APPENDIX A
REGISTRY OF JOINT STOCKS

Profile

Printer Version

Profile Info | People Info | Activites Info | Related Reg's Info

PROFILE - HALIFAX WATER - as of: 2016-12-02 02:41 PM

Business/ Organization Name:	HALIFAX WATER
Registry ID:	3221545
Type:	Partnership/Business Name
Nature of Business:	
Status:	Active
Jurisdiction:	Nova Scotia
Registered Office:	450 Cowie Hill Road Halifax NS Canada B3P 2V3
Mailing Address:	P.O. Box 8388, RPO CSC Halifax NS Canada B3K 5M1

PEOPLE

Name	Position	Civic Address	Mailing Address
Carl D. Yates	Recognized Agent	450 Cowie Hill Road Halifax NS B3P 2V3	P.O. Box 8388, RPO CSC Halifax NS B3K 5M1

ACTIVITIES

Activity	Date
Renewal Information Update	2016-07-12
Annual Renewal	2016-07-12
Annual Renewal	2015-07-27
Renewal Information Update	2014-07-14
Annual Renewal	2014-07-14
Annual Renewal	2013-09-20
Renewal Information Update	2013-09-20
Renewal Information Update	2012-07-27

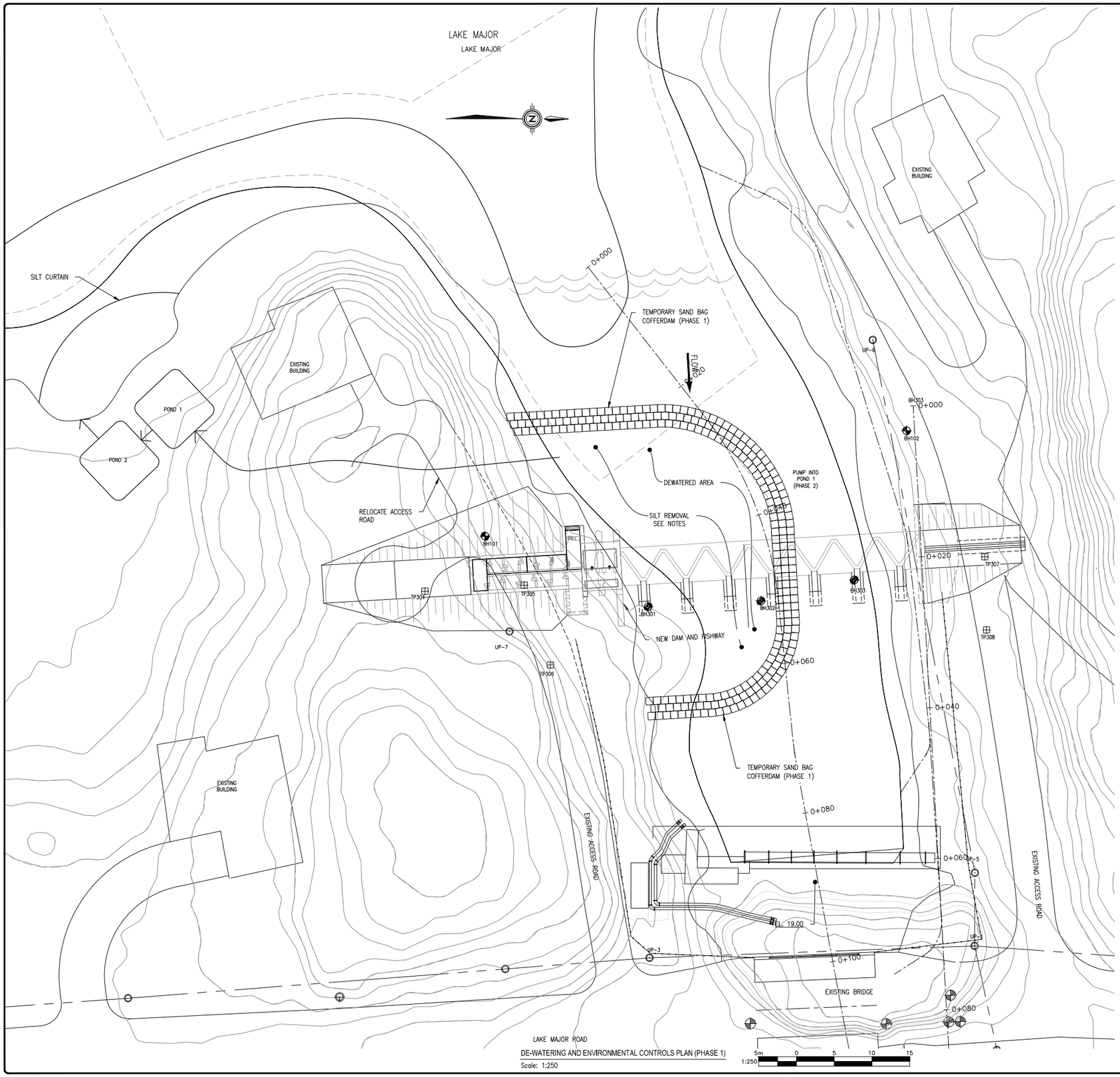
Annual Renewal	2012-07-27
Annual Renewal	2011-09-23
Annual Renewal	2010-09-02
Annual Renewal	2009-07-17
Annual Renewal	2008-07-14
Registered	2007-08-14

Show All Collapse

RELATED REGISTRATIONS

This Company ...	
HALIFAX REGIONAL WATER COMMISSION	Is registered by

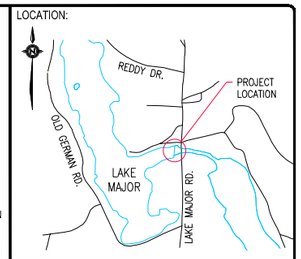
APPENDIX B
ENVIRONMENTAL CONTROLS



ENVIRONMENTAL NOTES:

1. CONTRACTOR IS RESPONSIBLE TO COLLECT WATER RUNOFF SAMPLES AT THE EXISTING DRAINAGE DITCH AFTER EACH SIGNIFICANT RAINFALL EVENT (GREATER THAN 15mm IN 24HR. PERIOD). WATER QUALITY MUST BE WITHIN NSDEL REQUIREMENTS (500mg/L). CONTRACTOR TO PROVIDE LAB RESULTS AFTER EACH MONTH.
2. CONTRACTOR MUST LIMIT AREA OF EXPOSED SOIL PRIOR TO PROCEEDING WITH GRUBBING, PREVIOUSLY EXPOSED SOIL MUST BE COVERED WITH GRAVELS, STRAW OR OTHER APPROVED MATERIALS.
3. THE CONTRACTOR IS RESPONSIBLE FOR DUST CONTROL ON THE SITE. DUST GENERATION SHALL BE SUPPRESSED THROUGH THE APPLICATION OF WATER TO EXPOSED DRY SOILS TO PREVENT DUST FROM BEING GENERATED BEYOND PROVINCIAL AND MUNICIPAL REGULATIONS OR BYLAWS OR FROM MIGRATING FROM THE CONSTRUCTION SITE.
4. THE CONTRACTOR SHALL HAVE ON SITE A PERSON WHO HAS SUCCESSFULLY THE EROSION AND SEDIMENT CONTROL COURSE PROVIDED BY THE NOVA SCOTIA DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS.
5. THE LIMITS OF DISTURBANCE IS IDENTIFIED ON THIS DRAWING, ANY ACTIVITY BY THE CONTRACTOR BEYOND THESE LIMITS REQUIRES THE WRITTEN AUTHORIZATION FROM THE CONSULTANT.
6. PROPOSED AMENDMENTS TO EROSION AND SEDIMENTATION CONTROL PLAN CONTOURS NOT SHOWN.

LOCATION:



NOTES:

REVISION	DESCRIPTION	DATE
A	ISSUED FOR DFO/NSE REVIEW	2016-11-29

FOR INFORMATION ONLY

Meco
innovation I Reliability I Performance
ADDRESS: 250 Baker Drive, Suite 210, Dartmouth, NS B2W 6L4
PHONE: (902) 444-3131
FAX: (902) 404-7777
WEB: www.MECOengineers.com

STAMPS:

CLIENT: Halifax Water

PROJECT:
LAKE MAJOR DAM REPLACEMENT

TITLE:
DE-WATERING AND ENVIRONMENTAL CONTROLS PLAN - PHASE 1

DESIGNED BY: P.M.	APPROVED BY: -
DRAFTED BY: -	MANAGER: R.N.B.
DATE: 2016-09-26	SCALE: AS SHOWN
PROJECT #: 10374	DRAWING No.: D10651

11/30/2016 4:22:27 PM
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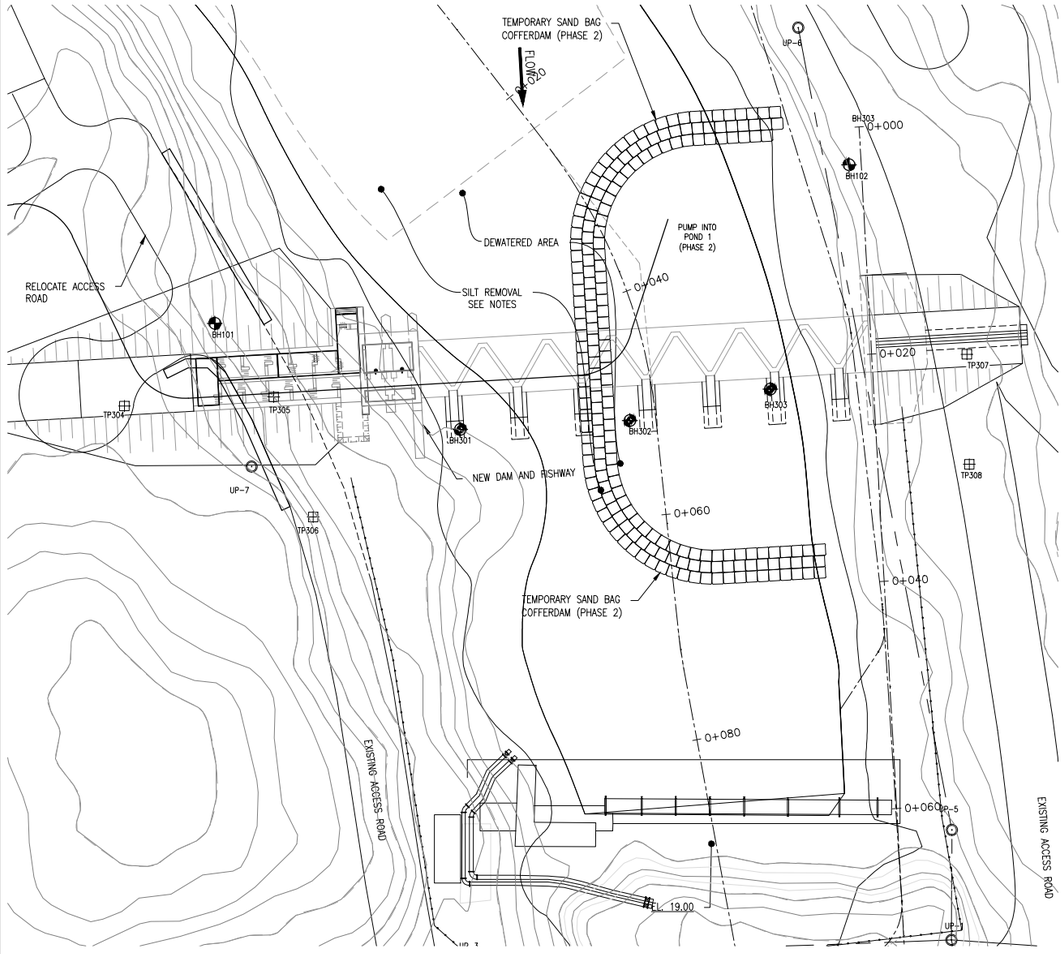
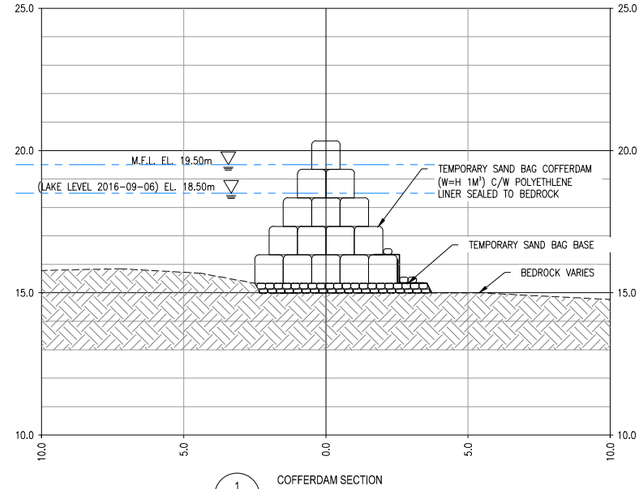


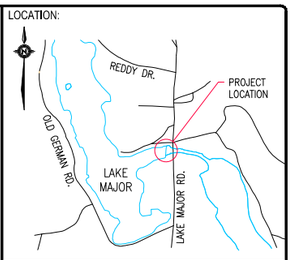
DE-WATERING AND ENVIRONMENTAL CONTROLS PLAN (PHASE 2)
Scale: 1:250

5m 0 5 10 15
1:250



1 COFFERDAM SECTION
Scale: 1:100

LOCATION:



NOTES:

1. DETAILS TO BE ADDED AT 35%

REVISION	DESCRIPTION	DATE
A	ISSUED FOR DFO/NSE REVIEW	2016-11-29

FOR INFORMATION ONLY

Meco
innovation I Reliability I Performance
ADDRESS: 250 Baker Drive, Suite 210, Dartmouth, NS B2W 6L4
PHONE: (902) 444-3131
FAX: (902) 404-7777
WEB: www.MECOengineers.com

STAMPS:

CLIENT: Halifax Water

PROJECT:
LAKE MAJOR DAM REPLACEMENT

TITLE:
DE-WATERING AND ENVIRONMENTAL CONTROLS PLAN AND SECTIONS – PHASE 2

DESIGNED BY:	APPROVED BY:
P.M.	–
DRAFTED BY:	MANAGER:
J.W.M.	R.N.B.
DATE:	SCALE:
2016-09-26	AS SHOWN
PROJECT #:	DRAWING No.
10374	D10652

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APPENDIX C
ENVIRONMENTAL PROTECTION PLAN – TABLE OF CONTENTS

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APPENDIX D
VEGETATION SURVEY

Table 1: Plant Apecies Observed, Lake Major, NS ***Project # 16-5799***

Common Name	*Scientific Name*	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status	S-Rank
Common Pipewort	*Eriocaulon aquaticum*	Not Listed	Not Listed	Not Listed	Secure	S5
Horned Bladderwort	*Utricularia cornuta*	Not Listed	Not Listed	Not Listed	Secure	S5
Three way Sedge	*Dulichium arundinaceum*	Not Listed	Not Listed	Not Listed	Secure	S5
American Burreed	*Sparganium americanum*	Not Listed	Not Listed	Not Listed	Secure	S5
Canada Rush	*Juncus canadensis*	Not Listed	Not Listed	Not Listed	Secure	S5
Alpine Pondweed	*Potamogeton alpinus*	Not Listed	Not Listed	Not Listed	Secure	S4
Wild Celery / Tape Grass	*Apium graveolens*	Not Listed	Not Listed	Not Listed	Exotic	SNA
Pickerel Weed	*Pontederia cordata*	Not Listed	Not Listed	Not Listed	Secure	S5
Fall Panic Grass	*Panicum dichotomiflorum*	Not Listed	Not Listed	Not Listed	Secure	S5
Yellow Pond-lily	*Nuphar lutea*	Not Listed	Not Listed	Not Listed	Secure	S5
Fragrant Pond-lily	*Nymphaea odorata*	Not Listed	Not Listed	Not Listed	Secure	S5
Speckald Alder	*Alnus incana*	Not Listed	Not Listed	Not Listed	Secure	S5
Red Spruce	*Picea rubens*	Not Listed	Not Listed	Not Listed	Secure	S5
Black Spruce	*Picea mariana*	Not Listed	Not Listed	Not Listed	Secure	S5
White Spruce	*Picea glauca*	Not Listed	Not Listed	Not Listed	Secure	S5
Red Maple	*Acer rubrum*	Not Listed	Not Listed	Not Listed	Secure	S5
White Pine	*Pinus strobus*	Not Listed	Not Listed	Not Listed	Secure	S5
Yellow Birch	*Betula alleghaniensis*	Not Listed	Not Listed	Not Listed	Secure	S5
Gray Birch	*Betula populifolia*	Not Listed	Not Listed	Not Listed	Secure	S5
White Birch	*Betula papyrifera*	Not Listed	Not Listed	Not Listed	Secure	S5
Sugar Maple	*Acer saccharum*	Not Listed	Not Listed	Not Listed	Secure	S5
Striped Maple	*Acer pensylvanicum*	Not Listed	Not Listed	Not Listed	Secure	S5
Eastern Hemlock	*Tsuga canadensis*	Not Listed	Not Listed	Not Listed	Secure	S4S5
Eastern Larch	*Larix laricina*	Not Listed	Not Listed	Not Listed	Secure	S5
White Ash	*Fraxinus americana*	Not Listed	Not Listed	Not Listed	Secure	S5
American Beech	*Fagus grandifolia*	Not Listed	Not Listed	Not Listed	Secure	S5
Fringed Sedge	*Carex crinita*	Not Listed	Not Listed	Not Listed	Secure	S5
Bladder Sedge	*Carex intumescens*	Not Listed	Not Listed	Not Listed	Secure	S5
Lurid Sedge	*Carex lurida*	Not Listed	Not Listed	Not Listed	Secure	S5
Star Sedge	*Carex echinata*	Not Listed	Not Listed	Not Listed	Secure	S5
Broom Sedge	*Carex scoparia*	Not Listed	Not Listed	Not Listed	Secure	S5
Three Seeded Sedge	*Carex trisperma*	Not Listed	Not Listed	Not Listed	Secure	S5
Cinnamon Fern	*Osmunda cinnamomea*	Not Listed	Not Listed	Not Listed	Secure	S5
Bracken Fern	*Pteridium aquilinum*	Not Listed	Not Listed	Not Listed	Secure	S5
Hay Scented Fern	*Dennstaedtia punctilobula*	Not Listed	Not Listed	Not Listed	Secure	S5
New York Fern	*Thelypteris noveboracensis*	Not Listed	Not Listed	Not Listed	Secure	S5
Royal Fern	*Osmunda regalis*	Not Listed	Not Listed	Not Listed	Secure	S5
Rice Cut Grass	*Leersia oryzoides*	Not Listed	Not Listed	Not Listed	Secure	S5
Common Tall Manna Grass	*Glyceria grandis*	Not Listed	Not Listed	Not Listed	Secure	S4S5
Canada Manna Grass	*Glyceria canadensis*	Not Listed	Not Listed	Not Listed	Secure	S5
Wooly Panic Grass	*Dichanthelium acuminatum*	Not Listed	Not Listed	Not Listed	Secure	S5
Reed Canary Grass	*Phalaris arundinacea*	Not Listed	Not Listed	Not Listed	Secure	S5
Black Huckleberry	*Gaylussacia baccata*	Not Listed	Not Listed	Not Listed	Secure	S5
Wild Raisin	*Viburnum nudum*	Not Listed	Not Listed	Not Listed	Secure	S5
Witch Hazel	*Hamamelis virginiana*	Not Listed	Not Listed	Not Listed	Secure	S5
Bayberry	*Morella pensylvanica*	Not Listed	Not Listed	Not Listed	Secure	S5
Gold Thread	*Coptis trifolia*	Not Listed	Not Listed	Not Listed	Secure	S5
Snowberry	*Gaultheria hispidula*	Not Listed	Not Listed	Not Listed	Secure	S5
Wild Lily of the Valley	*Maianthemum canadense*	Not Listed	Not Listed	Not Listed	Secure	S5
Bunchberry	*Cornus canadensis*	Not Listed	Not Listed	Not Listed	Secure	S5
Mountain Holly	*Nemopanthus mucronatus*	Not Listed	Not Listed	Not Listed	Secure	S5
Steeple Bush	*Spiraea tomentosa*	Not Listed	Not Listed	Not Listed	Secure	S5
Low Bush Blueberry	*Vaccinium angustifolium*	Not Listed	Not Listed	Not Listed	Secure	S5
Velvet Leaf Blueberry	*Vaccinium myrtilloides*	Not Listed	Not Listed	Not Listed	Secure	S5

Strum CONSULTING

Table 1: Plant Apecies Observed, Lake Major, NS ***Project # 16-5799***

Common Name	*Scientific Name*	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status	S-Rank
Rhodora	*Rhododendron canadense*	Not Listed	Not Listed	Not Listed	Secure	S5
Large Cranberry	*Vaccinium macrocarpon*	Not Listed	Not Listed	Not Listed	Secure	S5
Leatherleaf	*Chamaedaphne calyculata*	Not Listed	Not Listed	Not Listed	Secure	S5
Wintergreen	*Moneses uniflora*	Not Listed	Not Listed	Not Listed	Secure	S5
Wild Strawberry	*Fragaria virginiana*	Not Listed	Not Listed	Not Listed	Secure	S5
Choke Cherry	*Prunus virginiana*	Not Listed	Not Listed	Not Listed	Secure	S5
Blackberry	*Rubus allegheniensis*	Not Listed	Not Listed	Not Listed	Secure	S5
Flattop Aster	*Doellingeria umbellata*	Not Listed	Not Listed	Not Listed	Secure	S5
Low Rough Aster	*Eurybia radula*	Not Listed	Not Listed	Not Listed	Secure	S5
Rough Goldenrod	*Solidago rugosa*	Not Listed	Not Listed	Not Listed	Secure	S5
Soft Rush	*Juncus effusus*	Not Listed	Not Listed	Not Listed	Secure	S5
Crown Vetch	*Coronilla scorpioides*	Not Listed	Not Listed	Not Listed	Exotic	SNA
Japanese Knotweed	*Polygonum cuspidatum*	Not Listed	Not Listed	Not Listed	Exotic	SNA
Swamp Rose	*Rosa palustris*	Not Listed	Not Listed	Not Listed	Secure	S4
Canada Golden Rod	*Solidago canadensis*	Not Listed	Not Listed	Not Listed	Secure	S5
Lupine	*Lupinus nootkatensis*	Not Listed	Not Listed	Not Listed	Exotic	SNA
Lavender	*Limonium carolinianum*	Not Listed	Not Listed	Not Listed	Secure	S5
Clover	*Trifolium repens*	Not Listed	Not Listed	Not Listed	Exotic	SNA
Buttercup	*Ranunculus acris*	Not Listed	Not Listed	Not Listed	Exotic	SNA
Queen Anns Lace	*Daucus carota*	Not Listed	Not Listed	Not Listed	Exotic	SNA
Wild Sarsparilla	*Aralia nudicaulis*	Not Listed	Not Listed	Not Listed	Secure	S5
Blue Bead Lily	*Clintonia borealis*	Not Listed	Not Listed	Not Listed	Secure	S5
Sheep Laurel	*Kalmia angustifolia*	Not Listed	Not Listed	Not Listed	Secure	S5
Yew	*Taxus canadensis*	Not Listed	Not Listed	Not Listed	Secure	S5
Starflower	*Trientalis borealis*	Not Listed	Not Listed	Not Listed	Secure	S5
Swamp Yellow Loostrife	*Lysimachia terrestris*	Not Listed	Not Listed	Not Listed	Secure	S5
Water Lobelia	*Lobelia dortmanna*	Not Listed	Not Listed	Not Listed	Secure	S5
Wild Mint	*Mentha arvensis*	Not Listed	Not Listed	Not Listed	Secure	S5
Canada Fly Honeysuckle	*Lonicera canadensis*	Not Listed	Not Listed	Not Listed	Secure	S5
Hard Fescue	*Festuca trachyphylla*	Not Listed	Not Listed	Not Listed	Exotic	SNA
Tussoc Sedge	*Scirpus cyperinus*	Not Listed	Not Listed	Not Listed	Secure	S5
Pitcher Plant	*Sarracenia purpurea*	Not Listed	Not Listed	Not Listed	Secure	S5
Broad Leaved Cattail	*Typha latifolia*	Not Listed	Not Listed	Not Listed	Secure	S5
Cotton Grass	*Eriophorum angustifolium*	Not Listed	Not Listed	Not Listed	Secure	S5
Swamp Dewberry	*Rubus hispidus*	Not Listed	Not Listed	Not Listed	Secure	S5
Blue Flag Iris	*Iris versicolor*	Not Listed	Not Listed	Not Listed	Secure	S5
White Meadowsweet	*Spiraea alba*	Not Listed	Not Listed	Not Listed	Secure	S5
Canada Holly	*Ilex verticillata*	Not Listed	Not Listed	Not Listed	Secure	S5
Balsam Fir	*Abies balsamea*	Not Listed	Not Listed	Not Listed	Secure	S5
Sweet Gale	*Myrica gale*	Not Listed	Not Listed	Not Listed	Secure	S5
Pink Lady's-slipper	*Cypripedium acaule*	Not Listed	Not Listed	Not Listed	Secure	S5
Serviceberry	*Amelanchier sp.*	Not Listed	Not Listed	Not Listed	Secure	S4S5
Red Oak	*Quercus rubra*	Not Listed	Not Listed	Not Listed	Secure	S5
Black Sedge	*Carex nigra*	Not Listed	Not Listed	Not Listed	Secure	S5
	Carex folliculata	Not Listed	Not Listed	Not Listed	Secure	S5
Grey Birch	*Betula populifolia*	Not Listed	Not Listed	Not Listed	Secure	S5
Bog Aster	*Oclemena nemoralis*	Not Listed	Not Listed	Not Listed	Secure	S5
Whorled Wood Aster	*Oclemena acuminata*	Not Listed	Not Listed	Not Listed	Secure	S5
Sensitive Fern	*Oclemena nemoralis*	Not Listed	Not Listed	Not Listed	Secure	S5

Common Name	Species Name	*SARA*	COSEWIC	NS *ESA*	NS DNR Rank	S-Rank
Vascular Plants						
a Pussytoes	*Antennaria parlinii*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Acadian Quillwort	*Isoetes acadiensis*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Alder-leaved Buckthorn	*Rhamnus alnifolia*	Not Listed	Not Listed	Not Listed	Secure	S3
Alpine Bilberry	*Vaccinium uliginosum*	Not Listed	Not Listed	Not Listed	Sensitive	S3
American Cancer-root	*Conopholis americana*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
American False Pennyroyal	*Hedeoma pulegioides*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Appalachian Fir-Clubmoss	*Huperzia appalachiana*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Appalachian Polypody	*Polypodium appalachianum*	Not Listed	Not Listed	Not Listed	Undetermined	S3
Arrow-Leaved Violet	*Viola sagittata var. ovata*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Autumn Willow	*Salix serissima*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Balsam Groundsel	*Packera paupercula*	Not Listed	Not Listed	Not Listed	Secure	S3
Bearded Sedge	*Carex comosa*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Bebb's Sedge	*Carex bebbii*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Bicknell's Crane's-bill	*Geranium bicknellii*	Not Listed	Not Listed	Not Listed	Secure	S3
Big-leaved Marsh-elder	*Iva frutescens ssp. oraria*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Black Ash	*Fraxinus nigra*	Not Listed	Not Listed	Threatened	At Risk	S1S2
Blood Milkwort	*Polygala sanguinea*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Bloodroot	*Sanguinaria canadensis*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Blue Cohosh	*Caulophyllum thalictroides*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Blue Vervain	*Verbena hastata*	Not Listed	Not Listed	Not Listed	Secure	S3
Blueberry Willow	*Salix myrtillifolia*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Blunt Broom Sedge	*Carex tribuloides*	Not Listed	Not Listed	Not Listed	Secure	S3
Blunt Sweet Cicely	*Osmorhiza depauperata*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Bog Birch	*Betula pumila*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Bog Willow	*Salix pedicellaris*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Boreal Aster	*Symphyotrichum boreale*	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Branched Bartonia	*Bartonia paniculata ssp. paniculata*	Threatened	Threatened	Not Listed		SNA
Bristle-leaved Sedge	*Carex eburnea*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Broad-Glumed Brome	*Bromus latiglumis*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Bulblet Bladder Fern	*Cystopteris bulbifera*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Butternut	*Juglans cinerea*	Endangered	Endangered	Not Listed	Exotic	SNA
Buttonbush Dodder	*Cuscuta cephalanthi*	Not Listed	Not Listed	Not Listed	Undetermined	S2?
Canada Anemone	*Anemone canadensis*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Canada Cinquefoil	*Potentilla canadensis*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3

Common Name	Species Name	*SARA*	COSEWIC	NS *ESA*	NS DNR Rank	S-Rank
Canada Germander	*Teucrium canadense*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Canada Lily	*Lilium canadense*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Canada Rice Grass	*Piptatherum canadense*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Canada Tick-trefoil	*Desmodium canadense*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Canada Violet	*Viola canadensis*	Not Listed	Not Listed	Not Listed	Extirpated	SH
Canada Waterweed	*Elodea canadensis*	Not Listed	Not Listed	Not Listed	Secure	S3
Canada Wood Nettle	*Laportea canadensis*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Carey's Smartweed	*Polygonum careyi*	Not Listed	Not Listed	Not Listed	Undetermined	S1
Case's Ladies'-Tresses	*Spiranthes casei var. casei*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Chestnut Sedge	*Carex castanea*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Chinese Hemlock-parsley	*Conioselinum chinense*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Clammy Hedge-Hyssop	*Gratiola neglecta*	Not Listed	Not Listed	Not Listed	Sensitive	S1S2
Climbing False Buckwheat	*Polygonum scandens*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Clustered Sanicle	*Sanicula odorata*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Coast Pepper-Bush	*Clethra alnifolia*	Special Concern	Special Concern	Vulnerable	At Risk	S1
Coastal Plain Blue-eyed-grass	*Sisyrinchium fuscatum*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Comb-leaved Mermaidweed	*Proserpinaca pectinata*	Not Listed	Not Listed	Not Listed	Secure	S3
Common Bedstraw	*Galium aparine*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Common Moonwort	*Botrychium lunaria*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Common Scouring-rush	*Equisetum hyemale*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Common Scouring-rush	*Equisetum hyemale var. affine*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Cursed Buttercup	*Ranunculus sceleratus*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
Cut-Leaved Coneflower	*Rudbeckia laciniata*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
Cut-Leaved Coneflower	*Rudbeckia laciniata var. gaspereauensis*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
Cut-leaved Moonwort	*Botrychium dissectum*	Not Listed	Not Listed	Not Listed	Secure	S3
Deer-tongue Panic Grass	*Dichanthelium clandestinum*	Not Listed	Not Listed	Not Listed	Secure	S3
Dense Blazing Star	*Liatris spicata*	Threatened	Threatened	Not Listed		SNA
Disguised St John's-wort	*Hypericum dissimulatum*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Downy Rattlesnake-Plantain	*Goodyera pubescens*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Downy Willowherb	*Epilobium strictum*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Drummond's Rockcress	*Arabis drummondii*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Dudley's Rush	*Juncus dudleyi*	Not Listed	Not Listed	Not Listed	Secure	S3

Common Name	Species Name	*SARA*	COSEWIC	NS *ESA*	NS DNR Rank	S-Rank
Dwarf Bilberry	*Vaccinium caespitosum*	Not Listed	Not Listed	Not Listed	Secure	S3
Dwarf Clearweed	*Pilea pumila*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Dwarf Scouring-Rush	*Equisetum scirpoides*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Eastern Blue-Eyed-Grass	*Sisyrinchium atlanticum*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Eastern Leatherwood	*Dirca palustris*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Eastern Lilaeopsis	*Lilaeopsis chinensis*	Special Concern	Special Concern	Vulnerable	Sensitive	S2
Eastern White Cedar	*Thuja occidentalis*	Not Listed	Not Listed	Vulnerable	1 At Risk	S1
Estuarine Sedge	*Carex vacillans*	Not Listed	Not Listed	Not Listed	Undetermined	S1S3
False Mermaidweed	*Floerkea proserpinacoides*	Not Listed	Not At Risk	Not Listed	Sensitive	S2
Farwell's Water Milfoil	*Myriophyllum farwellii*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Fernald's Hay Sedge	*Carex foenea*	Not Listed	Not Listed	Not Listed	Secure	S3
Fernald's Serviceberry	*Amelanchier fernaldii*	Not Listed	Not Listed	Not Listed	Undetermined	S2S3
Flat-stemmed Pondweed	*Potamogeton zosteriformis*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Fleshy Hawthorn	*Crataegus succulenta*	Not Listed	Not Listed	Not Listed	Undetermined	S3S4
Fowler's Knotweed	*Polygonum fowleri*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Fragrant Green Orchid	*Platanthera huronensis*	Not Listed	Not Listed	Not Listed	Undetermined	S1S2
Fragrant Wood Fern	*Dryopteris fragrans var. remotiuscula*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Fries' Pondweed	*Potamogeton friesii*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Fringed Blue Aster	*Symphyotrichum ciliolatum*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Garber's Sedge	*Carex garberi*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Gasp ⊢⌐ Arrowgrass	*Triglochin gaspensis*	Not Listed	Not Listed	Not Listed	Undetermined	S3S4
Glaucous Blue Grass	*Poa glauca*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Gmelin's Water Buttercup	*Ranunculus gmelinii*	Not Listed	Not Listed	Not Listed	Secure	S3
Golden Alexanders	*Zizia aurea*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Goldencrest	*Lophiola aurea*	Threatened	Special Concern	Vulnerable	At Risk	S2
Green Spleenwort	*Asplenium trichomanes-ramosum*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Greene's Rush	*Juncus greenei*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
Greenish Sedge	*Carex viridula var. saxilittoralis*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Greenland Stitchwort	*Minuartia groenlandica*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Ground-Fir	*Lycopodium sabinifolium*	Not Listed	Not Listed	Not Listed	Secure	S3?
Hairy Goldenrod	*Solidago hispida*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1?
Hairy Lettuce	*Lactuca hirsuta var. sanguinea*	Not Listed	Not Listed	Not Listed	Sensitive	S2

Common Name	Species Name	*SARA*	COSEWIC	NS *ESA*	NS DNR Rank	S-Rank
Halberd-leaved Tearthumb	*Polygonum arifolium*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Hayden's Sedge	*Carex haydenii*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Heart-leaved Foamflower	*Tiarella cordifolia*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Hidden-scaled Sedge	*Carex cryptolepis*	Not Listed	Not Listed	Not Listed	Secure	S3
Highbush Blueberry	*Vaccinium corymbosum*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Hooked Agrimony	*Agrimonia gryposepala*	Not Listed	Not Listed	Not Listed	Secure	S3
Hooker's Orchid	*Platanthera hookeri*	Not Listed	Not Listed	Not Listed	Secure	S3
Hop Sedge	*Carex lupulina*	Not Listed	Not Listed	Not Listed	Secure	S3
Horned Sea-blite	*Suaeda calceoliformis*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Horn-leaved Riverweed	*Podostemum ceratophyllum*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Houghton's Sedge	*Carex houghtoniana*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Hyssop-leaved Fleabane	*Erigeron hyssopifolius*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Intermediate Mermaidweed	*Proserpinaca intermedia*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
Knotted Pearlwort	*Sagina nodosa*	Not Listed	Not Listed	Not Listed	Secure	S2S3
Knotted Pearlwort	*Sagina nodosa ssp. borealis*	Not Listed	Not Listed	Not Listed	Secure	S2S3
Labrador Bedstraw	*Galium labradoricum*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Lance-Leaf Grape-Fern	*Botrychium lanceolatum var. angustisegmentum*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Large Purple Fringed Orchid	*Platanthera grandiflora*	Not Listed	Not Listed	Not Listed	Secure	S3
Large Round-Leaved Orchid	*Platanthera macrophylla*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Large St John's-wort	*Hypericum majus*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Large Tick-Trefoil	*Desmodium glutinosum*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Large Toothwort	*Cardamine maxima*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
Laurentian Primrose	*Primula laurentiana*	Not Listed	Not Listed	Not Listed	Secure	S3
Least Moonwort	*Botrychium simplex*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Lesser Brown Sedge	*Carex adusta*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Lesser Pyrola	*Pyrola minor*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Lesser Rattlesnake-plantain	*Goodyera repens*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Little Curlygrass Fern	*Schizaea pusilla*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Livid Sedge	*Carex livida var. radicaulis*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
Loesel's Twayblade	*Liparis loeselii*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Long-bracted Frog Orchid	*Coeloglossum viride var. virescens*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2S3

Common Name	Species Name	*SARA*	COSEWIC	NS *ESA*	NS DNR Rank	S-Rank
Long-branched Frostweed	*Helianthemum canadense*	Not Listed	Not Listed	Endangered	At Risk	S1
Long-leaved Starwort	*Stellaria longifolia*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Loose-Flowered Sedge	*Carex laxiflora*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Maidenhair Spleenwort	*Asplenium trichomanes*	Not Listed	Not Listed	Not Listed	Secure	S3
Marsh Bellflower	*Campanula aparinoides*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Marsh Horsetail	*Equisetum palustre*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Marsh Mermaidweed	*Proserpinaca palustris var. palustris*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1?
Marsh Mermaidweed	*Proserpinaca palustris*	Not Listed	Not Listed	Not Listed	Secure	S3
Marsh Mermaidweed	*Proserpinaca palustris var. crebra*	Not Listed	Not Listed	Not Listed	Secure	S3
Meadow Horsetail	*Equisetum pratense*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Meadow Willow	*Salix petiolaris*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Michaux's Dwarf Birch	*Betula michauxii*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Mistassini Primrose	*Primula mistassinica*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Nantucket Serviceberry	*Amelanchier nantucketensis*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Narrow False Oats	*Trisetum spicatum*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Narrow-leaved Evening Primrose	*Oenothera fruticosa ssp. glauca*	Not Listed	Not Listed	Not Listed	Undetermined	S2
Narrow-leaved Panic Grass	*Dichanthelium linearifolium*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Necklace Spike Sedge	*Carex ormostachya*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Nodding Fescue	*Festuca subverticillata*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
Northern Adder's-tongue	*Ophioglossum pusillum*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Northern Bedstraw	*Galium boreale*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Northern Blueberry	*Vaccinium boreale*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Northern Bog Sedge	*Carex gynocrates*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Northern Bog Violet	*Viola nephrophylla*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Northern Clubmoss	*Lycopodium complanatum*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Northern Comandra	*Geocaulon lividum*	Not Listed	Not Listed	Not Listed	Secure	S3
Northern Maidenhair Fern	*Adiantum pedatum*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Nova Scotia Agalinis	*Agalinis neoscotica*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Orange-fruited Tinker's Weed	*Triosteum aurantiacum*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Ovate Spikerush	*Eleocharis ovata*	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Pale Green Orchid	*Platanthera flava var. herbiola*	Not Listed	Not Listed	Not Listed	Undetermined	S2
Pale Jewelweed	*Impatiens pallida*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Pale-Spiked Lobelia	*Lobelia spicata*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1

Common Name	Species Name	*SARA*	COSEWIC	NS *ESA*	NS DNR Rank	S-Rank
Panicled Hawkweed	*Hieracium paniculatum*	Not Listed	Not Listed	Not Listed	Secure	S3
Pennsylvania Sedge	*Carex pensylvanica*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1?
Pennsylvania Smartweed	*Polygonum pensylvanicum*	Not Listed	Not Listed	Not Listed	Secure	S3
Philadelphia Fleabane	*Erigeron philadelphicus*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Pinebarren Golden Heather	*Hudsonia ericoides*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Pink Crowberry	*Empetrum eamesii ssp. atropurpureum*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Pink Crowberry	*Empetrum eamesii ssp. eamesii*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Pink Crowberry	*Empetrum eamesii*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Pink Pyrola	*Pyrola asarifolia*	Not Listed	Not Listed	Not Listed	Secure	S3
Plantain-Leaved Sedge	*Carex plantaginea*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Porcupine Sedge	*Carex hystericina*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Prairie Sedge	*Carex prairea*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Prickly Hornwort	*Ceratophyllum echinatum*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Prototype Quillwort	*Isoetes prototypus*	Special Concern	Special Concern	Vulnerable	Sensitive	S2
Pubescent Sedge	*Carex hirtifolia*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Purple-stemmed Angelica	*Angelica atropurpurea*	Not Listed	Not Listed	Not Listed	Secure	S3
Purple-veined Willowherb	*Epilobium coloratum*	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Quebec Hawthorn	*Crataegus submollis*	Not Listed	Not Listed	Not Listed	Undetermined	S2?
Quill Spikerush	*Eleocharis nitida*	Not Listed	Not Listed	Not Listed	Secure	S3
Racemed Milkwort	*Polygala polygama*	Not Listed	Not Listed	Not Listed	Undetermined	S1
Ram's-Head Lady's-Slipper	*Cypripedium arietinum*	Not Listed	Not Listed	Endangered	At Risk	S1
Red Ash	*Fraxinus pennsylvanica*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Red Pigweed	*Chenopodium rubrum*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Richardson's Pondweed	*Potamogeton richardsonii*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Robinson's Hawkweed	*Hieracium robinsonii*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Robinson's Hawthorn	*Crataegus robinsonii*	Not Listed	Not Listed	Not Listed	Undetermined	S1?
Rock Spikemoss	*Selaginella rupestris*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Rock Whitlow-Grass	*Draba glabella*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Rock Whitlow-Grass	*Draba arabisans*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Roland's Sea-Blite	*Suaeda rolandii*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1?
Rosy Sedge	*Carex rosea*	Not Listed	Not Listed	Not Listed	Secure	S3
Round-lobed Hepatica	*Hepatica nobilis var. obtusa*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
Rugel's Plantain	*Plantago rugelii*	Not Listed	Not Listed	Not Listed	Secure	S3
Running Serviceberry	*Amelanchier stolonifera*	Not Listed	Not Listed	Not Listed	Secure	S3

Common Name	Species Name	*SARA*	COSEWIC	NS *ESA*	NS DNR Rank	S-Rank
Russet Cottongrass	*Eriophorum russeolum*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Saltmarsh Agalinis	*Agalinis maritima*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Saltmarsh Alkali Grass	*Puccinellia fasciculata*	Not Listed	Not Listed	Not Listed	Undetermined	S1
Saltmarsh Starwort	*Stellaria humifusa*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Satiny Willow	*Salix pellita*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Scabrous Black Sedge	*Carex atratiformis*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Seabeach Ragwort	*Senecio pseudoarnica*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Seaside Brookweed	*Samolus valerandi ssp. parviflorus*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Sea-Side Dock	*Rumex maritimus*	Not Listed	Not Listed	Not Listed		S3S4
Seaside Spurge	*Chamaesyce polygonifolia*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Secund Rush	*Juncus secundus*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Sharp-Fruit Rush	*Juncus acuminatus*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Sharp-fruited Knotweed	*Polygonum raii*	Not Listed	Not Listed	Not Listed	5 Undetermined	S2S3
Shining Ladies'-Tresses	*Spiranthes lucida*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Short-awned Foxtail	*Alopecurus aequalis*	Not Listed	Not Listed	Not Listed	Secure	S3
Showy Lady's-Slipper	*Cypripedium reginae*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Siberian Water Milfoil	*Myriophyllum sibiricum*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Silky Willow	*Salix sericea*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Silver Maple	*Acer saccharinum*	Not Listed	Not Listed	Not Listed	Undetermined	S1
Silvery-flowered Sedge	*Carex argyrantha*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Sitka Clubmoss	*Lycopodium sitchense*	Not Listed	Not Listed	Not Listed	Secure	S3
Slender Blue Flag	*Iris prismatica*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Slender Cottongrass	*Eriophorum gracile*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Slender Panic Grass	*Dichanthelium xanthophysum*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Slender Rice Grass	*Piptatherum pungens*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Small Burreed	*Sparganium natans*	Not Listed	Not Listed	Not Listed	Secure	S3
Small Round-leaved Orchid	*Platanthera orbiculata*	Not Listed	Not Listed	Not Listed	Secure	S3
Small Yellow Lady's-Slipper	*Cypripedium parviflorum var. makasin*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Small-flowered Bittercress	*Cardamine parviflora var. arenicola*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Small-flowered Woodrush	*Luzula parviflora*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Small's Knotweed	*Polygonum buxiforme*	Not Listed	Not Listed	Not Listed	Undetermined	S2S3
Small-spike False-nettle	*Boehmeria cylindrica*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Smooth Alder	*Alnus serrulata*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Smooth Cliff Fern	*Woodsia glabella*	Not Listed	Not Listed	Not Listed	Sensitive	S2

Common Name	Species Name	*SARA*	COSEWIC	NS *ESA*	NS DNR Rank	S-Rank
Smooth Sweet Cicely	*Osmorhiza longistylis*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Soapberry	*Shepherdia canadensis*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Southern Mudwort	*Limosella australis*	Not Listed	Not Listed	Not Listed	Secure	S3
Southern Rein Orchid	*Platanthera flava var. flava*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Southern Rein-Orchid	*Platanthera flava*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Southern Twayblade	*Listera australis*	Not Listed	Not Listed	Not Listed	Secure	S3
Spotted Pondweed	*Potamogeton pulcher*	Not Listed	Not Listed	Vulnerable	Sensitive	S2S3
Spreading Wild Rye	*Elymus hystrix var. bigeloviana*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Spurred Gentian	*Halenia deflexa*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Stalked Bulrush	*Scirpus pedicellatus*	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Steller's Rockbrake	*Cryptogramma stelleri*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
Swamp Milkweed	*Asclepias incarnata ssp. pulchra*	Not Listed	Not Listed	Not Listed	Undetermined	S3?
Swan's Sedge	*Carex swanii*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Sweet Wood Reed Grass	*Cinna arundinacea*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
Tender Sedge	*Carex tenera*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Thread-Like Naiad	*Najas gracillima*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Tierra del Fuego Dock	*Rumex maritimus var. fueginus*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Tower Mustard	*Arabis glabra*	Not Listed	Not Listed	Not Listed	Undetermined	S1
Triangular-valve Dock	*Rumex salicifolius var. mexicanus*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Tuckerman's Panic Grass	*Panicum tuckermanii*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Tuckerman's Sedge	*Carex tuckermanii*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Variegated Horsetail	*Equisetum variegatum*	Not Listed	Not Listed	Not Listed	Secure	S3
Vasey Rush	*Juncus vaseyi*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Virginia Anemone	*Anemone virginiana var. alba*	Not Listed	Not Listed	Not Listed	Sensitive	S1S2
Virginia Anemone	*Anemone virginiana*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Virginia Anemone	*Anemone virginiana var. virginiana*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Virginia Meadow Beauty	*Rhexia virginica*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Water Beggarticks	*Megalodonta beckii*	Not Listed	Not Listed	Not Listed	Secure	S3
Water Blinks	*Montia fontana*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Water Pygmyweed	*Crassula aquatica*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Water Smartweed	*Polygonum amphibium var. emersum*	Not Listed	Not Listed	Not Listed	Undetermined	S3?
Wavy-leaved Aster	*Symphyotrichum undulatum*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Western Hairy Rockcress	*Arabis hirsuta var. pycnocarpa*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2

Common Name	Species Name	*SARA*	COSEWIC	NS *ESA*	NS DNR Rank	S-Rank
White Adder's-Mouth	*Malaxis brachypoda*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
White Ash	*Fraxinus americana*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
White Mountain Saxifrage	*Saxifraga paniculata ssp. neogaea*	Not Listed	Not Listed	Not Listed	Sensitive	S2
White Trillium	*Trillium grandiflorum*	Not Listed	Not Listed	Not Listed	Undetermined	S1
White-stemmed Pondweed	*Potamogeton praelongus*	Not Listed	Not Listed	Not Listed	Sensitive	S3
White-Tinged Sedge	*Carex peckii*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2?
Whorled Water Milfoil	*Myriophyllum verticillatum*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Whorled Yellow Loosestrife	*Lysimachia quadrifolia*	Not Listed	Not Listed	Not Listed	Undetermined	S1
Wiegand's Sedge	*Carex wiegandii*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Wiegand's Wild Rye	*Elymus wiegandii*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Wild Black Currant	*Ribes americanum*	Not Listed	Not Listed	Not Listed	Undetermined	S1
Wild Celery	*Vallisneria americana*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Wild Chives	*Allium schoenoprasum var. sibiricum*	Not Listed	Not Listed	Not Listed	May Be At Risk	S2
Wild Comfrey	*Cynoglossum virginianum var. boreale*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Wild Leek	*Allium tricoccum*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Wood Anemone	*Anemone quinquefolia*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Woodland Strawberry	*Fragaria vesca ssp. americana*	Not Listed	Not Listed	Not Listed	Secure	S3S4
Woods-Rush	*Juncus subcaudatus var. planisepalus*	Not Listed	Not Listed	Not Listed	Sensitive	S3
Woolly Panic Grass	*Dichanthelium acuminatum var. lindheimeri*	Not Listed	Not Listed	Not Listed	Undetermined	S1?
Woolly Sedge	*Carex pellita*	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Yellow Bartonia	*Bartonia virginica*	Not Listed	Not Listed	Not Listed	Secure	S3
Yellow Ladies'-tresses	*Spiranthes ochroleuca*	Not Listed	Not Listed	Not Listed	Secure	S3
Yellow Lady's-slipper	*Cypripedium parviflorum var. pubescens*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Yellow Lady's-slipper	*Cypripedium parviflorum*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Yellow Marsh Marigold	*Caltha palustris*	Not Listed	Not Listed	Not Listed	Sensitive	S2
Yellow Spikerush	*Eleocharis olivacea*	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Yellow-seeded False Pimperel	*Lindernia dubia*	Not Listed	Not Listed	Not Listed	Secure	S3

Common Name	Species Name	*SARA*	COSEWIC	NS *ESA*	NS DNR Rank	S-Rank
Non-Vascular Plants						
a Feather Moss	Hylocomiastrum pyrenaicum	Not Listed	Not Listed	Not Listed	Sensitive	S3S4
a Moss	Tortula obtusifolia	Not Listed	Not Listed	Not Listed	Undetermined	S1?
a Moss	Sematophyllum demissum	Not Listed	Not Listed	Not Listed	Sensitive	S1S2
a Moss	Anacamptodon splachnoides	Not Listed	Not Listed	Not Listed	Sensitive	S2?
a Moss	Weissia muhlenbergiana	Not Listed	Not Listed	Not Listed	Sensitive	S2?
a Moss	Bryum algovicum	Not Listed	Not Listed	Not Listed	Sensitive	S2?
a Moss	Campylium polygamum	Not Listed	Not Listed	Not Listed	Undetermined	S2?
a Moss	Ditrichum rhynchostegium	Not Listed	Not Listed	Not Listed	Sensitive	S2?
a Moss	Philonotis marchica	Not Listed	Not Listed	Not Listed	Undetermined	S2?
a Moss	Racomitrium affine	Not Listed	Not Listed	Not Listed	Undetermined	S2?
a Moss	Sematophyllum marylandicum	Not Listed	Not Listed	Not Listed	Sensitive	S2?
a Moss	Platylomella lescurii	Not Listed	Not Listed	Not Listed	Sensitive	S2?
a Moss	Ephemerum serratum	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
a Moss	Tortula truncata	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
a Moss	Limprichtia revolvens	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
a Moss	Drummondia prorepens	Not Listed	Not Listed	Not Listed	Sensitive	S3?
a Moss	Anomodon tristis	Not Listed	Not Listed	Not Listed	Sensitive	S3?
a Moss	Thamnobryum alleghaniense	Not Listed	Not Listed	Not Listed	Sensitive	S3S4
Alder Silk Moss	Plagiothecium latebricola	Not Listed	Not Listed	Not Listed	Sensitive	S1S2
Aloe-Like Rigid Screw Moss	Aloina rigida	Not Listed	Not Listed	Not Listed	May Be At Risk	S1?
Anomalous Bristle Moss	Orthotrichum anomalum	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Appressed Jellyskin Lichen	Leptogium subtile	Not Listed	Not Listed	Not Listed	Sensitive	S3
Bark Willow Moss	Platydictya subtilis	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Beaded Jellyskin Lichen	Leptogium teretiusculum	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Bearded Jellyskin Lichen	Leptogium saturninum	Not Listed	Not Listed	Not Listed	Undetermined	S3S4
Black Rock-wafer Lichen	Phylliscum demangeonii	Not Listed	Not Listed	Not Listed	Undetermined	S2?
Black-foam Lichen	Anzia colpodes	Not Listed	Not Listed	Threatened	Sensitive	S3
Black-footed Reindeer Lichen	Cladina stygia	Not Listed	Not Listed	Not Listed	Sensitive	S3?
Blistered Jellyskin Lichen	Leptogium corticola	Not Listed	Not Listed	Not Listed	Sensitive	S3
Blistered Tarpaper Lichen	Collema nigrescens	Not Listed	Not Listed	Not Listed	Sensitive	S3
Blue Felt Lichen	Degelia plumbea	Special Concern	Vulnerable	Special Concern	Secure	S3

Common Name	Species Name	*SARA*	COSEWIC	NS *ESA*	NS DNR Rank	S-Rank
Blue-gray Moss Shingle Lichen	Moelleropsis nebulosa	Not Listed	Not Listed	Not Listed	Secure	S3
Blue-gray Rosette Lichen	Physcia caesia	Not Listed	Not Listed	Not Listed	Undetermined	S3S4
Boreal Felt Lichen - Atlantic pop.	Erioderma pedicellatum (Atlantic pop.)	Endangered	Endangered	Endangered	At Risk	S1
Bottlebrush Frost Lichen	Physconia detersa	Not Listed	Not Listed	Not Listed	Sensitive	S3S4
Coast Creeping Moss	Conardia compacta	Not Listed	Not Listed	Not Listed	Sensitive	S1?
Coastal Bushy Beard Lichen	Usnea flammea	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Condensed Broom Moss	Dicranum condensatum	Not Listed	Not Listed	Not Listed	Undetermined	S2?
Corrugated Shingles Lichen	Fuscopannaria ahlneri	Not Listed	Not Listed	Not Listed	Secure	S3
Eastern Waterfan	Peltigera hydrothyria	Not Listed	Not Listed	Threatened	May Be At Risk	S1
Elf Bloom Moss	Schistidium agassizii	Not Listed	Not Listed	Not Listed	Secure	S3S4
Finger Ring Lichen	Arctoparmelia incurva	Not Listed	Not Listed	Not Listed	Secure	S3S4
Fingered Tarpaper Lichen	Collema cristatum	Not Listed	Not Listed	Not Listed	Undetermined	S1
Fragile Coral Lichen	Sphaerophorus fragilis	Not Listed	Not Listed	Not Listed	Secure	S3S4
Fringe Lichen	Heterodermia neglecta	Not Listed	Not Listed	Not Listed	Secure	S3S4
Fringed Rosette Lichen	Physcia tenella	Not Listed	Not Listed	Not Listed	6 Not Assessed	S3S4
Frosted Glass-whiskers Lichen - Nova Scotia pop.	Sclerophora peronella (Nova Scotia pop.)	Special Concern	Not Listed	Special Concern		S1?
Ghost Antler Lichen	Pseudevernia cladonia	Not Listed	Not Listed	Not At Risk	Sensitive	S2S3
Giant Spear Moss	Calliergon giganteum	Not Listed	Not Listed	Not Listed	Sensitive	S3?
Graceful Felt Lichen	Erioderma mollissimum	Not Listed	Endangered	Endangered	May Be At Risk	S1S2
Green Starburst Lichen	Parmeliopsis ambigua	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Hairlike Dichelyma Moss	Dichelyma capillaceum	Not Listed	Not Listed	Not Listed	Secure	S3S4
Lesser Smoothcap Moss	Atrichum angustatum	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Light Beaked Moss	Eurhynchium hians	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Long-stalked Fine Wet Moss	Campylium radicale	Not Listed	Not Listed	Not Listed	Undetermined	S2?
Lustrous Peat Moss	Sphagnum subnitens	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Marine Seaweed Lichen	Lichina confinis	Not Listed	Not Listed	Not Listed	6 Not Assessed	S1?
Meadow Plait Moss	Hypnum pratense	Not Listed	Not Listed	Not Listed	Sensitive	S1S2
Metropolitan Timmia Moss	Timmia megapolitana	Not Listed	Not Listed	Not Listed	Sensitive	S1S2
Mountain Forest Grimmia	Grimmia anomala	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Mucronate Screw Moss	Tortula mucronifolia	Not Listed	Not Listed	Not Listed	Sensitive	S1S2

Common Name	Species Name	*SARA*	COSEWIC	NS *ESA*	NS DNR Rank	S-Rank
Naked Kidney Lichen	Nephroma bellum	Not Listed	Not Listed	Not Listed	Sensitive	S3
One-sided Groove Moss	Aulacomnium heterostichum	Not Listed	Not Listed	Not Listed	Sensitive	S1S2
Peppered Moon Lichen	Sticta fuliginosa	Not Listed	Not Listed	Not Listed	Sensitive	S3
Petalled Rocktripe Lichen	Umbilicaria polyphylla	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Poor-man's Shingles Lichen	Parmeliella parvula	Not Listed	Not Listed	Not Listed	May Be At Risk	S1?
Powdered Fringe Lichen	Heterodermia speciosa	Not Listed	Not Listed	Not Listed	Secure	S3
Powdered Moon Lichen	Sticta limbata	Not Listed	Not Listed	Not Listed	May Be At Risk	S1S2
Powder-tipped Antler Lichen	Everniastrum catawbiense	Not Listed	Not Listed	Not Listed	May Be At Risk	S2S3
Pygmy Pocket Moss	Fissidens exilis	Not Listed	Not Listed	Not At Risk	At Risk	S1S2
Rimmed Shingles Lichen	Fuscopannaria leucosticta	Not Listed	Not Listed	Not Listed	May Be At Risk	S2S3
Rockhair Lichen	Racodium rupestre	Not Listed	Not Listed	Not Listed	Undetermined	S2S3
Rugel's Anomodon Moss	Anomodon rugelii	Not Listed	Not Listed	Not Listed	Sensitive	S3S4
Salted Shell Lichen	Coccocarpia palmicola	Not Listed	Not Listed	Not Listed	Secure	S3S4
Scaly Pelt Lichen	Peltigera lepidophora	Not Listed	Not Listed	Not Listed	May Be At Risk	S1
Shaggy Fringed Lichen	Anaptychia palmulata	Not Listed	Not Listed	Not Listed	Secure	S3S4
Short-Beaked Rigid Screw Moss	Aloina brevirostris	Not Listed	Not Listed	Not Listed		S1
Short-pointed Lantern Moss	Cyrtomnium hymenophylloides	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Star Leafy Moss	Mnium stellare	Not Listed	Not Listed	Not Listed	Undetermined	S3?
Starke's Fork Moss	Kiaeria starkei	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Stretched Jellyskin Lichen	Leptogium milligranum	Not Listed	Not Listed	Not Listed	Sensitive	S2S3
Tattered Jellyskin Lichen	Leptogium lichenoides	Not Listed	Not Listed	Not Listed	May Be At Risk	S3
Thomson's Leafy Moss	Mnium thomsonii	Not Listed	Not Listed	Not Listed	Sensitive	S1S2
Tiny Cedar Moss	Cyrto-hypnum minutulum	Not Listed	Not Listed	Not Listed	Sensitive	S1S2
Tiny-leaved Haplocladium Moss	Bryohaplocladium microphyllum	Not Listed	Not Listed	Not Listed		S1S2
Toothed-leaved Nitrogen Moss	Tetraplodon angustatus	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Tree Pelt Lichen	Peltigera collina	Not Listed	Not Listed	Not Listed	Sensitive	S2?
Tufted Fen Moss	Paludella squarrosa	Not Listed	Not Listed	Not Listed	Sensitive	S1?
Valley Oakmoss Lichen	Evernia prunastri	Not Listed	Not Listed	Not Listed	Sensitive	S3S4
Wetland-plume Moss	Helodium blandowii	Not Listed	Not Listed	Not Listed	Secure	S3?
Woodland Owl Lichen	Solorina saccata	Not Listed	Not Listed	Not Listed	May Be At Risk	S2S3
Yew-leaved Pocket Moss	Fissidens taxifolius	Not Listed	Not Listed	Not Listed	Sensitive	S2?

APPENDIX E
WETLAND COMPONENT STUDY

July 4, 2016

Mr. Jonathan MacDonald
Halifax Water

Dear Mr. MacDonald,

Re: Wetland Delineation
Lake Major, Cherry Brook, NS

INTRODUCTION

Strum Consulting completed wetland delineation (the Study) on behalf of Halifax Water in June 2016 around Lake Major, in the Lake Major Watershed area. Lake Major is a 380 ha water reservoir which receives water from the 7000 ha protected Lake Major Watershed. Halifax Water plans to replace the existing dam at Lake Major and currently has a dam replacement application filed with Nova Scotia Environment (NSE). Dam replacement will increase water levels in Lake Major up to 1.0 m, from 19.0 m currently to 19.5 m with a high water level of 20.0 m.

STUDY SCOPE

The objective of the wetland delineation is to identify any wetlands that may be impacted by the increase in water levels due to dam replacement. The assessment was restricted to the land directly surrounding the lake and the results of the wetland delineation will be submitted to NSE as part of the dam replacement application.

The Study will involve a desktop review to assess the potential for wetland habitat around Lake Major. Based on the results of the desktop review, wetland delineation was completed in areas likely to have wetland habitat.

SITE DETAILS

The Lake Major Watershed is located in Dartmouth, NS (Drawing 1, attached). The watershed encompasses approximately 7000 hectares. Approximately 30% of the designated watershed area is part of the Waverly-Salmon River Long Lake Wilderness Area. The Waverly Game Sanctuary also overlaps approximately 30% of the watershed area. About 42% of land area is owned by Halifax Water, while approximately 42% are crown lands. The remaining 17% is privately owned, including portions of North Preston, Cherry Brook, and Montague Gold Mines.

Lake Major is approximately 380 ha in size and extends approximately 11.5 km. The lake is surrounded by undeveloped land which has been subjected to tree harvesting. The dam is located in the southeastern extent of the lake, underneath Lake Major Road, where the lake flows into Echo Pool. The Water Treatment Plant is located along the western edge of the lake, approximately 1.8 km northwest of the dam. The water treatment plant is accessed via Cherry Brook Road.

DESKTOP REVIEW

Methodology

A desktop identification of the location and extent of potential wetlands within the Assessment area was completed by reviewing the following information sources:

- Satellite and aerial photography;
- Nova Scotia Wet Areas Mapping database (WAM) (NSDNR 2012a);
- Nova Scotia Geomatics Centre; and
- NS Significant Species and Habitats database (NSDNR 2012b).

Results

The NS Significant Species and Habitat database identifies one marsh along the eastern edge of the lake, 4 km north of the dam (Drawing 2, attached).

The WAM database indicates the potential for numerous inflow channels into the lake; however, the steep slopes in this area do not suggest that they may have associated wetlands. There are two areas that may support wetland habitat in the middle of the lake along the eastern edge, 4 km north of the dam. Additional wetland habitat might be located in the vicinity of the dam.

The NS Geomatics Centre's topographic data series suggests steep sides to the lake which is not conducive to wetland habitat; particularly along the western edge of the lake and sections at the top and middle of the eastern side of the lake. Numerous watercourses were identified flowing into the Lake. One waterbody is located east of the lake which drains through an area of less steep topography which may have associated wetlands.

The assessment area is located in the Lake Major Tertiary Watershed, part of the Musquodoboit River Primary Watershed (Drawing 2B, attached).

FIELD SURVEYS

Methodology

The field wetland delineation was completed on June 10 and 19, 2016, by foot and by boat. Delineated wetland boundaries were flagged with pink flagging tape marked 'wetland delineation'. Wetland boundaries, and watercourse (and drainage) flow paths were recorded using a GPS receiver capable of sub 5 m accuracy.

In order for a wetland determination to be made, the following three criteria must be met:

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

A positive indicator must typically be present for all three parameters to definitively identify any given site as a wetland (US Army Corp of Engineers, 1987).

Locations of wetland boundaries were determined by confirming the presence/absence of wetland vegetation, hydrology, and soils within the Assessment area. Detailed wetland delineation methodologies and a glossary of commonly used terms are attached.

Results

A total of 29,177.2 m^2 of wetland habitat was identified in 13 wetlands along the shoreline of Lake Major (Drawings 3A and 3B, attached). Most exist as treed swamps or treed swamp/fen complexes with sphagnum dominated organic substrates. Herb layers generally consisted of Canada Mayflower (*Maianthemum canadensis*), Bog Aster (*Oclemena nemoralis*), Swamp Dewberry (*Rubus hispidus*), White Meadowsweet (*Spiraea alba*), Royal Fern (*Osmunda regalis),* Bunchberry (*Cornus canadensis*), Starflower (*Trientalis borealis*), Northern Long Sedge (*Carex folliculata*), Star Sedge (*Carex echinata*), Threeway Sedge (Dulichium arundinaceum), Leatherleaf (*Chamaedaphne calyculata*), and Sweet Gale (*Myrica gale*). Common shrubs observed included Speckled Alder (*Alnus incana*), Rhodora (*Rhododendron canadensis*), Wild Raisin (*Viburnum nudum*), Sweet Gale, regenerating Black Spruce (*Picea mariana*), Balsam Fir (*Abies balsamea*), and Red Maple (*Acer rubrum*). When present, the tree canopy consisted of Black Spruce, Balsam Fir, and Red Maple. Ten of the wetlands observed, consisting of 26,307.9 m^2 of area, are contiguous with the lake water consisting of a hydrologic source. An increase in water levels due to dam replacement could impact these wetlands, most likely by making them wetter.

Three wetlands (WL1, WL10, and WL12) are hydrologically isolated from the lake, although they are located within 20 m of the shoreline. WL1 is separated from the lake by a large ridge standing approximately 2 m high from the water surface. WL10 and WL12 are both located 1-2 m up from the water surface, although WL10 does have a drainage outflow into the lake. These wetlands will most likely remain unimpacted by increased water levels; however it is possible that an increase of 0.5 to 1.0 m in the lake water level could increase the input of water into these wetlands during periods of high wave action.

Table A summarizes the results of the wetland survey. Full wetland characteristics are provided in Table 1 (attached).

Table A: Summary of Wetland Assessment

Wetland Type	Wetland IDs	Number Observed	Area (m^2)
Shrub Swamp	WL1, WL10	2	803.7
Treed Swamp	WL2, WL3, WL4, WL5, WL9	5	2,759.2
Treed Swamp/Fen Complex	WL6, WL7, WL8, WL13	4	22,705.9
Fen	WL11	1	842.8
Bog	WL12	1	2,065.6
Total number of wetlands observed		**13**	**29,177.2**
Total number of wetlands contiguous with lake edge		**10**	**26,307.9**

CONCLUSIONS AND RECOMMENDATIONS

A preliminary wetland assessment was completed within a defined assessment area along the shores of Lake Major. A total of 13 wetlands (29,177.2 m^2) were identified, consisting predominantly of treed swamps and treed swamp/fen complexes. Ten of the identified wetlands (26,307.9 m^2) were observed to be contiguous with the lake's water surface.

Wetland boundaries were delineated and general wetland characterisations were recorded for these wetlands. However, should a wetland alteration application be required under provincial permitting, detailed functional assessments will be required for each of the identified wetlands.

CLOSURE

This report has been completed for the sole benefit of Halifax Water. Any other person or entity may not rely on this report without the express written consent of Strum Consulting and Halifax Water.

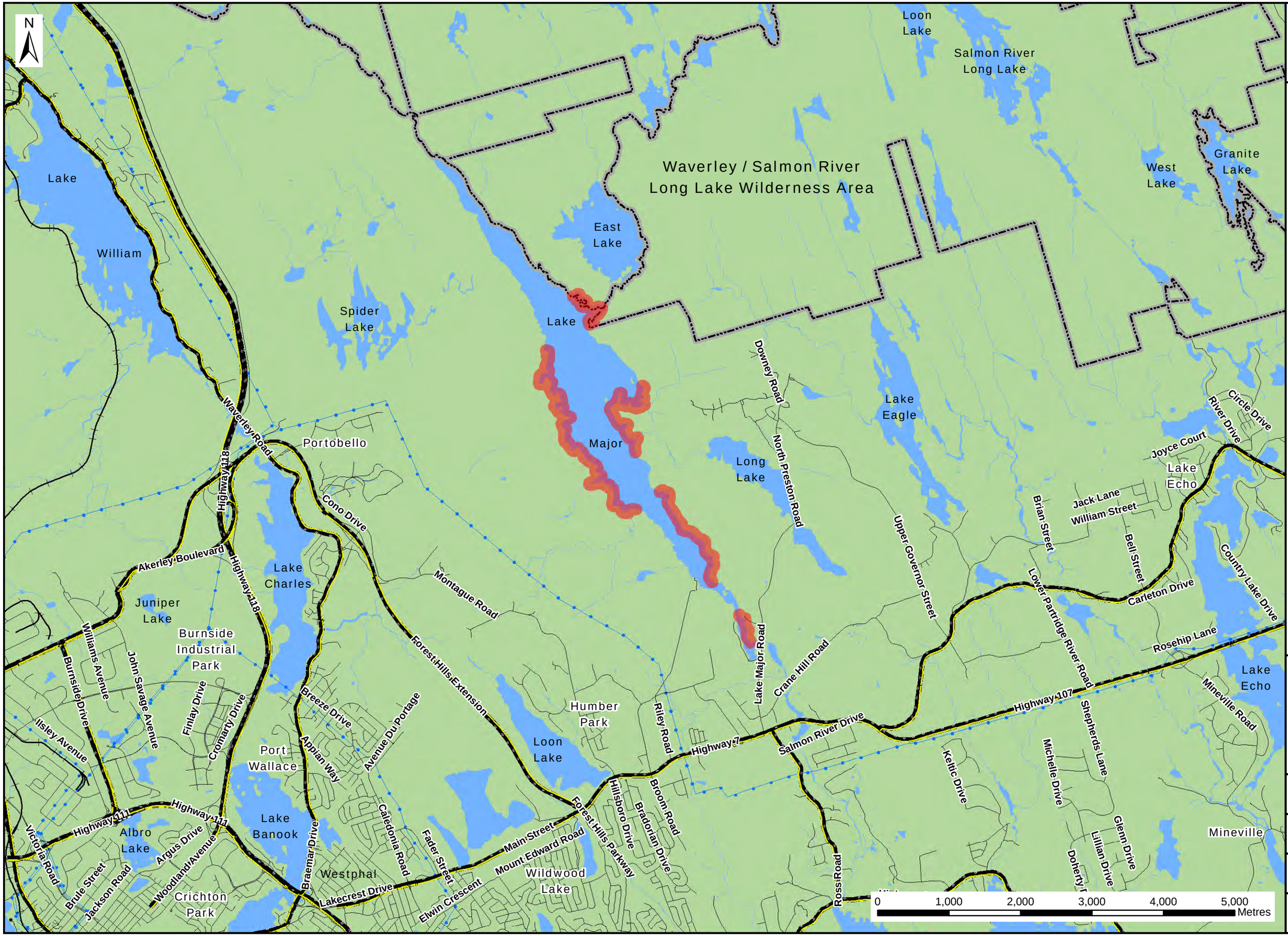
The conclusions presented in this report represent the best judgement of the assessor based on the current environmental standards. The assessor is unable to certify against undiscovered environmental liabilities due to the nature of the investigation and the limited data available.

If you have any questions, please contact us.

Thank you,

Heather Mosher, MSc.
Environmental Scientist
hmosher@strum.com

Shawn Duncan, BSc.
Vice President
sduncan@strum.com



Notes:

1. Reference: Bing Satellite Imagery. Digital Topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: WGS84, UTM Zone 20 North.

Legend:

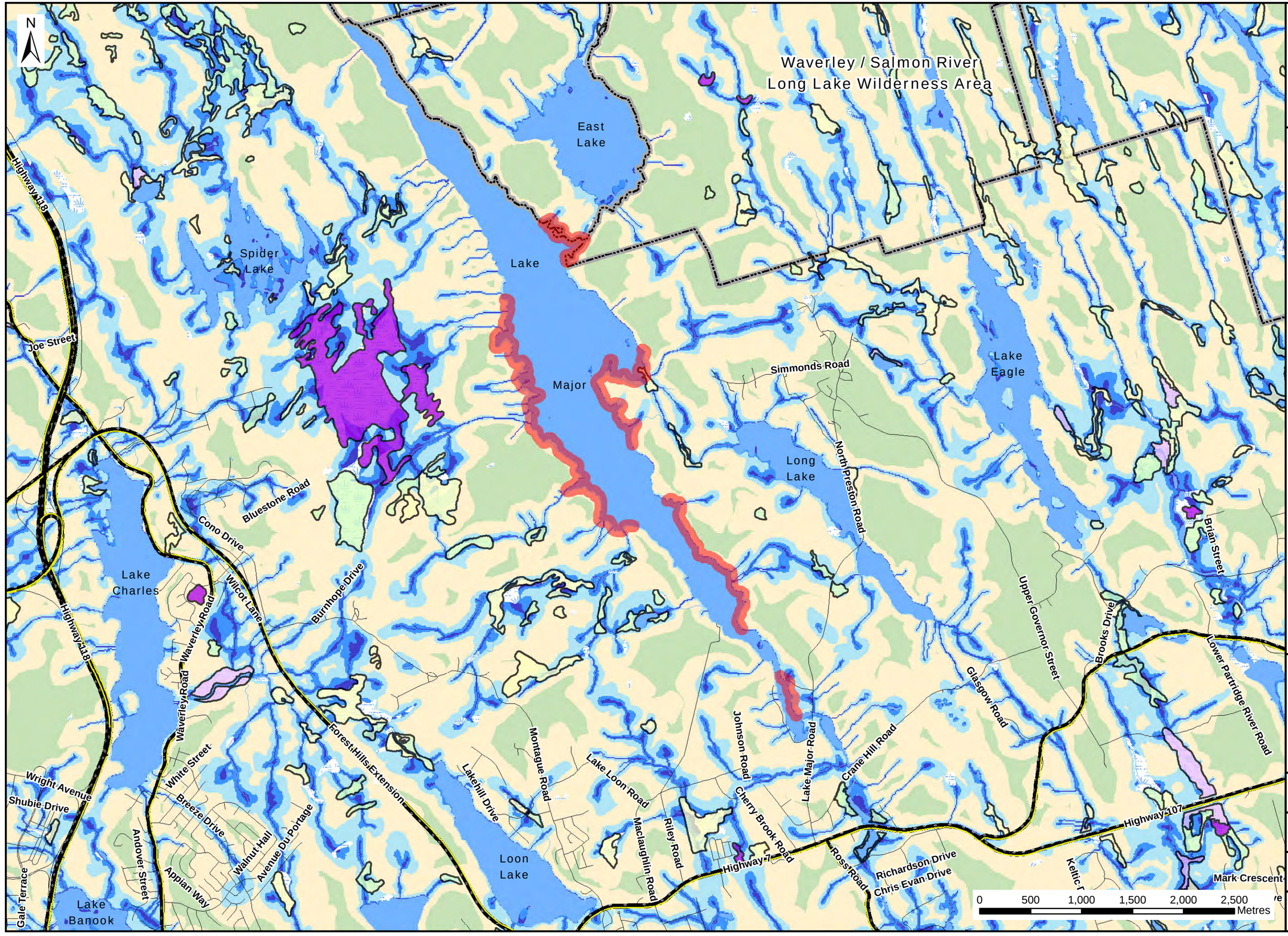
- Assessment Area
- Game Management
- Public Roads
- Major Roads and Highways
- Active Railroad
- Existing Pipeline
- Existing Transmission Lines
- Mapped Stream
- Water Bodies

Lake Major Wetland Delineation - Site Location

Strum 20 YEARS Taking Charge CONSULTING

*Engineering * Surveying * Environmental*
*Bedford * Antigonish * Moncton * Deer Lake*

Date:	Project #:
June 2016	16-5741
Scale: 1:50,000	Drawing #: 1
Drawn By: H. Serhan	
Checked By: H. Mosher	



Notes:

1. Reference: Bing Satellite Imagery. Digital Topographic Mapping by Nova Scotia Geomatics Centre. Wet Areas Mapping & Wetland Inventory by Nova Scotia Department of Natural Resources (NS DNR).
2. Projection: NAD83(CSRS), UTM Zone 20 North.

Legend:

- Assessment Area
- Game Management
- Public Roads
- Major Roads and Highways
- Active Railroad
- Mapped Stream
- Mapped Wet Area
- Water Bodies

NS DNR Wetland Inventory (Habitat)

- Bog or Fen
- Fen
- Marsh
- Salt Marsh
- Swamp

Depth to Water Table (m)

- 0 - 0.10 m
- 0.11 - 0.50 m
- 0.51 - 2 m
- 2.01 - 10 m
- > 10 m

Lake Major Wetland Delineation - Desktop Review Results

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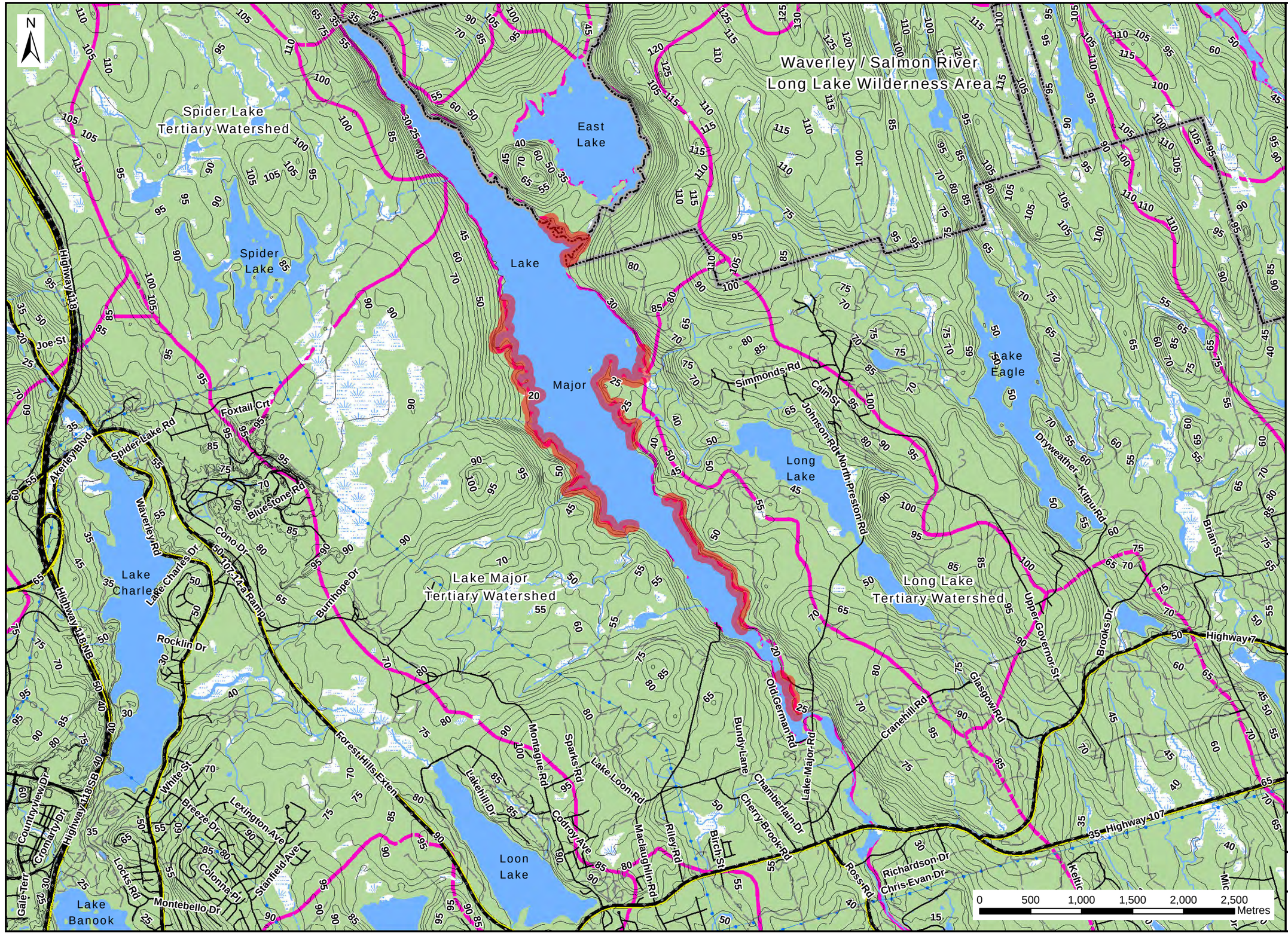
*Engineering * Surveying * Environmental*
*Bedford * Antigonish * Moncton * Deer Lake*

Date: June 2016	Project #: 16-5741
Scale: 1:35,000	Drawing #: **2A**
Drawn By: H. Serhan	
Checked By: H. Mosher	



Notes:

1. Reference: Bing Satellite Imagery. Digital Topographic Mapping by Nova Scotia Geomatics Centre. Watershed Boundaries by Nova Scotia Department of Natural Resources (NS DNR).
2. Projection: NAD83(CSRS), UTM Zone 20 North.

Legend:

- Assessment Area
- Contours (m)
- Game Management
- Major Roads and Highways
- Public Roads
- Access Roads / Trails
- Existing Transmission Lines
- Mapped Stream
- Mapped Indefinite Stream
- Mapped Wet Area
- Water Bodies
- Tertiary Watershed Boundary

Lake Major Wetland Delineation - Tertiary Watershed Boundaries

Strum Consulting — 20 Years Taking Charge

*Engineering * Surveying * Environmental*
*Bedford * Antigonish * Moncton * Deer Lake*

Date: June 2016	Project #: 16-5741
Scale: 1:35,000	Drawing #: **2B**
Drawn By: H. Serhan	
Checked By: H. Mosher	

N

Waverley / Salmon River
Long Lake Wilderness Area

Spider Lake

Detail E
Figure 3B

Detail F
Figure 3B

Lake

Detail D
Figure 3B

Detail G
Figure 3B

Detail C
Figure 3B

Major

Detail B
Figure 3B

Detail H
Figure 3B

Detail A
Figure 3B

Simmonds Road
Donald Lane
Cain Street
Johnson Road
North Preston Road
Long Lake
Lake Eagle
Burnhope Drive
Montague Road
Gold Lane
Forest Hills Extension
Lake Major Road

0 200 400 600 800 1,000
Metres

Notes:

1. Reference: Bing Satellite Imagery. Digital Topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.
3. GPS Data Collected is Approximate and Typically to +/-5m Accuracy.

Legend:

- Confirmed Wetland Boundary

Field Identified Wetlands (Habitat)

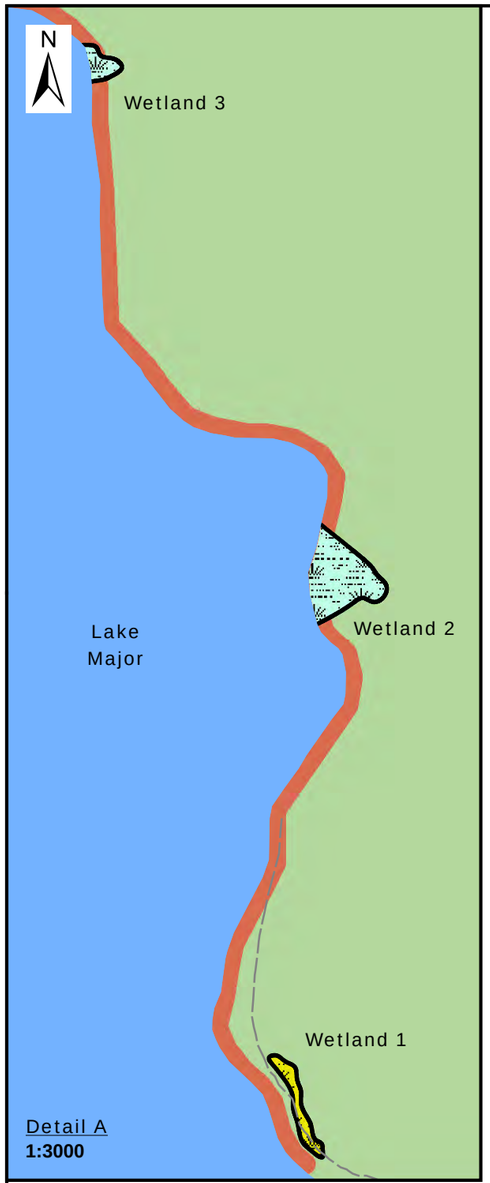
- Bog
- Fen
- Riparian Treed Swamp
- Shrub Swamp
- Treed Swamp
- Assessment Area
- Game Management
- Public Roads
- Major Roads and Highways
- Mapped Stream
- Water Bodies

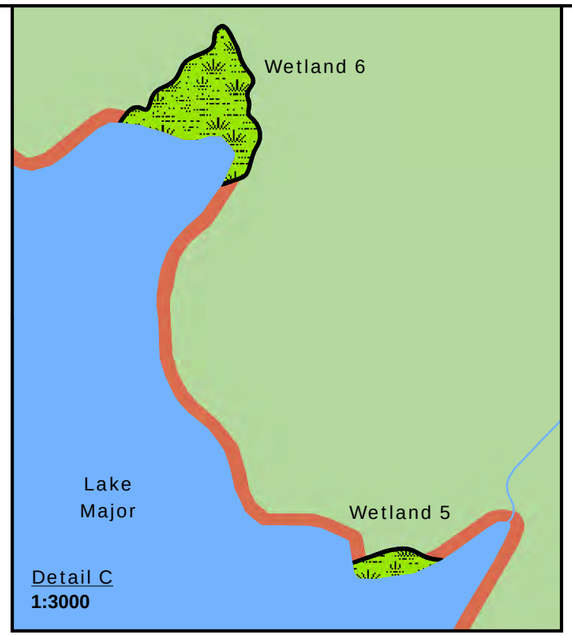
Lake Major Wetland Delineation - Survey Results

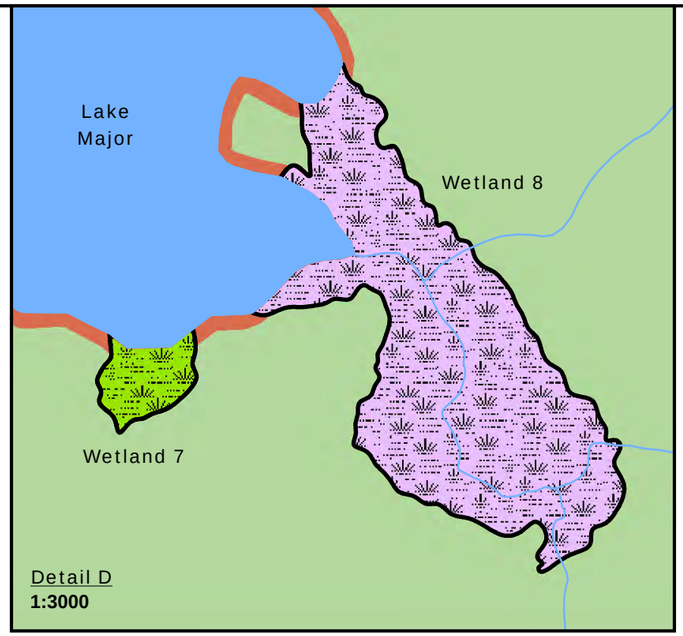
Strum 20 YEARS Taking Charge CONSULTING

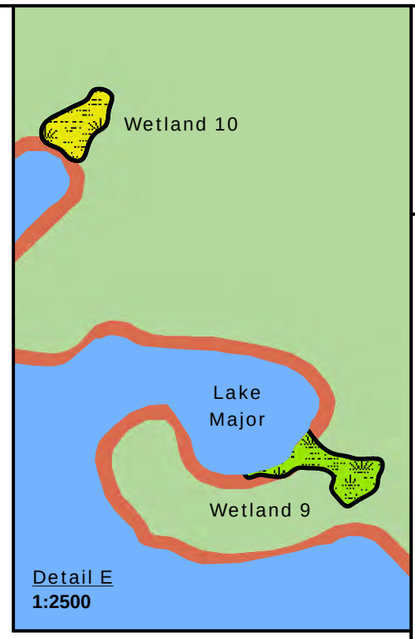
*Engineering * Surveying * Environmental*
*Bedford * Antigonish * Moncton * Deer Lake*

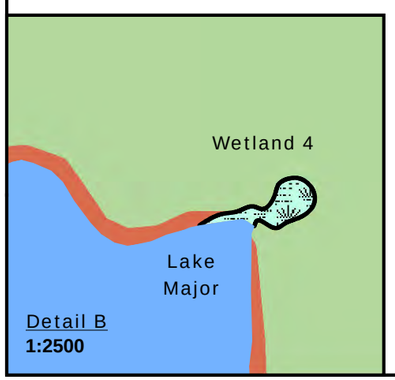
Date: June 2016	Project #: 16-5741
Scale: 1:20,000	Drawing #: **3A**
Drawn By: H. Serhan	
Checked By: H. Mosher	

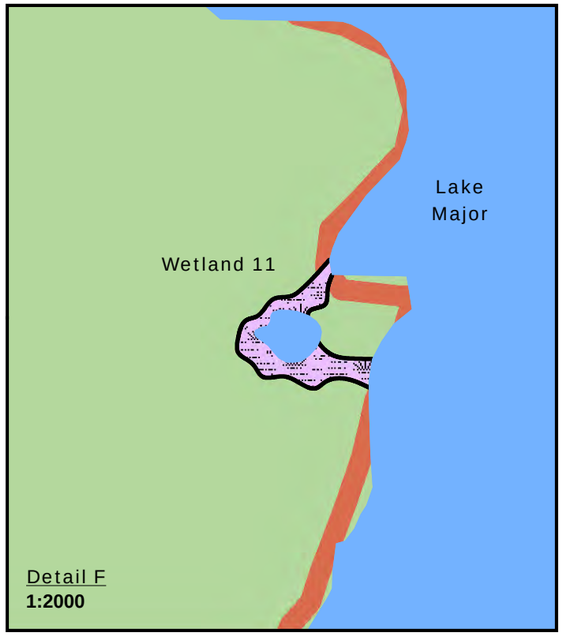


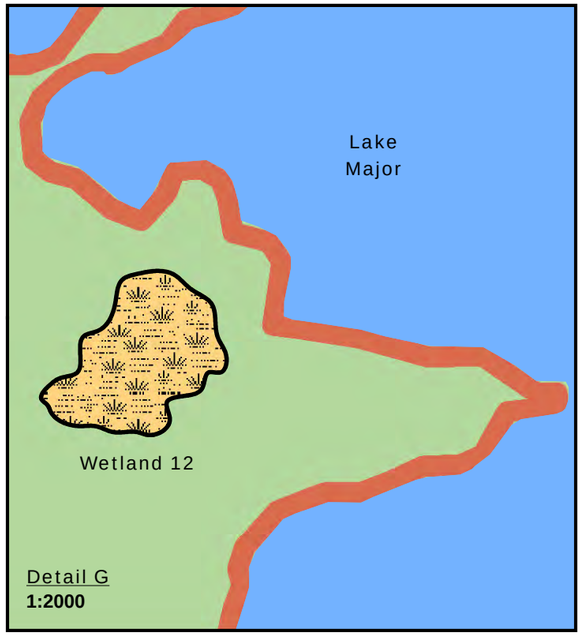


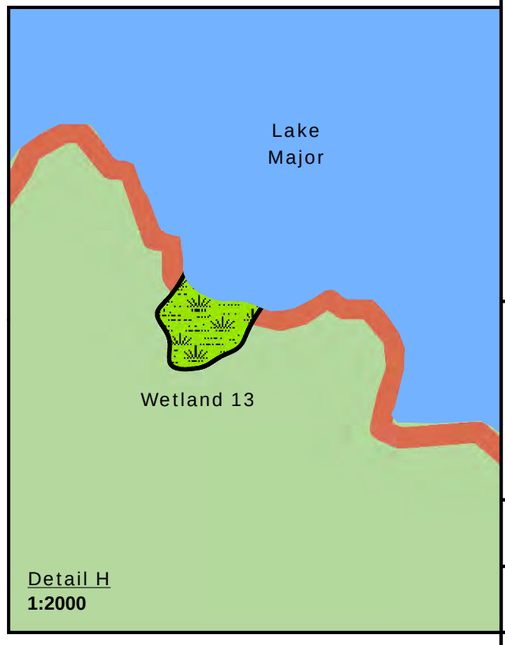












0 20 40 60 80 100 Metres

Notes:

1. Reference: Bing Satellite Imagery. Digital Topographic Mapping by Nova Scotia Geomatics Centre.
2. Projection: NAD83(CSRS), UTM Zone 20 North.
3. GPS Data Collected is Approximate and Typically to +/-5m Accuracy.

Legend:

- Confirmed Wetland Boundary

Field Identified Wetlands (Habitat)

- Bog
- Fen
- Riparian Treed Swamp
- Shrub Swamp
- Treed Swamp
- Assessment Area
- Public Roads
- Access Roads / Trails
- Mapped Stream
- Mapped Indefinite Stream
- Water Bodies

Lake Major Wetland Delineation - Survey Results

Strum Consulting — 20 YEARS Taking Charge

*Engineering * Surveying * Environmental*
*Bedford * Antigonish * Moncton * Deer Lake*

Date: June 2016	Project #: 16-5741
Scale: As Shown	Drawing #: **3B**
Drawn By: H. Serhan	
Checked By: H. Mosher	

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).

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.

<u>Identification of Hydrophytic Vegetation</u>
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).

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 Species[1]

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.

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.

USDA-NRCS. (United States Department of Agriculture- Natural Resources Conservation Service). 2010. *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils*. Version 7.0. 53 pp.

Zinck, M. 1998. *Rolands Flora of Nova Scotia*. Nimbus Publishing, Nova Scotia.

Environmental Laboratory. (1987). "Corps of Engineers wetlands delineation manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS. NTIS No. AD A176 912 (Note: Appendix C information is outdated and must be obtained from regional Wetlands offices)

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

Artificial Wetland – A created wetland requiring constant maintenance to remain a wetland.

Aerobic – A situation in which molecular oxygen is part of the environment.

Aquic moisture regime – A mostly reducing soil moisture regime nearly free of dissolved oxygen due to saturation by ground water or its capillary fringe and occurring at periods when the soil temperature at 19.7 in. is greater than 5 ^{o}C.

Baseline Study – An inventory of an existing community or environment that may provide information for planning or establishing goals for success criteria.

Basin – a depression.

Bidirectional-non-tidal – water levels subject to rise and fall due to fluctuations in lake levels; only applied to lentic wetlands (excluding those with a stream bisecting them = throughflow).

Bidirectional tidal – water levels subject to ebb and flood by tides.

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 activity zone, in order to protect the marine or freshwater resource.

Chroma – The relative purity or saturation of a colour; intensity of distinctive hue as related to grayness; one of the three variables of colour.

Concretion – A local concentration of chemical compounds (e.g. calcium carbonate, iron oxide) in the form of a grain or nodule of varying size, shape, hardness, and colour. Concretions of significance in hydric soils are usually iron and/or manganese oxides occurring at or near the soil surface, which develop under conditions of prolonged soil saturation.

Conservation – Ensuring that loss or degradation of wetland ecosystem functions does not occur and that previously lost or damaged functions are recovered.

Contiguous – Whereby two or more areas of wetland habitat are hydrologically connected via a watercourse and/or drainage channel.

Contour – An imaginary line of constant elevation. The corresponding line on a map is called a contour line.

Created Wetland – The conversion of a persistent upland vegetation community or ephemeral shallow water area into a permanent wetland where no previous wetland existed.

Diked – wetland surrounded by berms (dykes), may be flooded or not

Farmed – area still wet enough to be considered wetland buy subject to tillage or cultivation or wet-dependent plants (e.g., cranberries).

Disturbed Wetland – A wetland that is directly or indirectly altered by external human or natural forces.

Dominance – A descriptor of vegetation that is related to the standing crop of a species in an area, usually measured by height, areal cover or basal area (for trees).

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

Drained – A condition in which the level or volume of groundwater or surface water has been reduced or eliminated from an area by artificial means.

Emergent Plant – A rooted plant that has parts extending above the water surface, at least during portions of the year but does not tolerate prolonged inundation.

Enhanced Wetland – An existing wetland where some planned activity by humans addresses stresses or limitations that result in an increase of one or more functions or values.

Entrenched – wetland along a stream that has undergone significant erosion, creating a deep channel.

Estuarine-Embayment – located along the shores of an open bay or similar embayment in salt-brackish tidal waters.

Estuarine-Channel – located along the shores of a tidal river in the salt-brackish zone.

Eutrophic – Refers to a water body with more nutrients than its aquatic plant community can use, occasionally resulting in algal blooms.

Excavated – material removed from the wetland creating a depression.

Exotic – Not indigenous to a region; intentionally or accidentally introduced.

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.

Flat – a nearly level area with no detectable slope.

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.

Floodplain – a plain subject to river overflow and characterized by alluvial (water-deposited) soils; basin – depressions on the floodplain; flat – nearly level land

Flora – A list of all plant species that occur in an area.

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).

Float mat – wetland that is not rooted to the underlying substrate; may float around in a lake, for example.

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

Gleyed – A soil condition resulting from prolonged soil saturation, which is manifested by the presence of bluish or greenish colours through the soil mass or in mottles spots or streaks) among other colours. Gleying occurs under reducing soil conditions resulting from soil saturation, by which iron is reduced predominantly to the ferrous state.

Grazed – wetland actively used as pasture.

Growing Season – The portion of the year when soil temperatures at 19.7 in. below the soil surface are higher than biologic zero (5^{o}) (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.

Headwaters – The origins of streams and rivers.

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

Herbaceous Layer – Any vegetative stratum of a plant community that is composed predominantly of herbs.

Histic epipedon – A 20-40cm soil layer at or near the surface that is saturated for 30 consecutive days or more during the growing season in most years and contains a minimum of 20 percent organic matter when no clay is present or a minimum of 30 percent organic matter when 60 percent or greater clay is present.

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.

Hue – A characteristic of colour that denotes a colour in relation to red, yellow, blue, etc; one of the three variables of colour. Each colour chart in the Munsell Colour Book (Munsell Colour 1975) consists of a specific hue.

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

Hydrologic Regime – The distribution and circulation of water in an area during a given period including its fluctuations periodicity.

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.

Indicator – An event, entity or condition that typically characterizes a prescribed environment or situation; indicators determine or aid in determining whether or not certain stated circumstances exist.

Indicator status – One of the categories (e.g. OBL) that describes the estimated probability of a plant species occurring in wetlands.

Indigenous – Species which are native to a region.

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

Inundation – A condition in which water from any source temporarily or permanently floods land surface.

Irregularly flooded-tidal – inundated less than daily by the tides

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 River-Unconfined – Located along a river (width ≥20 m) with a distinct floodplain

Lotic River-Confined – Located along a river (width ≥20 m) with little or no floodplain

Lotic Stream-Unconfined – Located along a stream (width <20 m) with a distinct floodplain

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

Lotic Pond – Located along an in-stream pond.

Lentic Lake – Located along the shores of a lake.

Lentic Reservoir –Located along the shores of a reservoir.

Macrophyte – Any plant species that can be readily observed without the aid of optical magnification including all vascular plant species and mosses, as well as some attached and filamentous algae.

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

Mesophytic – Any plant species growing where soil moisture and aeration conditions lie between extremes. These species are typically found in habitats with average moisture conditions, neither very dry nor very wet.

Mineral soil – A soil consisting predominantly of, and having its properties determined predominantly by, mineral matter (sand, silt, clay) usually containing less than 20 percent organic matter.

Minerotrophic – Referring to waters rich in dissolved minerals, and to plant species and communities which grow well in these conditions.

Mitigation – The prevention, modification, or alleviation of impacts on the natural environment including any action with the intent to enhance beneficial effects.

Monitoring – Periodic evaluation of a site to determine success in achieving goals.

Mottles/Mottling – Spots or blotches of different colour or shades of colour interspersed within the dominant colour in a soil layer, usually resulting from the presence of periodic reducing soil conditions.

Muck – Highly decomposed organic material in which the original plant parts are not recognizable.

Natural Wetland – Dominated by native biota and occurring within a biophysical system which has developed through processes devoid of human intervention. Formed by natural processes (e.g. deglaciation, Aeolian processes, tectonic forces, or karst)

Nuisance Species – Species that detract from or interfere with wetland functions and/or values.

Ombrotrophic – Referring to waters poor in nutrients, where nutrients are obtained mostly from precipitation, and to plant species and communities which grow well in these conditions.

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.

Overbank flooding – Any situation in which inundation occurs as a result of the water level of a stream rising above bank level.

Paludified – Water levels or saturation affected by paludification processes, i.e., peat mosses wicking up water from a depression, spring, or seep and thereby allowing the wetland to creep uphill, smothering upland vegetation and converting these sites to wetland

Partly drained – Ditched or tile-drained but still wet enough to be considered wetland

Peat – An accumulation of partially decayed vegetation matter or histosol formed in areas where full decomposition is inhibited by acidic and anaerobic conditions.

Periodically – Detectable regular or irregular saturated soil conditions or inundation, resulting in ponding of groundwater, precipitation, overland flow, stream flooding or tidal influences that occur(s) with hours, days, weeks, months or even years between events.

Permanently flooded – Inundated year-round in all years.

Permanently saturated – High water tables virtually year-round, conditions favor development of peat.

Plant Community – All of the plant populations occurring in a shared habitat or environment.

Ponded – A condition in which water stands in a closed depression. Water may be removed only by percolation, evaporation and/or transpiration.

Poorly Drained – Soils that commonly are wet at or near the surface during a sufficient part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these conditions.

Positive Wetland Indicator – Any evidence of the presence of hydrophytic vegetation, hydric soil and/or wetland hydrology in an area.

Preliminary Wetland Determination – The process or procedure by which an area is adjudged a wetland or non-wetland outside of the accepted growing season (May 1 – September 30).

Reduced soil – A soil in which oxygen has been removed and chemical reduction of ions has taken place.

Redox Features – A distinct soil morphological characteristic most readily observable by a change in soil colour. Redox features are formed by the reduction of iron and manganese oxides in the soil when in an anaerobic state i.e. soil is saturated and there is an absence of oxygen.

Regularly flooded-tidal – Inundated by the tides at least once daily.

Rehabilitation – Improving the function and values of a degraded wetland.

Relief – The elevation of a land surface between two points; including the configuration of features such as hills and valleys.

Restoration – Changing existing function and structure of wetland habitat so that it is similar to historical conditions.

Restored – Former wetland that was destroyed (e.g., effectively drained, filled, or excavated) that has regained its wetland functions by human intervention, or existing wetland with impaired functions whose functions have been completely or partially improved by human action where the goal is to restore natural functions

Rhizosphere – The zone of soil in which interactions between living plant roots and microorganisms occur.

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

Root Zone – The portion of a soil profile in which plant roots occur.

Salt Marsh – Tidal wetland flooded by salt water and characterized by halophytic plants

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.

Seasonally flooded – Inundated for extended periods usually early in the growing season, typically flooded for more than a week

Seasonally saturated – High water tables for extended periods during the year, usually from late fall into spring, conditions favor development of mineral hydric soils

Semi-permanently flooded – Inundated year-round in most years, except extended dry periods (including droughts.

Soil matrix – The portion of a given soil having the dominant colour. In most cases, the matrix will be the portion of the soil having more than 50 percent of the same colour.

Soil texture – The relative proportions of the various sizes of particles in a soil.

Stunted – The inhibition of growth and development of trees and shrubs attributed to an excess of soil moisture (hydrology) and/or shallow rooting zones i.e. shallow bedrock.

Substrate – The base on which an attached species is growing.

Succession – Replacement of one vegetation community by another. Succession may be human induced or natural due to forces such as climate, hydrology or species competition.

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

Terrene Pond –Located along the shores of an isolated pond (no outlet)

Temporarily flooded – Inundated for brief periods usually at the beginning of the growing season, typically flooded for a week or less

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

Topography – The pattern of the soil surface, including its relief and the position of its natural and manmade features.

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

Transition Zone – The area in which a change from one vegetation community to another, or from wetland to non-wetland habitat occurs.

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

Upland – Any area that does not qualify as a wetland because the associated hydrologic regime is not sufficiently wet to elicit development of vegetation, soils and/or hydrologic characteristics associated with wetlands. Such areas occurring within floodplains are more appropriately termed non-wetlands.

Value (soil colour) – The relative lightness or intensity of a colour.

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.

Watershed – An area of land where water from rain and melting snow or ice drains downhill into a body of water, such as a river, lake reservoir, estuary etc. The watershed includes the streams and rivers that convey the water as well as wetlands and other natural heritage features and land surfaces from which water drains. The principle of ‘everything is connected’ is clearly evident in a watershed, as it involves water and any other feature or function that affects or is affected by water.

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

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 id adjudged a wetland or non wetland.

Table 1: Wetland Characteristics , Lake Major, Cherry Brook, NS *Project # 16-5741*

WETLAND ID	WETLAND SIZE (sq.m)	WETLAND TYPE	LANDSCAPE POSITION	LANDFORM	WATER FLOW	SOIL TYPE	SURFACE/HYDROLOGIC CONDITIONS	WETLAND BOUNDARY	DOMINANT VEGETATION			HYDROLOGIC CONNECTION WITH LAKE
									Herbs	Shrubs	Trees	
WL1	318.6	Shrub Swamp	Terrene	Basin	Isolated	Histosol (20 cm on bedrock)	1) High water table 2) Hydrogen sulfide odour 3) Surface water (20 - 30 cm) 3) Saturation at surface	Steep (east), moderate (west)	*Maianthemum canadensis; Oclemena nemoralis; Rubus hispidus; Spiraea alba*	*Alnus incana; Spiraea alba*	*Acer rubrum*	Isolated from the lake by high ridge (approximately 2 m). There is no apparent hydrologic connection between the wetland and the lake.
WL2	1,089.70	Treed Swamp	Lotic Stream/ Lentic Lake	Fringe	Throughflow	Histosol (20 cm on bedrock)	1) Saturated at surface 2) Intermittent standing water 3) Intermittent watercourse	Gentle	*Carex Trisperma; Calamagrostis canadensis; Trientalis borealis; Oclemena acuminata*	*Alnus incana; Abies balsamea; Picea mariana*	*Alnus incana; Abies balsamea*	Contigous with lake where an intermittent watercourse flows in.
WL3	191.2	Treed Swamp	Lotic Stream/ Lentic Lake	Fringe	Throughflow	Histosol (20 cm on bedrock)	1) Saturated at surface 2) Intermittent standing water 3) Intermittent watercourse	Gentle	*Carex Trisperma; Calamagrostis canadensis; Trientalis borealis; Oclemena acuminata; Maianthemum canadensis*	*Alnus incana; Abies balsamea*	*Abies Balsamea*	Contigous with lake where an intermittent watercourse flows in.
WL4	400.2	Treed Swamp	Lentic Lake/ Lotic Stream	Fringe	Throughflow	Histosol (20 cm on rock)	1) Saturated at surface 2) Intermittent standing water 3) Intermittent watercourse	Moderate	*Iris versicolor; Acer pensylvanicum; Oclemena acuminata; Onoclea sensiblis; Maianthemum canadensis;Rubus hispidus; Aralia nudicaulis; Trientalis borealis*	*Abies balsamea;*	*Acer rubrum; Abies balsamea; Fraxinus americana*	Contiguous with lake.
WL5	426.3	Treed Swamp	Lentic Lake	Fringe	Throughflow	Histosol (20 cm on bedrock)	1) Saturated at surface 2) Water stained leaves	Moderate	*Osmunda regalis; Cornus canadensis; Trientalis borealis; Carex folliculata; Aster sp.*	*Gaylussacia baccata; Rhododendron canadense; Acer rubrum; Myrica gale*	*Acer rubrum; Picea mariana; Pinus Strobus;*	Contiguous with lake.
WL6	2,306.30	Treed Swamp/ Fen	Lentic Lake	Fringe	Outflow	Histosol (50 cm+)	1) Saturated at surface 2) Intermittent surface water 3) Water stained leaves 4) Drainage patterns	Steep	*Carex echinata; Vaccinium macrocarpon; Chamaedaphne calyculata; Myrica gale; Rubus hispidus; Spiraea alba; Sarracenia purpurea; Dulichium arundinaceum*	*Myrica gale; Alnus incana; Acer rubrum; Chamaedaphne calyculata*	*Acer rubrum; Picea mariana; Pinus strobus (wetland edge)*	Contiguous with lake.
WL7	1,568.80	Treed swamp/ Fen	Lentic Lake	Fringe	Outflow	Histosol (25 cm on rock)	1) Saturation 2) Drainage patterns 3) Water stained leaves 4) Surface water	Steep	*Trientalis borealis; Osmunda regalis; Rubus hispidus; Acer Rubrum; Alnus incana; Morella pensylvanica; Picea mariana*	*Alnus incana; Acer rubrum; Morella pensylvanica; Vburnum nudum;*	*Acer rubrum; Picea mariana; Abies balsamea*	Contiguous with lake.
WL8	18,093.10	Treed Swamp/ Fen	Lentic Lake	Fringe	Throughflow	Histosol (60 cm+)	1) Surface water 2) Water stained leaves 3) Saturated at surface	Steep	*Sarracenia purpurea; Carex nigra; Vaccinium macrocarpon; Myrica gale; Carex folliculata; Chamaedaphne calyculata; Dulichium arundinaceum; Osmunda regalis; Iris versicolor*	*Myrica gale; Alnus incana; Betula populifolia*	*Alnus incana; Abies balsamea*	Contiguous with lake.

Strum CONSULTING

WETLAND ID	WETLAND SIZE (sq.m)	WETLAND TYPE	LANDSCAPE POSITION	LANDFORM	WATER FLOW	SOIL TYPE	SURFACE/HYDROLOGIC CONDITIONS	WETLAND BOUNDARY	DOMINANT VEGETATION			HYDROLOGIC CONNECTION WITH LAKE
									Herbs	Shrubs	Trees	
WL9	651.8	Treed swamp	Lentic Lake	Fringe	Outflow	Histosol (40 cm on rock)	1) Saturated at surface 2) Drainage patterns 3) Water stained leaves	Steep	*Viburnum nudum; Iris versicolor; Kalmia angustifoloia; Chamaedaphne calyculata; Cornus canadensis; Trientalis borealis; Osmunda cinnamomea; Rubus hispidus*	*Ilex verticillata; Abies balsamea; Picea mariana; Myrica gale*	Acer rubrum;	Contiguous with lake.
WL10	485.1	Shrub Swamp	Terrene	Basin	Outflow	Histosol (40 cm on rock)	1) Saturated at surface 2) Intermittent standing water (up to 30 cm)	Steep	*Viburnum nudum; Pinus strobus; Rubus hispidus; Cornus canadensis; Iris versicolor; Spiraea alba; Osmunda cinnamomea*	*Viburnum nudum; Ilex verticillata; Alnus incana; Abies balsamea; Acer rubrum, Larix laricina*	*Acer rubrum; Picea mariana;*	Located 1-2 m up from the lake's water surface. There is a small outlet from the wetland into the lake, but no apparent inflow of lake water into the wetland.
WL11	842.8	Fen	Lentic Lake	Fringe	Throughflow	Histosol (40 cm on rock)	1) Saturated at surface 2) Ponded water	Steep	*Osmunda regalis; Myrica gale; Oclemena nemoralis*	*Rhododendron canadense; Myrica gale; Gaylussacia baccata*	*Pinus Strobus; Acer rubrum*	Contiguous with lake.
WL12	2,065.60	Bog	Terrene	Basin	Isolated	Histosol (50 cm+)	1) Saturated at surface 2) Intermittent surface water	Moderate	*Chamadaphne Calyculata; Vaccinium macrocarpon; Dulichium arundinaceum*	*Myrica gale; Chamaedaphne calyculata; Picea mariana*	none	Located approximatley 2 m up from the lake's water surface. No apparent hydrologic connection between the wetland the lake.
WL13	737.7	Treed Swamp/ Fen	Lentic Lake	Fringe	Throughflow	Histosol	1) Saturated at surface	Steep	*Osmunda regalis; Rhododendron canadense; Rubus hispidus; Chamaedaphne calyculata; Oclemena nemoralis*	*Rhododendron canadense; Alnus incana; Picea mariana; Myrica gale*	*Acer rubrum; Picea mariana*	Contiguous with lake.

APPENDIX F
BIRD SURVEY COMPONENT STUDY

Table 1: Breeding Bird Survey Results , Lake Major, NS *Project # 16-5799*

Common Name	Scientific Name	Guild	Observed in the Morning?	Observed in the Evening?	Pre-Construction Breeding Bird Surveys (2012)		SARA Status	NSESA Status	COSEWIC Status	NSDNR Status	NS S-Rank
					Number Observed	Breeding Evidence*					
Alder Flycatcher	*Empidonax alnorum*	Passerine	Yes	No	2	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5B
American Black Duck	*Anas rubripes*	Waterfowl	Yes	Yes	15	FY - Confirmed Breeding	Not Listed	Not Listed	Not Listed	Secure	S5
American Crow	*Corvus brachyrhynchos*	Passerine	Yes	Yes	19	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5
American Goldfinch	*Spinus tristis*	Passerine	Yes	No	23	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5
American Redstart	*Setophaga ruticilla*	Passerine	Yes	No	3	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5B
American Robin	*Turdus migratorius*	Passerine	Yes	No	4	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5B
Bald Eagle	*Haliaeetus leucocephalus*	Raptor	Yes	No	3	H - Possible	Not Listed	Not Listed	Not at Risk	Secure	S4
Black-capped Chickadee	*Poecile atricapillus*	Passerine	Yes	No	35	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5
Black-throated Green Warbler	*Setophaga virens*	Passerine	Yes	No	1	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S4S5B
Blue Jay	*Cyanocitta cristata*	Passerine	Yes	Yes	7	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5
Blue-headed Vireo	*Vireo solitarius*	Passerine	Yes	No	14	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5B
Broad-winged Hawk	*Buteo platypterus*	Raptor	Yes	Yes	6	P- Probable	Not Listed	Not Listed	Not Listed	Secure	S4S5B
Common Grackle	*Quiscalus quiscula*	Passerine	Yes	No	4	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5B
Common Loon	*Gavia immer*	Waterfowl	Yes	No	2	P-Probable	Not Listed	Not Listed	Not at Risk	May Be At Risk	S3B,S4N
Common Raven	*Corvus corax*	Passerine	Yes	Yes	36	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5
Dark-eyed Junco	*Junco hyemalis*	Passerine	Yes	No	2	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S4S5
Double-crested Cormorant	*Phalacrocorax auritus*	Waterfowl	No	Yes	1	H - Possible	Not Listed	Not Listed	Not at Risk	Secure	S5B
Great Horned Owl	*Bubo virginianus*	Raptor	Yes	No	1	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5
Hermit Thrush	*Catharus guttatus*	Passerine	Yes	Yes	12	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5B
Herring Gull	*Larus argentatus*	Seabird	Yes	Yes	4	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S4S5
Lesser Black-backed Gull	*Larus fuscus*	Seabird	No	Yes	1	H - Possible	Not Listed	Not Listed	Not Listed	Accidental	SNA
Mallard	*Anas platyrhynchos*	Waterfowl	Yes	Yes	5	FY - Confirmed Breeding	Not Listed	Not Listed	Not Listed	Secure	S5
Northern Flicker	*Colaptes auratus*	Passerine	Yes	No	4	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5B
Osprey	*Pandion haliaetus*	Raptor	Yes	No	1	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5B
Pileated Woodpecker	*Dryocopus pileatus*	Passerine	Yes	No	1	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5
Pine Siskin	*Spinus pinus*	Passerine	Yes	No	6	H - Possible	Not Listed	Not Listed	Not Listed	Sensitive	S3S4B, S5N
Red-breasted Nuthatch	*Sitta canadensis*	Passerine	Yes	No	11	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S4S5
Red-eyed Vireo	*Vireo olivaceus*	Passerine	Yes	No	7	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5B
Semipalmated Plover	*Charadrius semipalmatus*	Shorebird	Yes	No	1	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S1S2B,S5M
Song Sparrow	*Melospiza melodia*	Passerine	Yes	No	3	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5B
Spotted Sandpiper	*Actitis macularius*	Shorebird	Yes	No	1	H - Possible	Not Listed	Not Listed	Not Listed	Sensitive	S3S4B
White-throated Sparrow	*Zonotrichia albicollis*	Passerine	Yes	No	2	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S5B
White-winged Crossbill	*Loxia leucoptera*	Passerine	Yes	No	2	H - Possible	Not Listed	Not Listed	Not Listed	Secure	S4S5

Table 2: Detailed Fall Migration Survey Results, Lake Major, NS *Project # 16-5799*

Date	Wind Speed KMPH	Wind Direction	Conditions	Temperature	Water Level in Lake	Species	Number	Flyover	Lacustarine Stopover	Terrestrial Stopover	Flight Direction	Notes
02-Sep-16	15	N	Overcast	15	Slightly Low	American Black Duck	2	ü	…	…	SW	…
02-Sep-16	15	N	Overcast	15	Slightly Low	American Crow	1	ü	…	…	S	…
02-Sep-16	15	N	Overcast	15	Slightly Low	Blue Jay	8	…	…	ü	…	…
02-Sep-16	15	N	Overcast	15	Slightly Low	American Goldfinch	4	…	…	ü	…	…
02-Sep-16	15	N	Overcast	15	Slightly Low	American Crow	7	…	…	ü	…	…
02-Sep-16	15	N	Overcast	15	Slightly Low	American Crow	2	ü	…	…	S	…
02-Sep-16	15	N	Overcast	15	Slightly Low	Bald Eagle	1	ü	…	…	S	…
02-Sep-16	15	N	Overcast	15	Slightly Low	Common Raven	1	ü	…	…	S	…
02-Sep-16	15	N	Overcast	15	Slightly Low	American Robin	6		…	ü	…	…
02-Sep-16	15	N	Overcast	15	Slightly Low	Pine Siskin	6	ü	…	…	SE	…
02-Sep-16	15	N	Overcast	15	Slightly Low	White-winged Crossbills	11	ü	…	…	SE	…
02-Sep-16	15	N	Overcast	15	Slightly Low	European Starling	40	ü	…	…	E	…
02-Sep-16	15	S	Overcast	15	Slightly Low	Semi Palmated Plover	1	…	ü	…	…	Foraging on exposed shoreline
02-Sep-16	15	N	Overcast	15	Slightly Low	Cedar Waxwing	1	…	ü	…	…	…
02-Sep-16	15	N	Overcast	15	Slightly Low	European Starling	11	…	…	ü	…	…
02-Sep-16	20	N	Fog / light rain	18	Slightly Low	European Starling	21	ü	…	…	SE	…
02-Sep-16	20	N	Fog / light rain	18	Slightly Low	Belted Kingfisher	1	…	…	…	W	…
02-Sep-16	20	N	Fog / light rain	18	Slightly Low	European Starling	31	ü	…	…	SW	…
02-Sep-16	20	N	Fog / light rain	18	Slightly Low	American Black Duck	1	…	ü	…	…	Approached from East, landed in lake
02-Sep-16	20	N	Fog / light rain	18	Slightly Low	Mourning Dove	1	ü	…	…	S	…
02-Sep-16	20	N	Fog / light rain	18	Slightly Low	American Crow	1	ü	…	…	S	…
02-Sep-16	20	N	Fog / light rain	18	Slightly Low	Common Raven	2	ü	…	…	E	…
02-Sep-16	20	N	Fog / light rain	18	Slightly Low	Blue Jay	2	ü	…	…	E	…
02-Sep-16	20	N	Fog / light rain	18	Slightly Low	Mallard	2	…	ü	…	…	…
02-Sep-16	20	N	Fog / light rain	18	Slightly Low	European Starling	40	ü	…	…	E	…
13-Sep-16	Low	N/A	Clear	12	Low	Belted Kingfisher	1	ü	…	…	E	…
13-Sep-16	Low	N/A	Clear	12	Low	Blue Jay	1	ü	…	…	S	…
13-Sep-16	Low	N/A	Clear	12	Low	Greater Yellowlegs	1	…	ü	…	…	…
13-Sep-16	Low	N/A	Clear	12	Low	Blue Jay	1	ü	…	…	S	…
13-Sep-16	Low	N/A	Clear	12	Low	Greater Yellowlegs	1	…	ü	…	…	…
13-Sep-16	Low	N/A	Clear	12	Low	Blue Jay	2	ü	…	…	S	…
13-Sep-16	Low	N/A	Clear	12	Low	Blue Jay	1	ü	…	…	…	…
13-Sep-16	Low	N/A	Clear	12	Low	Blue Jay	4	ü	…	…	NW	…
13-Sep-16	Low	N/A	Clear	12	Low	Blue Jay	3	ü	…	…	SE	…
13-Sep-16	Low	N/A	Clear	12	Low	American Crow	4	ü	…	…	W	…
13-Sep-16	Low	N/A	Clear	12	Low	Mourning Dove	2	…	ü	…	…	…
13-Sep-16	Low	N/A	Clear	12	Low	Black-capped Chickadee	6	…	…	ü	…	…
13-Sep-16	Low	N/A	Clear	12	Low	Belted Kingfisher	1	…	…	ü	…	…
13-Sep-16	10	N	Clear	15	Low	American Goldfinch	6	ü	…	…	S	…
13-Sep-16	10	N	Clear	15	Low	American Black Duck	2	ü	…	…	S	…
13-Sep-16	10	N	Clear	15	Low	Pileated Woodpecker	1	ü	…	…	W	…
13-Sep-16	10	N	Clear	15	Low	Mallard	3	…	ü	…	…	Family
13-Sep-16	10	N	Clear	15	Low	Common Grackle	20	…	…	ü	…	…
13-Sep-16	10	N	Clear	15	Low	European Starling	30	ü	…	…	S	…
13-Sep-16	10	N	Clear	15	Low	American Crow	6	ü	…	…	W	…
13-Sep-16	10	N	Clear	15	Low	American Crow	5	ü	…	…	SE	…
29-Sep-16	20	N	Cloudy	5	Very Low	American Crow	4	ü	…	…	W	…
29-Sep-16	20	N	Cloudy	5	Very Low	American Crow	10	…	…	ü	…	…
29-Sep-16	20	N	Cloudy	5	Very Low	American Black Duck	5	…	ü	…	…	…
29-Sep-16	20	N	Cloudy	5	Very Low	American Crow	2	ü	…	…	E	…
29-Sep-16	20	N	Cloudy	5	Very Low	American Black Duck	1	ü	…	…	S	Flow south from lake
29-Sep-16	20	N	Cloudy	5	Very Low	American Goldfinch	3	ü	…	…	S	…
29-Sep-16	20	N	Cloudy	5	Very Low	Osprey	1	ü	…	…	E	Soaring slowly, probably hunting in lake
29-Sep-16	20	N	Cloudy	5	Very Low	Common Grackle	7	ü	…	…	S	…
29-Sep-16	20	N	Cloudy	5	Very Low	Blue Jay	5	…	…	ü	…	…
29-Sep-16	20	N	Cloudy	5	Very Low	American Black Duck	2	ü	…	…	S	…
29-Sep-16	20	N	Cloudy	5	Very Low	Common Raven	4	ü	…	…	S	…
29-Sep-16	20	N	Cloudy	5	Very Low	American Crow	3	ü	…	…	S	…

Table 2: Detailed Fall Migration Survey Results, Lake Major, NS *Project # 16-5799*

Date	Wind Speed KMPH	Wind Direction	Conditions	Temperature	Water Level in Lake	Species	Number	Flyover	Lacustarine Stopover	Terrestrial Stopover	Flight Direction	Notes
29-Sep-16	20	N	Cloudy	5	Very Low	Common Tern	1	ü	…	…	S	Possibly hunting in lake further north
29-Sep-16	20	N	Cloudy	5	Very Low	American Robin	10	…	…	ü	…	…
29-Sep-16	20	N	Cloudy	5	Very Low	Double-crested Cormrant	35	ü	…	…	S	…
29-Sep-16	20	N	Cloudy	5	Very Low	Double-crested Cormrant	50	ü	…	…	S	…
29-Sep-16	20	N	Cloudy	5	Very Low	Double-crested Cormrant	1	…	ü	…	…	Came from N, landed in lake
29-Sep-16	20	N	Cloudy	5	Very Low	American Black Duck	3	…	ü	…	…	Foraging in shallows
29-Sep-16	20	N	Cloudy	5	Very Low	Black-backed Gull	1	ü	…	…	S	…
29-Sep-16	20	N	Cloudy	5	Very Low	Northern Harrier	1	ü	…	…	W	Possibly hunting
17-Oct-16	10	NE	Cloudy	9	Slightly Low	Mallard	3	…	…	ü	…	…
17-Oct-16	10	NE	Cloudy	9	Slightly Low	American Crow	4	ü	…	…	W	…
17-Oct-16	10	NE	Cloudy	9	Slightly Low	American Black Duck	24	ü	…	…	S	Large duck flock
17-Oct-16	10	NE	Cloudy	9	Slightly Low	Ring Billed Gull	1	ü	…	…	N	…
17-Oct-16	10	NE	Cloudy	9	Slightly Low	Blue Jay	3	ü	…	…	S	…
17-Oct-16	10	NE	Cloudy	9	Slightly Low	Black-capped Chickadee	10	…	…	ü	…	…
17-Oct-16	10	NE	Cloudy	9	Slightly Low	Warbler Spp.	8	…	…	ü	…	…
17-Oct-16	10	NE	Cloudy	9	Slightly Low	Blue Jay	12	…	…	ü	…	…
17-Oct-16	10	NE	Cloudy	9	Slightly Low	Mallard	1	…	ü	…	…	…
17-Oct-16	10	NE	Cloudy	9	Slightly Low	Kestrel	2	ü	…	…	N	…
17-Oct-16	10	NE	Cloudy	9	Slightly Low	Herring Gull	1	ü	…	…	N	

Table 3: Fall Migration Results Summary, Lake Major, NS ***Project # 16-5799***

Common Name	Scientific Name	Guild	Number Observed	SARA Status	NSESA Status	COSEWIC Status	NSDNR	NS S-Rank
American Black Duck	*Anas rubripes*	Waterfowl	40	Not Listed	Not Listed	Not Listed	Secure	S5
American Crow	*Corvus brachyrhynchos*	Passerine	49	Not Listed	Not Listed	Not Listed	Secure	S5
American Goldfinch	*Spinus tristis*	Passerine	13	Not Listed	Not Listed	Not Listed	Secure	S5
American Robin	*Turdus migratorius*	Passerine	16	Not Listed	Not Listed	Not Listed	Secure	S5B
Bald Eagle	*Haliaeetus leucocephalus*	Raptor	1	Not Listed	Not Listed	Not at Risk	Secure	S4
Belted Kingfisher	*Megaceryle alcyon*	Passerine	3	Not Listed	Not Listed	Not Listed	Secure	S5B
Great Black-backed Gull	*Larus marinus*	Seabird	1	Not Listed	Not Listed	Not Listed	Secure	S4
Black-capped Chickadee	*Poecile atricapillus*	Passerine	16	Not Listed	Not Listed	Not Listed	Secure	S5
Blue Jay	*Cyanocitta cristata*	Passerine	41	Not Listed	Not Listed	Not Listed	Secure	S5
Cedar Waxwing	*Bombycilla cedrorum*	Passerine	1	Not Listed	Not Listed	Not Listed	Secure	S5B
Common Grackle	*Quiscalus quiscula*	Passerine	27	Not Listed	Not Listed	Not Listed	Secure	S5B
Common Raven	*Corvus corax*	Passerine	7	Not Listed	Not Listed	Not Listed	Secure	S5
Common Tern	*Sterna hirundo*	Seabird	1	Not Listed	Not Listed	Not at Risk	Sensitive	S3B
Double-crested Cormorant	*Phalacrocorax auritus*	Waterfowl	86	Not Listed	Not Listed	Not at Risk	Secure	S5B
European Starling	*Sturnus vulgaris*	Passerine	173	Not Listed	Not Listed	Not Listed	Exotic	SNA
Greater Yellowlegs	*Tringa melanoleuca*	Shorebird	1	Not Listed	Not Listed	Not Listed	Sensitive	S3B,S5M
Herring Gull	*Larus argentatus*	Seabird	1	Not Listed	Not Listed	Not Listed	Secure	S4S5
American Kestrel	*Falco sparverius*	Raptor	2	Not Listed	Not Listed	Not Listed	Secure	S5B
Mallard	*Anas platyrhynchos*	Waterfowl	9	Not Listed	Not Listed	Not Listed	Secure	S5
Mourning Dove	*Zenaida macroura*	Passerine	3	Not Listed	Not Listed	Not Listed	Secure	S5
Northern Harrier	*Circus cyaneus*	Raptor	1	Not Listed	Not Listed	Not at Risk	Secure	S5B
Osprey	*Pandion haliaetus*	Raptor	1	Not Listed	Not Listed	Not Listed	Secure	S5B
Pileated Woodpecker	*Dryocopus pileatus*	Passerine	1	Not Listed	Not Listed	Not Listed	Secure	S5
Pine Siskin	*Spinus pinus*	Passerine	6	Not Listed	Not Listed	Not Listed	Sensitive	S3S4B, S5N
Ring-billed Gull	*Larus delawarensis*	Seabird	1	Not Listed	Not Listed	Not Listed	Secure	S1?B,S5N
Semipalmated Plover	*Charadrius semipalmatus*	Shorebird	1	Not Listed	Not Listed	Not Listed	Secure	S1S2B,S5M
Warbler Spp.	Unknown	Passerine	8	Unknown	Unknown	Unknown	Unknown	Unknown
White-winged Crossbill	*Loxia leucoptera*	Passerine	11	Not Listed	Not Listed	Not Listed	Secure	S4S5

APPENDIX G
NSDNR PERMIT

Department of
Environment & Labour

PO Box 697
Halifax, Nova Scotia
B3J 2T8

Our File Number

Nova Scotia

Office of the Minister

LICENCE TO CONDUCT ACTIVITIES NECESSARY TO EXERCISE A PRE-EXISTING INTEREST UNDER SUBSECTION 25(4) OF THE *WILDERNESS AREAS PROTECTION ACT*

WHEREAS the Halifax Regional Water Commission (the "Licencee") is the waterworks operator responsible for the infrastructure built and maintained as part of the Lake Major Water Supply, and is also responsible, under Section 106 of the *Environment Act*, for protecting the Lake Major Protected Water Area (the "Protected Water Area");

AND WHEREAS the Licencee has the responsibility for planning for future capacity and viability of the water supply for the Halifax Regional Municipality;

AND WHEREAS a portion of the Protected Water Area is within Waverley-Salmon River Long Lake Wilderness Area (the "Lands"), as described in Schedule "A", attached to and forming part of this Licence;

AND WHEREAS certain activities necessary for carrying out the Licencee's responsibilities would otherwise be prohibited under Sections 17 and 27 of the *Wilderness Areas Protection Act* (the 'Act');

AND WHEREAS the Licencee has a pre-existing interest as recognized under Section 25 of the Act;

The Minister of Environment and Labour (the "Licencor") hereby issues this Licence to the Licencee, under subsection 25(4) of the Act, to carry out activities on the Lands which would otherwise be prohibited under Section 17 of the Act, and which are necessary to exercise the above-noted interest. The Licence is subject to the General Terms and Conditions set out in the attached Schedule "B" as well as the Specific Terms and Conditions set out in the attached Schedule "C".

This licence is valid from the date of execution by both the Licencee and the Licencor until such time as the lands are no longer part of the water supply for the Halifax Regional Municipality.

This Licence is subject to cancellation by the Licencor, or person authorized by the Licencor, for non-compliance by the Licencee with the Act or its regulations, or any terms and conditions of this Licence.

This Licence is issued at Halifax in the Province of Nova Scotia this 15 day of May, 2007.

2007 Licence No. HRWC-01-2007

Mark Parent

Mark Parent, Minister
Nova Scotia Environment and Labour

Schedule "B"
General Terms and Conditions
(Licence No. HRWC-01-2007 for managing that portion of Lake Major Protected Water Area within Waverley-Salmon River Long Lake Wilderness Area)

1. The Licencor may cancel this Licence at any time by serving notice in writing to the Licencee at his/her last known address.

2. The Licencee understands that the Act shall apply at all times to activities within the Lands. No prohibited activities are to occur, other than the work or activities expressly authorized in this Licence as permitted under Section 25 of the Act.

3. This Licence does not impliedly grant any approval or authority to carry out activities which are prohibited under the Act, other than those that are identified in this Licence or attached Schedules.

4. Should this Licence be withdrawn for any reason, the Licencor shall not be held responsible for any costs or losses incurred by the Licencee by virtue of permission given to the Licencee in this Licence.

5. Her Majesty the Queen in right of the Province of Nova Scotia and the Licencor shall not be liable for any injury or damage (including death) to any person or for the loss of or damage to the property of the Licencee or any other party, in any manner based upon, occasioned by or in any way attributable to the performance of any act under this Licence.

6. The Licencee shall at all times indemnify and save harmless Her Majesty the Queen in right of the Province of Nova Scotia and the Licencor from and against all claims, demands, losses, costs, debts, damages, actions, suits or other proceedings by whomever made, sustained, brought or prosecuted in any manner based upon, occasioned by, arising out of or attributable in any way to the performance of any act under this Licence by, or the negligence of, Licencee, its servants, agents, or independent contractors.

7. The Licencee is an independent contractor and neither it, nor its employees or any sub-contractor shall be deemed to be an employee, servant or agent of the Department of Environment and Labour or Her Majesty the Queen in right of the Province of Nova Scotia.

8. The Licencee is responsible for obtaining access across any privately owned lands and rights of way.

9. The Licencee shall at all times comply with any applicable federal, provincial and municipal laws, related to the activities authorized by this Licence. It is the sole responsibility of the Licencee to obtain any permits which may be required for carrying out work or activities authorized by this Licence.

10. Without limiting the generality of condition 9, the Licencee must fully comply with all applicable labour laws and standards including the *Occupational Health and Safety Act* and any regulations made pursuant to it.

Schedule "C"
Specific Terms and Conditions
(Licence No. HRWC-01-2007 for activities within
Waverley-Salmon River Long Lake Wilderness Area)

1. With prior consent from the Licencor, the Licencee is permitted to carry out activities and developments which would otherwise be prohibited under the Act, and which are reasonably necessary for the development, operation, maintenance, expansion, restoration, repair, or dismantling of the Licencee's municipal water supply, including, but not limited to:

   (a) maintenance, operation and use of the East Lake dam; and

   (b) maintenance or use of the East Lake access road.

2. For the purpose of this Licence, consent from the Licencor means written authorization from the Manager of Protected Areas or Central Region Protected Areas Coordinator. The Licencor shall not unreasonably refuse consent. To obtain consent, contact:

   Protected Areas Coordinator, Central Region
   NS Environment and Labour
   Box 697 Halifax, NS B3J 2T8
   tel. 902-424-2123 email: maassoc@gov.ns.ca

3. The Licencee need not obtain the Licencor's consent for the following activities on the Lands:

   (a) posting signs at intervals along the boundary of the Protected Water Area, as required to enable the Licencee to meet its obligations under the *Environment Act* with respect to the Protected Water Area.

   (b) blazing the boundaries of the watershed as necessary, to maintain the boundaries, including marking, blazing and cutting of trees.

   (c) using vehicles, including all-terrain vehicles (ATV's) and snowmobiles, on the existing roadway to East Lake, for the purpose of operating or maintaining the dam and protecting the watershed.

   (d) operating motor boats on East Lake for the purpose of operating or maintaining the dam and protecting the watershed.

   (e) temporary flooding of the land abutting the shore of Lake Major or East Lake, beyond the normal high water level as a result of a severe (1 in 100 year) rainfall event. The normal high water level is defined as elevation 20.0 m for Lake Major and elevation 29.9 m for East Lake.

4. The Licencee may carry out activities required in an emergency situation, without the Licencor's immediate consent, in order to fulfill its obligations as waterworks operator, provided that care is taken to have the least environmental impact as possible in the

circumstances and that efforts are made to advise the Licencor as soon as is possible, and obtain consent for any ongoing, related activities. If activities are required in an emergency situation, the Licencee shall contact the Protected Areas Coordinator for the Central Region within 48 hours of the emergency situation.

5. The Licencee shall at all times keep work sites within the Lands, including the East Lake dam site and related access road, clean and tidy to the satisfaction of Nova Scotia Environment and Labour, and shall not cause or permit any nuisance or damage to adjacent or adjoining properties.