous Fish Habitat	Resident Fish Habitat	Aquatic Invertebrate Habitat	Amphibian and Turtle Habitat	Waterbird Feeding Habitat	Waterbird Nesting Habitat	Songbird, Raptor & Mammal Habitat	Pollinator Habitat	Native Plant Habitat	Public Use & Recognition
WL-5A	Α	•	•					•		•	•	•	•	•	•	•		•
WL-5E	3	•	•					•		•	•	•	•	•	•	•	•	•
WL-50	С	•	•					•		•	•	•	•					•
WL-5[	)	•	•	•		•		•		•	•	•	•	•	•	•		•
WL-5E	E	•	•					•			•	•	•					•
WL-6	)	•	•				•	•		•	•	•	•					•
WL-7	,	•	•			•		•		•	•	•	•	•	•	•		•
WL-8	}	•	•				•	•		•	•	•	•					•
WL-9	)	•				•		•		•	•	•	•					•
WL-10	0	•	•			•		•		•	•	•	•					•
WL-11	1	•	•			•		•		•	•	•	•		•	•		•
WL-13	3	•	•	•		•	•	•		•	•	•	•	•	•	•	•	•
WL-13	В	•	•			•		•					•					•
WL-16	6	•				•					•		•					•
WL-19	9 •			•	•	•							•					•
WL-20	<u> </u>			•	•	•						•	•	•	•	•		•
-	1-4		-					1			1		-	-				

#### 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<sup>1,2</sup>



#### 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.

  <a href="https://www.novascotia.ca/nse/ea/Replacement\_Effluent\_Treatment\_Facility\_Project/">https://www.novascotia.ca/nse/ea/Replacement\_Effluent\_Treatment\_Facility\_Project/</a>
- Nova Scotia Environment (NSE). 2019. Focus Report Terms of Reference for the Preparation of a Focus Report Regarding the Replacement Effluent Treatment Facility Project.

  <a href="https://www.novascotia.ca/nse/ea/Replacement\_Effluent\_Treatment\_Facility\_Project/Focus-Report-Terms-of-Reference.pdf">https://www.novascotia.ca/nse/ea/Replacement\_Effluent\_Treatment\_Facility\_Project/Focus-Report-Terms-of-Reference.pdf</a>
- 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



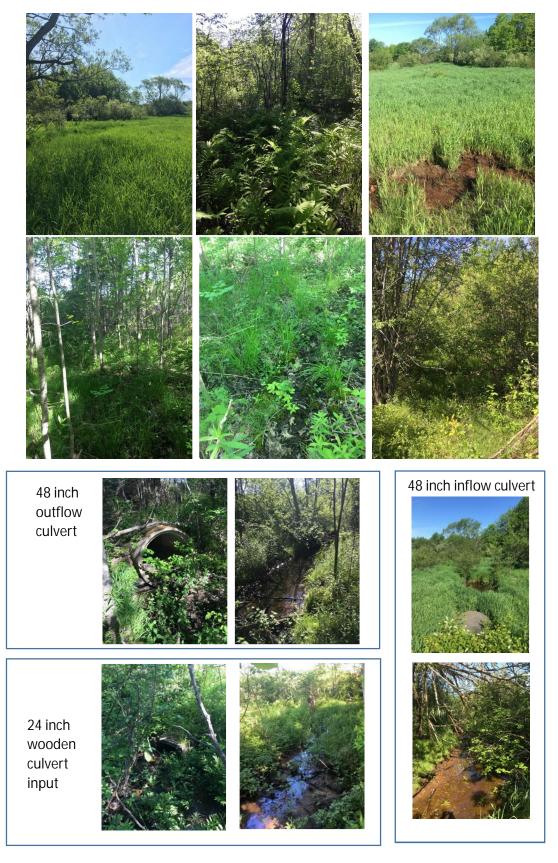
WC05 runs through WL-3



WL-5A – June 18, 2019



WL-5B – June 18, 2019



WL-5C- June 18, 2019



WC08 outflow:





48 inch input culvert:

WL-5D – June 18, 2019



Culvert input from Roundabout:



Small outlet stream





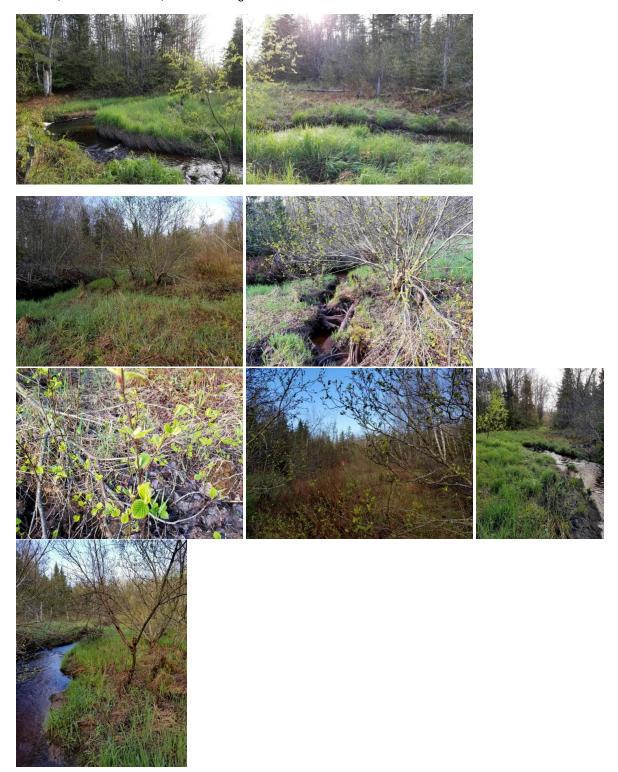
WL-5E – July 30, 2019



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:





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.



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): _f	lat
Slope:0.0% /0.0_ ° Lat.: 45.670176	Long.:	-62.727778	Datum: NAD83
Soil Map Unit Name/Type: Tormentine			ype: Salt Marsh
Are climatic/hydrologic conditions on the site typical for this time	of year? Yes   No		STATE SOLICE MICHAEL STATE STA
Are Vegetation ✓ , Soil ✓ , or Hydrology ✓	significantly disturbed?	Are "Normal Circumstances" prese	ent? Yes • No O
Are Vegetation, Soil, or Hydrology	naturally problematic?	(If needed, explain any answers i	
	<b>3</b> .		
SUMMARY OF FINDINGS - Attach site map sh	lowing sampling poi	nt locations, transects, impo	ortant features, etc.
Hydrophytic Vegetation Present? Yes   No			
Hydric Soil Present? Yes   No		ne Sampled Area nin a Wetland? Yes No O	
Wetland Hydrology Present? Yes   No		103 0 110 0	
Remarks: Freshwater input from a ditch-fed culvert (hydrology). Rexcapees are present along edges and within wetland (		ents encroachment of fill maierial (so	oil). Exotic shrubs and other garden
<b>VEGETATION</b> - Use scientific names of pl	ants. Dominan	t	
	Absolute Rel.Strat		sheet:
Tree Stratum (Plot size: 10 m )	% Cover Cover	Status Number of Dominant Sp	pecies
1	0	That are OBL, FACW, or	FAC:4(A)
2	0	Total Number of Domina	ant
34.		Species Across All Strata	4 (B)
5.	0 0.0%	Percent of dominant	Species
0	0 = Total Co	That Are OBL_FACW	or FAC:100.0% (A/B)
Sapling/Shrub Stratum (Plot size: 5 m		Prevalence Index wor	ksheet:
1	00.0%	Total % Cover of	of: Multiply by:
2	00.0%	OBL species	81.5 x 1 = 81.5
3	0	FACW species	30 x 2 = 60
4	0		7 x 3 = <u>21</u>
5	0 0.0%	FACU species	0 x 4 = 0
Herb Stratum (Plot size: 2 m	= Total Co	or E species	0 x 5 = 0
1 Schoenoplectus acutus	25 💆 21.1%	OBL Column Totals: 1	18.5 (A) <u>162.5</u> (B)
2. Typha latifolia	2521.1%	— Frevalence index	x = B/A = 1.371
3. Typha angustifolia	25	— Hydrophytic Vegetatio	on Indicators:
4. Phalaris arundinacea 5. Impatiens capensis	<u>25</u> <u>✓ 21.1%</u> 5	FACW 1 - Rapid Test for	Hydrophytic Vegetation
6 Caray atinata	0.5 0.49/	OBL 2 - Dominance Tes	st is > 50%
7. Spartina alterniflora		OBL 3 - Prevalence Ind	
8. Galium palustre	1 0.8%	OPI 4 - Morphological	Adaptations <sup>1</sup> (Provide supporting r on a separate sheet)
9. Solanum dulcamara		EAC	ophytic Vegetation <sup>1</sup> (Explain)
10. Calystegia sepium	5	FAC	
Woody Vine Stratum (Plot size: )	= Total Co	ver be present, unless dis	soil and wetland hydrology must sturbed or problematic.
1.	0 0.0%		
2			
	0 = Total Co		● No ○
Remarks: (Include photo numbers here or on a separate	e sheet.)		

SOIL			Sampling Point: WL-3
Profile Description: (Describe to the depth needed to docume	nt the indicator or confirm t	he absence of indicators.)	
Depth Matrix Re	dox Features	_	
(inches) Color (moist) % Color (moist)	<u>% Type</u> <sup>1</sup> Loc <sup>2</sup>	Texture	Remarks mi xed organi cs
		Silty Clay	
		_	
		<del></del>	
		_	
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Cove	red or Coated Sand Grains.	<sup>2</sup> Location: PL=Pore Lining	. M=Matrix.
Hydric Soil Indicators:			
Histosol (A1) Sandy Gleyer	l Matrix (S4)		ematic Hydric Soils <sup>3</sup> :
Histic Epipedon (A2) Sandy Redox		Coast Prairie Redox	(A16)
Black Histic (A3) Stripped Mat		Dark Surface (S7)	
Hydrogon Sulfido (A4)	/ Mineral (F1)	Iron Manganese Ma	asses (F12)
Stratified Layers (AE)	d Matrix (F2)	Very Shallow Dark	Surface (TF12)
2 cm Muck (A10) Depleted Ma		Other (Explain in R	emarks)
Depleted Below Dark Surface (A11)			
Thick Dark Surface (A12)	k Surface (F7)	<sup>3</sup> Indicators of hydropl	nytic vegetation and
Sandy Muck Mineral (S1) Redox Depre		wetland hydrology	y must be present,
5 cm Mucky Peat or Peat (S3)		unless disturbed	or problematic.
Restrictive Layer (if observed):			
Type: <u>None encountered</u>			
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 Indica	tors (minimum of two required_
✓ Surface Water (A1)	ned Leaves (B9)	Surface Soil (	Cracks (B6)
☐ High Water Table (A2) ✓ Aquatic Fa	• •	✓ Drainage Pat	, ,
	ic Plants (B14)		Vater Table (C2)
	Sulfide Odor (C1)	Crayfish Burn	
	nizospheres on Living Roots (C3		sible on Aerial Imagery (C9)
	f Reduced Iron (C4)		ressed Plants (D1)
☐ Algal Mat or Crust (B4) ☐ Recent Iron	Reduction in Tilled Soils (C6)	Geomorphic I	Position (D2)
	Surface (C7)	FAC-Neutral	Test (D5)
	Vell Data (D9)		
	lain in Remarks)		
otilai (Enp	an minonano,		
Field Observations:			
Surface Water Present? Yes   No Depth (in	ches):4		
Water Table Present? Yes  No Depth (in	ches): 0		
F /	We	tland Hydrology Present?	Yes   No
(includes capillary fringe) Yes No Depth (in			
Describe Recorded Data (stream gauge, monitoring well, aeria	I photos, previous inspection	ns), if available:	
Remarks:			

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 Cons	ulting
Landform (hillslope, terrace, etc.): Basin	Local relief (	(concave, convex, none): concave
· · · · · · · · · · · · · · · · · · ·		- NADOS
10.000017	Long.: -62.727807	
Soil Map Unit Name/Type: <u>Tormentine</u>	- Vos ( No ( )	Wetland Type: Swamp - shrub
Are climatic/hydrologic conditions on the site typical for this time of		explain in Remarks.)  Jormal Circumstances" present?  Yes  No  No
	significantly disturbed? Are "N	No Union of the Indian Circumstances of the Indian Circumstance of the Indian Circumst
Are Vegetation, Soil, or Hydrology	naturally problematic? (If ne	eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sho	wing sampling point location	ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes • No •		
Hydric Soil Present? Yes   No	Is the Sampled within a Wetlan	
Wetland Hydrology Present? Yes   No	within a wetlan	Yes © NO C
Remarks:		
Wetland is a shrub swamp with wet meadow characterist and other fill material within wetland (soil), and moderate		regularly mowed on roundabout side (Vegetation), road
<b>VEGETATION</b> - Use scientific names of pla		
(2)	Absolute Rel.Strat. Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 10 m	% Cover Cover Status	Number of Dominant Species
1. Salix bebbiana		That are OBL, FACW, or FAC:3(A)
2. Picea rubens 3. Acer rubrum	0.5 0 1.50/ 540	Total Number of Dominant
		Species Across All Strata:3(B)
4 5.	0 0.0%	Percent of dominant Species
	11 = Total Cover	That Are OBL, FACW, or FAC:100.0%(A/B)
Sapling/Shrub Stratum (Plot size: 5 m		Prevalence Index worksheet:
1. Prunus virginiana	516.1% _FACU	Total % Cover of: Multiply by:
2. Alnus incana		OBL species6 x 1 =6
3. Rosa multiflora	5 <u>16.1%</u> FACU	FACW species <u>116.5</u> x 2 = <u>233</u>
4. Spiraea alba		FAC species $2.5$ x 3 = $7.5$
5. Rubus hispidus		FACU species 10.5 x 4 = 42
Herb Stratum (Plot size: 2 m	= Total Cover	UPL species 0 x 5 = 0
1. Phalaris arundinacea	80 <b>▼</b> 85.6% FACW	Column Totals: <u>135.5</u> (A) <u>288.5</u> (B)
2. Solidago rugosa	2 2.1% FAC	Prevalence Index = B/A = 2.129
3. Carex intumescens		Hydrophytic Vegetation Indicators:
4. Equisetum sylvaticum	5 <u>5.3%</u> FACW	✓ 1 - Rapid Test for Hydrophytic Vegetation
5. Persicaria hydropiper	0.5	✓ 2 - Dominance Test is > 50%
6. Carex Iurida		✓ 3 - Prevalence Index is ≤3.0 <sup>1</sup>
7. Lysimachia terrestris	5	4 - Morphological Adaptations <sup>1</sup> (Provide supporting
8. 9.	0 0.0%	data in Remarks or on a separate sheet)
10.	0 0.0%	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
	93.5 = Total Cover	<sup>1</sup> Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size:)		be present, unless disturbed or problematic.
1		Hydrophytic
2	0 0.0%	Vegetation
	= Total Cover	Present? Yes VIO
Remarks: (Include photo numbers here or on a separate :	sheet )	
Tromains. (molade prioto numbers here or on a separate :	snoct.)	

SOIL		Sampling Point: <b>WL-5A</b>
Profile Description: (Describe to the depth needed to document the indicator or co	onfirm the	absence of indicators.)
Depth Matrix Redox Features		
<u>(inches)</u> <u>Color (moist)</u> <u>%</u> <u>Color (moist)</u> <u>%</u> <u>Type <sup>1</sup></u>	Loc <sup>2</sup>	Texture Remarks
0-2		Muck bl ack
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
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Gra	ains.	<sup>2</sup> Location: PL=Pore Lining. M=Matrix.
Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :
Histosol (A1) Sandy Gleyed Matrix (S4)		_
Histic Epipedon (A2) Sandy Redox (S5)		Coast Prairie Redox (A16)
Black Histic (A3) Stripped Matrix (S6)		Dark Surface (S7)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1)		☐ Iron Manganese Masses (F12)
Stratified Layers (A5) Loamy Gleyed Matrix (F2)		Very Shallow Dark Surface (TF12)
☐ 2 cm Muck (A10) ☐ Depleted Matrix (F3)		Other (Explain in Remarks)
Depleted Below Dark Surface (A11)  Redox Dark Surface (F6)		
☐ Thick Dark Surface (A12) ☐ Depleted Dark Surface (F7)		<sup>3</sup> Indicators of hydrophytic vegetation and
Sandy Muck Mineral (S1)  Redox Depressions (F8)		wetland hydrology must be present,
5 cm Mucky Peat or Peat (S3)		unless disturbed or problematic.
Restrictive Layer (if observed):		
Type: <u>None encountered</u>		
Depth (inches): N/A		Hydric Soil Present? Yes  No
Remarks:		
HYDROLOGY		
Wetland Hydrology Indicators:		Cocondan Indicators (minimum of two required
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required
Surface Water (A1)   ✓ Water-Stained Leaves (B9)		Surface Soil Cracks (B6)
✓ High Water Table (A2) ✓ Aquatic Fauna (B13)		✓ Drainage Patterns (B10)
Saturation (A3)		Dry Season Water Table (C2)
☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1)		Crayfish Burrows (C8)
Sediment Deposits (B2)  Oxidized Rhizospheres on Living R	Roots (C3)	Saturation Visible on Aerial Imagery (C9)
☐ Drift Deposits (B3) ☐ Presence of Reduced Iron (C4)		Stunted or Stressed Plants (D1)
☐ Algal Mat or Crust (B4) ☐ Recent Iron Reduction in Tilled So	oils (C6)	Geomorphic Position (D2)
☐ Iron Deposits (B5) ☐ Thin Muck Surface (C7)		✓ FAC-Neutral Test (D5)
☐ Inundation Visible on Aerial Imagery (B7) ☐ Gauge or Well Data (D9)		
Sparsely Vegetated Concave Surface (B8) Other (Explain in Remarks)		
	1	
Field Observations:		
Surface Water Present? Yes No Depth (inches):	-	
Water Table Present? Yes No Depth (inches): 26	-	v • · · ·
Saturation Present?  (includes capillary frings)  Yes No Depth (inches): 20	Wetla	and Hydrology Present? Yes   No
(includes capillally fillinge)	- cootion-	) if available:
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous in	spections	oj, ii avaiidbie:
Remarks:		

Project/Site: Northern Pulp Plant - Pipelin	ne PFA	Municipality/Coun	ty: Pictou		Sampling Date:	30-Jul-19
Applicant/Owner: NPNS					Sampling Point:	WL-5B
Investigator(s): Chris Kennedy		Affiliatio	on: Dillon Consu	ulting		
Landform (hillslope, terrace, etc.): Basin			Local relief (	concave, convex, none): co	oncave	
Slope:/	45 684747	Lon	— g∴ -62.730116	_	Datum: NAD8	
Soil Map Unit Name/Type:	43.004747		902.730110			
Are climatic/hydrologic conditions on the s	ita tumiaal far thia tima a	funara Yes No	(If no. e	xplain in Remarks.)	/pe:_Swamp - shrub	)
		significantly disturbed?			nt? Yes •	No O
		•		ormal Circumstances" prese		110
Are Vegetation, Soil	, or Hydrology	naturally problematic?	(If nee	eded, explain any answers in	n Remarks.)	
SUMMARY OF FINDINGS - At	tach site map sho	wing sampling p	ooint locatio	ns, transects, impo	rtant features,	etc.
Hydrophytic Vegetation Present?	Yes ● No ○					
Hydric Soil Present?	Yes ● No ○		s the Sampled	Area		
Wetland Hydrology Present?	Yes ● No ○	V	vithin a Wetlan	d? Yes ● No ○		
Remarks:						
Wetland is a shrub swamp with wet and other fill material within wetlan				regularly mowed on rour	ndabout side (Veget	tation), road
VEGETATION - Use scien	ntific names of pla	i <b>nt</b> s. Domir	nant			
		Speci Absolute Rel.St	es? ———	Dominance Test works	sheet:	
Tree Stratum (Plot size: 10 m	)	% Cover Cov		Number of Dominant Spe		
1. Salix bebbiana		1066.		That are OBL, FACW, or		(A)
2. Acer rubrum		5		Total Number of Domina	nt	
3			0%	Species Across All Strata:		(B)
4 5.			0%	Percent of dominant S	Snecies	
J		0 <u>0.</u> 15 = Total	0%	That Are OBL, FACW,		.0% (A/B)
Sapling/Shrub Stratum (Plot size: 5 m	)		OOVCI	Prevalence Index work	rsheet:	
1. Alnus incana		60 🗹 91.	.6% FACW	Total % Cover o		:
2. Rubus allegheniensis			6% FACU			1.5
3. Prunus virginiana		0.5 0.	8% FACU	FACW species 11	15.5 x 2 =	231
4		0 0.0	0%	FAC species	20 x 3 =	60
5		00.0	0%	FACU species	5.5 x 4 =	22
_Herb_Stratum (Plot size: 2 m	)	65.5 = Total	Cover	UPL species (	<u>).5                                    </u>	2.5
1 Solidago rugosa		58.0	0% FAC	Column Totals:1	(A)	317 (B)
2. Impatiens capensis		15 🗹 24.	.0% FACW	Prevalence Index	= B/A =2.2	17
3. Equisetum arvense		58.0	0% FAC	Hydrophytic Vegetatio		
4. Phalaris arundinacea		3048.	.0% FACW	1 - Rapid Test for H		tion
5. Ranunculus repens			0% FAC	✓ 2 - Dominance Test		
6. Carex arctata			8% <u>UPL</u>	✓ 3 - Prevalence Inde		
7. Carex scoparia 8. Lysimachia terrestris			8% <u>FACW</u> 8% OBL	4 - Morphological A		ide supporting
9. Chelone glabra			8% OBL 8% OBL	data in Remarks or	on a separate shee	et)
10. Persicaria sagittata			8% OBL	Problematic Hydro	phytic Vegetation <sup>1</sup>	(Explain)
		62.5 = Total		<sup>1</sup> Indicators of hydric	soil and wetland hy	drology must
Woody Vine Stratum (Plot size:				be present, unless dist	turbed or problema	tic.
1			0%	Hydrophytic		
2			0%	Vegetation	● No ○	
		= Total	Lover	Present? Yes		
Remarks: (Include photo numbers I	here or on a senarate	sheet)				
Nomarko. (moiade prioto nambers i	noro or on a soparate	311301.7				

SOIL											Sampling I	Point: WL-5B
Profile Desci	ription: (Des	cribe to th	ne depth n	eeded to	documen	t the indic	cator or co	onfirm th	e absence o	of indicators.)		
Depth		Matrix				lox Featur						
(inches)	Color (n	noist)_	%	Color	(moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Te	exture		Remarks
0-1									Muck		Black orga	ni cs
1-3	7.5YR	3/2	100						Silt Loam	ı		
3-13	7.5YR	4/2	100						Silt Loam	l		
13-15	10YR	7/1	95	7.5YR	5/8	5			Sandy Lo	am		
15-36	5YR	4/2							Loam			
1 Type: C=Con			RM=Reduc	ed Matrix	, CS=Covere	ed or Coate	ed Sand Gr	ains.	<sup>2</sup> Location:	PL=Pore Linin	g. M=Matrix.	
Hydric Soil I	Indicators:								Indica	ators for Prob	lematic Hydri	ic Soils 3 ·
Histosol (	(A1)			☐ Sa	ndy Gleyed	Matrix (S4	)				,	
	pedon (A2)			☐ Sa	ndy Redox	(S5)				ast Prairie Redo		
Black Hist				Sti	ripped Matri	ix (S6)				rk Surface (S7)		
	Sulfide (A4)			☐ Lo	amy Mucky	Mineral (F	1)			n Manganese N		
	Layers (A5)			☐ Lo	amy Gleyed	Matrix (F2	2)			-	Surface (TF12	.)
2 cm Muc				<b>✓</b> De	pleted Matr	ix (F3)			Other (Explain in Remarks)			
	Below Dark S	•	1)	Re	dox Dark Si	urface (F6)						
	k Surface (A1	•		☐ De	pleted Dark	Surface (F	7)		<sup>3</sup> India	cators of hydro	phytic vegetation	on and
	uck Mineral (S	•		Re	dox Depres	sions (F8)			W	etland hydrolo	gy must be pre	sent,
	cky Peat or Pea								1	uniess disturbe	d or problemat	IC.
Restrictive L	-											
	lone encount :hes):_N/A	Pren							Hydric S	Soil Present?	Yes	No O
	лез). <u>М/Д</u>											
Remarks:												
HYDROLO	)CV											
Wetland Hyd			roquirod: c	hock all ti	aat annly)					Cocondary India	eators (minimur	m of two required
	ators (minimu	ili oi one is	required, c				(DO)					m of two required
☐ Surface v	Vater (A1)				Water-Stain Aquatic Fau		(B9)		[	<ul><li>Surrace Soil</li><li>✓ Drainage Pa</li></ul>	Cracks (B6)	
							1.4\		<u>[</u>			20)
✓ Saturation					True Aquatio				L		Water Table (0	,2)
Water Ma					Hydrogen Si		` '	(00)		☐ Crayfish Bu		(20)
	Deposits (B2)	)			Oxidized Rh			ROOTS (C3)	) L	_	isible on Aerial	
Drift Dep				$\equiv$	Presence of		. ,	" (0()	L	_	Stressed Plants	(DT)
_ ~	or Crust (B4)				Recent Iron			olis (C6)	L		Position (D2)	
Iron Depo			<b>()</b>		Thin Muck S		•		<u> </u>	✓ FAC-Neutra	Test (D5)	
	on Visible on A	•			Gauge or W	•	•					
☐ Sparsely	Vegetated Cor	ncave Surfa	ice (B8)		Other (Expla	ain in Rema	arks)					
Field Observ	vations:							1				
Surface Water		Yes (	O No €	)	Depth (inc	:hes):		_ [				
Water Table P	Present?	Yes C	O No €	)	Depth (inc	hes).		_				
Saturation Pre		Yes (					22	Wet	land Hydro	logy Present?	Yes 💿	No O
(includes capi	llary fringe)				Depth (inc		22	<u>- I</u>	) 16 "			
Describe Rec	corded Data	(stream g	auge, mon	itoring v	vell, aerial	photos, p	revious ir	nspection	ıs), it availa	ble:		
Domortic												
Remarks:												

roject/Site: Northern Pulp Plant - Pipe	line PFA	Municipality/County:	Pictou	Sampling Date: 30-Jul-19
oplicant/Owner: NPNS				Sampling Point: WL-5C
vestigator(s): Chris Kennedy		Affiliation:	Dillon Consu	ulting
ndform (hillslope, terrace, etc.): Hillsi			Local relief (	concave, convex, none): convex
		Long.		- NADOO
		Lorig	-62.732702	
il Map Unit Name/Type: <u>Tormenti</u>		Vac 📵 Na 🔘		Wetland Type: Swamp - shrub
e climatic/hydrologic conditions on the			(If no, e	xplain in Remarks.)
e Vegetation 🗸 , Soil 🗸	, or Hydrology	significantly disturbed?	Are "N	ormal Circumstances" present? Yes   No
e Vegetation , Soil	, or Hydrology	naturally problematic?	(If nee	eded, explain any answers in Remarks.)
JMMARY OF FINDINGS - A	ttach site map sh	nowing sampling po	int locatio	ns, transects, important features, etc.
ydrophytic Vegetation Present?	Yes ● No ○			
lydric Soil Present?	Yes ● No ○		he Sampled	Area
/etland Hydrology Present?	Yes ● No ○	Wit	hin a Wetlan	d? Yes ● No ○
Remarks:	103 0 110 0			_
Treed Swamp with flood plain cha wetland (soil disturbance) and stro	ong stormwater influe	nce from ditching and ca	itchent (hydro	vay, evidence of ATV use and presence of road fill within ology).
	·	Absolute Rel.Stra		Dominance Test worksheet:
Tree Stratum (Plot size: 10 m	)	% Cover Cover		Number of Dominant Species
1. Populus tremuloides			6 FACU	That are OBL, FACW, or FAC: 4 (A)
2. Acer rubrum		5 💆 50.0%	6 FAC	Total Number of Dominant
3				Species Across All Strata: 5 (B)
4				Descent of deminent Species
5				Percent of dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)
Sapling/Shrub Stratum (Plot size: 5 r	m )	10 = Total Co	over	Describer as to describe as to
1 Alassa in a san		45 🗹 80.4%	6 FACW	Prevalence Index worksheet:  Total % Cover of: Multiply by:
2 Dans and Williams		10		OBL species 32.5 x 1 = 32.5
2				FACW species 70 x 2 = 140
1				FAC species 18.5 x 3 = 55.5
5.		0 0.0%	5	FACU species 16 x 4 = 64
Herb Stratum (Plot size: 2 m	)	56 = Total Co	over	UPL species $0 \times 5 = 0$
1. Impatiens capensis		25 🗹 35.29	6 FACW	Column Totals: 137 (A) 292 (B)
Persicaria sagittata		25 <b>2</b> 35.27	_	
3. Ranunculus acris		5 7.0%		Prevalence Index = B/A = 2.131
4. Ranunculus repens		5 7.0%		Hydrophytic Vegetation Indicators:
5. Geum aleppicum		3 4.2%		1 - Rapid Test for Hydrophytic Vegetation
6. Carex arcta		1 1.4%	OBL	2 - Dominance Test is > 50%
7. Lycopus americanus		1 1.4%	OBL	✓ 3 - Prevalence Index is ≤3.0 <sup>1</sup>
8. Solidago rugosa		0.5 0.7%	FAC FAC	4 - Morphological Adaptations 1 (Provide supportine data in Remarks or on a separate sheet)
9. Glyceria striata		5	OBL	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
7. Glyceria striata				
		0.5 0.7%	OBL	
10. Lysimachia terrestris	)	0.5 0.7% 71 = Total Co		
10. Lysimachia terrestris  Woody Vine Stratum (Plot size:		71 = Total Co	over	<sup>1</sup> Indicators of hydric soil and wetland hydrology mus- be present, unless disturbed or problematic.
10. Lysimachia terrestris		71 = Total Co	over	Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.  Hydrophytic
10. Lysimachia terrestris  Woody Vine Stratum (Plot size:  1.		71 = Total Co	over	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

SOIL	Sampling Point: WL-5C
Profile Description: (Describe to the depth needed to document the indicator or confirm	the absence of indicators.)
Depth Matrix Redox Features	· 
(inches) Color (moist) % Color (moist) % Type 1 Loc	<sup>2</sup> Texture Remarks
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
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.	<sup>2</sup> Location: PL=Pore Lining. M=Matrix.
Hydric Soil Indicators:	Indicators for Problematic Hydric Soils $^3$ :
☐ Histosol (A1) ☐ Sandy Gleyed Matrix (S4)	Coast Prairie Redox (A16)
Histic Epipedon (A2) Sandy Redox (S5) Black Histic (A3) Stripped Matrix (S4)	Dark Surface (S7)
Stripped Wattrix (30)	Iron Manganese Masses (F12)
Comy Mucky Mineral (F1)	☐ Very Shallow Dark Surface (TF12)
Loamy Gleyed Matrix (F2)	
☐ Depleted Matrix (F3)	Uther (Explain in Remarks)
Depleted Below Dark Surface (A11)  Redox Dark Surface (F6)	
☐ Thick Dark Surface (A12) ☐ Depleted Dark Surface (F7)	<sup>3</sup> Indicators of hydrophytic vegetation and
Sandy Muck Mineral (S1)  Redox Depressions (F8)	wetland hydrology must be present,
5 cm Mucky Peat or Peat (S3)	unless disturbed or problematic.
Restrictive Layer (if observed):	
Type: <u>Not encountered</u>	Hydric Soil Present? Yes No
Depth (inches): <u>N/A</u>	riyund Soir Fesent: Yes Wo
Remarks:	
HYDROLOGY	
Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required
✓ Surface Water (A1) ✓ Water-Stained Leaves (B9)	Surface Soil Cracks (B6)
☐ High Water Table (A2) ✓ Aquatic Fauna (B13)	✓ Drainage Patterns (B10)
✓ Saturation (A3) ☐ True Aquatic Plants (B14)	Dry Season Water Table (C2)
Water Marks (B1)  Hydrogen Sulfide Odor (C1)	Crayfish Burrows (C8)
Sediment Deposits (B2)  Oxidized Rhizospheres on Living Roots (C)	
✓ Drift Deposits (B3)	Stunted or Stressed Plants (D1)
☐ Algal Mat or Crust (B4) ☐ Recent Iron Reduction in Tilled Soils (C6	
☐ Iron Deposits (B5) ☐ Thin Muck Surface (C7)	FAC-Neutral Test (D5)
	TAC-Neutral Test (D3)
5 7, 7 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	
☐ Sparsely Vegetated Concave Surface (B8) ☐ Other (Explain in Remarks)	
Field Observations:	
Surface Water Present? Yes   No Depth (inches): 8	
Water Table Present? Yes No Depth (inches):	
Saturation Present? Ves No Depth (inches): 22	/etland Hydrology Present? Yes  ● No ○
(includes capillal y filinge)	(ana) if and in the
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspecti	ions), it available:
Remarks:	

	Municipality/County	Pictou	Sampling Date: 18-Jun-19
pplicant/Owner: NPNS			Sampling Point: WL-5D
nvestigator(s): Chris Kennedy	Affiliation	: Dillon Consu	ulting
andform (hillslope, terrace, etc.): Basin		Local relief (	concave, convex, none): flat
lope:0.0% /0.0 ° Lat.: 45.683560	Long.	- : -62.732972	Datum: NAD83
oil Map Unit Name/Type: Tormentine			Wetland Type: Swamp - shrub
re climatic/hydrologic conditions on the site typical for this	time of year? Yes   No	(If no, ex	xplain in Remarks.)
re Vegetation 🗹 , Soil 🗹 , or Hydrology	significantly disturbed?		ormal Circumstances" present? Yes   No
re Vegetation , Soil , or Hydrology	naturally problematic?		eded, explain any answers in Remarks.)
UMMARY OF FINDINGS - Attach site ma		oint locatio	ns, transects, important features, etc.
Hydrophytic Vegetation Present? Yes   No		the Sampled A	Aron
Hydric Soil Present? Yes  No	Ŭ wi	thin a Wetland	
Wetland Hydrology Present? Yes   No	0		
Wetland is a shrub swamp with shallow marsh cha the municipal building within wetland as well as every vegetation. Use scientific names of the state of the scientific names of the state of the scientific names of the scien	of plants.  Domina	rbance), and r	roundabout side (Vegetation), road and fill material from moderate stormwater inputs (hydrology).
(0)	Absolute Rel.Stra		Dominance Test worksheet:
Tree Stratum (Plot size: 10 m )	% Cover Cover		Number of Dominant Species
1. Acer rubrum 2.	0.5 100.0		That are OBL, FACW, or FAC:4 (A)
2			Total Number of Dominant
4			Species Across All Strata:4 (B)
5.	0 0.09	6	Percent of dominant Species
_	= Total C	Cover	That Are OBL, FACW, or FAC:100.0%(A/B)
Sapling/Shrub Stratum (Plot size: 5 m			Prevalence Index worksheet:
1. Salix bebbiana			Total % Cover of: Multiply by:
2. Acer rubrum	5 <u>25.0</u> 25.0		OBL species $\underline{60.5}$ $\times 1 = \underline{60.5}$
3. Alnus incana 4.			FACW species55
5.	0 0.09		FAC species $20.5$ $\times 3 = 61.5$ FACU species $0 \times 4 = 0$
	20 = Total C		UPL species $0 \times 5 = 0$
Herb Stratum (Plot size: 2 m	60 🗹 51.9	% OBL	Column Totals: <u>136</u> (A) <u>232</u> (B)
Typha latifolia      Phalaris arundinacea			
3. Onoclea sensibilis	20 17.3		Prevalence Index = B/A = 1.706
4. Rumex crispus	5 4.39		Hydrophytic Vegetation Indicators:
5. Solanum dulcamara	10 🗌 8.79	6 FAC	1 - Rapid Test for Hydrophytic Vegetation
6. Iris versicolor	0.5 0.49	6 OBL	<ul> <li>✓ 2 - Dominance Test is &gt; 50%</li> <li>✓ 3 - Prevalence Index is ≤3.0 <sup>1</sup></li> </ul>
7	00.09		□ 4 - Morphological Adaptations <sup>1</sup> (Provide supporting
89.	0		data in Remarks or on a separate sheet)
7	0 0.09		Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
10	0 0.09 115.5 = Total C		<sup>1</sup> Indicators of hydric soil and wetland hydrology must
10			be present, unless disturbed or problematic.
10			
Woody Vine Stratum (Plot size:)  1	00.09		Hydrophytic
Woody Vine Stratum (Plot size:)		6	Hydrophytic Vegetation Present?  Yes No

SOIL									Sampling Po	oint: WL-5D
Profile Description: (E	Describe to	the depth i	needed to	documen	t the indic	ator or co	onfirm the	e absence of indicators.)		
Depth	Matrix				dox Featur			_		
	(moist)	%	Color (	moist)_	%	Type 1	Loc <sup>2</sup>	Texture	Re	emarks
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		
							-	-		
							-			
1 Type: C=Concentration,	D=Depletion		ced Matrix.	CS=Covere	ed or Coate	d Sand Gr	ains.	<sup>2</sup> Location: PL=Pore Lining	. M=Matrix.	
Hydric Soil Indicators		.,						<del>`</del>		C-11- 3
✓ Histosol (A1)			San	ndv Gleved	Matrix (S4)	)		Indicators for Proble	ematic Hydric	Solls 3:
Histic Epipedon (A2)	)			ndy Redox		,		Coast Prairie Redox	(A16)	
Black Histic (A3)				pped Matri				Dark Surface (S7)		
Hydrogen Sulfide (A	4)				Mineral (F1	1)		Iron Manganese Ma	asses (F12)	
Stratified Layers (A5	5)				Matrix (F2			Very Shallow Dark	Surface (TF12)	
2 cm Muck (A10)				oleted Matr		,		Other (Explain in R	emarks)	
Depleted Below Dar	k Surface (A´	11)			urface (F6)					
Thick Dark Surface	(A12)				k Surface (F	7)		<sup>3</sup> Indicators of hydroph		
Sandy Muck Mineral	(S1)			dox Depres		')		wetland hydrology		
5 cm Mucky Peat or	Peat (S3)			iox Depres	1310113 (1 0)			unless disturbed		
Restrictive Layer (if o	bserved):									
Туре:										
Depth (inches):								Hydric Soil Present?	Yes 💿	No O
Remarks:										
HYDROLOGY										
Wetland Hydrology In	dicators:									
Primary Indicators (mini		is required;	check all th	at apply)				Secondary Indica	tors (minimum	of two required
✓ Surface Water (A1)			✓ w	/ater-Stain	ed Leaves (	(B9)		Surface Soil C	Cracks (B6)	
✓ High Water Table (A	(2)			quatic Fau		()		✓ Drainage Pati	. ,	
Saturation (A3)	/				c Plants (B1	14)			Vater Table (C2	)
Water Marks (B1)				-	ulfide Odor			Crayfish Burro	•	,
Sediment Deposits (	B2)			, ,	izospheres	` '	Roots (C3)		sible on Aerial I	magery (C9)
Drift Deposits (B3)	/				Reduced Ir		()		ressed Plants (I	
Algal Mat or Crust (I	34)				Reduction	` ,	oils (C6)	Geomorphic F	-	2.,
Iron Deposits (B5)	,				Surface (C7)		, (00)	FAC-Neutral		
✓ Inundation Visible o	n Aerial Imad	nery (B7)			'ell Data (D			The Neutral	1031 (20)	
Sparsely Vegetated	,			3	•	,				
Sparsery vegetated	concave sun	race (DO)		itner (Expia	ain in Rema	irks)				
Field Observations:										
Surface Water Present?	Yes	No (	$\supset$	Depth (inc	ches):	8				
Water Table Present?	Yes			Depth (inc		0	_			
Saturation Present?							Wetl	and Hydrology Present?	Yes 💿	No O
(includes capillary fringe				Depth (inc		0	-			
Describe Recorded Da	ta (stream	gauge, mo	nitoring w	ell, aerial	photos, p	revious in	spections	s), if available:		
Remarks:										

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		ocal relief (concave, convex, none): co	oncave
· · · · · · · · · · · · · · · · · · ·		_	Datum: NAD83
10.001002	Longo	52.732498	
Soil Map Unit Name/Type: <u>Tormentine</u>	- Vos ( No (		pe: Swamp - shrub
Are climatic/hydrologic conditions on the site typical for this time of		(If no, explain in Remarks.)	nt? Yes • No O
	significantly disturbed?	Are "Normal Circumstances" prese	nt? Yes S NO C
Are Vegetation, Soil, or Hydrology	naturally problematic?	(If needed, explain any answers in	Remarks.)
SUMMARY OF FINDINGS - Attach site map sho	wing sampling point	t locations, transects, impo	rtant features, etc.
Hydrophytic Vegetation Present? Yes ● No ○			
Hydric Soil Present? Yes ● No ○		Sampled Area	
Wetland Hydrology Present? Yes No	within	n a Wetland? Yes • No	
Remarks:			
Wetland is a shrub swamp with wet meadow characterist and other fill material within wetland (soil), and moderate			dabout side (Vegetation), road
<b>VEGETATION</b> - Use scientific names of pla			
(0)	Absolute Rel.Strat.	Indicator Dominance Test works	sheet:
Tree Stratum (Plot size: 10 m	% Cover Cover	Status Number of Dominant Spe	
1	0	That are OBL, FACW, or	FAC:4 (A)
2		Total Number of Domina	
4		Species Across All Strata:	4(B)
5.	0 0.0%	Percent of dominant S	
	0 = Total Cover	That Are OBL, FACW,	or FAC:100.0% (A/B)
_Sapling/Shrub Stratum (Plot size: 5 m		Prevalence Index work	sheet:
1. Alnus incana	10	FACW Total % Cover o	f: Multiply by:
2. Salix bebbiana			30 x 1 = 30
3			90 x 2 = 180
4 5.			0 x 3 = 0
	0		$     \begin{array}{ccccccccccccccccccccccccccccccccc$
Herb Stratum (Plot size: 2 m		01 L Species	<u> </u>
1 Typha latifolia	10		<u>20</u> (A) <u>210</u> (B)
2. Phalaris arundinacea	40 40.0%	FACW Prevalence Index	= B/A = <u>1.750</u>
Mentha arvensis     Persicaria sagittata	30	OBL Hydrophytic Vegetatio	n Indicators:
Persicaria sagittata     Myosotis laxa	10 10.0%	OBL 1 - Rapid Test for H	lydrophytic Vegetation
6		2 - Dominance Test	
7.	0 0.0%	<b>✓</b> 3 - Prevalence Inde	
8	0	4 - Morphological A	daptations <sup>1</sup> (Provide supporting on a separate sheet)
9	0 0.0%		phytic Vegetation <sup>1</sup> (Explain)
10	0 0.0%		soil and wetland hydrology must
Woody Vine Stratum (Plot size:)	= Total Cover	be present, unless dist	rurbed or problematic.
1	0 0.0%		
2.	0 0.0%	Hydrophytic Vegetation	
	0 = Total Cover		No O
Remarks: (Include photo numbers here or on a separate	sheet.)		

SOIL							Sampling Point: WL-5E
Profile Descr	iption: (Des	cribe to th	e depth nee	eded to document the indicator or con	nfirm the	e absence of indicators.)	
Depth		Matrix		Redox Features			
(inches)	Color (m		%	Color (moist) % Type 1	Loc2	Texture	Remarks
0-6	2.5YR	3/2					loose with roots
6-18	5YR	4/2					saturated
							with rust and black flecks
18-25	10Y	6/1				-	
<sup>1</sup> Type: C=Cond	centration, D=	Depletion,	RM=Reduced	d Matrix, CS=Covered or Coated Sand Grain	ns.	<sup>2</sup> Location: PL=Pore Linin	g. M=Matrix.
Hydric Soil I	ndicators:					Indicators for Prob	lematic Hydric Soils <sup>3</sup> :
Histosol (A	A1)			Sandy Gleyed Matrix (S4)			•
Histic Epip	edon (A2)			Sandy Redox (S5)		Coast Prairie Redo	• •
Black Hist	ic (A3)			Stripped Matrix (S6)		Dark Surface (S7)	
	Sulfide (A4)			Loamy Mucky Mineral (F1)		☐ Iron Manganese N	• •
Stratified	Layers (A5)			✓ Loamy Gleyed Matrix (F2)			Surface (TF12)
2 cm Mucl	k (A10)			Depleted Matrix (F3)		Other (Explain in I	Remarks)
Depleted	Below Dark Su	urface (A11)		Redox Dark Surface (F6)			
☐ Thick Darl	k Surface (A1:	2)		Depleted Dark Surface (F7)		3	
Sandy Mu	ck Mineral (S	1)				3 Indicators of hydrology	phytic vegetation and gy must be present,
5 cm Mucl	ky Peat or Pea	at (S3)		Redox Depressions (F8)			d or problematic.
Restrictive La	aver (if obse	rved):					·
	nt encounter						
Depth (incl						Hydric Soil Present?	Yes ● No ○
	103). <u>107 A</u>						
Remarks:							
HYDROLO	)GY						
Wetland Hyd	rology Indic	ators:					
Primary Indica	ntors (minimu	m of one is	required; che	eck all that apply)		Secondary Indic	ators (minimum of two required_
✓ Surface W	ater (A1)			Water-Stained Leaves (B9)		Surface Soil	Cracks (B6)
✓ High Wate	. ,			Aquatic Fauna (B13)		Drainage Pa	• •
✓ Saturation				True Aquatic Plants (B14)			Water Table (C2)
Water Mai				Hydrogen Sulfide Odor (C1)		Crayfish Bur	` '
	Deposits (B2)			Oxidized Rhizospheres on Living Ro	ots (C2)		isible on Aerial Imagery (C9)
					018 (03)		0 3 . ,
☐ Drift Depo				Presence of Reduced Iron (C4)	(0.1)		Stressed Plants (D1)
_ ~	or Crust (B4)			Recent Iron Reduction in Tilled Soil:	s (C6)	'	Position (D2)
Iron Depo	, ,			☐ Thin Muck Surface (C7)		✓ FAC-Neutral	Test (D5)
	n Visible on A	•		Gauge or Well Data (D9)			
☐ Sparsely \	egetated Cor	ncave Surfac	e (B8)	Other (Explain in Remarks)			
Field Observa	ations:						
Surface Water	Present?	Yes 💽	No 🔾	Depth (inches): 6			
Water Table Pi	resent?	Yes 💽	No O	Depth (inches):13			
Saturation Pres					Wetl	land Hydrology Present?	Yes  No
(includes capill	lary fringe)	Yes •		Depth (inches):6			
Describe Reco	orded Data	(stream ga	uge, monit	oring well, aerial photos, previous ins	pections	s), if available:	
Remarks:							

Investigator (s): Vanessa Graves, Torn Netly   Affiliation: Dillon Consulting   Leardism (Pilot size: Indicator Stratum (Pilot size: Sm.)   Landism (Pilot size: Sm.)   La	30-Jul-19
Landform (hillslope, terrace, etc.): Basin	WL-6
Soperation   Comment   C	
Soil Map Unit NamerType:	
Weltand Type: _Sammp - shrub	3
Ver   Very   V	
Are Vegetation	
Solid   Street   St	
SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present?  Yes No Sold Present?  Yes No Sold Sturbed From road fill and agricultural field infringes, hydrology disturbed from stormwater influence.  VEGETATION - Use scientific names of plants.  Dominant Species  Sold disturbed from road fill and agricultural field infringes, hydrology disturbed from stormwater influence.  VEGETATION - Use scientific names of plants.  Dominant Species  Tree Stratum (Plot size: 10 m )  Absolute Reli-Strat.  Secover Cover	NO U
Hydrophytic Vegetation Present? Yes No Services No No Services No	
Hydric Soil Present? Yes ● No ○  Wetland Hydrology Present? Yes ● No ○  Dominant Species Tolicator Present Indicator Status (Indicator Status Hydrology Action Factor Status Only 1 (Indicator Species That Are OBL, FACW, or FAC: 3  Total Number of Dominant Species That Are OBL, FACW, or FAC: 3  Total Mumber of Dominant Species That Are OBL, FACW or FAC: 100.0%  That Are OBL, FACW or FAC: 100.0%  Frevalence Index worksheet: Total % Cover of: Multiply by: Total % Cover of:	etc.
Hydric Soil Present?  Wetland Hydrology Present?  Ves No	
Vestand Hydrology Present?   Yes	
Number of Dominant Species   Number of Domi	
VEGETATION - Use scientific names of plants.         Dominant Species?           Tree Stratum (Plot size: 10 m)         Absolute (Accover Cover Cover Status)         Indicator (Accover Status)         Dominance Test worksheet: Number of Dominant Species (Accover Status)         N	
VEGETATION - Use scientific names of plants.         Dominant Species Track (Plot size: 10 m )         Absolute Rel Strat. (Cover Status Cover St	
Absolute   Rel Stratum   Plot size: 10 m	
Absolute   Rel Stratum   Plot size: 10 m     Absolute   Rel Stratus   Indicator   Status     Number of Dominant Species   That are OBL, FACW, or FAC:   3     3	
Absolute	
1.         □ 0.0%         Number of Dominant Species That are OBL, FACW, or FAC:         3           2.         □ 0.0%         Total Number of Dominant Species Across All Strata:         3           4.         □ 0.0%         Percent of dominant Species That Are OBL, FACW, or FAC:         3           5.         □ 0.0%         Percent of dominant Species That Are OBL, FACW, or FAC:         100.0%           1. Alnus incana         70         ✓ 70.0%         FACW           2. Salik discolor         10         10.0%         FACW           3. Sambucus nigra ssp. canadensis         5         5         5.0%         FACW           4. Spiraea alba         15         15.0%         FACW         FACW Species         20         x 1 = 20           4. Spiraea alba         15         15.0%         FACW         FACU Species         0         x 2 = 300           5.         0         0.0%         FACW Species         0         x 4 = 0         UPL species         0         x 4 = 0           Herb Stratum (Plot size: 2 m         )         10         12.5%         FACW         FACW Species         0         x 5 = 0           2. Phalaris arundinacea         30         ✓ 37.5%         FACW         FACW Species         0         x 5 = 0 </td <td></td>	
2.       0.0%       Total Number of Dominant Species Across All Strata:       3         4.       0.0%       0.0%       Percent of dominant Species That Are OBL, FACW, or FAC:       100.0%         5.       0.0%       0.0%       Percent of dominant Species That Are OBL, FACW, or FAC:       100.0%         1. Alnus incana       70       70.0%       FACW       Prevalence Index worksheet:       100.0%         2. Salix discolor       10       10.0%       FACW       OBL species       20       x 1 = 20         3. Sambucus nigra ssp. canadensis       5       5.0%       FACW       FACW       FACW species       150       x 2 = 300         4. Spiraea alba       15       15.0%       FACW       FACW species       150       x 2 = 300         5.       0       0.0%       FACU species       0       x 3 = 0       0         FACU species       0       x 3 = 0       0       0       0       0       0       0       x 4 = 0       0         UPL species       0       x 5 = 0       0       UPL species       0       x 5 = 0       0       0       0       0       10       12.5%       FACW       FACW       Prevalence Index = B/A = 1.882       1.882       1.882       1.882 </td <td>400</td>	400
3.   0   0.0%   Species Across All Strata:   3   3   4   1   1   1   1   1   1   1   1   1	(A)
4.	
Sapling/Shrub Stratum (Plot size: 5 m         0         0         - Total Cover         Percent of dominant Species That Are OBL, FACW, or FAC:         100.0%           1. Alnus incana         70         ✓ 70.0% FACW         Prevalence Index worksheet:         Prevalence Index worksheet:         Total % Cover of:         Multiply by:         Multiply by:         Multiply by:         OBL species         20         x 1 = 20         30         x 2 = 300         x 3 = 0         x 4 = 0         x 4 = 0         x 4 = 0         x 4 = 0         x 4 = 0         x 4 = 0         x 4 = 0         x 4 = 0         x 4 = 0         x 5 = 0	(B)
Sapling/Shrub Stratum (Plot size: 5 m   )	
1. Alnus incana       70       ✓ 70.0%       FACW       Total % Cover of:       Multiply by:         2. Salix discolor       10       10.0%       FACW       OBL species       20       x 1 = 20         3. Sambucus nigra ssp. canadensis       5       5.0%       FACW       FACW species       150       x 2 = 300         4. Spiraea alba       15       15.0%       FACW       FACW species       0       x 3 = 0         5.       0       0.0%       FACW species       0       x 4 = 0         Herb Stratum (Plot size: 2 m       )       100       = Total Cover       UPL species       0       x 4 = 0         1 Equisetum sylvaticum       10       12.5%       FACW       Column Totals:       170       (A)       320         2 Phalaris arundinacea       30       37.5%       FACW       Prevalence Index = B/A = 1.882         4 Onoclea sensibilis       10       12.5%       FACW       Prevalence Index = B/A = 1.882         4 Onoclea sensibilis       10       12.5%       FACW       1 - Rapid Test for Hydrophytic Vegetation         5.       10       12.5%       FACW       1 - Rapid Test for Hydrophytic Vegetation       2 - Dominance Test is > 50%         8.       0       0.0%       1 -	0% (A/B)
2. Salix discolor       10       10.0%       FACW       OBL species       20       x 1 = 20         3. Sambucus nigra ssp. canadensis       5       5.0%       FACW       FACW species       150       x 2 = 300         4. Spiraea alba       15       15.0%       FACW       FACW species       0       x 3 = 0         5.       0       0.0%       FACU species       0       x 4 = 0         Herb Stratum (Plot size: 2 m       10       12.5%       FACW         1 Equisetum sylvaticum       10       12.5%       FACW         2. Phalaris arundinacea       30       37.5%       FACW         3. Lysimachia terrestris       20       25.0%       OBL         4. Onoclea sensibilis       10       12.5%       FACW         5.       10       12.5%       FACW         6.       0       0.0%       Image: continuous sensibilis       Image: c	
3. Sambucus nigra ssp. canadensis       5       5.0%       FACW       FACW species       150       x 2 = 300         4. Spiraea alba       15       15.0%       FACW       FACW species       0       x 3 = 0         5.       0       0.0%       FACU species       0       x 4 = 0         Herb Stratum (Plot size: 2 m       100       = Total Cover       UPL species       0       x 4 = 0         1 Equisetum sylvaticum       10       12.5%       FACW       FACW       Column Totals:       170       (A)       320         2. Phalaris arundinacea       30       37.5%       FACW       Prevalence Index = B/A = 1.882       1.882         4. Onoclea sensibilis       10       12.5%       FACW       Prevalence Index = B/A = 1.882       1.882         5.       10       12.5%       FACW       Prevalence Index = B/A = 1.882       Hydrophytic Vegetation Indicators:         6.       0       0.0%       Image: Control of the prevalence Index is \$\leq \text{ 1.0}       Image: Control of the prevalence Index is \$\leq \text{ 2.0}       Image: Control of the prevalence Index is \$\leq \text{ 3.0}       Image: Control of the prevalence Index is \$\leq \text{ 3.0}       Image: Control of the prevalence Index is \$\leq \text{ 3.0}       Image: Control of the prevalence Index is \$\leq \text{ 3.0}       Image: Control of the prevalence I	
4. Spiraea alba       15       15.0%       FACW       FAC species       0       x 3 = 0         5.       0       0.0%       FACU species       0       x 4 = 0         Herb Stratum (Plot size: 2 m       )       100       = Total Cover       UPL species       0       x 5 = 0         1. Equisetum sylvaticum       10       12.5%       FACW       Column Totals:       170       (A)       320         2. Phalaris arundinacea       30       ✓ 37.5%       FACW       Prevalence Index = B/A = 1.882         3. Lysimachia terrestris       20       ✓ 25.0%       OBL       Hydrophytic Vegetation Indicators:         4. Onoclea sensibilis       10       12.5%       FACW         5.       10       12.5%       FACW         6.       0       0.0%       ✓ 2 - Dominance Test is > 50%         ✓ 2 - Dominance Test is > 50%       ✓ 3 - Prevalence Index is ≤ 3.0 ¹       ✓ 4 - Morphological Adaptations ¹ (Provide su data in Remarks or on a separate sheet)       ✓ 1 - Morphological Adaptations ¹ (Expl         10.       0       0.0%       ✓ 1 - Morphological Adaptations ¹ (Expl         1 - Morphological Adaptations ¹ (Expl       ✓ 1 - Morphological Adaptations ¹ (Expl       ✓ 1 - Morphological Adaptations ¹ (Expl         1 - Morphological Adaptations ¹ (Expl <td< td=""><td>20</td></td<>	20
5.       0       0.0%       FACU species       0       x 4 = 0         Herb Stratum (Plot size: 2 m       100       = Total Cover       UPL species       0       x 4 = 0         1, Equisetum sylvaticum       10       12.5%       FACW       Column Totals: 170       (A) 320         2, Phalaris arundinacea       30       37.5%       FACW       Prevalence Index = B/A = 1.882         3, Lysimachia terrestris       20       25.0%       OBL         4, Onoclea sensibilis       10       12.5%       FACW         5.       10       12.5%       FACW         6.       0       0.0%       ✓         7.       0       0.0%         8.       0       0.0%         9.       0       0.0%         10.       0.0%       ✓         10.       0.0%       ✓         10.       0.0%       ✓         10.       0.0%       ✓         10.       0.0%       ✓         10.       0.0%       ✓         10.       0.0%       ✓         10.       0.0%       ✓         10.       0.0%       ✓         10.       0.0%       ✓<	300
Herb Stratum (Plot size: 2 m         100         = Total Cover         UPL species         0         x 5 = 0           1, Equisetum sylvaticum         10         12.5% FACW         Column Totals: 170 (A) 320           2, Phalaris arundinacea         30         37.5% FACW         Prevalence Index = B/A = 1.882           3, Lysimachia terrestris         20         25.0% OBL         OBL           4, Onoclea sensibilis         10         12.5% FACW           5.         10         12.5% FACW           6.         0         0.0%           7.         0         0.0%           8.         0         0.0%           9.         0         0.0%           10.         0.0%         4 - Morphological Adaptations ¹ (Provide su data in Remarks or on a separate sheet)           9.         0         0.0%           10.         0.0%         Problematic Hydrophytic Vegetation ¹ (Expl           1 Indicators of hydric soil and wetland hydrolog be present, unless disturbed or problematic.	0
1   Equisetum sylvaticum   10	
2. Phalaris arundinacea 30 ✓ 37.5% FACW   3. Lysimachia terrestris 20 ✓ 25.0% OBL   4. Onoclea sensibilis 10 12.5% FACW   5. 10 12.5%   6. 0 0.0%   7. 0 0.0%   8. 0 0.0%   9. 0 0.0%   10. 0.0%   10. 0.0%   10. 0.0%   10. 1. Indicators of hydric soil and wetland hydrolog be present, unless disturbed or problematic.	
3. Lysimachia terrestris  4. Onoclea sensibilis  5.	320 (B)
4. Onoclea sensibilis  5.	82_
4. Onoclea sensibilis  5.	
5. 6. 7. 8. 9. 10	tion
7.  8.  9.  10.  Woody Vine Stratum (Plot size:  10.  0 0.0% 0.0% 0.0% 0.0% 10.  10.  10.  10.	
9. 0 0.0% data in Remarks or on a separate sheet)  10. 0 0.0% Problematic Hydrophytic Vegetation 1 (Expl  Woody Vine Stratum (Plot size: )	
9. 0 0.0% Problematic Hydrophytic Vegetation 1 (Expl. 10. 80 = Total Cover	ide supporting
10. 0 0.0% 1 Indicators of hydric soil and wetland hydrolog be present, unless disturbed or problematic.	
Woody Vine Stratum (Plot size:    80   = Total Cover   1 Indicators of hydric soil and wetland hydrolog be present, unless disturbed or problematic.	(Explain)
	drology must
	IIC.
1 0	
Vegetation Vegetation	
0 = Total Cover Present? Yes No O	
Remarks: (Include photo numbers here or on a separate sheet.)	

SOIL							Sampling Point: WL-6
Profile Descripti	on: (Desc	ribe to the	depth nee	eded to document the indicator or conf	firm the	e absence of indicators.)	
Depth —	M	atrix		Redox Features			
(inches)	Color (mo		%	Color (moist) % Type 1	Loc2	Texture	Remarks
0-5	5YR	3/3					organics and roots
5-7	7.5YR	5/2					saturation at 5 inches
7-20	7.5YR	4/3					
1 Type: C=Concent	ration D=[	Denletion RI	M=Reduced	Matrix, CS=Covered or Coated Sand Grain	15	<sup>2</sup> Location: PL=Pore Linin	n M=Matrix
Hydric Soil India		sepiciion, m	vi-reduced	Timating 05=00vered or coated sails ordin	15.		~
	Cators.			County Claved Matrix (CA)		Indicators for Prob	ematic Hydric Soils <sup>3</sup> :
Histosol (A1)	n (A2)			Sandy Gleyed Matrix (S4)		Coast Prairie Redo	x (A16)
Histic Epipedo				Sandy Redox (S5)		Dark Surface (S7)	
Hydrogen Sulf	,			Stripped Matrix (S6)		☐ Iron Manganese N	lasses (F12)
Stratified Layer				Loamy Mucky Mineral (F1)		☐ Very Shallow Dark	• •
				Loamy Gleyed Matrix (F2)			
2 cm Muck (A	•	5 (444)		✓ Depleted Matrix (F3)		U Other (Explain in I	Remarks)
Depleted Belo				Redox Dark Surface (F6)			
Thick Dark Su	` '			Depleted Dark Surface (F7)		3 Indicators of hydrop	phytic vegetation and
Sandy Muck N				Redox Depressions (F8)			gy must be present,
5 cm Mucky P	eat or Peat	(S3)				unless disturbe	d or problematic.
Restrictive Layer	r (if obser	ved):					
Type: <u>Not e</u>	ncountere	hdb					
Depth (inches)	:_N/A			_		Hydric Soil Present?	Yes ● No ○
Remarks:							
Kemarks.							
I							
HYDROLOG\	Y						
Wetland Hydrold	ay Indica	tors:					
Primary Indicators			auired: che	ock all that apply)		Secondary Indic	ators (minimum of two required
		i oi one is re	quireu, crie	_			
Surface Water	` '			✓ Water-Stained Leaves (B9)		☐ Surface Soil	` ,
High Water Ta				Aquatic Fauna (B13)		☐ Drainage Pa	
✓ Saturation (A3				True Aquatic Plants (B14)		_ ,	Water Table (C2)
Water Marks	(B1)			Hydrogen Sulfide Odor (C1)		Crayfish Bur	rows (C8)
Sediment Dep	oosits (B2)			Oxidized Rhizospheres on Living Roo	ots (C3)	✓ Saturation V	isible on Aerial Imagery (C9)
Drift Deposits	(B3)			Presence of Reduced Iron (C4)		☐ Stunted or S	Stressed Plants (D1)
☐ Algal Mat or C	Crust (B4)			Recent Iron Reduction in Tilled Soils	(C6)	<b>✓</b> Geomorphic	Position (D2)
☐ Iron Deposits	(B5)			☐ Thin Muck Surface (C7)		✓ FAC-Neutral	Test (D5)
Inundation Vis		rial Imagery	(B7)	Gauge or Well Data (D9)			` ,
Sparsely Vege							
Sparsely vege	stated Conc	ave Surrace	(50)	Other (Explain in Remarks)			
Field Observatio		Yes •	N- O	5 6			
Surface Water Pres	sent?		No O	Depth (inches): 2			
Water Table Prese	ent?	Yes $\bigcirc$	No 💿	Depth (inches):			
Saturation Present	1?	Yes	No O		Wetl	land Hydrology Present?	Yes ● No ○
(includes capillary	fringe)						
Describe Recorde	ed Data (s	stream gau	ige, monito	oring well, aerial photos, previous insp	pections	s), if available:	
Remarks:							
-							

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 Consu	lting		
Landform (hillslope, terrace, etc.): Floodplain		Local relief (d	concave, convex, none): fla	nt	
Slope: 0.0% / 0.0 ° Lat.: 45.695260	Long.:	-62.726775	_	Datum: NAD8	3
Soil Map Unit Name/Type: Tormentine		-02.720773	Wetland Tv	pe: Floodplain	
Are climatic/hydrologic conditions on the site typical for this time o	fugara Yes No O	(If no. e)	cplain in Remarks.)	pe. <u>Fioodpiairi</u>	
				nt? Yes •	No O
	significantly disturbed?		ormal Circumstances" preser		110 🔾
Are Vegetation, Soil, or Hydrology	naturally problematic?	(If nee	ded, explain any answers in	Remarks.)	
SUMMARY OF FINDINGS - Attach site map sho	wing sampling po	int locatio	ns, transects, impoi	rtant features,	etc.
Hydrophytic Vegetation Present? Yes  No  No					
Hydric Soil Present? Yes No		he Sampled A			
Wetland Hydrology Present? Yes No	With	hin a Wetland	d? Yes ● No ○		
Remarks:					
Hydrology disturbed by stormwater influence.					
Tryatology distarbed by stormwater limiterioe.					
	_				
<b>VEGETATION</b> - Use scientific names of pla	nts. Dominar Species				
Tree Stratum (Plot size: 10 m	Absolute Rel.Stra	t. Indicator	Dominance Test works	heet:	
	<u>% Cover Cover</u> 0 □ 0.0%		Number of Dominant Spe		(4)
1			That are OBL, FACW, or F	-AC:3	(A)
2	0 0.0%		Total Number of Dominar		(D)
4			Species Across All Strata:		(B)
5.	0 0.0%	,	Percent of dominant S		00/ (4/5)
	0 = Total Co	over	That Are OBL, FACW,	or FAC:100.	<u>0%</u> (A/B)
_Sapling/Shrub Stratum (Plot size: 5 m			Prevalence Index work	sheet:	
1. Salix bebbiana	5	6 FACW	Total % Cover of	f: Multiply by	:
2. Alnus incana	1060.6%	6 FACW	OBL species 10	0.5 x 1 =	10.5
3. Quercus rubra					221
4. Spiraea tomentosa	0.5 3.0%				0
5. Rubus idaeus					4
Herb Stratum (Plot size: 2 m		over		1 x 5 =	5
1 <sub>.</sub> Onoclea sensibilis	5	FACW	Column Totals: <u>1</u>	23 (A)	240.5 (B)
2. Phalaris arundinacea	9084.5%		Prevalence Index	= B/A = <u>1.9</u>	<u>55</u>
3. Carex Iurida	4		Hydrophytic Vegetation	n Indicators:	
4. Vicia cracca	1		✓ 1 - Rapid Test for H		tion
5. Lysimachia terrestris     6. Typha latifolia	$ \begin{array}{c cccc}  & 0.5 & & 0.5\% \\ \hline  & 0.5 & & 0.5\% \\ \end{array} $		✓ 2 - Dominance Test	is > 50%	
7. Carex stipata	0.5 0.5%		✓ 3 - Prevalence Inde	ex is <b>≤</b> 3.0 <sup>1</sup>	
8. Calamagrostis canadensis	5 4.7%		4 - Morphological A	daptations <sup>1</sup> (Prov	ide supporting
9.	0 0.0%		data in Remarks or	•	
10.	0 0.0%		Problematic Hydrop	, ,	
Woody Vine Stratum (Plot size:)	106.5 = Total Co	over	<sup>1</sup> Indicators of hydric s be present, unless dist	soil and wetland hy	drology must
	0		be present, unless dist	arbed or problema	tic.
1, 2.			Hydrophytic		
<u> </u>	0 = Total Co		Vegetation Present? Yes	No O	
	= TOTAL CC	ν CI	ricscrit:		
Remarks: (Include photo numbers here or on a separate	sheet.)				
Tromano. (molado prioto manibors nore di on a soparate	311001.)				

SOIL											Sampling I	Point: WL-7	
Profile Desci	ription: (Des	cribe to t	he depth n	eeded to	document	the indica	tor or co	nfirm the	e absence of indic	ators.)			
Depth		Matrix	· .			ox Feature			_				
(inches)	Color (n	noist)	%	Color	(moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture			Remarks	
0-4	7.5YR	3/2	100						Silt Loam	1	with organ	i cs	
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				
-													
-									-				
										_			
1 Type: C=Con	centration. D=	 =Depletion		ed Matrix	. CS=Covere	d or Coated	I Sand Gra	ains.	<sup>2</sup> Location: PL=Po	re Linina.	M=Matrix.		
Hydric Soil I			,		,				Indicators fo			io Soile 3.	
Histosol (				□ Sa	indy Gleyed	Matrix (S4)					,	C SOIIS ":	
	pedon (A2)				indy Redox (				Coast Prair		(A16)		
Black Hist	tic (A3)				ripped Matrix				Dark Surfa	ice (S7)			
Hydroger	Sulfide (A4)			=	amy Mucky I	` ,			☐ Iron Mang	anese Ma	sses (F12)		
Stratified	Layers (A5)				amy Gleyed				☐ Very Shallo	ow Dark S	Surface (TF12	<u>'</u> )	
2 cm Muc	ck (A10)				epleted Matri				Other (Exp	olain in Re	emarks)		
Depleted	Below Dark S	urface (A1	1)		-				_ ` '		,		
	k Surface (A1				edox Dark Su	` '			2				
	uck Mineral (S	•			epleted Dark		7)		<sup>3</sup> Indicators o	f hydroph	ytic vegetatio	on and	
	cky Peat or Pe	•		∟ R∈	edox Depress	sions (F8)					must be pre or problemat		
Restrictive L	•												
	nt encounte												
	thes): N/A								Hydric Soil Pre	esent?	Yes 💿	No $\bigcirc$	
Remarks:									l				
Kemarks.													
HYDROLO	)CV												
Wetland Hyd													
	ators (minimu	m of one i	s required; o									m of two requir	red
✓ Surface V	,				Water-Staine		39)				racks (B6)		
✓ High Wat					Aquatic Faur						erns (B10)		
✓ Saturation				_	True Aquatic						ater Table (C	2)	
Water Ma	ırks (B1)				Hydrogen Su	ılfide Odor (	(C1)		☐ Cray	fish Burro	ws (C8)		
✓ Sediment	Deposits (B2)	)			Oxidized Rhiz	zospheres o	n Living R	Poots (C3)	☐ Satu	ration Vis	ible on Aerial	l Imagery (C9)	
✓ Drift Dep	osits (B3)				Presence of I	Reduced Iro	on (C4)		Stun	ited or Str	essed Plants	(D1)	
Algal Mat	or Crust (B4)				Recent Iron	Reduction ir	n Tilled So	ils (C6)	Geor	morphic P	osition (D2)		
Iron Depo	osits (B5)				Thin Muck Su	urface (C7)			<b>✓</b> FAC-	Neutral T	est (D5)		
Inundation	n Visible on A	erial Imag	ery (B7)		Gauge or We	ell Data (D9)	)						
Sparsely	Vegetated Cor	ncave Surf	ace (B8)		Other (Expla								
. ,	J				otiloi (Enpia		,						
Field Observ	ations:												
Surface Water	Present?	Yes (	No C	)	Depth (inch	nes):	6	_					
Water Table P	resent?	Yes (	● No C	)	Depth (incl	nes):	13						
Saturation Pre	esent?	Yes (			Depth (inch		8	Wetl	and Hydrology Pr	esent?	Yes	No O	
(includes capi								-	) if overliett				
Describe Rec	oraea Data	(stream (	yauge, mor	iitoring v	veii, aeriai	priotos, pr	evious in	spections	s), if available:				
Damasti													
Remarks:													

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 Consu	ulting
Landform (hillslope, terrace, etc.): Basin	Local relief (	concave, convex, none): concave
· · · · · · · · · · · · · · · · · · ·		- NADOO
10.070	Long.: -62.724630	
Soil Map Unit Name/Type: <u>Tormentine</u>	V (2) N- (15	Wetland Type: Swamp - shrub
Are climatic/hydrologic conditions on the site typical for this time of		explain in Remarks.)
Are Vegetation 🗌 , Soil 🗹 , or Hydrology 🗹 🤉	significantly disturbed? Are "N	lormal Circumstances" present? Yes   No
Are Vegetation  , Soil , or Hydrology	naturally problematic? (If nee	eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sho	wing sampling point location	ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes ● No ○		
Hydric Soil Present? Yes No	Is the Sampled	Area
Wetland Hydrology Present? Yes No	within a Wetlan	d? Yes  ● No ○
Remarks:		
Soil disturbed from road fill infringes, hydrology disturbed	due to impounding by roadway an	d stormwater influence.
een aleta. 200 Henri Head III III III II II II II II II II II II	ado to impoditating by roadinary air	
VEGETATION II I'G C. I		
VEGETATION - Use scientific names of plan	nts. Dominant Species?	
_Tree Stratum (Plot size: 10 m )	Absolute Rel.Strat. Indicator	Dominance Test worksheet:
1	% Cover Cover Status  15 ✓ 60.0% FACW	Number of Dominant Species
Larix Iaricina     Betula populifolia	5 2 20 204 542	That are OBL, FACW, or FAC:6(A)
3. Acer rubrum	5 2 22 22 512	Total Number of Dominant
4		Species Across All Strata:6(B)
5.	0 0.0%	Percent of dominant Species
	25 = Total Cover	That Are OBL, FACW, or FAC:100.0% (A/B)
Sapling/Shrub Stratum (Plot size: 5 m		Prevalence Index worksheet:
1 <sub>.</sub> Alnus incana	80 <u>83.8%</u> <u>FACW</u>	Total % Cover of: Multiply by:
2. Spiraea alba	1010.5%FACW	OBL species $57.5$ $x 1 = 57.5$
3. Myrica gale		FACW species $105.5$ x 2 = $211$
4. Acer rubrum 5.		FAC species $10.5$ $\times 3 = 31.5$
	0	FACU species 0 x 4 = 0
Herb Stratum (Plot size: 2 m		UPL species x 5 =
1 <sub>.</sub> Sarracenia purpurea	10	Column Totals: <u>173.5</u> (A) <u>300</u> (B)
2. Iris versicolor		Prevalence Index = $B/A = 1.729$
3. Calamagrostis canadensis		Hydrophytic Vegetation Indicators:
4. Rubus hispidus 5. Viola macloskeyi		1 - Rapid Test for Hydrophytic Vegetation
6. Typha latifolia		<b>✓</b> 2 - Dominance Test is > 50%
7.		✓ 3 - Prevalence Index is ≤3.0 <sup>1</sup>
8.	0 0.0%	4 - Morphological Adaptations 1 (Provide supporting
9.	0 0.0%	data in Remarks or on a separate sheet)  Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
10.	0 0.0%	
	53 = Total Cover	1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
	0	be present, amess distalbed of problematic.
1 2.	0 0.0%	Hydrophytic
<del>-</del> ;	0 = Total Cover	Vegetation Present? Yes • No •
Remarks: (Include photo numbers here or on a separate s	sheet.)	
	•	

SOIL								Sampling Point: WL-8-2019
Profile Descr	iption: (Desc	ribe to th	e depth ne	eded to document	t the indicator or o	confirm the	e absence of indicators.	)
Depth		latrix			lox Features		_	
(inches)	Color (m	oist)_	%	Color (moist)	<u>%</u> Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-10							Peat	Peat with mixed organics
10-18		4/2	100				Sandy Clay Loam	hard packed, refusal at 18 inches.
							,,	Triches.
1 Type: C=Cond	entration. D=	Depletion.	RM=Reduce	ed Matrix, CS=Covere	ed or Coated Sand G		<sup>2</sup> Location: PL=Pore Lini	ng. M=Matrix.
Hydric Soil I								
Histosol (A				Sandy Gleyed	Motriy (C4)		Indicators for Prob	olematic Hydric Soils <sup>3</sup> :
Histosof (F	•						Coast Prairie Red	ox (A16)
Black Histi	. ,			Sandy Redox			Dark Surface (S7)	)
	Sulfide (A4)			Stripped Matri			Iron Manganese	Masses (F12)
	Layers (A5)			Loamy Mucky			Very Shallow Dar	k Surface (TF12)
2 cm Muck				Loamy Gleyed			Other (Explain in	
	Below Dark Su	rfoco (A11	<b>\</b>	Depleted Matr	rix (F3)		☐ Ottlei (Explain iii	Remarks)
			)	Redox Dark Su	urface (F6)			
	Surface (A12			Depleted Dark	Surface (F7)		3 Indicators of hydro	phytic vegetation and
	ck Mineral (S1)			Redox Depres	sions (F8)		wetland hydrolo	gy must be present,
5 cm Muck	ky Peat or Pea	t (S3)					unless disturbe	ed or problematic.
Restrictive La	ayer (if obser	ved):						
Type: <u>H</u> z	ard nacked so	nil						
Depth (inch	nes): <u>18</u>						Hydric Soil Present?	Yes ● No ○
Remarks:								
HYDROLO	ιGΥ							
Wetland Hyd								
		n of one is	required; ch	neck all that apply)			Secondary Indi	cators (minimum of two required
✓ Surface W	` ,			✓ Water-Stain	ed Leaves (B9)			l Cracks (B6)
High Wate	er Table (A2)			Aquatic Fau	na (B13)		<b>✓</b> Drainage P	atterns (B10)
✓ Saturation	(A3)			True Aquation	c Plants (B14)		☐ Dry Season	Water Table (C2)
☐ Water Mar	ks (B1)			Hydrogen Su	ulfide Odor (C1)		Crayfish Bu	rrows (C8)
Sediment	Deposits (B2)			Oxidized Rhi	izospheres on Living	Roots (C3)	Saturation	Visible on Aerial Imagery (C9)
☐ Drift Depo	sits (B3)			Presence of	Reduced Iron (C4)		✓ Stunted or	Stressed Plants (D1)
Algal Mat	or Crust (B4)			Recent Iron	Reduction in Tilled S	Soils (C6)	Geomorphi	c Position (D2)
☐ Iron Depo				☐ Thin Muck S			FAC-Neutra	
l <u> </u>	n Visible on Ae	rial Image	rv (B7)	=	ell Data (D9)			,
	egetated Cond	-	-					
Sparsery v	egetated Cont	Lave Surrac	.е (во)	Utner (Expla	ain in Remarks)			
Field Observe	ations.							
Field Observa		Yes 🧿	No O	Donth /ina	thank). 10			
Surface Water				Depth (Inc	:hes): 12	<b>-</b>		
Water Table Pr	resent?	Yes 🧿	No O	Depth (inc	thes):0	_ [		y v (a)
Saturation Pres		Yes •	No O	Depth (inc	thes): 0	Wet	land Hydrology Present	? Yes ⊙ No ○
(includes capill						incnest! = :	c) if available:	
Describe Reco	orueu Data (	siream ga	iuge, moni	toring well, aerial	priotos, previous	inspections	s), ii avaliable:	
Remarks:								

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 Cons	sulting
Landform (hillslope, terrace, etc.): Basin	Local relief	(concave, convex, none): concave
· · · · · · · · · · · · · · · · · · ·		- NADOO
101701121	Long.: -62.72126 <sup>4</sup>	·
Soil Map Unit Name/Type: <u>Tormentine</u>	Van A Na O	Wetland Type: Swamp - shrub
Are climatic/hydrologic conditions on the site typical for this time of		explain in Remarks.)
Are Vegetation 🗌 , Soil 🗹 , or Hydrology 🗹 si	ignificantly disturbed? Are "N	Normal Circumstances" present? Yes   No
Are Vegetation	aturally problematic? (If ne	eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map show	wing sampling point location	ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No O		
Hydric Soil Present? Yes No	Is the Sampled	
Wetland Hydrology Present? Yes No	within a Wetlar	nd? Yes  ● No ○
Remarks:	<u> </u>	
Soil disturbed from road fill infringement, hydrology disturb	oed due to impounding by roadwa	ay and stormwater influence
	p g j	y
<b>VEGETATION</b> - Use scientific names of plan	Dominant Species?	
	Absolute Rel.Strat. Indicator	Dominance Test worksheet:
1	% Cover Cover Status 20 ✓ 65.6% FACW	Number of Dominant Species
Larix iaricina     Betula populifolia	5 \( \begin{array}{cccccccccccccccccccccccccccccccccccc	That are OBL, FACW, or FAC:
3. Acer rubrum	0.5  1.6% FAC	Total Number of Dominant
Populus tremuloides	5	Species Across All Strata:5(B)
5.	0 0.0%	Percent of dominant Species
	30.5 = Total Cover	That Are OBL, FACW, or FAC: 100.0% (A/B)
Sapling/Shrub Stratum (Plot size: 5 m		Prevalence Index worksheet:
1. Abies balsamea	0.5 0.6% FAC	Total % Cover of: Multiply by:
2 <sub>.</sub> Alnus incana	80 <b>9</b> 3.0% FACW	OBL species <u>21</u> x 1 = <u>21</u>
3. Salix bebbiana	5 <u>5.8%</u> FACW	FACW species 120.5 x 2 = 241
4. Spiraea alba	0.5 0.6% FACW	FAC species <u>16</u> x 3 = <u>48</u>
5	0 0.0%	FACU species <u>5</u> x 4 = <u>20</u>
Herb Stratum (Plot size: 2 m	86 = Total Cover	UPL species <u>0</u> x 5 = <u>0</u>
1_Equisetum arvense		Column Totals: <u>162.5</u> (A) <u>330</u> (B)
2. Onoclea sensibilis		Prevalence Index = B/A = 2.031_
3. Calamagrostis canadensis	15 <u>✓</u> 32.6% OBL	Hydrophytic Vegetation Indicators:
4. Viola macloskeyi		1 - Rapid Test for Hydrophytic Vegetation
5. Scirpus cyperinus	1 <u>2.2%</u> OBL	✓ 2 - Dominance Test is > 50%
6	0 0.0%	✓ 3 - Prevalence Index is ≤3.0 <sup>1</sup>
7 8	0 0.0%	4 - Morphological Adaptations <sup>1</sup> (Provide supporting
9.	0 0.0%	data in Remarks or on a separate sheet)
10.	0 0.0%	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
	46 = Total Cover	<sup>1</sup> Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size:)		be present, unless disturbed or problematic.
1,		Hydrophytic
2	0 0.0%	Vegetation Vegetation
	0 = Total Cover	Present? Yes NO U
Demarks, (Include photo symbols have a series and a	hoot )	
Remarks: (Include photo numbers here or on a separate sh	ileet.)	

SOIL Sampling Point: WL-9-2019 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Matrix Redox Features Color (moist) Color (moist) Loc2 Texture Remarks (inches) Type Mucky Peat 0-5 with gravel, possible road fill, refusal 14 in. 5-14 5YR 4/4 90 5YR 4/2 10 Sandy Loam <sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining. M=Matrix. Hydric Soil Indicators: Indicators for Problematic Hydric Soils <sup>3</sup>: Histosol (A1) Sandy Gleyed Matrix (S4) Coast Prairie Redox (A16) Histic Epipedon (A2) Sandy Redox (S5) Dark Surface (S7) Black Histic (A3) Stripped Matrix (S6) Iron Manganese Masses (F12) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Stratified Layers (A5) Very Shallow Dark Surface (TF12) Loamy Gleyed Matrix (F2) 2 cm Muck (A10) Other (Explain in Remarks) Depleted Matrix (F3) Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) <sup>3</sup> Indicators of hydrophytic vegetation and Sandy Muck Mineral (S1) wetland hydrology must be present, Redox Depressions (F8) 5 cm Mucky Peat or Peat (S3) unless disturbed or problematic. Restrictive Layer (if observed): Type: Gravel No O Yes Hydric Soil Present? Depth (inches): 14 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 ✓ Surface Water (A1) ✓ Water-Stained Leaves (B9) ✓ Surface Soil Cracks (B6) ✓ High Water Table (A2) Aquatic Fauna (B13) ✓ Drainage Patterns (B10) ✓ Saturation (A3) True Aquatic Plants (B14) Dry Season Water Table (C2) Water Marks (B1) Hydrogen Sulfide Odor (C1) Crayfish Burrows (C8) Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) ✓ Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Drift Deposits (B3) Presence of Reduced Iron (C4) Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Geomorphic Position (D2) ▼ FAC-Neutral Test (D5) Iron Deposits (B5) ☐ Thin Muck Surface (C7) Inundation Visible on Aerial Imagery (B7) Gauge or Well Data (D9) Sparsely Vegetated Concave Surface (B8) Other (Explain in Remarks) Field Observations: Yes ● No ○ Depth (inches): Surface Water Present? Yes No O Water Table Present? 0 Depth (inches): Yes No O Wetland Hydrology Present? Saturation Present? No O Yes Depth (inches): Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:

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 Cor	nsulting
Landform (hillslope, terrace, etc.): Basin	Local relie	of (concave, convex, none):
Slope:/ Lat.:	Long.: -62.7192	Datum: NAD83
		<del></del>
Soil Map Unit Name/Type: Tormentine	s o Ves No (If no	Wetland Type: <u>Marsh/Swamp</u> , explain in Remarks.)
Are climatic/hydrologic conditions on the site typical for this tin Are Vegetation	<b>¬</b>	
Are Vegetation 🔲 , Soil 📙 , or Hydrology 📙	_	"Normal Circumstances" present? Yes • No •
Are Vegetation , Soil , or Hydrology	naturally problematic? (If r	needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map	showing sampling point locat	ions, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No O		
Hydric Soil Present? Yes No	Is the Sample	
Wetland Hydrology Present? Yes ● No ○	I within a wella	and? Yes   No ○
3 33		
Remarks: Swamp with marsh characteristics due to impounding	of deep water in the ditch along Hwy	v 106. Soil is disturbed by roadfill
Swamp with marsh characteristics due to impounding	y or deep water in the diten along riwy	y 100. 3011 is disturbed by Todariii.
<b>VEGETATION</b> - Use scientific names of	plants. Dominant Species?	
To a (Diet size, 10 m)	Absolute Rel.Strat. Indicate	
Tree Stratum (Plot size: 10 m )	% Cover Cover Status	Number of Dominant Species
1. Larix Iaricina 2. Acer rubrum	5	That are OBL, FACW, or FAC:
2 Dinus strobus	0.5	Total Number of Dominant
		Species Across All Strata:
5.	0 0.0%	Percent of dominant Species
·-	25.5 = Total Cover	That Are OBL, FACW, or FAC:100.0% (A/B)
_Sapling/Shrub Stratum (Plot size: 5 m)	<del></del>	Prevalence Index worksheet:
1. Alnus incana	80 <b>2</b> 98.2% FACW	Total % Cover of: Multiply by:
2. Acer rubrum	0.5 0.6% FAC	OBL species 18 x 1 = 18
3. Ledum groenlandicum		FACW species110 x 2 =220
4. Kalmia angustifolia		FAC species x 3 =63
5	0	FACU species x 4 = 2
_Herb_Stratum (Plot size: 2 m	81.5 = Total Cover	UPL species $0 \times 5 = 0$
1. Osmundastrum cinnamomeum	10 <b></b> 23.5% FACW_	Column Totals: <u>149.5</u> (A) <u>303</u> (B)
2. Viola macloskeyi	5 11.8% OBL	Prevalence Index = B/A = 2.027
3. Iris versicolor	0.51.2%OBL	Hydrophytic Vegetation Indicators:
4. Onoclea sensibilis	15 <u>V</u> 35.3% FACW	1 - Rapid Test for Hydrophytic Vegetation
5. Carex folliculata		2 - Dominance Test is > 50%
6. Typha latifolia		3 - Prevalence Index is ≤3.0 <sup>1</sup>
/ Maianthemum trifolium	10 23.5% OBL	4 - Morphological Adaptations <sup>1</sup> (Provide supporting
8. Vaccinium macrocarpon 9. Carex trisperma	0.5	data in Remarks or on a separate sheet)
10.	0.5 L 1.2% OBL 0 0.0%	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
	42.5 = Total Cover	1 Indicators of hydric soil and wetland hydrology must
		be present, unless disturbed or problematic.
1	00.0%	-
2	0	Hydrophytic Vegetation
	= Total Cover	Present? Yes No
		1
Remarks: (Include photo numbers here or on a separ	rate sheet.)	

SOIL										Sampling Point: WL-10
Profile Descr	iption: (Des	cribe to t	he depth ne	eded to	documen	t the indi	cator or co	onfirm the	e absence of indicators.)	
Depth	1	Matrix			Red	dox Featu			_	
(inches)	Color (m	noist)_	<u>%</u>	Color	(moist)	<u>%</u>	Type 1	Loc <sup>2</sup>	Texture	Remarks
0-4									Muck	
4-14	7.5YR	4/1	95	5YR	4/1	5			Sandy Clay	
					-			-		
1 Type: C=Con	centration, D=	Depletion	, RM=Reduce	ed Matrix	, CS=Cover	ed or Coat	ed Sand Gr	ains.	<sup>2</sup> Location: PL=Pore Lining. I	 √=Matrix.
Hydric Soil I	ndicators:								Indicators for Problem	natic Hydric Soils 3
Histosol (	A1)			Sa	ndy Gleyed	Matrix (S4	1)			
Histic Epip	pedon (A2)			Sa	ndy Redox	(S5)			Coast Prairie Redox (	A16)
Black Hist				Str	ripped Matr	ix (S6)			☐ Dark Surface (S7)	(= )
	Sulfide (A4)			Lo	amy Mucky	Mineral (F	1)		☐ Iron Manganese Mass	
	Layers (A5)			Lo	amy Gleyed	Matrix (F	2)		☐ Very Shallow Dark Su	
2 cm Muc				<b>✓</b> De	pleted Mati	rix (F3)			U Other (Explain in Ren	narks)
	Below Dark Su		1)	Re	dox Dark S	urface (F6	)			
	k Surface (A1:	•		☐ De	pleted Darl	k Surface (	F7)		<sup>3</sup> Indicators of hydrophy	tic vegetation and
	ick Mineral (S	•		<b>✓</b> Re	dox Depres	ssions (F8)			wetland hydrology r	must be present,
	ky Peat or Pea								unless disturbed o	r problematic.
Restrictive L	-									
	<u>nt encounter</u>	-ed							Hydric Soil Present?	Yes ● No ○
Depth (inc	nes): <u>N/A</u>								,	105 - 110 -
Remarks:										
HYDROLC	)GY									
Wetland Hyd	lrology Indic	ators:								
Primary Indica	ators (minimu	m of one is	required; ch	neck all th	nat apply)				Secondary Indicato	rs (minimum of two required
✓ Surface W	/ater (A1)			<b>✓</b> \	Water-Stain	ed Leaves	(B9)		Surface Soil Cra	acks (B6)
✓ High Wate	er Table (A2)			<b>V</b>	Aquatic Fau	na (B13)			☐ Drainage Patte	rns (B10)
<b>✓</b> Saturation	n (A3)				True Aquati		14)		☐ Dry Season Wa	ter Table (C2)
☐ Water Ma	rks (B1)			I	Hydrogen S	ulfide Odo	r (C1)		Crayfish Burrov	vs (C8)
Sediment	Deposits (B2)				Oxidized Rh	izospheres	on Living F	Roots (C3)	Saturation Visit	ole on Aerial Imagery (C9)
☐ Drift Depo	osits (B3)			F	Presence of	Reduced	ron (C4)		✓ Stunted or Stre	essed Plants (D1)
Algal Mat	or Crust (B4)				Recent Iron	Reduction	in Tilled So	oils (C6)	Geomorphic Po	sition (D2)
☐ Iron Depo	osits (B5)				Thin Muck S	Surface (C7	7)		▼ FAC-Neutral Te	st (D5)
✓ Inundatio	n Visible on A	erial Imag	ery (B7)		Gauge or W	ell Data (E	9)			
Sparsely \	egetated Cor	cave Surfa	ace (B8)		Other (Expla	ain in Rem	arks)			
Field Observ	ations:									
Surface Water	Present?	Yes (	● No ○		Depth (inc	ches):	40	_		
Water Table P	resent?	Yes (	● No ○		Depth (inc	ches):	0			
Saturation Pre	sent?	Yes (	No O		Depth (inc		0	Wet	land Hydrology Present?	Yes ● No ○
(includes capil								-	-) if an all (1)	
Describe Rec	orded Data	(stream g	jauge, moni	itoring v	veii, aerial	pnotos, p	previous in	spections	s), if available:	
Remarks:										

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 re	elief (concave, convex, none): concave
Slope: 0.0% / 0.0 ° Lat.: 45.708870	Long.: -62.71:	3570 Datum: NAD83
	Long02.71.	
Soil Map Unit Name/Type:	· · · Vos ( No ()	mo, explain in Remarks.)  Wetland Type: Swamp - shrub
Are climatic/hydrologic conditions on the site typical for this time of		· · · · · · · · · · · · · · · · · · ·
		re "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 sho	wing sampling point loc	ations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes  No		
Hydric Soil Present? Yes ● No ○	Is the Samp	
	within a We	etland? Yes   No
, 3,		
Remarks: Soil disturbed from road fill, hydrology disturbed from sto	rmwater influences and impou	nding by roadway
3011 disturbed from road fill, flydrology disturbed from sto	imwater iimachees and impodi	iding by roddway.
<b>VEGETATION</b> - Use scientific names of pla		
(District 10 m	Absolute Rel.Strat. Indic	
Tree Stratum (Plot size: 10 m )	% Cover Cover Sta	Number of Dominant Species
1. Acer rubrum	15	
Picea mariana     Betula populifolia	<u>5</u>	Total Number of Dominant
A Loriy Joriana	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	— Species Across Air Strata (b)
5.	0 0.0%	Percent of dominant Species
<u> </u>	30.5 = Total Cover	That Are OBL, FACW, or FAC: 100.0% (A/B)
_Sapling/Shrub Stratum (Plot size: 5 m)		Prevalence Index worksheet:
1. Alnus incana	40 <b>2</b> 50.0% FAC	N Total % Cover of: Multiply by:
2. Spiraea alba	10 12.5% FAC	W OBL species 51 x 1 = 51
3. Nemopanthus mucronatus		FACW species
4. Betula populifolia	5 <u>6.3%</u> FAC	FAC species <u>35</u> x 3 = <u>105</u>
5. Acer rubrum	5 <u>6.3%</u> FAC	FACU species 0 x 4 = 0
_Herb_Stratum (Plot size: 2 m)	= Total Cover	UPL species x 5 =0
1 <sub>.</sub> Pontederia cordata	15 <b></b> 31.9%OBL	Column Totals: <u>157.5</u> (A) <u>299</u> (B)
2. Onoclea sensibilis	15 🗹 31.9% FAC	Prevalence Index = B/A = 1.898
3. Juncus effusus	5 <u>10.6%</u> OBL	
4. Glyceria striata	10 <u></u>	1 - Rapid Test for Hydrophytic Vegetation
5. Carex Iurida	0.5	✓ 2 - Dominance Test is > 50%
6. Maianthemum trifolium	0.5	✓ 3 - Prevalence Index is <3.0.1
/ Impatiens capensis	0.5 1.1% FAC	M
8. Osmundastrum cinnamomeum 9.	0.5  1.1% FAC	data in Remarks or on a separate sheet)
10.		Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
	0 <u>0.0%</u> 47 = Total Cover	1 Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size:)	Total cover	be present, unless disturbed or problematic.
1	_ 0	Lludraphytic
2	0	Hydrophytic Vegetation
	= Total Cover	Present? Yes • No •
		. I
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.) Matrix Redox Features Color (moist) Color (moist) Loc2 Texture Remarks (inches) Type Black with high organics Muck 0-13 content 13-15 7.5YR 3/1 100 Loamy Sand 15-25 7.5YR 6/1 99 5YR 4/6 Loamy Sand <sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining. M=Matrix. Hydric Soil Indicators: Indicators for Problematic Hydric Soils <sup>3</sup>: Sandy Gleyed Matrix (S4) Histosol (A1) Coast Prairie Redox (A16) ✓ Histic Epipedon (A2) Sandy Redox (S5) Dark Surface (S7) Black Histic (A3) Stripped Matrix (S6) Iron Manganese Masses (F12) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Stratified Layers (A5) Very Shallow Dark Surface (TF12) Loamy Gleyed Matrix (F2) 2 cm Muck (A10) Other (Explain in Remarks) ✓ Depleted Matrix (F3) Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) <sup>3</sup> Indicators of hydrophytic vegetation and Sandy Muck Mineral (S1) wetland hydrology must be present, Redox Depressions (F8) 5 cm Mucky Peat or Peat (S3) unless disturbed or problematic. Restrictive Layer (if observed): Type: Not encountered No O Yes Hydric Soil Present? Depth (inches): N/A Remarks: **HYDROLOGY** Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Secondary Indicators (minimum of two required ✓ Surface Water (A1) ✓ Water-Stained Leaves (B9) Surface Soil Cracks (B6) ✓ High Water Table (A2) ✓ Aquatic Fauna (B13) Drainage Patterns (B10) ✓ Saturation (A3) True Aquatic Plants (B14) ☐ Dry Season Water Table (C2) Water Marks (B1) Hydrogen Sulfide Odor (C1) Crayfish Burrows (C8) Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Saturation Visible on Aerial Imagery (C9) ✓ Stunted or Stressed Plants (D1) Drift Deposits (B3) Presence of Reduced Iron (C4) Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Geomorphic Position (D2) FAC-Neutral Test (D5) Iron Deposits (B5) ☐ Thin Muck Surface (C7) ✓ Inundation Visible on Aerial Imagery (B7) Gauge or Well Data (D9) Sparsely Vegetated Concave Surface (B8) Other (Explain in Remarks) Field Observations: Yes ● No ○ Depth (inches): 8 Surface Water Present? Yes No O Water Table Present? 0 Depth (inches): No O Yes Wetland Hydrology Present? Saturation Present? Yes No O Depth (inches): Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks:

Project/Site: Northern Pulp Plant - Pipeline PFA		Municipality/Cou	nty: Pictou		Sampling Date: 04-Jun-19
Applicant/Owner: NPNS					Sampling Point: WL-13
nvestigator(s): Chris Kennedy, Kelly Regan		Affiliat	ion: <u>Dillon Cons</u> u	ulting	
andform (hillslope, terrace, etc.): Basin			Local relief (	concave, convex, none): fla	t
Slope: 0.0% / 0.0 ° Lat.: 45.71	4652	Lo	 ng.: -62.707846		Datum: NAD83
Soil Map Unit Name/Type:Tormentine			3	Wetland Typ	De: Marsh
Are climatic/hydrologic conditions on the site typi	drology 🗹 si	year? Yes • No gnificantly disturbed aturally problematic?	? Are "N	xplain in Remarks.) ormal Circumstances" presen	Yes  No O
SUMMARY OF FINDINGS - Attach	site map shov	ving sampling	point location	ns, transects, impor	tant features, etc.
Hydrophytic Vegetation Present? Yes  Hydric Soil Present? Yes  Wetland Hydrology Present? Yes  Remarks:	● No ○		Is the Sampled within a Wetlan		
soil disturbed from roadfill infringes and h				impounding by roadway.	
<b>VEGETATION</b> - Use scientific	names or pian	Spec	inant cies? ————	T	
_Tree Stratum (Plot size: 10 m )		Absolute Rel.S	Strat. Indicator ver Status	Dominance Test worksl	
1			0.0%	Number of Dominant Spec That are OBL, FACW, or F.	
2.		0 0	0.0%	Tatal Number of Danis	
3		0 0 0	0.0%	Total Number of Dominan Species Across All Strata:	4(B)
4		0 0	0.0%		
5			0.0%	Percent of dominant Sp That Are OBL, FACW, of	
Sapling/Shrub Stratum (Plot size: 5 m	,	= Tota	al Cover		
1		40 🗹 5	7.1% OBL	Prevalence Index works	
2		15	1.4% FACW	Total % Cover of OBL species 10	: Multiply by: 05 x 1 = 105
2			7.1% FACW		$\frac{100}{100}$ $\frac{100}{100}$ $\frac{100}{100}$
4. Chamaedaphne calyculata			4.3% OBL		$\begin{array}{cccccccccccccccccccccccccccccccccccc$
5.		0 0 0	0.0%		$\begin{array}{cccccccccccccccccccccccccccccccccccc$
Herb Stratum (Plot size: 2 m )		70 = Tot	al Cover		$\begin{array}{cccccccccccccccccccccccccccccccccccc$
1. Typha latifolia		20 🗹 3	6.4% OBL	Column Totals: 12	25 (A) <u>145</u> (B)
Calamagrostis canadensis			4.5% OBL		
3. Nuphar lutea			0.1% OBL	Prevalence Index =	
4.			0.0%	Hydrophytic Vegetation	
5.		0 0	0.0%	1 - Rapid Test for Hy	
6		0 0	0.0%	2 - Dominance Test	
7		0 0 0	).0%	▼ 3 - Prevalence Index	
8			).0%	data in Remarks or	daptations <sup>1</sup> (Provide supporting on a separate sheet)
9 10.			0.0%	Problematic Hydrop	hytic Vegetation <sup>1</sup> (Explain)
10			0.0%	1 Indicators of hydric s	soil and wetland hydrology must
Woody Vine Stratum (Plot size:	)	= Tot	al Cover	be present, unless distu	urbed or problematic.
1,		0 0 0	).0%	I leader a least	
2		_ 0	).0%	Hydrophytic Vegetation	
		0 = Tota	al Cover	Present? Yes	No O
Remarks: (Include photo numbers here o	r on a separate sh	neet.)			

SOIL								Sampling Point: WL-13
Profile Desci	ription: (Desc	ribe to th	e depth ne	eded to document	t the indicator or	confirm the	e absence of indicators.	)
Depth		1atrix			lox Features		_	
(inches)	Color (m	oist)_	%	Color (moist)	<u>%</u> Type <sup>1</sup>	Loc2	Texture	Remarks
0-29							Muck	
29-36	7.5R	2.5/2	100				Silt Loam	With decayed wood
					-			
1 Type: C=Con	centration D=	Denletion	RM=Reduce	d Matrix, CS=Covere	ed or Coated Sand (	Grains	<sup>2</sup> Location: PL=Pore Linir	ng M=Matrix
Hydric Soil I		Depletion,	TIWI-TEGGGC	a mann, oo-oovere	sa or obatea saria	oranio.		-
✓ Histosol (				Const. Claused	Martin (CA)		Indicators for Prob	lematic Hydric Soils <sup>3</sup> :
				Sandy Gleyed			Coast Prairie Red	ox (A16)
Black Hist	pedon (A2)			Sandy Redox (			Dark Surface (S7)	1
	Sulfide (A4)			Stripped Matri:			Iron Manganese I	Masses (F12)
	Layers (A5)			Loamy Mucky	Mineral (F1)		Very Shallow Dark	
2 cm Muc	-			Loamy Gleyed	Matrix (F2)			
	. ,	5 (044)		Depleted Matri	ix (F3)		U Other (Explain in	Remarks)
	Below Dark Su		)	Redox Dark Su	urface (F6)			
	k Surface (A12	•		Depleted Dark	Surface (F7)		3 Indicators of hydro	phytic vegetation and
Sandy Mu	ıck Mineral (S1	)		Redox Depress	sions (F8)			gy must be present,
5 cm Muc	ky Peat or Pea	t (S3)					unless disturbe	ed or problematic.
Restrictive L	ayer (if obse	ved):						
Туре: <u>N</u>	<u>ot encounter</u>	2dh						
Depth (inc	hes): N/A						Hydric Soil Present?	Yes ⊙ No ○
Remarks:								
Kemarks.								
HYDROLO	)GY							
Wetland Hyd	drology Indica	ators:						
_			required: ch	eck all that apply)			Secondary Indi	cators (minimum of two required
		TOT OHE IS	required, en		ed Leaves (B9)			
✓ Surface V	. ,				,			Cracks (B6)
✓ High Wat				Aquatic Faur			☐ Drainage Pa	
✓ Saturation	` ,			✓ True Aquatio				Water Table (C2)
Water Ma	` ,				ulfide Odor (C1)		Crayfish Bu	
Sediment	Deposits (B2)			Oxidized Rhi	izospheres on Livinç	g Roots (C3)	☐ Saturation \	Jisible on Aerial Imagery (C9)
☐ Drift Dep	osits (B3)			Presence of	Reduced Iron (C4)		✓ Stunted or	Stressed Plants (D1)
☐ Algal Mat	or Crust (B4)			Recent Iron	Reduction in Tilled	Soils (C6)	<b>✓</b> Geomorphic	Position (D2)
☐ Iron Depo	osits (B5)			Thin Muck S	urface (C7)		✓ FAC-Neutra	l Test (D5)
✓ Inundation	n Visible on Ae	rial Image	ry (B7)	Gauge or We	ell Data (D9)			
	Vegetated Con-				ain in Remarks)			
	ragatata aan		()	Other (Expla	iii iii Keiliaiks)			
Field Observe	ations.							
Field Observ		Yes 🤄	No O	Donth /:	hos): 40			
Surface Water	Present?			Depth (incl	hes): 40	-		
Water Table P	resent?	Yes 🤄	No 🔾	Depth (incl	hes):0	_		v
Saturation Pre		Yes •	No O	Depth (incl	hes): 0	Wet	land Hydrology Present	? Yes ● No ○
(includes capi								
Describe Rec	orded Data (	stream ga	auge, moni	toring well, aerial	photos, previous	inspections	s), if available:	
Remarks:								

Project/Site: Northern Pulp Plant - Pipel	ine PFA		Municipa	lity/County:	Pictou		Sampling Date:	05-Jun-19
Applicant/Owner: NPNS							Sampling Point:	WL-13B
Investigator(s): Chris Kennedy, Kelly Re	gan			Affiliation:	Dillon Consu	ulting		
Landform (hillslope, terrace, etc.): Basin					Local relief (d	concave, convex, none): cc	nvex	
·				Long:		_	Datum: NAD8	3
				Long	-62.706302		_	
Soil Map Unit Name/Type: <u>Tormenting</u>			Vac	No ○	(16		pe: Swamp - shrub	
Are climatic/hydrologic conditions on the		is time of yea				xplain in Remarks.)	v (a)	
Are Vegetation , Soil	, or Hydrology	<b>s</b> ign	ificantly di	sturbed?	Are "No	ormal Circumstances" preser	nt? Yes •	No O
Are Vegetation , Soil .	, or Hydrology	natu	irally prob	lematic?	(If nee	eded, explain any answers in	Remarks.)	
SUMMARY OF FINDINGS - A	ttach site ma	ap showi	ng sam	pling poi	int locatio	ns, transects, impo	rtant features,	etc.
Hydrophytic Vegetation Present?	Yes   No	0						
Hydric Soil Present?	Yes   No	$\bigcirc$			ne Sampled A	Area		
Wetland Hydrology Present?		$\bigcirc$		With	nin a Wetland	d? Yes ● No ○		
Remarks:	100 - 110							
Soil disturbed from agricultural fiel	d runoff which	is sediment	-laden (r	ed denosits	and roadfil	l hydrology disturbed fro	om stormwater infli	ience
Son distarbed from agricultural field	a ranon winch	is scallificht	idden (i	cu ucposits	y ana roaam	ii, iiyarology alstarbea iic	on stormwater in	derice.
<b>VEGETATION</b> - Use scie	ntific names	of plants	j.	Dominan  Species?				
- (Diet size, 10 m	,		Absolute	Rel.Strat	. Indicator	Dominance Test works	heet:	
Tree Stratum (Plot size: 10 m			% Cover		Status	Number of Dominant Spe		40
2 Diago alguag			0.5	50.0%		That are OBL, FACW, or F	AC: <u>2</u>	(A)
•			0.5	0.0%		Total Number of Dominar		
3 4.			0	0.0%		Species Across All Strata:	2	(B)
5.			0	0.0%		Percent of dominant S	pecies	
<u> </u>			1	= Total Co		That Are OBL, FACW,		0% (A/B)
_Sapling/Shrub Stratum (Plot size: 5 r	n )			7014.00	• • • • • • • • • • • • • • • • • • • •	Prevalence Index work	sheet.	
1 Alessa income			60	92.3%	FACW	Total % Cover of		
2. Spiraea alba			5	7.7%	FACW		3 x 1 =	3
3			0	0.0%		FACW species 12	20.5 x 2 =	241
4			0	0.0%		FAC species 7	v.5 x 3 =	22.5
5			0	0.0%		FACU species	1 x 4 =	4
_Herb_Stratum (Plot size: 2 m	)		65	= Total Co	ver	UPL species	0 x 5 =	0
1 Impatiens capensis			40	<b>✓</b> 60.6%	FACW	Column Totals:1	32 (A)	270.5 (B)
2. Solidago rugosa			5	7.6%		Prevalence Index		
3. Viola macloskeyi			3	4.5%	OBL			47_
4. Oxalis stricta			0.5	0.8%	FACU	Hydrophytic Vegetation  ✓ 1 - Rapid Test for H		
5. Ranunculus acris			1	1.5%	FAC	✓ 2 - Dominance Test		LION
6. Ranunculus repens			1	1.5%	FAC	✓ 3 - Prevalence Inde		
7. Rubus hispidus			5	7.6%		4 - Morphological A		ido supporting
8. Onoclea sensibilis			10	15.2%		data in Remarks or	on a separate shee	et)
9. Phalaris arundinacea			0.5	0.8%		Problematic Hydrop	ohytic Vegetation <sup>1</sup>	(Explain)
10						1 Indicators of hydric s	soil and wetland hy	drology must
Woody Vine Stratum (Plot size:	)		66	= Total Co	ver	be present, unless dist	urbed or problema	tic.
1			0	0.0%				
2			0	0.0%		Hydrophytic Vegetation		
			0	= Total Co	ver	Present? Yes	No 🔾	
						1		
Remarks: (Include photo numbers	here or on a se	parate shee	et.)					

SOIL										Sampling Point: WL-13B	
Profile Descr	iption: (Des	cribe to t	the depth r	needed to	o documen	t the indi	cator or c	onfirm the	e absence of indicators.)		
Depth		Matrix			Rec	dox Featu			_		
(inches)	Color (r	noist)_	<u>%</u>	Color	(moist)	<u>%</u>	Type 1	Loc <sup>2</sup>	Texture	Remarks	_
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	С				
						-			-		_
								-			_
						-					_
					_						_
<sup>1</sup> Type: C=Cond	centration, D	=Depletion	n, RM=Redu	ced Matrix	c, CS=Cover	ed or Coat	ed Sand Gr	rains.	<sup>2</sup> Location: PL=Pore Lining.	M=Matrix.	
Hydric Soil I	ndicators:								Indicators for Probler	natic Hydric Soils <sup>3</sup> :	
Histosol (A	A1)				andy Gleyed	Matrix (S4	1)		Coast Prairie Redox	(A16)	
	pedon (A2)				andy Redox	(S5)			Dark Surface (S7)	,,110)	
Black Hist	` ,			St	ripped Matr	ix (S6)			☐ Iron Manganese Mas	reac (F12)	
	Sulfide (A4)				oamy Mucky	Mineral (F	1)		Very Shallow Dark Si	• •	
	Layers (A5)				oamy Gleyed	l Matrix (F2	2)		_		
2 cm Muc	• ,		4)	D	epleted Matr	rix (F3)			✓ Other (Explain in Re	narks)	
	Below Dark S		1)	☐ R	edox Dark S	urface (F6)	)				
	k Surface (A1	•		D	epleted Dark	k Surface (	F7)		<sup>3</sup> Indicators of hydrophy	tic vegetation and	
	ick Mineral (S			☐ R	edox Depres	sions (F8)			wetland hydrology		
	ky Peat or Pe								unless disturbed o	problematic.	
Restrictive La	-	ervea):									
Type: _ar									Hydric Soil Present?	Yes ● No ○	
Depth (incl	nes): <u>74</u>										
Remarks:											
Red parent m	naterial pres	ent, poss	ible fill fror	m histroi	c agricultur	al of high	iway cons	struction a	activities.		
HYDROLC	)CV										
Wetland Hyd	03		ic roquirod.	chook all t	hat apply)				Socondary Indicate	are (minimum of two required	
Primary Indica		im or one i	is required;				(2.0)			ors (minimum of two required	
Surface W	` ,				Water-Stain		(B9)		✓ Surface Soil Cr	` '	
✓ High Wate					Aquatic Fau		4.4		☐ Drainage Patte		
✓ Saturation	` '				True Aquati	•	•		☐ Dry Season Wa	• •	
Water Ma	, ,				Hydrogen S			D + (00)	Crayfish Burro		
✓ Sediment		)			Oxidized Rh	•	-	Roots (C3)		ble on Aerial Imagery (C9)	
Drift Depo					Presence of			" (0()		essed Plants (D1)	
	or Crust (B4)				Recent Iron			olis (C6)	✓ Geomorphic Po		
Iron Depo			(D.7)		Thin Muck S				✓ FAC-Neutral Te	:ST (D5)	
	n Visible on A	-			Gauge or W						
Sparsely \	Vegetated Co	ncave Surf	ace (B8)		Other (Expla	ain in Rem	arks)				
Field Observa	ations:										_
Surface Water		Yes (	No (	$\supset$	Depth (inc	ches):	4				
Water Table P		Yes (					8	_			
Saturation Pre					Depth (inc			- Wetl	land Hydrology Present?	Yes ● No ○	
(includes capil	lary fringe)	Yes (			Depth (inc		0	_			
Describe Rec	orded Data	(stream (	gauge, mo	nitoring	well, aerial	photos, p	orevious i	nspections	s), if available:		
Remarks:											

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 Co	onsulting
Landform (hillslope, terrace, etc.): Hillside	Local reli	ief (concave, convex, none): convex
Slope: 0.0% / 0.0 ° Lat.: 45.722537	Long.: -62.699	933 Datum: NAD83
Soil Map Unit Name/Type: Tormentine		Wetland Type: Swamp - treed
Are climatic/hydrologic conditions on the site typical for this time of	vear? Yes   No   (If n	no, explain in Remarks.)
		e "Normal Circumstances" present?
		f needed, explain any answers in Remarks.)
3 —		
SUMMARY OF FINDINGS - Attach site map sho	wing sampling point loca	itions, transects, important features, etc.
Hydrophytic Vegetation Present? Yes   No		
Hydric Soil Present? Yes   No	Is the Sampl within a Wet	
Wetland Hydrology Present? Yes   No		100 2 110 2
Remarks:		
Soil disturbed from roadfill, hydrology disturbed from stor	mwater influence.	
<b>VEGETATION</b> - Use scientific names of plan	nts. Dominant	
,	——————————————————————————————————————	nator Dominance Test worksheet:
<u>Tree Stratum</u> (Plot size: 10 m	% Cover Cover State	
1. Betula populifolia		That are OBL, FACW, or FAC:4 (A)
2. Populus tremuloides	<u>5</u> <u>11.1%FACU</u>	Total Number of Dominant
3. Abies balsamea	10	Species Across All Strata: 5 (B)
4. Picea rubens 5.		Percent of dominant Species
J	45 = Total Cover	That Are OBL, FACW, or FAC: 80.0% (A/B)
_Sapling/Shrub Stratum (Plot size: 5 m	Total seven	Prevalence Index worksheet:
1. Alnus incana		
2. Acer rubrum	10 15.4% FAC	OBL species 0 x 1 = 0
3	0	FACW species80 x 2 =160
4	_ 0	FAC species40 x 3 =120
5		FACU species15 x 4 =60
Herb Stratum (Plot size: 2 m	65 = Total Cover	UPL species 0 x 5 = 0
1 Onoclea sensibilis		Column Totals: <u>135</u> (A) <u>340</u> (B)
2		Prevalence Index = B/A = 2.519
3		Hydrophytic Vegetation Indicators:
4 5.		1 - Rapid Test for Hydrophytic Vegetation
6		2 - Dominance Test is > 50%
7	0 0 000	3 - Prevalence Index is ≤3.0 <sup>1</sup>
8.	0 0.0%	4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
9	0 0.0%	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
10	0 0.0%	
	= Total Cover	Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1.	0 0.0%	
2		Hydrophytic Vegetation
	0 = Total Cover	Present? Yes No
Remarks: (Include photo numbers here or on a separate s	sheet.)	

SOIL							Sampling Point: WL-16
Profile Descr	iption: (Desc	cribe to th	ne depth ne	eded to document the indicator or co	nfirm the	e absence of indicator	rs.)
Depth		Matrix		Redox Features		_	
(inches)	Color (m	noist)_	<u>%</u>	Color (moist) % Type <sup>1</sup>	Loc <sup>2</sup>	Texture  Mucky Peat	Remarks
<u>0-5</u> 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	possible road fill
15-21	2.5YR	5/3	100			Sandy Clay	
<sup>1</sup> Type: C=Con	centration, D=	Depletion,	RM=Reduce	d Matrix, CS=Covered or Coated Sand Gra	ins.	<sup>2</sup> Location: PL=Pore Li	ning. M=Matrix.
Hydric Soil I	ndicators:					Indicators for Pr	oblematic Hydric Soils <sup>3</sup> :
Histosol (	•			Sandy Gleyed Matrix (S4)		Coast Prairie Re	edox (A16)
	pedon (A2)			Sandy Redox (S5)		Dark Surface (\$	·
Black Hist	Sulfide (A4)			Stripped Matrix (S6)		☐ Iron Manganes	•
_ ` `	Layers (A5)			Loamy Mucky Mineral (F1)		_	ark Surface (TF12)
2 cm Muc				Loamy Gleyed Matrix (F2)		Other (Explain	
	Below Dark Su	urface (A1	1)	Depleted Matrix (F3)			,
Thick Dar	k Surface (A12	2)		Redox Dark Surface (F6) Depleted Dark Surface (F7)		3	
Sandy Mu	ıck Mineral (S1	1)		Redox Depressions (F8)			rophytic vegetation and plogy must be present,
5 cm Muc	ky Peat or Pea	nt (S3)		Redox Depressions (10)			bed or problematic.
Restrictive L	ayer (if obse	rved):					
Type: N	<u>ot encounter</u>	-ed					v
Depth (inc	hes): <u>N/A</u>					Hydric Soil Presen	t? Yes   No
Remarks:							
11)/000016							
HYDROLC	)GY						
Wetland Hyd							
		m of one is	required; ch	eck all that apply)			dicators (minimum of two required
Surface W				Water-Stained Leaves (B9)			Soil Cracks (B6)
High Wate				Aquatic Fauna (B13)			Patterns (B10)
✓ Saturation				☐ True Aquatic Plants (B14) ☐ Hydrogen Sulfide Odor (C1)			on Water Table (C2)
Water Ma	Deposits (B2)			Oxidized Rhizospheres on Living R	oots (C2)		Burrows (C8) n Visible on Aerial Imagery (C9)
Drift Depo				Presence of Reduced Iron (C4)	0018 (C3)		or Stressed Plants (D1)
	or Crust (B4)			Recent Iron Reduction in Tilled So	ils (C6)		hic Position (D2)
☐ Iron Depo				Thin Muck Surface (C7)	(00)	_	tral Test (D5)
✓ Inundatio		erial Image	ery (B7)	Gauge or Well Data (D9)			
	Vegetated Con	•	· .	Other (Explain in Remarks)			
	-						
Field Observ	ations:						
Surface Water	Present?	Yes (	No O	Depth (inches): 20			
Water Table P	resent?	Yes (	No O	Depth (inches):0			
Saturation Pre		Yes (	No O	Depth (inches): 0	Wet	land Hydrology Presei	nt? Yes • No O
(includes capil					enaction	s) if available:	
pescribe kec	orueu Data (	suediii g	auge, moni	toring well, aerial photos, previous ins	spections	s), ii avaliable:	
Remarks:							
Kemarks:							

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): fl	at
Slope: 0.0% / 0.0 ° Lat.: 45.706188	Long.:	-62.716295	Datum: NAD83
Soil Map Unit Name/Type: Tormentine			ype: Swamp - shrub
Are climatic/hydrologic conditions on the site typical for this time of	veera Yes • No O	(If no, explain in Remarks.)	ype. Swarrip - Stillub
			ent? Yes • No •
	significantly disturbed?	Are "Normal Circumstances" prese	
Are Vegetation, Soil, or Hydrology r	naturally problematic?	(If needed, explain any answers in	n Remarks.)
SUMMARY OF FINDINGS - Attach site map sho	wing sampling poir	nt locations, transects, impo	ortant features, etc.
Hydrophytic Vegetation Present? Yes  No			
Hydric Soil Present? Yes No		e Sampled Area	
Wetland Hydrology Present? Yes No	withi	in a Wetland? Yes • No	
, 3,			
Remarks: Soil disturbed from roadfill and hydrology disturbed from s	stormwater influences		
con distarbod from roadini dila fiyarology distarbod from s	storriwator irinaciicos.		
<b>VEGETATION</b> - Use scientific names of plan	ominant Dominant Species?		
Tree Stratum (Plot size: 10 m	Absolute Rel.Strat.	Indicator Dominance Test work	sheet:
1. Larix Iaricina	<u>% Cover Cover</u> 5 □ 19.6%	Status Number of Dominant Sp	
2. Acer rubrum	15 <b>1</b> 58.8%	FACW That are OBL, FACW, or FAC	FAC: <u>3</u> (A)
2 Dicea mariana	0.5 2.0%	Total Number of Domina	
4. Abies balsamea	5 19.6%	Species Across All Strata	: (B)
5.	0 0.0%	Percent of dominant S	
	25.5 = Total Cov	That Are OBL, FACW,	or FAC:(A/B)
Sapling/Shrub Stratum (Plot size: 5 m		Prevalence Index wor	ksheet:
1. Spiraea alba	_ 5	FACW Total % Cover of	of: Multiply by:
2. Nemopanthus mucronatus	6090.2%	OBL Species 6	$55.5$ $\times 1 = 65.5$
3. Viburnum nudum			41 x 2 = 82
4. Abies balsamea		_	$21.5$ $\times 3 = 64.5$
5. Kalmia angustifolia	$ \begin{array}{ccc}                                   $	FACU species	0 x 4 = 0
Herb Stratum (Plot size: 2 m	= Total Cov	01 2 species	0 x 5 = 0
1 <sub>.</sub> Maianthemum trifolium	513.9%_	OBL Column Totals:	128 (A) <u>212</u> (B)
2. Onoclea sensibilis	3083.3%_	FACW Prevalence Index	= B/A = <u>1.656</u>
3. Iris versicolor	0.5 1.4%	OBL Hydrophytic Vegetation	on Indicators:
4. Ranunculus repens 5.	$ \begin{array}{c ccccc}  & 0.5 & & 1.4\% \\ \hline  & 0 & & 0.0\% \\ \end{array} $	1 - Rapid Test for H	Hydrophytic Vegetation
4	0	2 - Dominance Tes	t is > 50%
7.		3 - Prevalence Ind	ex is <b>≤</b> 3.0 <sup>1</sup>
8.	0 0.0%	4 - Morphological	Adaptations 1 (Provide supporting
9.	0 0.0%		r on a separate sheet)  phytic Vegetation <sup>1</sup> (Explain)
10	0 0.0%	,	. , ,
	36 = Total Cov	'er 'Indicators of hydric be present, unless dis	soil and wetland hydrology must turbed or problematic.
woody vine Stratum (Fiot Size)  1	0	22 2. 223.11, 4.11000 410	
2		Hydrophytic	
	0 = Total Cov	ver Vegetation Present? Yes	No
Remarks: (Include photo numbers here or on a separate s	heet.)		

SOIL							Sampling Point: WL-19
Profile Descr	iption: (Des	cribe to t	he depth ne	eded to document the indicator or co	nfirm th	e absence of indicators	.)
Depth		Matrix		Redox Features		_	
(inches)	Color (n		%	Color (moist) % Type <sup>1</sup>	Loc2	Texture	Remarks
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.
							Clay layer at II III.
						-	
1 Type: C=Cond		- Depletion	RM=Reduce	d Matrix, CS=Covered or Coated Sand Gra	nins.	<sup>2</sup> Location: PL=Pore Lini	ng. M=Matrix.
Hydric Soil I							_ <del>*</del>
Histosol (				Sandy Gleyed Matrix (S4)		Indicators for Prol	olematic Hydric Soils <sup>3</sup> :
	oedon (A2)					Coast Prairie Rec	lox (A16)
Black Hist				Sandy Redox (S5)		☐ Dark Surface (S7	")
	Sulfide (A4)			Stripped Matrix (S6)		☐ Iron Manganese	Masses (F12)
	Layers (A5)			Loamy Mucky Mineral (F1)		Very Shallow Day	rk Surface (TF12)
2 cm Muc	-			Loamy Gleyed Matrix (F2)		Other (Explain in	
	Below Dark S	urfaco (A1	1)	✓ Depleted Matrix (F3)		Citiei (Expiaiii iii	r Kerriai KS)
	k Surface (A1		1)	Redox Dark Surface (F6)			
	•	•		Depleted Dark Surface (F7)		3 Indicators of hydro	ophytic vegetation and
	ick Mineral (S			Redox Depressions (F8)			ogy must be present,
	ky Peat or Pea					unless disturb	ed or problematic.
Restrictive La	ayer (if obse	rved):					
Type: <u>_cl</u>	av						
Depth (inc	hes): <u>11</u>					Hydric Soil Present?	Yes  No
Remarks:							
I							
I							
HYDROLC	)CV						
HYDROLC	JG Y						
Wetland Hyd	Irology India	ators:					
Primary Indica	ators (minimu	m of one is	required; ch	eck all that apply)		Secondary Ind	icators (minimum of two required
✓ Surface W	Vater (A1)			✓ Water-Stained Leaves (B9)		✓ Surface So	il Cracks (B6)
✓ High Wate	er Table (A2)			Aquatic Fauna (B13)		☐ Drainage F	Patterns (B10)
✓ Saturation				☐ True Aquatic Plants (B14)		☐ Dry Seasor	n Water Table (C2)
☐ Water Ma				Hydrogen Sulfide Odor (C1)		Crayfish Bu	ırrows (C8)
<b>✓</b> Sediment		ı		Oxidized Rhizospheres on Living R	oots (C3)		Visible on Aerial Imagery (C9)
Drift Depo				Presence of Reduced Iron (C4)	()		Stressed Plants (D1)
	or Crust (B4)			Recent Iron Reduction in Tilled So	ils (C6)		ic Position (D2)
Iron Depo				Thin Muck Surface (C7)	113 (00)	_	al Test (D5)
		orial Image	om. (D7)			▼ TAC-Neutra	ar rest (D3)
	n Visible on A	· ·		Gauge or Well Data (D9)			
☐ Sparsely \	Vegetated Cor	icave Surfa	ice (B8)	Uther (Explain in Remarks)			
Field Observ	ations:						
Surface Water	Present?	Yes (	● No ○	Depth (inches): 6			
Water Table P	resent?	Yes (	No O	Depth (inches):0			
Saturation Pre					Wet	land Hydrology Present	:? Yes ◉ No ◯
(includes capil	lary fringe)	Yes (		Depth (inches): 0	-		
Describe Rec	orded Data	(stream g	auge, monit	toring well, aerial photos, previous in	spection	s), if available:	
Remarks:							
-							

Project/Site: Northern Pulp Plant - Pipel	ine PFA		Municipa	lity/County:	Pictou		Sampling Date:	30-Jul-19
Applicant/Owner: NPNS							Sampling Point:	WL-20
Investigator(s): Chris Kennedy				Affiliation:	Dillon Consu	ılting		
Landform (hillslope, terrace, etc.): Basin					Local relief (	concave, convex, none): fla	t	
Slope: 0.0% / 0.0 ° Lat.:	45.707936			Long.:	-62.714413		Datum: NAD8	3
Soil Map Unit Name/Type: Tormentii						Wetland Ty	oe: Swamp - shrub	
Are climatic/hydrologic conditions on the		r this time of	year? Yes	No ○	(If no, ex	xplain in Remarks.)		
Are Vegetation , Soil	, or Hydrolog		significantly di			ormal Circumstances" preser	nt? Yes •	No $\bigcirc$
Are Vegetation , Soil	, or Hydrolog	av 🗌	naturally prob	lematic?	(If nee	ded, explain any answers in	Remarks.)	
SUMMARY OF FINDINGS - A	, ,	,,			•	. , ,	•	etc
		No O				113, transects, impor	tarr rearares,	
Hydrophytic Vegetation Present?		No •		Is th	he Sampled <i>i</i>	Area		
Hydric Soil Present?		No O		with	nin a Wetland	d? Yes ○ No ●		
Wetland Hydrology Present?	res 😊	NO C						
Remarks: Excavation and compaction caused	d disturbance	as to soil as	well as hyd	rology due	to nondina	Additional hydrology dist	urhance due to dito	hina
Excavation and compaction causes	a distarbance	23 10 3011 43	well as riyu	rology duc	to portaing.	Additional frydrology disti	dibance due to dite	illig.
NEOFTATION - Heavile								
VEGETATION - Use scie	ntific nam	ies of pla	nts.	Dominan  Species?		1		
Tree Stratum (Plot size: 10 m	)		Absolute % Cover	Rel.Strat	t. Indicator Status	Dominance Test works	heet:	
1			5	✓ 33.3%		Number of Dominant Spe That are OBL, FACW, or F		(A)
2 Diaga wuhana			5	33.3%	FACU			
3. Abies balsamea			5	33.3%	FAC	Total Number of Dominar Species Across All Strata:		(B)
4				0.0%				
5			0	0.0%		Percent of dominant S That Are OBL, FACW, (		5% (A/B)
_Sapling/Shrub Stratum (Plot size: 5 r	n	)	15	= Total Co	over			
1		, ,	30	<b>✓</b> 75.0%	5 FACW	Prevalence Index work Total % Cover of		
2. Spiraea alba			10	25.0%			0   x 1 =	0
3.			0	0.0%				110
4			0	0.0%		FAC species 2	<u>20</u> x 3 =	60
5				0.0%		· · · · · · · · · · · · · · · · · · ·	5 x 4 =	20
Herb Stratum (Plot size: 2 m	)		40	= Total Co	over	UPL species	0 x 5 =	0
1. Onoclea sensibilis			15	60.0%	FACW_	Column Totals:8	80 (A) _	<u>190</u> (B)
2. Equisetum arvense			5	20.0%		Prevalence Index	= B/A = <u>2.3</u>	<u>75</u>
3. Solanum dulcamara			5	20.0%		Hydrophytic Vegetation	n Indicators:	
4 5.			0	0.0%		1 - Rapid Test for H	ydrophytic Vegetat	ion
6.			0	0.0%		✓ 2 - Dominance Test		
7.			0	0.0%		✓ 3 - Prevalence Inde		
8			0	0.0%		4 - Morphological A data in Remarks or	daptations <sup>1</sup> (Provi	de supporting
9			0	0.0%		Problematic Hydrop	•	
10			0	0.0%		1 Indicators of hydric s	3	
	)		25	= Total Co	over	be present, unless dist	urbed or problema	tic.
1			0	0.0%				
2			0	0.0%		Hydrophytic Vegetation		
			0	= Total Co	over	Present? Yes	No O	
Demorks, (Include all Includes	hare ·		oboot \			ı		
Remarks: (Include photo numbers	nere or on a	separate s	snee(.)					

SOIL								Sampling Point: WL-20
Profile Descr	ription: (Des	cribe to th	ne depth ne	eded to document	the indicator or	confirm th	e absence of indicato	rs.)
Depth		Matrix		Red	ox Features		_	
(inches)	Color (m		<u>%</u>	Color (moist)	<u>%</u> Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks Black Muck with Organics
0-4	5YR	3/1	100				Muck	
4-9	5YR	3/1	100				Silt Loam	
9-13	2.5YR	4/3	100				Sandy Loam	Possi bl e Roadfill
						-		
		Depletion,	RM=Reduce	ed Matrix, CS=Covere	ed or Coated Sand G	Grains.	<sup>2</sup> Location: PL=Pore L	ining. M=Matrix.
Hydric Soil I							Indicators for Pr	oblematic Hydric Soils <sup>3</sup> :
Histosol (	•			Sandy Gleyed			Coast Prairie R	edox (A16)
Black Hist	pedon (A2)			Sandy Redox (			✓ Dark Surface (	S7)
	Sulfide (A4)			Stripped Matri			☐ Iron Manganes	se Masses (F12)
Stratified	Layers (A5)			Loamy Mucky Loamy Gleyed			☐ Very Shallow □	Oark Surface (TF12)
2 cm Muc	k (A10)			Depleted Matri			Other (Explain	in Remarks)
Depleted	Below Dark Su	urface (A11	)	Redox Dark Su				
Thick Dar	k Surface (A12	2)		Depleted Dark	` ,		3 Indicators of by	drophytic vegetation and
Sandy Mu	ıck Mineral (S1	1)		Redox Depress				ology must be present,
5 cm Muc	ky Peat or Pea	at (S3)					unless distu	rbed or problematic.
Restrictive L	ayer (if obse	rved):						
Туре: <u> </u>	ravels and R	<u>nrk</u>					Lludria Cail Dracan	it? Yes O No •
Depth (inc	hes): 13						Hydric Soil Presen	TES O NO O
Remarks:								
HYDROLC	)GY							
Wetland Hyd	drology Indic	ators:						
Primary Indica	ators (minimur	m of one is	required; ch	neck all that apply)			Secondary Ir	ndicators (minimum of two required
✓ Surface V	Vater (A1)			✓ Water-Staine			✓ Surface :	Soil Cracks (B6)
High Wat	er Table (A2)			✓ Aquatic Faur	na (B13)		☐ Drainage	Patterns (B10)
Saturation	n (A3)			True Aquation	Plants (B14)		Dry Seas	son Water Table (C2)
✓ Water Ma					ılfide Odor (C1)			Burrows (C8)
	Deposits (B2)				zospheres on Living	Roots (C3)		on Visible on Aerial Imagery (C9)
Drift Depo					Reduced Iron (C4)			or Stressed Plants (D1)
	or Crust (B4)				Reduction in Tilled :	Soils (C6)		phic Position (D2)
☐ Iron Depo			(D7)	✓ Thin Muck S			✓ FAC-Neu	tral Test (D5)
	n Visible on A	-	-	☐ Gauge or We				
<b>▼</b> Sparsely	Vegetated Con	icave Surra	ce (B8)	☐ Other (Expla	in in Remarks)			
Field Observ	rations:							
Surface Water		Yes 🤄	No O	Denth (inc	hes):5			
		Yes C				_		
Water Table P Saturation Pre				•	hes):	—   <sub>Wet</sub>	land Hydrology Prese	nt? Yes   No
(includes capil		Yes C	No •	Depth (inc	hes):	_		
Describe Rec	orded Data (	(stream ga	auge, moni	toring well, aerial	photos, previous	inspection	s), if available:	
Remarks:								

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 re	elief (concave, convex, none): flat
<u> </u>	long : /2.720	9257 Datum: NAD83
10.001707	Long.: -62.729	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Soil Map Unit Name/Type: <u>Tormentine</u>	Voc No No (vs	Wetland Type: UPLAND
Are climatic/hydrologic conditions on the site typical for this time of		no, explain in Remarks.)
Are Vegetation 🔲 , Soil 🔲 , or Hydrology 🔲 s	ignificantly disturbed? A	re "Normal Circumstances" present? Yes   No
Are Vegetation , Soil , or Hydrology r	naturally problematic? (I	If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map show	wing sampling point loc	ations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No		
Hydric Soil Present? Yes No	Is the Samp	
Wetland Hydrology Present? Yes No	within a We	etland? Yes O No •
Remarks:		
Remarks.		
NEGETATION II III II III		
<b>VEGETATION</b> - Use scientific names of plan	Dominant Species?	
_Tree Stratum (Plot size: 10 )	Absolute Rel.Strat. Indic	
1 5	% Cover Cover State	Number of Dominant Species
Populus tremuloides		
3. Prunus virginiana	10 <b>✓</b> 24.4% FACU	Total Number of Dominant
4. Crataegus monogyna	0.5	Species Across All Strata. 4 (B)
5. Sorbus aucuparia	0.5	Percent of dominant Species
	41 = Total Cover	That Are OBL, FACW, or FAC: 0.0% (A/B)
Sapling/Shrub Stratum (Plot size: 5 m		Prevalence Index worksheet:
1 <sub>.</sub> Prunus virginiana	<u>15</u> <u>71.4%</u> FACL	Total % Cover of: Multiply by:
2. Populus tremuloides		OBL species 0 x 1 = 0
3. Sorbus aucuparia		FACW species x 2 = 0
4. Fraxinus americana 5.	5 <u>✓</u> 23.8% FACU	
J	0 0.0%	FACU species x 4 =244
Herb Stratum (Plot size: 2 m	= Total Cover	UPL species x 5 = 5
1	0 0.0%	Column Totals:62 (A)249 (B)
2	0 0.0%	Prevalence Index = B/A = 4.016
3	0 0.0%	Hydrophytic Vegetation Indicators:
4	0	1 - Rapid Test for Hydrophytic Vegetation
5		2 - Dominance Test is > 50%
6.	0 0.0%	3 - Prevalence Index is ≤3.0 1
7. 8.	0 0.0%	4 - Morphological Adaptations <sup>1</sup> (Provide supporting
9.	0 0.0%	data in Remarks or on a separate sheet)
10.	0	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
(5)	0 = Total Cover	Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size:)		be present, unless disturbed or problematic.
12	0 0.0%	Hydrophytic
	0	Vegetation Present? Yes No •
	= Total Cover	Fresent:
Remarks: (Include photo numbers here or on a separate s	heet )	
Remarks. (melade prioto numbers here or on a separate s	neet.)	

SOIL											Sampling I	Point: <u>Ur</u>	Pit 1
Profile Descr	iption: (Des	cribe to t	he depth	needed to	document	t the indi	cator or c	onfirm the	e absence	of indicators.)			
Depth		Matrix			Red	lox Featu			_				
(inches)	Color (n	noist)_	%	Color	(moist)	%	Type 1	Loc <sup>2</sup>	T	exture		Remarks	
0-9	7.5YR	3/1	100						Loam		with grave		
9-16	5YR	4/4	100						Silt Loar	n	with grave	el S	
16-21	10YR	6/2	98	7.5YR	5/8	2			Sandy L	oam	with grave	els	
-					-	-		-	-				
											_		
1 Type: C=Cond	centration, D	=Depletion	, RM=Redu	iced Matrix,	CS=Covere	ed or Coate	ed Sand Gr	ains.	<sup>2</sup> Location	: PL=Pore Linin	g. M=Matrix.		
Hydric Soil I	ndicators:								Indic	ators for Prob	lematic Hydri	c Soils <sup>3</sup>	:
Histosol (A	•				ndy Gleyed		4)			oast Prairie Redo	x (A16)		
	pedon (A2)				ndy Redox					ark Surface (S7)			
Black Hist	Sulfide (A4)				ipped Matri					on Manganese N			
	Layers (A5)				amy Mucky					ery Shallow Dark		))	
2 cm Muc	-				amy Gleyed		2)			ther (Explain in I		-/	
	Below Dark S	urface (A1	1)		pleted Matr					trier (Explain in i	Kemarks)		
	k Surface (A1		.,		dox Dark Su				2				
	ck Mineral (S	•			pleted Dark		F7)			icators of hydror			
	ky Peat or Pe			∟ Re	dox Depres	sions (F8)			\	wetland hydrolog unless disturbe			
Restrictive La	ayer (if obse	erved):											
Type: _ar		,											
Depth (incl									Hydric	Soil Present?	Yes 🔾	No 💿	
Remarks:									1				
rtomarto.													
HYDROLC	)GY												
Wetland Hyd	rology India	cators:											
Primary Indica			s required;	check all th	nat apply)					Secondary Indic	ators (minimur	n of two r	required
Surface W	/ater (A1)				Water-Stain	ed Leaves	(B9)			Surface Soil			
	er Table (A2)				Aquatic Fau		(= - )			Drainage Pa	,		
☐ Saturation					· Γrue Aquatio		14)				Water Table (0	(2)	
☐ Water Ma	rks (B1)			□ F	Hydrogen Sı	ulfide Odor	r (C1)			Crayfish Bur			
Sediment	Deposits (B2)	)			Oxidized Rhi	izospheres	on Living	Roots (C3)		Saturation V	isible on Aerial	l Imagery	(C9)
☐ Drift Depo	osits (B3)			F	Presence of	Reduced I	ron (C4)			Stunted or S	Stressed Plants	(D1)	
Algal Mat	or Crust (B4)			F	Recent Iron	Reduction	in Tilled S	oils (C6)		Geomorphic	Position (D2)		
☐ Iron Depo	osits (B5)			1	Γhin Muck S	urface (C7	')			FAC-Neutral	Test (D5)		
Inundation	n Visible on A	erial Imag	ery (B7)		Gauge or W	ell Data (D	19)						
Sparsely \	egetated Cor	ncave Surfa	ace (B8)		Other (Expla	ain in Rema	arks)						
Field Observa	ations:			,									
Surface Water	Present?	Yes (	O No (	•)	Depth (inc	hes):		_					
Water Table P	resent?	Yes (	O No (	lacksquare	Depth (inc	hes):						_	
Saturation Pre	sent?	Yes (	) No (					Wetl	land Hydro	ology Present?	Yes 🔾	No 🖲	)
(includes capil					Depth (inc			_	\				
Describe Rec	orded Data	(stream o	gauge, mo	nitoring w	vell, aerial	photos, p	revious ii	nspections	s), if availa	able:			
Remarks:													

Affiliation:   Dillon Consulting   Local relief (concave, convex, none):   Convex	Project/Site: Northern Pulp Plant - Pipeline PFA	Municipality/County:	Pictou	Sampling Date: 30-Jul-19
Card Teller (concave, convex, none):   Convex	Applicant/Owner: NPNS			Sampling Point: Up Pit 2
Sopi   0.0%	Investigator(s): Chris Kennedy	Affiliation:	Dillon Consulting	
Sopi   0.0%	Landform (hillslope, terrace, etc.): Shoulder slope		Local relief (concave, convex, none): C	onvex
Soil Map Unit Name/Type:	<del>-</del>		_	
Aposlute   Sampled Area within a Wetland?   Sample Area   Sample Area within a Wetland?   Are "Normal Circumstances" present?   Yes	101010070	Lorig		
Ace vegetation		V ( N- (		ype: <u>UPLAND</u>
Vegetation			(If no, explain in Remarks.)	
SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.  Hydrophytic Vegetation Present? Yes No was within a Wetland? Yes No within a Wetland? Y	Are Vegetation 🔲 , Soil 🔲 , or Hydrology 🔲 si	gnificantly disturbed?	Are "Normal Circumstances" prese	ent? Yes ♥ No ∪
Hydrophylic Vegetation Present?   Yes	Are Vegetation $\ \square$ , Soil $\ \square$ , or Hydrology $\ \square$ na	aturally problematic?	(If needed, explain any answers in	n Remarks.)
State   Sampled Area within a Wetland?   See   No	SUMMARY OF FINDINGS - Attach site map shov	ving sampling poir	nt locations, transects, impo	ortant features, etc.
Section   Present?   Yes	Hydrophytic Vegetation Present? Yes No   No			
VEGETATION - Use scientific names of plants.   Dominant Species				
VEGETATION - Use scientific names of plants.	0 0	Withi	ma wetiand? Yes O No O	
VEGETATION - Use scientific names of plants.         Dominant           Tree Stratum (Plot size: 10 m )         Absolute ReliStrat. Net Species? ReliStrat. Indicator 96 (Cover Status)         Dominant Species 1 (Indicator 96 (Cover Status)         Dominant Species 1 (Indicator 96 (Cover Status)         Number of Dominant Species 1 (Indicator 1 are OBL, FACW, or FAC: 3 (Cover Status)         Number of Dominant Species 1 (Indicator 1 are OBL, FACW, or FAC: 3 (Cover Status)         Number of Dominant Species 1 (Indicator 1 are OBL, FACW, or FAC: 3 (Cover Status)         Number of Dominant Species 1 (Indicator 1 are OBL, FACW, or FAC: 3 (Cover Status)         Number of Dominant Species 1 (Indicator 1 are OBL, FACW, or FAC: 3 (Cover Status)         Number of Dominant Species 1 (Indicator 1 are OBL, FACW, or FAC: 3 (Cover Status)         Number of Dominant Species 1 (Indicator 1 are OBL, FACW, or FAC: 3 (Cover Status)         Number of Dominant Species 1 (Indicator 1 are OBL, FACW, or FAC: 3 (Cover OBL)         Number of Dominant Species 1 (Indicator 1 are OBL, FACW, or FAC: 3 (Cover OBL)         Number of Dominant Species 1 (Indicator 1 are OBL, FACW, or FAC: 3 (Cover OBL)         Number of Dominant Species 1 (Indicator 1 are OBL, FACW, or FAC: 3 (Cover OBL)         Prevalence Index worksheet         That Are OBL, FACW, or FAC: 3 (Cover OBL)         Solution 1 are Total Cover 1 are	Totalia rijal ologji riosom.			
Absolute   Rel Stratum   Plot size: 10 m	Remarks.			
Absolute   Rel Stratum   Plot size: 10 m				
Absolute   Rel Stratum   Plot size: 10 m     Absolute   Rel Stratus   Cover   Cover   Status   Number of Dominant Species   That are OBL, FACW, or FAC:   3 (# 2	VEGETATION III III III C			
Absolute   Absolute   Rei Stratum   Plot size: 10 m   )	VEGETATION - Use scientific names of plan			
1. Acer rubrum 2. Populus tremuloides 3. Abies balsamea 4. Abies balsamea 5. Abies balsamea 5. Abies balsamea 6. Abies balsamea 7. Abies balsamea 8. Abies balsamea 9. Abies balsamea 1. Abies	Torra Charteria (Plot size: 10 m	Absolute Rel.Strat.	maioatoi	sheet:
2. Populus tremuloides         5         6.2%         FACU         Total Number of Dominant Species Across All Strata:         6. (E           4. Betula populifolia         5         6.2%         FAC         FACU         FACU         FACU Species Across All Strata:         6. (E           5. Betula papyrifera         0.5         0.6%         FACU         FACU TATA ARE OBL, FACW, or FAC:         50.0%         (A           Sapling/Shrub Stratum (Plot size: 5 m         )         1. Abies balsamea         5         9.9%         FAC         FACU         Prevalence Index worksheet:         Total % Cover of:         Multiply by:         0         OBL species         0 x 1 = 0         Column totals:	1 Acon rubrum		Number of Dominant Sp	
3. Abies balsamea 4. Betula populifolia 5. Betula papyrifera 5. Betula papyrifera 6. Sapling/Shrub Stratum (Plot size: 5 m 7. Abies balsamea 7. Viburnum nudum 7. Abies balsamea 8. S	-			FAC: <u>3</u> (A)
4. Betula populifolia  5. Betula papyrifera  5. Betula papyrifera  5. Betula papyrifera  6. Sapling/Shrub Stratum (Plot size: 5 m )  1. Abies balsamea  5.			Total Number of Domina	
5. Betula papyrifera         0.5 80.5 = Total Cover         FACU 880.5 = Total Cover         Percent of dominant Species That Are OBL, FACW, or FAC: 50.0% (Assemble of Prevalence Index worksheet: That Are OBL, FACW, or FAC: 50.0% (Assemble of Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0.5 x 2 = 1         Prevalence Index worksheet: Total % Cover of: Multip			Species Across Air Strata	: <u>6</u> (B)
Sapling/Shrub Stratum (Plot size: 5 m   )		0.5 0.6%		
1. Abies balsamea       5       ✓ 90.9%       FAC       Total % Cover of: Multiply by:         2. Viburnum nudum       0.5       9.1%       FACW       OBL species       0 x1 = 0         3.       0       0.0%       FACW species       0.5 x2 = 1         4.       0       0.0%       FAC species       81       x3 = 243         5.       0       0.0%       FACU species       16       x4 = 64         UPL species       4       x5 = 20         2. Maianthemum canadense       5       32.3%       FACU       Column Totals: 101.5       (A) 328       (B         2. Maianthemum canadense       5       32.8%       FACU       Prevalence Index = B/A = 3.232       Hydrophytic Vegetation Indicators:         4. Ranunculus acris       1       6.5%       FAC       Hydrophytic Vegetation Indicators:       1 - Rapid Test for Hydrophytic Vegetation         5. Luzula acuminata       0.5       3.2%       FACU       1 - Rapid Test for Hydrophytic Vegetation         6.       0       0.0%       3 - Prevalence Index is ≤ 3.0 1       4 - Morphological Adaptations 1 (Provide suppor data in Remarks or on a separate sheet)       1 - Rapid Test for Hydrophytic Vegetation 1 (Explain)         10.       0       0.0%       1 - Rapid Test for Hydrophytic Vegetation 1 (Explain		80.5 = Total Cov	er That Are OBL, FACW,	or FAC:
2. Viburnum nudum       0.5       9.1%       FACW       OBL species       0       x 1 = 0       A         3.       0       0.0%       FACW species       0.5       x 2 = 1       FACW species       0.5       x 2 = 1       FACW species       0.5       x 3 = 243       FACU species       81       x 3 = 243       FACU species       16       x 4 = 64       UPL species       16       x 4 = 64       UPL species       4       x 5 = 20       Column Totals:       10.5       A       32.3%       FACU       FACU species       16       x 4 = 64       UPL species       4       x 5 = 20       Column Totals:       10.5       A       328       (B         2. Maianthemum canadense       5       32.3%       FACU       Prevalence Index = B/A = 3.232       Hydrophytic Vegetation Indicators:       Hydrophytic Vegetation Indicators:       1 - Rapid Test for Hydrophytic Vegetation       1 - Rapid Test for Hydrophytic Vegetation       2 - Dominance Test is > 50%       3 - Prevalence Index is ≤ 3.0 ¹       4 - Morphological Adaptations ¹ (Provide suppor data in Remarks or on a separate sheet)       4 - Morphological Adaptations ¹ (Explain)       1 Indicators of hydric soil and wetland hydrology metals	Sapling/Shrub Stratum (Plot size: 5 m		Prevalence Index wor	ksheet:
3.	1. Abies balsamea	5 90.9%	FAC Total % Cover of	of: Multiply by:
4.		0.5 9.1%	FACW OBL species	0 x 1 = 0
5.		0	FACW species	0.5 x 2 =1
Herb Stratum (Plot size: 2 m	-			81 x 3 = <u>243</u>
1   Veronica officinalis   5   ✓   32.3%   FACU   FACU   Column Totals: 101.5   (A)   328   (B)	5		-	
2. Maianthemum canadense 3. Hieracium alleghaniense 4. Ranunculus acris 5. Luzula acuminata 6. 0.5 3.2% FACU 6. 0 0.0% 7. 0 0.0% 8. 0 0.0% 9. 0 0.0% 10. 0 0.0% 11. Facult Cover 1. Indicators of hydric soil and wetland hydrology metals in the standard soil and wetland hydrology metals in the sta	Herb Stratum (Plot size: 2 m		er UPL species	
3. Hieracium alleghaniense  4. Ranunculus acris  5. Luzula acuminata  6. 0 0 0.0%  7. 0 0 0.0%  8. 0 0 0.0%  9. 0 0.0%  10. 0 0.0%  15. 5 - Total Cover	1 Veronica officinalis	5 22.3%	FACU Column Totals: 1	<u>01.5</u> (A) <u>328</u> (B)
4. Ranunculus acris       1       6.5%       FAC         5. Luzula acuminata       0.5       3.2%       FACU         6.       0       0.0%         7.       0       0.0%         8.       0       0.0%         9.       0       0.0%         10.       0       0.0%         15.5       - Total Cover       1 - Rapid Test for Hydrophytic Vegetation         2 - Dominance Test is > 50%       3 - Prevalence Index is ≤3.0 ¹         4 - Morphological Adaptations ¹ (Provide suppor data in Remarks or on a separate sheet)       Problematic Hydrophytic Vegetation ¹ (Explain)         1 - Rapid Test for Hydrophytic Vegetation       1 - Rapid Test for Hydrophytic Vegetation         2 - Dominance Test is > 50%       3 - Prevalence Index is ≤3.0 ¹         4 - Morphological Adaptations ¹ (Provide suppor data in Remarks or on a separate sheet)       Problematic Hydrophytic Vegetation ¹ (Explain)         1 - Rapid Test for Hydrophytic Vegetation       1 - Rapid Test for Hydrophytic Vegetation         1 - Rapid Test for Hydrophytic Vegetation       1 - Rapid Test for Hydrophytic Vegetation         2 - Dominance Test is > 50%       3 - Prevalence Index is ≤3.0 ¹         3 - Prevalence Index is ≤3.0 ¹       4 - Morphological Adaptations ¹ (Provide support data in Remarks or on a separate sheet)         3 - Prevalence Index is ≤3.0 ¹	2 <sub>.</sub> Maianthemum canadense	5 232.3%	FACU Prevalence Index	= B/A = <u>3.232</u>
4. Ranunculus acris  5. Luzula acuminata  6.		4	UPL Hydrophytic Vegetation	on Indicators:
5. Luzula acuminata  6. 0 0.0%  7. 0 0.0%  8. 0 0.0%  9. 0 0.0%  10. 0 0.0%  15.5 - Total Cover			FAC 1 - Rapid Test for I	
7.  8.  0 □ 0.0%  9.  0 □ 0.0%  10.  3 - Prevalence Index is ≤3.0 ¹  4 - Morphological Adaptations ¹ (Provide suppor data in Remarks or on a separate sheet)  Problematic Hydrophytic Vegetation ¹ (Explain)  15.5 - Total Cover			_ <u>FACU</u> _ 2 - Dominance Tes	t is > 50%
8. 0 0.0% data in Remarks or on a separate sheet)  10. 0 0.0% Problematic Hydrophytic Vegetation 1 (Explain)  15.5 - Total Cover			3 - Prevalence Ind	ex is <b>≤</b> 3.0 <sup>1</sup>
9. 0 0.0% Problematic Hydrophytic Vegetation 1 (Explain) 10. 15.5 - Total Cover	8	0 0.0%	4 - Morphological	Adaptations <sup>1</sup> (Provide supporting
10	9.			•
15.5 - Total Cover 1.1 Indicators of hydric soil and wetland hydrology m	10.			. , , ,
Woody Vine Stratum (Plot size: ) be present, unless disturbed or problematic.	(0)		er ! Indicators of hydric	soil and wetland hydrology must
			pe present, uniess dis	turbed or problematic.
1	1			
Vegetation Vegetation	<u> </u>		Vegetation	○ No ●
0 = Total Cover Present? Yes V NO S		= Total Cov	ei Present? 163	
Remarks: (Include photo numbers here or on a separate sheet.)	Domarks: (Include photo numbers here or on a constate of	noot )		

SOIL								Sampling Point: Up Pit 2
Profile Descript	tion: (Descr	ibe to the	depth nee	ded to document	the indicator or c	onfirm the	e absence of indicators.)	
		atrix			ox Features		,	
Depth — _(inches)_	Color (mo			Color (moist)	% Type <sup>1</sup>	Loc2	- Texture	Remarks
0-24		3/3		, , , , , , ,			Sandy Loam	
	- JIK						- Carray Eduin	
							-	
				-				
					<del></del>	-	-	
<sup>1</sup> Type: C=Concen	ntration, D=D	epletion, Ri	√=Reduced	Matrix, CS=Covere	ed or Coated Sand Gr	rains.	<sup>2</sup> Location: PL=Pore Lining.	M=Matrix.
Hydric Soil Ind	licators:						Indicators for Probler	natic Hydric Soils <sup>3</sup> :
Histosol (A1)	)			Sandy Gleyed I	Matrix (S4)			,
Histic Epiped	lon (A2)			Sandy Redox (	(S5)		Coast Prairie Redox	(A16)
Black Histic (				Stripped Matrix			Dark Surface (S7)	
Hydrogen Su							☐ Iron Manganese Mas	ses (F12)
Stratified Lay				Loamy Mucky I			Very Shallow Dark S	urface (TF12)
	, , ,			Loamy Gleyed	Matrix (F2)			
2 cm Muck (/	,			☐ Depleted Matri	x (F3)		Other (Explain in Re	marks)
Depleted Bel	low Dark Surf	face (A11)		Redox Dark Su	ırface (F6)			
Thick Dark S	urface (A12)			Depleted Dark			3	
Sandy Muck	Mineral (S1)						Indicators of hydrophy wetland hydrology	
5 cm Mucky		(\$3)		☐ Redox Depress	sions (F8)		unless disturbed of	
							I III I I I I I I I I I I I I I I I I	problematic.
Restrictive Laye								
Туре:								
Depth (inches	s):			_			Hydric Soil Present?	Yes ○ No •
Remarks:								
110111011101								
HYDROLOG	Υ							
Wetland Hydrol	logy Indicat	ors:						
Primary Indicator	rs (minimum	of one is re	quired; che	ck all that apply)			Secondary Indicate	ors (minimum of two required
Surface Water	er (A1)			Water-Staine	ed Leaves (B9)		Surface Soil Cr	acks (B6)
High Water 1	Table (A2)			Aquatic Faun	na (R13)		Drainage Patte	` '
					• •			
Saturation (A	•			True Aquatic			☐ Dry Season W	, ,
Water Marks	(B1)				ılfide Odor (C1)		Crayfish Burro	ws (C8)
Sediment De	posits (B2)			Oxidized Rhiz	zospheres on Living	Roots (C3)	Saturation Visi	ble on Aerial Imagery (C9)
Drift Deposit	s (B3)			Presence of I	Reduced Iron (C4)		Stunted or Str	essed Plants (D1)
Algal Mat or					Reduction in Tilled S	nils (C6)	Geomorphic Po	
						0113 (00)	_	
Iron Deposits				Thin Muck Su			FAC-Neutral To	est (D5)
Inundation V	isible on Aeri	ial Imagery	(B7)	☐ Gauge or We	ell Data (D9)			
Sparsely Veg	etated Conca	ave Surface	(B8)	Other (Explain	in in Remarks)			
				_ ` '	,			
Field Observation	one:							
		Yes $\bigcirc$	No •	Donth /:	206):			
Surface Water Pro	esent?			Deptn (incr	nes):	-		
Water Table Pres	ent?	Yes $\bigcirc$	No 💿	Depth (inch	nes):			
Saturation Preser	nt?	v	N. (a)			Wetl	and Hydrology Present?	Yes ○ No •
(includes capillary		Yes O	No 💿	Depth (inch	nes):			
Describe Record	ded Data (s	tream gau	ge, monito	oring well, aerial į	photos, previous ir	nspections	s), if available:	
	•	ū		·	•			
Domarks:								
Remarks:								

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 Cons	sulting
Landform (hillslope, terrace, etc.): Shoulder slope	Local relief	(concave, convex, none): convex
<del>-</del>		- NAD00
10170011	Long.: -62.716690	
Soil Map Unit Name/Type: Tormentine	V (2) N- (15)	Wetland Type: UPLAND
Are climatic/hydrologic conditions on the site typical for this time of		explain in Remarks.)
Are Vegetation  , Soil , or Hydrology	significantly disturbed? Are "N	Normal Circumstances" present? Yes   No
Are Vegetation  , Soil , or Hydrology   ,	naturally problematic? (If ne	eeded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sho	wing sampling point location	ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No		
Hydric Soil Present? Yes ○ No ●	Is the Sampled	
Wetland Hydrology Present? Yes No   No	within a Wetlar	nd? Yes ○ No •
Remarks:		
Remarks.		
VEGETATION III I III		
VEGETATION - Use scientific names of plan	NTS. Dominant Species? ————	
	Absolute Rel.Strat. Indicator	Dominance Test worksheet:
1. Abies balsamea	% Cover Cover Status  10 14.3% FAC	Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
2. Acer rubrum	15 <b>✓</b> 21.4% FAC	That are OBL, FACW, OF FAC.
3. Picea rubens	35 <b>✓</b> 50.0% FACU	Total Number of Dominant Species Across All Strata: 4 (B)
4. Pinus strobus	5 7.1% FACU	Species Across Air Strata.
5. Populus tremuloides	5 7.1% FACU	Percent of dominant Species That Are OBL FACW or FAC: 50.0% (A/B)
	= Total Cover	That Are OBL, FACW, or FAC: 50.0% (A/B)
Sapling/Shrub Stratum (Plot size: 5 m		Prevalence Index worksheet:
1. Abies balsamea	4 <u>✓ 80.0% FAC</u>	Total % Cover of: Multiply by:
2. Picea rubens 3.	0 0000	OBL species 0 x 1 = 0
4.		FACW species $0$ $x 2 = 0$ FAC species $29$ $x 3 = 87$
5.	0 0.0%	FAC species 29 x 3 = 87 FACU species 46 x 4 = 184
-	5 = Total Cover	$\begin{array}{cccccccccccccccccccccccccccccccccccc$
Herb Stratum (Plot size: 2 m		· ————————————————————————————————————
1		Column Totals: <u>75</u> (A) <u>271</u> (B)
2		Prevalence Index = B/A = 3.613
34	0 0.0%	Hydrophytic Vegetation Indicators:
5.	0 0.0%	1 - Rapid Test for Hydrophytic Vegetation
6	0 0.0%	2 - Dominance Test is > 50%
7	0 0.0%	3 - Prevalence Index is ≤3.0 1
0	0 0.0%	4 - Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)
9	0 0.0%	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
10	0 0.0%	1 Indicators of hydric soil and wetland hydrology must
	= Total Cover	be present, unless disturbed or problematic.
1.	0 0.0%	
2	0 0.0%	Hydrophytic Vegetation
	= Total Cover	Present? Yes No •
		1
Remarks: (Include photo numbers here or on a separate s	sheet.)	

SOIL							Sampling Point: Up Pit 3
Profile Descr	iption: (Des	cribe to t	he depth n	eeded to document the indicator or conf	irm the	e absence of indicators.	)
Depth (inches)	N	Matrix noist)		Redox Features  Color (moist) % Type 1	Loc <sup>2</sup>	- Texture	Remarks
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
						Eddin	to gravel
1 Type: C=Cond	entration, D=	Depletion	, RM=Reduc	ed Matrix, CS=Covered or Coated Sand Grain	S.	<sup>2</sup> Location: PL=Pore Lini	ng. M=Matrix.
Hydric Soil I		.,	,				
Histosol (A				Sandy Gleyed Matrix (S4)			olematic Hydric Soils <sup>3</sup> :
Histic Epip	•			Sandy Redox (S5)		Coast Prairie Red	, ,
Black Histi				Stripped Matrix (S6)		☐ Dark Surface (S7	•
	Sulfide (A4)			Loamy Mucky Mineral (F1)		☐ Iron Manganese	• •
	Layers (A5)			Loamy Gleyed Matrix (F2)		☐ Very Shallow Dar	
2 cm Mucl				Depleted Matrix (F3)		Other (Explain in	Remarks)
	Below Dark Su		1)	Redox Dark Surface (F6)			
	Surface (A12	•		☐ Depleted Dark Surface (F7)		3 Indicators of hydro	ophytic vegetation and
	ck Mineral (S1			Redox Depressions (F8)		wetland hydrolo	ngy must be present,
	ky Peat or Pea					uniess disturbe	ed or problematic.
Restrictive La	-						
	am with ara	VEIS				Hydric Soil Present?	Yes ○ No •
Depth (inch	nes): <u>18</u>					3	1.00 - 1.10 -
Remarks:							
HYDROLO	GY						
Wetland Hyd	rology Indic	ators:					
Primary Indica	itors (minimur	m of one is	s required; c	heck all that apply)		Secondary Indi	cators (minimum of two required
Surface W	ater (A1)			Water-Stained Leaves (B9)			il Cracks (B6)
☐ High Wate	er Table (A2)			Aquatic Fauna (B13)		☐ Drainage P	atterns (B10)
Saturation	(A3)			True Aquatic Plants (B14)		Dry Seasor	Water Table (C2)
Water Mai	rks (B1)			Hydrogen Sulfide Odor (C1)		Crayfish Bu	ırrows (C8)
Sediment	Deposits (B2)			Oxidized Rhizospheres on Living Roo	ots (C3)	☐ Saturation	Visible on Aerial Imagery (C9)
Drift Depo				Presence of Reduced Iron (C4)			Stressed Plants (D1)
	or Crust (B4)			Recent Iron Reduction in Tilled Soils	(C6)		c Position (D2)
☐ Iron Depo				☐ Thin Muck Surface (C7)		☐ FAC-Neutra	al Test (D5)
	n Visible on A	9	, ,	☐ Gauge or Well Data (D9)			
☐ Sparsely V	egetated Con	cave Surf	ace (B8)	Other (Explain in Remarks)			
					ı		
Field Observa		Yes (	⊃ <sub>No</sub>	) Danish (inches)			
Surface Water				' '			
Water Table Pr		Yes (	⊃ No	Depth (inches):	\\/\0+1	land Hydrology Present	? Yes ○ No •
Saturation Pres (includes capill		Yes (	⊃ No ⊙	Depth (inches):	vveti	iand Hydrology Present	Y Tes C NO C
		stream o	auge, mon	itoring well, aerial photos, previous insp	ections	s), if available:	
		( oaiii g	,			.,,	
Remarks:							
Norman No.							

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 Cons	ulting
Landform (hillslope, terrace, etc.): Shoulder slope	Local relief	(concave, convex, none): convex
		- NADOO
01070 010	Long.: -62.721130	·· <u> </u>
Soil Map Unit Name/Type: Tormentine	V (2) N- (15)	Wetland Type: UPLAND
Are climatic/hydrologic conditions on the site typical for this time of		explain in Remarks.)
Are Vegetation  , Soil , or Hydrology	significantly disturbed? Are "N	Jormal Circumstances" present? Yes   No ○
Are Vegetation . , Soil . , or Hydrology	naturally problematic? (If ne	eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sho	wing sampling point location	ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No		
Hydric Soil Present? Yes ○ No ●	Is the Sampled	
Wetland Hydrology Present? Yes No   No	within a Wetlar	nd? Yes ○ No ●
Remarks:		
Remarks.		
VEGETATION III I III		
VEGETATION - Use scientific names of plan	Nts. Dominant Species? ———	
	Absolute Rel.Strat. Indicator	Dominance Test worksheet:
1. Picea rubens	00 00 004 5104	Number of Dominant Species That are OBL, FACW, or FAC: 2 (A)
Betula papyrifera	00 7 504 54011	That are OBL, TACW, OF TAC.
3. Betula populifolia	00 05 004 540	Total Number of Dominant Species Across All Strata: 5 (B)
4. Abies balsamea	10 12 50/ 540	Species Across Air Strata.
5	0 0.0%	Percent of dominant Species That Are ORL FACW or FAC: 40.0% (A/B)
	80 = Total Cover	That Are OBL, FACW, or FAC: 40.0% (A/B)
Sapling/Shrub Stratum (Plot size: 5 m		Prevalence Index worksheet:
1. Picea rubens		Total % Cover of: Multiply by:
Abies balsamea     Repulus tremuloides	4	OBL species 0 x 1 = 0
Ι <sub>Λ</sub> ΄		FACW species $0$ $x 2 = 0$ FAC species $55$ $x 3 = 165$
5.	0 0.0%	FAC species 55 x 3 = 165 FACU species 76 x 4 = 304
-	51 = Total Cover	UPL species $0 \times 5 = 0$
Herb Stratum (Plot size: 2 m		
1	0 0.0%	Column Totals: 131 (A) 469 (B)
2	0 0.0%	Prevalence Index = B/A = 3.580
34	0 0.0%	Hydrophytic Vegetation Indicators:
5.	0 0.0%	1 - Rapid Test for Hydrophytic Vegetation
6	0 0.0%	2 - Dominance Test is > 50%
	0 0.0%	3 - Prevalence Index is ≤3.0 1
0	0 0.0%	4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
9	0 0.0%	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
10	0 0.0%	1 Indicators of hydric soil and wetland hydrology must
	0 = Total Cover	be present, unless disturbed or problematic.
1.	0 0.0%	
2	0 0.0%	Hydrophytic Vegetation
	= Total Cover	Present? Yes No •
		<u> </u>
Remarks: (Include photo numbers here or on a separate s	sheet.)	

SOIL							Sampling Point: Up pit 4
Profile Descr	iption: (Desc	ribe to th	ne depth ne	eeded to document the indicator or conf	irm the	e absence of indicators.	)
Depth	N	latrix		Redox Features		_	
(inches)	Color (m	oist)_	<u>%</u> _	Color (moist) <u>%</u> Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-1							organi c layer
1-26	7.5YR	4/4	100			Loam	
			-				
							_
1 Type: C=Cond	entration D=	Denletion	RM=Reduc	ed Matrix, CS=Covered or Coated Sand Grains	<u> </u>	<sup>2</sup> Location: PL=Pore Linir	ng M=Matrix
· · ·		Беріспоп,	NW-Nedde	ca Matrix, c5=covered of Godica Sana Grains	J.		·
Hydric Soil I						Indicators for Prob	lematic Hydric Soils <sup>3</sup> :
Histosol (A	•			Sandy Gleyed Matrix (S4)		Coast Prairie Redo	ox (A16)
Histic Epip				Sandy Redox (S5)		Dark Surface (S7)	
	Sulfide (A4)			Stripped Matrix (S6)		☐ Iron Manganese N	
_ ` `				Loamy Mucky Mineral (F1)		☐ Very Shallow Darl	• •
	Layers (A5)			Loamy Gleyed Matrix (F2)			
2 cm Mucl				Depleted Matrix (F3)		Other (Explain in	Remarks)
	Below Dark Su		)	Redox Dark Surface (F6)			
	k Surface (A12	•		Depleted Dark Surface (F7)		3 Indicators of hydro	phytic vegetation and
Sandy Mu	ck Mineral (S1	)		Redox Depressions (F8)		wetland hydrolo	gy must be present,
5 cm Mucl	ky Peat or Pea	t (S3)					d or problematic.
Restrictive La	ayer (if obser	ved):					
Туре:							
Depth (incl	nes).					Hydric Soil Present?	Yes ○ No ●
Remarks:							
HYDROLO	ΙGΥ						
Wetland Hyd							
Primary Indica	itors (minimun	n of one is	required; c	heck all that apply)		Secondary Indic	cators (minimum of two required
Surface W				Water-Stained Leaves (B9)			Cracks (B6)
☐ High Wate	er Table (A2)			Aquatic Fauna (B13)		☐ Drainage Pa	atterns (B10)
Saturation	(A3)			True Aquatic Plants (B14)		☐ Dry Season	Water Table (C2)
☐ Water Mai	rks (B1)			Hydrogen Sulfide Odor (C1)		Crayfish Bu	rrows (C8)
Sediment	Deposits (B2)			Oxidized Rhizospheres on Living Roo	ts (C3)	Saturation \	Jisible on Aerial Imagery (C9)
Drift Depo	sits (B3)			Presence of Reduced Iron (C4)			Stressed Plants (D1)
	or Crust (B4)			Recent Iron Reduction in Tilled Soils	(C6)		Position (D2)
Iron Depo				☐ Thin Muck Surface (C7)	(00)	FAC-Neutra	
		rial Images	(D7)			TAC-Neutra	r rest (D3)
	n Visible on Ae	9	, ,	Gauge or Well Data (D9)			
☐ Sparsely V	egetated Con	cave Surfa	ce (B8)	Other (Explain in Remarks)			
Field Observa	ations:						
Surface Water	Present?	Yes (	) No ●	Depth (inches):			
Water Table Pi	resent?	yes (	No ●				
Saturation Pres				2 op 111 (11101105)1	Wetl	land Hydrology Present	? Yes ○ No •
(includes capill		Yes C	No 💿	Depth (inches):			
		stream a	auge, mon	itoring well, aerial photos, previous insp	ections	s), if available:	
	(	9	J	, , , , , , , , , , , , , , , , , , ,		•	
Domarka							
Remarks:							

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 Consu	ulting
Landform (hillslope, terrace, etc.): Shoulder slope	Local relief (	(concave, convex, none): convex
<del>-</del>		- NADOO
01070 010	Long.: -62.704326	
Soil Map Unit Name/Type: Tormentine	Vec No No	Wetland Type: UPLAND
Are climatic/hydrologic conditions on the site typical for this time of		explain in Remarks.)
Are Vegetation	significantly disturbed? Are "N	lormal Circumstances" present? Yes   No
Are Vegetation . , Soil . , or Hydrology	naturally problematic? (If nee	eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sho	wing sampling point locatio	ons, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No		
Hydric Soil Present? Yes No •	Is the Sampled	
Wetland Hydrology Present? Yes ○ No ●	within a Wetlan	d? Yes ○ No ●
Tronana Tryan Stogy Trosonti		
Remarks:		
<b>VEGETATION</b> - Use scientific names of plan	nts. Dominant Species?	
_Tree Stratum (Plot size: 10 m )	Absolute Rel.Strat. Indicator	Dominance Test worksheet:
1 8	% Cover Cover Status 30 ✓ 35.1% FACU	Number of Dominant Species
Picea rubens     Pinus strobus	15 17.5% FACU	That are OBL, FACW, or FAC:1(A)
3. Abies balsamea	25 <b>✓</b> 29.2% FAC	Total Number of Dominant
4. Acer rubrum	15	Species Across All Strata:3(B)
5. Betula populifolia	0.5 0.6% FAC	Percent of dominant Species
	85.5 = Total Cover	That Are OBL, FACW, or FAC: 33.3% (A/B)
Sapling/Shrub Stratum (Plot size: 5 m	_	Prevalence Index worksheet:
1. Picea rubens	10 <u> </u>	Total % Cover of: Multiply by:
2. Abies balsamea		OBL species 0 x 1 = 0
3		FACW species 0 x 2 = 0
5.	0 0.0%	FAC species $41$ $\times 3 = 123$
-	10.5 = Total Cover	FACU species $55.5$ $x 4 = 222$ UPL species $0$ $x 5 = 0$
Herb Stratum (Plot size: 2 m		
1_Pteridium aquilinum		Column Totals: <u>96.5</u> (A) <u>345</u> (B)
2	0 0.0%	Prevalence Index = $B/A = 3.575$
3	0	Hydrophytic Vegetation Indicators:
4 5	0 0.0%	1 - Rapid Test for Hydrophytic Vegetation
6.	0 0.0%	2 - Dominance Test is > 50%
7	0 0.0%	3 - Prevalence Index is ≤3.0 <sup>1</sup>
8	0 0.0%	4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
9	0 0.0%	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
10	0 0.0%	1 Indicators of hydric soil and wetland hydrology must
	= Total Cover	be present, unless disturbed or problematic.
1.	0 0.0%	
2.	0 0.0%	Hydrophytic
	0 = Total Cover	Vegetation Present? Yes ○ No •
Remarks: (Include photo numbers here or on a separate s	sheet.)	

SOIL								Sampling Point: Up Pit 5
Profile Descript	ion: (Descr	ibe to th	e depth ne	eded to document the in	dicator or cor	nfirm the	absence of indicators.)	
Depth (inches) 0-1	M Color (mo	atrix oist)	_%	Redox Fea Color (moist) %	tures Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks 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	
<sup>1</sup> Type: C=Concent	tration, D=E	Depletion, I	RM=Reduce	ed Matrix, CS=Covered or Co	ated Sand Grai	ins.	<sup>2</sup> Location: PL=Pore Linin	g. M=Matrix.
Hydric Soil Indi Histosol (A1) Histic Epipedt Black Histic ( Hydrogen Su Stratified Lay 2 cm Muck (A Depleted Beld Thick Dark St Sandy Muck I 5 cm Mucky F	on (A2) A3) Ifide (A4) ers (A5) A10) ow Dark Sur urface (A12) Mineral (S1)			Sandy Gleyed Matrix (S) Sandy Redox (S5) Stripped Matrix (S6) Loamy Mucky Mineral Loamy Gleyed Matrix Depleted Matrix (F3) Redox Dark Surface (Depleted Dark Surface Redox Depressions (F	(F1) (F2) F6) e (F7)		Coast Prairie Redo Dark Surface (S7) Iron Manganese M Very Shallow Dark Other (Explain in	Masses (F12) Surface (TF12) Remarks)
Restrictive Laye	er (if obser	ved):						
Туре:								
Depth (inches)	):						Hydric Soil Present?	Yes ○ No •
Remarks: HYDROLOG	Y							
Wetland Hydrol	ogy Indica	tors:						
Primary Indicator	s (minimum	of one is	required; cl	neck all that apply)			Secondary India	ators (minimum of two required
Surface Wate High Water T Saturation (A Water Marks Sediment Deposits Algal Mat or ( Iron Deposits Inundation V Sparsely Veg	rable (A2) (B1) posits (B2) s (B3) Crust (B4) s (B5) isible on Aer etated Conc	-	-	Water-Stained Leav Aquatic Fauna (B13 True Aquatic Plants Hydrogen Sulfide Or Oxidized Rhizospher Presence of Reduce Recent Iron Reducti Thin Muck Surface of Gauge or Well Data Other (Explain in Re	(B14) (B14) dor (C1) res on Living Rod Iron (C4) ion in Tilled Soil (C7) (D9)		Crayfish Bur Saturation \ Stunted or S	water Table (C2) rows (C8) /isible on Aerial Imagery (C9) Stressed Plants (D1) Position (D2)
Field Observation Surface Water Presentation	esent? ent? it? rfringe)	Yes C Yes C Yes O	No O	Depth (inches): _ Depth (inches): _ Depth (inches): _ toring well, aerial photos			and Hydrology Present?	yes ○ No ●
Remarks:								

Project/Site: Northern Pulp Plant - Pipeline PFA	Municipality/County: Pictou	Sampling Date: 30-Jul-19
Applicant/Owner: NPNS		Sampling Point: WL5E Up
nvestigator(s): _Vanessa Graves, Tom Neily	Affiliation: Dillon Co	onsulting
andform (hillslope, terrace, etc.): Shoulder slope	Local reli	ief (concave, convex, none): convex
None:		
10.0011111	Long.: -62./321	
Soil Map Unit Name/Type: <u>Tormentine</u>	Voc. No. O	Wetland Type: UPLAND
Are climatic/hydrologic conditions on the site typical for this time of		o, explain in Remarks.)  = "Normal Circumstances" present?  Yes   No
		e "Normal Circumstances" present? Yes W No C
Are Vegetation , Soil , or Hydrology i	naturally problematic? (If	needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sho	wing sampling point loca	itions, transects, important features, etc.
Hydrophytic Vegetation Present? Yes • No •		
Hydric Soil Present? Yes No •	Is the Sample	
0 0	within a Wet	:land? Yes ○ No •
Trockana rijarologij rrosom.		
Remarks:		
<b>VEGETATION</b> - Use scientific names of plan	nts. Dominant Species? ———	
_Tree Stratum (Plot size: 10 m	Absolute Rel.Strat. Indica	
1	% Cover Cover Statu 80 ✓ 100.0% FACU	Number of Dominant Species
Populus tremuloides     2		That are OBL, FACW, or FAC:4(A)
3		Total Number of Dominant
4		Species Across All Strata: 5 (B)
5	0 0.0%	Percent of dominant Species  That Are OBL FACW or FAC: 80.0% (A/B)
	80 = Total Cover	That Are OBL, FACW, or FAC: 80.0% (A/B)
Sapling/Shrub Stratum (Plot size: 5 m		Prevalence Index worksheet:
1. Rhamnus cathartica		Total % Cover of: Multiply by:
2. Alnus incana		
3 4.		FACW species $30 \times 2 = 60$
5.	_ 0	FAC species 70 x 3 = 210 FACU species 80 x 4 = 320
	40 = Total Cover	FACU species 80 x 4 = 320 UPL species 0 x 5 = 0
Herb Stratum (Plot size: 2 m )		
1_Doellingeria umbellata		Column Totals: <u>190</u> (A) <u>600</u> (B)
Equisetum arvense     Carex aquatilis	40 57.1% FAC	Prevalence Index = B/A = 3.158
4.		Hydrophytic Vegetation Indicators:
5		1 - Rapid Test for Hydrophytic Vegetation
6.	0 0.0%	2 - Dominance Test is > 50%
7	0 0.0%	3 - Prevalence Index is ≤3.0 <sup>1</sup>
8	0 0.0%	4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
9	0 0.0%	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
10	0 0.0%	1 Indicators of hydric soil and wetland hydrology must
_Woody Vine Stratum (Plot size:)	= Total Cover	be present, unless disturbed or problematic.
WOODY VIIIE STATUIT (FIOUSIZE)	0 0.0%	
1. 2.	0 0.0%	Hydrophytic  Vagetation
1,		Hydrophytic Vegetation Present?  Yes  No  No

SOIL			Sampling Point: <b>W</b>	L5E Up
Profile Description: (Describe to the depth needed	to document the indicator or confir	m the absence of	indicators.)	
Depth Matrix	Redox Features			
(inches) Color (moist) % Col	or (moist) <u>%</u> Type <sup>1</sup> Lo	oc² Tex	ture Remarks	
0-4 5YR 3/2			organics with roo	ıs
4-18 5YR 4/2		Silt Loam		
18-21 7.5YR 3/1				
21-23 5YR 4/2		-		
2123 311 4/2				
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Ma	triv CS_Covered or Coated Sand Crains	2Location: I	PL=Pore Lining. M=Matrix.	
Hydric Soil Indicators:	tilk, C3=Covered of Coated Saild Glains.			
Histosol (A1)	Sandy Gleyed Matrix (S4)	Indicate	ors for Problematic Hydric Soils <sup>3</sup>	:
Histic Epipedon (A2)	Sandy Redox (S5)	Coas	t Prairie Redox (A16)	
Black Histic (A3)	· ·	☐ Dark	Surface (S7)	
Hydrogen Sulfide (A4)	Stripped Matrix (S6)	Iron	Manganese Masses (F12)	
Stratified Layers (A5)	Loamy Mucky Mineral (F1)	☐ Very	Shallow Dark Surface (TF12)	
2 cm Muck (A10)	Loamy Gleyed Matrix (F2)	Othe	r (Explain in Remarks)	
Depleted Below Dark Surface (A11)	Depleted Matrix (F3)	_	,	
Thick Dark Surface (A12)	Redox Dark Surface (F6)	2		
Sandy Muck Mineral (S1)	Depleted Dark Surface (F7)		tors of hydrophytic vegetation and land hydrology must be present,	
5 cm Mucky Peat or Peat (S3)	Redox Depressions (F8)		less disturbed or problematic.	
Restrictive Layer (if observed):			·	
Type:				
Depth (inches):		Hydric Sc	il Present? Yes O No 💿	
Remarks:		ı		
Kemarks.				
LIVEROLOGY				
HYDROLOGY				
Wetland Hydrology Indicators:				
Primary Indicators (minimum of one is required; check a	all that apply)	Se	condary Indicators (minimum of two r	equired
Surface Water (A1)	Water-Stained Leaves (B9)		Surface Soil Cracks (B6)	
High Water Table (A2)	Aquatic Fauna (B13)		Drainage Patterns (B10)	
Saturation (A3)	True Aquatic Plants (B14)		Dry Season Water Table (C2)	
Water Marks (B1)	Hydrogen Sulfide Odor (C1)		Crayfish Burrows (C8)	
Sediment Deposits (B2)	Oxidized Rhizospheres on Living Roots	(C3)	Saturation Visible on Aerial Imagery	(C9)
Drift Deposits (B3)	Presence of Reduced Iron (C4)		Stunted or Stressed Plants (D1)	
Algal Mat or Crust (B4)	Recent Iron Reduction in Tilled Soils (0	C6)	Geomorphic Position (D2)	
☐ Iron Deposits (B5)	Thin Muck Surface (C7)	<b>✓</b>	FAC-Neutral Test (D5)	
Inundation Visible on Aerial Imagery (B7)	Gauge or Well Data (D9)			
Sparsely Vegetated Concave Surface (B8)	Other (Explain in Remarks)			
	_ Other (Explain in Remarks)			
Field Observations:				
Surface Water Present? Yes No   No	Depth (inches):			
0 0				
	Depth (inches):	Wetland Hydrold	gy Present? Yes O No 🖲	)
Saturation Present? (includes capillary fringe)  Yes No	Depth (inches):		a,	
Describe Recorded Data (stream gauge, monitorin	g well, aerial photos, previous inspec	ctions), if availabl	e:	
(-1 <u>1111111111</u>	5 , <sub>F</sub> , <sub>F</sub>	.,,		
Remarks:				
Normal No.				

Are Vegetation Soil On Hydrology Inaturally possible SUMMARY OF FINDINGS - Attach site map showing satisfy the Hydrophytic Vegetation Present? Yes No Hydric Soil Present? Yes No Wetland Hydrology Present? Yes No Femarks:  VEGETATION - Use scientific names of plants.    Tree Stratum (Plot size: 10 m	Long.:  /es No O  ly disturbed?  problematic?  ampling poi  Is the with open content of the cont	(If no, exampled Anin a Wetland	Datum: NAD83  Wetland Type: UPLAND  xplain in Remarks.)  ormal Circumstances" present? Yes No Oeded, explain any answers in Remarks.)  ans, transects, important features, etc.
Landform (hillslope, terrace, etc.): Shoulder slope  Slope:	Long.:  /es No O  ly disturbed?  problematic?  ampling poi  Is the with open content of the cont	Local relief (d -62.729489  (If no, e) Are "No (If nee nt locatio ne Sampled A nin a Wetland	Datum: NAD83  Wetland Type: UPLAND  xplain in Remarks.)  ormal Circumstances" present? Yes No ormal circumstances in Remarks.)  ans, transects, important features, etc.  Area d? Yes No •
Solope: 0.0% / 0.0 ° Lat.: 45.689866  Soil Map Unit Name/Type: Tormentine  Are climatic/hydrologic conditions on the site typical for this time of year? You have Vegetation V , Soil V , or Hydrology V significantly have Vegetation , Soil O , or Hydrology naturally public Summary OF FINDINGS - Attach site map showing sate Hydrophytic Vegetation Present? Yes No Hydrology Present? Yes No Wetland Hydrology Present? Yes No Person No Pers	Dominan Species?  Is the with the species of the sp	(If no, e) Are "No (If nee nt location ne Sampled Anin a Wetland	Datum: NAD83  Wetland Type: UPLAND  Explain in Remarks.)  ormal Circumstances" present? Yes No Oeded, explain any answers in Remarks.)  ens, transects, important features, etc.  Area d? Yes No O
Are climatic/hydrologic conditions on the site typical for this time of year?  Are Vegetation	Dominan Species?  Is the with the species of the sp	(If no, e) Are "No (If nee nt locatio ne Sampled A nin a Wetland	Wetland Type: UPLAND  xplain in Remarks.)  ormal Circumstances" present? Yes No O  aded, explain any answers in Remarks.)  ans, transects, important features, etc.  Area d? Yes No
Are climatic/hydrologic conditions on the site typical for this time of year?  Are Vegetation	Dominan Species?  Is the with the species of the sp	(If no, e) Are "No (If nee nt locatio ne Sampled A nin a Wetland	Wetland Type: UPLAND  xplain in Remarks.)  ormal Circumstances" present? Yes No O  aded, explain any answers in Remarks.)  ans, transects, important features, etc.  Area d? Yes No
Are climatic/hydrologic conditions on the site typical for this time of year?  Are Vegetation   Are Vegetati	Dominan Species?  Lute Cover Cover 14.3%	Are "No (If nee nt location ne Sampled Anin a Wetland	explain in Remarks.)  ormal Circumstances" present?  eded, explain any answers in Remarks.)  ens, transects, important features, etc.  Area d?  Yes O No O
Are Vegetation  , Soil  , or Hydrology  , significantly Are Vegetation  , Soil  , or Hydrology  , naturally postumentary  , or Hydrology  , or Hydrolo	Dominan Species?  Lute Cover Cover 14.3%	Are "No (If nee nt location ne Sampled Anin a Wetland	ormal Circumstances" present?  Yes No O  eded, explain any answers in Remarks.)  Ins, transects, important features, etc.  Area d?  Yes No O
Are Vegetation  , Soil  , or Hydrology  naturally positive No  natur	Dominan Species?  Rel. Strat Cover Cover 14.3%	(If nee	Area d? Yes O No •
SUMMARY OF FINDINGS - Attach site map showing satisfies the stream of th	Dominan Species? Rel.Strat Cover	nt locatio ne Sampled A nin a Wetland	Area d? Yes O No •
Hydrophytic Vegetation Present?  Hydric Soil Present?  Wetland Hydrology Present?  Remarks:  VEGETATION - Use scientific names of plants.  Tree Stratum (Plot size: 10 m ) Absol % Co 1. Salix bebbiana 10	Dominan Species? Rel.Strat Cover 14.3%	ne Sampled Anin a Wetland	Area d? Yes ○ No ●
Hydric Soil Present?  Wetland Hydrology Present?  Remarks:  VEGETATION - Use scientific names of plants.  Tree Stratum (Plot size: 10 m ) Absol % Co	Dominan Species? Rel.Strat Cover Cover	tIndicator	d? Yes ○ No ●
Hydric Soil Present?  Wetland Hydrology Present?  Remarks:  VEGETATION - Use scientific names of plants.  Tree Stratum (Plot size: 10 m ) Absol % Co 1. Salix bebbiana 10	Dominan Species? Rel.Strat Cover Cover	tIndicator	d? Yes ○ No ●
Wetland Hydrology Present? Yes No  Remarks:  VEGETATION - Use scientific names of plants.  Tree Stratum (Plot size: 10 m )	Dominan Species? Rel.Strat Cover	t	
Remarks:  VEGETATION - Use scientific names of plants.  Tree Stratum (Plot size: 10 m ) Absol % Co 1. Salix bebbiana 10	Species?  Iute Rel.Strat  Over Cover  14.3%	Indicator	Dominance Test worksheet:
VEGETATION - Use scientific names of plants.	Species?  Iute Rel.Strat  Over Cover  14.3%	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 10 m         Absol % Co           1. Salix bebbiana         10	Species?  Iute Rel.Strat  Over Cover  14.3%	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 10 m         Absol % Co           1. Salix bebbiana         10	Species?  Iute Rel.Strat  Over Cover  14.3%	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 10 m         )         Absol % Co           1. Salix bebbiana         10	Species?  Iute Rel.Strat  Over Cover  14.3%	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 10 m ) % Co  1. Salix bebbiana 10	Nute Rel.Strat	. Indicator	Dominance Test worksheet:
1. Salix bebbiana 10	) 14.3%	Status	
		FACW	Number of Dominant Species That are OBL, FACW, or FAC: 5 (A)
2. Populus tremuloides 50	71.4%		That are OBL, FACW, or FAC: (A)
3. Quercus rubra 10			Total Number of Dominant Species Across All Strata: 6 (B)
4			Species Across Air Strata
5	0.0%		Percent of dominant Species That Are ORL FACW or FAC: 83.3% (A/B)
	= Total Co	ver	That Are OBL, FACW, or FAC: 83.3% (A/B)
Sapling/Shrub Stratum (Plot size: 5 m			Prevalence Index worksheet:
1. Alnus incana 10			Total % Cover of: Multiply by:
2. Amelanchier canadensis 5			OBL species 0 x 1 = 0
3. Rosa virginiana 10 4. 0		FAC	FACW species 75 x 2 = 150 FAC species 20 x 3 = 60
5. 0			FAC species 20 x 3 = 60 FACU species 65 x 4 = 260
25		ver	UPL species x 5 =
Herb Stratum (Plot size: 2 m )		FACIAL	
1 Spiraea alba 30			
2. Doellingeria umbellata 20 3. Maianthemum canadense 5		FACU FACU	Prevalence Index = B/A = 2.938
4. Equisetum sylvaticum 5		FACW	Hydrophytic Vegetation Indicators:
5. Solidago rugosa 5		FAC	1 - Rapid Test for Hydrophytic Vegetation
6. 0	0.0%		✓ 2 - Dominance Test is > 50%
7. 0	0.0%		✓ 3 - Prevalence Index is ≤3.0 <sup>1</sup>
8			4 - Morphological Adaptations 1 (Provide supporting data in Remarks or on a separate sheet)
9			Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
10			<sup>1</sup> Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size:)	= Total Co	ver	be present, unless disturbed or problematic.
10	0.0%		
2	0.0%		Hydrophytic Vegetation
0	= Total Co	ver	Present? Yes No O
			1

SOIL					Sampling Point: WL6 Up
Profile Description: (Desc	ribe to the depth r	needed to document the indicator or conf	firm the	absence of indicators.)	
•	Matrix	Redox Features			
(inches) Color (m		a a	Loc <sup>2</sup>	Texture	Remarks
0-4 5YR	3/2				organi cs
4-12 5YR	4/3			-	refusal at 12 inches
4-12 311	4/3				
1 Type: C-Concentration D-	Depletion PM-Peduc	ced Matrix, CS=Covered or Coated Sand Grain	nc	<sup>2</sup> Location: PL=Pore Lining	n M-Matrix
31	Depletion, Rivi=Reduc	ed Matrix, C3=Covered of Coated Sand Grain	15.		
Hydric Soil Indicators:				Indicators for Probl	ematic Hydric Soils <sup>3</sup> :
Histosol (A1)		Sandy Gleyed Matrix (S4)		Coast Prairie Redo	x (A16)
Histic Epipedon (A2)		Sandy Redox (S5)		Dark Surface (S7)	,
☐ Black Histic (A3) ☐ Hydrogen Sulfide (A4)		Stripped Matrix (S6)		☐ Iron Manganese M	lasses (F12)
		Loamy Mucky Mineral (F1)		☐ Very Shallow Dark	• •
Stratified Layers (A5)		Loamy Gleyed Matrix (F2)			
2 cm Muck (A10)		Depleted Matrix (F3)		Other (Explain in F	Remarks)
Depleted Below Dark Su		Redox Dark Surface (F6)			
Thick Dark Surface (A12	•	Depleted Dark Surface (F7)		<sup>3</sup> Indicators of hydrop	shytic vegetation and
Sandy Muck Mineral (S1)	)	Redox Depressions (F8)		wetland hydrolog	ly must be present,
5 cm Mucky Peat or Pea	t (S3)				d or problematic.
Restrictive Layer (if obser	rved):				
Туре:					
Depth (inches): 12				Hydric Soil Present?	Yes 🔾 No 🗨
Remarks:					
HYDROLOGY					
Wetland Hydrology Indica	ators:				
Primary Indicators (minimun		check all that apply)		Secondary Indic	ators (minimum of two required
	ir or one is required, t				
Surface Water (A1)		Water-Stained Leaves (B9)		☐ Surface Soil	. ,
High Water Table (A2)		Aquatic Fauna (B13)		Drainage Pa	
Saturation (A3)		☐ True Aquatic Plants (B14)		_ ′	Water Table (C2)
Water Marks (B1)		☐ Hydrogen Sulfide Odor (C1)		Crayfish Bur	
Sediment Deposits (B2)		Oxidized Rhizospheres on Living Roc	ots (C3)		isible on Aerial Imagery (C9)
Drift Deposits (B3)		Presence of Reduced Iron (C4)		Stunted or S	tressed Plants (D1)
Algal Mat or Crust (B4)		Recent Iron Reduction in Tilled Soils	(C6)	Geomorphic	Position (D2)
☐ Iron Deposits (B5)		☐ Thin Muck Surface (C7)		<b>▼</b> FAC-Neutral	Test (D5)
☐ Inundation Visible on Ae	erial Imagery (B7)	Gauge or Well Data (D9)			
Sparsely Vegetated Cond	cave Surface (B8)	Other (Explain in Remarks)			
	` ,	Cities (Explain in recitatio)			
Field Observations:					
Surface Water Present?	Yes O No	Depth (inches):			
		. , ,			
Water Table Present?	Yes O No 🤄	Depth (inches):	34/	on al Hudro-I D	Yes ○ No •
Saturation Present?	Yes O No G	Depth (inches):	vvetla	and Hydrology Present?	res UNU S
(includes capillary fringe)			ootlas-	) if available:	
Describe Recorded Data (	siream gauge, moi	nitoring well, aerial photos, previous insp	bections	), ii avaiiabie:	
Remarks:					