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1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

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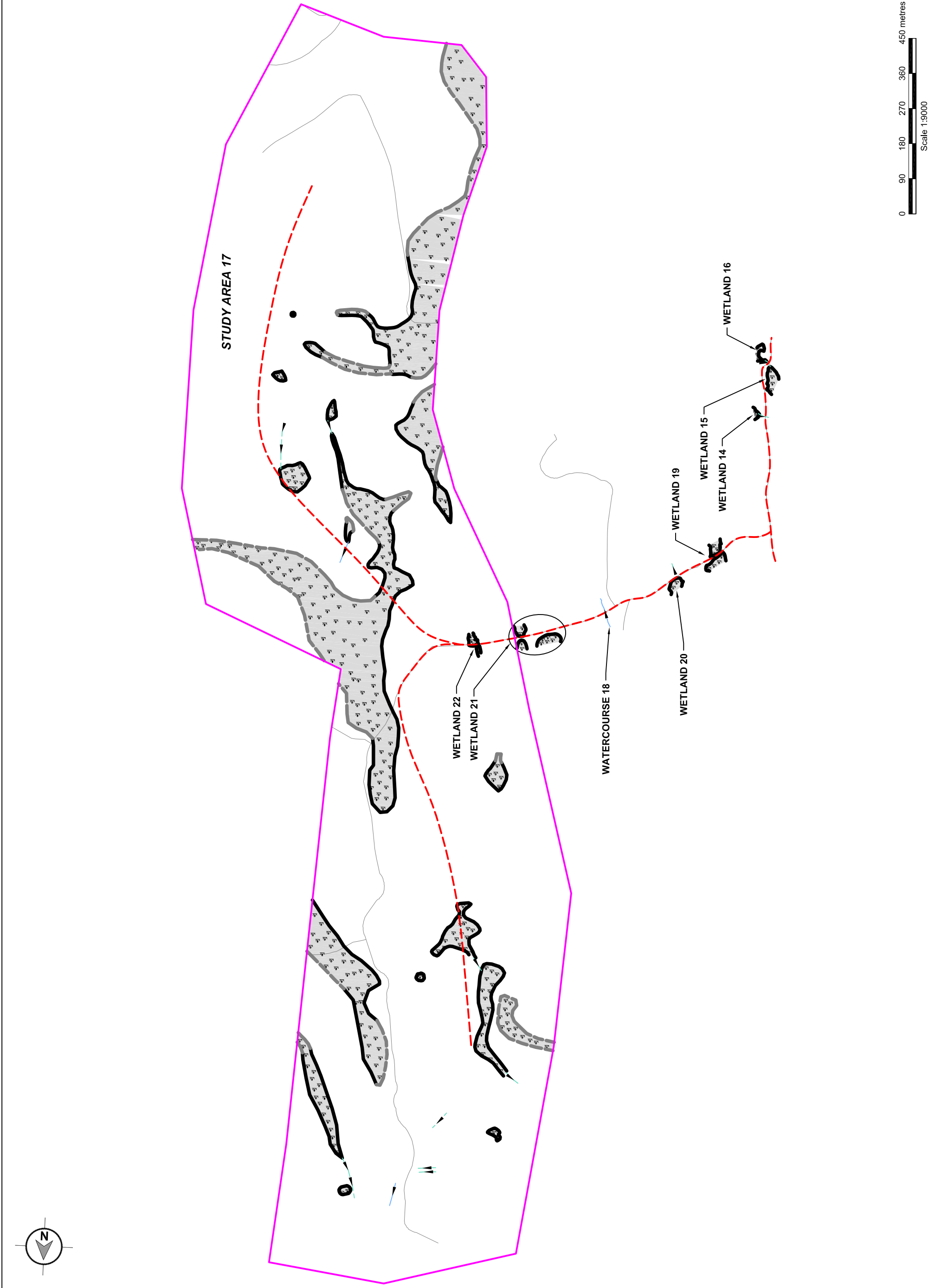
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	Proposed Road
	Existing Paved Road
	Existing Trail / Access Road
	Mapped Stream
	Mapped Indefinite Stream
	Mapped Water Bodies
	Field Identified Watercourse
	Wetland Boundary (Field Observed)
	Wetland Boundary (Approximate)

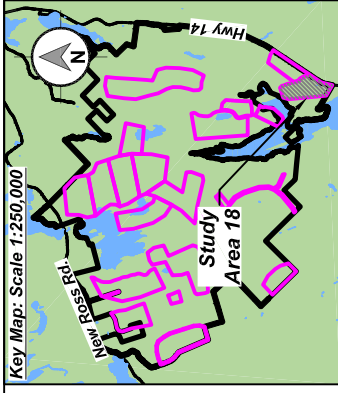
Assessment Results - Study Area 17



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:9000	DRAWING #:	
DRAWN BY:	H. Serhan	CHECKED BY:	A. Walter

2Q





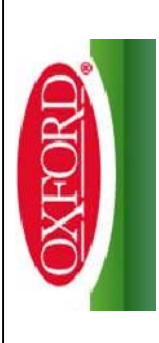
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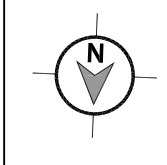
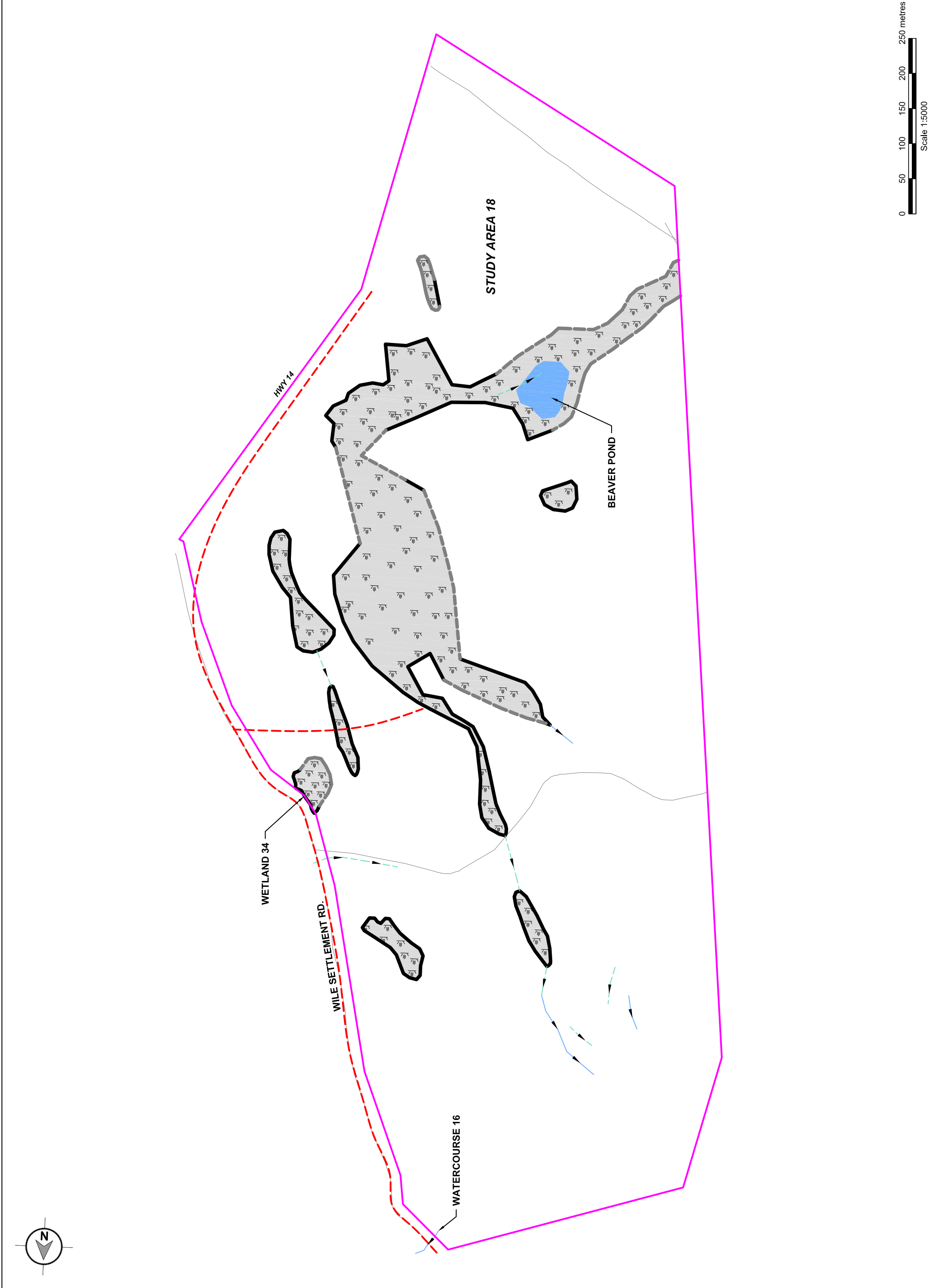
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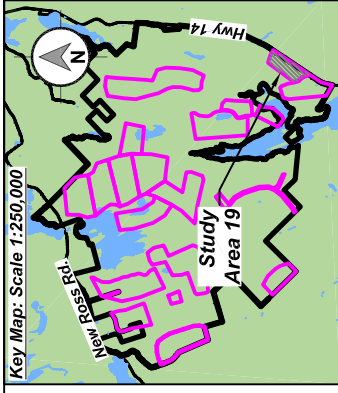
Study Area
Proposed Road	-----
Existing Paved Road	-----
Existing Trail / Access Road	-----
Mapped Stream	-----
Mapped Indefinite Stream	-----
Mapped Water Bodies	.....
Field Identified Watercourse	-----
Field Identified Drainage	-----
Wetland Boundary (Field Observed)	-----
Wetland Boundary (Approximate)	-----

Assessment Results - Study Area 18



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:5000	DRAWING #:	
DRAWN BY:	H. Serhan	CHECKED BY:	A. Walter
			2R





Notes:

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2. Projection: NAD83(CSRS), UTM Zone 20 North.

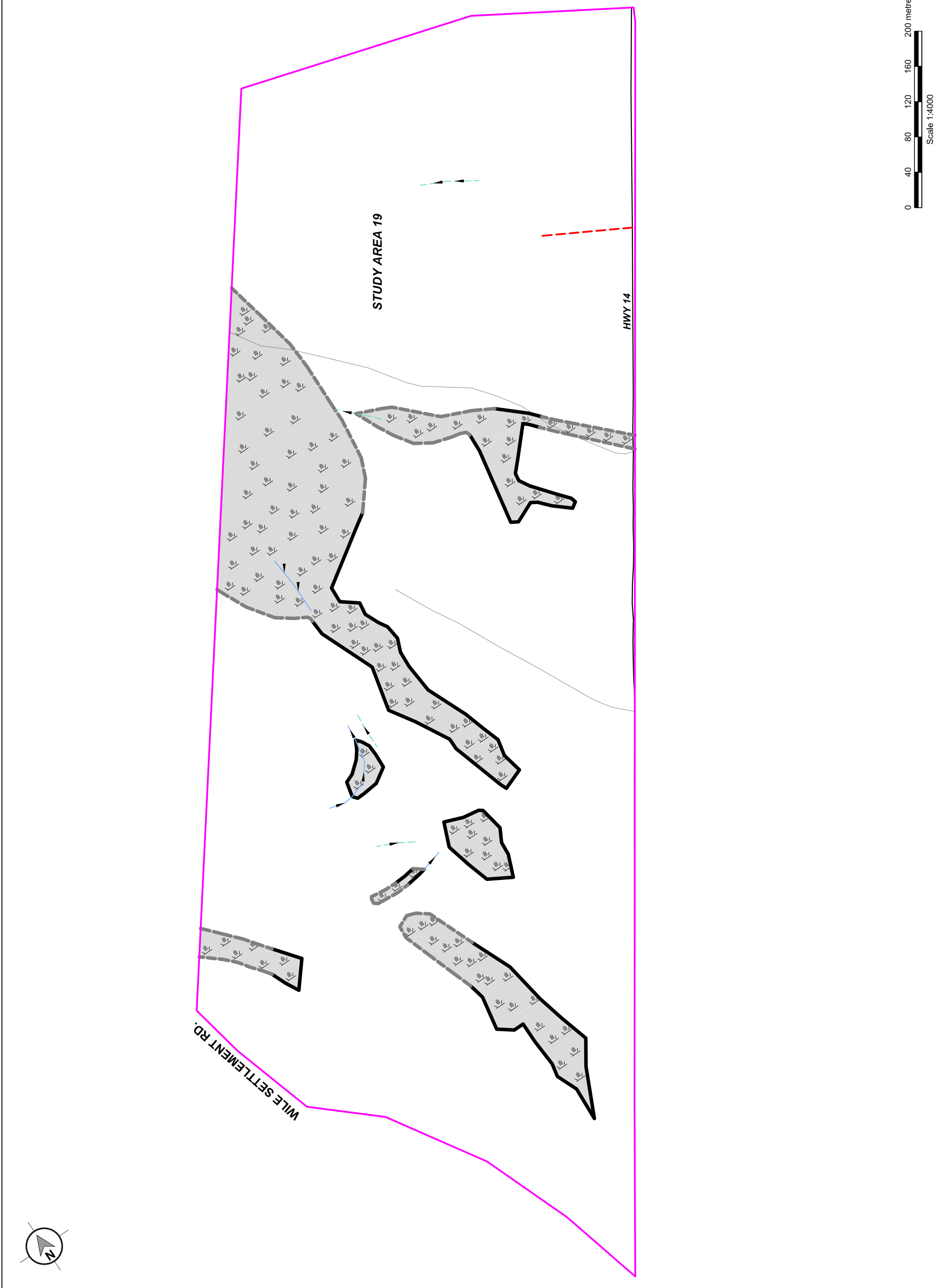
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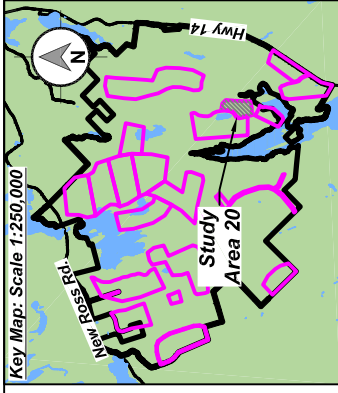
	Study Area
	Proposed Road
	Existing Paved Road
	Existing Trill / Access Road
	Mapped Stream
	Mapped Indefinite Stream
	Mapped Water Bodies
	Field Identified Watercourse
	Welland Boundary (Field Observed)
	Welland Boundary (Approximate)

Assessment Results - Study Area 19



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:4000	DRAWING #:	
DRAWN BY:	H. Serhan	CHECKED BY:	A. Walter
			2S





Notes:

1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

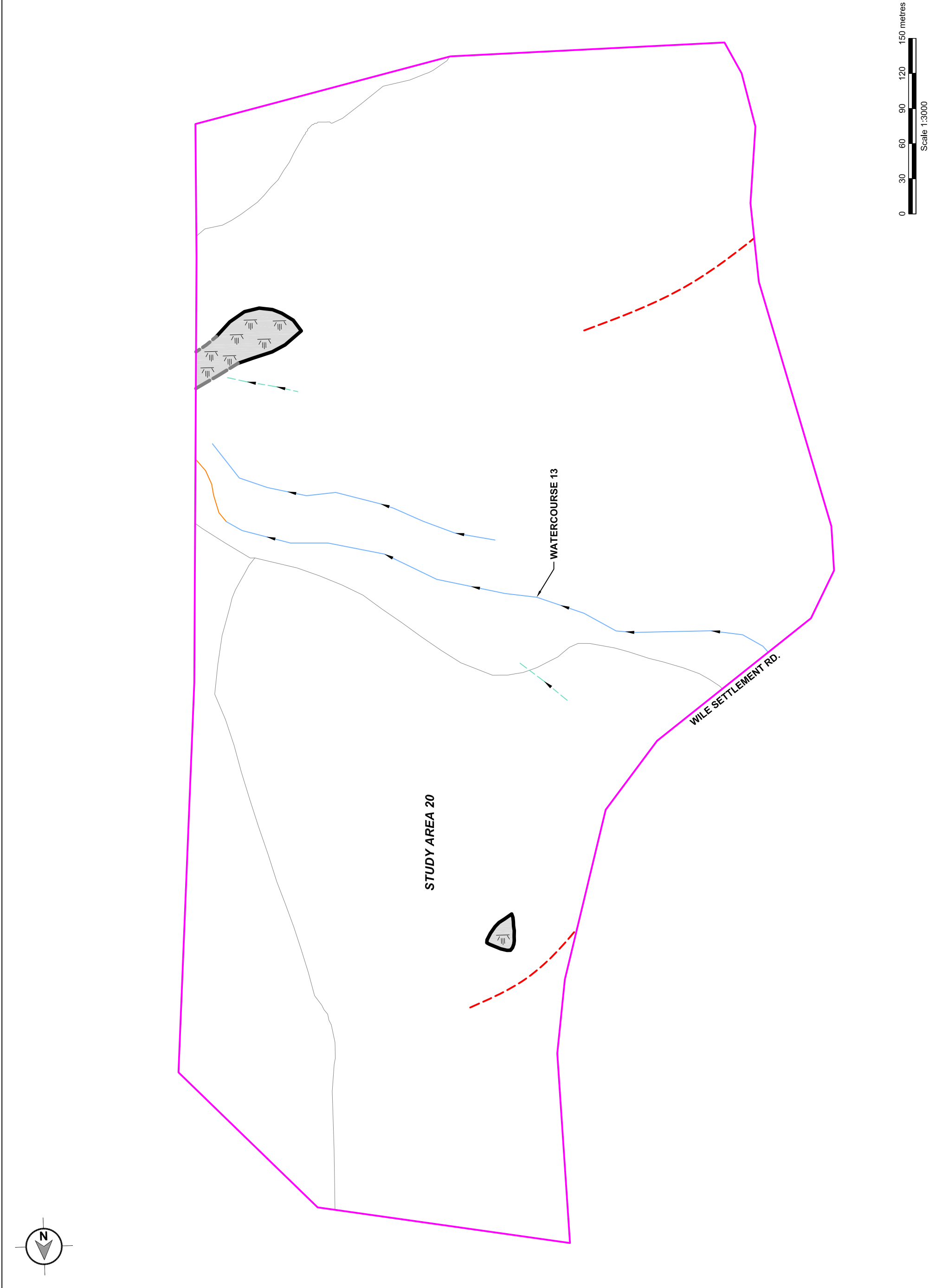
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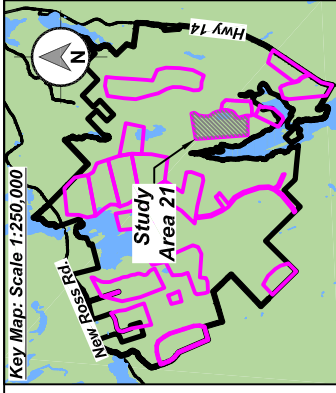
	Study Area
	Proposed Road
	Existing Paved Road
	Existing Trail / Access Road
	Mapped Stream
	Mapped Indefinite Stream
	Mapped Water Bodies
	Field Identified Watercourse
	Welland Boundary (Field Observed)
	Welland Boundary (Approximate)

Assessment Results - Study Area 20



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:3000	DRAWING #:	
DRAWN BY:	H. Serhan	CHECKED BY:	A. Walter
			27





Notes:

1. Reference: Site Plan supplied by client. Digital topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.

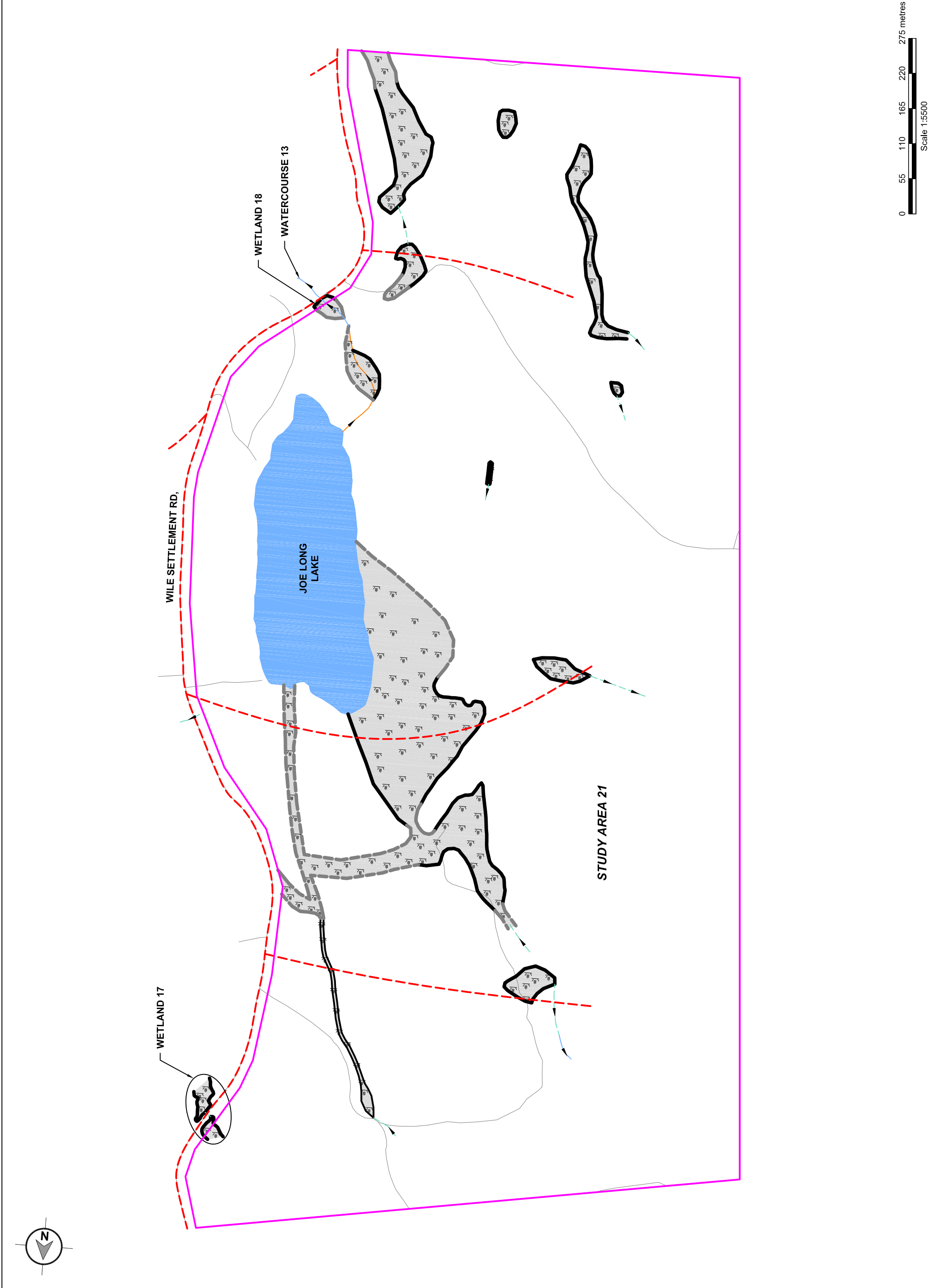
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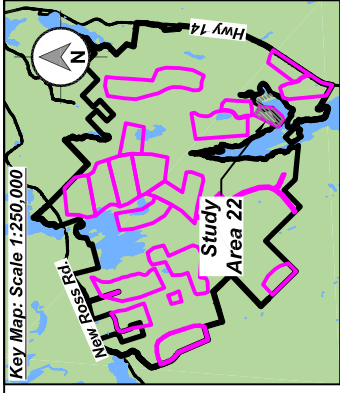
Study Area
Proposed Road
Existing Paved Road
Existing Trail / Access Road
Mapped Stream	.....
Mapped Indefinite Stream	.....
Mapped Water Bodies	.....
Field Identified Watercourse	.....
Field Identified Drainage	.....
Wetland Boundary (Field Observed)	.....
Wetland Boundary (Approximate)	.....

Assessment Results - Study Area 21



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:5500	DRAWING #:	
DRAWN BY:	H. Serhan	2U	
CHECKED BY:	A. Walter		





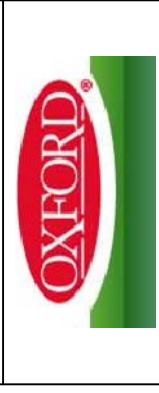
Notes:

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2. Projection: NAD83(CSRS), UTM Zone 20 North.

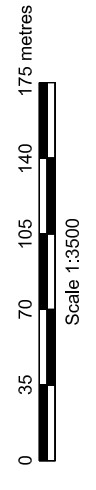
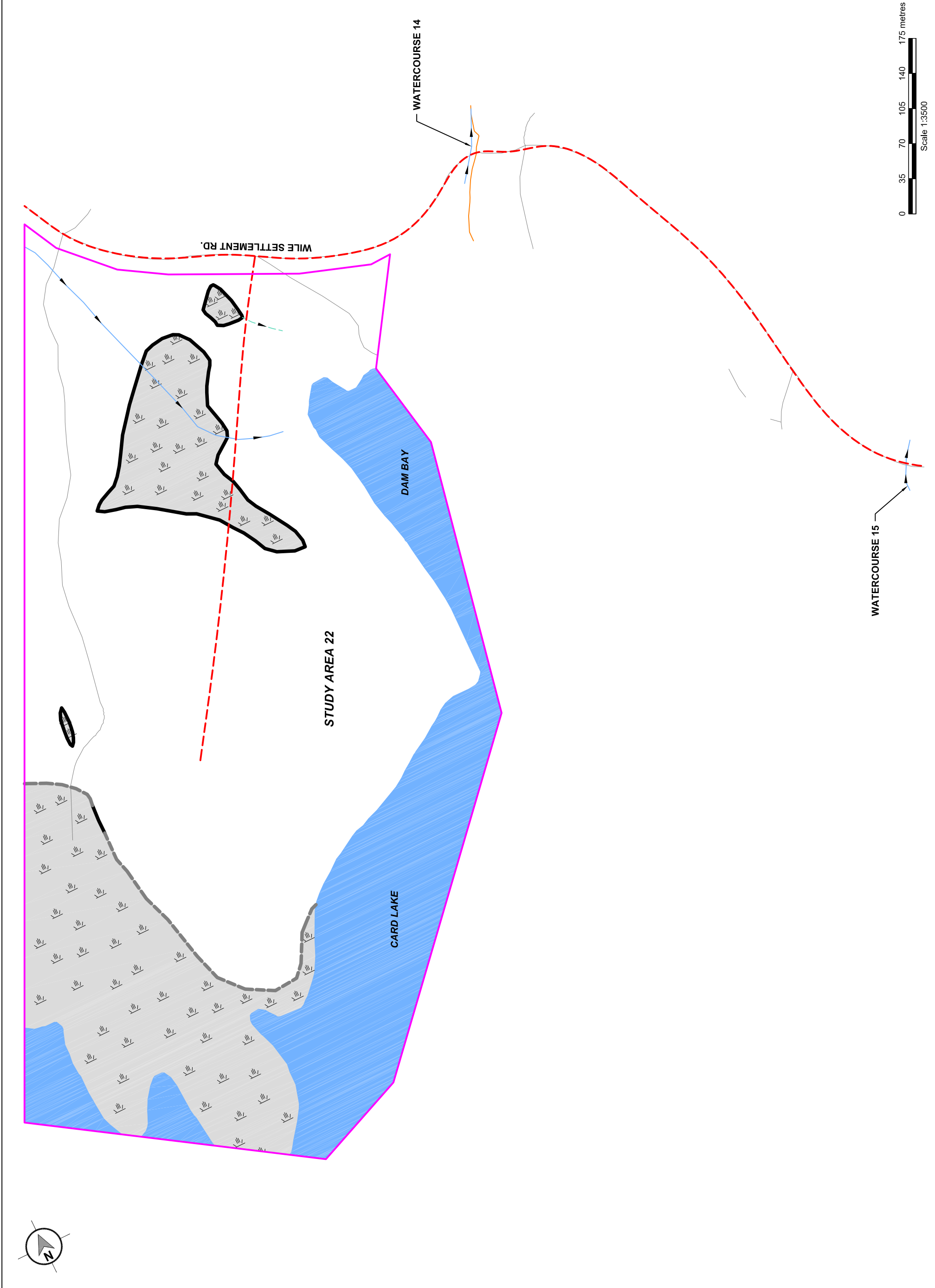
Legend:

Study Area
Proposed Road
Existing Paved Road	.....
Existing Trail / Access Road	.....
Mapped Stream	.....
Mapped Indefinite Stream	.....
Mapped Water Bodies	.....
Field Identified Watercourse	.....
Field Identified Drainage	.....
Welland Boundary (Field Observed)	.....
Welland Boundary (Approximate)	.....

Assessment Results - Study Area 22



DATE:	Jan. 2012	PROJECT #:	11-4140
SCALE:	1:3500	DRAWING #:	
DRAWN BY:	H. Serhan	2V	
CHECKED BY:	A. Walter		



APPENDIX B
WETLAND AND WATERCOURSE CHARACTERISTICS

WETLAND ID	PHOTO#	WETLAND TYPE	LANDSCAPE POSITION	LANDFORM	WATER FLOW	SOIL TYPE	SURFACE/HYDROLOGIC CONDITIONS	WETLAND BOUNDARY	DOMINANT VEGETATION			WATERCOURSE PRESENT
									Herbs	Shrubs	Trees	
1	1	Treed Swamp	Lotic Stream (confined)	Basin	Throughflow	Organic	1) Saturated throughout 2) Standing water	Gentle	New York fern, rattlesnake grass, starflower	balsam fir, speckled alder	balsam fir	Ephemeral stream drains beneath existing road through wetland
2	2	Treed Swamp	Lotic Stream (confined)	Basin	Throughflow (inferred)	Organic	1) Saturated throughout 2) Intermittent standing water 3) Groundwater within 10 cm	Gentle	bunchberry, cinnamon fern, goldthread, sheep laurel	balsam fir, witherod, black spruce	balsam fir, black spruce	Drainage channel exists beneath existing road
3	3	Treed Swamp	Terrene	Basin	Outflow (inferred)	Organic	1) Standing water (~ 10 cm deep)	Gentle	woolgrass, Juncus spp., cinnamon fern, bunchberry	balsam fir, black spruce, hemlock	yellow birch, balsam fir	None observed
4	4	Shrub Swamp	Lotic Stream (confined)	Basin	Throughflow	Organic (Histosol)	1) Saturated throughout 2) Standing water (~ 15 cm deep) 3) Undefined/braided watercourse	Gentle	rattlesnake grass	speckled alder	none	Watercourse 1 drains water from Wetland 4 to the east
5	5	Treed Swamp	Lotic Stream (confined) - inferred	Basin/Sloped	Outflow (inferred)	Organic	1) Saturated throughout 2) Intermittent standing water	Gentle	cinnamon fern, new york fern	balsam fir, hemlock	balsam fir, yellow birch	Drainage channel flows into Wetland 5 from beneath the existing road
6	6	Treed Swamp	Terrene	Basin	Outflow	Organic	1) Saturated throughout 2) Intermittent standing water	Gentle	dwarf red raspberry, New York fern, cinnamon fern	balsam fir	yellow birch, balsam fir	Drainage channel connects western and eastern portions of Wetland 6 beneath the existing road
7	7	Treed Swamp	Lotic Stream (confined)	Basin	Throughflow	Organic	1) Intermittent standing water 2) Saturated throughout 3) Groundwater within 20 cm	Gentle	wood fern spp.	balsam fir	yellow birch	Watercourse 2 runs through Wetland 7
8	8	Shrub/Treed Swamp	Lotic Stream (confined) - inferred	Basin	Outflow (inferred)	Organic over depleted mineral	1) Saturated surfaces 2) Groundwater within 10 cm	Gentle	sheep laurel, bunchberry, twinflower, snowberry, cinnamon fern	black spruce, balsam fir	black spruce, balsam fir	None observed
9	9	Treed Swamp	Lotic Stream (confined) - inferred	Basin	Outflow	Organic over depleted mineral	1) Saturated throughout	Gentle	bunchberry, blackberry, balsam fir, New York fern, wood fern spp.	black spruce, trembling aspen, balsam fir	balsam fir	None observed

WETLAND ID	PHOTO#	WETLAND TYPE	LANDSCAPE POSITION	LANDFORM	WATER FLOW	SOIL TYPE	SURFACE/HYDROLOGIC CONDITIONS	WETLAND BOUNDARY	DOMINANT VEGETATION			WATERCOURSE PRESENT
									Herbs	Shrubs	Trees	
10	10	Treed Swamp	Terrene	Basin	Isolated	Organic above rock/boulders	1) Saturated surfaces 2) Standing water abutting road	Gentle	woolgrass, sheep laurel, New York fern, bunchberry	balsam fir, black spruce	balsam fir	None observed
11	11	Shrub Swamp	Terrene	Basin	Isolated outflow(?)	Organic on bedrock	1) Standing water	Gentle	woolgrass, black spruce, sheep laurel	black spruce	none	Drainage channel exits Wetland 11 to the northwest
12	12	Vernal pool	N/A	N/A	N/A	Organic on rock	1) Standing water	Gentle	woolgrass, sphagnum mat in centre	none	none	None observed
13	13	Shrub Swamp	Terrene	Basin	Outflow (inferred)	Organic	1) Surface water	Gentle	rhodora, sheep laurel	rhodora, black spruce, balsam fir	none	None observed
14	14	Treed Swamp	Terrene	Sloped/seepage	Outflow (inferred)	Organic	1) Saturated surfaces 2) Intermittent standing water (~ 5 cm deep)	Gentle	New York fer, three-seeded sedge, Juncus spp.	balsam fir	balsam fir	Drainage channel flows into Wetland 14 from beneath the existing road
15	15	Treed Swamp	Terrene	Basin	Outflow (inferred)	Organic	1) Saturated surfaces 2) Groundwater at 7 cm	Gentle	sheep laurel, bunchberry, cinnamon fern, wool grass, snowberry, black spruce	black spruce	black spruce, balsam fir	Drainage channel connects Wetlands 15 and 16 beneath the existing road
16	16	Treed Swamp	Lotic Stream (confined) - inferred	Sloped/seepage	Throughflow	Organic above depleted mineral	1) Saturated surfaces 2) Intermittent standing water 3) Groundwater within 10 cm	Gentle	cinnamon fern, three-seeded sedge, woolgrass, snowberry, balsam fir	balsam fir	balsam fir	None
17	17	Shrub Swamp	Lotic Stream (confined) - inferred	Basin	Throughflow (inferred)	Organic above depleted mineral	1) Saturated throughout 2) Intermittent standing water at 2 cm 3) Groundwater within 15 cm	Gentle to moderate	swamp goldenrod, balsam fir, sensitive fern	speckled alder, balsam fir	balsam fir, red maple	Drainage channel connects western and eastern portions of Wetland 17 beneath the existing road

WETLAND ID	PHOTO#	WETLAND TYPE	LANDSCAPE POSITION	LANDFORM	WATER FLOW	SOIL TYPE	SURFACE/HYDROLOGIC CONDITIONS	WETLAND BOUNDARY	DOMINANT VEGETATION			WATERCOURSE PRESENT
									Herbs	Shrubs	Trees	
18	18	Marsh	Lotic Stream (confined)	Basin	Throughflow	Organic	1) Standing water (≥ 1 m)	Gentle to moderate	cattail	None	None	Watercourse 13 runs through Wetland 18
19	19 - northern portion 20 - southern portion	Treed Swamp	Lotic Stream (confined) - inferred	Basin	Throughflow	Organic	1) Standing water (~ 10 cm deep) 2) Hydrogen sulphide odour 3) Drainage channels	Gentle	balsam fir, black spruce, cinnamon fern, three-seeded sedge, bunchberry, sheep laurel, snowberry, Carex spp.	pin cherry, balsam fir, black spruce	black spruce, balsam fir	None observed
20	21	Treed Swamp	Lotic Stream (confined) - inferred	Basin	Throughflow (inferred)	Depleted below dark surface	1) Intermittent standing water 2) Saturated surfaces 3) Groundwater within 20 cm	Gentle	cinnamon fern, bunchberry, sheep laurel, goldthread	balsam fir, black spruce	balsam fir, black spruce	Drainage channel exits Wetland 20 beneath the existing road
21	22- northern portion 23 - southern portion	Treed Swamp	Lotic Stream (confined) - inferred	Basin	Outflow	Organic	1) Standing water (~ 5 cm deep) 2) Hydrogen sulphide odour 3) Saturated surfaces 4) Groundwater within 5 cm	Gentle	three-seeded sedge, cinnamon fern, balsam fir	speckled alder, balsam fir, black spruce	balsam fir, black spruce	None observed
22	24	Treed Swamp	Seepage	Basin	Outflow	Organic	1) Standing water (~ 10 cm)	Gentle	Carex spp., fringed sedge, sheep laurel	balsam fir, black spruce	white birch, black spruce, balsam fir	None observed
23a	25	Fen	Lotic Stream (confined) - inferred	Basin	Throughflow	Organic	1) Standing water (~ 10 cm)	Gentle to moderate	Carex spp., grass spp., sheep laurel	black spruce	black spruce	None observed
23b	26	Treed Swamp	Lotic Stream (confined) - inferred	Basin	Throughflow	Organic over depleted mineral	1) Standing water (~ 10 cm)	Gentle	cinnamon fern, rattlesnake grass	balsam fir	balsam fir	None observed
24	27	Shrub Swamp	Terrene	Basin	Outflow	Organic over depleted mineral	1) Saturated surfaces	Gentle	woolgrass, balsam fir	balsam fir, grey birch	none	None observed

WETLAND ID	PHOTO#	WETLAND TYPE	LANDSCAPE POSITION	LANDFORM	WATER FLOW	SOIL TYPE	SURFACE/HYDROLOGIC CONDITIONS	WETLAND BOUNDARY	DOMINANT VEGETATION			WATERCOURSE PRESENT
									Herbs	Shrubs	Trees	
25	28	Treed Swamp	Lotic Stream (confined)	Basin	Throughflow	Organic	1) Saturated surfaces 2) Groundwater within 5 cm 3) Hydrogen sulphide odour	Gentle to moderate	grass spp., goldenrod spp., woolgrass	black spruce, red maple	red maple (inferred, to be confirmed during growing season)	Watercourse 20 drains through Wetland 25 from south to north
26	29	Shrub Swamp	Lotic Stream (confined)	Sloped/seepage	Throughflow	Organic	1) Groundwater at surface 2) Hydrogen sulphide odour 3) Drainage patterns 4) Water stained leaves	Moderate	spikerush spp., grass spp., black spruce	black spruce	none	Watercourse 19 exits northern portion of Wetland 26
27	30	Shrub Swamp	Terrene	Basin	Isolated	Organic	1) Saturated surfaces 2) Groundwater within 5 cm 3) Drainage patterns	Unknown	woolgrass	black spruce	none	None observed
28	31	Shrub Swamp	Terrene	Basin	Inflow	Organic	1) Saturated surfaces 2) Standing water adjacent to road	Unknown	woolgrass, black spruce	black spruce	none	None observed
29	32	Treed Swamp	Terrene	Basin	Inflow (inferred)	Organic over depleted mineral	1) Saturated surfaces 2) Groundwater within 20 cm	Very gentle	bracken fern, cinnamon fern, bunchberry	balsam fir, black spruce	balsam fir, black spruce	None observed
30	33	Shrub Swamp	Terrene	Basin	Throughflow (inferred)	Organic over depleted mineral	1) Saturated surfaces 2) Groundwater within 10 cm 3) Standing water in tire ruts	Gentle	woolgrass	black spruce	none (cut over)	None observed
31	34	Fen	Lotic Stream (confined) - inferred	Basin	Throughflow	Organic	1) Standing and flowing water	Unknown	rush spp., grass spp.	none	none	Watercourse 21 drains from western portions of Wetland 31 beneath the existing road
32a	35	Treed Swamp	Lotic Stream (confined) - inferred	Basin	Throughflow	Organic	1) Flooded with flowing water 2) Drainage patterns 3) Hydrogen sulphide odour	Unknown	grass spp., goldenrod spp., balsam fir	balsam fir, black spruce	balsam fir, black spruce	None observed

WETLAND ID	PHOTO#	WETLAND TYPE	LANDSCAPE POSITION	LANDFORM	WATER FLOW	SOIL TYPE	SURFACE/HYDROLOGIC CONDITIONS	WETLAND BOUNDARY	DOMINANT VEGETATION			WATERCOURSE PRESENT
									Herbs	Shrubs	Trees	
32b	36	Shrub Fen	Lotic Stream (confined) - inferred	Basin	Throughflow	Organic	1) Flowing water 2) Hydrogen sulphide odour	Gentle to moderate	grass spp., Carex spp., black spruce	black spruce	none	None observed
33	37	Vernal Pool	N/A	N/A	N/A	Organic on bedrock	1) Standing water (~ 10 cm)	Gentle	woolgrass	none	none	Vernal pool likely created during road construction
34	38	Shrub Swamp	Terrene	Basin	Outflow (inferred)	Organic	1) Saturated surfaces 2) Groundwater within 10 cm 3) Standing water in tire ruts	Gentle	woolgrass, black spruce	black spruce	none	None observed

Table B2: Watercourse Characteristics - Wetland Assessment – South Canoe Wind Project

Project #11-4140

FEATURE ID	PHOTO#	WIDTH (m)	WATER DEPTH (cm)	SUBSTRATE	FLOW	DRAINAGE DIRECTION	BANK VEGETATION	OTHER OBSERVATIONS
Watercourse 1	39	2.5-3	15	Silt and muck	very slow	west to east	grasses and speckled alder	moderately defined channel
Watercourse 2	40	1.5-2	15	Sand/gravel, some boulders	moderate	west to east	ferns and trees	undefined bank
Watercourse 3	41	1.5-2	10	Sand/gravel, some boulders	slow	west to east	ferns and trees	moderately defined bank with rocks
Watercourse 4	42	1.5-3	20	Gravel	slow	west to east	herbs and saplings	undefined banks
Watercourse 5	43	1-2	5	Gravel	very slow	west to east	saplings and trees	undefined banks, braided to the east (off site). Sourced by drainage channel to the west of the road.
Watercourse 6	44	1.5-2	5	Gravel	slow	west to east	saplings and trees	undefined channel, sourced by a drainage channel to the west of road and drains through culvert
Watercourse 7	45	1.5-2	5	Gravel	moderate	west to east	herbs and saplings	defined channel, sourced by an ephemeral stream and roadside ditch
Watercourse 8	46	1-1.5	5	Gravel and rock	moderate	west to east	grasses, ferns, and trees	moderately defined banks, sourced by an off site watercourse
Watercourse 9	47	1.5-2	10	Gravel and rock	moderate to fast	west to east	herbs and saplings	well defined channel
Watercourse 10	48	2-3	50	Gravel and rock	slow to moderate	west to east	grasses, saplings, and trees	undefined banks
Watercourse 11	49	1-1.5	10	Gravel	slow	west to east	ferns, trees, and saplings	defined banks
Watercourse 12	50	1-1.5	10	Gravel	moderate	east to west	sedges, saplings, mosses	well defined channel, boulders on bank
Watercourse 13	51	2-3	10	Gravel	moderate to fast	west to east	saplings and trees	undefined to moderately defined bank
Watercourse 14	52	5-7	30	Rock and boulders	moderate to fast	south to north	saplings and trees	well defined banks
Watercourse 15	53	0.5-1	50	Gravel and rock	slow	southwest to northeast	saplings	well defined banks
Watercourse 16	54	1-1.5	10	Sand/gravel	slow	southwest to northeast	trees	well defined banks
Watercourse 17	55	2-2.5	40	Gravel	slow	southeast to northwest	trees	well defined banks
Watercourse 18	56	1-1.5	7	Gravel	slow	north to south	ferns, saplings, and trees	moderately defined banks
Watercourse 19	57	1.5-2	10	Sand/gravel	moderate	south to north	saplings and trees	undefined banks
Watercourse 20	58	0.5-1	10	Sand/gravel	moderate	south to north	grasses and sedges	moderately defined banks
Watercourse 21	59	1-1.5	7	Sand/gravel	slow	east to west	saplings and trees	undefined banks

APPENDIX C
WETLAND DELINEATION METHODOLOGY

WETLAND DELINEATION IDENTIFICATION METHODOLOGY

Wetlands and Watercourses in Nova Scotia

Wetlands in Nova Scotia are regulated by NSE under Section 105 of the *Environment Act*. Under the Act, wetlands are:

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

Watercourses are defined in the *Environment Act* as:

Any creek, brook, stream, river, lake, pond, spring, lagoon, or any other natural body of water, and includes all the water in it, and also the bed and the shore (whether there is actually any water in it or not). It also includes all groundwater.

Watercourses are defined in Halifax Regional Municipality (HRM) land use by-laws as:

A lake, river, stream, ocean, or other natural body of water.

Delineation Methodology

In order for a wetland determination to be made, the following three criteria were assessed the field:

- Presence of hydrophytic (water loving) vegetation;
- Presence of hydrologic conditions that result in periods of flooding, ponding, or saturation during the growing season; and
- Presence of hydric soils (anaerobic conditions in upper part).

Although detailed data point analysis was not completed within the study areas, soil pits were completed frequently to confirm the presence/absence of wetland hydrology and hydric soils, as per the methodology below. A general vegetation survey was also completed within the wetlands to confirm hydrophytic vegetation.

Identification of Hydrophytic Vegetation

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanent or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory 1987). Hydrophytic vegetation should be the dominant plant type in wetland habitat (Environmental Laboratory 1987).

WETLAND DELINEATION IDENTIFICATION METHODOLOGY

Dominant plant species observed in each wetland were classified according to indicator status (probability of occurrence in wetlands), in accordance with the U.S. Fish and Wildlife Service (USFWS) National List of Vascular Plant Species that Occur in Wetlands: NE Region (Region 1) (Reed 1988). Please refer to Table 1 (below) for these classifications. These indicators are used as this region most closely resembles the flora of Nova Scotia and climate regime. Further relevant information was reviewed in Flora of Nova Scotia (Zinck, 1998).

Table 1: Classification of Wetland-Associated Plant Species¹

Plant Species Classification	Abbreviation ²	Probability of Occurring in Wetland
Obligate	OBL	>99%
Facultative Wetland	FACW	66-99%
Facultative	FAC	33-66%
Facultative Upland	FACU	1-33%
Upland	UPL	<1%
No indicator status	NI	Insufficient information to determine status
Plants That Are Not Listed (assumed upland species)	NL	Does not occur in wetlands in any region.

¹ Source: Reed 1988

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

If the majority (greater than 50%) of the dominant vegetation at a data point is classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC), then the location of the data point is considered to be dominated by hydrophytic vegetation.

Identification of Hydric Soils

A hydric soil is a soil that has formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA-NRCS 2010). Indicators of the presence of a hydric soil include soil colour (gleyed soils and soils with bright mottles and/or low matrix chroma), aquic or preaquic moisture regime, reducing soil conditions, sulfidic material (odour), soils listed on the hydric soils list, iron and manganese concretions, organic soils (histosols), histic epipedon, high organic content in surface layer in sandy soils, and organic streaking in sandy soils.

Soil pits were excavated to a maximum depth of 40 cm or refusal. The soil in each was then examined for hydric soil indicators. The matrix colour and mottle colour (if present) of the soil were determined using the Munsell Soil Colour Charts.

Determination of Wetland Hydrology

Wetland habitat, by definition, either periodically or permanently, has a water table at, near, or above the land surface or that is saturated with water. To be classified as a wetland, a site should have at least one primary indicator or two secondary indicators of wetland hydrology, as shown in Table 2.

WETLAND DELINEATION IDENTIFICATION METHODOLOGY

Table 2: Indicators of Wetland Hydrology

Examples of Primary Indicators	Examples of Secondary Indicators
Water marks	Oxidized Root Channels in the Upper 30 cm
Drift Lines	Local Soil Survey Data
Sediment Deposition	Dry season Water Table
Drainage Patterns	Stunted or Stressed Plants
Water-stained leaves	
Visual Observation of Saturated Soils	
Visual Observation of Inundation	

Wetland habitat is assessed for signs of hydrology, via visual observations across the area and through assessment of soil pits.

References

Environmental Laboratory (1987), Corps of Engineers Wetlands Delineation Manual, US Army Corp of Engineers, 1987.

Reed. 1988. National List of Plant Species that Occur in Wetlands: NE Region (Region 1) U.S. Fish and Wildlife Service, Washington, DC.

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APPENDIX D
PHOTOGRAPH LOG



Photo 1: Wetland 1.



Photo 2: Wetland 2.



Photo 3: Wetland 3.



Photo 4: Wetland 4.



Photo 5: Wetland 5.



Photo 6: Wetland 6.



Photo 7: Wetland 7.



Photo 8: Wetland 8.



Photo 9: Wetland 9.



Photo 10: Wetland 10.



Photo 11: Wetland 11.



Photo 12: Wetland 12.



Photo 13: Wetland 13.



Photo 14: Wetland 14.



Photo 15: Wetland 15.



Photo 16: Wetland 16.



Photo 17: Wetland 17.



Photo 18: Wetland 18.

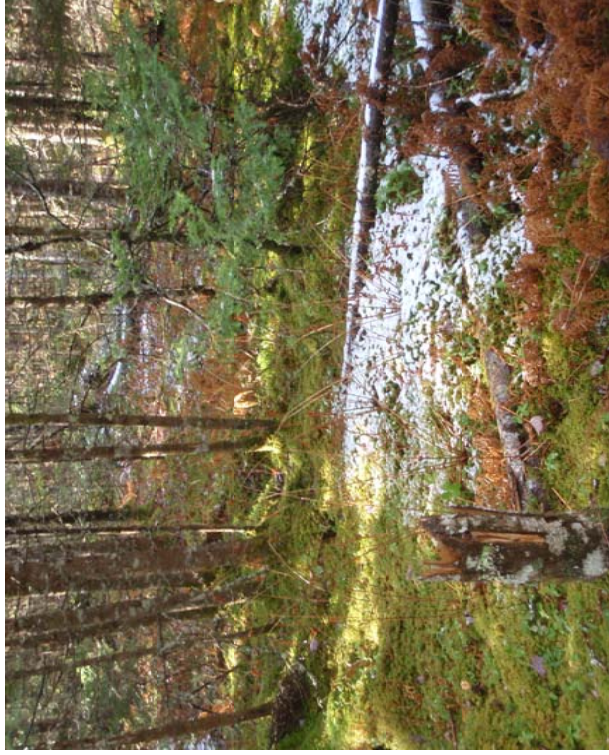


Photo 19: Wetland 19 (northern portion).



Photo 20: Wetland 19 (southern portion).

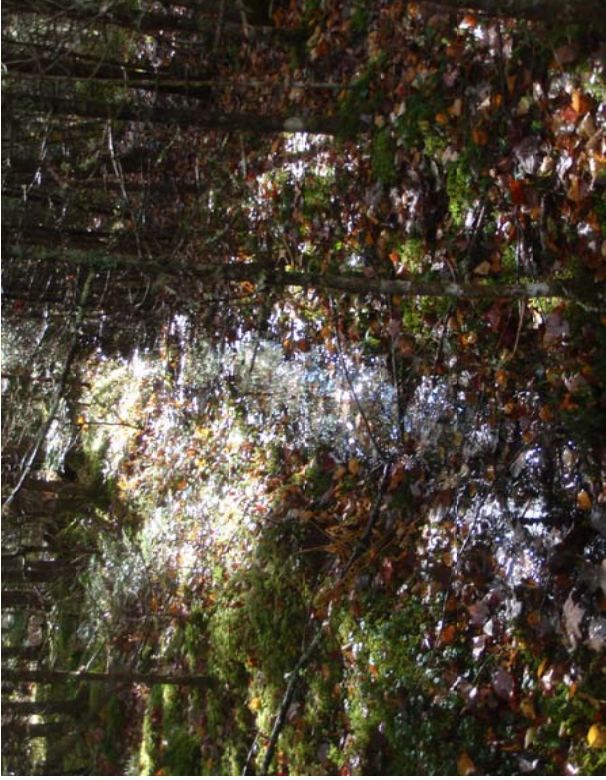


Photo 21: Wetland 20.

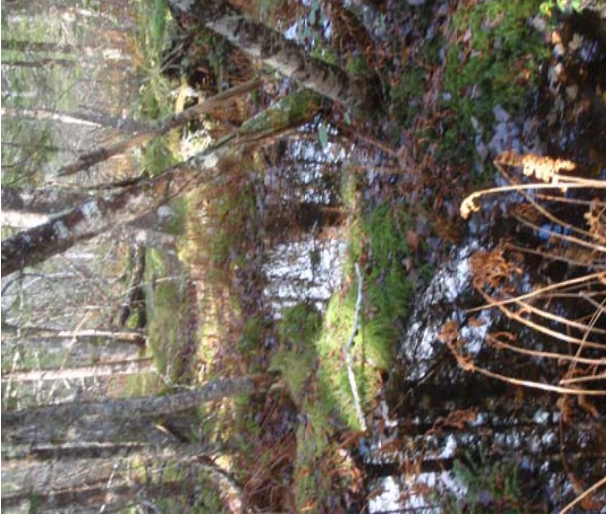


Photo 22: Wetland 21 (northern portion).



Photo 23: Wetland 21 (southern portion).



Photo 24: Wetland 22.



Photo 25: Wetland 23a (northern portion).

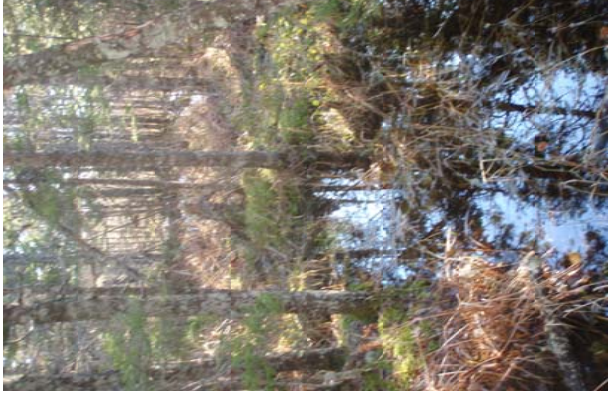


Photo 26: Wetland 23b (southern portion).



Photo 27: Wetland 24.



Photo 28: Wetland 25.



Photo 29: Wetland 26.



Photo 30: Wetland 27.



Photo 31: Wetland 28.



Photo 32: Wetland 29.



Photo 33: Wetland 30.



Photo 34: Wetland 31.



Photo 35: Wetland 32a.



Photo 36: Wetland 32b.



Photo 37: Wetland 33.



Photo 38: Wetland 34.



Photo 39: Watercourse 1.

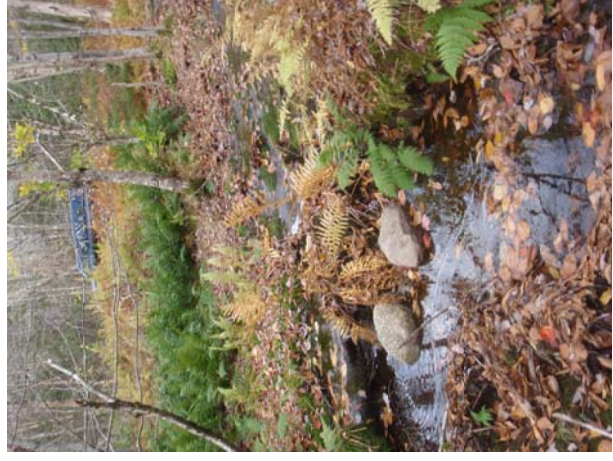


Photo 40: Watercourse 2.



Photo 41: Watercourse 3.



Photo 42: Watercourse 4.



Photo 43: Watercourse 5.



Photo 44: Watercourse 6.



Photo 45: Watercourse 7.



Photo 46: Watercourse 8.



Photo 47: Watercourse 9.

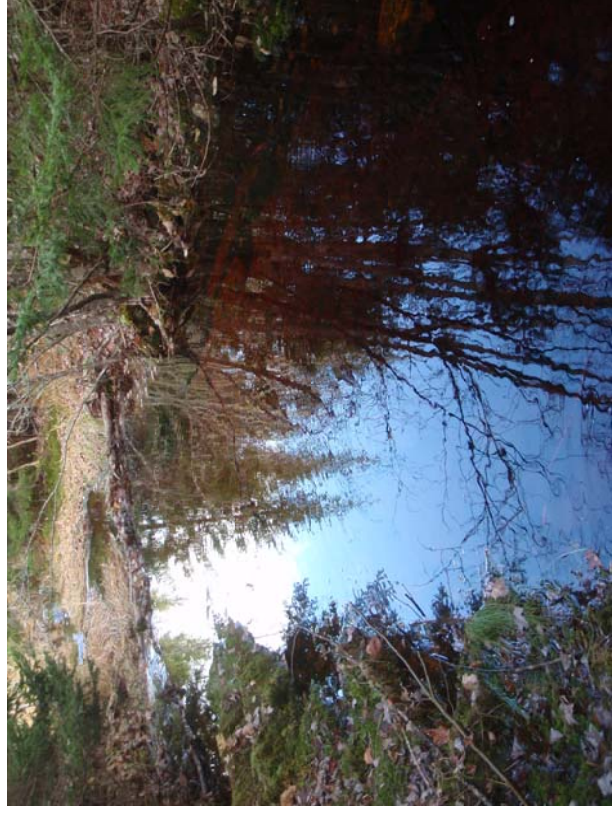


Photo 48: Watercourse 10.



Photo 49: Watercourse 11.



Photo 50: Watercourse 12.



Photo 51: Watercourse 13.



Photo 52: Watercourse 14.



Photo 53: Watercourse 15.



Photo 54: Watercourse 16.



Photo 55: Watercourse 17.



Photo 56: Watercourse 18.



Photo 57: Watercourse 19.



Photo 58: Watercourse 20.



Photo 59: Watercourse 21.

APPENDIX E
GLOSSARY OF COMMONLY USED TERMS

Glossary of Commonly Used Terms

Anaerobic – A situation in which molecular oxygen is absent (or effectively so) from the environment.

Basin – a depression.

Bog – acidic, nutrient-poor peatland characterized by woody plants (shrub bogs by ericaceous shrubs or treed bogs by black spruce, for example) and nearly permanently saturated soils.

Braided – Where streams or rivers divide into a network of smaller channels which are divided by often temporary islands.

Buffer – An area of land bordering a waterbody and/or wetland habitat which has been designated as a no

Dominant Species – A plant species that exerts a controlling influence on or defines the character of a community.

Fen – a mineral-rich peatland that can be dominated by a variety of plants both herbaceous and woody including calcium-loving plants (calciphiles); examples are graminoid fen, shrub fen, and treed fen

Fill Material – Any material placed in an area to increase surface elevation.

Flooded – A condition in which the soil surface is temporarily covered in flowing water from any source, such as streams overflowing their bank, runoff from adjacent or surrounding slopes, inflow from high tides, or any combination of these sources.

Fringe – bordering a water body and in tidal areas, any salt marsh or other wetland that is flooded by typical high tides and in non-tidal areas, usually a marsh in standing water (typically flooded all year in most years) and no-vegetated wetlands within the stream or river banks (in the ordinary high water mark zone).

Function – The physical, chemical and biological processes, attributes and linkages related to a particular wetland.

Growing Season – The portion of the year when soil temperatures at 19.7 in. below the soil surface are higher than biologic zero (5°) (U.S. Department of Agriculture-soil Conservation Service 1985). For ease of determination this period can be approximated by the number of frost free days (U.S Department of the Interior 1970). The growing season in Nova Scotia is June 01 – September 30.

Habitat – The environment occupied by individuals of a particular species, population or community, including everything required during the life cycle such as food, shelter and breeding places.

Herb – A non-woody individual of a macrophytic species.

Histosol – An order in soil taxonomy composed of organic soils that have organic soil materials in more than half of the upper 8 cm or that are of any thickness if directly over bedrock.

Hydric Soil – Soil characterized by abundance of moisture and much reduced oxygen levels, to the extent that the soil tolerates water-tolerant vegetation.

Hydrology – The science dealing with the properties, distribution and circulation of water both on and under the surface.

Hydrophytic Vegetation (plants) – Vegetation adapted to growing in water or in hydric soil.

Inflow – water flows into the subject wetland from an upstream channel

Glossary of Commonly Used Terms

Isolated – water flow comes from high groundwater levels or from surface or subsurface runoff; no channeled flow in or out of the wetland; may be subject to overflow during extreme precipitation or snowmelt events; wetland is “geographically isolated” – surrounded completely by upland (non-hydric soils).

Logged – forested wetland where timber has been recently harvested

Lotic Stream-Confined – Located along a stream (width <20 m) with little or no floodplain

Marsh – Freshwater wetland usually flooded for the entire growing season and dominated by herbaceous vegetation.

Organic soil – A soil is classified as an organic soil when it is 1) saturated for prolonged periods (unless artificially drained) and has more than 30 percent of organic matter if the mineral fraction is more than 50 percent clay, or more than 20 percent organic matter if the mineral fraction has no clay; or 2) never saturated with water for more than a few days and having more than 34 percent organic matter.

Outflow – Water flows out of the wetland, downslope from this source; no channeled surface water inflow.

Riparian – Inhabiting, or situated on the bank of a river, stream or watercourse.

Sapling/shrub – A layer of vegetation composed of woody plants <0.8 m in diameter at breast height but greater than 1 m in height, exclusive of woody vines.

Saturated soil – A condition where all easily drained voids (pores) between soil particles in the root zone are temporarily or permanently filled with water to the soil surface at pressures greater than the atmosphere.

Swamp – Freshwater wetland dominated by woody plants (shrub swamp or forested swamp), often growing on mineral soils or mucks, and subject to seasonally flooded for extended periods.

Terrene – Located at the uppermost area in a subbasin (i.e., the source of a stream), or located along a river or stream but at an elevation not subject to overbank flooding, or located in an isolated basin, on an isolated flat, or on an isolated slope

Throughflow – Water flows in and out of wetland, typically as overbank flow, but also includes wetlands along lakes (lentic wetlands) that have a stream coursing through them from locations outside the lake

Transect – A line on the ground along which observations are made at some interval.

Tree – A woody plant > 0.8 m in diameter at breast height, regardless of height (exclusive of woody vines).

Vegetation layer – A subunit of a plant community in which all component species exhibit the same growth form (e.g. trees, saplings/shrubs, herbs).

Watercourse (as defined under Section 105 of the *Environment Act*) – Any creek, brook, stream, river, lake, pond, spring, lagoon, or any other natural body of water, and includes all the water in it, and also the bed and the shore (whether there is actually in it or not). It also includes groundwater.

Watercourse – (as defined in the Halifax Regional Municipality [HRM] land use by-laws) – A lake, river, stream, ocean or other natural body of water.

Water Table (groundwater) – The surface below which the soil is saturated with water.

Glossary of Commonly Used Terms

Wetland – Lands that are seasonally or permanently covered by shallow water, including lands where the water table is at or very close to the surface. In either case, the presence of abundant water has caused the formation of hydric soils and has favoured the dominance of either hydrophytic or water-tolerant plants.

Wetland boundary – The point on the ground at which a shift from wetlands to nonwetlands or aquatic habitats occurs.

Wetland determination – The process or procedure by which an area is adjudged a wetland or non wetland.