

Appendix F:
Wetlands Assessment



September 9, 2013

Ms. Amy Pellerin
Natural Forces Wind Inc.
1801 Hollis Street, Suite 1205
Halifax, NS B3J 3N4

Dear Ms. Pellerin,

Re: Wetland Assessment
Barrachois Community Wind Farm

Strum Consulting completed a desktop review and field surveys for the Barrachois Community Wind Farm (the Project), on behalf of Natural Forces Wind Inc. The objectives of this study were to evaluate the potential presence wetlands at the Project site to support Natural Forces Wind Inc. in the planning stages of the Project.

SITE DETAILS

Natural Forces Wind Inc. has proposed the development of a 4 MW wind energy project located north of Highway 223 (Grand Narrows Highway), Barrachois, in the Cape Breton Municipality (CBRM), Nova Scotia (Drawing 1). The Project site consists of two parcels of land identified by Property Identification Numbers (PIDs) 15189178 and 15537657, and is surrounded by resource forest with the exception of residential properties to the west along Long Island Road. Highway 223 (Grand Narrows Highway) crosses the southeastern corner of the Project site.

An assessment area was defined for the Project based on a general proposed development area (Drawing 2) encompassing two wind turbine generator locations and associated access roads. An existing access road currently extends from Highway 223 throughout the southeastern portion of the site.

METHODOLOGY

Desktop Review

The primary step in wetland delineation involves a review of available local databases and maps. The following resources were consulted as part of this assessment:

Engineering • Surveying • Environmental

Head Office
Railside, 1355 Bedford Hwy.
Bedford, NS B4A 1C5
t. 902.835.5560 (24/7)
f. 902.835.5574

Antigonish Office
3-A Vincent's Way
Antigonish, NS B2G 2X3
t. 902.863.1465
f. 902.863.1389

Deer Lake Office
101 Nicholville Road
Deer Lake, NL A8A 1V5
t. 855.770.5560
f. 902.835.5574

- NS DNR Significant Species and Habitat Database;
- NSDNR Wet Areas Mapping (WAM); and
- Topographic Mapping.

A review of the NSDNR Significant Species and Habitat database identified one treed swamp located in the western portion of the site associated with a mapped indefinite stream discharging to the St. Andrews Channel (NSDNR 2013). In addition, a treed bog or fen is situated along the south-southeastern property boundary, immediately south of Highway 223 (Drawing 3). WAM results indicate the potential for wetland habitat in both areas, in addition to a wet area extending from the southern property boundary into the central portion of the site (NSDNR 2012).

Field Assessment

The wetland assessment was carried out in July 2013 by Strum wetland delineator, John Murray.

The assessment area was walked to assess for potential wetland habitat and the presence of watercourses. Strategic investigational transects were routed to identify the outer extent of the habitat. Where wetland boundaries were observed in the field, individual waypoints to identify the outer edges of the wetland habitat were recorded. Where wetland habitat extended beyond transect routes, approximate wetland boundaries were identified based on field observations and desktop information. Wetland boundaries within the assessment area were defined based on the criteria set out in the US Corps of Engineers Wetland Delineation Manual (1987). The field data was combined with information collected from the NSDNR Significant Species and Habitat database and the WAM database to identify preliminary wetland boundaries.

RESULTS

The approximate locations of wetlands and watercourse are shown on Drawing 4.

Wetland habitat is interspersed throughout the assessment area and consistently comprises treed swamp habitat with imperfect to poorly drained soils. The northern portion of the assessment area contains six treed swamps draining to the south via a field identified watercourse that drains to the south. Tree species observed include immature/mature black spruce, balsam fir, red maple, speckled alder, white birch. Herb and shrub layers consisted of cinnamon fern, grasses, three-sided sedge, brown beakrush, and Canada holly. The south-central portion of the assessment area contains two small treed swamps and one large treed swamp which lies adjacent to the watercourse and drains to the south/southeast. Tree species within this large wetland include sapling/immature black spruce, balsam fir, eastern hemlock, yellow birch, red maple, white spruce and white birch. Herbs and shrubs were dominated by cinnamon fern, slivery spleenwort, Canada holly, grasses and sedges.

A small treed swamp and watercourse are situated adjacent to Highway 223, draining west to east.

CONCLUSIONS

A wetland study was completed within a defined assessment area at the Barrachois Community Wind Project site. Multiple areas of treed swamp habitat and three watercourses were observed during the field survey. Preliminary wetland boundaries and watercourse locations were identified for Project planning.

RECOMMENDATIONS

Once the Project layout is finalized, a detailed assessment for wetland habitat and watercourses should be completed along the access roads and at turbine pad locations. Delineation of wetland boundaries at these locations should be completed in the growing season (June 1 - September 30).

Should development activities require alteration of wetland habitat or a watercourse, provincial permitting will be required.

CLOSURE

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

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,



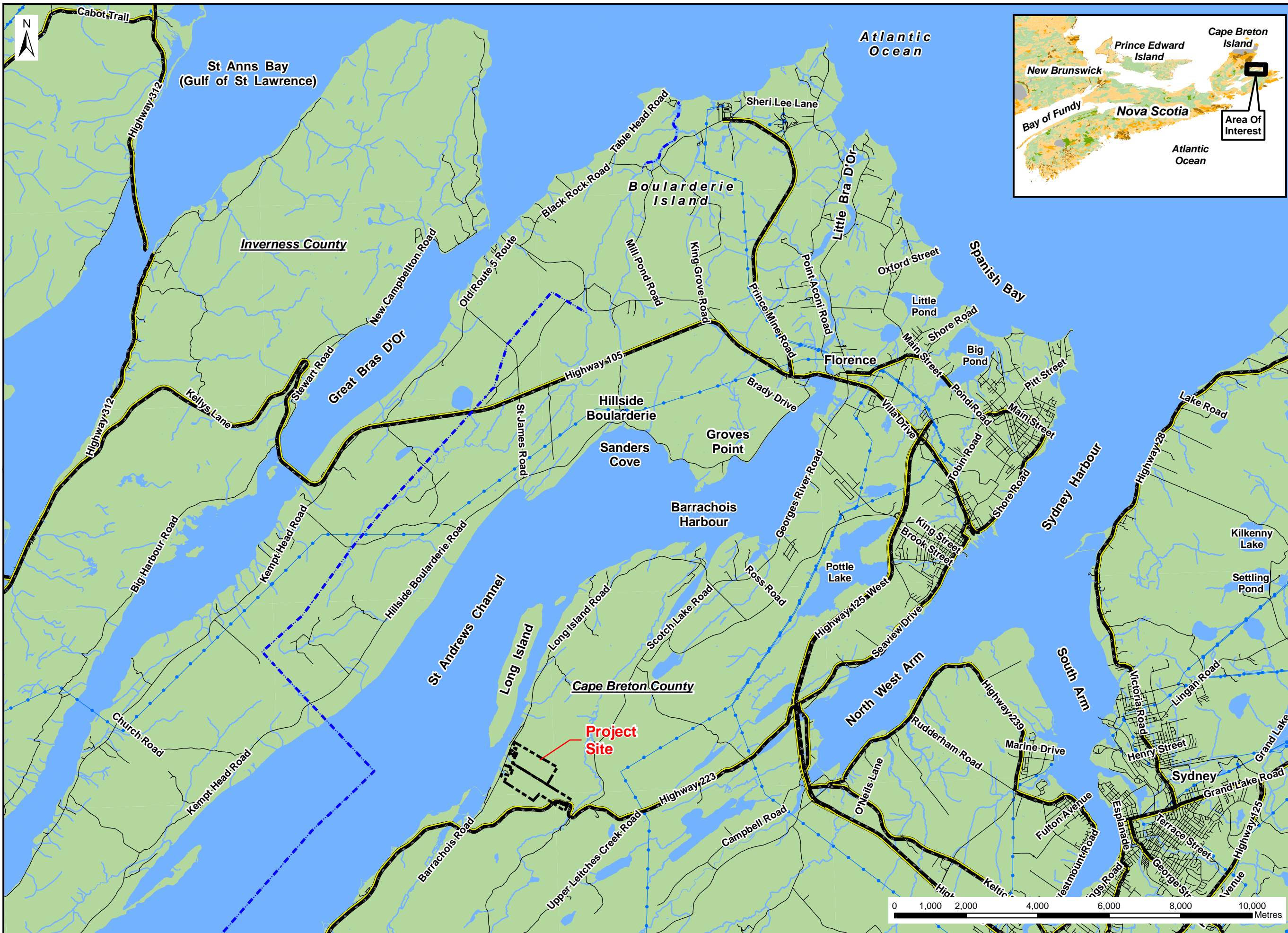
Andy Walter, BSc.
Environmental Specialist
awalter@strum.com

REFERENCES

NSDNR (Nova Scotia Department of Natural Resources). 2012. Wet Areas Mapping and Flow Accumulation Channels. Retrieved from <http://novascotia.ca/natr/forestry/gis/wamdownload.asp>.

NSDNR (Nova Scotia Department of Natural Resources). 2013. Nova Scotia Significant Species and Habitats Database. Retrieved from <http://www.gov.ns.ca/natr/wildlife/habitats/hab-data/>

US Army Corp of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual.



- Notes:**
- Reference: Digital Topographic Mapping by Nova Scotia Geomatics Centre.
 - Projection: NAD83, UTM Zone 20 North.

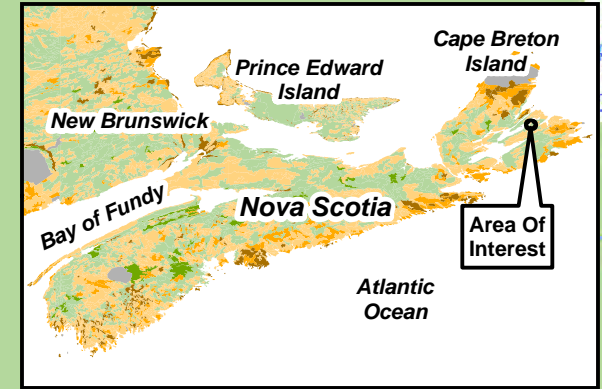
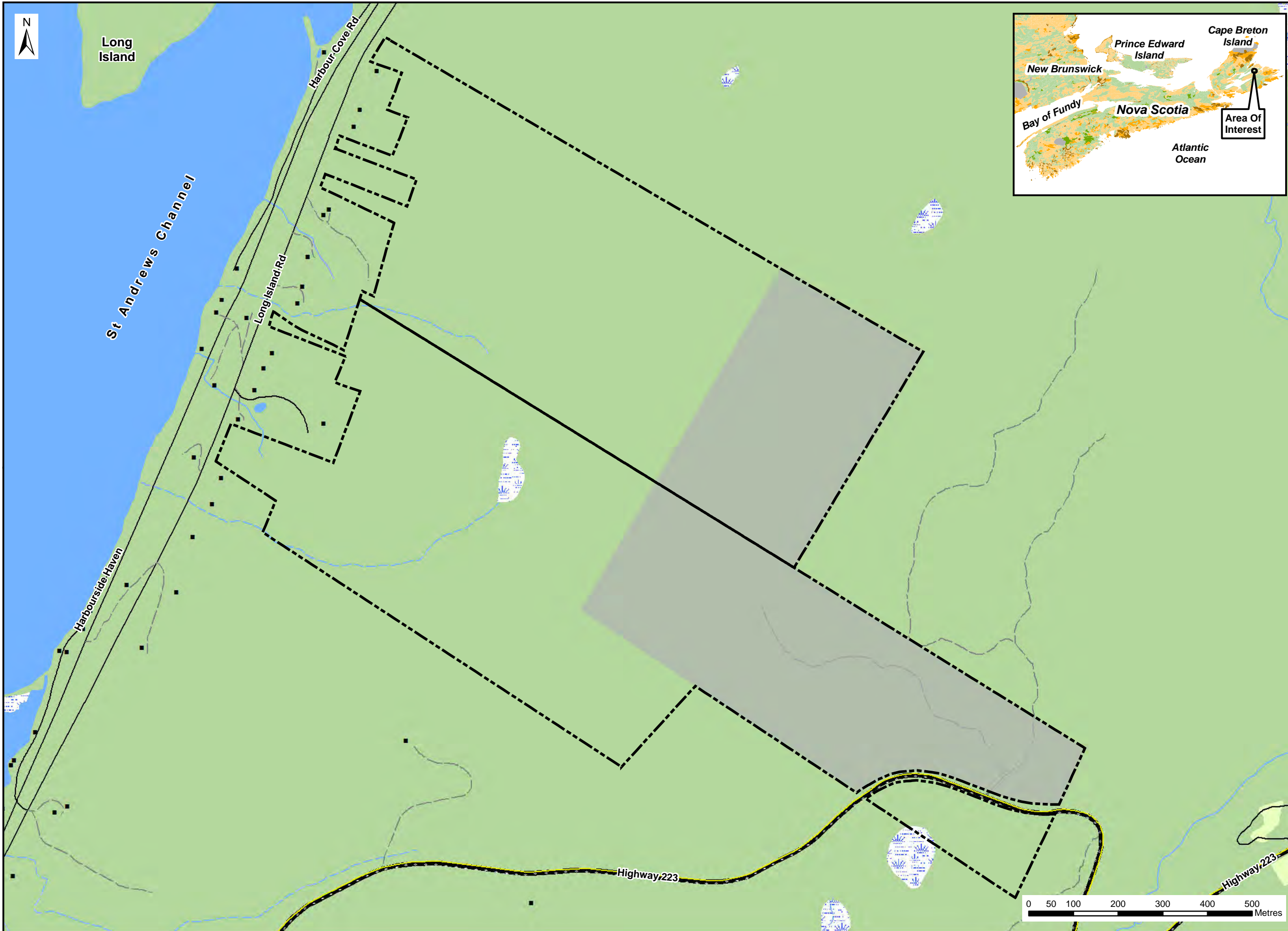
- Legend:**
- Project Site Boundary
 - County Boundary
 - Public Roads
 - Major Roads and Highways
 - Existing Transmission Lines
 - Mapped Stream
 - Water Bodies

Site Location



Date: August 2013	Project #: 13-4684
Scale: 1:100,000	Drawing #: 1
Drawn By: H. Serhan	
Checked By: A. Walter	





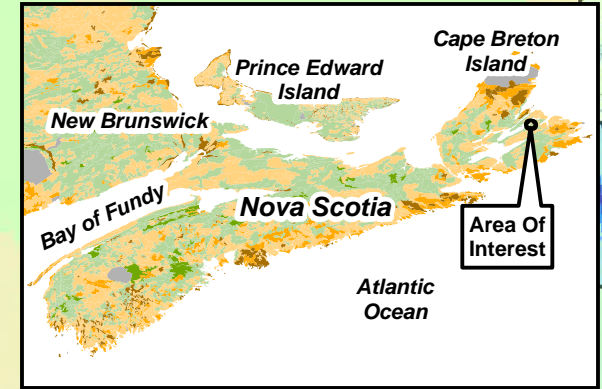
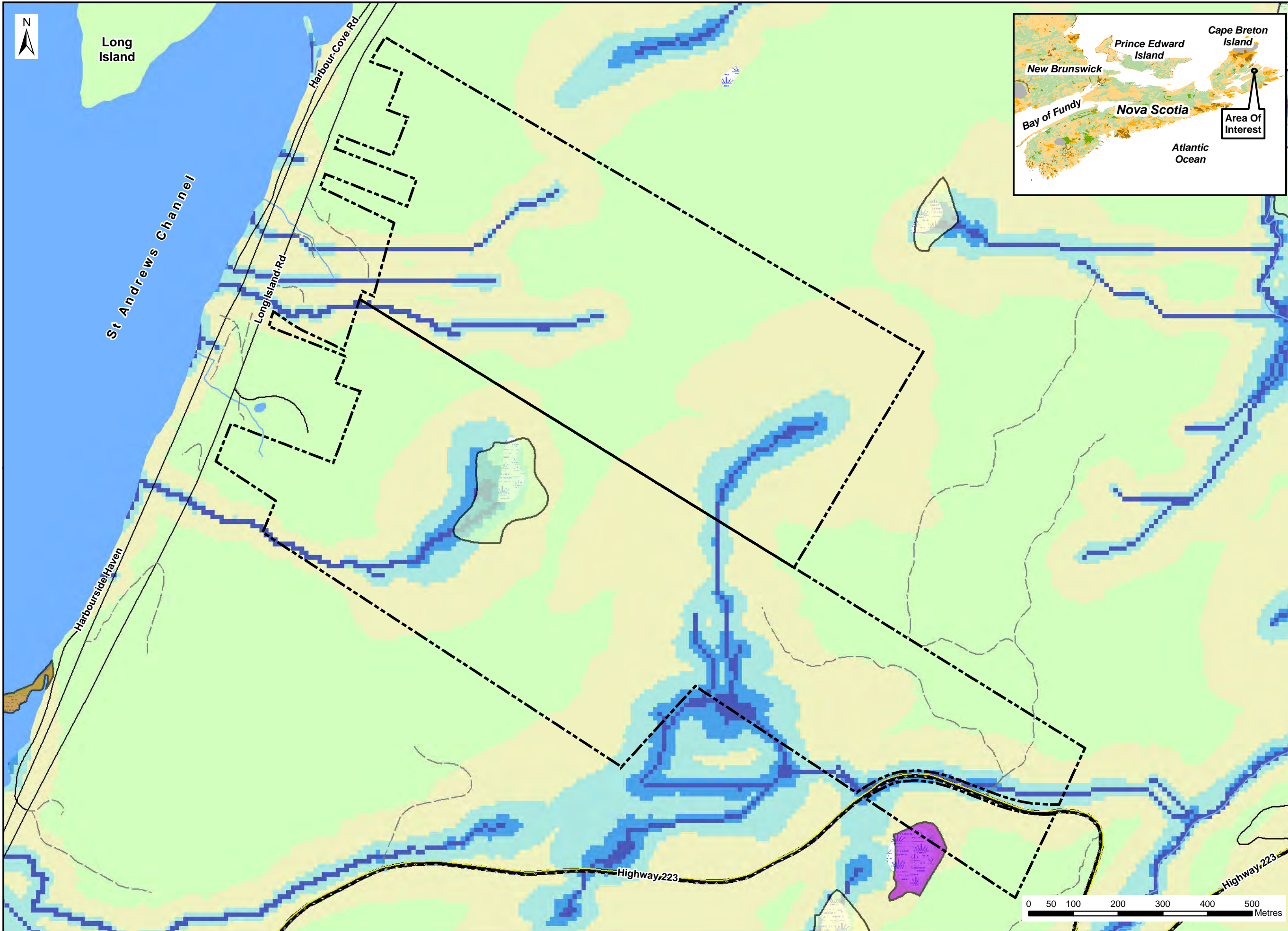
Notes:
 1. Reference: Digital Topographic Mapping by Nova Scotia Geomatics Centre.
 2. Projection: NAD83, UTM Zone 20 North.

- Legend:**
- Project Site Boundary
 - Assessment Area
 - Building
 - Major Roads and Highways
 - Public Roads
 - Access Roads / Trails
 - Mapped Stream
 - Mapped Indefinite Stream
 - Water Bodies
 - Mapped Wet Area
 - Cleared Area

Assessment Area



Date: August 2013	Project #: 13-4684
Scale: 1:8000	Drawing #: 2
Drawn By: H. Serhan	
Checked By: A. Walter	



- Notes:**
- Reference: Digital Topographic Mapping by Nova Scotia Geomatics Centre. Wet Areas Mapping and Wetland Inventory by Nova Scotia Department of Natural Resources (NS DNR).
 - Projection: NAD83, UTM Zone 20 North.

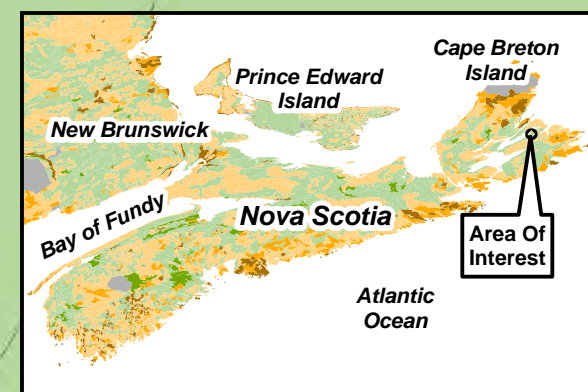
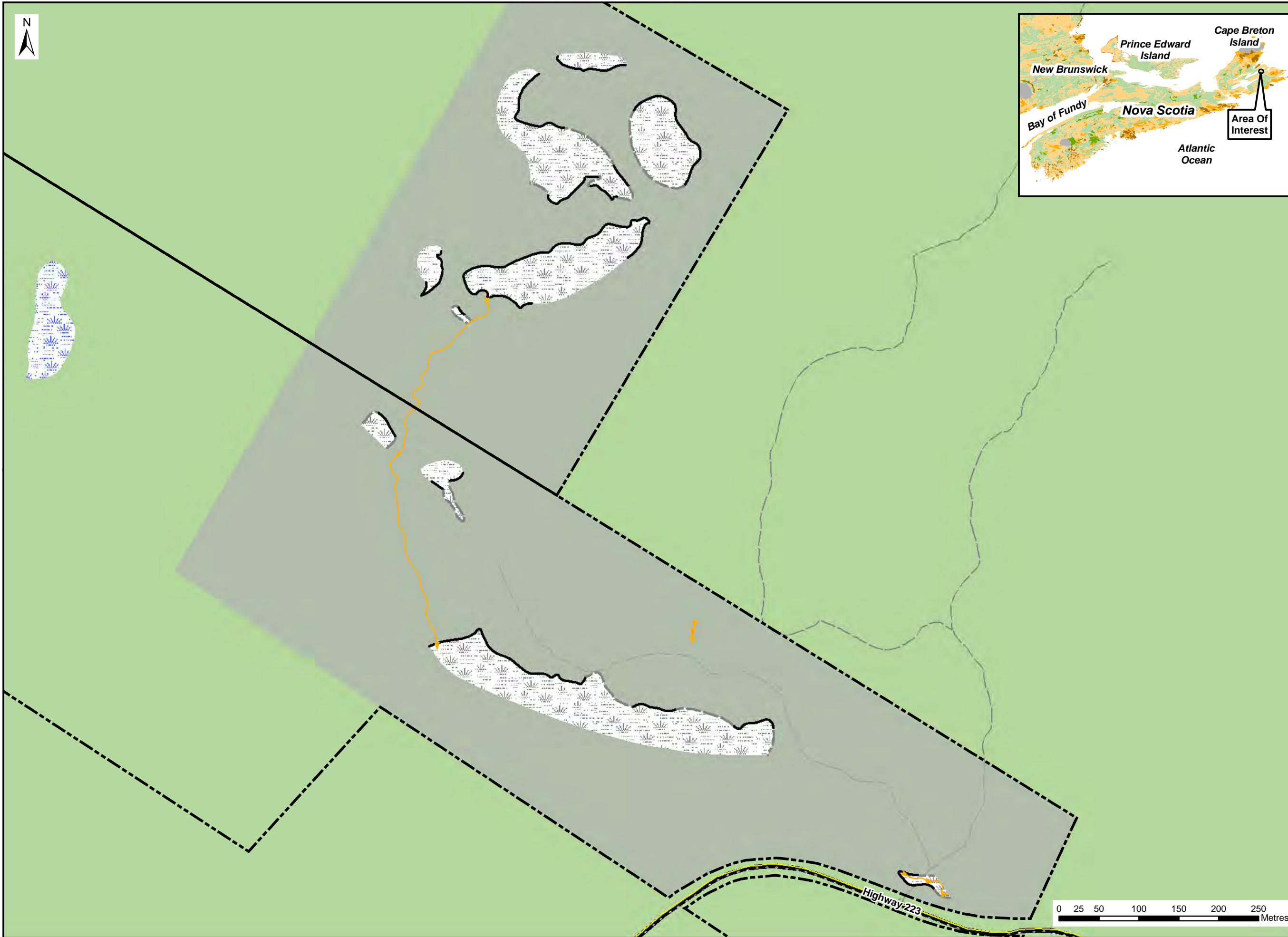
- Legend:**
- Project Site Boundary
 - Major Roads and Highways
 - Public Roads
 - Access Roads / Trails
 - Mapped Stream
 - Water Bodies
 - Mapped Wet Area
- NS DNR Wetland Inventory**
- Wetland Type**
- Bog or Fen
 - Fen
 - Marsh
 - Salt Marsh
 - Swamp
 - Water
- Depth to Water Table (m)**
- 0 - 0.10 m
 - 0.11 - 0.50 m
 - 0.51 - 2 m
 - 2.01 - 10 m
 - > 10 m

Desktop Review Results



Date: August 2013	Project #: 13-4684
Scale: 1:8000	Drawing #: 3
Drawn By: H. Serhan	
Checked By: A. Walter	





Notes:

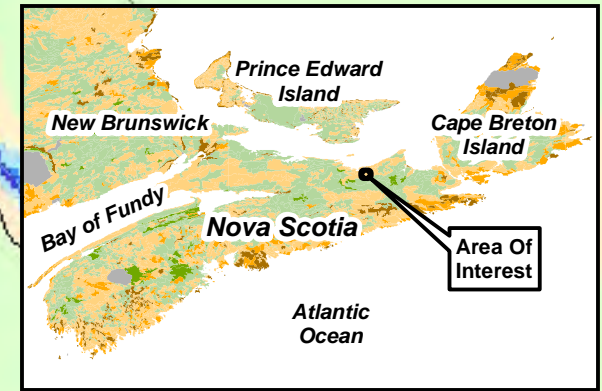
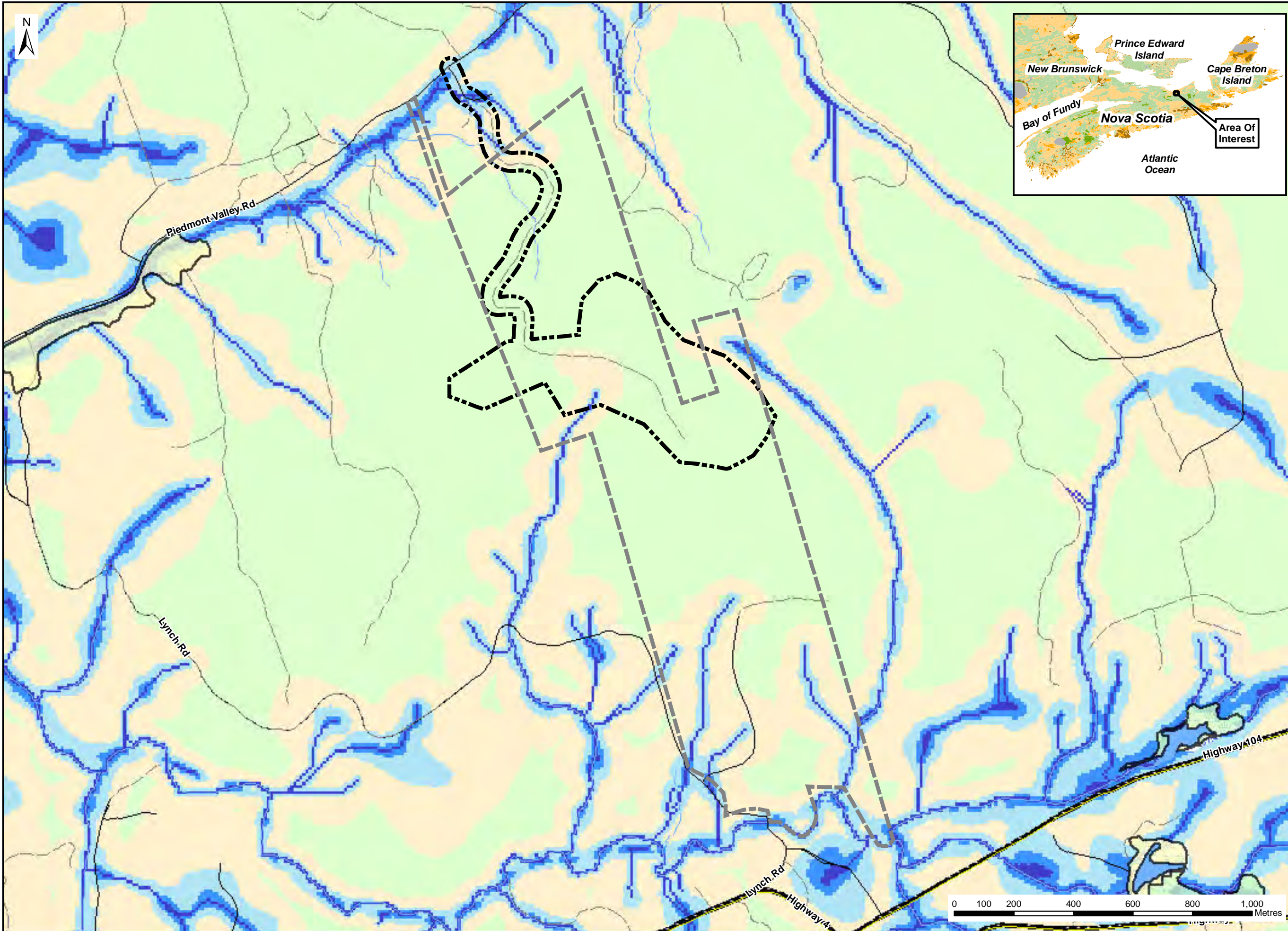
- Reference: Digital Topographic Mapping by Nova Scotia Geomatics Centre. Wet Areas Mapping and Wetland Inventory by Nova Scotia Department of Natural Resources (NS DNR).
- Projection: NAD83, UTM Zone 20 North.

- Legend:**
- Project Site Boundary
 - Observed Watercourse
 - Observed Wetland Boundary
 - Approximate Wetland Boundary
 - Observed Wetland Habitat
 - Assessment Area
 - Major Roads and Highways
 - Public Roads
 - Access Roads / Trails
 - Mapped Stream
 - Water Bodies
 - Mapped Wet Area

Assessment Results



Date: August 2013	Project #: 13-4684
Scale: 1:8000	Drawing #: 4
Drawn By: H. Serhan	
Checked By: A. Walter	



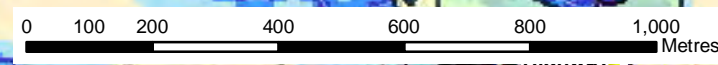
- Notes:**
- Reference: Digital Topographic Mapping by Nova Scotia Geomatics Centre. Wetland Inventory and Wet Areas Mapping by Nova Scotia Department of Natural Resources (NS DNR).
 - Projection: NAD83(CSRS), UTM Zone 20 North.

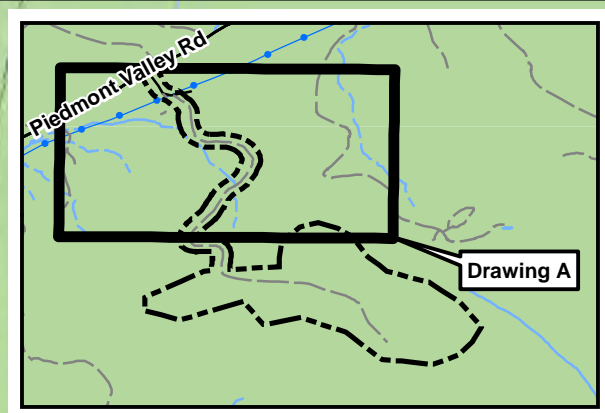
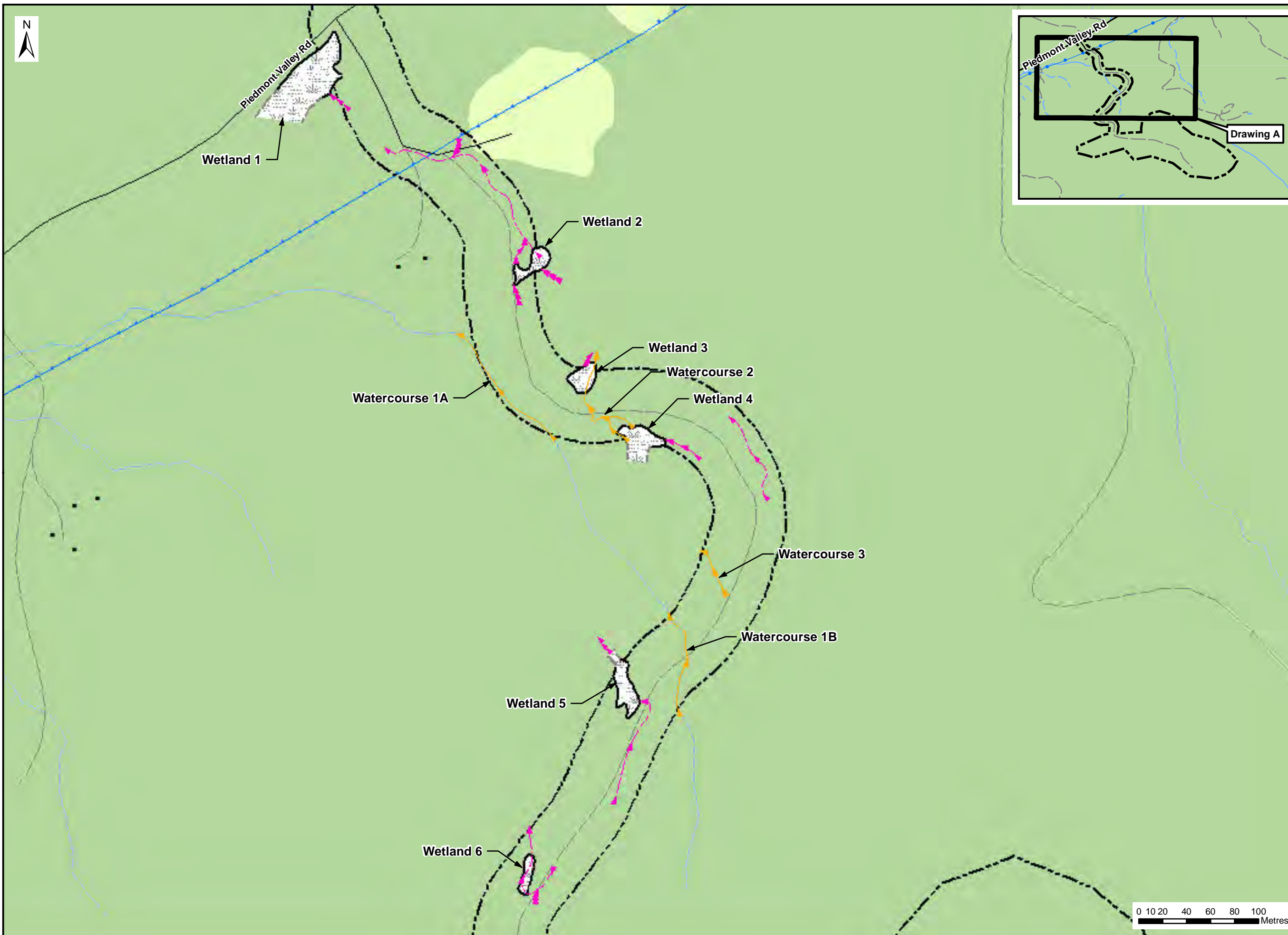
- Legend:**
- Project Site Boundary
 - Assessment Area
- NS DNR Wetland Inventory**
- Wetland Type**
- Bog or Fen
 - Fen
 - Marsh
 - Salt Marsh
 - Swamp
- Major Roads and Highways**
- Public Roads
 - Access Roads / Trails
- Water Features**
- Mapped Stream
 - Mapped Indefinite Stream
 - Water Bodies
 - Mapped Wet Area
- Depth to Water Table (m)**
- 0 - 0.10 m
 - 0.11 - 0.50 m
 - 0.51 - 2 m
 - 2.01 - 10 m
 - > 10 m

Desktop Review Results



Date: October 2013	Project #: 12-4509
Scale: 1:12,000	Drawing #: 1
Drawn By: H. Serhan	
Checked By: S. Dickey	





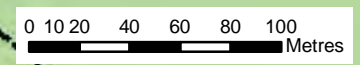
- Notes:**
1. Reference: Digital Topographic Mapping by Nova Scotia Geomatics Centre.
 2. Projection: NAD83(CSRS), UTM Zone 20 North.
 3. GPS Data Taken is Typically to +/-5m Accuracy.

- Legend:**
- Field Identified Watercourse
 - Field Identified Drainage Channel
 - Confirmed Wetland Boundary
 - Approximate Wetland Boundary
 - Field Identified Wetland
 - Assessment Area
 - Building
 - Public Roads
 - Access Roads / Trails
 - Existing Transmission Lines
 - Mapped Stream
 - Mapped Indefinite Stream
 - Water Bodies
 - Cleared Area

Survey Results



Date: October 2013	Project #: 12-4509
Scale: 1:3000	Drawing #: 2A
Drawn By: H. Serhan	
Checked By: S. Dickey	





Wetland 6

Wetland 8

Wetland 9

Wetland 10

Wetland 11

Watercourse 4

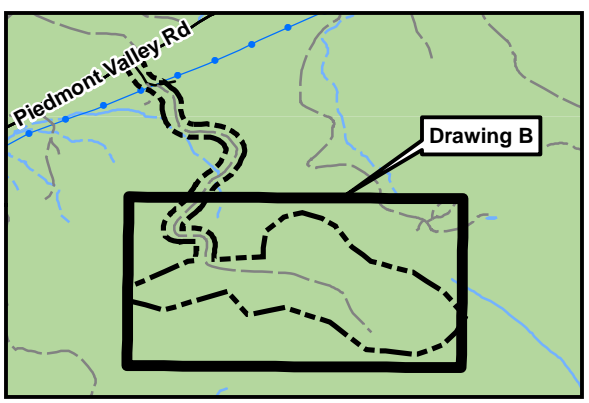
Wetland 7

Watercourse 5

Watercourse 6

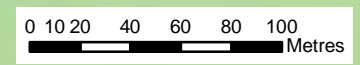
Watercourse 7

Wetland 12



- Notes:**
1. Reference: Digital Topographic Mapping by Nova Scotia Geomatics Centre.
 2. Projection: NAD83(CSRS), UTM Zone 20 North.
 3. GPS Data Taken is Typically to +/-5m Accuracy.

- Legend:**
- Field Identified Watercourse
 - Field Identified Drainage Channel
 - Confirmed Wetland Boundary
 - Approximate Wetland Boundary
 - Field Identified Wetland
 - Assessment Area
 - Public Roads
 - Access Roads / Trails
 - Mapped Stream
 - Mapped Indefinite Stream



Survey Results



Date: October 2013	Project #: 12-4509
Scale: 1:3000	Drawing #: 2B
Drawn By: H. Serhan	
Checked By: S. Dickey	

Appendix G:
Vascular Plant Study



September 9, 2013

Ms. Amy Pellerin
Natural Forces KjbX Inc.
1801 Hollis Street, Suite 1205
Halifax, NS B3J 3N4

Dear Ms. Pellerin,

**Re: Flora and Habitat Assessment
Barrachois Community Wind Farm**

Strum Consulting completed a desktop review and field surveys for the Barrachois Community Wind Farm (the Project), on behalf of Natural Forces Wind Inc. The objectives of this study were to evaluate the potential presence of rare plants and to identify habitat types at the Project site to support Natural Forces Wind Inc. in the planning stages of the Project.

SITE DETAILS

Natural Forces Wind Inc. has proposed the development of a 4 MW wind energy project located north of Highway 223 (Grand Narrows Highway), Barrachois, in the Cape Breton Municipality (CBRM), Nova Scotia (Drawing 1). The Project site consists of two parcels of land identified by Property Identification Numbers (PIDs) 15189178 and 15537657, and is surrounded by resource forest with the exception of residential properties to the west along Long Island Road. Highway 223 (Grand Narrows Highway) crosses the southeastern corner of the Project site.

An assessment area was defined for the Project based on a general proposed development area (Drawing 2) encompassing two wind turbine generator locations and associated access roads. An existing access road currently extends from Highway 223 throughout the southeastern portion of the site.

METHODOLOGY

Desktop Review

The Atlantic Canada Conservation Data Centre (ACCDC) database was reviewed to compile a list of recorded observations of flora species within 100 km of the Project site. This preliminary list was then used to develop a short list of plant species of conservation interest (SOCI) that may be present at the Project site (Table 1). For the purpose of this assessment, plant SOCI included:

Engineering • Surveying • Environmental

Head Office
Railside, 1355 Bedford Hwy.
Bedford, NS B4A 1C5
t. 902.835.5560 (24/7)
f. 902.835.5574

Antigonish Office
3-A Vincent's Way
Antigonish, NS B2G 2X3
t. 902.863.1465
f. 902.863.1389

Deer Lake Office
101 Nicholasville Road
Deer Lake, NL A8A 1V5
t. 855.770.5560
f. 902.835.5574

- Species listed as “Red” or “Yellow” under the Nova Scotia Department of Natural Resources (NSDNR) General Status Ranks of Wild Species in Nova Scotia;
- Species assessed as endangered, threatened, or of special concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC);
- Species ranked as endangered, threatened, or of special concern under the Species at Risk Act (SARA); and/or
- Species protected under the Nova Scotia Endangered Species Act (NS ESA).

The results of the desktop review were then used by a botanist to develop a field assessment strategy based on site habitat.

Field Assessment

A vascular plant survey was completed in July 2013 by expert botanist Jim Jotcham, within a designated survey area. The survey was designed to focus on potential areas for the siting of two turbines and the associated access road (Drawing 2). A list of plant species identified at the site was compiled and is provided in Table 2.

RESULTS

Results of the desktop review indicated that 249 vascular flora species have been identified within 100 km of the Project site (ACCDC 2013). Of the 249 vascular plant species identified by ACCDC, 180 vascular flora SOCI were identified within 100 km of the Project site (Table 1).

The vascular plant survey encompassed four habitat types: upland forests, regenerating forests, and wetlands. A complete list of vascular plant species identified during the survey is provided in Table 2. Representative photos are also attached.

Upland Forests

Upland forest habitats were dominated by hardwood and mixed wood stands. The southeastern extent of the assessment area was dominated by mixed wood habitat, with hardwood stands accounting for portions of the northern extent of the assessment area, and intermittent smaller stands adjacent to the existing road.

Deciduous tree species observed included red maple (*Acer rubrum*), white birch (*Betula papyrifera*), sugar maple (*Acer saccharum*), speckled alder (*Alnus incana*), yellow birch (*Betula alleghaniensis*), and stripped maple (*Acer pensylvanicum*).

Coniferous species consisted of balsam fir (*Abies balsamea*), white spruce (*Picea glauca*), eastern hemlock (*Tsuga canadensis*) and eastern white pine (*Pinus strobus*). A diverse mix of plant, herb and shrub species included:

- wild sarsaparilla (*Aralia nudicaulis*);
- bunchberry (*Cornus canadensis*);

- star flower (*Borago officinalis*);
- clintonia lily (*Clintonia borealis*);
- Canada golden rod (*Solidago canadensis*);
- beech fern (*Phegopteris connectilis*);
- interrupted fern (*Osmunda claytoniana*);
- cinnamon fern (*Osmunda cinnamomea*);
- New York fern (*Thelypteris noveboracensis*);
- hay-scented fern (*Dennstaedtia punctilobula*);
- St. John's wort (*Hypericum perforatum*);
- bitterweet nightshade (*Solanum dulcamara*);
- colts foot (*Tussilago farfara*);
- oxeye daisy (*Leucanthemum vulgare*);
- fowl mana grass (*Glyceria striata*);
- bone set (*Eupatorium perfoliatum*);
- hawkweed (*Hieracium pilosella*);
- bladder sedge (*Carex intumescens*);
- twinflower (*Linnaea borealis*);
- wood fern (*Dryopteris intermedia*);
- sensitive fern (*Onoclea sensibilis*);
- bracken fern (*Pteridium aquilinum*);
- rock polypody (*Polypodium virginianum*);
- brown beakrush (*Rhynchospora fusca*);
- three-seed sedge (*Carex trisperma*);
- raspberry (*Rubus idaeus*);
- red elderberry (*Sambucus racemosa*); and
- Canada holly (*Ilex verticillata*).

Regenerating Forests

Portions of the landscape have been clear cut and regrowth is dominated by immature/regenerated sapling mixed wood and softwood stands. Eastern hemlock, white ash (*Fraxinus americana*), American beech (*Fagus grandifolia*) and wood fern (*Dryopteris intermedia*) were commonly observed.

Wetlands

Wetland habitat is relatively interspersed throughout the assessment area and predominantly consists of treed swamps. Woody cover was generally immature/mature black spruce, balsam fir, red maple, speckled alder, white birch, yellow birch, eastern hemlock and red maple. Common herbs include cinnamon fern, grasses and sedge. Other wetland common species included silvery spleenwort (*Deparia acrostichoides*), brown beakrush (*Rhynchospora fusca*), and Canada holly (*Nemopanthus mucronatus*).

CONCLUSIONS

A rare plant and habitat survey was completed within a defined assessment area at the Barrachois Community Wind Project site. No vascular plant SOCI were observed during the plant survey. Dominant habitat existing at the Project site comprises hardwood and mixed wood upland forest, regenerating forest and areas of wetland habitat.

CLOSURE

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

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,



Andy Walter, BSc.
Environmental Specialist
awalter@strum.com

REFERENCES

ACCDC (Atlantic Canada Data Conservation Centre). 2013. Data Report 5059: Barrachois Community Wind Farm, NS. Atlantic Canada Conservation Data Centre, New Brunswick Canada.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2012. Wildlife Species Search. Retrieved from http://www.cosewic.gc.ca/eng/sct1/index_e.cfm
Government of Canada. 2012. Species at Risk Public Registry. Retrieved from http://www.sararegistry.gc.ca/default_e.cfm.

NSDNR (Nova Scotia Department of Natural Resources). 2010. General Status Ranks of Wild Species in Nova Scotia. Retrieved from <http://www.gov.ns.ca/natr/wildlife/genstatus/ranks.asp>

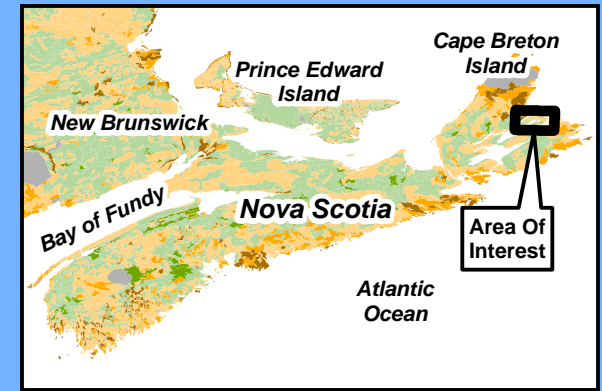
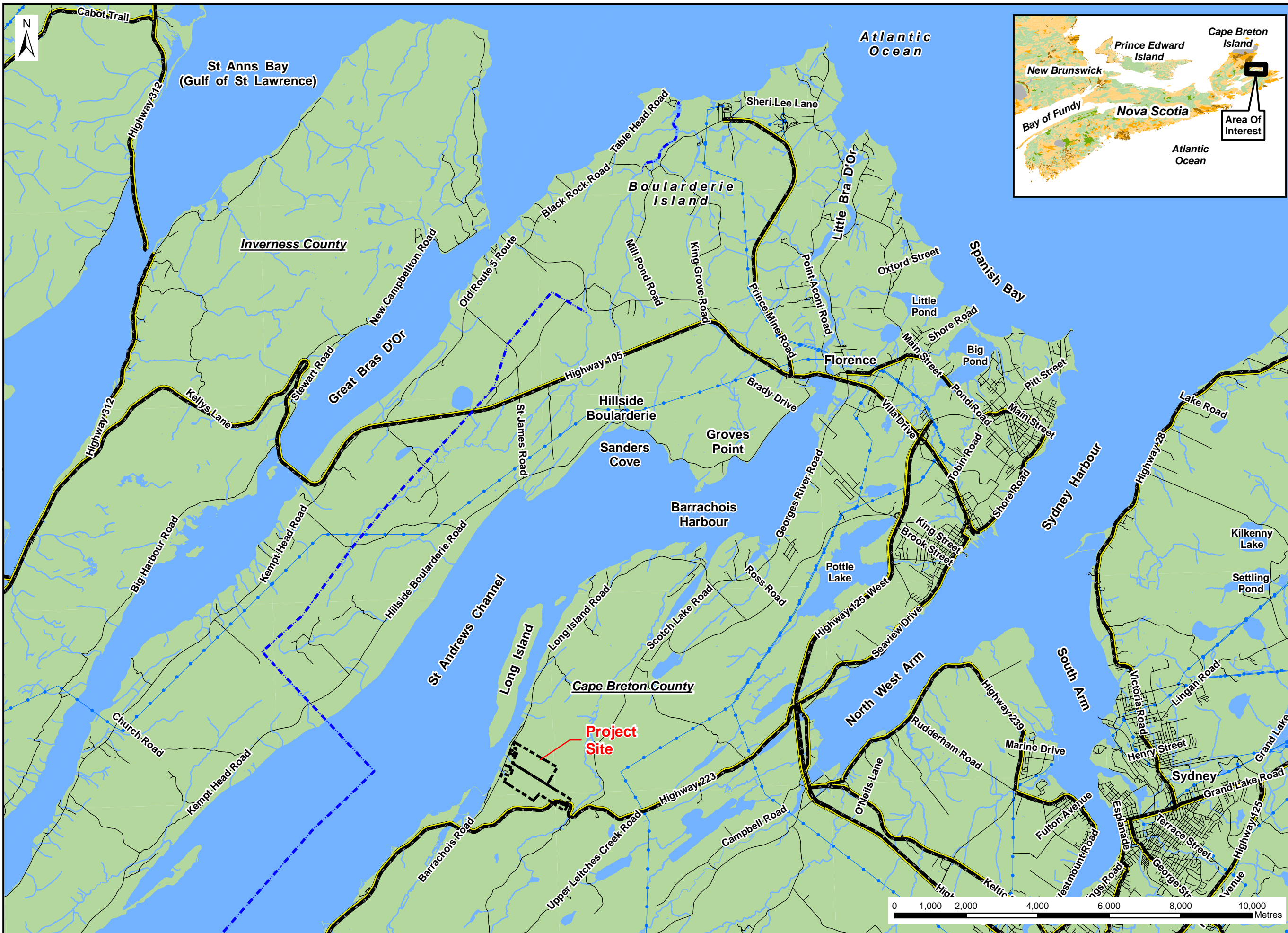
NSDNR (Nova Scotia Department of Natural Resources). 2012. Wet Areas Mapping and Flow Accumulation Channels. Retrieved from <http://novascotia.ca/natr/forestry/gis/wamdownload.asp>.

NSDNR (Nova Scotia Department of Natural Resources). 2013. Nova Scotia Significant Species and Habitats Database. Retrieved from <http://www.gov.ns.ca/natr/wildlife/habitats/hab-data/>

NS ESA (Nova Scotia Endangered Species Act). 2013. Retrieved from <http://www.gov.ns.ca/natr/wildlife/biodiversity/species-list.asp>.

Species at Risk Act, 2002, SC 2002, c 29, as amended by 2012.

US Army Corp of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual.



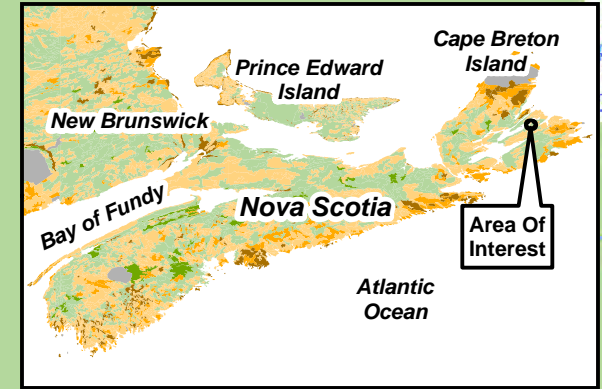
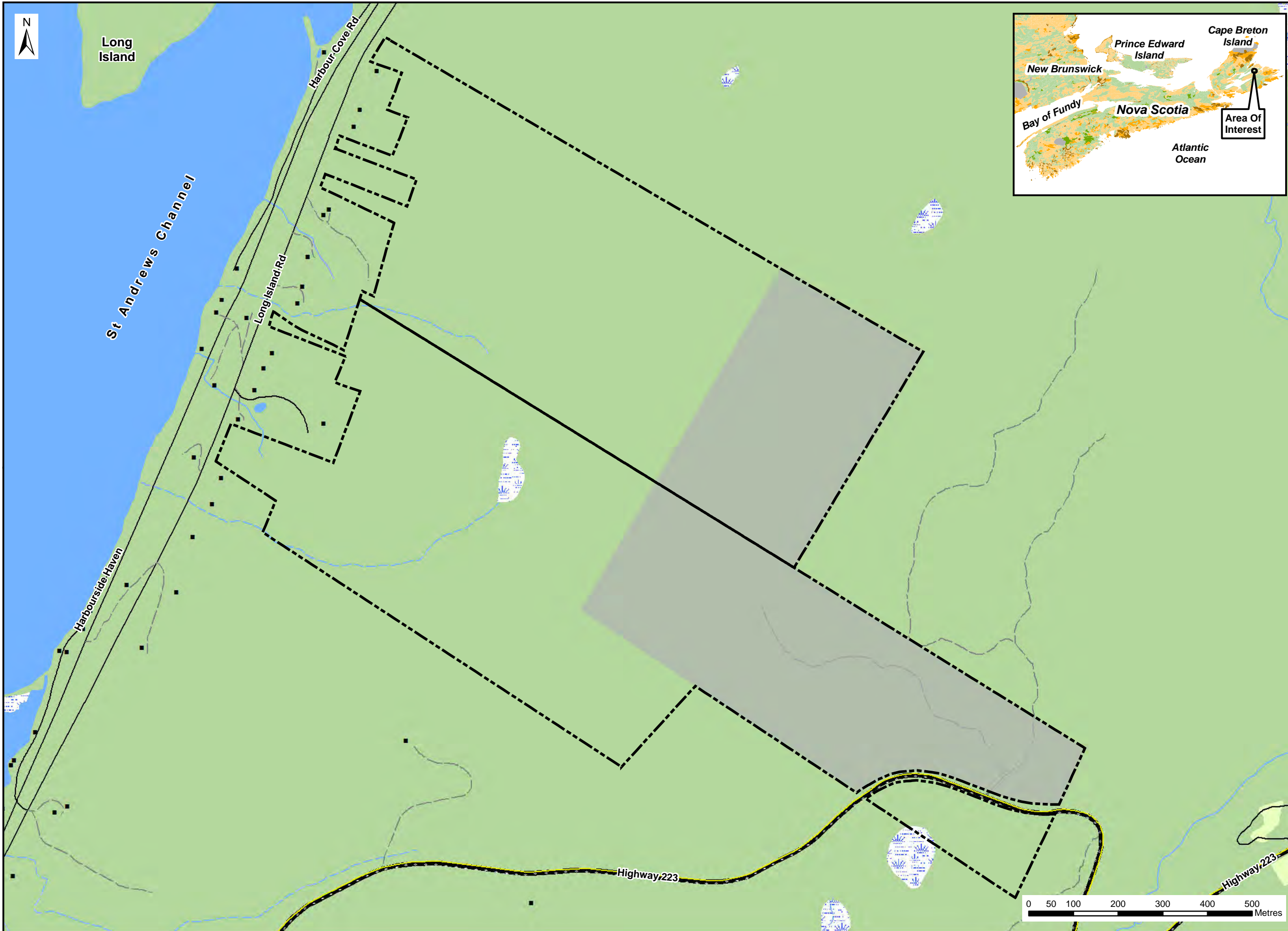
- Notes:**
- Reference: Digital Topographic Mapping by Nova Scotia Geomatics Centre.
 - Projection: NAD83, UTM Zone 20 North.

- Legend:**
- Project Site Boundary
 - County Boundary
 - Public Roads
 - Major Roads and Highways
 - Existing Transmission Lines
 - Mapped Stream
 - Water Bodies

Site Location



Date: August 2013	Project #: 13-4684
Scale: 1:100,000	Drawing #: 1
Drawn By: H. Serhan	
Checked By: A. Walter	



Notes:
 1. Reference: Digital Topographic Mapping by Nova Scotia Geomatics Centre.
 2. Projection: NAD83, UTM Zone 20 North.

- Legend:**
- Project Site Boundary
 - Assessment Area
 - Building
 - Major Roads and Highways
 - Public Roads
 - Access Roads / Trails
 - Mapped Stream
 - Mapped Indefinite Stream
 - Water Bodies
 - Mapped Wet Area
 - Cleared Area

Assessment Area



Date: August 2013	Project #: 13-4684
Scale: 1:8000	2
Drawn By: H. Serhan	
Checked By: A. Walter	

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Alder-leaved Buckthorn	Rhamnus alnifolia	Not Listed	Not Listed	Not Listed	Yellow
Alpine Bilberry	Vaccinium uliginosum	Not Listed	Not Listed	Not Listed	Yellow
Alpine Bistort	Polygonum viviparum	Not Listed	Not Listed	Not Listed	Red
Alpine Cliff Fern	Woodsia alpina	Not Listed	Not Listed	Not Listed	Red
Alpine Rush	Juncus alpinoarticulatus	Not Listed	Not Listed	Not Listed	Red
Alpine Timothy	Phleum alpinum	Not Listed	Not Listed	Not Listed	Red
American False Pennyroyal	Hedeoma pulegioides	Not Listed	Not Listed	Not Listed	Yellow
Arctic Kidney Lichen	Nephroma arcticum	Not Listed	Not Listed	Not Listed	Red
Bastard's Toadflax	Comandra umbellata	Not Listed	Not Listed	Not Listed	Red
Bearberry Willow	Salix uva-ursi	Not Listed	Not Listed	Not Listed	Red
Bearded Sedge	Carex comosa	Not Listed	Not Listed	Not Listed	Yellow
Bebb's Sedge	Carex bebbii	Not Listed	Not Listed	Not Listed	Red
Big-leaved Marsh-elder	Iva frutescens ssp. oraria	Not Listed	Not Listed	Not Listed	Yellow
Black Ash	Fraxinus nigra	Not Listed	Threatened	Not Listed	Yellow
Blistered Tarpaper Lichen	Collema furfuraceum	Not Listed	Not Listed	Not Listed	Yellow
Blood Milkwort	Polygala sanguinea	Not Listed	Not Listed	Not Listed	Yellow
Bloody Beard Lichen	Usnea mutabilis	Not Listed	Not Listed	Not Listed	Yellow
Blue Cohosh	Caulophyllum thalictroides	Not Listed	Not Listed	Not Listed	Red
Blue Felt Lichen	Degelia plumbea	No Status	Vulnerable	Special Concern	Green
Blue Mountain Heather	Phyllodoce caerulea	Not Listed	Not Listed	Not Listed	Red
Blunt Sweet Cicely	Osmorhiza depauperata	Not Listed	Not Listed	Not Listed	Red
Blunt-leaved Pondweed	Potamogeton obtusifolius	Not Listed	Not Listed	Not Listed	Yellow
Bog Birch	Betula pumila	Not Listed	Not Listed	Not Listed	Yellow
Bog Willow	Salix pedicellaris	Not Listed	Not Listed	Not Listed	Yellow
Boreal Aster	Symphotrichum boreale	Not Listed	Not Listed	Not Listed	Yellow
Boreal Felt Lichen - Atlantic pop.	Erioderma pedicellatum (Atlantic pop.)	Endangered	Endangered	Endangered	Red
Bristle-leaved Sedge	Carex eburnea	Not Listed	Not Listed	Not Listed	Yellow
Broad-Glumed Brome	Bromus latiglumis	Not Listed	Not Listed	Not Listed	Red
Brook Lobelia	Lobelia kalmii	Not Listed	Not Listed	Not Listed	Red
Canada Anemone	Anemone canadensis	Not Listed	Not Listed	Not Listed	Red
Canada Germander	Teucrium canadense	Not Listed	Not Listed	Not Listed	Yellow
Canada Lily	Lilium canadense	Not Listed	Not Listed	Not Listed	Yellow
Canada Rice Grass	Piptatherum canadense	Not Listed	Not Listed	Not Listed	Yellow

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Canada Wood Nettle	Laportea canadensis	Not Listed	Not Listed	Not Listed	Yellow
Chestnut Sedge	Carex castanea	Not Listed	Not Listed	Not Listed	Red
Climbing False Buckwheat	Polygonum scandens	Not Listed	Not Listed	Not Listed	Yellow
Clustered Sanicle	Sanicula odorata	Not Listed	Not Listed	Not Listed	Red
Common Butterwort	Pinguicula vulgaris	Not Listed	Not Listed	Not Listed	Red
Crinkled Snow Lichen	Flavocetraria nivalis	Not Listed	Not Listed	Not Listed	Yellow
Cuckoo Flower	Cardamine pratensis	Not Listed	Not Listed	Not Listed	Red
Cursed Buttercup	Ranunculus sceleratus	Not Listed	Not Listed	Not Listed	Red
Cut-leaved Anemone	Anemone multifida	Not Listed	Not Listed	Not Listed	Red
Dense Whitlow-grass	Draba pycnosperma	Not Listed	Not Listed	Not Listed	Red
Diapensia	Diapensia lapponica	Not Listed	Not Listed	Not Listed	Red
Downy Willowherb	Epilobium strictum	Not Listed	Not Listed	Not Listed	Yellow
Drummond's Rockcress	Arabis drummondii	Not Listed	Not Listed	Not Listed	Yellow
Dudley's Rush	Juncus dudleyi	Not Listed	Not Listed	Not Listed	Yellow
Dwarf Bilberry	Vaccinium caespitosum	Not Listed	Not Listed	Not Listed	Yellow
Dwarf White Birch	Betula minor	Not Listed	Not Listed	Not Listed	Yellow
Estuary Beggarticks	Bidens hyperborea	Not Listed	Not Listed	Not Listed	Red
False Mermaidweed	Floerkea proserpinacoides	Not Listed	Not Listed	Not at Risk	Yellow
False Willow Moss	Platydictya jungermannioides	Not Listed	Not Listed	Not Listed	Yellow
Few-flowered Spikerush	Eleocharis quinqueflora	Not Listed	Not Listed	Not Listed	Red
Field Locoweed	Oxytropis campestris var. johannensis	Not Listed	Not Listed	Not Listed	Red
Field Wormwood	Artemisia campestris var. borealis	Not Listed	Not Listed	Not Listed	Red
Flat-stemmed Pondweed	Potamogeton zosteriformis	Not Listed	Not Listed	Not Listed	Yellow
Fragile Twisted Moss	Tortella fragilis	Not Listed	Not Listed	Not Listed	Yellow
Fragrant Wood Fern	Dryopteris fragrans var. remotiuscula	Not Listed	Not Listed	Not Listed	Yellow
Fries' Pondweed	Potamogeton friesii	Not Listed	Not Listed	Not Listed	Red
Fringed Blue Aster	Symphyotrichum ciliolatum	Not Listed	Not Listed	Not Listed	Yellow
Giant Spear Moss	Calliergon giganteum	Not Listed	Not Listed	Not Listed	Yellow
Glandular Birch	Betula glandulosa	Not Listed	Not Listed	Not Listed	Red
Glaucous Blue Grass	Poa glauca	Not Listed	Not Listed	Not Listed	Yellow
Glaucous Rattlesnakeroot	Prenanthes racemosa	Not Listed	Not Listed	Not Listed	Red
Green Spleenwort	Asplenium trichomanes-ramosum	Not Listed	Not Listed	Not Listed	Yellow
Greenland Stitchwort	Minuartia groenlandica	Not Listed	Not Listed	Not Listed	Yellow

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Hairlike Sedge	Carex capillaris	Not Listed	Not Listed	Not Listed	Yellow
Hairy Willow	Salix vestita	Not Listed	Not Listed	Not Listed	Red
Highland Rush	Juncus trifidus	Not Listed	Not Listed	Not Listed	Yellow
Hooked Scorpion Moss	Scorpidium scorpioides	Not Listed	Not Listed	Not Listed	Yellow
Hornemann's Willowherb	Epilobium hornemannii	Not Listed	Not Listed	Not Listed	Yellow
Hyssop-leaved Fleabane	Erigeron hyssopifolius	Not Listed	Not Listed	Not Listed	Yellow
Inverted Bladderwort	Utricularia resupinata	Not Listed	Not Listed	Not Listed	Red
Labrador Bedstraw	Galium labradoricum	Not Listed	Not Listed	Not Listed	Yellow
Lapland Rosebay	Rhododendron lapponicum	Not Listed	Not Listed	Not Listed	Red
Large Round-Leaved Orchid	Platanthera macrophylla	Not Listed	Not Listed	Not Listed	Yellow
Large St John's-wort	Hypericum majus	Not Listed	Not Listed	Not Listed	Red
Laurentian Bladder Fern	Cystopteris laurentiana	Not Listed	Not Listed	Not Listed	Red
Lesser Brown Sedge	Carex adusta	Not Listed	Not Listed	Not Listed	Yellow
Lesser Pyrola	Pyrola minor	Not Listed	Not Listed	Not Listed	Yellow
Lesser Rattlesnake-plantain	Goodyera repens	Not Listed	Not Listed	Not Listed	Yellow
Livid Sedge	Carex livida	Not Listed	Not Listed	Not Listed	Red
Long-bracted Frog Orchid	Coeloglossum viride var. virescens	Not Listed	Not Listed	Not Listed	Red
Long-leaved Starwort	Stellaria longifolia	Not Listed	Not Listed	Not Listed	Yellow
Loose-flowered Alpine Sedge	Carex rariflora	Not Listed	Not Listed	Not Listed	Red
Maidenhair Spleenwort	Asplenium trichomanes	Not Listed	Not Listed	Not Listed	Yellow
Marsh Bellflower	Campanula aparinoides	Not Listed	Not Listed	Not Listed	Yellow
Marsh Grass-of-Parnassus	Parnassia palustris var. parviflora	Not Listed	Not Listed	Not Listed	Red
Marsh Horsetail	Equisetum palustre	Not Listed	Not Listed	Not Listed	Red
Marsh Lousewort	Pedicularis palustris	Not Listed	Not Listed	Not Listed	Red
Meadow Horsetail	Equisetum pratense	Not Listed	Not Listed	Not Listed	Yellow
Menzies' Rattlesnake-plantain	Goodyera oblongifolia	Not Listed	Not Listed	Not Listed	Yellow
Michaux's Dwarf Birch	Betula michauxii	Not Listed	Not Listed	Not Listed	Yellow
Mistassini Primrose	Primula mistassinica	Not Listed	Not Listed	Not Listed	Yellow
Moor Rush	Juncus stygius ssp. americanus	Not Listed	Not Listed	Not Listed	Yellow
Mountain Sorrel	Oxyria digyna	Not Listed	Not Listed	Not Listed	Red
Multi-rayed Goldenrod	Solidago multiradiata	Not Listed	Not Listed	Not Listed	Red
Naked Kidney Lichen	Nephroma bellum	Not Listed	Not Listed	Not Listed	Yellow
Net-Veined Willow	Salix reticulata	Not Listed	Not Listed	Not Listed	Red

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
New Jersey Rush	Juncus caesariensis	Special Concern	Vulnerable	Special Concern	Yellow
Northern Arnica	Arnica lonchophylla	Not Listed	Not Listed	Not Listed	Red
Northern Blueberry	Vaccinium boreale	Not Listed	Not Listed	Not Listed	Red
Northern Bog Sedge	Carex gynocrates	Not Listed	Not Listed	Not Listed	Red
Northern Bog Violet	Viola nephrophylla	Not Listed	Not Listed	Not Listed	Yellow
Northern Burreed	Sparganium hyperboreum	Not Listed	Not Listed	Not Listed	Yellow
Northern Comandra	Geocaulon lividum	Not Listed	Not Listed	Not Listed	Yellow
Northern Gentian	Gentianella amarella ssp. acuta	Not Listed	Not Listed	Not Listed	Red
Northern Holly Fern	Polystichum lonchitis	Not Listed	Not Listed	Not Listed	Yellow
Northern Maidenhair Fern	Adiantum pedatum	Not Listed	Not Listed	Not Listed	Red
Norwegian Whitlow-Grass	Draba norvegica	Not Listed	Not Listed	Not Listed	Red
Orange-fruited Tinker's Weed	Triosteum aurantiacum	Not Listed	Not Listed	Not Listed	Yellow
Oval-leaved Bilberry	Vaccinium ovalifolium	Not Listed	Not Listed	Not Listed	Red
Pale Jewelweed	Impatiens pallida	Not Listed	Not Listed	Not Listed	Yellow
Peppered Moon Lichen	Sticta fuliginosa	Not Listed	Not Listed	Not Listed	Yellow
Philadelphia Fleabane	Erigeron philadelphicus	Not Listed	Not Listed	Not Listed	Yellow
Pinebarren Golden Heather	Hudsonia ericoides	Not Listed	Not Listed	Not Listed	Yellow
Pink Crowberry	Empetrum eamesii	Not Listed	Not Listed	Not Listed	Yellow
Poor-man's Shingles Lichen	Parmeliella parvula	Not Listed	Not Listed	Not Listed	Red
Porcupine Sedge	Carex hystericina	Not Listed	Not Listed	Not Listed	Red
Powdered Honeycomb Lichen	Cavernularia hultenii	Not Listed	Not Listed	Not Listed	Red
Proliferous Fescue	Festuca prolifera	Not Listed	Not Listed	Not Listed	Yellow
Pubescent Sedge	Carex hirtifolia	Not Listed	Not Listed	Not Listed	Yellow
Purple False Oats	Trisetum melicoides	Not Listed	Not Listed	Not Listed	Red
Purple Mountain Saxifrage	Saxifraga oppositifolia	Not Listed	Not Listed	Not Listed	Red
Red Bulrush	Blysmus rufus	Not Listed	Not Listed	Not Listed	Red
Red Pigweed	Chenopodium rubrum	Not Listed	Not Listed	Not Listed	Red
Richardson's Pondweed	Potamogeton richardsonii	Not Listed	Not Listed	Not Listed	Red
Robinson's Hawkweed	Hieracium robinsonii	Not Listed	Not Listed	Not Listed	Yellow
Rock Whitlow-Grass	Draba arabisans	Not Listed	Not Listed	Not Listed	Red
Russet Sedge	Carex saxatilis	Not Listed	Not Listed	Not Listed	Red
Sage Willow	Salix candida	Not Listed	Endangered	Not Listed	Red
Saltmarsh Starwort	Stellaria humifusa	Not Listed	Not Listed	Not Listed	Yellow

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Scabrous Black Sedge	Carex atratiformis	Not Listed	Not Listed	Not Listed	Yellow
Scirpuslike Sedge	Carex scirpoidea	Not Listed	Not Listed	Not Listed	Yellow
Seabeach Ragwort	Senecio pseudoarnica	Not Listed	Not Listed	Not Listed	Yellow
Sharp-fruited Rush	Juncus acuminatus	Not Listed	Not Listed	Not Listed	Yellow
Shining Ladies'-Tresses	Spiranthes lucida	Not Listed	Not Listed	Not Listed	Red
Short-awned Foxtail	Alopecurus aequalis	Not Listed	Not Listed	Not Listed	Yellow
Showy Lady's-Slipper	Cypripedium reginae	Not Listed	Not Listed	Not Listed	Red
Slender Beakrush	Rhynchospora capillacea	Not Listed	Not Listed	Not Listed	Red
Slender Blue Flag	Iris prismatica	Not Listed	Not Listed	Not Listed	Red
Slender Cottongrass	Eriophorum gracile	Not Listed	Not Listed	Not Listed	Yellow
Slim-stemmed Reed Grass	Calamagrostis stricta	Not Listed	Not Listed	Not Listed	Yellow
Small Yellow Lady's-Slipper	Cypripedium parviflorum var. makasin	Not Listed	Not Listed	Not Listed	Yellow
Small-flowered Anemone	Anemone parviflora	Not Listed	Not Listed	Not Listed	Red
Small-flowered Bittercress	Cardamine parviflora var. arenicola	Not Listed	Not Listed	Not Listed	Yellow
Smooth Cliff Fern	Woodsia glabella	Not Listed	Not Listed	Not Listed	Yellow
Smooth Sweet Cicely	Osmorhiza longistylis	Not Listed	Not Listed	Not Listed	Red
Soapberry	Shepherdia canadensis	Not Listed	Not Listed	Not Listed	Yellow
Southern Mudwort	Limosella australis	Not Listed	Not Listed	Not Listed	Yellow
Southern Twayblade	Listera australis	Not Listed	Not Listed	Not Listed	Red
Sparse-Flowered Sedge	Carex tenuiflora	Not Listed	Not Listed	Not Listed	Red
Spiked Woodrush	Luzula spicata	Not Listed	Not Listed	Not Listed	Red
Spotted Pondweed	Potamogeton pulcher	Not Listed	Vulnerable	Not Listed	Red
Spurred Gentian	Halenia deflexa	Not Listed	Not Listed	Not Listed	Yellow
Squashberry	Viburnum edule	Not Listed	Not Listed	Not Listed	Yellow
Steller's Rockbrake	Cryptogramma stelleri	Not Listed	Not Listed	Not Listed	Red
Sticky False Asphodel	Triantha glutinosa	Not Listed	Not Listed	Not Listed	Red
Swamp Loosestrife	Decodon verticillatus	Not Listed	Not Listed	Not Listed	Yellow
Swedish Bunchberry	Cornus suecica	Not Listed	Not Listed	Not Listed	Yellow
Sweet Wood Reed Grass	Cinna arundinacea	Not Listed	Not Listed	Not Listed	Red
Tree Pelt Lichen	Peltigera collina	Not Listed	Not Listed	Not Listed	Yellow
Triangular-valve Dock	Rumex salicifolius var. mexicanus	Not Listed	Not Listed	Not Listed	Yellow
Tufted Fen Moss	Paludella squarrosa	Not Listed	Not Listed	Not Listed	Yellow
Virginia Anemone	Anemone virginiana	Not Listed	Not Listed	Not Listed	Yellow

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Water Beggarticks	Megalodonta beckii	Not Listed	Not Listed	Not Listed	Yellow
Water Blinks	Montia fontana	Not Listed	Not Listed	Not Listed	Red
Water Pygmyweed	Crassula aquatica	Not Listed	Not Listed	Not Listed	Yellow
Western Hairy Rockcress	Arabis hirsuta var. pycnocarpa	Not Listed	Not Listed	Not Listed	Red
White Mountain Saxifrage	Saxifraga paniculata ssp. neogaea	Not Listed	Not Listed	Not Listed	Yellow
White-stemmed Pondweed	Potamogeton praelongus	Not Listed	Not Listed	Not Listed	Yellow
Whorled Water Milfoil	Myriophyllum verticillatum	Not Listed	Not Listed	Not Listed	Yellow
Wiegand's Sedge	Carex wiegandii	Not Listed	Not Listed	Not Listed	Red
Wiegand's Wild Rye	Elymus wiegandii	Not Listed	Not Listed	Not Listed	Red
Wild Chives	Allium schoenoprasum	Not Listed	Not Listed	Not Listed	Red
Wood Anemone	Anemone quinquefolia	Not Listed	Not Listed	Not Listed	Yellow
Woodland Rush	Juncus subcaudatus	Not Listed	Not Listed	Not Listed	Yellow
Yellow Lady's-slipper	Cypripedium parviflorum	Not Listed	Not Listed	Not Listed	Yellow
Yellow Marsh Marigold	Caltha palustris	Not Listed	Not Listed	Not Listed	Yellow
Yellow Mountain Saxifrage	Saxifraga aizoides	Not Listed	Not Listed	Not Listed	Red

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Alleghaney Blackberry	Rubus allegheniensis	Not Listed	Not Listed	Not Listed	Green
American Beech	Fagus grandifolia	Not Listed	Not Listed	Not Listed	Green
Balsam Fir	Abies balsamea	Not Listed	Not Listed	Not Listed	Green
Bittersweet Nightshade	Solanum dulcamara	Not Listed	Not Listed	Not Listed	Exotic
Black Knapweed	Centaurea nigra	Not Listed	Not Listed	Not Listed	Exotic
Black Spruce	Picea mariana	Not Listed	Not Listed	Not Listed	Green
Bladder Sedge	Carex intumescens	Not Listed	Not Listed	Not Listed	Green
Boreal Bog Sedge	Carex magellanica	Not Listed	Not Listed	Not Listed	Green
Bracken Fern	Pteridium aquilinum	Not Listed	Not Listed	Not Listed	Green
Brown Beakrush	Rhynchospora fusca	Not Listed	Not Listed	Not Listed	Green
Bunchberry	Cornus canadensis	Not Listed	Not Listed	Not Listed	Green
Calico Aster	Symphyotrichum lateriflorum	Not Listed	Not Listed	Not Listed	Green
Canada Blue Grass	Poa compressa	Not Listed	Not Listed	Not Listed	Exotic
Canada Fly Honeysuckle	Lonicera canadensis	Not Listed	Not Listed	Not Listed	Green
Canada Goldenrod	Solidago canadensis	Not Listed	Not Listed	Not Listed	Green
Canada Hawkweed	Hieracium canadense	Not Listed	Not Listed	Not Listed	Green
Cinnamon Fern	Osmunda cinnamomea	Not Listed	Not Listed	Not Listed	Green
Club Spur Orchid	Platanthera clavellata	Not Listed	Not Listed	Not Listed	Green
Coltsfoot	Tussilago farfara	Not Listed	Not Listed	Not Listed	Exotic
Common Boneset	Eupatorium perfoliatum	Not Listed	Not Listed	Not Listed	Green
Common Buttercup	Ranunculus acris	Not Listed	Not Listed	Not Listed	Exotic
Common Dandelion	Taraxacum officinale	Not Listed	Not Listed	Not Listed	Exotic
Common Hawkweed	Hieracium lachenalii	Not Listed	Not Listed	Not Listed	Exotic
Common Hemp-nettle	Galeopsis tetrahit	Not Listed	Not Listed	Not Listed	Exotic
Common Labrador Tea	Ledum groenlandicum	Not Listed	Not Listed	Not Listed	Green
Common Lady Fern	Athyrium filix-femina	Not Listed	Not Listed	Not Listed	Green
Common Oak Fern	Gymnocarpium dryopteris	Not Listed	Not Listed	Not Listed	Green
Common Plantain	Plantago major	Not Listed	Not Listed	Not Listed	Exotic
Common Self-heal	Prunella vulgaris	Not Listed	Not Listed	Not Listed	Green
Common Speedwell	Veronica officinalis	Not Listed	Not Listed	Not Listed	Exotic
Common St. John's-wort	Hypericum perforatum	Not Listed	Not Listed	Not Listed	Exotic
Common Winterberry	Ilex verticillata	Not Listed	Not Listed	Not Listed	Green
Creeping Buttercup	Ranunculus repens	Not Listed	Not Listed	Not Listed	Exotic

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Creeping Snowberry	Gaultheria hispidula	Not Listed	Not Listed	Not Listed	Green
Dwarf Red Raspberry	Rubus pubescens	Not Listed	Not Listed	Not Listed	Green
Eastern Hay-Scented Fern	Dennstaedtia punctilobula	Not Listed	Not Listed	Not Listed	Green
Eastern Hemlock	Tsuga canadensis	Not Listed	Not Listed	Not Listed	Green
Eastern White Pine	Pinus strobus	Not Listed	Not Listed	Not Listed	Green
Evergreen Wood Fern	Dryopteris intermedia	Not Listed	Not Listed	Not Listed	Green
Field Horsetail	Equisetum arvense	Not Listed	Not Listed	Not Listed	Green
Flat-branched Tree-clubmoss	Lycopodium obscurum	Not Listed	Not Listed	Not Listed	Green
Fowl Manna Grass	Glyceria striata	Not Listed	Not Listed	Not Listed	Green
Fringed Sedge	Carex crinita	Not Listed	Not Listed	Not Listed	Green
Goldthread	Coptis trifolia	Not Listed	Not Listed	Not Listed	Green
Grass-leaved Goldenrod	Euthamia graminifolia	Not Listed	Not Listed	Not Listed	Green
Helleborine	Epipactis helleborine	Not Listed	Not Listed	Not Listed	Exotic
Indian Pipe	Monotropa uniflora	Not Listed	Not Listed	Not Listed	Green
Interrupted Fern	Osmunda claytoniana	Not Listed	Not Listed	Not Listed	Green
Low Rough Aster	Eurybia radula	Not Listed	Not Listed	Not Listed	Green
Mad-dog Skullcap	Scutellaria lateriflora	Not Listed	Not Listed	Not Listed	Green
Mountain Holly	Nemopanthus mucronatus	Not Listed	Not Listed	Not Listed	Green
Mountain Wood Fern	Dryopteris campyloptera	Not Listed	Not Listed	Not Listed	Green
Mouse-ear Hawkweed	Hieracium pilosella	Not Listed	Not Listed	Not Listed	Exotic
New York Fern	Thelypteris noveboracensis	Not Listed	Not Listed	Not Listed	Green
Northern Beech Fern	Phegopteris connectilis	Not Listed	Not Listed	Not Listed	Green
Northern Shorthusk	Brachyelytrum septentrionale	Not Listed	Not Listed	Not Listed	Green
Northern Starflower	Trientalis borealis	Not Listed	Not Listed	Not Listed	Green
Northern Water Horehound	Lycopus uniflorus	Not Listed	Not Listed	Not Listed	Green
Old Field Cinquefoil	Potentilla simplex	Not Listed	Not Listed	Not Listed	Green
One-sided Wintergreen	Orthilia secunda	Not Listed	Not Listed	Not Listed	Green
Oxeye Daisy	Leucanthemum vulgare	Not Listed	Not Listed	Not Listed	Exotic
Paper Birch	Betula papyrifera	Not Listed	Not Listed	Not Listed	Green
Partridgeberry	Mitchella repens	Not Listed	Not Listed	Not Listed	Green
Path Rush	Juncus tenuis	Not Listed	Not Listed	Not Listed	Green
Pearly Everlasting	Anaphalis margaritacea	Not Listed	Not Listed	Not Listed	Green
Pin Cherry	Prunus pensylvanica	Not Listed	Not Listed	Not Listed	Green

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Pinesap	Monotropa hypopithys	Not Listed	Not Listed	Not Listed	Green
Pink Lady's-Slipper	Cypripedium acaule	Not Listed	Not Listed	Not Listed	Green
Pussy Willow	Salix discolor	Not Listed	Not Listed	Not Listed	Green
Queen Anne's Lace	Daucus carota	Not Listed	Not Listed	Not Listed	Exotic
Red Maple	Acer rubrum	Not Listed	Not Listed	Not Listed	Green
Red Raspberry	Rubus idaeus	Not Listed	Not Listed	Not Listed	Green
Rock Polypody	Polypodium virginianum	Not Listed	Not Listed	Not Listed	Green
Rose Twisted-stalk	Streptopus lanceolatus	Not Listed	Not Listed	Not Listed	Green
Rough-stemmed Goldenrod	Solidago rugosa	Not Listed	Not Listed	Not Listed	Green
Round-leaved Sundew	Drosera rotundifolia	Not Listed	Not Listed	Not Listed	Green
Running Clubmoss	Lycopodium clavatum	Not Listed	Not Listed	Not Listed	Green
Sensitive Fern	Onoclea sensibilis	Not Listed	Not Listed	Not Listed	Green
Shining Firmoss	Huperzia lucidula	Not Listed	Not Listed	Not Listed	Green
Showy Mountain Ash	Sorbus decora	Not Listed	Not Listed	Not Listed	Green
Small Cranberry	Vaccinium oxycoccos	Not Listed	Not Listed	Not Listed	Green
Small-flowered Evening Primrose	Oenothera parviflora	Not Listed	Not Listed	Not Listed	Green
Soft Rush	Juncus effusus	Not Listed	Not Listed	Not Listed	Green
Speckled Alder	Alnus incana	Not Listed	Not Listed	Not Listed	Green
Stiff Clubmoss	Lycopodium annotinum	Not Listed	Not Listed	Not Listed	Green
Striped Maple	Acer pensylvanicum	Not Listed	Not Listed	Not Listed	Green
Sugar Maple	Acer saccharum	Not Listed	Not Listed	Not Listed	Green
Tall Hawkweed	Hieracium piloselloides	Not Listed	Not Listed	Not Listed	Exotic
Tall Meadow-Rue	Thalictrum pubescens	Not Listed	Not Listed	Not Listed	Green
Three-leaved False Solomon's Seal	Maianthemum trifolium	Not Listed	Not Listed	Not Listed	Green
Three-leaved Rattlesnakeroot	Prenanthes trifoliolata	Not Listed	Not Listed	Not Listed	Green
Three-seeded Sedge	Carex trisperma	Not Listed	Not Listed	Not Listed	Green
Tufted Vetch	Vicia cracca	Not Listed	Not Listed	Not Listed	Exotic
Twinflower	Linnaea borealis	Not Listed	Not Listed	Not Listed	Green
Violet	Viola sp.	#N/A	#N/A	#N/A	#N/A
White Ash	Fraxinus americana	Not Listed	Not Listed	Not Listed	Green
White Spruce	Picea glauca	Not Listed	Not Listed	Not Listed	Green
Whorled Wood Aster	Oclemena acuminata	Not Listed	Not Listed	Not Listed	Green
Wild Lily-of-The-Valley	Maianthemum canadense	Not Listed	Not Listed	Not Listed	Green

Common Name	Scientific Name	SARA Status	NSESA Status	COSEWIC Status	NSDNR Status
Wild Sarsaparilla	Aralia nudicaulis	Not Listed	Not Listed	Not Listed	Green
Wild Strawberry	Fragaria virginiana	Not Listed	Not Listed	Not Listed	Green
Woodland Horsetail	Equisetum sylvaticum	Not Listed	Not Listed	Not Listed	Green
Yellow Birch	Betula alleghaniensis	Not Listed	Not Listed	Not Listed	Green
Yellow Bluebead Lily	Clintonia borealis	Not Listed	Not Listed	Not Listed	Green



Photo 1: Sapling/immature mixed wood habitat along existing access road.



Photo 2: Coniferous upland habitat.



Photo 3: Mature hardwood habitat.



Photo 4: Mixed wood habitat.



Photo 5: Treed swamp habitat.



Photo 6: Clearing by meteorological tower.

Appendix H:
Noise Impact Assessment

**Barrachois Wind Farm
Noise Impact Assessment Report
October 2013**



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** The WindPRO v2.8, Decibel Module Calculation Results for Enercon E-92 2.3 MW @ 98m Hub Height. To review General Specification for the Enercon E-92 2.3 MW please contact:

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I. Introduction

Natural Forces Wind Inc. has undertaken a noise impact assessment for the proposed Barrachois Wind Farm site to assess the impact of the wind farm's sound emissions on the surrounding points of immission. Details outlining the project, immission receptors, prediction methodology and assumptions made for the assessment are included herein, with WindPRO results for the turbine supplied in the annexes. The Land Use By-law for Cape Breton Regional Municipality does not state any restrictions pertaining to sound pressure levels relating to wind turbines activities. Therefore, the Ontario *Noise Guidelines for Wind Farms* will be used during this assessment as a guideline regarding acceptable noise emission from the proposed Barrachois Wind Farm.

The noise analysis was conducted using the ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation model within the Decibel module of the software package, WindPRO version 2.8.

2. General Description of Project Site and Surrounds

The proposed Barrachois Wind Farm consists of a maximum of 2 wind turbine generators (WTG) located in Cape Breton Regional Municipality, Nova Scotia. Currently, Enercon E-92 2.0 MW wind turbines are being considered for the project and therefore were used to calculate predicted sound pressure levels, however if the turbine type was to change, a new noise assessment would be conducted. The project site is situated approximately 17 kilometers west of Sydney and adjacent to the Grand Narrows Highway. Land around the proposed project area is zoned as a General Development Zone and so, will not require re-zoning. A map of the site is included in Annex A.

The predominant noise sources in the area are from road traffic along Grand Narrows Highway including the traffic coming to and from the quarries located approximately 1.5 kilometers from the proposed site.

3. Noise Guidelines for Wind Farm

3.1. Provincial and Municipal Noise Guidelines

As previously mentioned, the Land Use By-law for the Cape Breton Regional Municipality does not include any restrictions concerning acceptable sound pressure levels being emitted from wind turbines.

The province of Nova Scotia does not have any guidelines or written restrictions for acceptable sound pressure levels, but adheres to the guidelines outlined in Ontario's *Noise Guidelines for Wind Farms*.

3.2. Ontario Provincial Noise Guidelines

For the proposed Barrachois Wind Farm, the Ontario *Noise Guidelines for Wind Farms* was used as a general guideline. The guidelines describe receptors in rural environments as Class 3. The sound level limits established for this class of receptors is demonstrated in Table I for wind turbines at different wind speeds.

Table I - Summary of sound level limits for wind turbines (Ministry of the Environment, 2008).

Wind Speed (m/s) at 10 m height	4	5	6	7	8	9	10
Wind Turbine Sound Level Limits Class 3 Area, dB(A)	40.0	40.0	40.0	43.0	45.0	49.0	51.0

To ensure a conservative assessment of the sound level limits emitted by the proposed Barrachois Wind Farm, a general limit of 40 dB(A) was used for wind speeds ranging between and including 4 and 12 m/s.

The noise assessment used the height above grade at the centre of the receptors of 4.5 m as proposed by the guideline for single and two story dwellings.

4. Description of Receptors

The 64 points of reception taken into consideration for this noise impact assessment are residential buildings and/or seasonal camps located within 2,000 metres (m) of the nearest proposed WTG. The receptors are located at dwellings along Long Island Road, Grand Narrows Hwy and Scotch Lake Rd.

Details of receptor locations and distances to nearest WTG are detailed in Table 2. The receptor IDs included in Table 2 correspond with the WindPRO generated map included in Annex B.

Table 2 - Description of receptors.

Point of Reception ID Letter	Location (UTM Zone 20, NAD 83)		Distance from Receptor to	
	Easting	Northing	Wind turbine 1	Wind turbine 2
A	699,390	5,114,718	1111	1222
B	699,996	5,115,986	1219	1697
C	698,494	5,113,292	2545	2344
D	699,579	5,115,277	997	1329
E	698,898	5,114,057	1788	1700
F	699,607	5,115,353	1006	1361
G	700,006	5,116,009	1236	1715
H	698,713	5,113,573	2201	2024
I	698,904	5,113,699	1972	1799
J	698,960	5,114,160	1687	1622
K	702,080	5,113,531	2080	1740
L	699,711	5,115,698	1136	1564
M	702,185	5,115,542	1823	1988
N	699,192	5,114,507	1348	1379
O	702,093	5,115,230	1642	1744
P	699,348	5,114,636	1166	1243
Q	698,858	5,113,874	1912	1783
R	699,594	5,115,576	1139	1534
S	699,677	5,115,651	1126	1544
T	699,431	5,114,837	1059	1220
U	702,007	5,113,556	2008	1664
V	699,080	5,114,064	1624	1520
W	698,450	5,113,228	2619	2413
X	699,565	5,115,235	994	1311
Y	699,791	5,115,839	1193	1644
Z	699,273	5,114,844	1217	1371
AA	698,473	5,113,175	2636	2419
AB	701,523	5,113,504	1714	1303
AC	698,811	5,113,558	2131	1941
AD	699,257	5,114,656	1251	1336
AE	699,186	5,114,312	1419	1382

Point of Reception ID Letter	Location (UTM Zone 20, NAD 83)		Distance from Receptor to	
	Easting	Northing	Wind turbine 1	Wind turbine 2
AF	698,526	5,113,330	2497	2298
AG	699,698	5,115,684	1135	1560
AH	699,373	5,114,684	1132	1229
AI	702,141	5,113,610	2078	1757
AJ	699,959	5,116,274	1500	1981
AK	702,141	5,115,488	1763	1922
AL	698,770	5,113,700	2081	1923
AM	699,276	5,114,439	1289	1291
AN	699,235	5,114,397	1341	1330
AO	699,311	5,114,914	1179	1360
AP	699,496	5,115,042	1008	1254
AQ	698,861	5,113,932	1881	1765
AR	698,428	5,113,212	2646	2440
AS	699,329	5,114,805	1162	1305
AT	700,016	5,116,082	1300	1781
AU	698,452	5,113,159	2662	2445
AV	699,456	5,114,938	1036	1239
AW	699,736	5,115,734	1145	1581
AX	699,157	5,114,195	1494	1421
AY	698,481	5,113,258	2577	2372
AZ	698,788	5,113,803	2009	1871
BA	701,712	5,113,599	1765	1392
BB	698,948	5,114,120	1716	1640
BC	702,072	5,113,418	2148	1791
BD	699,969	5,115,937	1186	1660
BE	699,846	5,116,154	1435	1907
BF	699,782	5,115,796	1164	1611
BG	699,773	5,115,771	1150	1594
BH	699,904	5,116,104	1365	1839
BI	699,303	5,114,585	1221	1278
BJ	699,484	5,114,571	1049	1097
BK	698,904	5,114,096	1766	1688
BL	698,907	5,114,023	1795	1698

5. Description of Sources

5.1. Turbine Locations

A map of the project area with the proposed WTG layout is illustrated in Annex A. There are no existing or proposed wind farms within 5 kilometers of the project, thus it is unlikely any cumulative noise effects will occur. UTM coordinates of the WTGs are given below in Table 3. WTG ID numbers included in Table 3 correspond with the labels to the WindPRO generated map included Annex B.

Table 3 - Coordinates of proposed turbine locations.

WTG ID Number	Proposed WTG Location (UTM Zone 20, NAD 83)	
	Easting	Northing
1	700,490	5,114,871
2	700,566	5,114,388

5.2. Turbine Types

The model of WTGs being considered for the proposed wind farm is the Enercon E-92 2.0 MW. Because the turbines at Barrachois will be de-rated Enercon E-92 turbines from their maximum capacity of 2.3 MW to 2.0 MW, this assessment uses E-92 2.3 MW turbines to model the noise impact on nearby receptors.

This model utilizes horizontal axis, upwind, 3-bladed, and a microprocessor pitch control system.

Table 4 - Enercon E-92 2.3 MW turbine characteristics below outlines their main characteristics.

Table 4 - Enercon E-92 2.3 MW turbine characteristics. (Enercon, 2012)

WTG Type	Rotor Diameter (m)	Hub Height (m)	Rated Output (MW)
E-92 2.3	92.0	98	2.3

5.3. Power Curve Data

The power curve for the E-92 2.3 MW WTGs at Noise Mode 0 and with an air density of 1.225 kg/m³ is shown below in Figure I.

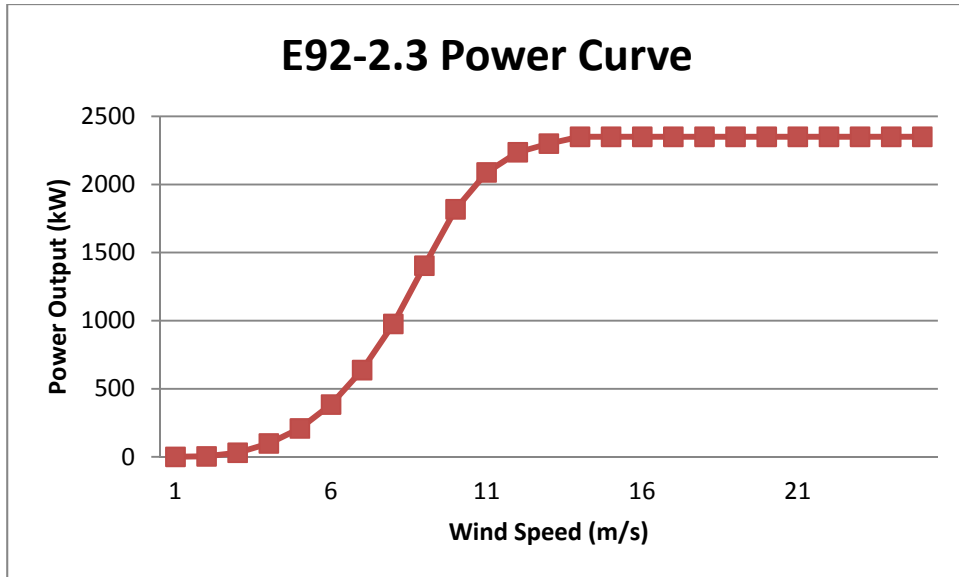


Figure I – Power curve for the Enercon E-92 2.3.

6. Wind Turbine Noise Emission Rating

The noise emission data for the Enercon E-92 2.3 WTG, shown in Table 5 below, was provided by Enercon Canada (2012). The Sound Pressure Levels (SPL) were measured to IEC 61400-11 standards, which stipulate measurements at a height of 10m above ground level (a.g.l.) with an air density of 1.225 kg/m³ that is taken to be representative of the project area. Where data is shown as 'N/A', WindPRO has extrapolated octave band data to generate appropriate SPL values in order to complete the calculation. These source noise levels are incorporated in the prediction calculations referenced in Section 7.

Table 5 - Enercon E-92 2.3 MW noise emission data for 98m hub height.

Wind speed at 10m a.g.l. (m/s)	SPL (LWA) (dB(A) re 10 ⁻¹² Watts)	Octave Band Centre Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
4	97.6	79.2	86.2	89.6	92.2	92.2	89.1	84.3	74.8
5	99.9	81.5	88.5	91.9	94.5	94.3	91.4	86.6	77.1
6	102.2	83.8	90.8	84.2	96.8	96.6	93.7	88.9	79.4
7	103.4	85.0	92.0	95.4	98.0	97.8	94.9	90.1	80.6
8	104.4	86.0	93.0	96.4	99.0	98.8	95.9	91.1	81.6
9	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
10	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
11	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
12	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2

7. Impact Assessment

7.1. Prediction Methodology

The SPL was calculated at each point of reception (listed in Table 2) using the Decibel module of WindPRO v.2.8 which uses the ISO 9613-2 model “Attenuation of sound during propagation outdoors, Part 2: A general method of calculation”. The calculations were performed using the Enercon E-92 2.3 MW wind turbine generators with a hub height of 98m. A global ground attenuation of 0.0 was used to represent a ‘worst case scenario’ that produces results that are unaffected by sound absorption from topographical characteristics such as trees, grass, etc. The WindPRO generated noise contour map for the Enercon E-92 2.3 with a 98m hub height can be found in Annex B.

As another conservative measure, downwind propagation has been assumed to occur simultaneously in all directions and from all wind turbines. Furthermore, no attenuation from topographical shielding (other buildings, barns, trees etc.) has been considered between the turbines and receptors. In reality, noise propagation in an upwind direction would lead to a significant reduction of incident noise levels at receptors located in the upwind direction in relation to the wind turbine.

No correction for special audible characteristics such as clearly audible tones, impulses or modulation of sound levels has been made. These are not common characteristics of modern wind turbine generators in a well designed wind farm. The absence of tonal noise is normally guaranteed by wind turbine manufacturers. Furthermore, impulses and modulation of sound levels from the wind farm under normal conditions would not be of a level to necessitate the application of any penalty.

A full list of parameters assumed for the predictions is provided in Annex B.

7.2. Results of Noise Predictions

The results of the noise prediction model at each point of immission, as summarized in Table 6, prove compliance with the Ontario *Noise Guidelines for Wind Farms* and the 40 dB(A) conservative SPL emission limit. The table demonstrates the loudest noise levels for any wind speed modelled between and including 4 to 12 m/s. As the guideline requirements have been exceeded, it was deemed unnecessary to conduct noise monitoring to establish background noise levels.

The receptor with the highest perceived noise immission was receptor BJ, which received a maximum emission of 36.2 dB(A) from the Enercon E-92 2.3 MW machine, at a 98m hub heights.

The modelled noise results for a wind speed of 9 m/s, approximately the ‘noisiest’ operational speed of a Enercon E92 wind turbine is mapped in Annexe B. The receptor ID labels on the contour plot correspond with the WindPRO ID listed in Table 2.

Table 6 - Wind turbine noise impact assessment summary.

Point of Reception ID letter	Distance from Receptor to nearest wind turbine (m)	Max Sound Level from wind farm for all wind speeds dB(A)	Compliance with Ontario Guidelines (Yes/No)	Compliance with 40 dB(A) Noise Level (Yes/No)
A	1111	35.3	Yes	Yes
B	1219	33.4	Yes	Yes
C	2344	26.9	Yes	Yes
D	997	35.6	Yes	Yes
E	1700	30.8	Yes	Yes
F	1006	35.5	Yes	Yes
G	1236	33.2	Yes	Yes
H	2024	28.6	Yes	Yes
I	1799	30	Yes	Yes
J	1622	31.4	Yes	Yes
K	1740	30	Yes	Yes
L	1136	34.1	Yes	Yes
M	1823	29.9	Yes	Yes
N	1348	33.6	Yes	Yes
O	1642	31.2	Yes	Yes
P	1166	35	Yes	Yes
Q	1783	30.2	Yes	Yes
R	1139	34.2	Yes	Yes
S	1126	34.2	Yes	Yes
T	1059	35.6	Yes	Yes
U	1664	30.5	Yes	Yes
V	1520	32.1	Yes	Yes
W	2413	26.5	Yes	Yes
X	994	35.7	Yes	Yes
Y	1193	33.6	Yes	Yes
Z	1217	34.2	Yes	Yes
AA	2419	26.5	Yes	Yes
AB	1303	32.9	Yes	Yes
AC	1941	29.1	Yes	Yes
AD	1251	34.2	Yes	Yes
AE	1382	33.3	Yes	Yes
AF	2298	27.1	Yes	Yes
AG	1135	34.1	Yes	Yes
AH	1132	35.2	Yes	Yes
AI	1757	30	Yes	Yes
AJ	1500	31.2	Yes	Yes
AK	1763	30.3	Yes	Yes
AL	1923	29.3	Yes	Yes

Point of Reception ID letter	Distance from Receptor to nearest wind turbine (m)	Max Sound Level from wind farm for all wind speeds dB(A)	Compliance with Ontario Guidelines (Yes/No)	Compliance with 40 dB(A) Noise Level (Yes/No)
AM	1289	34.2	Yes	Yes
AN	1330	33.8	Yes	Yes
AO	1179	34.4	Yes	Yes
AP	1008	35.8	Yes	Yes
AQ	1765	30.3	Yes	Yes
AR	2440	26.4	Yes	Yes
AS	1162	34.7	Yes	Yes
AT	1300	32.7	Yes	Yes
AU	2445	26.4	Yes	Yes
AV	1036	35.7	Yes	Yes
AW	1145	34	Yes	Yes
AX	1421	32.9	Yes	Yes
AY	2372	26.8	Yes	Yes
AZ	1871	29.6	Yes	Yes
BA	1392	32.3	Yes	Yes
BB	1640	31.3	Yes	Yes
BC	1791	29.7	Yes	Yes
BD	1186	33.6	Yes	Yes
BE	1435	31.7	Yes	Yes
BF	1164	33.8	Yes	Yes
BG	1150	34	Yes	Yes
BH	1365	32.2	Yes	Yes
BI	1221	34.6	Yes	Yes
BJ	1049	36.2	Yes	Yes
BK	1688	31	Yes	Yes
BL	1698	30.8	Yes	Yes

8. Conclusions and Recommendations

Natural Forces Wind Inc. has completed a thorough assessment to evaluate the noise impact of the proposed Barrachois Wind Farm at residential locations within 2 kilometers of a proposed wind turbine generator. Based on the parameters used to run the WindPRO noise prediction model, it has been shown that the predicted SPLs emitted by any of the proposed WTGs are less than 40 dB(A), thus demonstrating compliance with the Ontario *Noise Guidelines for Wind Farms*. As a result of this study, no noise mitigation strategies are recommended.

9. References

Cape Breton Regional Municipality (2009). Land Use By-Law of the Cape Breton Regional Municipality. CBRM.

Enercon GmbH ed. (2012). *Sound power level of the Enercon E-92*. Germany.

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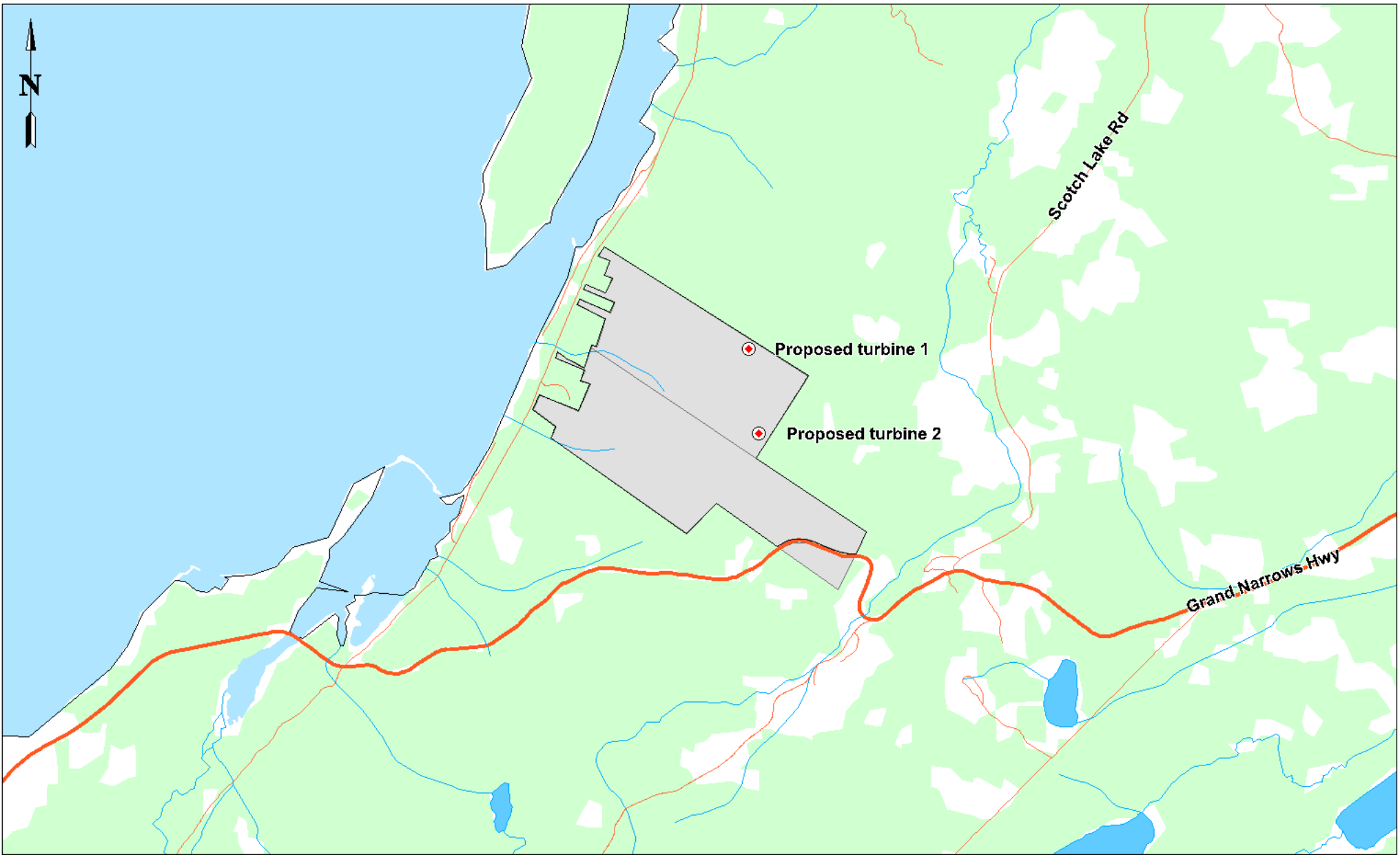
Enercon GmbH ed. (2012). *Technical information data pack ENERCON E-92*. Germany

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ANNEX A

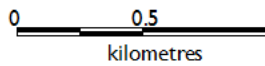
Site Layout Map



LEGEND

-  Project land
-  Proposed turbines
-  Highway
-  Arterial & minor road
-  Watercourse

SCALE



1:30,000

KEY MAP



PROJECT

Barrachois Wind Farm

FIGURE

Annex A

TITLE

Site Layout

DATE

October 3rd 2013



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ANNEX B

WindPRO v2.8, Decibel Module Calculation Results

Enercon E-92 2.3 MW @ 98m Hub Height

Project:

Barrachois Wind Farm

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Natural Forces Wind Inc
1791 Barrington Street Suite 1030
CA-HALIFAX, Nova Scotia B3J 3L1

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Calculated:
03/10/2013 2:53 PM/2.8.579

DECIBEL - Main Result

Calculation: Barrachois - Noise Impact Assesment

Noise calculation model:

ISO 9613-2 General

Wind speed:

4.0 m/s - 12.0 m/s, step 1.0 m/s

Ground attenuation:

None

Meteorological coefficient, C0:

0.0 dB

Type of demand in calculation:

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

Noise values in calculation:

All noise values are mean values (Lwa) (Normal)

Pure tones:

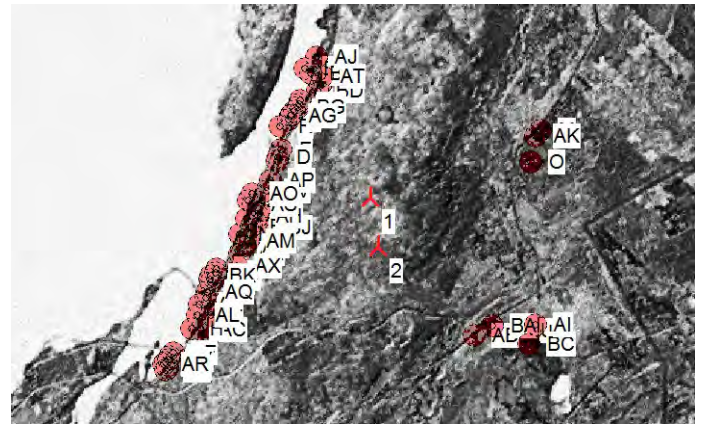
Pure and Impulse tone penalty are added to WTG source noise

Height above ground level, when no value in NSA object:

4.5 m Don't allow override of model height with height from NSA object

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0.0 dB(A)



Scale 1:75,000
New WTG Noise sensitive area

WTGs

UTM (north)-NAD83 (US+CA) Zone: 20				WTG type			Noise data										
East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Creator	Name	First wind speed [m/s]	LwaRef [dB(A)]	Last wind speed [m/s]	LwaRef [dB(A)]	Pure tones	
1	700,490	5,114,871	192.4	ENERCON E-92 2,3 MW 2300 ...	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	98.0	EMD	Level 0 - calculated - Op.Mode 1 - 03/2012	4.0	97.6	12.0	105.0	0 dB g
2	700,566	5,114,388	176.1	ENERCON E-92 2,3 MW 2300 ...	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	98.0	EMD	Level 0 - calculated - Op.Mode 1 - 03/2012	4.0	97.6	12.0	105.0	0 dB g

h) Generic octave distribution used
g) Data calculated from data for other wind speed (uncertain)

Calculation Results

Sound Level

Noise sensitive area No.	Name	UTM (north)-NAD83 (US+CA) Zone: 20			Demands			Sound Level		Demands fulfilled ?		
		East	North	Z	Imission	Max Noise	Distance	Max From WTGs	Noise	Distance	All	
				[m]	[m]	[dB(A)]	[m]	[dB(A)]				
A	Noise sensitive point: User defined (1)	699,390	5,114,718	36.9	4.5	40.0	243	35.3	Yes	Yes	Yes	
B	Noise sensitive point: User defined (2)	699,996	5,115,986	37.7	4.5	40.0	243	33.4	Yes	Yes	Yes	
C	Noise sensitive point: User defined (3)	698,494	5,113,292	6.9	4.5	40.0	243	26.9	Yes	Yes	Yes	
D	Noise sensitive point: User defined (4)	699,579	5,115,277	34.4	4.5	40.0	243	35.6	Yes	Yes	Yes	
E	Noise sensitive point: User defined (5)	698,898	5,114,057	3.9	4.5	40.0	243	30.8	Yes	Yes	Yes	
F	Noise sensitive point: User defined (6)	699,607	5,115,353	35.2	4.5	40.0	243	35.5	Yes	Yes	Yes	
G	Noise sensitive point: User defined (7)	700,006	5,116,009	35.8	4.5	40.0	243	33.2	Yes	Yes	Yes	
H	Noise sensitive point: User defined (8)	698,713	5,113,573	7.2	4.5	40.0	243	28.6	Yes	Yes	Yes	
I	Noise sensitive point: User defined (9)	698,904	5,113,699	17.8	4.5	40.0	243	30.0	Yes	Yes	Yes	
J	Noise sensitive point: User defined (10)	698,960	5,114,160	6.1	4.5	40.0	243	31.4	Yes	Yes	Yes	
K	Noise sensitive point: User defined (11)	702,080	5,113,531	95.0	4.5	40.0	243	30.0	Yes	Yes	Yes	
L	Noise sensitive point: User defined (12)	699,711	5,115,698	9.4	4.5	40.0	243	34.1	Yes	Yes	Yes	
M	Noise sensitive point: User defined (13)	702,185	5,115,542	72.5	4.5	40.0	243	29.9	Yes	Yes	Yes	
N	Noise sensitive point: User defined (14)	699,192	5,114,507	19.8	4.5	40.0	243	33.6	Yes	Yes	Yes	
O	Noise sensitive point: User defined (15)	702,093	5,115,230	66.7	4.5	40.0	243	31.2	Yes	Yes	Yes	
P	Noise sensitive point: User defined (16)	699,348	5,114,636	35.2	4.5	40.0	243	35.0	Yes	Yes	Yes	
Q	Noise sensitive point: User defined (17)	698,858	5,113,874	6.5	4.5	40.0	243	30.2	Yes	Yes	Yes	
R	Noise sensitive point: User defined (18)	699,594	5,115,576	7.5	4.5	40.0	243	34.2	Yes	Yes	Yes	
S	Noise sensitive point: User defined (19)	699,677	5,115,651	9.5	4.5	40.0	243	34.2	Yes	Yes	Yes	
T	Noise sensitive point: User defined (20)	699,431	5,114,837	35.5	4.5	40.0	243	35.6	Yes	Yes	Yes	
U	Noise sensitive point: User defined (21)	702,007	5,113,556	95.2	4.5	40.0	243	30.5	Yes	Yes	Yes	
V	Noise sensitive point: User defined (22)	699,080	5,114,064	43.7	4.5	40.0	243	32.1	Yes	Yes	Yes	
W	Noise sensitive point: User defined (23)	698,450	5,113,228	7.2	4.5	40.0	243	26.5	Yes	Yes	Yes	

To be continued on next page...

Project:

Barrachois Wind Farm

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03/10/2013 2:53 PM/2.8.579

DECIBEL - Main Result

Calculation: Barrachois - Noise Impact Assessment

...continued from previous page

Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20				Demands		Sound Level		Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From	Noise	Distance	All	
					[m]	[dB(A)]	[m]	WTGs	[dB(A)]			
X	Noise sensitive point: User defined (24)	699,565	5,115,235	35.9	4.5	40.0	243	35.7		Yes	Yes	Yes
Y	Noise sensitive point: User defined (25)	699,791	5,115,839	3.9	4.5	40.0	243	33.6		Yes	Yes	Yes
Z	Noise sensitive point: User defined (26)	699,273	5,114,844	8.4	4.5	40.0	243	34.2		Yes	Yes	Yes
AA	Noise sensitive point: User defined (27)	698,473	5,113,175	16.3	4.5	40.0	243	26.5		Yes	Yes	Yes
AB	Noise sensitive point: User defined (28)	701,523	5,113,504	100.7	4.5	40.0	243	32.9		Yes	Yes	Yes
AC	Noise sensitive point: User defined (29)	698,811	5,113,558	13.8	4.5	40.0	243	29.1		Yes	Yes	Yes
AD	Noise sensitive point: User defined (30)	699,257	5,114,656	18.4	4.5	40.0	243	34.2		Yes	Yes	Yes
AE	Noise sensitive point: User defined (31)	699,186	5,114,312	36.8	4.5	40.0	243	33.3		Yes	Yes	Yes
AF	Noise sensitive point: User defined (32)	698,526	5,113,330	7.3	4.5	40.0	243	27.1		Yes	Yes	Yes
AG	Noise sensitive point: User defined (33)	699,698	5,115,684	9.1	4.5	40.0	243	34.1		Yes	Yes	Yes
AH	Noise sensitive point: User defined (34)	699,373	5,114,684	36.7	4.5	40.0	243	35.2		Yes	Yes	Yes
AI	Noise sensitive point: User defined (35)	702,141	5,113,610	92.0	4.5	40.0	243	30.0		Yes	Yes	Yes
AJ	Noise sensitive point: User defined (36)	699,959	5,116,274	10.0	4.5	40.0	243	31.2		Yes	Yes	Yes
AK	Noise sensitive point: User defined (37)	702,141	5,115,488	72.3	4.5	40.0	243	30.3		Yes	Yes	Yes
AL	Noise sensitive point: User defined (38)	698,770	5,113,700	4.9	4.5	40.0	243	29.3		Yes	Yes	Yes
AM	Noise sensitive point: User defined (39)	699,276	5,114,439	40.0	4.5	40.0	243	34.2		Yes	Yes	Yes
AN	Noise sensitive point: User defined (40)	699,235	5,114,397	36.4	4.5	40.0	243	33.8		Yes	Yes	Yes
AO	Noise sensitive point: User defined (41)	699,311	5,114,914	10.4	4.5	40.0	243	34.4		Yes	Yes	Yes
AP	Noise sensitive point: User defined (42)	699,496	5,115,042	38.1	4.5	40.0	243	35.8		Yes	Yes	Yes
AQ	Noise sensitive point: User defined (43)	698,861	5,113,932	5.2	4.5	40.0	243	30.3		Yes	Yes	Yes
AR	Noise sensitive point: User defined (44)	698,428	5,113,212	6.2	4.5	40.0	243	26.4		Yes	Yes	Yes
AS	Noise sensitive point: User defined (45)	699,329	5,114,805	19.4	4.5	40.0	243	34.7		Yes	Yes	Yes
AT	Noise sensitive point: User defined (46)	700,016	5,116,082	28.9	4.5	40.0	243	32.7		Yes	Yes	Yes
AU	Noise sensitive point: User defined (47)	698,452	5,113,159	15.3	4.5	40.0	243	26.4		Yes	Yes	Yes
AV	Noise sensitive point: User defined (48)	699,456	5,114,938	34.0	4.5	40.0	243	35.7		Yes	Yes	Yes
AW	Noise sensitive point: User defined (49)	699,736	5,115,734	9.3	4.5	40.0	243	34.0		Yes	Yes	Yes
AX	Noise sensitive point: User defined (50)	699,157	5,114,195	42.7	4.5	40.0	243	32.9		Yes	Yes	Yes
AY	Noise sensitive point: User defined (51)	698,481	5,113,258	8.4	4.5	40.0	243	26.8		Yes	Yes	Yes
AZ	Noise sensitive point: User defined (52)	698,788	5,113,803	1.7	4.5	40.0	243	29.6		Yes	Yes	Yes
BA	Noise sensitive point: User defined (53)	701,712	5,113,599	96.9	4.5	40.0	243	32.3		Yes	Yes	Yes
BB	Noise sensitive point: User defined (54)	698,948	5,114,120	5.9	4.5	40.0	243	31.3		Yes	Yes	Yes
BC	Noise sensitive point: User defined (55)	702,072	5,113,418	95.3	4.5	40.0	243	29.7		Yes	Yes	Yes
BD	Noise sensitive point: User defined (56)	699,969	5,115,937	38.3	4.5	40.0	243	33.6		Yes	Yes	Yes
BE	Noise sensitive point: User defined (57)	699,846	5,116,154	0.0	4.5	40.0	243	31.7		Yes	Yes	Yes
BF	Noise sensitive point: User defined (58)	699,782	5,115,796	8.7	4.5	40.0	243	33.8		Yes	Yes	Yes
BG	Noise sensitive point: User defined (59)	699,773	5,115,771	10.1	4.5	40.0	243	34.0		Yes	Yes	Yes
BH	Noise sensitive point: User defined (60)	699,904	5,116,104	6.0	4.5	40.0	243	32.2		Yes	Yes	Yes
BI	Noise sensitive point: User defined (61)	699,303	5,114,585	31.1	4.5	40.0	243	34.6		Yes	Yes	Yes
BJ	Noise sensitive point: User defined (62)	699,484	5,114,571	67.9	4.5	40.0	243	36.2		Yes	Yes	Yes
BK	Noise sensitive point: User defined (63)	698,904	5,114,096	1.6	4.5	40.0	243	31.0		Yes	Yes	Yes
BL	Noise sensitive point: User defined (64)	698,907	5,114,023	7.6	4.5	40.0	243	30.8		Yes	Yes	Yes

Distances (m)

WTG	
NSA	
1	2
A	1111 1222
B	1219 1697
C	2545 2344
D	997 1329
E	1788 1700
F	1006 1361
G	1236 1715
H	2201 2024

To be continued on next page...

Project:

Barrachois Wind Farm

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DECIBEL - Main Result**Calculation:** Barrachois - Noise Impact Assesment

...continued from previous page

WTG

NSA	1	2
I	1972	1799
J	1687	1622
K	2080	1740
L	1136	1564
M	1823	1988
N	1348	1379
O	1642	1744
P	1166	1243
Q	1912	1783
R	1139	1534
S	1126	1544
T	1059	1220
U	2008	1664
V	1624	1520
W	2619	2413
X	994	1311
Y	1193	1644
Z	1217	1371
AA	2636	2419
AB	1714	1303
AC	2131	1941
AD	1251	1336
AE	1419	1382
AF	2497	2298
AG	1135	1560
AH	1132	1229
AI	2078	1757
AJ	1500	1981
AK	1763	1922
AL	2081	1923
AM	1289	1291
AN	1341	1330
AO	1179	1360
AP	1008	1254
AQ	1881	1765
AR	2646	2440
AS	1162	1305
AT	1300	1781
AU	2662	2445
AV	1036	1239
AW	1145	1581
AX	1494	1421
AY	2577	2372
AZ	2009	1871
BA	1765	1392
BB	1716	1640
BC	2148	1791
BD	1186	1660
BE	1435	1907
BF	1164	1611
BG	1150	1594
BH	1365	1839
BI	1221	1278
BJ	1049	1097
BK	1766	1688
BL	1795	1698

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Barrachois Wind Farm

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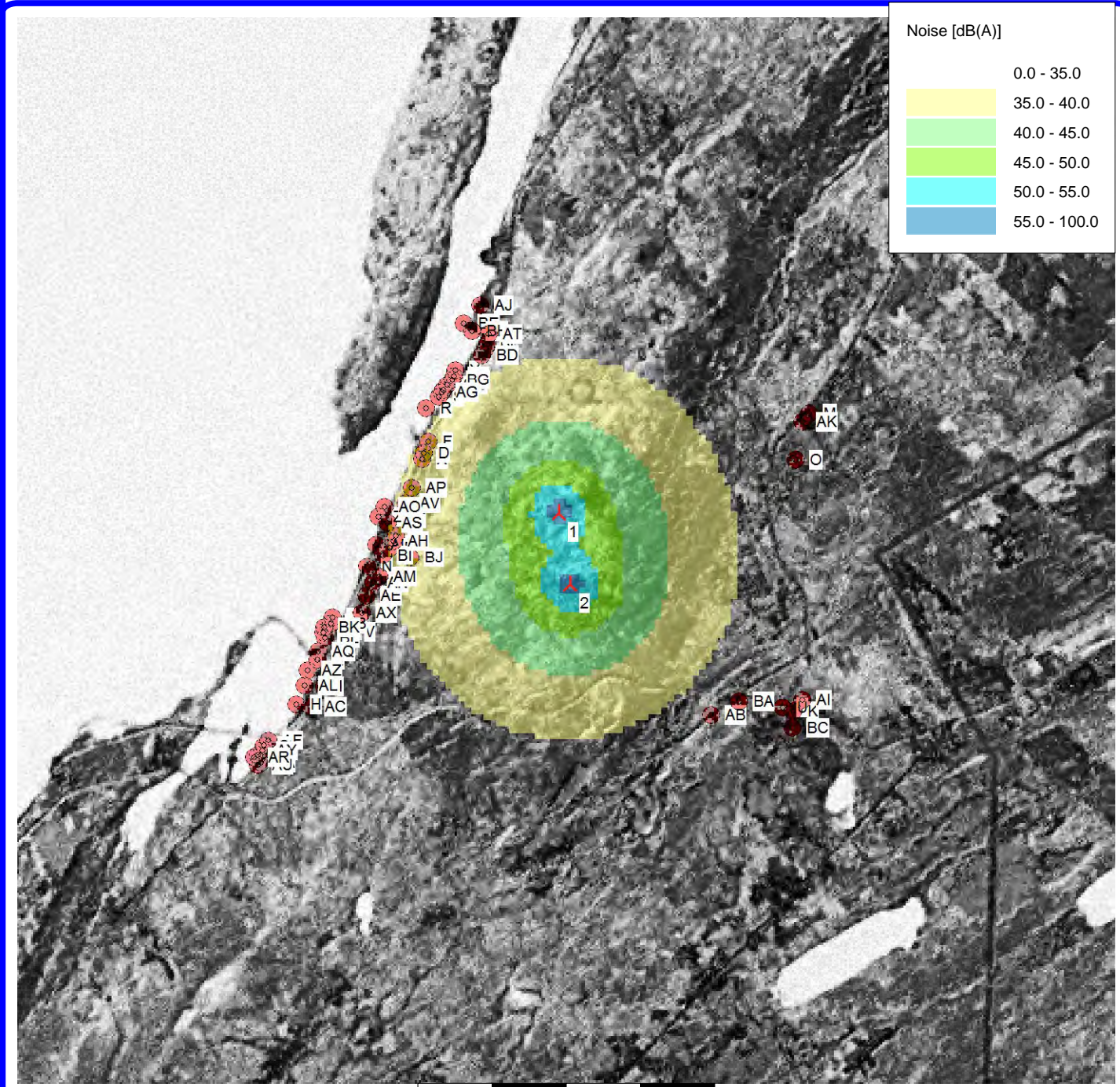
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DECIBEL - Map 9.0 m/s

Calculation: Barrachois - Noise Impact Assesment



Noise [dB(A)]	
0.0 - 35.0	
35.0 - 40.0	
40.0 - 45.0	
45.0 - 50.0	
50.0 - 55.0	
55.0 - 100.0	

0 500 1000 1500 2000 m

Map: WindPRO map , Print scale 1:40,000, Map center UTM (north)-NAD83 (US+CA) Zone: 20 East: 700,528 North: 5,114,630

New WTG

Noise sensitive area

Noise calculation model: ISO 9613-2 General. Wind speed: 9.0 m/s

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Barrachois Wind Farm

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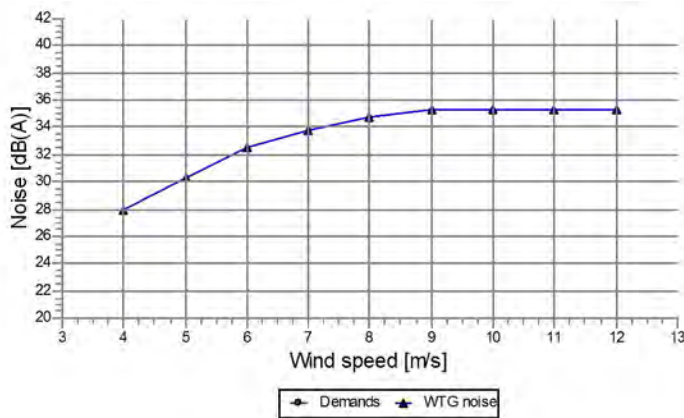
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DECIBEL - Detailed results

Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

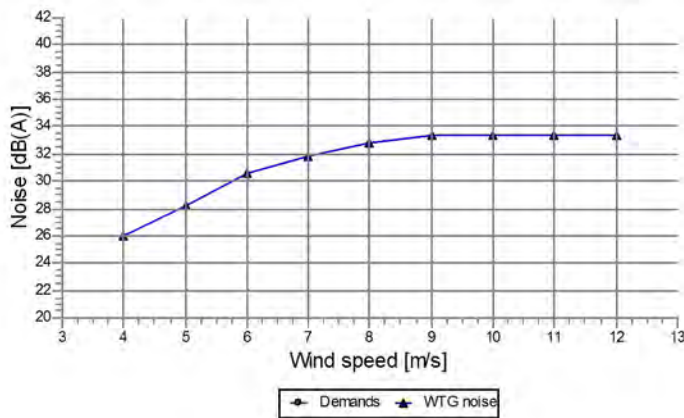
Noise sensitive point: User defined (1) (A)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	27.9	Yes
5.0	40.0	30.2	Yes
6.0	40.0	32.5	Yes
7.0	40.0	33.7	Yes
8.0	40.0	34.7	Yes
9.0	40.0	35.3	Yes
10.0	40.0	35.3	Yes
11.0	40.0	35.3	Yes
12.0	40.0	35.3	Yes

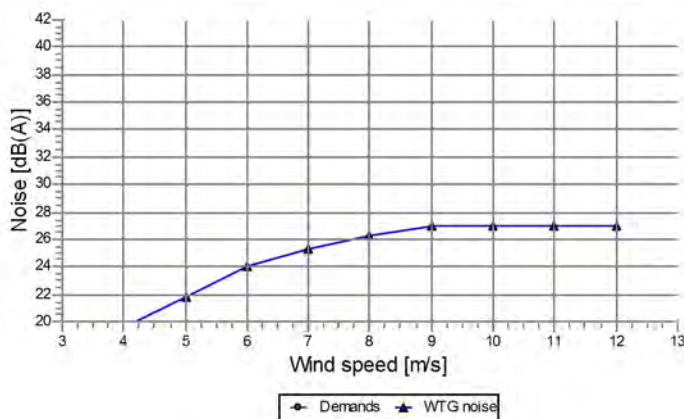
Noise sensitive point: User defined (2) (B)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.0	Yes
5.0	40.0	28.3	Yes
6.0	40.0	30.6	Yes
7.0	40.0	31.8	Yes
8.0	40.0	32.8	Yes
9.0	40.0	33.4	Yes
10.0	40.0	33.4	Yes
11.0	40.0	33.4	Yes
12.0	40.0	33.4	Yes

Noise sensitive point: User defined (3) (C)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	19.5	Yes
5.0	40.0	21.8	Yes
6.0	40.0	24.1	Yes
7.0	40.0	25.3	Yes
8.0	40.0	26.3	Yes
9.0	40.0	26.9	Yes
10.0	40.0	26.9	Yes
11.0	40.0	26.9	Yes
12.0	40.0	26.9	Yes

Project:

Barrachois Wind Farm

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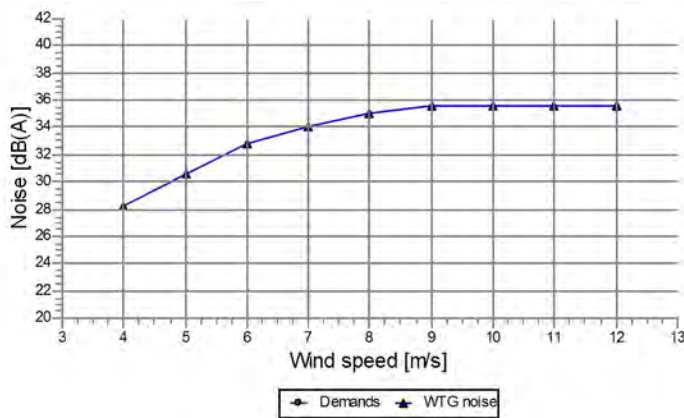
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DECIBEL - Detailed results

Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

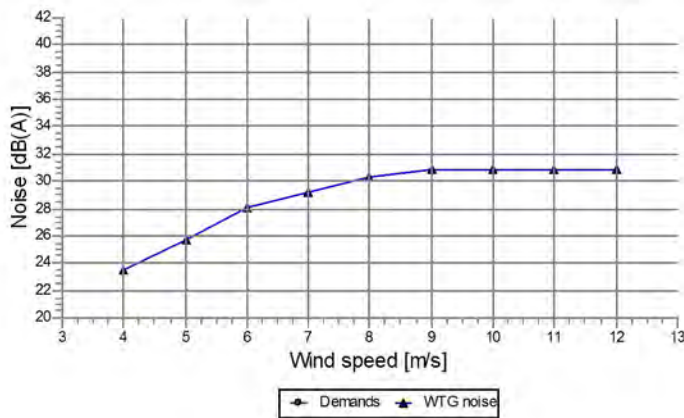
Noise sensitive point: User defined (4) (D)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	28.3	Yes
5.0	40.0	30.6	Yes
6.0	40.0	32.8	Yes
7.0	40.0	34.1	Yes
8.0	40.0	35.0	Yes
9.0	40.0	35.6	Yes
10.0	40.0	35.6	Yes
11.0	40.0	35.6	Yes
12.0	40.0	35.6	Yes

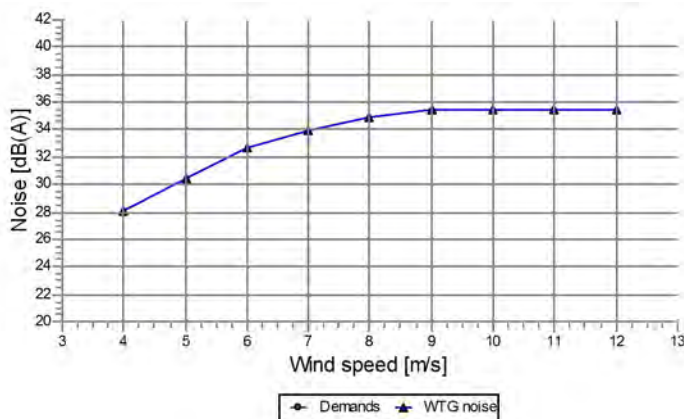
Noise sensitive point: User defined (5) (E)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	23.5	Yes
5.0	40.0	25.8	Yes
6.0	40.0	28.0	Yes
7.0	40.0	29.2	Yes
8.0	40.0	30.2	Yes
9.0	40.0	30.8	Yes
10.0	40.0	30.8	Yes
11.0	40.0	30.8	Yes
12.0	40.0	30.8	Yes

Noise sensitive point: User defined (6) (F)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	28.1	Yes
5.0	40.0	30.4	Yes
6.0	40.0	32.7	Yes
7.0	40.0	33.9	Yes
8.0	40.0	34.9	Yes
9.0	40.0	35.5	Yes
10.0	40.0	35.5	Yes
11.0	40.0	35.5	Yes
12.0	40.0	35.5	Yes

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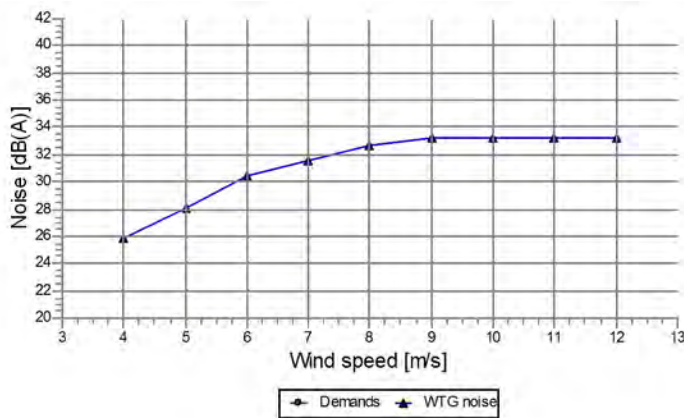
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DECIBEL - Detailed results

Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

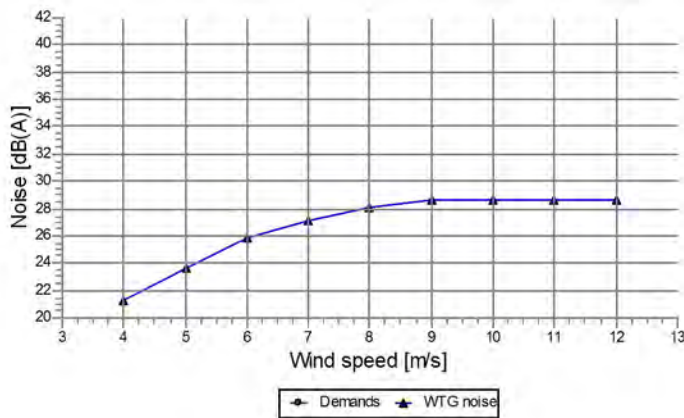
Noise sensitive point: User defined (7) (G)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	25.8	Yes
5.0	40.0	28.1	Yes
6.0	40.0	30.4	Yes
7.0	40.0	31.6	Yes
8.0	40.0	32.6	Yes
9.0	40.0	33.2	Yes
10.0	40.0	33.2	Yes
11.0	40.0	33.2	Yes
12.0	40.0	33.2	Yes

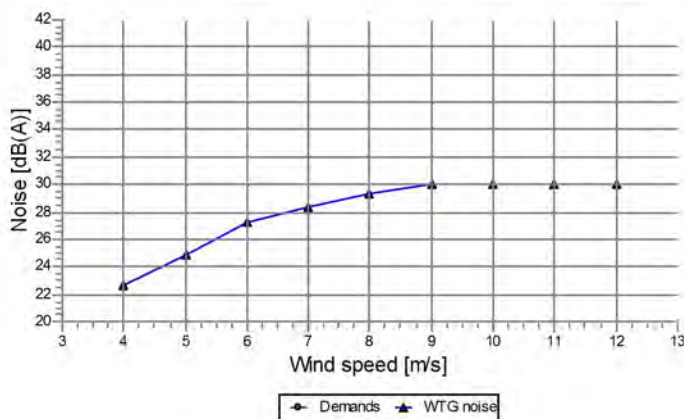
Noise sensitive point: User defined (8) (H)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	21.3	Yes
5.0	40.0	23.6	Yes
6.0	40.0	25.9	Yes
7.0	40.0	27.1	Yes
8.0	40.0	28.0	Yes
9.0	40.0	28.6	Yes
10.0	40.0	28.6	Yes
11.0	40.0	28.6	Yes
12.0	40.0	28.6	Yes

Noise sensitive point: User defined (9) (I)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	22.6	Yes
5.0	40.0	24.9	Yes
6.0	40.0	27.2	Yes
7.0	40.0	28.4	Yes
8.0	40.0	29.4	Yes
9.0	40.0	30.0	Yes
10.0	40.0	30.0	Yes
11.0	40.0	30.0	Yes
12.0	40.0	30.0	Yes

Project:

Barrachois Wind Farm

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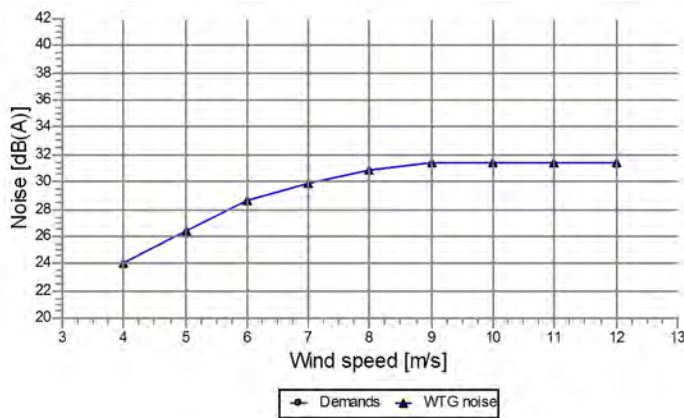
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DECIBEL - Detailed results

Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

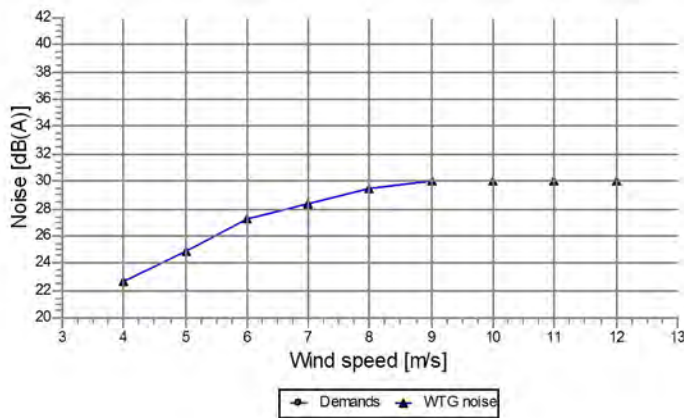
Noise sensitive point: User defined (10) (J)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	24.1	Yes
5.0	40.0	26.4	Yes
6.0	40.0	28.6	Yes
7.0	40.0	29.8	Yes
8.0	40.0	30.8	Yes
9.0	40.0	31.4	Yes
10.0	40.0	31.4	Yes
11.0	40.0	31.4	Yes
12.0	40.0	31.4	Yes

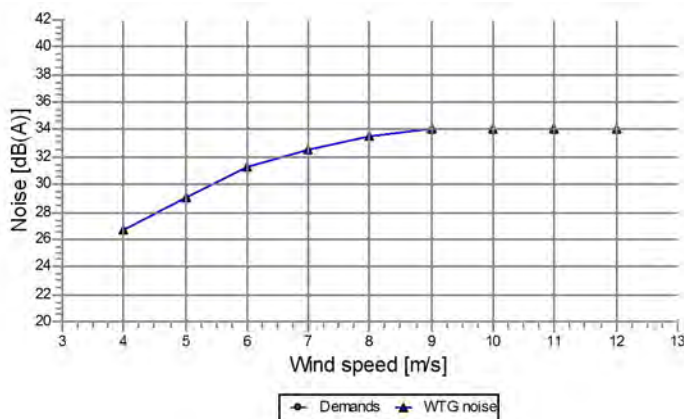
Noise sensitive point: User defined (11) (K)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	22.6	Yes
5.0	40.0	24.9	Yes
6.0	40.0	27.2	Yes
7.0	40.0	28.4	Yes
8.0	40.0	29.4	Yes
9.0	40.0	30.0	Yes
10.0	40.0	30.0	Yes
11.0	40.0	30.0	Yes
12.0	40.0	30.0	Yes

Noise sensitive point: User defined (12) (L)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.7	Yes
5.0	40.0	29.0	Yes
6.0	40.0	31.3	Yes
7.0	40.0	32.5	Yes
8.0	40.0	33.5	Yes
9.0	40.0	34.1	Yes
10.0	40.0	34.1	Yes
11.0	40.0	34.1	Yes
12.0	40.0	34.1	Yes

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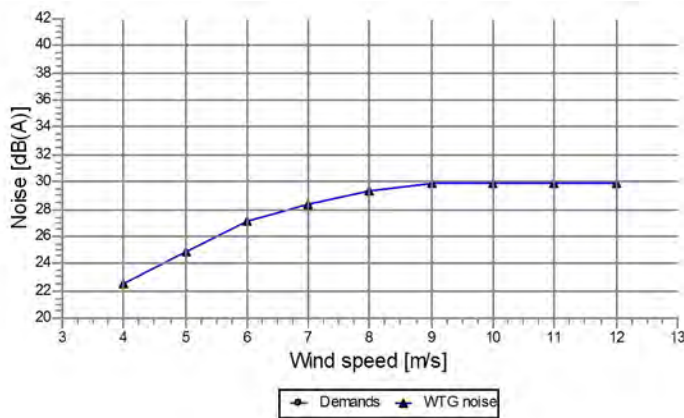
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DECIBEL - Detailed results

Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

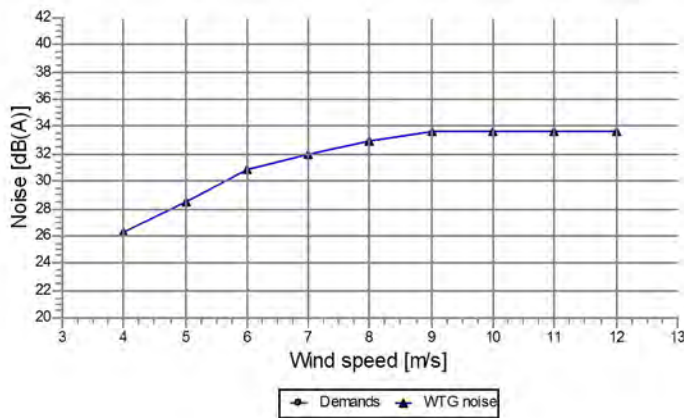
Noise sensitive point: User defined (13) (M)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	22.5	Yes
5.0	40.0	24.8	Yes
6.0	40.0	27.1	Yes
7.0	40.0	28.3	Yes
8.0	40.0	29.3	Yes
9.0	40.0	29.9	Yes
10.0	40.0	29.9	Yes
11.0	40.0	29.9	Yes
12.0	40.0	29.9	Yes

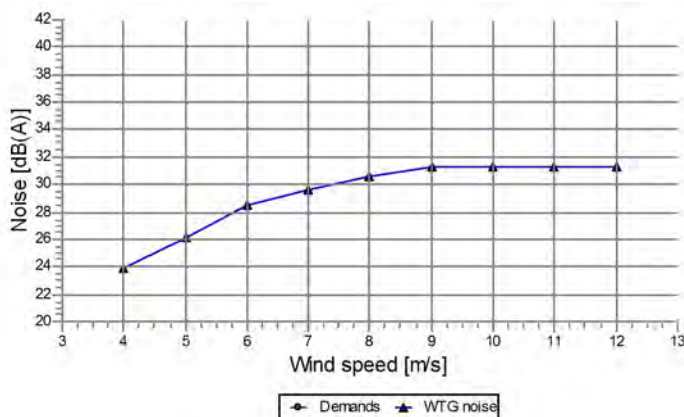
Noise sensitive point: User defined (14) (N)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.2	Yes
5.0	40.0	28.5	Yes
6.0	40.0	30.8	Yes
7.0	40.0	32.0	Yes
8.0	40.0	33.0	Yes
9.0	40.0	33.6	Yes
10.0	40.0	33.6	Yes
11.0	40.0	33.6	Yes
12.0	40.0	33.6	Yes

Noise sensitive point: User defined (15) (O)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	23.9	Yes
5.0	40.0	26.2	Yes
6.0	40.0	28.4	Yes
7.0	40.0	29.6	Yes
8.0	40.0	30.6	Yes
9.0	40.0	31.2	Yes
10.0	40.0	31.2	Yes
11.0	40.0	31.2	Yes
12.0	40.0	31.2	Yes

Project:
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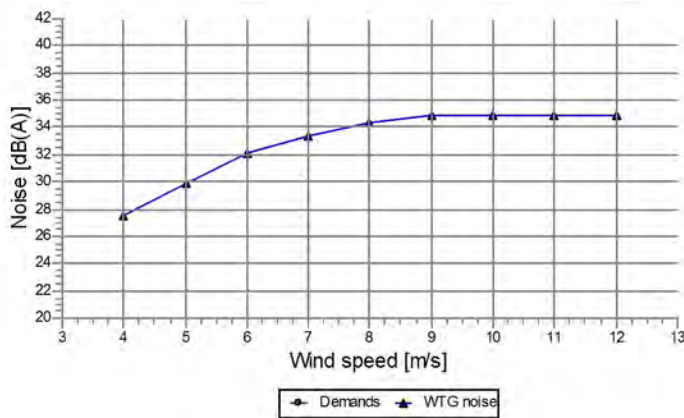
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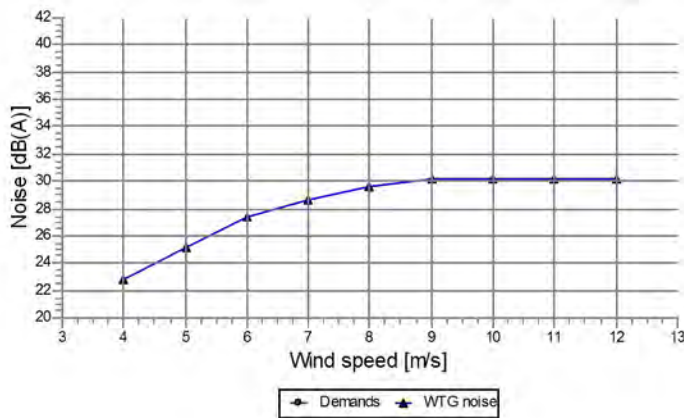
Calculation: Barrachois - Noise Impact Assessment **Noise calculation model:** ISO 9613-2 General

Noise sensitive point: User defined (16) (P)



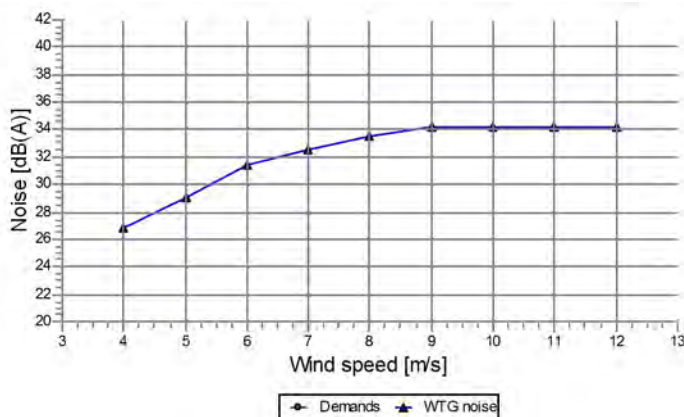
Sound Level			
Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	27.6	Yes
5.0	40.0	29.9	Yes
6.0	40.0	32.2	Yes
7.0	40.0	33.4	Yes
8.0	40.0	34.4	Yes
9.0	40.0	35.0	Yes
10.0	40.0	35.0	Yes
11.0	40.0	35.0	Yes
12.0	40.0	35.0	Yes

Noise sensitive point: User defined (17) (Q)



Sound Level			
Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	22.8	Yes
5.0	40.0	25.1	Yes
6.0	40.0	27.4	Yes
7.0	40.0	28.6	Yes
8.0	40.0	29.6	Yes
9.0	40.0	30.2	Yes
10.0	40.0	30.2	Yes
11.0	40.0	30.2	Yes
12.0	40.0	30.2	Yes

Noise sensitive point: User defined (18) (R)



Sound Level			
Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.8	Yes
5.0	40.0	29.1	Yes
6.0	40.0	31.4	Yes
7.0	40.0	32.6	Yes
8.0	40.0	33.6	Yes
9.0	40.0	34.2	Yes
10.0	40.0	34.2	Yes
11.0	40.0	34.2	Yes
12.0	40.0	34.2	Yes

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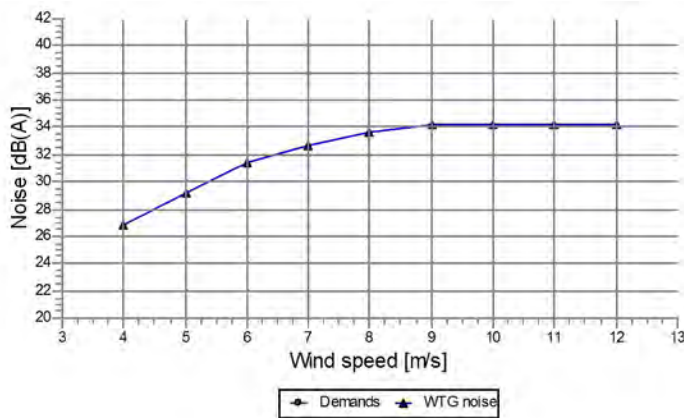
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Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

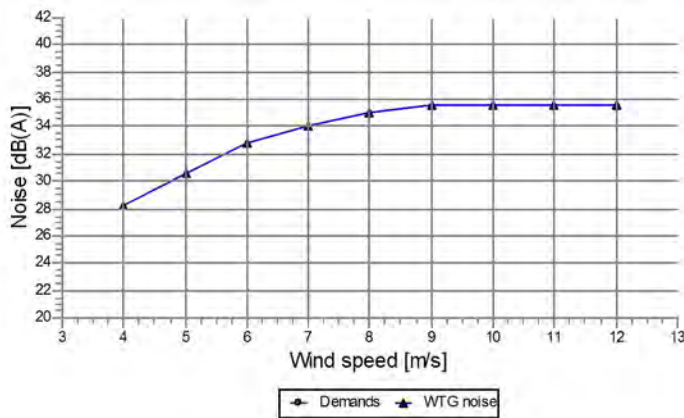
Noise sensitive point: User defined (19) (S)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.8	Yes
5.0	40.0	29.1	Yes
6.0	40.0	31.4	Yes
7.0	40.0	32.6	Yes
8.0	40.0	33.6	Yes
9.0	40.0	34.2	Yes
10.0	40.0	34.2	Yes
11.0	40.0	34.2	Yes
12.0	40.0	34.2	Yes

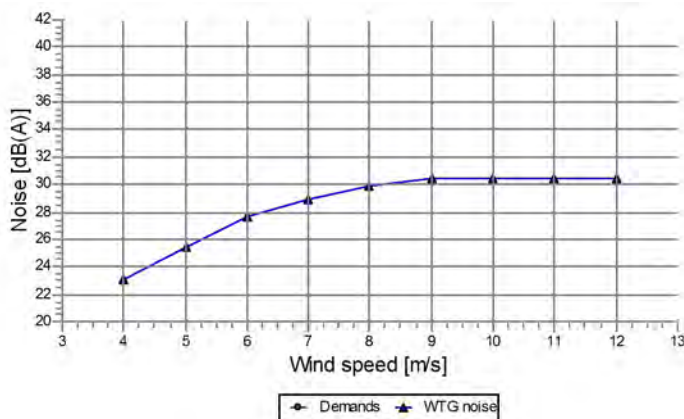
Noise sensitive point: User defined (20) (T)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	28.2	Yes
5.0	40.0	30.5	Yes
6.0	40.0	32.8	Yes
7.0	40.0	34.0	Yes
8.0	40.0	35.0	Yes
9.0	40.0	35.6	Yes
10.0	40.0	35.6	Yes
11.0	40.0	35.6	Yes
12.0	40.0	35.6	Yes

Noise sensitive point: User defined (21) (U)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	23.1	Yes
5.0	40.0	25.4	Yes
6.0	40.0	27.7	Yes
7.0	40.0	28.9	Yes
8.0	40.0	29.9	Yes
9.0	40.0	30.5	Yes
10.0	40.0	30.5	Yes
11.0	40.0	30.5	Yes
12.0	40.0	30.5	Yes

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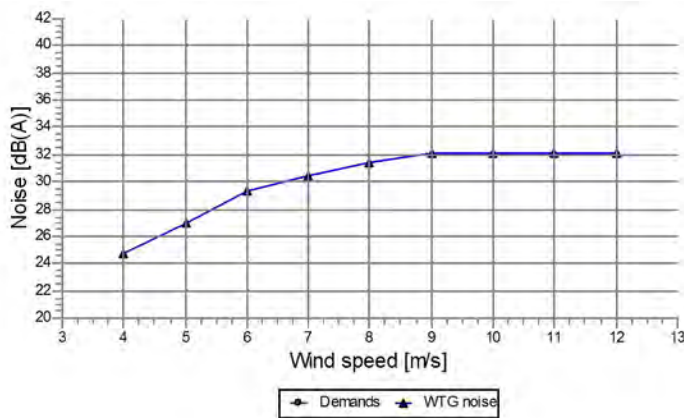
Calculated:

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Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

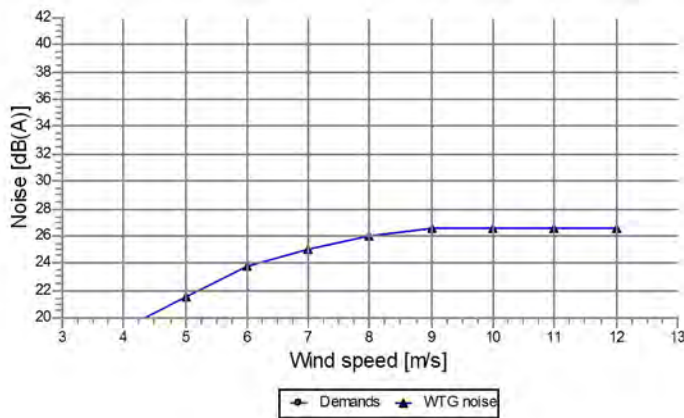
Noise sensitive point: User defined (22) (V)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	24.7	Yes
5.0	40.0	27.0	Yes
6.0	40.0	29.3	Yes
7.0	40.0	30.5	Yes
8.0	40.0	31.5	Yes
9.0	40.0	32.1	Yes
10.0	40.0	32.1	Yes
11.0	40.0	32.1	Yes
12.0	40.0	32.1	Yes

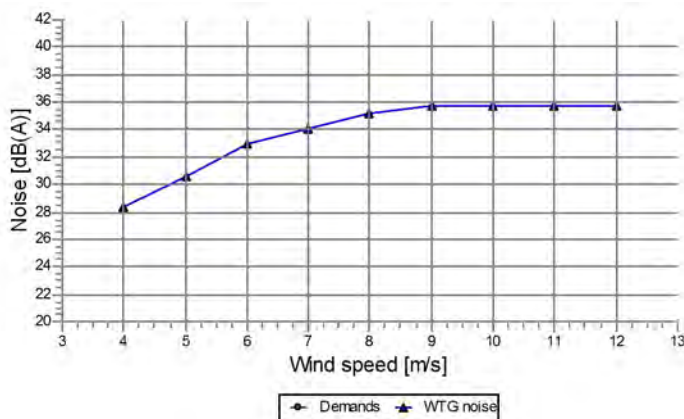
Noise sensitive point: User defined (23) (W)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	19.2	Yes
5.0	40.0	21.5	Yes
6.0	40.0	23.7	Yes
7.0	40.0	25.0	Yes
8.0	40.0	25.9	Yes
9.0	40.0	26.5	Yes
10.0	40.0	26.5	Yes
11.0	40.0	26.5	Yes
12.0	40.0	26.5	Yes

Noise sensitive point: User defined (24) (X)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	28.3	Yes
5.0	40.0	30.6	Yes
6.0	40.0	32.9	Yes
7.0	40.0	34.1	Yes
8.0	40.0	35.1	Yes
9.0	40.0	35.7	Yes
10.0	40.0	35.7	Yes
11.0	40.0	35.7	Yes
12.0	40.0	35.7	Yes

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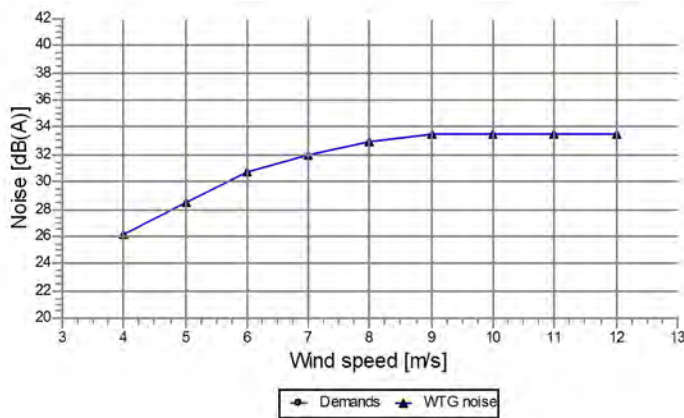
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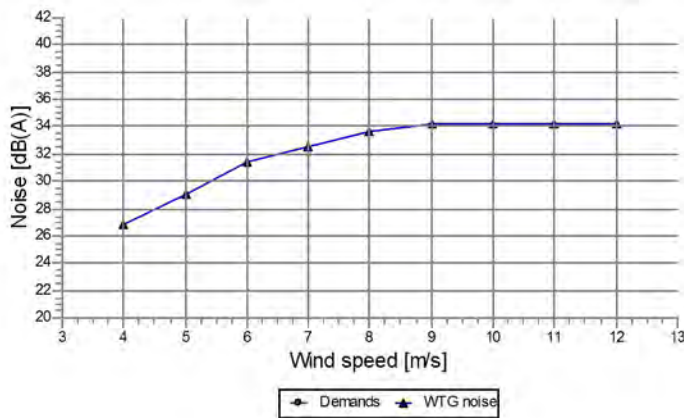
Noise sensitive point: User defined (25) (Y)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.2	Yes
5.0	40.0	28.5	Yes
6.0	40.0	30.8	Yes
7.0	40.0	32.0	Yes
8.0	40.0	33.0	Yes
9.0	40.0	33.6	Yes
10.0	40.0	33.6	Yes
11.0	40.0	33.6	Yes
12.0	40.0	33.6	Yes

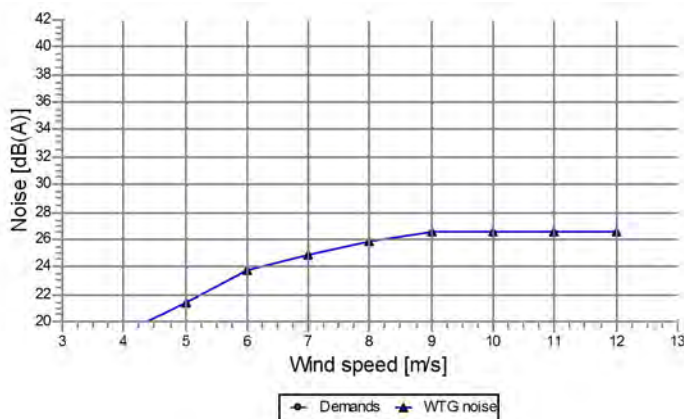
Noise sensitive point: User defined (26) (Z)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.8	Yes
5.0	40.0	29.1	Yes
6.0	40.0	31.4	Yes
7.0	40.0	32.6	Yes
8.0	40.0	33.6	Yes
9.0	40.0	34.2	Yes
10.0	40.0	34.2	Yes
11.0	40.0	34.2	Yes
12.0	40.0	34.2	Yes

Noise sensitive point: User defined (27) (AA)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	19.1	Yes
5.0	40.0	21.4	Yes
6.0	40.0	23.7	Yes
7.0	40.0	24.9	Yes
8.0	40.0	25.9	Yes
9.0	40.0	26.5	Yes
10.0	40.0	26.5	Yes
11.0	40.0	26.5	Yes
12.0	40.0	26.5	Yes

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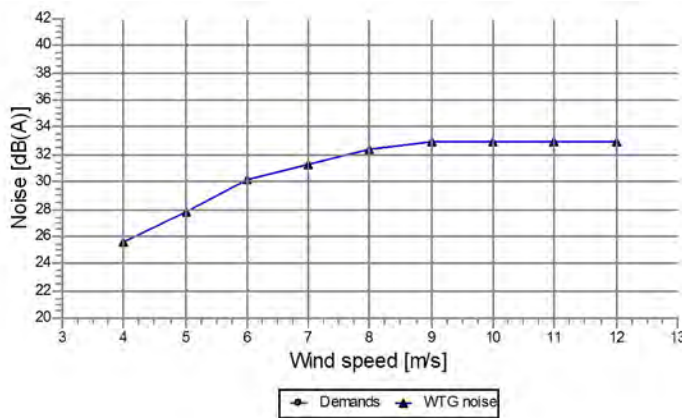
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Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

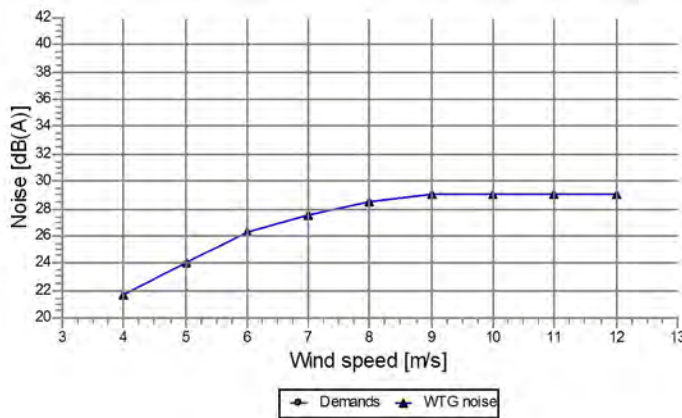
Noise sensitive point: User defined (28) (AB)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	25.5	Yes
5.0	40.0	27.8	Yes
6.0	40.0	30.1	Yes
7.0	40.0	31.3	Yes
8.0	40.0	32.3	Yes
9.0	40.0	32.9	Yes
10.0	40.0	32.9	Yes
11.0	40.0	32.9	Yes
12.0	40.0	32.9	Yes

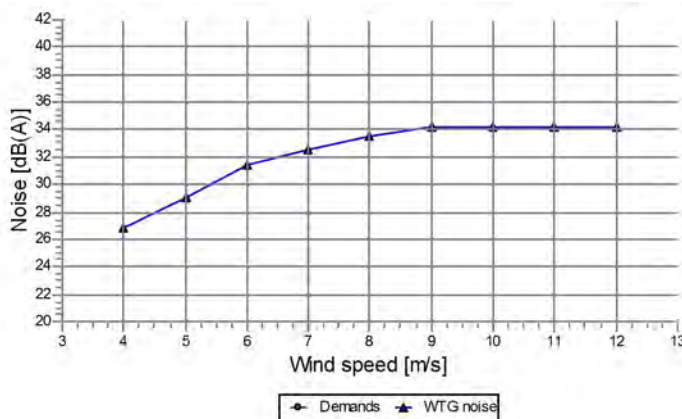
Noise sensitive point: User defined (29) (AC)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	21.7	Yes
5.0	40.0	24.0	Yes
6.0	40.0	26.3	Yes
7.0	40.0	27.5	Yes
8.0	40.0	28.5	Yes
9.0	40.0	29.1	Yes
10.0	40.0	29.1	Yes
11.0	40.0	29.1	Yes
12.0	40.0	29.1	Yes

Noise sensitive point: User defined (30) (AD)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.8	Yes
5.0	40.0	29.1	Yes
6.0	40.0	31.4	Yes
7.0	40.0	32.6	Yes
8.0	40.0	33.6	Yes
9.0	40.0	34.2	Yes
10.0	40.0	34.2	Yes
11.0	40.0	34.2	Yes
12.0	40.0	34.2	Yes

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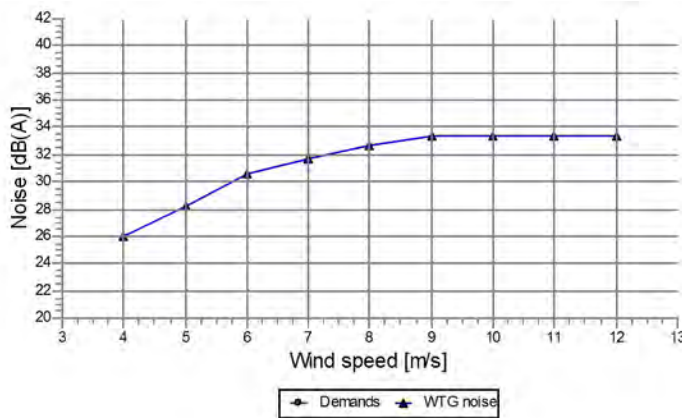
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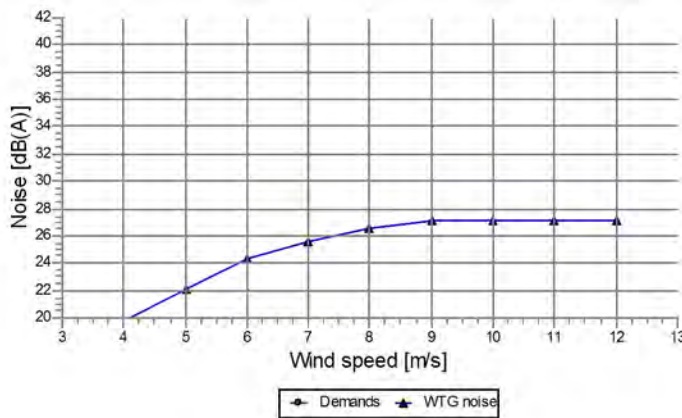
Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

Noise sensitive point: User defined (31) (AE)



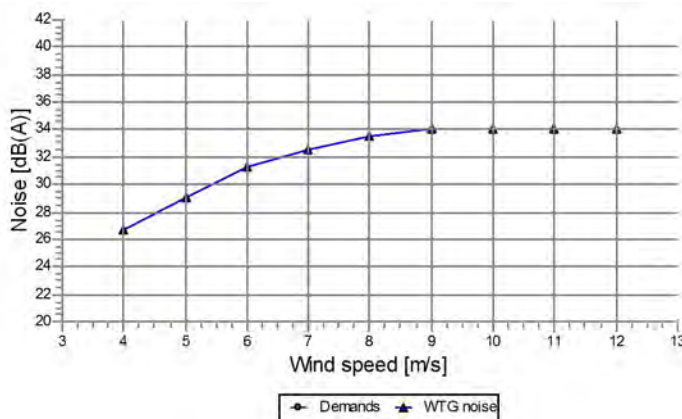
Sound Level			
Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	25.9	Yes
5.0	40.0	28.2	Yes
6.0	40.0	30.5	Yes
7.0	40.0	31.7	Yes
8.0	40.0	32.7	Yes
9.0	40.0	33.3	Yes
10.0	40.0	33.3	Yes
11.0	40.0	33.3	Yes
12.0	40.0	33.3	Yes

Noise sensitive point: User defined (32) (AF)



Sound Level			
Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	19.7	Yes
5.0	40.0	22.0	Yes
6.0	40.0	24.3	Yes
7.0	40.0	25.5	Yes
8.0	40.0	26.5	Yes
9.0	40.0	27.1	Yes
10.0	40.0	27.1	Yes
11.0	40.0	27.1	Yes
12.0	40.0	27.1	Yes

Noise sensitive point: User defined (33) (AG)



Sound Level			
Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.7	Yes
5.0	40.0	29.0	Yes
6.0	40.0	31.3	Yes
7.0	40.0	32.5	Yes
8.0	40.0	33.5	Yes
9.0	40.0	34.1	Yes
10.0	40.0	34.1	Yes
11.0	40.0	34.1	Yes
12.0	40.0	34.1	Yes

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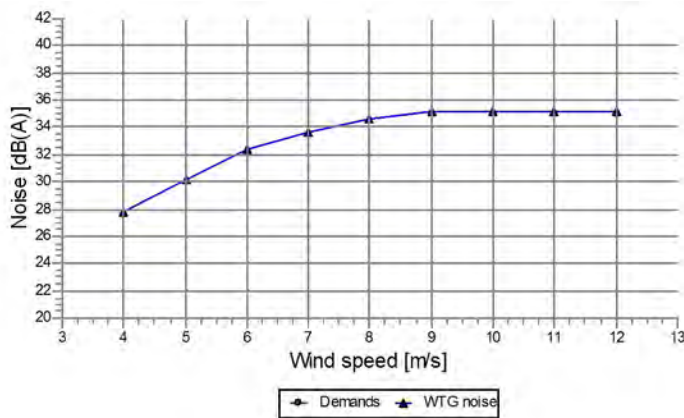
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Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

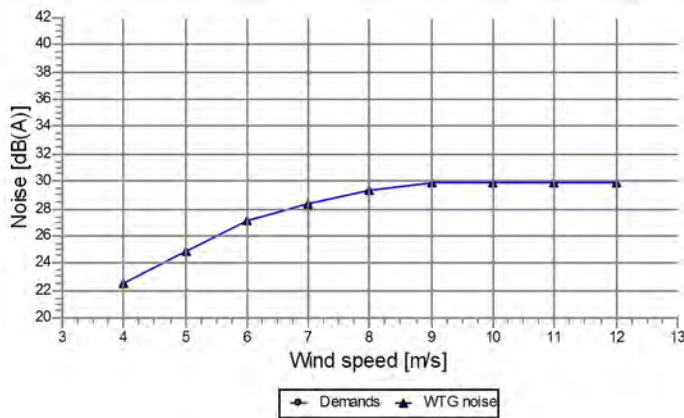
Noise sensitive point: User defined (34) (AH)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	27.8	Yes
5.0	40.0	30.1	Yes
6.0	40.0	32.4	Yes
7.0	40.0	33.6	Yes
8.0	40.0	34.6	Yes
9.0	40.0	35.2	Yes
10.0	40.0	35.2	Yes
11.0	40.0	35.2	Yes
12.0	40.0	35.2	Yes

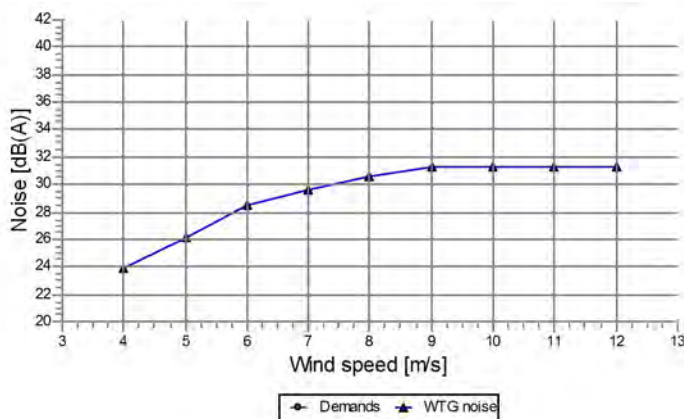
Noise sensitive point: User defined (35) (AI)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	22.6	Yes
5.0	40.0	24.9	Yes
6.0	40.0	27.2	Yes
7.0	40.0	28.4	Yes
8.0	40.0	29.4	Yes
9.0	40.0	30.0	Yes
10.0	40.0	30.0	Yes
11.0	40.0	30.0	Yes
12.0	40.0	30.0	Yes

Noise sensitive point: User defined (36) (AJ)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	23.8	Yes
5.0	40.0	26.1	Yes
6.0	40.0	28.4	Yes
7.0	40.0	29.6	Yes
8.0	40.0	30.6	Yes
9.0	40.0	31.2	Yes
10.0	40.0	31.2	Yes
11.0	40.0	31.2	Yes
12.0	40.0	31.2	Yes

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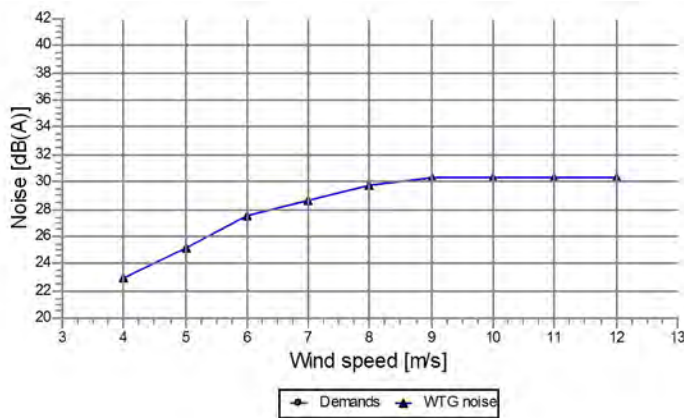
Calculated:

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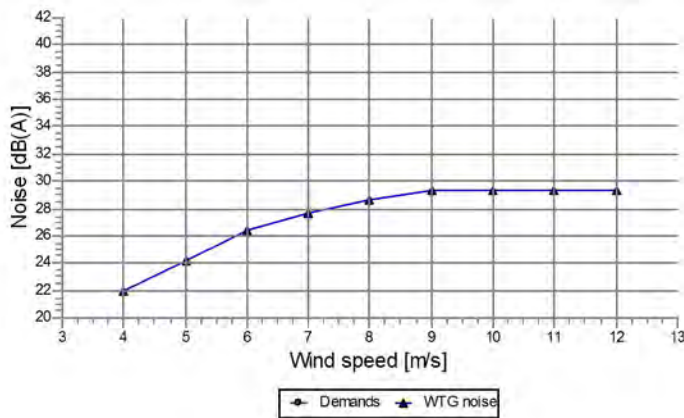
Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

Noise sensitive point: User defined (37) (AK)



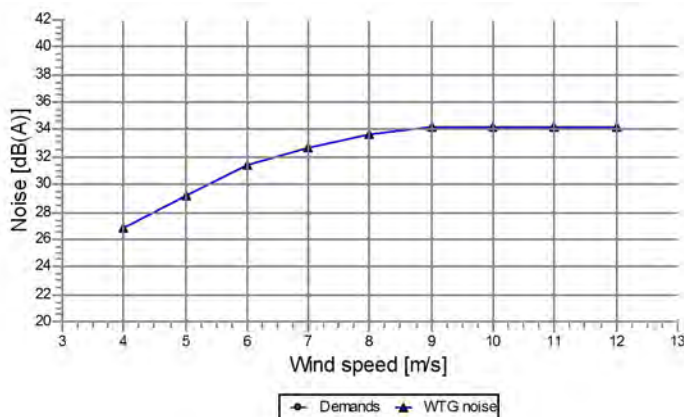
Sound Level			
Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	22.9	Yes
5.0	40.0	25.2	Yes
6.0	40.0	27.5	Yes
7.0	40.0	28.7	Yes
8.0	40.0	29.7	Yes
9.0	40.0	30.3	Yes
10.0	40.0	30.3	Yes
11.0	40.0	30.3	Yes
12.0	40.0	30.3	Yes

Noise sensitive point: User defined (38) (AL)



Sound Level			
Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	21.9	Yes
5.0	40.0	24.2	Yes
6.0	40.0	26.5	Yes
7.0	40.0	27.7	Yes
8.0	40.0	28.7	Yes
9.0	40.0	29.3	Yes
10.0	40.0	29.3	Yes
11.0	40.0	29.3	Yes
12.0	40.0	29.3	Yes

Noise sensitive point: User defined (39) (AM)



Sound Level			
Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.8	Yes
5.0	40.0	29.1	Yes
6.0	40.0	31.4	Yes
7.0	40.0	32.6	Yes
8.0	40.0	33.6	Yes
9.0	40.0	34.2	Yes
10.0	40.0	34.2	Yes
11.0	40.0	34.2	Yes
12.0	40.0	34.2	Yes

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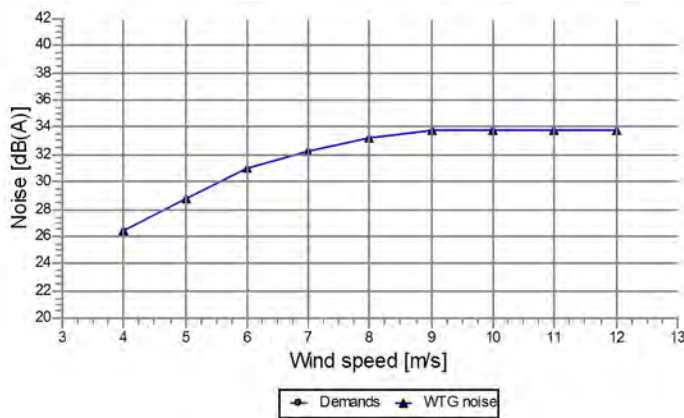
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Calculation: Barrachois - Noise Impact Assessment **Noise calculation model:** ISO 9613-2 General

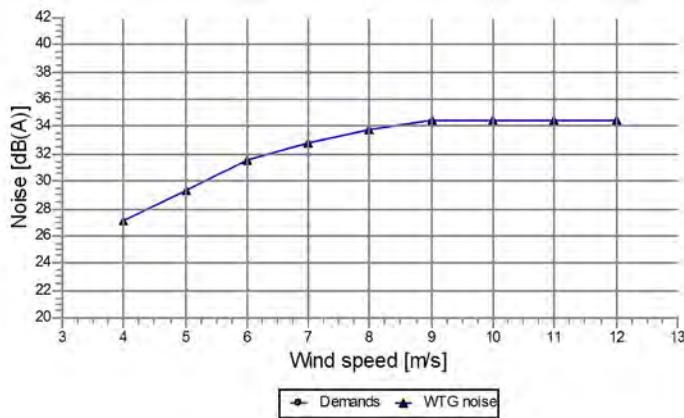
Noise sensitive point: User defined (40) (AN)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.5	Yes
5.0	40.0	28.8	Yes
6.0	40.0	31.0	Yes
7.0	40.0	32.2	Yes
8.0	40.0	33.2	Yes
9.0	40.0	33.8	Yes
10.0	40.0	33.8	Yes
11.0	40.0	33.8	Yes
12.0	40.0	33.8	Yes

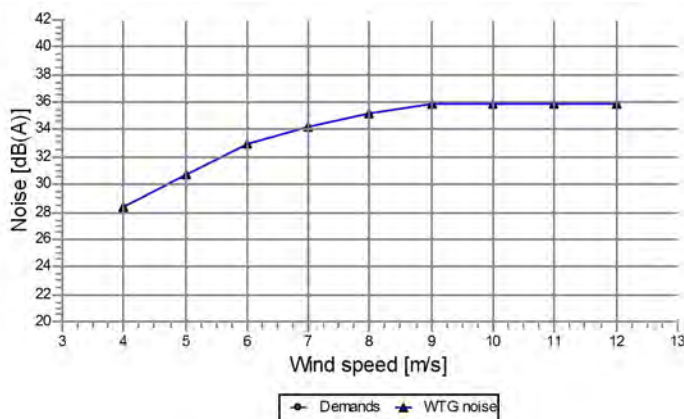
Noise sensitive point: User defined (41) (AO)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	27.0	Yes
5.0	40.0	29.3	Yes
6.0	40.0	31.6	Yes
7.0	40.0	32.8	Yes
8.0	40.0	33.8	Yes
9.0	40.0	34.4	Yes
10.0	40.0	34.4	Yes
11.0	40.0	34.4	Yes
12.0	40.0	34.4	Yes

Noise sensitive point: User defined (42) (AP)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	28.4	Yes
5.0	40.0	30.7	Yes
6.0	40.0	33.0	Yes
7.0	40.0	34.2	Yes
8.0	40.0	35.2	Yes
9.0	40.0	35.8	Yes
10.0	40.0	35.8	Yes
11.0	40.0	35.8	Yes
12.0	40.0	35.8	Yes

Project:
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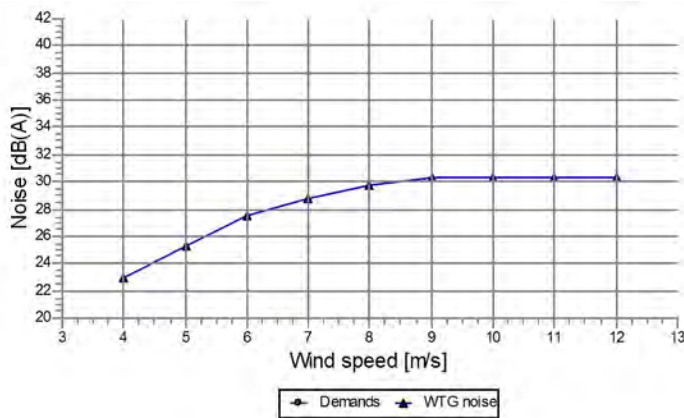
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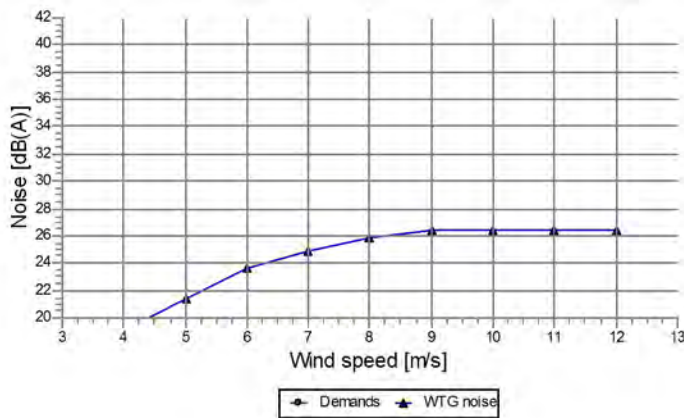
Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

Noise sensitive point: User defined (43) (AQ)



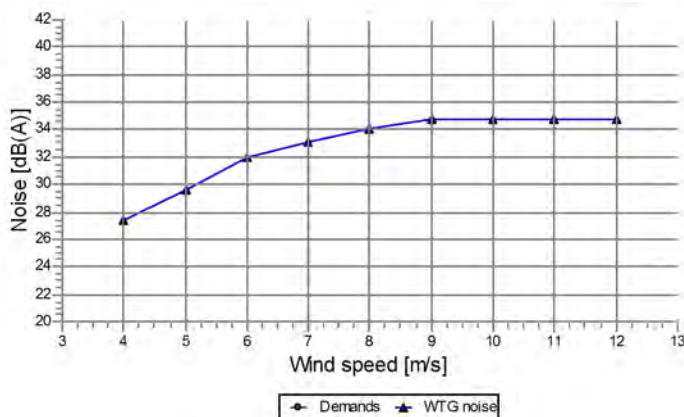
Sound Level			
Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	23.0	Yes
5.0	40.0	25.3	Yes
6.0	40.0	27.6	Yes
7.0	40.0	28.8	Yes
8.0	40.0	29.8	Yes
9.0	40.0	30.3	Yes
10.0	40.0	30.3	Yes
11.0	40.0	30.3	Yes
12.0	40.0	30.3	Yes

Noise sensitive point: User defined (44) (AR)



Sound Level			
Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	19.0	Yes
5.0	40.0	21.3	Yes
6.0	40.0	23.6	Yes
7.0	40.0	24.8	Yes
8.0	40.0	25.8	Yes
9.0	40.0	26.4	Yes
10.0	40.0	26.4	Yes
11.0	40.0	26.4	Yes
12.0	40.0	26.4	Yes

Noise sensitive point: User defined (45) (AS)



Sound Level			
Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	27.3	Yes
5.0	40.0	29.6	Yes
6.0	40.0	31.9	Yes
7.0	40.0	33.1	Yes
8.0	40.0	34.1	Yes
9.0	40.0	34.7	Yes
10.0	40.0	34.7	Yes
11.0	40.0	34.7	Yes
12.0	40.0	34.7	Yes

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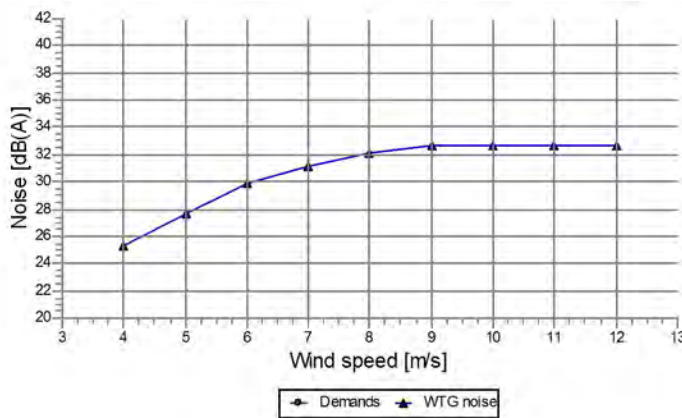
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DECIBEL - Detailed results

Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

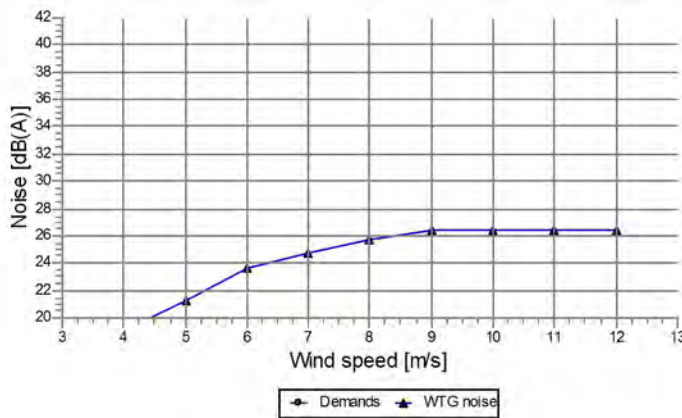
Noise sensitive point: User defined (46) (AT)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	25.3	Yes
5.0	40.0	27.6	Yes
6.0	40.0	29.9	Yes
7.0	40.0	31.1	Yes
8.0	40.0	32.1	Yes
9.0	40.0	32.7	Yes
10.0	40.0	32.7	Yes
11.0	40.0	32.7	Yes
12.0	40.0	32.7	Yes

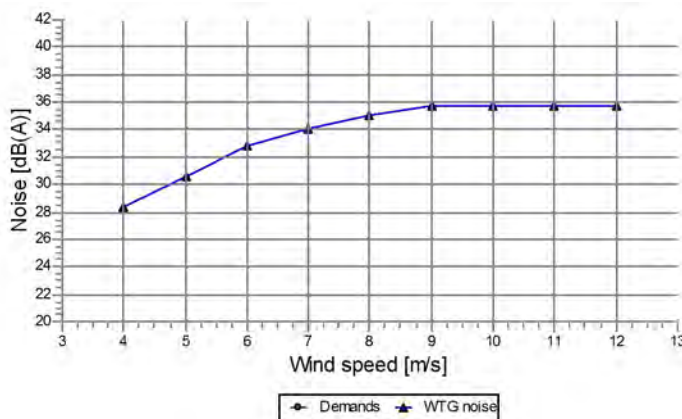
Noise sensitive point: User defined (47) (AU)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	19.0	Yes
5.0	40.0	21.3	Yes
6.0	40.0	23.6	Yes
7.0	40.0	24.8	Yes
8.0	40.0	25.8	Yes
9.0	40.0	26.4	Yes
10.0	40.0	26.4	Yes
11.0	40.0	26.4	Yes
12.0	40.0	26.4	Yes

Noise sensitive point: User defined (48) (AV)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	28.3	Yes
5.0	40.0	30.6	Yes
6.0	40.0	32.9	Yes
7.0	40.0	34.1	Yes
8.0	40.0	35.1	Yes
9.0	40.0	35.7	Yes
10.0	40.0	35.7	Yes
11.0	40.0	35.7	Yes
12.0	40.0	35.7	Yes

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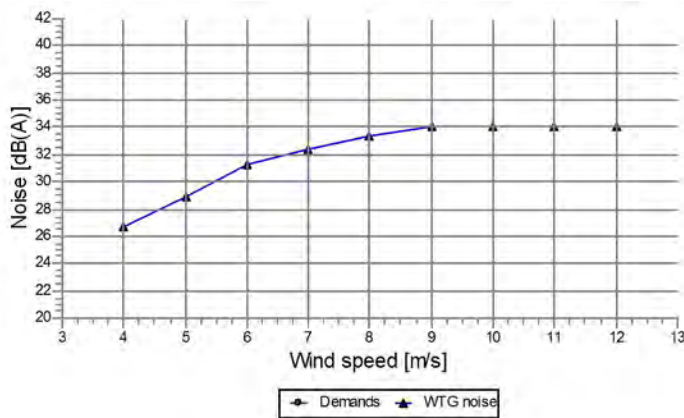
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DECIBEL - Detailed results

Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

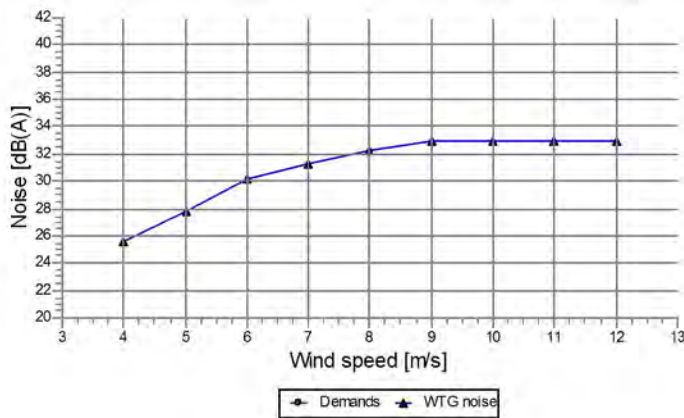
Noise sensitive point: User defined (49) (AW)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.6	Yes
5.0	40.0	28.9	Yes
6.0	40.0	31.2	Yes
7.0	40.0	32.4	Yes
8.0	40.0	33.4	Yes
9.0	40.0	34.0	Yes
10.0	40.0	34.0	Yes
11.0	40.0	34.0	Yes
12.0	40.0	34.0	Yes

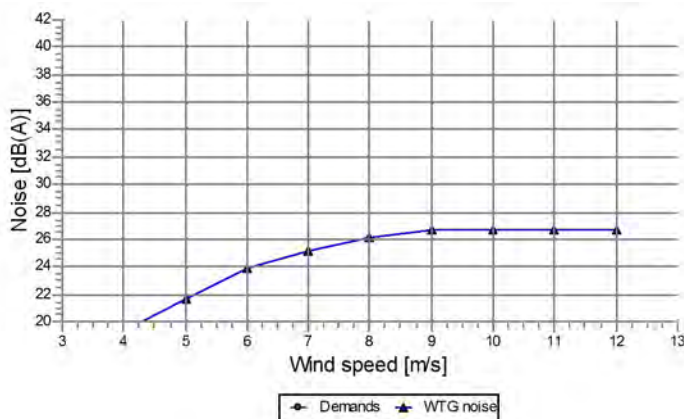
Noise sensitive point: User defined (50) (AX)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	25.5	Yes
5.0	40.0	27.8	Yes
6.0	40.0	30.1	Yes
7.0	40.0	31.3	Yes
8.0	40.0	32.3	Yes
9.0	40.0	32.9	Yes
10.0	40.0	32.9	Yes
11.0	40.0	32.9	Yes
12.0	40.0	32.9	Yes

Noise sensitive point: User defined (51) (AY)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	19.4	Yes
5.0	40.0	21.7	Yes
6.0	40.0	24.0	Yes
7.0	40.0	25.2	Yes
8.0	40.0	26.2	Yes
9.0	40.0	26.8	Yes
10.0	40.0	26.8	Yes
11.0	40.0	26.8	Yes
12.0	40.0	26.8	Yes

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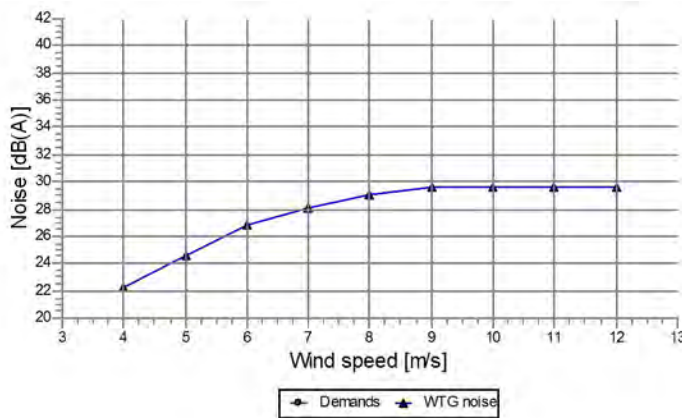
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Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

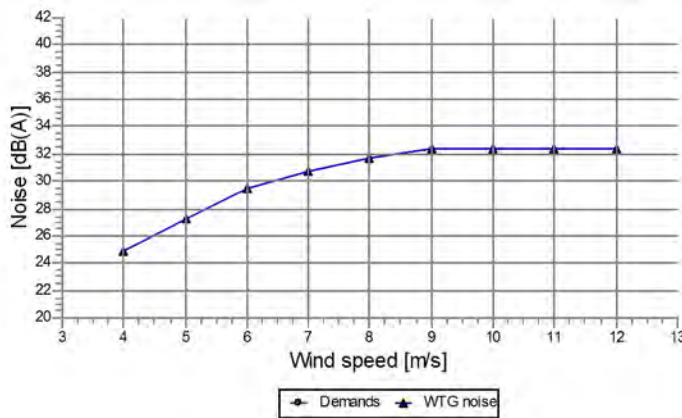
Noise sensitive point: User defined (52) (AZ)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	22.2	Yes
5.0	40.0	24.5	Yes
6.0	40.0	26.8	Yes
7.0	40.0	28.0	Yes
8.0	40.0	29.0	Yes
9.0	40.0	29.6	Yes
10.0	40.0	29.6	Yes
11.0	40.0	29.6	Yes
12.0	40.0	29.6	Yes

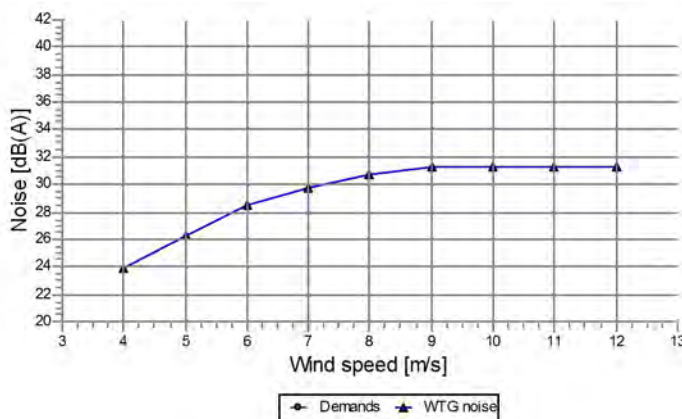
Noise sensitive point: User defined (53) (BA)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	24.9	Yes
5.0	40.0	27.2	Yes
6.0	40.0	29.5	Yes
7.0	40.0	30.7	Yes
8.0	40.0	31.7	Yes
9.0	40.0	32.3	Yes
10.0	40.0	32.3	Yes
11.0	40.0	32.3	Yes
12.0	40.0	32.3	Yes

Noise sensitive point: User defined (54) (BB)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	23.9	Yes
5.0	40.0	26.2	Yes
6.0	40.0	28.5	Yes
7.0	40.0	29.7	Yes
8.0	40.0	30.7	Yes
9.0	40.0	31.3	Yes
10.0	40.0	31.3	Yes
11.0	40.0	31.3	Yes
12.0	40.0	31.3	Yes

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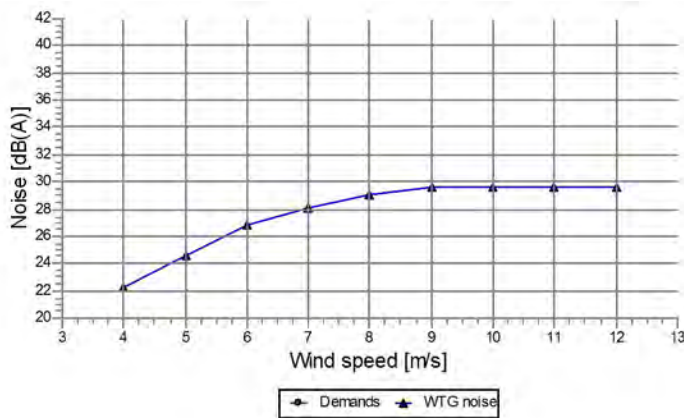
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Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

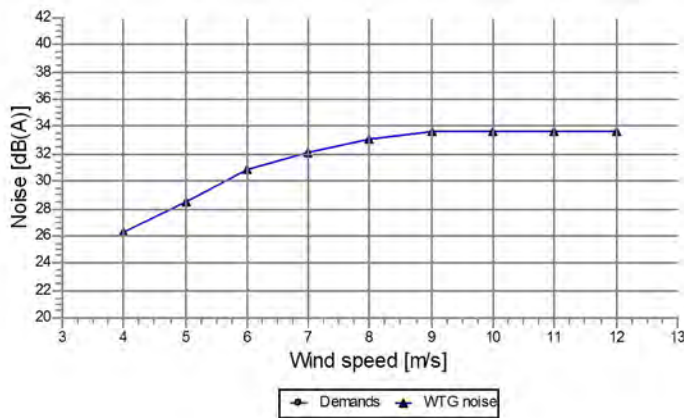
Noise sensitive point: User defined (55) (BC)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	22.3	Yes
5.0	40.0	24.6	Yes
6.0	40.0	26.9	Yes
7.0	40.0	28.1	Yes
8.0	40.0	29.1	Yes
9.0	40.0	29.7	Yes
10.0	40.0	29.7	Yes
11.0	40.0	29.7	Yes
12.0	40.0	29.7	Yes

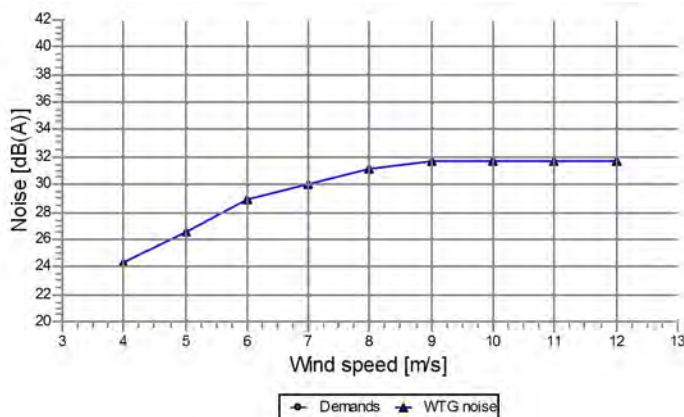
Noise sensitive point: User defined (56) (BD)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.3	Yes
5.0	40.0	28.6	Yes
6.0	40.0	30.8	Yes
7.0	40.0	32.0	Yes
8.0	40.0	33.0	Yes
9.0	40.0	33.6	Yes
10.0	40.0	33.6	Yes
11.0	40.0	33.6	Yes
12.0	40.0	33.6	Yes

Noise sensitive point: User defined (57) (BE)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	24.3	Yes
5.0	40.0	26.6	Yes
6.0	40.0	28.9	Yes
7.0	40.0	30.1	Yes
8.0	40.0	31.1	Yes
9.0	40.0	31.7	Yes
10.0	40.0	31.7	Yes
11.0	40.0	31.7	Yes
12.0	40.0	31.7	Yes

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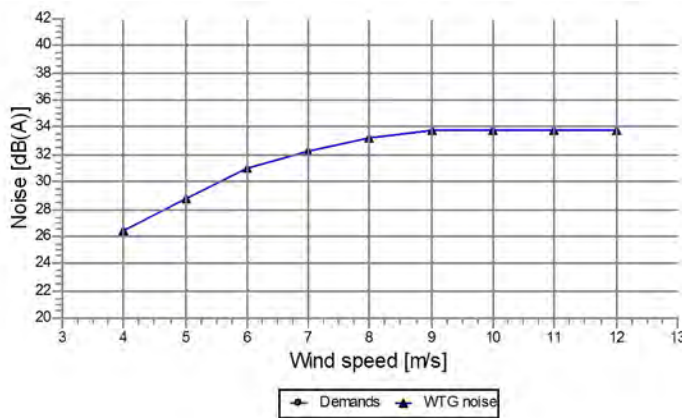
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Calculation: Barrachois - Noise Impact Assessment **Noise calculation model:** ISO 9613-2 General

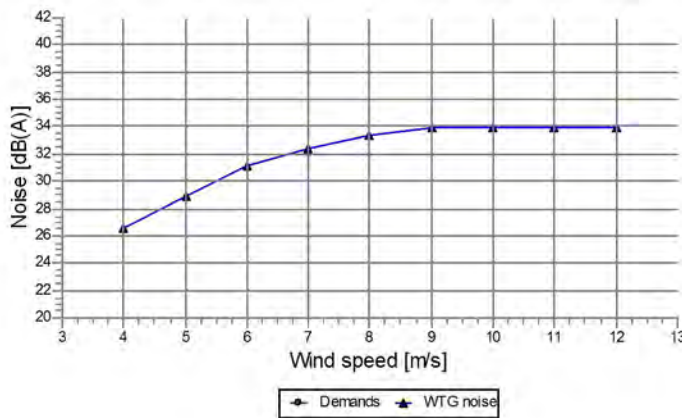
Noise sensitive point: User defined (58) (BF)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.4	Yes
5.0	40.0	28.7	Yes
6.0	40.0	31.0	Yes
7.0	40.0	32.2	Yes
8.0	40.0	33.2	Yes
9.0	40.0	33.8	Yes
10.0	40.0	33.8	Yes
11.0	40.0	33.8	Yes
12.0	40.0	33.8	Yes

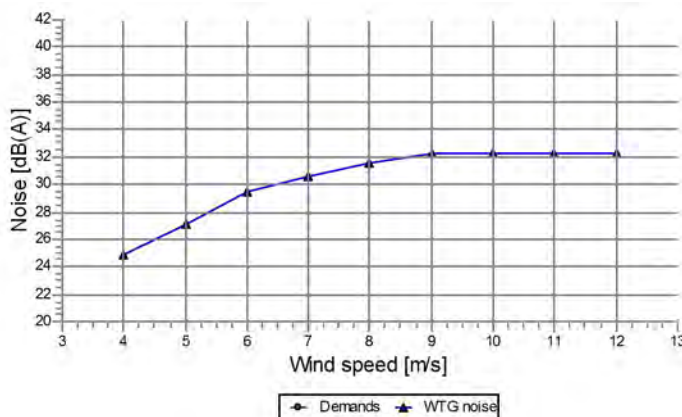
Noise sensitive point: User defined (59) (BG)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	26.6	Yes
5.0	40.0	28.9	Yes
6.0	40.0	31.2	Yes
7.0	40.0	32.4	Yes
8.0	40.0	33.4	Yes
9.0	40.0	34.0	Yes
10.0	40.0	34.0	Yes
11.0	40.0	34.0	Yes
12.0	40.0	34.0	Yes

Noise sensitive point: User defined (60) (BH)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	24.8	Yes
5.0	40.0	27.1	Yes
6.0	40.0	29.4	Yes
7.0	40.0	30.6	Yes
8.0	40.0	31.6	Yes
9.0	40.0	32.2	Yes
10.0	40.0	32.2	Yes
11.0	40.0	32.2	Yes
12.0	40.0	32.2	Yes

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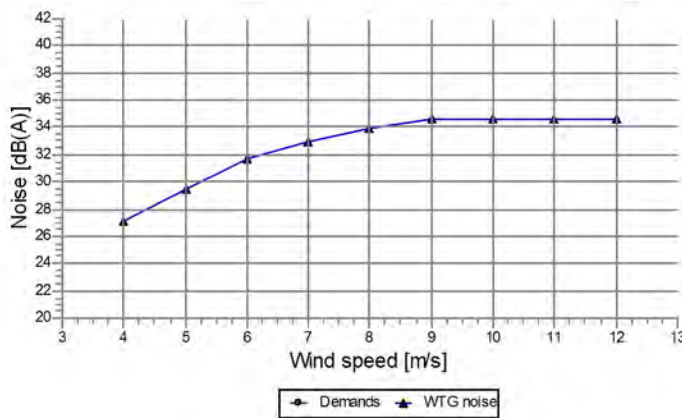
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Calculation: Barrachois - Noise Impact Assessment Noise calculation model: ISO 9613-2 General

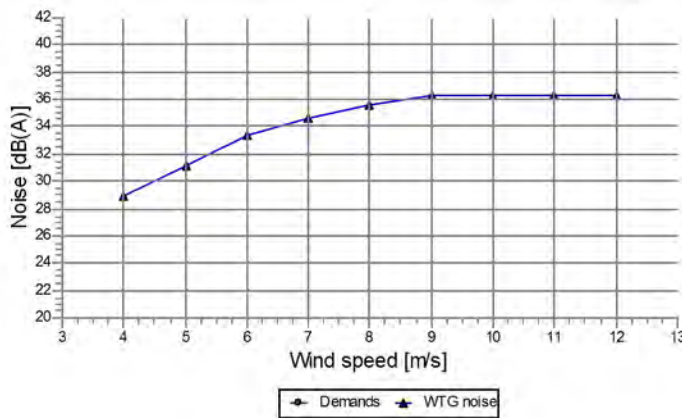
Noise sensitive point: User defined (61) (BI)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	27.2	Yes
5.0	40.0	29.5	Yes
6.0	40.0	31.8	Yes
7.0	40.0	33.0	Yes
8.0	40.0	34.0	Yes
9.0	40.0	34.6	Yes
10.0	40.0	34.6	Yes
11.0	40.0	34.6	Yes
12.0	40.0	34.6	Yes

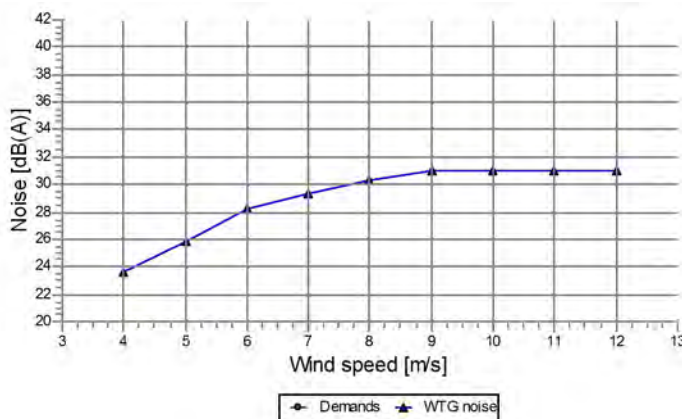
Noise sensitive point: User defined (62) (BJ)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	28.8	Yes
5.0	40.0	31.1	Yes
6.0	40.0	33.4	Yes
7.0	40.0	34.6	Yes
8.0	40.0	35.6	Yes
9.0	40.0	36.2	Yes
10.0	40.0	36.2	Yes
11.0	40.0	36.2	Yes
12.0	40.0	36.2	Yes

Noise sensitive point: User defined (63) (BK)



Sound Level

Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	23.6	Yes
5.0	40.0	25.9	Yes
6.0	40.0	28.2	Yes
7.0	40.0	29.4	Yes
8.0	40.0	30.4	Yes
9.0	40.0	31.0	Yes
10.0	40.0	31.0	Yes
11.0	40.0	31.0	Yes
12.0	40.0	31.0	Yes

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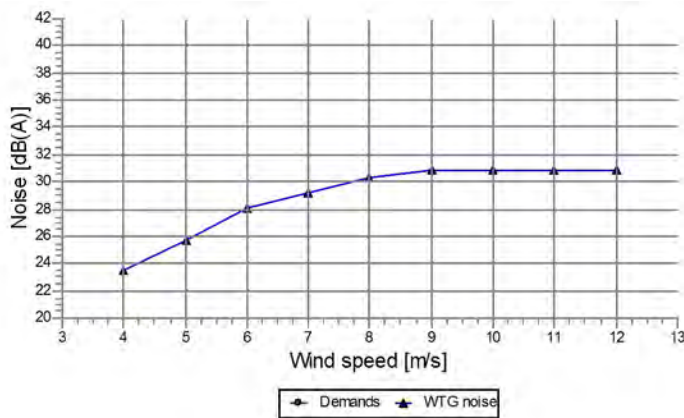
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Calculation: Barrachois - Noise Impact Assessment **Noise calculation model:** ISO 9613-2 General

Noise sensitive point: User defined (64) (BL)



Wind speed [m/s]	Demands [dB(A)]	WTG noise [dB(A)]	Demands fulfilled ?
4.0	40.0	23.4	Yes
5.0	40.0	25.7	Yes
6.0	40.0	28.0	Yes
7.0	40.0	29.2	Yes
8.0	40.0	30.2	Yes
9.0	40.0	30.8	Yes
10.0	40.0	30.8	Yes
11.0	40.0	30.8	Yes
12.0	40.0	30.8	Yes

