

Appendix B

Field Notes



Stantec

0-3 u/s = 0678543 5231574
0-3 d/s = 0678514 5231734
WIND FARM WATERBODY RAPID ASSESSMENT FORM

Too shallow
to fish
WQ

Station # 0-3 Project Name Bow Lake Wind Farm
Watercourse Name unknown trib to Mont. Rv. Project # 1609 60734
Photos 611-613 Field Staff NB, MF
Date July 12/12 Time 13:30
Weather conditions in previous 24 hrs No precip. Hot 28°C
GPS Coordinates (Zone) 16T E N Datum NAD83
Descriptive Location ~1 km east of Hwy 17 on Dump Rd. Crosses over rd. No culvert.

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) _____
Time in situ measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.4 (m) Maximum Pool Depth 5.0 (cm)
Mean Bankfull Width 1.2 (m) Mean Water Depth 3.0 (cm)
% Riffle 100 % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability minor scour on banks u/s + d/s but well vegetated.

Substrate (% cover)

Bedrock 20 Cobble 25 Sand 10 Silt _____ Muck _____
10 Boulder 15 Gravel _____ Clay _____ Marl 20 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% sugar maple, yellow birch, fern sp.

Adjacent Land Use

forest, ATV trail (Dump Rd)

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Possible spawn & nursery closer to Montreal Rv (d/s)

Migratory Obstructions (seasonal, permanent)

Steep gradient, no culvert @ Dump Rd, dry

Note any fish observations none.

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Intermittent Indirect

0-3 u/s = 0678543 5231574
0-3 d/s = 0678514 5231734

Field Notes Authored by ME

Field Notes QA/QCed by MEllah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 0-2
 Watercourse Name unknown
 Photos 608-610
 Date July 12/12
 Weather conditions in previous 24 hrs No precip. Hot, 28°C
 GPS Coordinates (Zone) 16T E N — Datum NAD83
 Descriptive Location ~ 1.2 km east of Hwy 17 on Dump Rd. Crosses under Dump Rd.

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time *in-situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.4 (m) Maximum Pool Depth 2 (cm) *STAND. WATER*
 Mean Bankfull Width 0.6 (m) Mean Water Depth _____ (cm)
 % Riffle _____ % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability minor scour v/s + d/s. but well veget'd

Substrate (% cover)

Bedrock 10 Cobble 30 Sand 20 Silt _____ Muck _____
 Boulder 20 Gravel _____ Clay _____ Marl 10 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

80% sugar maple, korn sp, yellow birch

Adjacent Land Use

forest, ATV trail (Dump Rd)

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

possible spawning closer to Montreal Rv. mouth

Migratory Obstructions (seasonal, permanent)

steep gradient, pitched culvert, dry

Note any fish observations none

Waterbody Notes

Natural Watercourse _____ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

intermittent, indirect

Hog sp. in standing water pools v/s + d/s

Field Notes Authored by MF

Field Notes QA/QCed by ME/ah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 0-1

Watercourse Name unknown

Photos 605-607

Date July 12/12

Weather conditions in previous 24 hrs no precip. Hot, 28°C

GPS Coordinates (Zone) 16T E 0680373

Descriptive Location ~1.2 km west of Rebecca Rd. on Hogg Dam Rd.

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff NB, MF

Time 12:45

Too shallow to fish

Datum NAD83

Runs under rd.

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____

Water Temperature (°C) _____ Air Temperature (°C) _____

Time *in situ* measurements taken _____

Too shallow

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.0 (m) Maximum Pool Depth 2 (cm)

Mean Bankfull Width 1.2 (m) Mean Water Depth 1 (cm)

% Riffle 100 % Pool _____ % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability minor undercut banks d/s

Substrate (% cover)

Bedrock 40 Cobble 30 Sand _____ Silt _____ Muck _____

Boulder 20 Gravel _____ Clay _____ Marl 10 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg

Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

80% sugar maple, yellow birch, fern sp.

Adjacent Land Use

forest, Hogg Rd.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

possible spawn + nursery closer to Montreal Rv. (d/s)

Migratory Obstructions (seasonal, permanent)

steep gradient, dry, lack of channel u/s of rd., perched culvert.

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____

Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. REA d/s of rd only.

Field Notes Authored by MM

Field Notes QA/QCed by MEllah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

MT sets

Stantec

Station # 9B-1

Watercourse Name unknown

Photos 566-569

Date July 11/12

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff NB, MF

Time 14:30

Weather conditions in previous 24 hrs no precip. Hot, 27°C

GPS Coordinates (Zone) 16T E 0682638 N 523371 Datum NAD83

Descriptive Location ~100 m south of Gate #2 heading south on Hogg Dam Rd.

Water Quality

Dissolved Oxygen (mg/L) 7.85 pH 7.34 Conductivity (µS/cm) 53

Water Temperature (°C) 18.73 Air Temperature (°C) 27°C

Time *in situ* measurements taken 14:40

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.2 (m) Maximum Pool Depth 0.6 (m)

Mean Bankfull Width 2.5 (m) Mean Water Depth 20 (cm)

70 % Riffle 10 % Pool 40 % Run 10 % Flat

Evidence of eroding banks, Comments on bank stability minor undercut w/s of culverts

Substrate (% cover)

Bedrock 30 Cobble 20 Sand 10 Silt 10 Muck 10

Boulder 30 Gravel 10 Clay 10 Marl 10 Detritus 10

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg

Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

80% Buffalo berry, Sugar maple, fern sp.

Adjacent Land Use

Hogg Dam Rd, Hydro Corridor

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Spawning, nursery, forage

Migratory Obstructions (seasonal, permanent)

none observed

Note any fish observations schools of Northern Redbelly dace + 2 Brook trout

~20 m d/s of Hogg Rd

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐

Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc. No v/s + d/s waypoints

as delineated already and connects to Montreal Riv.

Permanent, Direct

Field Notes Authored by MF

Field Notes QA/QCed by NB



Project Name Bow Lake Wind Farm Station Number 98-1
Project Number 1609 60734 Pass No. (if applicable) /
Photos 566-569 Date (yyyymmdd): July 12
Descriptive Location ~100 m South of Gate #2 on Hogg Dam Rd
heading south on Hogg Dam Rd
UTM coordinates 0682638 easting 523371 northing zone 16T

Fishing Method (circle one): _____ Backpack Boat Unit Model/Make _____
 Sampling Method (circle one): _____ even habitat transect spot
 Effort (Electrofishing Seconds): _____ Number of Netters: _____ Number of Anodes: _____
Settings
 Frequency (Hz) _____ Voltage (volts) _____ Current (Amps) _____ Power (Watts) _____

Length of Stream Surveyed (m) Traps set @ culverts under rd crossing (Hogg)

Station Characteristics:

Width (m):	Range <u>1.0 - 1.4</u>	Average: <u>1.2</u>
Depth (m):	Range <u>0.1 - 0.6</u>	Average: <u>0.2</u>

Water Clarity/Colour:	<u>clear</u>	Water Velocity if Measured (m/s):	<u>N/A</u>	Time	<u>14:30</u>
Temperature (°C)	<u>18.73</u>	Conductivity (uS/cm)	<u>53</u>		
pH	<u>7.34</u>	Dissolved Oxygen (mg/L)	<u>7.85</u>		

[illegible]

Field Staff: NB.MK

Notes By: MF

(Station Diagram on Back)



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

9B-2015-0682582 523 3320

9B-2015-0682569 523 3351

#Dry, No Fishing

Station # 9B-2

Watercourse Name unknown

Photos 570-572

Date July 11/12

Weather conditions in previous 24 hrs no precip.

GPS Coordinates (Zone) 16T E

Descriptive Location ~20m south of gate #2 of Hogg Rd.

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff NB, MF

Time 14:50

Datum NAD83

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____

Water Temperature (°C) _____ Air Temperature (°C) _____

Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.3 (m) Maximum Pool Depth 10 (cm)

Mean Bankfull Width _____ (m) Mean Water Depth 5 (cm)

_____ % Riffle 100 % Pool _____ % Run _____ % Flat

Evidence of eroding banks, Comments on bank stability none

Substrate (% cover)

Bedrock _____ Cobble 40 Sand 20 Silt _____ Muck _____
Boulder 40 Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg

Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

40% floating pond weed, yellow birch

Adjacent Land Use Hogg Rd, Hydro Corridor

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

possible spawn

Migratory Obstructions (seasonal, permanent)

dry

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____

Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Indirect, intermittent.

Dry d/s, standing water u/s (seep)

Field Notes Authored by MF

Field Notes QA/QCed by NB



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

No fishing - dry

9B-3 d/s = 0682595 5233346

9B-3 d/s = 0682584 5233357

Station # 9B-3

Project Name Bow Lake Wind Farm

Watercourse Name unknown

Project # 1609 60734

Photos 573-576

Field Staff NB, MP

Date July 11/12

Time 15:03

Weather conditions in previous 24 hrs No precip. 28°C

GPS Coordinates (Zone) 16T E N Datum NAD83

Descriptive Location ~ 2 m south of Gate #2 of Hogs Dam Rd

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____

Water Temperature (°C) _____ Air Temperature (°C) _____

Time in situ measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m) ref. Maximum Pool Depth _____ (cm)

Mean Bankfull Width 0.6 (m) Mean Water Depth _____ (cm)

_____ % Riffle _____ % Pool _____ % Run _____ % Flat

Evidence of eroding banks, Comments on bank stability none

Substrate (% cover)

Bedrock	<u>10</u>	Cobble	<u>40</u>	Sand	<u>20</u>	Silt		Muck
Boulder	<u>30</u>	Gravel		Clay		Marl		Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg

Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

90% eastern white cedar, yellow birch

Adjacent Land Use

Hogs Rd, Hydro corridor

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

possible spawning connected to 9B-1

Migratory Obstructions (seasonal, permanent)

dry

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____

Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

9B-3 us = 9B-3 us = 0682595, 5233346

Field Notes Authored by MP

Field Notes QA/QCed by NB



WIND FARM WATERBODY RAPID ASSESSMENT FORM

MT set

Stantec

Station # 9B-4 Project Name Bow Lake Wind Farm
 Watercourse Name Bay of Montreal Rv. Project # 1609 60734
 Photos 572-580 Field Staff NB, MF
 Date July 11/12 Time 15:20
 Weather conditions in previous 24 hrs no precip. 28°C
 GPS Coordinates (Zone) 16T E 0682389 N 523371 Datum NAD83
 Descriptive Location ~ 700m dis. of dam

Water Quality

Dissolved Oxygen (mg/L) 8.13 pH 7.41 Conductivity (µS/cm) 51
 Water Temperature (°C) 23.44 Air Temperature (°C) 27°C
 Time in situ measurements taken 15:30

Watercourse Dimensions & Morphology

Mean Watercourse Width 35-235 (m) Maximum Pool Depth 1.0 (m) } Montreal Rv.
 Mean Bankfull Width 70-235 (m) m.p. Mean Water Depth 1.0 (m)
 % Riffle 40 % Pool 60 % Run % Flat
 Evidence of eroding banks, Comments on bank stability none - boulder along shore line

Substrate (% cover)

Bedrock 30 Cobble 30 Sand Silt 10 Muck
20 Boulder Gravel Clay Marl 10 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

5% water has receded away from riparian veg. (dam)

Adjacent Land Use

dam, forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawning, forage, nursery

Migratory Obstructions (seasonal, permanent)

none

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by MAF

Field Notes QA/QCed by MB



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Too shallow
to fish

9B-5 u/s = 0682467 9233064

9B-5 d/s = 0682497 5233236

Station # 9B-5 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 581-583 Field Staff NB, ME
 Date July 11/12 Time 15:45
 Weather conditions in previous 24 hrs no precipitation 28°
 GPS Coordinates (Zone) 16T E N Datum NAD83
 Descriptive Location ~250 south of Gate #2 when heading south on
Hogg Rd. u/s starts south along rd side

Water Quality

Dissolved Oxygen (mg/L) 7.63 pH 7.37 Conductivity (µS/cm) 81
 Water Temperature (°C) 21.0 Air Temperature (°C) 28°
 Time in situ measurements taken 15:50

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.6 (m) Maximum Pool Depth 0.10 (cm)
 Mean Bankfull Width 0.7 (m) Mean Water Depth _____ (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability no erosion

Substrate (% cover)

Bedrock 25 Cobble 30 Sand _____ Silt _____ Muck _____
5 Boulder 30 Gravel _____ Clay _____ Marl 10 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

70% mountain maple, mountain ash

Adjacent Land Use

Hogg Rd.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none

Migratory Obstructions (seasonal, permanent)

underground, intermittent, perched csp.

Note any fish observations None

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Intermittent, Indirect.
Water disappears ~ 5 d/s (south) of Hogg Rd.

9B-5 u/s = 0682467 5233064

Field Notes Authored by MF

Field Notes QA/QCed by 9B



WIND FARM WATERBODY RAPID ASSESSMENT FORM

MT Set

Stantec

Station # 9B-8 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 590-592 Field Staff NB, MF
 Date July 11/12 Time 16:55
 Weather conditions in previous 24 hrs no precip. Hot, 28°C
 GPS Coordinates (Zone) 16T E 0682053 N 5232704 Datum NAD83
 Descriptive Location ~1.5 km north of Rebecca Rd on Hogs Rd.

Water Quality

Dissolved Oxygen (mg/L) 7.40 pH 7.0 Conductivity (µS/cm) 31
 Water Temperature (°C) 15.14 Air Temperature (°C) 27°C
 Time *in situ* measurements taken 17:00

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m) Maximum Pool Depth 7 (cm)
 Mean Bankfull Width 1.0 (m) Mean Water Depth 5 (cm)
40 % Riffle 100 % Pool 60 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability none

Substrate (% cover)

Bedrock 50 Cobble 10 Sand 40 Silt 20 Muck 0
 Boulder 50 Gravel 0 Clay 0 Marl 30 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

80% black spruce, poplar sp, white birch

Adjacent Land Use

Hogs Rd

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn, forage, nursery

Migratory Obstructions (seasonal, permanent)

none

Note any fish observations none

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc. direct, permanent

v/s area is ponded ~ 10m wide + + 1.0m deep

Field Notes Authored by MF

Field Notes QA/QCed by NB



Project Name Bow Lake Wind Farm Station Number 9B-8
Project Number 1609 60734 Pass No. (if applicable) ✓
Photos 59D-59Z Date (yyyymmddj): July 11 / 12
Descriptive Location ~1.5 km north of Rebecca Rd on Hogg Rd

UTM coordinates 0682053 easting 5232704 northing zone 16T

Fishing Method (circle one): Backpack Boat Unit Model/Make _____
 Sampling Method (circle one): even habitat transect spot

Effort (Electrofishing Seconds): _____ Number of Netters: _____ Number of Anodes: _____

Settings	Voltage (volts)	Current (Amps)	Power (Watts)
Frequency (Hz)			

Station Information

Length of Stream Surveyed (m)

Station Characteristics: Width (m): Range 0.5 - 1.0 Average: 0.7
 Depth (m): Range 71.0 - 0.10 Average: ~~0.805~~ 0.05 m (d/s)

Water Clarity/Colour:	<u>Clear</u>	Water Velocity if Measured (m/s):	<u>N/A</u>	Time	<u>17:00</u>
Temperature (°C)	<u>15.14</u>	Conductivity (µS/cm)	<u>31</u>		
pH	<u>7.08</u>	Dissolved Oxygen (mg/L)	<u>7.40</u>		

Catch Data

[illegible]

Fish Measurements on Separate Sheet? **YIN**

Field Staff: NB. m

Notes By: MR

(Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

MT Set

Stantec

Station # 9B-9 Project Name Bow Lake Wind Farm
 Watercourse Name Montreal Rm Project # 1609 60734
 Photos 593-595 Field Staff NB, MF
 Date July 11/12 Time 17:10
 Weather conditions in previous 24 hrs No precip. Hgt 28°C
 GPS Coordinates (Zone) 16T E 068969 N 5232664 Datum NAD83
 Descriptive Location In bay of Montreal Rm ~ 1.0 km north of Rebecca Rd

Water Quality

Dissolved Oxygen (mg/L) 7.79 pH 7.00 Conductivity (µS/cm) 51
 Water Temperature (°C) 26.22 Air Temperature (°C) 28°C
 Time in situ measurements taken 17:15

Watercourse Dimensions & Morphology

Mean Watercourse Width 235 (m) Maximum Pool Depth ✓ (cm)
 Mean Bankfull Width 235 (m) Mean Water Depth ✓ (cm)
 % Riffle 100 % Pool ✓ % Run ✓ % Flat ✓
 Evidence of eroding banks, Comments on bank stability none

Substrate (% cover)

Bedrock 30 Cobble 20 Sand ✓ Silt ✓ Muck ✓
 Boulder 30 Gravel ✓ Clay ✓ Marl ✓ Detritus ✓

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress ✓ Aquatic Veg ✓
 Overhanging Vegetation Woody Debris Boulder ✓ Other ✓

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

5% water receded due to dam activities

Adjacent Land Use

Highway Rd

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn, nurse, forage

Migratory Obstructions (seasonal, permanent)

none

Note any fish observations Schools of cyprinidae

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel ✓ Grassed Swale ✓ Buried Tile ✓
 Surficial Drainage (i.e. furrows) ✓ Dugout Pond ✓ Dominated by Aquatic Veg ✓ Dry ✓

Other Habitat Notes, Incidental Wildlife Observations, etc. ruffed grouse w 2 babies

Field Notes Authored by MF

Field Notes QA/QCed by MF



Project Name Bow Lake Wind Farm Station Number 9B-9
Project Number 1609 60734 Pass No. (if applicable) —
Photos 593-595 Date (yyyymmdd): July 12
Descriptive Location In bay of Montreal Rv ~ 1.0km north of
Rebecca Rd.
UTM coordinates 06 81969 easting 523 2664 northing zone 16T

Fishing Method (circle one): Backpack Boat Unit Model/Make
 Sampling Method (circle one): even habitat transect spot
 Effort (Electrofishing Seconds): _____ Number of Netters: _____ Number of Anodes: _____
Settings
 Frequency (Hz) _____ Voltage (volts) _____ Current (Amps) _____ Power (Watts) _____

Length of Stream Surveyed (m)

Station Characteristics:

Width (m): Range Average:
Depth (m): Range 0.30 - 0.6 Average: 0.5

Water Clarity/Colour: tea / tanind
Temperature (°C) 26.22
pH 7.00

Water Velocity if Measured (m/s): N/A Time 17:10
 Conductivity (uS/cm) 51
 Dissolved Oxygen (mg/L) 7.79

Catch Data

[illegible]

Fish Measurements on Separate Sheet? **Y**

Field Staff: NB, mf

Notes By: MF

(Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Trop 3
set

Stantec

Station # 9B-10 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 597-598 Field Staff NB, MF
 Date July 12/12 Time 11:15
 Weather conditions in previous 24 hrs No precipitation, 27°C
 GPS Coordinates (Zone) 16T E 0689129 N 5231791 Datum NAD83
 Descriptive Location On Hogg Dam Rd ~325m north of Rebecca Rd.

Water Quality

Dissolved Oxygen (mg/L) 7.47 pH 6.95 Conductivity (µS/cm) 60
 Water Temperature (°C) 10.00 Air Temperature (°C) 28°C
 Time in situ measurements taken 11:20

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.2 (m) Maximum Pool Depth 15.0 (cm)
 Mean Bankfull Width 2.5 (m) Mean Water Depth 8 (cm)
60 % Riffle 10 % Pool 30 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability minor undercut banks

Substrate (% cover)

Bedrock 30 Cobble 40 Sand 0 Silt 0 Muck 0
 Boulder 20 Gravel 0 Clay 0 Marl 10 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress 0 Aquatic Veg 0
Overhanging Vegetation Woody Debris Boulder 0 Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
70% white birch, sugar maple, eastern white cedar. d/s area open: not much shade
 Adjacent Land Use Hogg Dam Rd, Hydro Corridor, Forest.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, nursery, forage
 Migratory Obstructions (seasonal, permanent)
deep gradient on d/s side
 Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by mf

Field Notes QA/QCed by m ellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Traps set

Stantec

Station # 9B-11 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 599-601 Field Staff NBME
 Date July 12/12 Time 11:35
 Weather conditions in previous 24 hrs No precip, 27°C hot
 GPS Coordinates (Zone) 16T E 0681825 N 5231566 Datum NAD83
 Descriptive Location ~200m north of Rebecca on Hogs Dam Rd.
Crosses under rd.

Water Quality

Dissolved Oxygen (mg/L) 7.39 pH 7.22 Conductivity (µS/cm) 49
 Water Temperature (°C) 11.97 Air Temperature (°C) 28°C
 Time in situ measurements taken 11:40

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.65 (m) Maximum Pool Depth 8 (cm)
 Mean Bankfull Width 2.0 (m) Mean Water Depth 5 (cm)
60 % Riffle 20 % Pool 20 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability none observed. Rip Rap on d/s side near culvert. well veg'd banks.

Substrate (% cover)

Bedrock 30 Cobble 30 Sand 0 Silt 10 Muck 0
 Boulder 20 Gravel 0 Clay 0 Marl 10 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
40% sugar maple (immature), Under hydro lines is trimmed + sprayed
 Adjacent Land Use hydro corridor, Hogs Rd, Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Possible spawn, forage, nursery
 Migratory Obstructions (seasonal, permanent)
steep gradient in d/s section
 Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

Permanent

Field Notes Authored by MF

Field Notes QA/QCed by MEI

Stantec Consulting Ltd - Electrofishing Record and Catch Results

Project Name Bow Lake Wind Farm Station Number 9B-11
Project Number 1609 60734 Pass No. (if applicable) —
Photos 99-601 Date (yyyymmdd): July 12
Descriptive Location ~200 m north of Rebeca Rd on Hogg Dam Rd.
Crosses under rd.
UTM coordinates 0681825 easting 5231566 northing zone 16T

Fishing Method (circle one):

Sampling Method (circle one):

Effort (Electrofishing Seconds):

Settings

Frequency (Hz)

Backpack

even

Boat

habitat

transect

Unit Model/Make

spot

Number of Netters:

Number of Anodes:

Voltage (volts)

Current (Amps)

Power (Watts)

Station Information

Length of Stream Surveyed (m) trapped - 20m u/s from culvert

Station Characteristics:

Width (m):	Range <u>0.45-1.25</u>	Average: <u>0.65</u>
Depth (m):	Range <u>0.05-0.08</u>	Average: <u>0.05</u>

Water Clarity/Colour: clear

Water Velocity if Measured (m/s): N/A

Time 11:45

Temperature (°C) 11.97

Conductivity (uS/cm) 49

pH 7.22

Dissolved Oxygen (mg/L) 7.39

Catch Data

[illegible]

Fish Measurements on Separate Sheet? ☒ Y ☐ N

Field Staff: NB, MF

Notes By: MF

(Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9A-1 Project Name Bar Lake
 Watercourse Name w6 - Dam Headpond - Montreal R. Project # 110960771
 Photos 9744-9748 Field Staff Joe Keen Mitch Ellah
 Date 2012/08/27 Time 5:51 pm
 Weather conditions in previous 24 hrs Sattered showers, fog in morning
 GPS Coordinates (Zone) 16T E 683206 N 5234589 Datum NAD83
 Descriptive Location Upstream of Dam @ Montreal River - head Pond

Water Quality

Dissolved Oxygen (mg/L) 8.69 pH 6.97 Conductivity (µS/cm) 58
 Water Temperature (°C) 21.05 Air Temperature (°C) 23°C
 Time in situ measurements taken 5:48 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width (m) Maximum Pool Depth (cm)
 Mean Bankfull Width (m) Mean Water Depth (cm)
 % Riffle 100 % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability Stable - bedrock

Substrate (% cover)

70 Bedrock 10 Cobble Sand Silt Muck
20 Boulder Gravel Clay Marl Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
< 5% tree/shrub line.

Adjacent Land Use

Dam, Natural forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Walleye?

Migratory Obstructions (seasonal, permanent)
Dam

Note any fish observations none observed

Waterbody Notes

Natural Watercourse Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc. Walleye caught on previous visit

Field Notes Authored by Joe Keen

Field Notes QA/QCed by MSU/ah



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

NKT set
Fishable

Station # 10-31
 Watercourse Name Montreal Rv. bay
 Photos 530-532
 Date July 9 / 12
 Weather conditions in previous 24 hrs no precip. Hot + muggy
 GPS Coordinates (Zone) 16T E 0683227 N 5234576 Datum NAD83
 Descriptive Location In small bay ~ 300 m east of dam on Montreal Rv.

Water Quality

Dissolved Oxygen (mg/L) 8.23 pH 7.09 Conductivity (µS/cm) 57
 Water Temperature (°C) 23.23 Air Temperature (°C) 27°C
 Time in situ measurements taken 14:30

Watercourse Dimensions & Morphology

Mean Watercourse Width (m) Maximum Pool Depth > 5.0 (m) Dam head pond.
 Mean Bankfull Width (m) Mean Water Depth > 5.0 (m)
 % Riffle 100 % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

80 Bedrock 10 Cobble Sand Silt Muck
 Boulder 10 Gravel Clay Marl Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

50% old log jam pieces, poplar sp., sugar maple.

Adjacent Land Use

McKay rd, dam, Montreal Rv.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn, forage, nursery

Migratory Obstructions (seasonal, permanent)

dam

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc. scarlet tanager.

Field Notes Authored by MF

Field Notes QA/QCed by NB



Page 1 of 1 12

Project Name Bow Lake Wind Farm Station Number 10-31

Project Number 1609 60734 Pass No. (if applicable) —

Photos 530-532 Date (yyyymmdd): July 9/12

Descriptive Location On Montreal Rv ~ 300m east of dam + ~
60m east of McKenay rd.

UTM coordinates 0683227 easting 5234576 northing zone 16T

Fishing Method (circle one): Backpack Boat Unit Model/Make
 Sampling Method (circle one): even habitat transect spot
 Effort (Electrofishing Seconds): _____ Number of Netters: _____ Number of Anodes: _____
Settings
 Frequency (Hz) _____ Voltage (volts) _____ Current (Amps) _____ Power (Watts) _____

Length of Stream Surveyed (m) Lake bang

Station Characteristics:

Width (m):	Range	Average:
Depth (m):	Range <u>0.4 - 0.8</u>	Average: <u>0.5</u>

Set: July 9, 2012
Det: July 10, 2012 @ 13:20

Water Clarity/Colour:	<u>tea colour</u>	Water Velocity if Measured (m/s):	<u>N/A</u>	Time	<u>14:30</u>
Temperature (°C)	<u>23.23</u>	Conductivity (uS/cm)	<u>57</u>		
pH	<u>7.09</u>	Dissolved Oxygen (mg/L)	<u>8.23</u>		

Catch Data

[illegible]

Fish Measurements on Separate Sheet? ☒ Y ☐ N

Field Staff: NB MF

Notes By: MF

(Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NWB

Stantec

Station # 9A-2 Project Name Bow Lake
 Watercourse Name unnamed Project # 160960771
 Photos none Field Staff Joe Keen Mitch Ellah
 Date 2012/08/28 Time 6:00 pm
 Weather conditions in previous 24 hrs sunny, warm & fog in am
 GPS Coordinates (Zone) 16T E 684191 N 5234599 Datum NAD83
 Descriptive Location South side of Mickey Rd. south of 10-22, 1250m east of dam

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity ($\mu\text{S}/\text{cm}$) _____ Dry
 Water Temperature ($^{\circ}\text{C}$) _____ Air Temperature ($^{\circ}\text{C}$) 23^{\circ}\text{C}
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm) Dry
 Mean Bankfull Width _____ (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability Dry

Substrate (% cover)

DB No channel - leaf litter, soil
 Bedrock _____ Cobble _____ Sand _____ Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

Mature Mixed forest - 90%

Adjacent Land Use

Mickey Rd & Natural Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none

Migratory Obstructions (seasonal, permanent)

no channel

Note any fish observations none

Waterbody Notes

Natural Watercourse _____ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) ☒ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry ☒

Other Habitat Notes, Incidental Wildlife Observations, etc.

Not a REA WB - no channel
no culvert under road - no evidence of significant water flow. Mapped water feature
not present within zone of investigation

Field Notes Authored by Joe Keen

Field Notes QA/QCed by M. Ellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-22
 Watercourse Name Unnamed Pond
 Photos 1044, 1045
 Date July 7/12
 Weather conditions in previous 24 hrs mix sun & cloud, light rain last night
 GPS Coordinates (Zone) 16T E 684133 N 5234664 Datum NAD83
 Descriptive Location small pond on north side of road, beneath hydro towers/line

Project Name Bow Lake Wind Farm
 Project # 1609 60734
 Field Staff M. Johns, M. Ellah
 Time 15:30

Water Quality

Dissolved Oxygen (mg/L) 5.58 pH 5.36 Conductivity (µS/cm) 19
 Water Temperature (°C) 30.1 Air Temperature (°C) ~26°C (estimated)
 Time in situ measurements taken 15:30 → 27.5 measured

Watercourse Dimensions & Morphology

Mean Watercourse Width (m) Maximum Pool Depth 0.8 m (cm)
 Mean Bankfull Width (m) Mean Water Depth 30 (cm)
 % Riffle % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability

Substrate (% cover)

Bedrock Cobble Sand Silt Muck
 Boulder Gravel Clay Marl 100 Detritus

In-water Cover

Cover Types Present (circle): Not Applicable
 Overhanging Vegetation Undercut Banks Deep Pool Watercress Aquatic Veg
 Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 0%

Adjacent Land Use

Hydro corridors, roadway

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) None

Migratory Obstructions (seasonal, permanent)

Not Applicable (road blocks downstream flow to valley)
 Note any fish observations None - Not fish habitat

Waterbody Notes

→ Small Pond
 Natural Watercourse Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

Adult eastern newt, green frogs, dragon fly nymph
Temperatures re-checked. Pond is warmer
than air temperature.

Field Notes Authored by Mike Johns

Field Notes QA/QCed by M. Ellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-14 Project Name Bow Lake Wind Farm
 Watercourse Name unnamed Project # 1609 60734
 Photos 0982-0985 Field Staff MEllah, M Johns
 Date July 6/12 Time 15:40
 Weather conditions in previous 24 hrs sunny, hot & humid, no precip, light wind NW
 GPS Coordinates (Zone) 16T E 684318 N 5234730 Datum NAD83
 Descriptive Location northeast of current road that runs along Montreal River
Hogg Dam Road.

Water Quality

Dissolved Oxygen (mg/L) 5.26 pH 5.39 Conductivity (μ S/cm) 28
 Water Temperature ($^{\circ}$ C) 27.93 Air Temperature ($^{\circ}$ C) 25^{\circ}C
 Time *in situ* measurements taken 15:55

Watercourse Dimensions & Morphology

Mean Watercourse Width pond (m) Maximum Pool Depth 200 (cm)
 Mean Bankfull Width pond (m) Mean Water Depth 150 (cm)
 % Riffle 100 % Pool 0 % Run 0 % Flat 0
 Evidence of eroding banks, Comments on bank stability
Sand section of shoreline eroding into pond - other banks stable

Substrate (% cover)

30 Bedrock 0 Cobble 30 Sand 20 Silt 0 Muck 0
 Boulder 0 Gravel 0 Clay 0 Marl 20 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg.
 Overhanging Vegetation Woody Debris Boulder 0 Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
0% - surrounding forest mixed, white pine, white spruce, red maple
 Adjacent Land Use
roadside, hydrolines, forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas) groundwater upwellings
possible groundwater source - stained substrate iron colour
 Migratory Obstructions (seasonal, permanent)
natural dam, road + culvert
 Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

green frog, wood frog, Am. toad tadpoles, green tree frog tadpoles
2nd pond hydrologically connected to 1st pond (10-14) survey location

Field Notes Authored by MEllah

Field Notes QA/QCed by ME



Station Number 10-14

Pass No. (if applicable)

Date (yyyymmdd): July / 12

Descriptive Location north of currently used road which is along Montreal River

UTM coordinates 684318 easting 5234730 northing zone 16T
 Wavelength 10-14

Fishing Method (circle one): minnow trap x5 Backpack Boat
 Sampling Method (circle one): even habitat transect spot

Effort (Electrofishing Seconds): _____ Number of Netters: _____ Number of Anodes: _____

Settings

Frequency (Hz) _____ Voltage (volts) _____ Current (Amps) _____ Power (Watts) _____

Station Information

Length of Stream Surveyed (m) 20

Station Characteristics: Width (m): Range 7-10 Average: pond
Depth (m): Range 0.5-2 Average: 1.5

Water Clarity/Colour:	<u>iron stained</u>
Temperature (°C)	<u>25.2</u>
pH	<u>6.32</u>

Water Velocity if Measured (m/s): _____ Time 15:55
 Conductivity (uS/cm) 14
 Dissolved Oxygen (mg/L) 7.25 trap lift time July
 9:30am

Catch Data

[illegible]

Fish Measurements on Separate Sheet? Y(N)

Field Staff: Mellah
M Johns

Notes By: M Ella

(Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Fieldable

Stantec

Station # 10-27 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 616-520 Field Staff NB, MF
 Date July 9 / 12 Time 12:10
 Weather conditions in previous 24 hrs no precip. Hot + muggy (28°C)
 GPS Coordinates (Zone) 16T E N Datum NAD83
 Descriptive Location On McKen rd ~ 1.3 km west of proposed
substation + ~170 m north of Montreal Rv.

Water Quality

Dissolved Oxygen (mg/L) 8.30 pH 7.27 Conductivity (µS/cm) 23
 Water Temperature (°C) ~~10.37~~ 10.37 Air Temperature (°C) 27°C
 Time *in situ* measurements taken 12:20

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.7 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 2.0 (m) Mean Water Depth 8 (cm)
30 % Riffle 10 % Pool 60 % Run % Flat
 Evidence of eroding banks, Comments on bank stability minor undercut banks

Substrate (% cover)

Bedrock 30 Cobble 30 Sand Silt Muck
 Boulder 30 Gravel Clay Marl 10 Detritus

In-Water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% sugar maple, fern sp, yellow birch

Adjacent Land Use

McKen Rd, Hydro Corridor

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn

Migratory Obstructions (seasonal, permanent)

perched culvert, maybe steep gradient

Note any fish observations

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

Direct, Permanent 10-27 4/5 = 0685193 5234427
10-27 4/5 = 0685000, 5234750

Field Notes Authored by MF

Field Notes QA/QCed by JB



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Too low to Fish

Station # 10-29
 Watercourse Name unknown
 Photos 524-526
 Date July 9/12
 Weather conditions in previous 24 hrs No precip. Hot, muggy (28°C)
 GPS Coordinates (Zone) 16T E
 Descriptive Location Runs along north ditch to McKay Rd

Project Name Bow Lake Wind Farm
 Project # 1609 60734
 Field Staff NB, MF
 Time 12:55
 Datum NAD83

Water Quality

Dissolved Oxygen (mg/L) 9.33 pH 7.00 Conductivity (µS/cm) 52
 Water Temperature (°C) 10.71 Air Temperature (°C) 27°C
 Time *in situ* measurements taken 12:50

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.4 (m) Maximum Pool Depth 5 (cm)
 Mean Bankfull Width 0.5 (m) Mean Water Depth 2 (cm)
10 % Riffle 50 % Pool 40 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability MINOR SCOUR

Substrate (% cover)

Bedrock 20 Cobble 20 Sand 0 Silt 0 Muck 0
 Boulder 30 Gravel 0 Clay 0 Marl 30 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
80% sugar maple, fern sp.
 Adjacent Land Use
McKay Rd.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Possible spawn
 Migratory Obstructions (seasonal, permanent)
lack of water
 Note any fish observations none

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel ✓ Grassed Swale 0 Buried Tile 0
 Surficial Drainage (i.e. furrows) 0 Dugout Pond 0 Dominated by Aquatic Veg 0 Dry 0

Other Habitat Notes, Incidental Wildlife Observations, etc.

10-29 4/5 = 0685095, 5234614
10-29 4/5 = 0685208, 5234667

Field Notes Authored by MF

Field Notes QA/QCed by NB



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Too shallow
to fish

Station # 10-28 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 521-523 Field Staff NB.me
 Date July 9/12 Time 12:30
 Weather conditions in previous 24 hrs no precip. Hot and muggy (28°C)
 GPS Coordinates (Zone) 16T E Datum NAD83
 Descriptive Location on McKay Rd ~ 1.2 km west of proposed substation

Water Quality

Dissolved Oxygen (mg/L) 8.49 pH 7.14 Conductivity (µS/cm) 220
 Water Temperature (°C) 11.02 Air Temperature (°C) 27°C
 Time in situ measurements taken 12:35

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.25 (m) Maximum Pool Depth 4 (cm)
 Mean Bankfull Width 1.10 (m) Mean Water Depth 2 (cm)
30 % Riffle 20 % Pool 50 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

Bedrock 40 Cobble 30 Sand 0 Silt 0 Muck 0
10 Boulder 0 Gravel 0 Clay 0 Marl 20 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks 0 Deep Pool 0 Watercress 0 Aquatic Veg 0
Overhanging Vegetation Woody Debris Boulder Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% Sugar maple, Fern sp

Adjacent Land Use

McKay rd.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none - disappears underground before McKay Rd.

Migratory Obstructions (seasonal, permanent)

goes underground

Note any fish observations None

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel 0 Grassed Swale 0 Buried Tile 0
 Surficial Drainage (i.e. furrows) 0 Dugout Pond 0 Dominated by Aquatic Veg 0 Dry 0

Other Habitat Notes, Incidental Wildlife Observations, etc.

10-28 4/5 = 0685252, 5234522

10-28 d/5 = 0685246, 5234668

Field Notes Authored by NB

Field Notes QA/QCed by NB



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

10-25 d/s = 0685150 5234876

MT set 2
d/s culverts
McKay Rd.

Station # 10-25 Project Name Bow Lake Wind Farm
 Watercourse Name unknown trib to Mont. Rv. Project # 1609 60734
 Photos 505-508 + 509-511 Field Staff NB, MF
 Date July 9/12 Time 11:10
 Weather conditions in previous 24 hrs no precip. Hot, muggy 28°C → MT traps
 GPS Coordinates (Zone) 16T E 0685308 N 5234772 Datum NAD83
 Descriptive Location @ McKay Rd crossing ~ 300 m west of proposed
substation.

Water Quality

Dissolved Oxygen (mg/L) 9.79 pH 7.13 Conductivity (µS/cm) 54
 Water Temperature (°C) 12.20 Air Temperature (°C) 28°C
 Time in situ measurements taken 11:15

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth 60 (cm)
 Mean Bankfull Width 4.5 (m) Mean Water Depth 10 (cm)
40 % Riffle 10 % Pool 40 % Run 10 % Flat
 Evidence of eroding banks, Comments on bank stability none observed mod undercut
banks

Substrate (% cover)

Bedrock 30 Cobble 30 Sand Silt Muck
10 Boulder 30 Gravel Clay Marl Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

80% Mountain maple, yellow birch, sugar maple.

Adjacent Land Use

McKay Rd, Hydro corridor, Montreal Rv.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Spawn, Nursery, forage

Migratory Obstructions (seasonal, permanent)

Perched culverts @ d/s end.

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

Direct, Permanent 10-25 d/s = 0685527, 5234553
10-25 d/s = 0685150, 5234876

Field Notes Authored by MF

Field Notes QA/QCed by NB

(Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

No fishing - dry

Stantec

Station # 10-26

Watercourse Name unknown

Photos 512-515

Date July 9 / 12

Weather conditions in previous 24 hrs no precip. hot, muggy 28°C

GPS Coordinates (Zone) 16T E

Descriptive Location ~ 250 South of McKay Rd + ~ 275 m west of

proposed substation

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff NB, ME

Time 11:40

Datum NAD83

Water Quality

Dissolved Oxygen (mg/L) 8.68

pH 7.09

Conductivity (µS/cm) 30

Water Temperature (°C) 11.62

Air Temperature (°C) 27°C

Time in situ measurements taken 11:56

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.0 (m)

Maximum Pool Depth — (cm)

Mean Bankfull Width 3.0 (m)

Mean Water Depth — (cm)

— % Riffle

— % Pool

— % Run

— % Flat

Evidence of eroding banks, Comments on bank stability

minor undercut banks

Substrate (% cover)

20 Bedrock 25 Cobble 30

Sand

Silt

Muck

20 Boulder 25 Gravel

Clay

Marl

Detritus

In-water Cover

Cover Types Present (circle):

Undercut Banks

Deep Pool

Watercress

Aquatic Veg

Overhanging Vegetation

Woody Debris

Boulder

Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% yellow birch, sugar maple, fern sp.

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn

Migratory Obstructions (seasonal, permanent)

dry

Note any fish observations none - dry

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel

Grassed Swale

Buried Tile

Surficial Drainage (i.e. furrows)

Dugout Pond

Dominated by Aquatic Veg

Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

Intermittent, indirect?

10-26 4/5 = 0685472, 5234543

10-26 d/5 = 0685479, 5234603

Field Notes Authored by ME

Field Notes QA/QCed by NB



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-13 Project Name Bow Lake Wind Farm
 Watercourse Name unnamed Project # 1609 60734
 Photos 0978, -0981 Field Staff Mike Johns, Mitch Ellah
 Date July 6 / 12 Time 15:00
 Weather conditions in previous 24 hrs Hot, no rain, light westerly winds
 GPS Coordinates (Zone) 16T E 684'945 N 5234'187 Datum NAD83
 Descriptive Location 240m downstream of large beaver pond / small lake

Water Quality

Dissolved Oxygen (mg/L) 1.26 pH 5.48 Conductivity (μ S/cm) 16
 Water Temperature ($^{\circ}$ C) 17.1 Air Temperature ($^{\circ}$ C) ~24^{\circ}C
 Time in situ measurements taken 15:00

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.6 (m) Maximum Pool Depth 40 (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 4 (cm)
5 % Riffle 80 % Pool 5 % Run 10 % Flat
 Evidence of eroding banks, Comments on bank stability
undercut banks

Substrate (% cover)

Bedrock 40 Cobble 20 Sand Silt Muck
5 Boulder 30-25 Gravel Clay Marl 5 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% Mature Hardwoods prevalent, but generally stable
 Adjacent Land Use
Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
No Critical Habitat

Migratory Obstructions (seasonal, permanent)
None observed Low water levels

Note any fish observations none observed

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc. Good habitat & and morphology except for limited discharge. Fish are present in pond ~240m upstream.
Black Throated Blue warbler, Swainson's Thrush, oven bird

Field Notes Authored by M. Johns

Field Notes QA/QCed by M. Ellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-16

Watercourse Name unnamed

Photos # 1011-1021 + 1022

Date July 7/12

Weather conditions in previous 24 hrs mix sun & cloud, light rain

GPS Coordinates (Zone) 16T E 685163

Descriptive Location 386m to turbine 12, NW to T12

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff Mellah, M Johns

Time 10:45 am

Datum NAD83

Water Quality

Dissolved Oxygen (mg/L) 7.56 pH 6.46 Conductivity (µS/cm) 21

Water Temperature (°C) 15.60 Air Temperature (°C) 18°C

Time in situ measurements taken 10:56 am

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.70 (m) Maximum Pool Depth 15 (cm)

Mean Bankfull Width 1.5 (m) Mean Water Depth 10 (cm)

% Riffle 50 % Pool 25 % Run 25 % Flat

Evidence of eroding banks, Comments on bank stability stable banks - low gradient, low flow
vegetation + organic debris stabilizing banks

Substrate (% cover)

Bedrock ? Cobble ? Sand ? Silt ? Muck ?
Boulder ? Gravel ? Clay ? Marl 100 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg

Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% - early succession

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none - indirect - source headwaters

Migratory Obstructions (seasonal permanent)

low flows

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐

Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

@ UTM represents downstream of 10-16 - confluence of 10-16 & 10-17

@ at confluence of 10-16 & 10-17 water pools due to higher soil ridge - water seeps through ridge to form new channel

Field Notes Authored by Mellah

Field Notes QA/QCed by M Johns



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # 10-17
 Watercourse Name Unnamed
 Photos # 1023 - 1027
 Date July 7/12

Project Name Bow Lake Wind Farm
 Project # 1609 60734
 Field Staff M. Johns, M. Ellah
 Time 10:14

Weather conditions in previous 24 hrs Very light rain for brief periods, mostly hot and clear
 GPS Coordinates (Zone) 16T E 685264 N 5234107 Datum NAD83
 Descriptive Location 320m NW of proposed turbine 12 location

Water Quality

Dissolved Oxygen (mg/L) 5.33 pH 6.24 Conductivity (µS/cm) 16 29
 Water Temperature (°C) 18°C 14.16 Air Temperature (°C) 18
 Time *in situ* measurements taken 10:17

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.20 (m) Maximum Pool Depth 5 (cm)
 Mean Bankfull Width 5.0 (m) Mean Water Depth 1 (cm)
0 % Riffle 10 % Pool 10 % Run 80 % Flat
 Evidence of eroding banks, Comments on bank stability None

Substrate (% cover)

Bedrock _____ Cobble _____ Sand _____ Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl 100 Detritus _____

In-water Cover

No direct cover
 Cover Types Present (circle): Undercut Banks _____ Deep Pool _____ Watercress _____ Aquatic Veg _____
 Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100, Sugar Maple, yellow birch with some white spruce and fir
 Adjacent Land Use Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
None - see
 Migratory Obstructions (seasonal, permanent)
low flow
 Note any fish observations None, No direct habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

seep is about 10m diameter.
Waypoint coordinates above are at a seep at the origin of 10-17
Wide flat "channel" or Sargasso area dominated by hydrophytic
macrophytes including Jewelweed and sedges, but no Aquatic macrophytes

Field Notes Authored by Mike Johns

Field Notes QA/QCed by MEllah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-18 Project Name Bow Lake Wind Farm
 Watercourse Name unnamed Project # 1609 60734
 Photos 1028-1030 Field Staff MEllah, MJohns
 Date July 7/12 Time 12:45 am
 Weather conditions in previous 24 hrs mix sun & cloud, light rain last night
 GPS Coordinates (Zone) 16T E 685279 N 5233952 Datum NAD83
 Descriptive Location 250m NW of proposed turbine 12 location u/s 10-18
10-18 d/s 0685141, 5234075

Water Quality

Dissolved Oxygen (mg/L) 8.26 pH 6.46 Conductivity (µS/cm) 26
 Water Temperature (°C) 14.64 Air Temperature (°C) 18
 Time in situ measurements taken 10:45 am

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.30 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 0.60 (m) Mean Water Depth 5 (cm)
50 % Riffle 30 % Pool 20 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability stable banks - supported by vegetation & substrate

Substrate (% cover)

Bedrock 20 Cobble 10 Sand 0 Silt 0 Muck 0
3 Boulder 60 Gravel 0 Clay 0 Marl 7 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% - early successional dominant with sugar maple & yellow birch
 Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None - headwaters

Migratory Obstructions (seasonal, permanent)

high elevations, steep slopes

Note any fish observations None - No direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

Swainson's Thrush
East flycatcher, Black throated Green Warbler, ovenbird

Field Notes Authored by MEllah

Field Notes QA/QCed by MJohns



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-19

Watercourse Name Unnamed

Photos 1031-1035

Date July 7/12

Weather conditions in previous 24 hrs ~1mm rain, light w. winds, mostly clear and hot

GPS Coordinates (Zone) 16T E 685271 N 5233 431 Datum NAD83

Descriptive Location ~280m west of proposed turbine 11 location

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff Mike Johns, Mitch Ellah

Time 11:40

Water Quality

Dissolved Oxygen (mg/L) 6.65

pH 6.20 Conductivity (µS/cm) 23

Water Temperature (°C) 14.81

Air Temperature (°C) ~20°C

Time in situ measurements taken 11:43

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.4 (m)

Maximum Pool Depth 20 (cm)

Mean Bankfull Width 1.1 (m)

Mean Water Depth 4 (cm)

10 % Riffle 30 % Pool 30 % Run 30 % Flat

Evidence of eroding banks, Comments on bank stability undercuts in some areas but generally stable due to boulders and root mass

Substrate (% cover)

Bedrock	<u>15</u>	Cobble	<u>30</u>	Sand		Silt		Muck
<u>30</u> Boulder		Gravel	<u>25</u>	Clay		Marl	<u>10</u>	Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% Mature deciduous (sugar maple) (yellow birch)

Adjacent Land Use

Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None

Migratory Obstructions (seasonal, permanent)

High gradient, limited flow

Note any fish observations None - no direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Fairly high gradient stream through middle of wide valley
feature
seep at its end.

Field Notes Authored by Mike Johns

Field Notes QA/QCed by M. Ellah



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # 10-20

Watercourse Name unnamed

Photos 1036-1039

Date July 7/12

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff MEllah, M Johns

Time 12:10

Weather conditions in previous 24 hrs Sunny, cloudy mix, light rain last night

GPS Coordinates (Zone) 16T E 685043 N 5233484 Datum NAD83

Descriptive Location 235m N of turbine 10 - survey location - UTM is u/s at source

Water Quality

Dissolved Oxygen (mg/L) 5.50 pH 6.13 Conductivity (µS/cm) 16

Water Temperature (°C) 16.50 Air Temperature (°C) 19

Time in situ measurements taken 12:15

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.40 (m) Maximum Pool Depth 10 (cm)

Mean Bankfull Width 1.2 (m) Mean Water Depth 5 (cm)

10 % Riffle 10 % Pool 80 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability stable banks due to undisturbed vegetation & substrate along bank.

Substrate (% cover)

Bedrock	<u>50</u>	Cobble	<u>10</u>	Sand		Silt		Muck
Boulder	<u>10</u>	Gravel		Clay		Marl	<u>30</u>	Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg

Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% - early successional dominant sugar maple

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none - source water for larger water features at lower elevations

Migratory Obstructions (seasonal, permanent)

high gradient, steep slopes

Note any fish observations

none - no direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐

Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

stonefly's, Black Throated Green Warbler

Field Notes Authored by MEllah

Field Notes QA/QCed by m. Johns



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-8 Project Name Bow Lake Wind Farm
 Watercourse Name unnamed Project # 1609 60734
 Photos 0953-0955 Field Staff Mellah, M Johns
 Date July 6/12 Time 10:30 am
 Weather conditions in previous 24 hrs sunny, hot - 0 precipitation, light winds
 GPS Coordinates (Zone) 16T E 684826 N 5233972 Datum NAD83
 Descriptive Location beaver pond SE of proposed access rd into turbine 1.

Water Quality

Dissolved Oxygen (mg/L) 7.25 pH 6.32 Conductivity (µS/cm) 14
 Water Temperature (°C) 25.20 Air Temperature (°C) 20°C
 Time *in situ* measurements taken 10:15 am

Watercourse Dimensions & Morphology

Mean Watercourse Width pond (m) Maximum Pool Depth (cm)
 Mean Bankfull Width (m) Mean Water Depth 1.0 (cm)(m)
 % Riffle % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability

Substrate (% cover)

Bedrock Cobble Sand Silt Muck
 Boulder Gravel Clay Marl 100 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
0% shaded, surrounding forest mixed white pine, sugar maple, white spruce
 Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
water depth over winter essential to survival of cyprinids
 Migratory Obstructions (seasonal, permanent)
beaver dam
 Note any fish observations cyprinids observed - see fish collection report

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc. ruby throated hummingbirds
- dragonflies
- shallow beaver pond - estimated 2.0m

Field Notes Authored by Mellah

Field Notes QA/QCed by Re Johns

Station Number 10-8Pass No. (if applicable)

Date (yyyymmdd): July 6 / 12

UTM coordinates 684826 easting 5233972 northing zone 16T
GPS waypoint 10-8

Fishing Method (circle one): minnow traps x 5 Backpack Boat
 Sampling Method (circle one): even habitat 7 transect spot

Effort (Electrofishing Seconds): _____ Number of Netters: _____ Number of Anodes: _____

Settings

Frequency (Hz) Voltage (volts) Current (Amps) Power (Watts)

Station Information

Length of Stream Surveyed (m) 100

Station Characteristics: Width (m): Range beaver pond Average:
 Depth (m): Range 0.5 - 2.5 Average: 1.5

Water Clarity/Colour: tea colour

Temperature (°C) 25.2

pH 6.32

Water Velocity if Measured (m/s):

Conductivity (uS/cm)

Dissolved Oxygen (mg/L)

trap set
Time 10:15 am
trap
lift time 2:15 pm

Catch Data

[illegible]

Fish Measurements on Separate Sheet? Y/N

Field Staff: MELICH
M Johns

Notes By: Mitch Ellah
(Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-12 Project Name Bow Lake Wind Farm
 Watercourse Name unnamed Project # 1609 60734
 Photos 0972-0974 Field Staff MEllah, M Johns
 Date July 6/12 Time 13:14
 Weather conditions in previous 24 hrs sunny, hot + humid, no precipitation, light wind
 GPS Coordinates (Zone) 16T E 684590 N 5233463 Datum NAD83
 Descriptive Location 10-12 US E 684537, N 5233605 DS of 10-12 - GPS label
South east of turbine 1 - close to proposed access rd to S of turbine 1 as 10-9 DS

Water Quality

Dissolved Oxygen (mg/L) 5.62 pH 5.85 Conductivity (µS/cm) 23
 Water Temperature (°C) 16.60 Air Temperature (°C) 24°C
 Time in situ measurements taken 13:20

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.30 (m) Maximum Pool Depth 8 (cm)
 Mean Bankfull Width 1.0 (m) Mean Water Depth 4 (cm)
 % Riffle 70 % Pool 30 % Run 30 % Flat

Evidence of eroding banks, Comments on bank stability

stable banks - substrate & vegetation providing bank stabilization

Substrate (% cover)

Bedrock 80 Cobble 10 Sand 5 Silt 5 Muck 5
 Boulder 5 Gravel 5 Clay 5 Marl 5 Detritus 5

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% - sugar maple, white birch

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none - indirect by providing headwaters

Migratory Obstructions (seasonal, permanent)

high elevation, steep slopes

Note any fish observations none

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by MEllah

Field Notes QA/QCed by MF



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-11

Watercourse Name unnamed

Photos # 0964-0966

Date July 6/12

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff M. Johns, M. Ellah

Time 12:30

Weather conditions in previous 24 hrs clear, hot, no precipitation, light westerly winds

GPS Coordinates (Zone) 16T E 684 350 N 5 233 554 Datum NAD83

Descriptive Location ~130m South of Turbine #1 (proposed location), east tributary to watercourse 10-9

Water Quality

Dissolved Oxygen (mg/L) 6.78 pH 6.08 Conductivity (µS/cm) 22

Water Temperature (°C) 16.2 Air Temperature (°C) 24

Time in situ measurements taken 11:58

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.6 (m) Maximum Pool Depth 10 (cm)

Mean Bankfull Width 1.0 (m) Mean Water Depth 2 (cm)

30 % Riffle 30 % Pool 30 % Run 10 % Flat

Evidence of eroding banks, Comments on bank stability Some undercuts, but banks generally stable due to root mass

Substrate (% cover)

Bedrock 20 Cobble 20 Sand Silt Muck
Boulder 30 Gravel Clay Marl 10 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100%, Early Mature Deciduous

Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None

Migratory Obstructions (seasonal, permanent)

steep gradient

Note any fish observations None - no direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile

Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc. originates from wetland area at coordinates above.

Field Notes Authored by Mike Johns

Field Notes QA/QCed by M. Ellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-9 Project Name Bow Lake Wind Farm
 Watercourse Name unnamed Project # 1609 60734
 Photos 0956-0960 Field Staff MEllah, M Johns
 Date July 6/12 Time 11:40
 Weather conditions in previous 24 hrs sunny, hot + humid, no precipitation, BW 1
 GPS Coordinates (Zone) 16T E 0684453 N 5233481 Datum NAD83
 Descriptive Location 200m south of turbine 1, near proposed access road.

Water Quality

Dissolved Oxygen (mg/L) 7.69 pH 6.39 Conductivity (µS/cm) 20
 Water Temperature (°C) 16.93 Air Temperature (°C) 24°C
 Time *in situ* measurements taken 11:50 PM

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.0 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 1.2 (m) Mean Water Depth 10 (cm)
30 % Riffle 40 % Pool 30 % Run % Flat
 Evidence of eroding banks, Comments on bank stability some bank erosion - banks mostly stable - organic debris, vegetation & substrate stabilizing banks

Substrate (% cover)

Bedrock	<u>20</u>	Cobble	<u>15</u>	Sand	<u> </u>	Silt	<u> </u>	Muck	<u> </u>
Boulder	<u>50</u>	Gravel	<u> </u>	Clay	<u> </u>	Marl	<u>10</u>	Detritus	<u> </u>

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
90% - white birch, sugar maple, mature / early succession
 Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
indirect fish habitat - water source for beaver ponds
 Migratory Obstructions (seasonal, permanent)
high gradients
 Note any fish observations none - no direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

least flycatcher
chipmunk, red backed salamander
10-9 DS (down stream) UTM: 684590, 5233463

Field Notes Authored by MEllah

Field Notes QA/QCed by M Johns



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-10
 Watercourse Name Unnamed
 Photos 0961, 0962, 0963
 Date July 6/12

Project Name Bow Lake Wind Farm
 Project # 1609 60734
 Field Staff M. Johns, M. Ellah
 Time 12:07

Weather conditions in previous 24 hrs clear, hot, no precipitation, light W. winds
 GPS Coordinates (Zone) 16T E 684 343 N 5233 466 Datum NAD83
 Descriptive Location ~200m south of Turbine #1, upstream west branch of watercourse flowing into 10-9

Water Quality

Dissolved Oxygen (mg/L) 6.83 pH 6.04 Conductivity (µS/cm) 16
 Water Temperature (°C) 16.30 Air Temperature (°C) 24°C
 Time in situ measurements taken 11:55

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.8 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 1.2 (m) Mean Water Depth 2 (cm)
30 % Riffle 20 % Pool 30 % Run 20 % Flat
 Evidence of eroding banks, Comments on bank stability under cut banks, but typically stable due to root structure

Substrate (% cover)

10 Bedrock 20 Cobble 30 Sand 10 Silt 10 Muck
10 Boulder 30 Gravel 10 Clay 10 Marl 10 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% shaded, Mature Deciduous
 Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
None

Migratory Obstructions (seasonal, permanent)
High Gradient

Note any fish observations None - no direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Black Throated Green Warblers, suffed grouse, Two sops combine to form watercourse origin, one at coordinates above, the second at UTM 16T 684 393E, S 233 443 N (NAD 83) and saved on GPS2 as "10-10A".

Field Notes Authored by Mike Johns

Field Notes QA/QCed by M. Ellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-6

Watercourse Name unnamed

Photos 9375-9377

Date July 5/12

Weather conditions in previous 24 hrs Sunny, hot & humid

GPS Coordinates (Zone) 16T E 684482

Descriptive Location north east of turbine 3 - close to 10-4 + 10-5

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff Mellah N Burnett

Time 17:10

Datum NAD83

005
GPS1

Water Quality

Dissolved Oxygen (mg/L) 6.54

pH 6.80

Conductivity (µS/cm) 23

Water Temperature (°C) 16.29

Air Temperature (°C) 27°C

Time *in situ* measurements taken 17:10

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.40 (m)

Maximum Pool Depth 10 (cm)

Mean Bankfull Width 1.0 (m)

Mean Water Depth 5 (cm)

0 % Riffle

50 % Pool

50 % Run

0 % Flat

Evidence of eroding banks, Comments on bank stability

some bank erosion, vegetation & earth stabilizing banks

Substrate (% cover)

10

Bedrock

30

Cobble

Sand

Silt

5

Muck

5

Boulder

30

Gravel

Clay

Marl

20

Detritus

In-water Cover

Cover Types Present (circle):

Undercut Banks

Deep Pool

Watercress

Aquatic Veg

Overhanging Vegetation

Woody Debris

Boulder

Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

60% sugar maple, white birch - early succession

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none, indirect habitat - water source

Migratory Obstructions (seasonal, permanent)

steep slopes

Note any fish observations

none - not direct fish habitat

Waterbody Notes

Natural Watercourse ☒

Trapezoidal Channel

Grassed Swale

Buried Tile

Surficial Drainage (i.e. furrows)

Dugout Pond

Dominated by Aquatic Veg

Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by Mellah

Field Notes QA/QCed by MF



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-5 Project Name Bow Lake Wind Farm
 Watercourse Name unnamed Project # 1609 60734
 Photos 9367-9371 Field Staff MEllah, M Johns
 Date July 5/12 Time 15:20
 Weather conditions in previous 24 hrs sunny, hot, dry
 GPS Coordinates (Zone) 16T E 684629 N 5233143 Datum NAD83
 Descriptive Location 200m NE of turbine 3 UTM: survey location, see other notes for further vt

Water Quality

Dissolved Oxygen (mg/L) 7.21 pH 6.69 Conductivity (µS/cm) 29
 Water Temperature (°C) 16.34 Air Temperature (°C) 28°C
 Time *in situ* measurements taken 15:30

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.40 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 1.0 (m) Mean Water Depth 5 (cm)
90 % Riffle 10 % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability
minimal erosion, stable banks - veg & cobble supported

Substrate (% cover)

Bedrock	<u>60</u>	Cobble	<u></u>	Sand	<u></u>	Silt	<u></u>	Muck	<u></u>
Boulder	<u>30</u>	Gravel	<u></u>	Clay	<u></u>	Marl	<u>7</u>	Detritus	<u></u>

In-water Cover

Cover Types Present (circle): none Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
90%, sugar maple, yellow birch
 Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
indirect fish habitat
 Migratory Obstructions (seasonal, permanent)
steep slopes
 Note any fish observations none

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

GPS 1 W4 side 10-5 sidebranch 2 utm: 0684518, 5233140 headwaters of 10-5 sidebranch GPS 1 WPT 3
 0684604, 5233149

Other Habitat Notes, Incidental Wildlife Observations, etc.

utm origin of channel: left channel (u/s) 16T 0684637 5233046 GPS 1 WPT 3
 right channel (u/s) 16T 0684619 5233056 GPS 1 WPT 3
 WPT 8 (GPS) seep - 684631, 5233173 #10-seep - 684622, 5233242 - GPS 2
 WPT 9 (GPS) confluence of multiple water features - utm: 684623, 5233206
 Field Notes Authored by Mitchell Field Notes QA/QCed by ME



See July fieldsheets (10-7)

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

also 10-7

Station # T3 pref WA108

Watercourse Name _____

Photos 3212 → 3215Date May 1 2012

Weather conditions in previous 24 hrs _____

GPS Coordinates (Zone) 16T E 684474N 5233042 Datum

Descriptive Location _____

Project Name Bow Lake Phase 1

Project # _____

Field Staff K. Easterday + M. PoretskyTime 10:30

Water Quality

Dissolved Oxygen (mg/L) _____

pH _____ Conductivity (µS/cm) _____

Water Temperature (°C) _____

Air Temperature (°C) _____

Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.3 (m)Maximum Pool Depth 5 (cm)Mean Bankfull Width 0.5 (m)Mean Water Depth 2 (cm)% Riffle _____ % Pool 50 % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability _____

50% Falls

Substrate (% cover)

Bedrock	Cobble	Sand	Silt	Muck
<u>60</u>	<u>20</u>		<u>10</u>	
Boulder	Gravel	Clay	Marl	Detritus
			<u>20</u>	

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg

Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

40%

Adjacent Land Use

crown land forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

no

Migratory Obstructions (seasonal, permanent)

seasonalNote any fish observations no

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____

Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Boulder and channel on slope WBlow lying area ups not a WBchannelled flow d/s through flat area WB

Field Notes Authored by _____

Field Notes QA/QCed by _____



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

see T3-Pre-W108

Station # 10-7

Watercourse Name unnamed

Photos 9378-9380

Date July 5/12

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff MEllch, N Burnett

Time 17:20

Weather conditions in previous 24 hrs Sunny, hot + humid, no precip

GPS Coordinates (Zone) 16T E 0684504 N 5233053 Datum NAD83

Descriptive Location NE of turbine 4, in close proximity to 10-4, 10-5 + 10-6

Water Quality

Dissolved Oxygen (mg/L) 4.14 pH 6.26 Conductivity (µS/cm) 16

Water Temperature (°C) 15.55 Air Temperature (°C) 27°C

Time *in situ* measurements taken 17:20

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.40 (m) Maximum Pool Depth 15 (cm)

Mean Bankfull Width 0.60 (m) Mean Water Depth 50 (cm)

0 % Riffle 60 % Pool 40 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability

no erosion, stable banks

Substrate (% cover)

Bedrock 5 Cobble 20 Sand 5 Muck
Boulder 10 Gravel 60 Clay 60 Marl 60 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg

Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% sugar maple, white birch, early succession

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

indirect habitat - water source

Migratory Obstructions (seasonal, permanent)

steep slopes

Note any fish observations

none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐

Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by MEllch

Field Notes QA/QCed by MF



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-3 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 9360 - 9362 Field Staff Mellah, M Johns
 Date July 5/12 Time 1:40 pm
 Weather conditions in previous 24 hrs sunny, hot
 GPS Coordinates (Zone) 16T E 684420 N 5232815 Datum NAD83
 Descriptive Location ~260m south of turbine 3

Water Quality

Dissolved Oxygen (mg/L) 4.55 pH 6.98 Conductivity (μ S/cm) 19
 Water Temperature ($^{\circ}$ C) 20.40 Air Temperature ($^{\circ}$ C) ~~20.40~~ 28 $^{\circ}$ C
 Time in situ measurements taken 1:45 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.60 (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width 1.5 (m) Mean Water Depth 5 (cm)
 % Riffle 50 % Pool 50 % Run % Flat

Evidence of eroding banks, Comments on bank stability

sections of bank w low erosion - mostly vegetated banks

Substrate (% cover)

Bedrock 5 Cobble 5 Sand 5 Silt 5 Muck
 Boulder Gravel Clay Marl 80 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

90% - ferns, jewelweed, w birch, smapple, w spruce

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none

Migratory Obstructions (seasonal, permanent)

organic debris steep slope, high gradient

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

very

-indirect fish habitat

-not direct fish habitat

Field Notes Authored by Mitchell

Field Notes QA/QCed by MF



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-34 WA-112 Project Name Bow Lake
 Watercourse Name unknown Project # 160960771
 Photos 759 & 760 - from use 08 Field Staff M & INCE
 Date April 4, 2012 Time _____
 Weather conditions in previous 24 hrs clear cool
 GPS Coordinates (Zone) 16T E N Datum NAD83
 Descriptive Location 85 m northeast of Turbine 2 original position

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width 2.0 (m) Mean Water Depth 15 (cm)
50 % Riffle 20 % Pool 30 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability exposed roots - slight undercutting

Substrate (% cover)

Bedrock	<u>10</u>	Cobble	<u>20</u>	Sand	<u>10</u>	Silt		Muck
<u>20</u> Boulder	<u>10</u>	Gravel		Clay		Marl	<u>30</u>	Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Mature maple & yellow birch 80% cover
 Adjacent Land Use Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____

Migratory Obstructions (seasonal, permanent)

steep grade, dense willow, dry at times
 Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by _____ Field Notes QA/QCed by _____



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-33 - 2Prf-4 Project Name Bow Lake
 Watercourse Name unmarked Project # 160960771
 Photos 3209, 3211, 3208, 3207, 3210 Field Staff Nash Poiry, Kaitie Eastling
 Date Apr 130, 2012 Time 12:00 pm
 Weather conditions in previous 24 hrs overcast, windy
 GPS Coordinates (Zone) 16T E See below N Datum NAD83
 Descriptive Location 100m southeast of Turbine 2 location (original)

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 10°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.30 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 0.5 (m) Mean Water Depth 10 (cm)
30 % Riffle 20 % Pool 50 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability little evidence of erosion

Substrate (% cover)

Bedrock _____ Cobble 20 Sand 20 Silt _____ Muck _____
20 Boulder 10 Gravel _____ Clay _____ Marl 30 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
80% yellow birch, balsam poplar, maple
 Adjacent Land Use Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____

Migratory Obstructions (seasonal, permanent) _____

Intermittent - dry at times, high gradient.
 Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

GPS Pts - Channel start = upstream end of channel
2Prf 2 = downy stream end of channel

Field Notes Authored by _____

Field Notes QA/QCed by _____



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-20 (isolated seep 2) Project Name Bow Lake Wind
 Watercourse Name un-named Project # 1609 60771
 Photos 9808-9809 Field Staff Mitch Ellah, Joe Keane
 Date 2012/08/28 Time 3:50 pm
 Weather conditions in previous 24 hrs ~22°C, light wind, no precip, foggy
 GPS Coordinates (Zone) 16T E 685571 N 5234604 Datum NAD83
 Descriptive Location ~110 m east of 10-25

Water Quality

N/A - low water levels
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time in situ measurements taken _____

Watercourse Dimensions & Morphology

ISOLATED SEEP - see below for size
 Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width _____ (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble _____ Sand _____ Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% - mixed forest - mature
 Adjacent Land Use
forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
none

Migratory Obstructions (seasonal, permanent)
isolated seep

Note any fish observations
none

Waterbody Notes

✓ seep
 Natural Watercourse _____ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

seep dimensions ~ 10m x 5m

Field Notes Authored by M. Ellah

Field Notes QA/QCed by M.P.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-19 (isolated seep 1) Project Name Bow Lake Wind
 Watercourse Name un-named Project # 1609 60771
 Photos 9805-9807 Field Staff Mitch Ullah, Joe Keene
 Date 2012/08/28 Time 3:40pm
 Weather conditions in previous 24 hrs ~22°C, light wind, no precip, foggy
 GPS Coordinates (Zone) 16t E 685602 N 5234606 Datum NAD83
 Descriptive Location ~130m east of 10-25

Water Quality

Dissolved Oxygen (mg/L) N/A - low water levels pH Conductivity (µS/cm)
 Water Temperature (°C) Air Temperature (°C)
 Time in situ measurements taken

Watercourse Dimensions & Morphology

ISOLATED SEEP - see below for site
 Mean Watercourse Width (m) Maximum Pool Depth (cm)
 Mean Bankfull Width (m) Mean Water Depth (cm)
 % Riffle % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability

Substrate (% cover)

 Bedrock Cobble Sand Silt Muck
 Boulder Gravel Clay Marl Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% - mixed forest - mature
 Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
none
 Migratory Obstructions (seasonal, permanent)
isolated seep
 Note any fish observations
none

Waterbody Notes

✓ seep
 Natural Watercourse Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

seep dimensions → 10m x 10m

Field Notes Authored by maula

Field Notes QA/QCed by m.p.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-17
 Watercourse Name Unnamed WB
 Photos 9810 - 9814
 Date 2012/09/28

Project Name Bow Lake
 Project # 160960771
 Field Staff Joe Keen, McElach
 Time 4:08 pm

Weather conditions in previous 24 hrs Sunny warm, foggy
 GPS Coordinates (Zone) 16T E see bottom N Datum NAD 83
 Descriptive Location DS of confluence with side channel 2 US - @ SW corner of Trastana Station
to upstream reaches south of laydown area to the southeast

Water Quality

Dissolved Oxygen (mg/L) 12.54 pH 6.83 Conductivity (µS/cm) 59
 Water Temperature (°C) 12.48 Air Temperature (°C) 23°C
 Time in situ measurements taken 4:09 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5m (m) Maximum Pool Depth 30 70 (cm)
 Mean Bankfull Width 4 6.0m (m) Mean Water Depth 10 (cm)
50 % Riffle 30 % Pool 20 % Run % Flat
 Evidence of eroding banks, Comments on bank stability undercut banks, deep channel
exposed roots & leaning trees

Substrate (% cover)

Bedrock	<u>30</u>	Cobble	<u>20</u>	Sand	<u>10</u>	Silt		Muck
<u>20</u>	Boulder	<u>20</u>	Gravel		Clay		Marl	Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

80% Mixed forest - mature

Adjacent Land Use

Natural forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Yes - Brook Trout observed

Migratory Obstructions (seasonal, permanent)

no grade - permanent to high-grade in US section

Note any fish observations Brook Trout observed

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Brook Trout observed

DS on confluence channel not out - 685418 E, 5234664 N

7-17

Field Notes Authored by Joe Keen

Field Notes QA/QCed by McElach



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-16 Project Name Bow Lake
 Watercourse Name hatched WB Project # 160960771
 Photos 9801-9804 Field Staff Joe Keel M. Elah
 Date 2012/08/28 Time 3:36pm
 Weather conditions in previous 24 hrs sunny warm - am fog
 GPS Coordinates (Zone) 16T E see below N Datum NAD83
 Descriptive Location west of 7-15 @ SW end of forested area

Water Quality

Dissolved Oxygen (mg/L) 12.18 pH 6.91 Conductivity (µS/cm) 49
 Water Temperature (°C) 7.05°C Air Temperature (°C) 23°C
 Time *in situ* measurements taken 3:39pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.2m (m) Maximum Pool Depth 20cm (cm)
 Mean Bankfull Width 3.0m (m) Mean Water Depth 5cm (cm)
60 % Riffle 30 % Pool 20 % Run % Flat
 Evidence of eroding banks, Comments on bank stability slight undercutting - sub surface flow in places

Substrate (% cover)

Bedrock Cobble 50 Sand 30 Silt Muck
 Boulder Gravel Clay Marl 20 Detritus

Water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

80% mixed forest - mature

Adjacent Land Use

Natural forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

groundwater / coldwater WB

Migratory Obstructions (seasonal, permanent)

grade @ US end - subsurface flow

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

7-16 US GPS = 685750E 5234671N

7-16 DS GPS = Confluence w 7-15 - 685669E 5234731N

Field Notes Authored by Joe Keel

Field Notes QA/QCed by M. Elah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-15
 Watercourse Name unnamed WB
 Photos 9797-9798 9800
 Date 2012/08/28

Project Name Bow Lake
 Project # 160960771
 Field Staff Joe Kane Mikel Ellah
 Time 3:00 pm

Weather conditions in previous 24 hrs Sunny warm - morning fog
 GPS Coordinates (Zone) 16T E See below N Datum NA083
 Descriptive Location west of 7-14 on South high side off trans former station

Water Quality

Dissolved Oxygen (mg/L) 9.97 pH 6.82 Conductivity (µS/cm) 11
 Water Temperature (°C) 14.30 Air Temperature (°C) 23°C
 Time *in situ* measurements taken 3:03 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.3 (m) Maximum Pool Depth 25 (cm)
 Mean Bankfull Width 4.0 (m) Mean Water Depth 10 (cm)
40 % Riffle 30 % Pool 30 % Run % Flat
 Evidence of eroding banks, Comments on bank stability Slight undercutting

Substrate (% cover)

Bedrock Cobble 50 Sand 30 Silt Muck
 Boulder Gravel Clay Marl 20 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
80% mixed forest - mature

Adjacent Land Use

Natural forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

grade - underground sections

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

ds end goes underground
 GPS - US-7-15 - Sep - 685904E - 5234537N 7-15-US-Sep#2 685907E 5234597N
05-7-15 685666E 5234778N
Midland 7-15 685776E 5234692N

Field Notes Authored by Joe Kane

Field Notes QA/QCed by M. Ellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-14 Project Name Bow Lake
 Watercourse Name Unnamed WB Project # 160960771
 Photos 9791-9796 Field Staff Joe Kane Mitch Elch
 Date 2012/08/28 Time 2:30 pm
 Weather conditions in previous 24 hrs warm sunny - fog in am
 GPS Coordinates (Zone) 16T E see below in other notes Datum NAD83
 Descriptive Location West of 7-13 along south edge of Trans former station.

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (uS/cm) Dry
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width dry 0.20 (m) Maximum Pool Depth dry < 10 (cm) *most of channel isolated pools*
 Mean Bankfull Width 4.0 (m) Mean Water Depth dry < 5 (cm) Dry
60 % Riffle 30 % Pool 10 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability slight undercutting around roots

Substrate (% cover)

Bedrock _____ Cobble 50 Sand 30% Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl 20 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____
Ferns

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

80% mixed forest - mature

Adjacent Land Use

Natural Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Dry

Migratory Obstructions (seasonal, permanent)

Dry - Intermittent - high gradient - isolated

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry ☒

Other Habitat Notes, Incidental Wildlife Observations, etc.

7-14-US GPS sep- 685932 E 5234632 N
7-14 mid channel - 685910 E 5234698 N
7-14 DS 685820 E 5234806 N

Field Notes Authored by Joe Kane

Field Notes QA/QCed by Mallah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-13 Project Name Brw Lake
 Watercourse Name unnamed WB Project # 160960771
 Photos 9785 - 9790 Field Staff Joe Kern Mitch Ellah
 Date 2012/08/28 Time 2:00 pm
 Weather conditions in previous 24 hrs warm sunny foggy rain
 GPS Coordinates (Zone) see below - other notes N Datum NAD83
 Descriptive Location west of 7-12 on south side of transformer station

Water Quality

Dissolved Oxygen (mg/L) 12.27 pH 6.74 Conductivity (μ S/cm) 40
 Water Temperature ($^{\circ}$ C) 7.13 Air Temperature ($^{\circ}$ C) 22^{\circ}C
 Time *in situ* measurements taken 2:02 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 1m (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 2.5 (m) Mean Water Depth 5 (cm)
50 % Riffle 30 % Pool 20 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability much of upper end is underground

Substrate (% cover)

Bedrock 0 Cobble 30 Sand 50 Silt 30 Muck 0
 Boulder 0 Gravel 0 Clay 0 Marl 20 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
90% mixed forest

Adjacent Land Use

Natural forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
cold water source

Migratory Obstructions (seasonal, permanent)
steep grade - small amount of flow

Note any fish observations 0

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel 0 Grassed Swale 0 Buried Tile 0
 Surficial Drainage (i.e. furrows) 0 Dugout Pond 0 Dominated by Aquatic Veg 0 Dry 0

Other Habitat Notes, Incidental Wildlife Observations, etc.

spring overflows from side of ridge
2 travels underground down slope with additional underground flow in spots
 GPS US 685899 E - 5234777 N 2 red squirrels
 GPS DS 685847 E - 5234846 N

- wood frog - 7-13 seen - continues to follow - not primary source 685887 E 5234764 N

Field Notes Authored by Joe Kern

Field Notes QA/QCed by M. Ellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-12 Project Name Bow Lake
 Watercourse Name Unroad spring fed WB Project # 160960771
 Photos 9777 Field Staff Joe Kere North End
 Date 2012/08/28 Time 1:27 pm
 Weather conditions in previous 24 hrs sunny & warm, fog am
 GPS Coordinates (Zone) 16T E see below N Datum NAD83
 Descriptive Location West of 7-11 Cape of ridge pointing North

Water Quality

Dissolved Oxygen (mg/L) 12.17 pH 6.81 Conductivity (µS/cm) 15
 Water Temperature (°C) 6.60 °C Air Temperature (°C) 22 °C
 Time in situ measurements taken 1:30 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 m (m) Maximum Pool Depth 0.2 m (cm)
 Mean Bankfull Width 1.5 m (m) Mean Water Depth 0.1 m (cm)
50 % Riffle 30 % Pool 20 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability underground a lot - undercut banks

Substrate (% cover)

Bedrock 0 Cobble 30 Sand 30 Silt 0 Muck 0
 Boulder 0 Gravel 0 Clay 0 Marl 20 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

80% cover - mixed forest

Adjacent Land Use

Natural forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

coldwater spring

Migratory Obstructions (seasonal, permanent)

grade - underground sections

Note any fish observations

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

grows underground a lot - originates from
rocky ridge - visible flow, spring fed - groundwater - cold water stream - Discharges to
spring peepers, green frogs & wood frogs GPS US seep/spring 685987 E - 5234881 N
DS 7-12 685865 E - 5234867 N
DS 7-12 side brack 2685885 E - 5234858 N

Field Notes Authored by Joe Kere

Field Notes QA/QCed by M. Gellish



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-11
 Watercourse Name unnamed
 Photos 9772-9776
 Date 2012/08/28

Project Name Bow Lake
 Project # 8 160960771
 Field Staff Joe Kane M.D. E. Nak
 Time 1:07 pm

Weather conditions in previous 24 hrs sunny warm, fog am
 GPS Coordinates (Zone) 16T E see notes below N Datum NAD83
 Descriptive Location west of 7-10, flows into 7-10/7-9

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) Dry
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width Dry (m) Maximum Pool Depth Dry (cm)
 Mean Bankfull Width 2.5m (m) Mean Water Depth Dry (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability slight undercutting

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 65 Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl 25 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____
Ferns

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
90% mixed forest

Adjacent Land Use

Natural forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Dry

Migratory Obstructions (seasonal, permanent)
Dry - Undercutting, high gradient

Note any fish observations _____

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry ☒

Other Habitat Notes, Incidental Wildlife Observations, etc.

7-11 us seep 686090 E, 5234769 N
 7-10/7-11 7-10 collars 686090 E, 5234843 N

Field Notes Authored by Joe Kane

Field Notes QA/QCed by McElhiney



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-10 Project Name Bow Lake
 Watercourse Name unnamed waterbody Project # 160960771
 Photos 9768 → 9771 Field Staff Joe Keene Mitch Ellah
 Date 2012/08/28 Time 12:47 pm
 Weather conditions in previous 24 hrs Sunny morning Foggy AM
 GPS Coordinates (Zone) 16T E See below N Datum WAD83
 Descriptive Location West of 7-9 @ SE of transformer station

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____ Dry
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width Dry (m) Maximum Pool Depth Dry (cm)
 Mean Bankfull Width 2.5m (m) Mean Water Depth Dry (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability slight undercutting

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 70 Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl 30 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____
Ferns & Touch-me-not

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

80% cover - mature forest

Adjacent Land Use

Natural Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

Dry - Intermittent

Note any fish observations Dry

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry ☒

Other Habitat Notes, Incidental Wildlife Observations, etc.

US 7-10 & 7-11 - 686-146 E 5234746 N

OS Confluence 7-10 & 7-9 - 686090 E, 5234843 N

Seep-2-7-10 - 686140 E, 5234754 N

Field Notes Authored by Joe Keene

Field Notes QA/QCed by M. Ellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-9 Project Name Bow Lake
 Watercourse Name Unmanned Project # 160960771
 Photos 7963 4766 Field Staff Joe Koe, Michelle
 Date 2012/08/28 Time 12:17 pm
 Weather conditions in previous 24 hrs warm & sunny, foggy am
 GPS Coordinates (Zone) 16T E See below N Datum NAD 83
 Descriptive Location South of Marshel River, South of Transline station - SE end

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) Dry
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) _____
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width Dry (m) Maximum Pool Depth Dry (cm)
 Mean Bankfull Width 2.5m (m) Mean Water Depth Dry (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability Slight undercutting

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 60 Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl 40 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
> 80% mixed forest canopy
 Adjacent Land Use
Natural Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____

Migratory Obstructions (seasonal, permanent) _____

Dry - Intermittent
 Note any fish observations _____

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry ☒

Other Habitat Notes, Incidental Wildlife Observations, etc.

Lots of woody debris, better logs, relatively steep grade
OS GPS = 686 039 E, 5234917 N
US GPS = 686 202 E, 5234759 N

Field Notes Authored by Joe Koe

Field Notes QA/QCed by Michelle



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-18 Project Name Bow Lake
 Watercourse Name Unmarked WB Project # 160960771
 Photos 9816-9819 Field Staff Joe Kene Mitch Ellah
 Date 2012/08/28 Time 5:45 pm
 Weather conditions in previous 24 hrs Warm & Sunny - fog in am
 GPS Coordinates (Zone) 16 T E see below N Datum NAD83
 Descriptive Location east of 7-9 along Access Road, East of Transformer Area

Water Quality

not enough H₂O to get water quality
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 23.0°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.20 (m) Maximum Pool Depth <10 (cm)
 Mean Bankfull Width 1.5 (m) Mean Water Depth <5cm (cm)
80 % Riffle 20 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability undercutting

Substrate (% cover)

Bedrock _____ Cobble 50 Sand 30 Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl 20 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____
Ferns

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

80% mature mixed forest

Adjacent Land Use

Forest & access road.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

steep g. road

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____
not much water

Other Habitat Notes, Incidental Wildlife Observations, etc.

steep grade, very R top, diffuse @ bottom - very little flow - underground flow

7-18 US say 686151 E 5234900 N
 7-18 DS 686125 E 5234964 N

Field Notes Authored by Joe Kene

Field Notes QA/QCed by MEllah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

E-Fishable

Stantec

Station # 7-5
Watercourse Name unknown
Photos 491-493
Date July 8/12

Project Name Bow Lake Wind Farm
Project # 1609 60734
Field Staff NB, MF
Time 16:10

Weather conditions in previous 24 hrs no precip. Hot 28°C, muggy
GPS Coordinates (Zone) 16T E 0686748 N 5234691 Datum NAD83
Descriptive Location ~620 m southeast along ATV trail / proposed access rd from Mackay Rd

Water Quality

Dissolved Oxygen (mg/L) 10.26 pH 6.27 Conductivity (µS/cm) 55
Water Temperature (°C) 14.72 Air Temperature (°C) 27°C
Time in situ measurements taken 16:15

Watercourse Dimensions & Morphology

Mean Watercourse Width 70 (m) Maximum Pool Depth 30 (cm)
Mean Bankfull Width 2.0 (m) Mean Water Depth 10 (cm)
20 % Riffle 20 % Pool 60 % Run % Flat
Evidence of eroding banks, Comments on bank stability moderate undercut banks.

Substrate (% cover)

Bedrock 20 Cobble 35 Sand Silt Muck
Boulder 35 Gravel Clay Marl 5 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% sugar maple, fern sp, yellow birch
Adjacent Land Use
ATV trail / proposed access rd

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, nursery, forage
Migratory Obstructions (seasonal, permanent)
none
Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

Direct, Permanent

Field Notes Authored by MF

Field Notes QA/QCed by W. Ellah



(Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non fishable
Dry

Stantec

Station # 7-8

Watercourse Name unknown

Photos 555-557

Date July 11/12

Weather conditions in previous 24 hrs no precip 27°C

GPS Coordinates (Zone) 16T E

Descriptive Location Connected to 7-3 downstream ~ 300 m north

of stream (W8) @ south end

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff NB, MF

Time 11:55

Datum NAD83

Water Quality

Dissolved Oxygen (mg/L) _____

Water Temperature (°C) _____

Time in situ measurements taken _____

pH _____

Conductivity (µS/cm) _____

Air Temperature (°C) _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m)

Mean Bankfull Width 0.8 (m)

Maximum Pool Depth _____ (cm)

Mean Water Depth _____ (cm)

% Riffle _____

% Pool _____

% Run _____

% Flat _____

Evidence of eroding banks, Comments on bank stability minor undercut

Substrate (% cover)

Bedrock _____

Boulder _____

Cobble 30

Gravel _____

Sand 20

Clay _____

Silt 10

Marl 40

Muck _____

Detritus _____

In-water Cover

Cover Types Present (circle):

Undercut Banks

Deep Pool _____

Watercress _____

Aquatic Veg _____

Overhanging Vegetation

Woody Debris

Boulder _____

Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% fern sp, sugar maple

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none

Migratory Obstructions (seasonal, permanent)

dry

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒

Trapezoidal Channel _____

Grassed Swale _____

Buried Tile _____

Surficial Drainage (i.e. furrows) _____

Dugout Pond _____

Dominated by Aquatic Veg _____

Dry ☒

Other Habitat Notes, Incidental Wildlife Observations, etc.

None

7-8 as = 0686821, 5234086

7-8 ds = 0686810, 5234074

Field Notes Authored by MF

Field Notes QA/QCed by NB



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-1 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 401-405 Field Staff NB, MF
 Date July 06/12 Time 10:10
 Weather conditions in previous 24 hrs 29°C mvg, hot
 GPS Coordinates (Zone) 16T E 06873047 N 5233928 Datum NAD83
 Descriptive Location ~800m NE of T-19 on proposed access rd / ATV trail

Water Quality

Dissolved Oxygen (mg/L) 6.27 pH 6.73 Conductivity (µS/cm) 18
 Water Temperature (°C) 16.38 Air Temperature (°C) 27°C
 Time *in situ* measurements taken 16:15

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m) Maximum Pool Depth 10-15 (cm) - Pool
 Mean Bankfull Width 0.75 (m) Mean Water Depth N/A (cm)
 % Riffle 100 % Pool 0 % Run 0 % Flat STAN
 Evidence of eroding banks, Comments on bank stability WATER

Substrate (% cover)

Bedrock 40 Cobble 0 Sand 0 Silt 0 Muck 0
 Boulder 10 Gravel 0 Clay 0 Marl 0 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100%
 Adjacent Land Use forest road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
none
 Migratory Obstructions (seasonal, permanent)
dry
 Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

GPS 1 - WP 15
Intermittent, indirect

Field Notes Authored by MF Field Notes QA/QCed by Mellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 7-1
 Watercourse Name unknown
 Photos 401-405 9870-9876
 Date July 06/12
 Weather conditions in previous 24 hrs 20°C muggy, hot
 GPS Coordinates (Zone) 16T E 0687314 N 5233928 Datum NAD83
 Descriptive Location ~800m NE of T-19 on proposed access rd / ATV trail

Project Name Bow Lake Wind Farm
 Project # 1609 60734
 Field Staff NB, MF, JK, NE 2012/08/29
 Time 16:10

Water Quality

Dissolved Oxygen (mg/L) 6.27 pH 6.73 Conductivity (µS/cm) 18
 Water Temperature (°C) 16.38 Air Temperature (°C) 27°C
 Time in situ measurements taken 16:15

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m) Maximum Pool Depth 10-15 (cm) - Pool
 Mean Bankfull Width 0.75 (m) Mean Water Depth N/A (cm)
 % Riffle 100 % Pool 0 % Run 0 % Flat STAN
 Evidence of eroding banks, Comments on bank stability WAT

Substrate (% cover)

Bedrock 40 Cobble 0 Sand 0 Silt 0 Muck 0
 Boulder 10 Gravel 0 Clay 0 Marl 10 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100%

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none

Migratory Obstructions (seasonal, permanent)

dry

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel 0 Grassed Swale 0 Buried Tile 0
 Surficial Drainage (i.e. furrows) 0 Dugout Pond 0 Dominated by Aquatic Veg 0 Dry 0

Other Habitat Notes, Incidental Wildlife Observations, etc.

GPS 1 - WP 15 - GPS-US @ access road 687314 E 5233928 N
 Intermittent indirect - GPS @ 7-1 channel 687238 E 5233915 N
 7-1 channel @ project boundary 687191 E 5233810 N 7-1 DS-loss definition 687129 E 5233849 N
 Channel loses definition in a wetland form method.

Field Notes Authored by MF

Field Notes QA/QCed by Mellah



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

LAKE

Station # 1-1 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Lake Project # 1609 60734
 Photos 381-383 Field Staff NB, MF
 Date July 06/12 Time 12:10
 Weather conditions in previous 24 hrs ~28°C, clear, muggy
 GPS Coordinates (Zone) 16T E 0686639 N 5033216 Datum NAD83
 Descriptive Location ~360m west of T-13 @ most southern tip of lake (was)

Water Quality

Dissolved Oxygen (mg/L) 9.03 pH 8.78 Conductivity (µS/cm) 19
 Water Temperature (°C) 26.33 Air Temperature (°C) 27°C
 Time in situ measurements taken 12:25

Watercourse Dimensions & Morphology

Mean Watercourse Width ~250 (m) Maximum Pool Depth N/A (cm)
 Mean Bankfull Width N/A (m) Mean Water Depth N/A (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability None

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 20 Silt 10 Muck Detritus
15% Boulder _____ Gravel _____ Clay _____ Marl 70

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder _____ Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

80% 15%

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn, forage, nursery

Migratory Obstructions (seasonal, permanent)

none

Note any fish observations

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

3x MT set @ 12:15 (10-30cm) on July 6, 2012

WP10, GPS 1

Fished

Field Notes Authored by MF

Field Notes QA/QCed by M. Gellah

UTM coordinates 0686639 easting 5233216 northing zone 16T

Power (Watts)

Average:

9.03

Comments (i.e. age, disease, etc):

Note: Eastern Newt captured in trap.

(Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Not fishable

Stantec

1-5-1s Top = 16T 0686894 5233304
1-5-1s Bot = 16T 0686872 5233342

Station # 1-5 Project Name Bow Lake Wind Farm
Watercourse Name unknown Project # 1609 60734
Photos 420-422 Field Staff NB, MF
Date July 07/12 Time 10:30
Weather conditions in previous 24 hrs 2-4 mm rain overnight
GPS Coordinates (Zone) 16T E L N Datum NAD83
Descriptive Location ~ 600m east of T-13 + ~ 200m northwest of str 1-4

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) _____
Time in situ measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.40 (m) Maximum Pool Depth 2 (cm) STAND. WATER
Mean Bankfull Width 0.65 (m) Mean Water Depth _____ (cm)
% Riffle _____ % Pool 100 % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability minor undercut banks

Substrate (% cover)

Bedrock 30 Cobble 10 Sand _____ Silt _____ Muck _____
40 Boulder _____ Gravel _____ Clay _____ Marl 20 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

fern sp, sugar maple, jewel weed
Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none

Migratory Obstructions (seasonal, permanent)

steep gradient, dry

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

~ 80 m u/s from main channel, 1-5 becomes very steep: REA end
No fishing: dry, stand. water

Field Notes Authored by MF

Field Notes QA/QCed by Mellal



Stantec

1-12 d/s = 0687052 5233739
1-12 u/s = 0687127 5233702

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Too shallow
to fish

Station # 1-12 Project Name Bow Lake Wind Farm
Watercourse Name unknown Project # 1609 60734
Photos 449-450 Field Staff NB, MF
Date July 7 / 12 Time 15:35
Weather conditions in previous 24 hrs 2-4 mm rain overnight
GPS Coordinates (Zone) 16T E N Datum NAD83
Descriptive Location ~ 150 m d/s of beaver pond + ~ 400 m northwest of T-18

Water Quality

Dissolved Oxygen (mg/L) pH Conductivity (µS/cm)
Water Temperature (°C) Air Temperature (°C)
Time in situ measurements taken

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.6 (m) Maximum Pool Depth 4 (cm)
Mean Bankfull Width 1.0 (m) Mean Water Depth 2 (cm)
% Riffle % Pool % Run % Flat
Evidence of eroding banks, Comments on bank stability minor undercut banks

Substrate (% cover)

Bedrock 40 Cobble Sand Silt Muck
Boulder 40 Gravel Clay Marl 20 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% sugar maple, fern sp.
Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
possible spawn
Migratory Obstructions (seasonal, permanent)
steep gradient, low water levels
Note any fish observations None

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

Ovenbird 1-12 us = 0687127, 5233702
1-12 ds = 0687052, 5233739

Field Notes Authored by MP

Field Notes QA/QCed by mgellah



1-14 d/s = 0686962 5233710
 1-14 d/s = 0687006 5233752

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 1-14 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 454-459 Field Staff NB, MF
 Date July 7 / 12 Time 15:50
 Weather conditions in previous 24 hrs 2-4 mm rain
 GPS Coordinates (Zone) 16T E N Datum NAD83
 Descriptive Location ~ 70m d/s from 1-12 + 1-13 confluence

Water Quality

Dissolved Oxygen (mg/L) 8.72 pH 6.92 Conductivity (µS/cm) 14
 Water Temperature (°C) 18.72 Air Temperature (°C) 28.0
 Time in situ measurements taken 16:00

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.75 (m) Maximum Pool Depth 30.0 (cm)
 Mean Bankfull Width 1.0 (m) Mean Water Depth 20.0 (cm)
20 % Riffle 40 % Pool 20 % Run 20 % Flat
 Evidence of eroding banks, Comments on bank stability minor undercut banks

Substrate (% cover)

Bedrock 40 Cobble 10 Sand Silt Muck
30 Boulder Gravel Clay Marl 20 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
80% sugar maple, yellow birch
 Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, forage, nursery
 Migratory Obstructions (seasonal, permanent)
sparsely log jams
 Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

1-14 d/s = 0686962, 5233710
1-14 d/s = 0687006, 5233752

Field Notes Authored by MF

Field Notes QA/QCed by Mgelan



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Don Fishwick

Stantec

Station # 1-10 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 442-444 Field Staff NB, MF
 Date July 7/12 Time 14:35
 Weather conditions in previous 24 hrs 2-4mm overnight
 GPS Coordinates (Zone) 16T E N Datum NAD83
 Descriptive Location ~225m west of T-18. Trib to Lake (w21)

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time in situ measurements taken _____

too little water to sample.

DRY

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m) Maximum Pool Depth N/A (cm)
 Mean Bankfull Width 0.6 (m) Mean Water Depth N/A (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability none

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 10 Silt 10 Muck _____
20 Boulder _____ Gravel 60 Clay _____ Marl _____ Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

20% immature sugar maple, eastern white cedar

Adjacent Land Use

Forest, lake

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

possible spawn + nursery

Migratory Obstructions (seasonal, permanent)

dry / low water

Note any fish observations

none - dry

Waterbody Notes

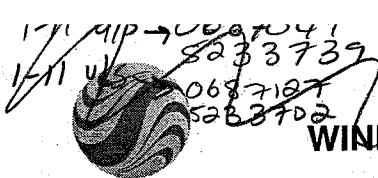
Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

1-10 u/s = 0687138, 5233768
1-10 d/s = 0687130, 5233736

Field Notes Authored by MF

Field Notes QA/QCed by mgelch



Substrate + disturbance due to beaver dam @ outlet

WIND-FARM WATERBODY RAPID ASSESSMENT FORM

LAKE
Traps Set

Stantec

Station # 1-11
Watercourse Name unknown
Photos 445 + 446
Date July 7/12

Project Name Bow Lake Wind Farm
Project # 1609 60734
Field Staff NB, MF
Time 14:50

Weather conditions in previous 24 hrs 2-4mm overnight
GPS Coordinates (Zone) 16T E 0687127 N 5233702 Datum NAD83
Descriptive Location ~300m west of T-18 @ North end of lake (W21)

Water Quality

Dissolved Oxygen (mg/L) 9.43 pH 7.07 Conductivity (μ S/cm) 17
Water Temperature ($^{\circ}$ C) 27.60 Air Temperature ($^{\circ}$ C) 28^{\circ}
Time in situ measurements taken 13:10

Watercourse Dimensions & Morphology

Mean Watercourse Width — (m) Maximum Pool Depth > 1.0 (m)
Mean Bankfull Width — (m) Mean Water Depth > 1.0 (m)
% Riffle 100 % Pool — % Run — % Flat —
Evidence of eroding banks, Comments on bank stability None

Substrate (% cover)

Bedrock — Cobble — Sand 40 Silt 20 Muck —
Boulder 10 Gravel — Clay — Marl 30 Detritus —

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
20% eastern white cedar, balsam fir.
Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, nursery, forage
Migratory Obstructions (seasonal, permanent)
Beaver dam @ NW end of lake
Note any fish observations none

Waterbody Notes

Natural Watercourse ✓ LAKE Trapezoidal Channel — Grassed Swale — Buried Tile —
Surficial Drainage (i.e. furrows) — Dugout Pond — Dominated by Aquatic Veg — Dry —

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by MF

Field Notes QA/QCed by MEH



Minnow Traps

Station Number 1-1

Pass No. (if applicable) /

Date (yyyymmdd): July 7 / 12

UTM coordinates 0687127 easting 5233702 northing zone 16T

Unit Model/Make

spot

Number of Anodes:

Power (Watts)

LAKÉ

Average:

Time 15:00

17

9.43

Comments (i.e. age, disease, etc):

No catch

Note: heavily influenced from old beaver dam

Field Staff: NB, MF

Notes By: ME

(Station Diagram on Back)



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

LAKE.
Fished w dip net

Station # 2-4
Watercourse Name unknown lake
Photos 478-482
Date July 08/12

Project Name Bow Lake Wind Farm
Project # 1609 60734
Field Staff NB, MF
Time 13:35

Weather conditions in previous 24 hrs no precip. hot, muggy
GPS Coordinates (Zone) 16T E 0988922 N 5233652 Datum NAD83
Descriptive Location ~75 m directly north of access rd of T-21 + T-23. ~ mid point between T-21 + T-23. SW end of lake

Water Quality

Dissolved Oxygen (mg/L) 8.74 pH 5.61 Conductivity (µS/cm) 11
Water Temperature (°C) 26.84 Air Temperature (°C) 28°C
Time in situ measurements taken 13:40

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width _____ (m) Mean Water Depth _____ (cm)
% Riffle 100 % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 10 Silt 20 Muck _____
Boulder 10 Gravel _____ Clay _____ Marl 40 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
60% Buffalo berry, eastern white cedar, sugar maple, balsam fir
Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Possible = spawn, nursery, forage. May not due to pH levels
Migratory Obstructions (seasonal, permanent) _____

Note any fish observations Walked 60-70 along shore with dip net. No fish observed or captured

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by MF

Field Notes QA/QCed by mgelach



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 3-4
 Watercourse Name unnamed
 Photos 1075 - 1080
 Date July 9/12
 Weather conditions in previous 24 hrs 68° 67% E, 5233 861 N
 GPS Coordinates (Zone) 16T E N Datum NAD83
 Descriptive Location 299m ESE of proposed turbine #22 location

Water Quality

Dissolved Oxygen (mg/L) 10.28 pH 6.17 Conductivity (µS/cm) 14
 Water Temperature (°C) 14.53 Air Temperature (°C) ~22
 Time *in situ* measurements taken 12:55

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.3 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 1.0 (m) Mean Water Depth 2 (cm)
0 % Riffle 70 % Pool 0 % Run 30 % Flat
 Evidence of eroding banks, Comments on bank stability some undercut, but roots and boulders maintain bank stability

Substrate (% cover)

0 Bedrock 10 Cobble 10 Sand 20 Muck
15 Boulder 15 Gravel 10 Clay 30 Marl 30 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% Shaded, mature maple stand
 Adjacent Land Use forested

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None

Migratory Obstructions (seasonal, permanent)

low flow

Note any fish observations None - not direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. Ravens, Aquatic invertebrates
ponded areas. No flow, only ponded areas in channel. stream flows into lake/pond downstream of project area
mayfly larvae mosquito larvae

Field Notes Authored by Mike Johns

Field Notes QA/QCed by MEllch



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 3-5 Project Name Bow Lake Wind Farm
 Watercourse Name unnamed Project # 1609 60734
 Photos 1081-1084 Field Staff Mike Johns, Mitch Ellah
 Date July 9/12 Time 15:50 14:50
 Weather conditions in previous 24 hrs Mostly clear, hot, no precipitation
 GPS Coordinates (Zone) 16T E 690 0014 N 5233 557 Datum NAD83
 Descriptive Location 470m NW of proposed Turbine # 25 location

Water Quality

Dissolved Oxygen (mg/L) 5.50 pH 5.93 Conductivity (µS/cm) 17
 Water Temperature (°C) 15.29 Air Temperature (°C) ~23
 Time in situ measurements taken 15:00

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 1.0 (m) Mean Water Depth 5 (cm)
0 % Riffle 50 % Pool 0 % Run 50 % Flat
 Evidence of eroding banks, Comments on bank stability Some undercutts but stabilized by root structure

Substrate (% cover)

0 Bedrock 15 Cobble 10 Sand 5 Silt 20 Muck
5 Boulder 15 Gravel 5 Clay 35 Marl 35 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% Shaded by mature deciduous
 Adjacent Land Use Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None
 Migratory Obstructions (seasonal, permanent)
High gradient further downstream, low flow
 Note any fish observations None - No direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. Flow barely discernable.
Black Throated green warbler. Northern Parula, Winter Wrens (6 together)
upstream end of reach @ 6090084 E, 5233487 N were to
valleys converge.

Field Notes Authored by Mike Johns Field Notes QA/QCed by mtellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Too shallow for mt.

Stantec

Station # 3-1
Watercourse Name unknown
Photos 483-487
Date July 08/12

Project Name Bow Lake Wind Farm
Project # 1609 60734
Field Staff NB, MF
Time 14:10

Weather conditions in previous 24 hrs no precip. Hot muggy
GPS Coordinates (Zone) 16T E 0689207 N 5233730 Datum NAD83
Descriptive Location ~250m NE of T-23 @ SE end of lake in channel that connects northern lake to southern lake (3-1)

Water Quality

Dissolved Oxygen (mg/L) 5.81 pH 5.56 Conductivity (µS/cm) 14
Water Temperature (°C) 19.86 Air Temperature (°C) 26°C
Time in situ measurements taken 14:15

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.4 (m) Maximum Pool Depth 50 (cm)
Mean Bankfull Width 0.78 (m) Mean Water Depth 8 (cm)
% Riffle 30 % Pool 40 % Run 30 % Flat
Evidence of eroding banks, Comments on bank stability minor undercut banks

Substrate (% cover)

Bedrock 30 Cobble 20 Sand 10 Muck 20
Boulder 20 Gravel 20 Clay 20 Marl 20 Detritus

Riparian Zone

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Spruce, yellow birch, balsam fir, sugar maple
Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn, forage, nursery
Migratory Obstructions (seasonal, permanent)
low levels of water, log jam (beaver dam) @ outlet to lake
Note any fish observations

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

See back

Field Notes Authored by MF

Field Notes QA/QCed by Mallah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # W-37 9C-2 Project Name Bow Lake
 Watercourse Name Unnamed Lake W-37 Project # 160960771
 Photos # 9752-9756 Field Staff Jackson Mitch Eliah
 Date 10/2/08/28 Time 10:48am
 Weather conditions in previous 24 hrs to Sunny, foggy morning, warm
 GPS Coordinates (Zone) 16T E 682611 N 5230605 Datum NAD 83
 Descriptive Location South West end of Project Area - water extraction location

Water Quality

Dissolved Oxygen (mg/L) 9.01 pH 7.11 Conductivity (µS/cm) 23
 Water Temperature (°C) 21.82 Air Temperature (°C) 22°C
 Time *in situ* measurements taken 10:49am

Watercourse Dimensions & Morphology Lake

Mean Watercourse Width — (m) Maximum Pool Depth — (cm)
 Mean Bankfull Width — (m) Mean Water Depth — (cm)
 % Riffle 100 % Pool — % Run — % Flat —
 Evidence of eroding banks, Comments on bank stability stable banks - gravel/cobble with grasses

Substrate (% cover)

Bedrock	<u>20</u>	Cobble	<u>20</u>	Sand	<u>20</u>	Silt	<u>4</u>	Muck	
Boulder	<u>30</u>	Gravel		Clay		Marl	<u>10</u>	Detritus	

Water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
< 5% shoreline trees

Adjacent Land Use

Access road - in forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

Note any fish observations Dead Creek Chub on shoreline

Waterbody Notes

Natural Watercourse ☒ Lake Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☒ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc. ducks, eastern shorebirds
shallow - could not use main body.

Field Notes Authored by Joe Koe

Field Notes QA/QCed by MS Mah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9C-3 Project Name Bow Lake
 Watercourse Name unnamed w/b Project # 160960771
 Photos # 9757-9762 Field Staff Joe Kees Mitchell
 Date 2012/08/28 Time 11:00 am
 Weather conditions in previous 24 hrs Sunny warm, foggy am.
 GPS Coordinates (Zone) 16T E See below - other notes Datum NAD 83
 Descriptive Location Creek bed east of 9C-2 Lake.

Water Quality

Dissolved Oxygen (mg/L) _____ Dry pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width Dry (m) Maximum Pool Depth Dry (cm)
 Mean Bankfull Width 2.5m (m) Mean Water Depth Dry (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble 20 Sand 30 Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl 50 Detritus _____
Leaf Litter

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% - Forest Blueberry sedge

Adjacent Land Use

Natural Forest + Access Road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____

Migratory Obstructions (seasonal, permanent) _____

Dry Intermittent

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry ☒

Other Habitat Notes, Incidental Wildlife Observations, etc.

9C3 DS GPS-0682608 E 5230 591 N
 9C3 US GPS-0682713 E, 5230 573 N

Field Notes Authored by _____

Field Notes QA/QCed by MSU ah



Stantec

⊕ previously assessed by Mark Pomeroy.

WIND FARM WATERBODY RAPID ASSESSMENT FORM

9 WA109-T4 (cont)

Station # 10-2

Watercourse Name unknown

Photos 9357-9359

Date July 12

Weather conditions in previous 24 hrs sunny, hot

GPS Coordinates (Zone) 16T E 684639

Descriptive Location NE of turbine 4, within forest

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff MEllch, M. Johns

Time 1:20 pm

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____

Water Temperature (°C) _____ Air Temperature (°C) _____

Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)

Mean Bankfull Width _____ (m) Mean Water Depth _____ (cm)

_____ % Riffle _____ % Pool _____ % Run _____ % Flat

Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

_____ Bedrock _____ Cobble _____ Sand _____ Silt _____ Muck

_____ Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus

In-water Cover

Cover Types Present (circle): _____ Undercut Banks _____ Deep Pool _____ Watercress _____ Aquatic Veg

Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) _____

Adjacent Land Use

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations _____

Waterbody Notes

Natural Watercourse _____ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____

Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by _____

Field Notes QA/QCed by _____



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

2 10-2

Station # WA-109? T4 (orig) Project Name Bow Lake Phase 1
 Watercourse Name _____ Project # _____
 Photos _____ Field Staff M. Pomeroy & K. Easterling
 Date Apr 30 2012 Time: 12:43pm
 Weather conditions in previous 24 hrs rain, snow, wind
 GPS Coordinates (Zone) 16T E N Datum NAD87
 Descriptive Location approx 100 m NE of T4 preferred original

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.3 (m) Maximum Pool Depth 0.3 (m)
 Mean Bankfull Width 0.5 (m) Mean Water Depth 0.15 (m)
 _____ % Riffle 80 % Pool 20 falls _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock 40 Cobble _____ Sand _____ Silt _____ Muck _____
40 Boulder _____ Gravel _____ Clay _____ Marl 20 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress _____ Aquatic Veg _____
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

>80%, trees, mature

Adjacent Land Use

forest, wetland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

groundwater seepage

Migratory Obstructions (seasonal, permanent)

Falls (several) avg. 30cm

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. no closer to turbine than

100m

-WB, but outside 81m

Field Notes Authored by M. Pomeroy

Field Notes QA/QCed by _____



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-1
 Watercourse Name unknown
 Photos 353-355
 Date July 5/12

Project Name Bow Lake Wind Farm
 Project # 1609 60734
 Field Staff Mellch, N Burnett
 Time 11:20am

Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 16T E 684356 seep N 5232380 seep Datum NAD83
 Descriptive Location east of turbine 5, seeping from bedrock, flowing along proposed access road

Water Quality

Dissolved Oxygen (mg/L) 9.79 pH 7.20 Conductivity (µS/cm) 35
 Water Temperature (°C) 16.0 Air Temperature (°C) 28°C
 Time *in situ* measurements taken 11:25 am

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.150 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 1 (m) Mean Water Depth 5 (cm)
70 % Riffle 30 % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability banks stable

Substrate (% cover)

<u>5</u>	Bedrock	<u>30</u>	Cobble	<u>10</u>	Sand	<u>5</u>	Silt	<u> </u>	Muck
<u>5</u>	Boulder	<u>40</u>	Gravel	<u> </u>	Clay	<u> </u>	Marl	<u>5</u>	Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

5%, raspberry, elderberry, shrubs

Adjacent Land Use

forest, road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

steep slope, developing water feature

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry ☒

Other Habitat Notes, Incidental Wildlife Observations, etc.

USGS seep origin UTM: 684357, 5232346 (WPT 001)
small sections
newly weedy fish, sedges, forget me not
saved waypoint

Field Notes Authored by Mitch Allen

Field Notes QA/QCed by Mark Loring



Station Number 10 - 1

Pass No. (if applicable) N/A

Date (yyyymmdd): July 11 12

↳ at bottom of hill on west side

UTM coordinates 684361 easting 5232403 northing zone 16T

Sampling Method (circle one): traps x 5 even habitat transect / spot

Effort (Electrofishing Seconds): _____ Number of Netters: _____ Number of Anodes: _____

Settings

Frequency (Hz) _____ Voltage (volts) _____ Current (Amps) _____ Power (Watts) _____

Station Information

Length of Stream Surveyed (m) . 10

Station Characteristics:

Width (m): Range 3-5 Average: 4

Depth (m): Range 30-60 Average: 0.40

Water Clarity/Colour: clear

Water Velocity if Measured (m/s): Set Time 12:05 - July 11/16

Temperature (°C) 17.20

Conductivity (uS/cm) 39 Lift time: 10:00am

pH 6.17

Dissolved Oxygen (mg/L) 7.85 4 July 13/12

Catch Data

[illegible]

Fish Measurements on Separate Sheet? Y(N)

Field Staff: Mellah
M Johns

Notes By: Mellah

(Station Diagram on Back)

No



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # 10-21
 Watercourse Name unnamed
 Photos 104 1040-1043
 Date July 7 / 12

Project Name Bow Lake Wind Farm
 Project # 1609 60734
 Field Staff McGee, M Johns
 Time 13:45

Weather conditions in previous 24 hrs mix sun + cloud, light rain last night
 GPS Coordinates (Zone) 16T E 685389 N 5233343 Datum NAD83
 Descriptive Location 342m SE of proposed turbine 10 location, close to proposed access roads that link turbines 9, 10, 11 & 12.

Water Quality

Dissolved Oxygen (mg/L) 5.78 pH 6.04 Conductivity (µS/cm) 19
 Water Temperature (°C) 15.40 Air Temperature (°C) 22
 Time in situ measurements taken 13:55

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.40 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 1.0 (m) Mean Water Depth 5 (cm)
 % Riffle 40 % Pool 60 % Run 60 % Flat

Evidence of eroding banks, Comments on bank stability

banks stable, vegetation, organic debris & substrate stabilizing bank

Substrate (% cover)

Bedrock 50 Cobble 10 Sand 10 Silt 10 Muck 10
20 Boulder 10 Gravel 10 Clay 10 Marl 10 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% - early / mature, sugar maple dominant
 Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
none

Migratory Obstructions (seasonal, permanent)

high gradient, steep slopes

Note any fish observations none - not direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☒

Other Habitat Notes, Incidental Wildlife Observations, etc.

mayfly larvae observed in standing water within channel

sections d/s are dry

Field Notes Authored by McGee

Field Notes QA/QCed by McGee



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 11-4
 Watercourse Name unnamed
 Photos 1095-1100, 1101-1102
 Date July 11/12

Project Name Bow Lake Wind Farm
 Project # 1609 60734
 Field Staff Mellah, M Johns
 Time 12:30

Weather conditions in previous 24 hrs sunny, no precip, light winds
 GPS Coordinates (Zone) 16T E 684439 N 5231686 Datum NAD83
 Descriptive Location 560 m WSW of proposed turbine location

Water Quality

Dissolved Oxygen (mg/L) 9.10 pH 6.02 Conductivity (uS/cm) 30
 Water Temperature (°C) 9.85 Air Temperature (°C) ~24
 Time in situ measurements taken 12:30

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.2 (m) Maximum Pool Depth 40 (cm)
 Mean Bankfull Width 1.8 (m) Mean Water Depth 15 (cm)
35 % Riffle 35 % Pool 30 % Run 30 % Flat
 Evidence of eroding banks, Comments on bank stability stable banks, supported by vegetation, large substrate + organic debris

Substrate (% cover)

Bedrock	<u>55</u>	Cobble	<u>30</u>	Sand	<u>10</u>	Silt		Muck
Boulder		Gravel		Clay		Marl	<u>5</u>	Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
50% - dominant vegetation mixed forest, - Wspsice, Smaple, W Cedar
 Adjacent Land Use road, forest, forestry practices

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Cold water contributions to potential cold water habitats downstream
 Migratory Obstructions (seasonal, permanent)
perched sections in stream develop with low water levels in summer
 Note any fish observations none - no direct fish habitat
↳ impassable barrier in stream - waterfall
↳ ntm - 11-4 WTRFBL 684380, 5231487
↳ stream doubled in size at this location

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

⊗ riparian zone assessment includes 150m zone of investigation - sections of stream flow through open canopy meadow like habitat + 0% riparian cover
⊗ close to roadside, 2 groundwater seeps flow into stream - iron stained substrate
⊗ d/s, outside of project area, stream dissipates considerably, questionable fish habitat
 Field Notes Authored by Mellah Field Notes QA/QCed by M Johns



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 12-1 Project Name Bow Lake Wind Farm
 Watercourse Name Unnamed Project # 1609 60734
 Photos 1060 - 1063 + 1064 - 1066 Field Staff Mike Johns, Mitch Ellah
 Date July 8 / 12 Time 16:00
 Weather conditions in previous 24 hrs very light rain (<1mm), but mostly clear, high of ~27
 GPS Coordinates (Zone) 16T E 085483 N S 233093 Datum NAD83
 Descriptive Location ~300m North of the proposed turbine 9 location

Water Quality

Dissolved Oxygen (mg/L) 7.47 pH 6.53 Conductivity (µS/cm) 24
 Water Temperature (°C) 16.66 Air Temperature (°C) 25
 Time in situ measurements taken 16:10

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.8 (m) Maximum Pool Depth 40 (cm)
 Mean Bankfull Width 1.4 (m) Mean Water Depth 5 (cm)
15 % Riffle 40 % Pool 15 % Run 30 % Flat
 Evidence of eroding banks, Comments on bank stability undercut banks common
but boulders and roots stabilize banks

Substrate (% cover)

Bedrock 10 Cobble 15 Sand 20 Silt 5 Muck 5
 Boulder 50 Gravel 5 Clay 5 Marl 5 Detritus 5

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% Mature Deciduous
 Adjacent Land Use Forested

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
excellent substrate and thermal properties for brook trout spawning
 Migratory Obstructions (seasonal, permanent)
logs and boulders present seasonal barriers at current water level
 Note any fish observations None

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

Extensive visual observations over 150m of this watercourse
searching for fish; No fish observed.

Field Notes Authored by Mike Johns

Field Notes QA/QCed by M. Ellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 11-3
 Watercourse Name unnamed
 Photos 1052-1059
 Date July 8 / 12
 Weather conditions in previous 24 hrs light rain but mostly clear high of ~27
 GPS Coordinates (Zone) 16T E 685335 N 5232494 Datum NAD83
 Descriptive Location ~150 m downstream of large fen between proposed turbine locations 8 and 9

Project Name Bow Lake Wind Farm
 Project # 1609 60734
 Field Staff Mike Johns, Mitch Ellah
 Time 14:40

Water Quality

Dissolved Oxygen (mg/L) 6.60 pH 6.28 Conductivity (µS/cm) 35
 Water Temperature (°C) 17.10 Air Temperature (°C) ~23°C
 Time in situ measurements taken 14:43

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.2 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 1.4 (m) Mean Water Depth 3 (cm)
20 % Riffle 25 % Pool 25 % Run 30 % Flat
 Evidence of eroding banks, Comments on bank stability stable banks, typically lined with boulders

Substrate (% cover)

Bedrock 25 Cobble 0 Sand 10 Silt 0 Muck 0
25 Boulder 20 Gravel 0 Clay 0 Marl 20 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool 0 Watercress 0 Aquatic Veg 0
 Overhanging Vegetation Woody Debris Boulder Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100

Adjacent Land Use

Forest - mixed

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None

Migratory Obstructions (seasonal, permanent)

None observed

Note any fish observations No fish observed. Not direct fish habitat due to limited overwintering pools, limited flow and high gradient further downstream

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel 0 Grassed Swale 0 Buried Tile 0
 Surficial Drainage (i.e. furrows) 0 Dugout Pond 0 Dominated by Aquatic Veg 0 Dry 0

Other Habitat Notes, Incidental Wildlife Observations, etc. Crayfish observed in water course, indicating flow is likely permanent. Chironomids observed. Watercourse originates in fen upstream of project location

Field Notes Authored by Mike Johns

Field Notes QA/QCed by MEllah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 11-1
Watercourse Name unnamed
Photos 1046-1048
Date July 8/12

Project Name Bow Lake Wind Farm
Project # 1609 60734
Field Staff MEllah, M Johns
Time 12:05

Weather conditions in previous 24 hrs sunny, hot, no precipitation, light winds

GPS Coordinates (Zone) 16T E 685200 N 5232079 Datum NAD83

Descriptive Location 291m NE of proposed turbine 6 location, south of proposed access road

Water Quality

Dissolved Oxygen (mg/L) DRY pH DRY Conductivity (µS/cm) DRY
Water Temperature (°C) DRY Air Temperature (°C) 22
Time in situ measurements taken DRY

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.80 (m) Maximum Pool Depth DRY (cm)
Mean Bankfull Width 1.0 (m) Mean Water Depth DRY (cm)
% Pile DRY % Pool DRY % Run DRY % Flat DRY
Evidence of eroding banks, Comments on bank stability banks appear stable
vegetation, organic debris & substrate stabilizing banks

Substrate (% cover)

Bedrock 60 Cobble 3 Sand DRY Silt 20 Muck DRY
2 Boulder DRY Gravel DRY Clay DRY Marl 15 Detritus DRY

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other DRY

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
70% early successional dominant sugar maple, white cedar, balsam fir
Adjacent Land Use forestry road, forestry logging activity

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
none
Migratory Obstructions (seasonal, permanent)
low flow, high gradients
Note any fish observations
none

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel DRY Grassed Swale DRY Buried Tile DRY
Surficial Drainage (i.e. furrows) DRY Dugout Pond DRY Dominated by Aquatic Veg DRY Dry DRY

Other Habitat Notes, Incidental Wildlife Observations, etc. white Throated sparrow
black flies

Field Notes Authored by MEllah

Field Notes QA/QCed by MEllah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 11-2
Watercourse Name unnamed
Photos 1049-1051
Date July 8/12

Project Name Bow Lake Wind Farm
Project # 1609 60734
Field Staff Mellah, M Johns
Time 12:25

Weather conditions in previous 24 hrs Sunny, hot, no precip, light winds

GPS Coordinates (Zone) 16T E 685148 N 5232033 Datum NAD83

Descriptive Location 254m NE of proposed turbine 6 location, south of proposed access road, 79m

Water Quality

Dissolved Oxygen (mg/L) 9.61 pH 6.00 Conductivity (μ S/cm) 41
Water Temperature ($^{\circ}$ C) 11.84 Air Temperature ($^{\circ}$ C) 22
Time in situ measurements taken 12:25

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.50 (m) Maximum Pool Depth 40 (cm)
Mean Bankfull Width 1.0 (m) Mean Water Depth 20 (cm)
5 % Riffle 60 % Pool 35 % Run 35 % Flat
Evidence of eroding banks, Comments on bank stability stable banks - stabilized by vegetation, organic debris, substrate

Substrate (% cover)

Bedrock 15 Cobble 60 Sand 5 Silt 20 Muck 5
Boulder 5 Gravel 5 Clay 5 Marl 20 Detritus 5

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 80% - early successional forest w dominant sugar maple + yellow birch
Adjacent Land Use logging, forestry practices

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) thermal regime critical for potential cold water species downstream
Migratory Obstructions (seasonal, permanent) high gradient, organic debris, perched sections
Note any fish observations none - not direct fish habitat within project area

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

- potential to contribute to cold water habitat

Field Notes Authored by Mellah

Field Notes QA/QCed by M Johns



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 1-3 Project Name Bow Lake Wind Farm
 Watercourse Name Unknown Project # 1609 60734
 Photos 398-400 9820-9823 Field Staff NB, MF & JK + ME (2012/08/29)
 Date July 06/12 Time 14:45
 Weather conditions in previous 24 hrs hot muggy
 GPS Coordinates (Zone) 16T E 0686798 N 5232855 Datum NAD83
 Descriptive Location ~400m north of T-15

Water Quality

Dissolved Oxygen (mg/L) 8.34 / 8.22 pH 7.09 / 8.09 Conductivity (µS/cm) 18 / 43
 Water Temperature (°C) 17.71 / 14.16 Air Temperature (°C) 27°C / 22°C
 Time in situ measurements taken 14:50 / 10:35 am

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.7 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 1.2 (m) Mean Water Depth 5 (cm)
20 % Riffle 80 % Pool 0 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability moderate undercut banks

Substrate (% cover)

Bedrock 40 Cobble 0 Sand 0 Silt 0 Muck 0
 Boulder 15 Gravel 0 Clay 0 Marl 5 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress 0 Aquatic Veg 0
Overhanging Vegetation Woody Debris Boulder Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 70%

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) none

Migratory Obstructions (seasonal, permanent) steep gradient

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

Indirect, intermittent
WP 14 (GPS 1)
Lower end Ferns
GPS 1-3 use wetland source - 686768 E, 5232948 N Lowland/wetland source for 1-3 686710 E 5232970 N
GPS 1-3 DS channel flows out of Project boundary Upstream wetland source for 1-3 686664 E, 5232950 N
50+m long, 15 m wide.

Field Notes Authored by MF

Field Notes QA/QCed by M Gellan



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 1-3 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 398-400 Field Staff NB, MF
 Date July 06/12 Time 14:45
 Weather conditions in previous 24 hrs hot muggy
 GPS Coordinates (Zone) 16T E 06867980 N 5232855 Datum NAD83
 Descriptive Location ~400m north of T-15

Water Quality

Dissolved Oxygen (mg/L) 8.34 pH 7.09 Conductivity (µS/cm) 18
 Water Temperature (°C) 17.71 Air Temperature (°C) 27.0
 Time *in situ* measurements taken 14:50

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.7 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 1.2 (m) Mean Water Depth 5 (cm)
 % Riffle _____ % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability moderate undercut banks

Substrate (% cover)

Bedrock 40 Cobble _____ Sand _____ Silt _____ Muck _____
40 Boulder 15 Gravel _____ Clay _____ Marl 5 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress _____ Aquatic Veg _____
Overhanging Vegetation Woody Debris Boulder _____ Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
70%

Adjacent Land Use

6066-1

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none

Migratory Obstructions (seasonal, permanent)

steep gradient

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. WP 14 (GPS 1)

Indirect, intermittent

Field Notes Authored by MF

Field Notes QA/QCed by M. Gellah



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

LAKE
Fished

Station # 1-4 Project Name Bow Lake Wind Farm
 Watercourse Name unknown lake Project # 1609 60734
 Photos 416-419 Field Staff NB, MF
 Date July 07/12 Time 09:30
 Weather conditions in previous 24 hrs 2-4 mm of rain overnight
 GPS Coordinates (Zone) 16T E 0687046 N 5233247 Datum NAD83
 Descriptive Location ~ 700m east of T-13 @ northwest end of lake ~
70m south of unevaluated wetland.

Water Quality

Dissolved Oxygen (mg/L) 8.18 pH 6.75 Conductivity (μ S/cm) 16
 Water Temperature ($^{\circ}$ C) 23.89 Air Temperature ($^{\circ}$ C) 24^{\circ}
 Time *in situ* measurements taken 09:35

Watercourse Dimensions & Morphology

Mean Watercourse Width ~200 (m) Maximum Pool Depth N/A (cm) LAKE
 Mean Bankfull Width N/A (m) Mean Water Depth N/A (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

Bedrock 40 Cobble 5 Sand 5 Silt 10 Muck
10 Boulder _____ Gravel _____ Clay _____ Marl 30 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

50% balsam fir, EW cedar

Adjacent Land Use

Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

nursery, spawn, forage

Migratory Obstructions (seasonal, permanent)

none

Note any fish observations None observed along 60m minnow trap spacing

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

WP 18, GPS 1

Permanent, Direct

Field Notes Authored by MF

Field Notes QA/QCed by m illal



Project Name	<u>Bow Lake Wind Farm</u>		Station Number	<u>1-4</u>	
Project Number	<u>1609 6073 4</u>		Pass No. (if applicable)	<u>—</u>	
Photos	<u>416-419</u>		Date (yyyymmdd):	<u>July 12</u>	
Descriptive Location	<u>~ 700 m east of T-13 @ northwest corner of lake ~</u> <u>70m south of unvegetated wetland</u>				
UTM coordinates	<u>0687046</u>	easting	<u>5233247</u>	northing	zone <u>16T</u>

Fishing Method (circle one): Backpack Boat Unit Model/Make
 Sampling Method (circle one): even habitat transect spot
 Effort (Electrofishing Seconds): _____ Number of Netters: _____ Number of Anodes: _____
Settings
 Frequency (Hz) _____ Voltage (volts) _____ Current (Amps) _____ Power (Watts) _____

Length of Stream Surveyed (m) _____

Station Characteristics:

Width (m):	Range _____	Average: _____
Depth (m):	Range 0.30 - 0.60	Average: 0.50

Ret: 09:30 July 8, 1981

Lake

Water Clarity/Colour:	<u>turbid.</u>	Water Velocity if Measured (m/s):	<u>N/A</u>	Time	<u>09:45</u>
Temperature (°C)	<u>23.89</u>	Conductivity (uS/cm)	<u>16</u>		
pH	<u>6.75</u>	Dissolved Oxygen (mg/L)	<u>8.18</u>		

[illegible]

Notes By: MF

(Station Diagram on Back)



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # 1-9
 Watercourse Name unknown
 Photos 438-441
 Date July 7 / 12

Project Name Bow Lake Wind Farm
 Project # 1609 60734
 Field Staff NB, MF
 Time 13:25

Weather conditions in previous 24 hrs 2.4 mm overnight
 GPS Coordinates (Zone) 16T E N — Datum NAD83
 Descriptive Location ~400 m NE of T-17

Water Quality

Dissolved Oxygen (mg/L) 11.79 pH 7.00 Conductivity (µS/cm) 3.9
 Water Temperature (°C) 10.83 Air Temperature (°C) 28°C
 Time in situ measurements taken 13:30

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 1.0 (m) Mean Water Depth 4 (cm)
5 % Riffle 70 % Pool 15 % Run 10 % Flat
 Evidence of eroding banks, Comments on bank stability minor undercut banks

Substrate (% cover)

Bedrock 40 Cobble — Sand — Silt — Muck —
40 Boulder 10 Gravel — Clay — Marl 10 Detritus —

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress — Aquatic Veg —
Overhanging Vegetation Woody Debris Boulder Other —

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

fern sp, sugar maple

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none, steep gradient

Migratory Obstructions (seasonal, permanent)

steep gradient

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel — Grassed Swale — Buried Tile —
 Surficial Drainage (i.e. furrows) — Dugout Pond — Dominated by Aquatic Veg — Dry —

Other Habitat Notes, Incidental Wildlife Observations, etc.

1-9 u/s = 0687580, 5233255
1-9 d/s = 0687639, 5233233

Field Notes Authored by MF

Field Notes QA/QCed by malah



1-80/5 0687798 5233095
1-80/5 0688103 5230873

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff NB, MF

Time 11:45

m overnight.

Datum NAD83

5-17.

Water Quality

Dissolved Oxygen (mg/L) 11.08 pH 7.11 Conductivity ($\mu\text{S}/\text{cm}$) 36

Water Temperature ($^{\circ}\text{C}$) 15.77 Air Temperature ($^{\circ}\text{C}$) 28^{\circ}\text{C}

Time *in situ* measurements taken 11:50

Mean Watercourse Width 0.5 (m) Maximum Pool Depth 10 (cm)
Mean Bankfull Width 1.0 (m) Mean Water Depth 7 (cm)
 % Riffle 80 % Pool 20 % Run % Flat
Evidence of eroding banks. Comments on bank stability moderate undercut

Substrate (% cover)		Cobble		Sand		Silt		Muck	
20	Bedrock	20							
	Boulder	30							
			Gravel		Clay		Marl	20	Detritus

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

90% jewel weed, yellow birch, sugar maple, fern sp.

Adjacent Land Use

forest

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Spawn, forage, nursery

Migratory Obstructions (seasonal, permanent)

coarse loess

Note any fish observations 3X BRTR observed (3-4 inch) 0687984 5232962

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by W. J. T.

Field Notes QA/QCed by m gellan



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

1-7015 16T 0687633 5233029

1-7015 16T 0687796 5233098

1-7015 (side channel) 0687632 5233054

Station # 147

Watercourse Name unknown

Photos 423-426

Date July 07/12

Weather conditions in previous 24 hrs 2-4 mm rain overnight

GPS Coordinates (Zone) 16T E

N

Datum NAD83

Descriptive Location ~300 m NE of T-17

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff NB, MI

Time 11:20

Water Quality

Dissolved Oxygen (mg/L) _____

pH _____

Conductivity (µS/cm) _____

Water Temperature (°C) _____

Air Temperature (°C) _____

Time in situ measurements taken _____

STAND WATER Too shallow

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m)

Maximum Pool Depth 2 (cm)

Mean Bankfull Width 0.7 (m)

Mean Water Depth 1 (cm)

% Riffle _____

100 % Pool

% Run _____

% Flat _____

Evidence of eroding banks, Comments on bank stability _____

minor undercut, well defined

Substrate (% cover)

Bedrock 40

Cobble 20

Sand _____

Silt _____

Muck _____

30 Boulder

Gravel _____

Clay _____

Marl 10

Detritus _____

Water Cover

Cover Types Present (circle):

Undercut Banks

Deep Pool

Watercress _____

Aquatic Veg _____

Overhanging Vegetation

Woody Debris

Boulder

Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% fern sp, sugar maple,

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None

Migratory Obstructions (seasonal, permanent)

Step gradient

Note any fish observations None

Waterbody Notes

Natural Watercourse ☒

Trapezoidal Channel _____

Grassed Swale _____

Buried Tile _____

Surficial Drainage (i.e. furrows) _____

Dugout Pond _____

Dominated by Aquatic Veg _____

Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Intermittent, indirect

Field Notes Authored by MF

Field Notes QA/QCed by Mallal



Stantec

1-6 d/s 0688171 5232798
1-6 u/s not taken ~70m u/s of
low lying swamp.

KEA RUNS FOR THE ENTIRETY OF
STUDY BOUNDARY, GPS CO-ORDS FOR OUR
SURVEY ONLY.

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # 1-6
Watercourse Name unknown
Photos 435-437
Date July 7 / 12
Weather conditions in previous 24 hrs 2-4 mm overnight
GPS Coordinates (Zone) 16T E N Datum NAD83
Descriptive Location ~600m east of T-17 + 40m east of low lying swamp area

Water Quality

Dissolved Oxygen (mg/L) 10.08 pH 7.00 Conductivity (μ S/cm) 39
Water Temperature ($^{\circ}$ C) 18.75 Air Temperature ($^{\circ}$ C) 28.2
Time in situ measurements taken 12:50

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.4 (m) Maximum Pool Depth 40 (cm)
Mean Bankfull Width 3.5 (m) Mean Water Depth 15 (cm)
20 % Riffle 30 % Pool 40 % Run 10 % Flat
Evidence of eroding banks, Comments on bank stability mod. undercut banks.

Substrate (% cover)

Bedrock 10 Cobble 10 Sand 40 Silt 20 Muck 20
Boulder 20 Gravel 10 Clay 10 Marl 20 Detritus 20

Riparian Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% yellow birch, sugar maple, fern sp
Adjacent Land Use Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, nursery, forage
Migratory Obstructions (seasonal, permanent)
possible fish barriers (logs, jams, boulders)
Note any fish observations 12:50

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

1-6 u/s - not taken ~70m u/s of low lying swamp
1-6 d/s - 0688171, 5232798

Field Notes Authored by MF

Field Notes QA/QCed by M Gellat



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Could not set traps or dip net. Water receded off the study boundary.

Station # 2-2
Watercourse Name unknown lake
Photos 471-473
Date July 8 / 12

Project Name Bow Lake Wind Farm
Project # 1609 60734
Field Staff NB, MF
Time 12:40

Weather conditions in previous 24 hrs no precip. 28°C, hot
GPS Coordinates (Zone) 16T E 0688228 N 5233264 Datum NAD83
Descriptive Location ~600m directly west of T-21 @ North end of lake. Very low water levels.

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) _____
Time in situ measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width _____ (m) Mean Water Depth _____ (cm)
_____ % Riffle _____ % Pool _____ % Run _____ % Flat
Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock 10 Cobble _____ Sand 10 Silt 30 Muck _____
10 Boulder _____ Gravel _____ Clay _____ Marl 40 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

grasses
Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

dry within study boundary. water outside of study boundary

Migratory Obstructions (seasonal, permanent)

dry at times

Note any fish observations none - dry

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by MF

Field Notes QA/QCed by m900ah



2-3 us = 0688712 5233645
2-3 ds = 0688662 5233494

WIND FARM WATERBODY RAPID ASSESSMENT FORM

STAND.
WATER
NO fishing.

Stantec

Station # 2-3 Project Name Bow Lake Wind Farm
Watercourse Name unknown Project # 1609 60734
Photos 475-477 Field Staff NB, MF
Date July 08/12 Time 13:05
Weather conditions in previous 24 hrs no precip. Hot, muggy
GPS Coordinates (Zone) 16T E N Datum NAD83
Descriptive Location ~170 m SE of T-21

Water Quality

Dissolved Oxygen (mg/L) 4.51 pH 6.55 Conductivity (µS/cm) 18
Water Temperature (°C) 13.63 Air Temperature (°C) 27°C
Time in situ measurements taken 13:10

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.4 (m) Maximum Pool Depth 15.0 (cm)
Mean Bankfull Width 1.6 (m) Mean Water Depth 7.0 (cm)
% Riffle 100 % Pool 0 % Run 0 % Flat 0
Evidence of eroding banks, Comments on bank stability boulders along bank. stable.

Substrate (% cover)

Bedrock 30 Cobble 10 Sand 0 Silt 0 Muck 0
30 Boulder 20 Gravel 0 Clay 0 Marl 10 Detritus 0

Water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other if water present

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

fern sp, sugar maple

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none

Migratory Obstructions (seasonal, permanent)

steep gradient, dry

Note any fish observations none

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel 0 Grassed Swale 0 Buried Tile 0
Surficial Drainage (i.e. furrows) 0 Dugout Pond 0 Dominated by Aquatic Veg 0 Dry 0

Other Habitat Notes, Incidental Wildlife Observations, etc.

Intermittent, Indirect 2-3 us = 0688712, 5233645
2-3 ds = 0688662, 5233494

Field Notes Authored by MF

Field Notes QA/QCed by mgllah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 3-3
Watercourse Name Unnamed
Photos 1072 - 1074
Date July 9 / 12

Project Name Bow Lake Wind Farm
Project # 1609 60734
Field Staff Mike Johns, Mitch Ellah
Time 11:40

Weather conditions in previous 24 hrs mostly sunny, hot, very little precipitation (>1mm)
GPS Coordinates (Zone) 16T E 689422 N 5233363 Datum NAD83
Descriptive Location ~230 NNE of proposed turbine #24 location

Water Quality

Dissolved Oxygen (mg/L) 5.22 pH 6.03 Conductivity (µS/cm) 15
Water Temperature (°C) 14.29 Air Temperature (°C) ~20°C
Time in situ measurements taken 11:45

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.60 (m) Maximum Pool Depth 20 (cm)
Mean Bankfull Width 0.80 (m) Mean Water Depth 4 (cm)
0 % Riffle 0 % Pool 0 % Run 0 % Flat
Evidence of eroding banks, Comments on bank stability Banks stable from root masses and also, stream has low gradient/velocity in this reach

Substrate (% cover)

0 Bedrock 5 Cobble 10 Sand 35 Muck
5 Boulder 5 Gravel 40 Clay 40 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100 - early mature mixed forest dominant balsam fir, white spruce
Adjacent Land Use Forest - mixed

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
None
Migratory Obstructions (seasonal, permanent)
Low Flow
Note any fish observations
None - Not direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc. upstream end of reach at 689563 E 5233400 N. Abundant sphagnum moss in valley floor, adjacent to stream - standing pool, no flowing water

Field Notes Authored by Mike Johns

Field Notes QA/QCed by mellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 3-6 Project Name Bow Lake Wind Farm
 Watercourse Name Unnamed Project # 1609 60734
 Photos 1085-1087 Field Staff Mike Johns, Mitch Ellah
 Date July 9/12 Time 16:00
 Weather conditions in previous 24 hrs Mostly clear, hot, no precipitation
 GPS Coordinates (Zone) 16T E 6891976 N 15232922 Datum NAD83
 Descriptive Location 450m SW of proposed turbine # 25 location

Water Quality

Dissolved Oxygen (mg/L) 8.04 pH 5.99 Conductivity (µS/cm) 18
 Water Temperature (°C) 14.95 Air Temperature (°C) ~22°C
 Time in situ measurements taken 16:05

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.3 (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width 3.2 (m) Mean Water Depth 10 (cm)
10 % Riffle 60 % Pool 10 % Run 40 % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

0 Bedrock 15 Cobble 20 Sand 0 Silt 15 Muck
10 Boulder 25 Gravel 0 Clay 0 Marl 15 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% Shaded by mature deciduous

Adjacent Land Use

Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None

Migratory Obstructions (seasonal, permanent)

low flow and steep reach starting just downstream of way point above

Note any fish observations

None as not likely direct fish habitat. Long section of stream walked and no fish observed

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. Braided Channel.

Very little flow. some sections dry at surface.

Field Notes Authored by Mike Johns

Field Notes QA/QCed by Mitchell



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 3-7 Project Name Bow Lake Wind Farm
 Watercourse Name Unnamed Project # 1609 60734
 Photos 1088-1090 Field Staff Mike Johns, Mitch Ellah
 Date July 9/12 Time 16:35
 Weather conditions in previous 24 hrs Mostly clear, hot, no precipitation
 GPS Coordinates (Zone) 16T E 689755 N 5233182 Datum NAD83
 Descriptive Location 207m + east of proposed Turbine #24 location

Water Quality

Dissolved Oxygen (mg/L) 15.90 5.64 pH 5.89 Conductivity (µS/cm) 29
 Water Temperature (°C) 15.90 Air Temperature (°C) ~22
 Time *in situ* measurements taken 16:40

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.25 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 0.70 (m) Mean Water Depth 2 (cm)
0 % Riffle 30 % Pool 0 % Run 70 % Flat
 Evidence of eroding banks, Comments on bank stability stable banks - boulder lined

Substrate (% cover)

0 Bedrock 25 Cobble 15 Sand Silt Muck
30 Boulder 20 Gravel Clay Marl 10 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
95 Mature hardwood
 Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None

Migratory Obstructions (seasonal, permanent)

Very steep gradient, impassable to fish at lower end

Note any fish observations

None - no direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by Mike Johns

Field Notes QA/QCed by Mitch



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 3-8

Watercourse Name Unknown

Photos 1176-1180

Date July 9/12 August

Weather conditions in previous 24 hrs clear, no precip

GPS Coordinates (Zone) 16T E

Descriptive Location near turbine 24 - along road (proposed) previously unmarked

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff NB, DC

Time 11:00

Datum NAD83

Water Quality

Dissolved Oxygen (mg/L) Not enough to measure

pH 7.5

Conductivity (uS/cm) 200

Water Temperature (°C) 20.0

Air Temperature (°C) 20.0

Time in situ measurements taken 11:00

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.8 (m)

Maximum Pool Depth 0.05 (cm)

Mean Bankfull Width 0.9-1.0 (m)

Mean Water Depth 0.01 - dry (cm)

% Riffle 0

% Pool 0

% Run 100

% Flat 0

Evidence of eroding banks, Comments on bank stability minor scarring

Substrate (% cover)

Bedrock 25 Cobble 30 Sand 0 Silt 0 Muck 0
Boulder 25 Gravel 0 Clay 0 Marl 0 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks 0 Deep Pool 0 Watercress 0 Aquatic Veg 0
Overhanging Vegetation Woody Debris Boulder 0 Other Sevelweed

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% Yellow Birch, Balsam Poplar, Fern sp

Adjacent Land Use Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

intermittent

Note any fish observations none (only small pools left)

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel 0 Grassed Swale 0 Buried Tile 0
Surficial Drainage (i.e. furrows) 0 Dugout Pond 0 Dominated by Aquatic Veg 0 Dry 0

Other Habitat Notes, Incidental Wildlife Observations, etc.

intermittent, 3-8 US = 0689990, 5233257
3-8 DS = 0689644, 5233416

Field Notes Authored by NB

Field Notes QA/QCed by MEllah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 4-1 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 634, 637 Field Staff NB, MF
 Date July 14/12 Time 11:30
 Weather conditions in previous 24 hrs No precip. Hot, 27°C. Today = 2-3 mm
 GPS Coordinates (Zone) 16T E N Datum NAD83
 Descriptive Location ~ 130 m south of T-28

Water Quality

Dissolved Oxygen (mg/L) 6.56 pH 6.01 Conductivity (µS/cm) 24
 Water Temperature (°C) 15.48 Air Temperature (°C) 28°C
 Time in situ measurements taken 11:45

Watercourse Dimensions & Morphology

Mean Watercourse Width 4.0 (m) Maximum Pool Depth 10 (cm) Pools
 Mean Bankfull Width 1.5 (m) Mean Water Depth 2 (cm)
 % Riffle 100 % Pool 0 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability

Substrate (% cover)

Bedrock 40 Cobble 20 Sand 0 Silt 0 Muck 0
20 Boulder 10 Gravel 0 Clay 0 Marl 0 Detritus 0

Riparian Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% sugar maple, Fern sp, yellow birch

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None

Migratory Obstructions (seasonal, permanent)

Dry low water levels

Note any fish observations None

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

Indirect, Intermitent 4-1 us = 0689616, 5232225
4-1 ds = 0689274, 5232204

Field Notes Authored by MF

Field Notes QA/QCed by mgellan



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

No o/s or d/s co-ords as already delineated.

Too shallow to fish

Station # 42
 Watercourse Name unknown
 Photos 638-640
 Date July 14, 2012
 Weather conditions in previous 24 hrs No rain overnight. Today - 2mm during survey
 GPS Coordinates (Zone) 16T E 0689561 N 5232535 Datum NAD83
 Descriptive Location ~ 300m east of T-28.

Water Quality

Dissolved Oxygen (mg/L) 7.00 pH 6.12 Conductivity (μ S/cm) 41
 Water Temperature ($^{\circ}$ C) 15.75 Air Temperature ($^{\circ}$ C) 28^{\circ}
 Time in situ measurements taken 12:25

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.6 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 1.3 (m) Mean Water Depth 5 (cm)
 % Riffle 95 % Pool 5 % Run 5 % Flat
 Evidence of eroding banks, Comments on bank stability minor undercut banks, cobble banks + well vegetated

mainly standing water

Substrate (% cover)

Bedrock 40 Cobble 15 Sand 5 Silt 10 Muck 5
 Boulder 30 Gravel 5 Clay 5 Marl 10 Detritus 5

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% fern sp, yellow birch, sugar maple
 Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Possible spawn + nursery.

Migratory Obstructions (seasonal, permanent)
dry @ times.

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc. Intermittent, possibly direct.

Field Notes Authored by MF

Field Notes QA/QCed by M Gellan



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

4-4 u/s = 0687813
4-4 d/s = 0689829 5232837

Dry. No fishing

Station # 4-4
Watercourse Name unknown
Photos 644-648
Date July 14/12
Weather conditions in previous 24 hrs yesterday = 27°C, hot Today = 2mm rain, muggy 28°C
GPS Coordinates (Zone) 16T E N Datum NAD83
Descriptive Location ~150m N of T-26

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) _____
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.0 (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width 2.0 (m) Mean Water Depth _____ (cm)
_____ % Riffle _____ % Pool _____ % Run _____ % Flat
Evidence of eroding banks, Comments on bank stability minor undercut banks, well vegetated

Substrate (% cover)

Bedrock 20 Cobble 30 Sand _____ Silt _____ Muck _____
Boulder 30 Gravel _____ Clay _____ Marl 20 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% yellow birch, aspen, Sugar Maple

Adjacent Land Use

Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None

Migratory Obstructions (seasonal, permanent)

dry

Note any fish observations None

Waterbody Notes

Natural Watercourse _____ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Intermittent, Indirect
Lots of leaf litter within channel

4-4 u/s = 0689893, 5232605

4-4 d/s = 0689829, 5232832

Field Notes Authored by MF

Field Notes QA/QCed by Mellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Dry, No Fishing

Station # 4-5 Project Name Bow Lake Wind Farm
 Watercourse Name UNKNOWN Project # 1609 60734
 Photos 649-653 Field Staff NB, MF
 Date July 14/12 Time 13:25
 Weather conditions in previous 24 hrs yesterday = hot, 28°C, Today = 28°C, 2mm rain
 GPS Coordinates (Zone) 16T E N Datum NAD83
 Descriptive Location ~200m Northeast of RT-26

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time in situ measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 1.0 (m) Mean Water Depth _____ (cm)
 % Riffle _____ % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability minor scour + undercut on banks

Substrate (% cover)

Bedrock _____ Cobble 25 Sand 30 Silt 30 Muck _____
 Boulder 25 Gravel _____ Clay _____ Marl 20 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% sugar maple, fern sp., yellow birch
 Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
None

Migratory Obstructions (seasonal, permanent)
dry

Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry ☒

Other Habitat Notes, Incidental Wildlife Observations, etc.

Insect, Invertebrate
Lots of leaf litter in channel
Broadwinged Hawk w babies
4-545 = 0689988, 5232725
4-545 = 0689829, 5232837

Field Notes Authored by MF

Field Notes QA/QCed by MSellah



Delimited on map. No v/s or g/s co-ords

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Fish observed

Stantec

Station # 0-9
Watercourse Name unknown
Photos 631-633
Date July 13/12

Project Name Bow Lake Wind Farm
Project # 1609 60734
Field Staff NB, MF
Time 13:10

Weather conditions in previous 24 hrs No precip. Hot 28°C
GPS Coordinates (Zone) 16T E 0688535 N 5232792 Datum NAD83
Descriptive Location ~1.6km NNE of Bow Lake on proposed collector line

Water Quality

Dissolved Oxygen (mg/L) 5.57 pH 6.65 Conductivity (µS/cm) 24
Water Temperature (°C) 15.13 Air Temperature (°C) 27°C
Time in situ measurements taken 13:15

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m) Maximum Pool Depth 20 (cm)
Mean Bankfull Width 3.0 (m) Mean Water Depth 10 (cm)
30 % Riffle 30 % Pool 30 % Run 10 % Flat
Evidence of eroding banks, Comments on bank stability minor undercut bank well

Substrate (% cover)

Bedrock	<u>30</u>	Cobble	<u>30</u>	Sand		Silt		Muck
Boulder	<u>50</u>	Gravel		Clay		Marl		Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

90% fan sp, yellow birch, sugar maple

Adjacent Land Use

forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Spawning, forage, nursery

Migratory Obstructions (seasonal, permanent)

none observed

Note any fish observations Fish sp observed (3 individuals)

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc. Permanent, Direct

Field Notes Authored by MF

Field Notes QA/QCed by MB



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 0-7 Project Name Bow Lake Wind Farm
 Watercourse Name unknown Project # 1609 60734
 Photos 624-626 Field Staff NB, MF
 Date July 13/12 Time 12:15
 Weather conditions in previous 24 hrs No precipitation. Hot, 28°C
 GPS Coordinates (Zone) 16T E N Datum NAD83
 Descriptive Location ~ 1km NNE of Bow Lk. on proposed collector line

Water Quality

Dissolved Oxygen (mg/L) 4.79 pH 6.44 Conductivity (µS/cm) 38
 Water Temperature (°C) 16.64 Air Temperature (°C) 27°C
 Time in situ measurements taken 12:20

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width 1.2 (m) Mean Water Depth 5 (cm)
60 % Riffle 40 % Pool 0 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability minor scour on d/s banks

Substrate (% cover)

Bedrock 0 Cobble 20 Sand 20 Silt 40 Muck 0
 Boulder 0 Gravel 0 Clay 0 Marl 20 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
70% balsam bir, sugar maple, Fern sp.

Adjacent Land Use
Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Possible spawn closer to d/s area. Forage + nursery, spawn in pooled area u/s
 Migratory Obstructions (seasonal, permanent)
Fish barrier between d/s u/s area, lack of water.
 Note any fish observations none

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

Intermittent (dependent on pond levels on u/s side)
0-7 u/s = 0688781, 5232376
0-7 d/s = 0688638, 5232439

Field Notes Authored by MF

Field Notes QA/QCed by NB



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

0-4 d/s = 0089231 5231981
0-4 d/s = 0088972 5231932

No fishing
Brook Trout
observed in
40cm pool

Station # 0-4
Watercourse Name unknown
Photos 614-616
Date July 13/12
Weather conditions in previous 24 hrs No precip. Hot, 27°C
GPS Coordinates (Zone) 16T E N Datum NAD83
Descriptive Location ~400m NNE of Bow Lake on the proposed Collector Line

Water Quality

Dissolved Oxygen (mg/L) 5.96 pH 7.27 Conductivity (µS/cm) 26
Water Temperature (°C) 14.53 Air Temperature (°C) 27°C
Time *in situ* measurements taken 11:17

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.7 (m) Maximum Pool Depth 40 (cm)
Mean Bankfull Width 1.5 (m) Mean Water Depth 5 (cm)
% Riffle 40 % Pool 60 % Run 60 % Flat
Evidence of eroding banks, Comments on bank stability minor scour on banks but well vegetated

Substrate (% cover)

Bedrock 15 Cobble 50 Sand 1 Silt 1 Muck 1
20 Boulder 5 Gravel 1 Clay 1 Marl 10 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% sugar maple, fern sp, balsam Ar.
Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, nursery, forage

Migratory Obstructions (seasonal, permanent)
low water levels

Note any fish observations ~6" Brook Trout observed (4 individuals)

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

Direct, Intermittent
0-4 u/s = 0089231, 5231981
0-4 d/s = 0088972, 5231932

Field Notes Authored by MF

Field Notes QA/QCed by MB



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Fished

Stantec

Station # 0-10 Project Name Bow Lake Wind Farm
 Watercourse Name Negick Lake Project # 1609 60734
 Photos 655-670 Field Staff NB, MF
 Date July 14/12 Time 15:10
 Weather conditions in previous 24 hrs Yesterday = Hot 28°C Today = 2mm rain, 27°C
 GPS Coordinates (Zone) 16T E 0689233 N 5231378 Datum NAD83
 Descriptive Location @ Beaver dam @ west end of Negick.

Water Quality

Dissolved Oxygen (mg/L) 9.11 pH 6.32 Conductivity (µS/cm) 19
 Water Temperature (°C) 26.66 Air Temperature (°C) 28°C
 Time *in situ* measurements taken 15:10

Watercourse Dimensions & Morphology

Mean Watercourse Width 25.0 (m) Maximum Pool Depth 72.0 (cm)
 Mean Bankfull Width 30.0 (m) Mean Water Depth 71.2 (cm)
 % Riffle 100 % Pool 0 % Run 0 % Flat 0
 Evidence of eroding banks, Comments on bank stability none observed.

Substrate (% cover)

Bedrock		Cobble	<u>30</u>	Sand		Silt	<u>10</u>	Muck
Boulder	<u>30</u>	Gravel		Clay		Marl	<u>30</u>	Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

15% Buffalo berry, lily pads, algae mats

Adjacent Land Use

boat launch, beaver dam, ATV trails.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Spawn, Refuge, Nursery

Migratory Obstructions (seasonal, permanent)

None - Beaver dam destroyed

Note any fish observations Schools of Northern Redbelly dace, creek chub + 1x 8" Northern Pike observed

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by MF

Field Notes QA/QCed by MEE



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Minnow Traps
Set

Station # 0-11 Project Name Bow Lake Wind Farm
 Watercourse Name trib of Negick + Bow Lake Project # 1609 60734
 Photos 661-664 Field Staff NB, MF
 Date July 14 / 12 Time 15:30
 Weather conditions in previous 24 hrs Yesterday = 24°C hot, Today = 24°C rain, hot 27°C
 GPS Coordinates (Zone) 16T E 0689084 N 5231337 Datum NAD83
 Descriptive Location 150m ~ 100m west of west end of Negick Lake in stream on south side of ATV trail

Water Quality

Dissolved Oxygen (mg/L) 7.62 pH 6.29 Conductivity (µS/cm) 29
 Water Temperature (°C) 26.06 Air Temperature (°C) 28°C
 Time in situ measurements taken 15:30

Watercourse Dimensions & Morphology

Mean Watercourse Width 10.0 (m) Maximum Pool Depth 60 (cm)
 Mean Bankfull Width 20.0 (m) Mean Water Depth 30 (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability No erosion observed

Substrate (% cover)

Bedrock _____ Cobble 20 Sand 10 Silt 30 Muck _____
 Boulder 10 Gravel _____ Clay _____ Marl 30 Detritus _____

Riparian Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
10% emergent aquatic veg, yellow birch
 Adjacent Land Use ATV trails

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Spawn, Nursery, Forage

Migratory Obstructions (seasonal, permanent)
Spawn, Forage, Nursery None observed

Note any fish observations 100 Cyprinidae observed

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by MF

Field Notes QA/QCed by ME



Project Name Bow Lake Wind Farm Station Number 0-11
Project Number 160960734 Pass No. (if applicable) —
Photos 661-664 Date (yyyymmdd): July 14 / 12
Descriptive Location ~100m west of west end of Negick Lake in
stream South side of ATV trail
UTM coordinates 0689089 easting 5231337 northing zone 16T

Fishing Method (circle one): Backpack Boat Unit Model/Make
 Sampling Method (circle one): even habitat transect spot
 Effort (Electrofishing Seconds): _____ Number of Netters: _____ Number of Anodes: _____
Settings
 Frequency (Hz) _____ Voltage (volts) _____ Current (Amps) _____ Power (Watts) _____

Length of Stream Surveyed (m)

Station Characteristics:

Width (m): Range ~~10.0-20.0~~ Average: ~~25.0~~

Depth (m): Range ~~1.2-2.0~~ Average: 0.5

0.3-0.6

Water Clarity/Colour: tea / tannin
 Temperature (°C) 26.06
 pH 6.29

Water Velocity if Measured (m/s):	<u>N/A</u>
Conductivity (uS/cm)	<u>29</u>
Dissolved Oxygen (mg/L)	<u>7.62</u>

Set-July 14/12-1035
retrieved
Time 15:30-July 14/12

Catch Data

Species	Number of Fish	Comments (i.e. age, disease, etc):
Creek chub	1 (1)	
Observed schools of various cyprinidae		

Fish Measurements on Separate Sheet? Y/N

Field Staff: NB, MF

Notes By: MF

(Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 0-12 (Previously ST-1)

Watercourse Name unnamed

Photos 1153-1160

Date July 14/12

Weather conditions in previous 24 hrs Mostly clear, hot w ~1mm precip in past hour

GPS Coordinates (Zone) 16T E 6891488 N 5.230185 Datum NAD83

Descriptive Location NNW of proposed turbine #35 location 550m. Along proposed TAP Line (South of Mile 67 Road and Bow Lake)

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff Mike Johns, Mitch Ellah

Time 12:00

Water Quality

Dissolved Oxygen (mg/L) Dry pH Dry Conductivity (µS/cm) Dry

Water Temperature (°C) Dry Air Temperature (°C) ~23°C

Time *in situ* measurements taken Not recorded

Watercourse Dimensions & Morphology

Mean Watercourse Width Dry (m) Maximum Pool Depth 0 (cm)

Mean Bankfull Width 2.0 (m) Mean Water Depth 0 (cm)

% Riffle _____ % Pool _____ % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability Some undercutts but stable due to root mass, boulder and large woody debris

Substrate (% cover)

Bedrock	<u>10</u>	Cobble	<u>10</u>	Sand	<u>10</u>	Muck	
Boulder	<u>10</u>	Gravel		Clay	<u>50</u>	Detritus	

In-water Cover

Cover Types Present (circle): currently Dry Undercut Banks / Deep Pool _____ Watercress _____ Aquatic Veg _____
Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% shaded by Mature maple forest
Adjacent Land Use Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None

Migratory Obstructions (seasonal, permanent)

sections with high gradient. Low flow
Note any fish observations None Not Direct fish habitat

Waterbody Notes

Natural Watercourse / Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry /

Other Habitat Notes, Incidental Wildlife Observations, etc. Intermittent or Ephemeral stream. few pockets of standing water. Defined channel begins at upstream end of the reach assessed, at the coordinates above.

Field Notes Authored by Mike Johns

Field Notes QA/QCed by MEH



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 0-13 (previously ST-2)

Watercourse Name unnamed

Photos 1161 - 1163 (see photo log)

Date July 14/12

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff Mike Johns, Mitch Ellab

Time 12:35

Weather conditions in previous 24 hrs Mostly clear, hot, light rain in past 2 hours

GPS Coordinates (Zone) 16T E 689282 N 5230570 Datum NAD83

Descriptive Location ~845 m south of beaver dam between Negick and Bow Lake, on a TAP line.

Water Quality

Dissolved Oxygen (mg/L) 3.21

pH 5.98

Conductivity (µS/cm) 24

Water Temperature (°C) 14.00

Air Temperature (°C) ~22°C

Time in situ measurements taken 12:40

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.3 (m)

Maximum Pool Depth 20 (cm)

Mean Bankfull Width 1.4 (m)

Mean Water Depth 5 (cm)

0 % Riffle

20 % Pool

0 % Run

80 % Flat

Evidence of eroding banks, Comments on bank stability undercut banks, but stable due to boulder, wood and root mass

Substrate (% cover)

0

Bedrock

10

Cobble

15

Sand

Silt

Muck

40

Boulder

15

Gravel

Clay

Marl

20

Detritus

In-water Cover

Cover Types Present (circle):

Undercut Banks

Deep Pool

Watercress

Aquatic Veg

Overhanging Vegetation

Woody Debris

Boulder

Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% Shaded, Mixed Forest, maple dominant (mature)

Adjacent Land Use

Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None

Migratory Obstructions (seasonal, permanent)

Sections with steep gradient. Low flow

Note any fish observations

None - no direct fish habitat

Waterbody Notes

Natural Watercourse ✓

Trapezoidal Channel

Grassed Swale

Buried Tile

Surficial Drainage (i.e. furrows)

Dugout Pond

Dominated by Aquatic Veg

Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

standing water.

Field Notes Authored by Mike Johns

Field Notes QA/QCed by mgjllh



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 5-2
 Watercourse Name unnamed
 Photos 1151-1154
 Date July 13/12

Project Name Bow Lake Wind Farm
 Project # 1609 60734
 Field Staff Mike Johns, Mitch Ellah
 Time 13:40

Weather conditions in previous 24 hrs Hot dry, clear
 GPS Coordinates (Zone) 16T E 689161 N 5.229 472 Datum NAD83
 Descriptive Location 164 m ENE of proposed turbine #34 location

Water Quality

Dissolved Oxygen (mg/L) Dry pH Dry Conductivity (µS/cm) Dry
 Water Temperature (°C) Dry Air Temperature (°C) Dry
 Time in situ measurements taken not recorded, dry

Watercourse Dimensions & Morphology

Mean Watercourse Width Dry (m) Maximum Pool Depth Dry (cm)
 Mean Bankfull Width 1.4 (m) Mean Water Depth Dry (cm)
Dry % Riffle Dry % Pool Dry % Run Dry % Flat
 Evidence of eroding banks, Comments on bank stability undercuts common but stabilized by boulder and root mass

Substrate (% cover)

Bedrock	<u>10</u>	Cobble	<u>30</u>	Sand		Silt		Muck
<u>10</u> Boulder	<u>30</u>	Gravel		Clay		Marl	<u>20</u>	Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% shaded, mature deciduous

Adjacent Land Use

Forested

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None - Dry - not direct fish habitat

Migratory Obstructions (seasonal, permanent)

Low flow, fairly high gradient

Note any fish observations

None - not direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry ☒

Other Habitat Notes, Incidental Wildlife Observations, etc.

currently dry, intermittent or ephemeral channel ending @ small pond with water

Field Notes Authored by Mike Johns

Field Notes QA/QCed by MELlah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 5-3
Watercourse Name Unnamed
Photos 1155-1157
Date July 14/12

Project Name Bow Lake Wind Farm
Project # 1609 60734
Field Staff Mike Johns, Mitch Elleg
Time 11:14

Weather conditions in previous 24 hrs Hot, clear, no rain
GPS Coordinates (Zone) 16T E 689542 N 5229534 Datum NAD83
Descriptive Location ~200m west of proposed turbine #35 location

Water Quality

Dissolved Oxygen (mg/L) 2.46 pH 6.05 Conductivity ($\mu\text{S/cm}$) 25
Water Temperature ($^{\circ}\text{C}$) 14.72 Air Temperature ($^{\circ}\text{C}$) 23^{\circ}\text{C}
Time *in situ* measurements taken 11:15

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.50 (m) Maximum Pool Depth 206 (cm)
Mean Bankfull Width 1.3 (m) Mean Water Depth 4 (cm)
0 % Riffle 25 % Pool 0 % Run 75 % Flat
Evidence of eroding banks, Comments on bank stability stable banks

Substrate (% cover)

Bedrock	<u>10</u>	Cobble	<u>20</u>	Sand		Silt	<u>20</u>	Muck
Boulder	<u>20</u>	Gravel		Clay		Marl	<u>20</u>	Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
95% Mature Maple, fern ground cover
Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
None

Migratory Obstructions (seasonal, permanent)
low flow

Note any fish observations No fish observed, not direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc. Spring Peeper, Green Frog

Field Notes Authored by Mike Johns

Field Notes QA/QCed by MEll



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 6-1 Project Name Bow Lake Wind Farm
 Watercourse Name Unnamed Project # 1609 60734
 Photos 1133 - 1136 Field Staff Mike Johns, Mitch Ellah
 Date July 12/12 Time 13:05
 Weather conditions in previous 24 hrs Sunny, no precip, light winds
 GPS Coordinates (Zone) 16T E 688 956 N 5.228 414 Datum NAD83
 Descriptive Location 187m East, slightly south of proposed turbine #36 location

Water Quality

Dissolved Oxygen (mg/L) 4.95 pH 5.72 Conductivity (µS/cm) 18
 Water Temperature (°C) 15.23 Air Temperature (°C) ~25
 Time in situ measurements taken 13:10

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.8 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 1.2 (m) Mean Water Depth 5 (cm)
0 % Riffle 50 % Pool 0 % Run 50 % Flat
 Evidence of eroding banks, Comments on bank stability stable banks due to rock and root mass

Substrate (% cover)

0 Bedrock 20 Cobble 10 Sand 10 Muck
20 Boulder 15 Gravel 5 Clay 25 Marl 25 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

90% shaded, mixed forest

Adjacent Land Use

forest (maple, cedar, birch)

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

None

Migratory Obstructions (seasonal, permanent)

low flow

Note any fish observations

None - no direct fish habitat

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Green Frogs

no observable flow pockets of standing water

Black throated Green Warbler, Ruffed Grouse

Field Notes Authored by Mike Johns

Field Notes QA/QCed by M. Ellah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9F-10 Project Name Bow Lake
 Watercourse Name W47 Lake - unnamed Project # 160960771
 Photos 9730 - 9733 Field Staff Joe Kane Mitch Ellah
 Date 2012/08/27 Time 1:30 pm
 Weather conditions in previous 24 hrs Scattered Showers - Fog in Morning
 GPS Coordinates (Zone) 16T E 688607 N 5227591 Datum NAD83
 Descriptive Location Lake W47 @ South boundary of project Area, west of W49

Water Quality

Dissolved Oxygen (mg/L) 8.51 pH 6.86 Conductivity (μ S/cm) 16
 Water Temperature ($^{\circ}$ C) 23.74 Air Temperature ($^{\circ}$ C) 26 $^{\circ}$ C
 Time *in situ* measurements taken 1:33 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width Lake (m) Maximum Pool Depth 2m + (cm)
 Mean Bankfull Width Lake (m) Mean Water Depth — (cm)
 % Riffle 100 % Pool — % Run — % Flat —
 Evidence of eroding banks, Comments on bank stability Cobble/gravel banks - stable

Substrate (% cover)

Bedrock 30 Cobble 20 Sand 10 Silt — Muck —
 Boulder 40 Gravel — Clay — Marl — Detritus —

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress — Aquatic Veg —
 Overhanging Vegetation Woody Debris Boulder — Other —

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
< 5% Shrub.

Adjacent Land Use

Forest - Natural - Access road, cottage.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

Beaver activity - lodge on North shore.

Note any fish observations none observed

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel — Grassed Swale — Buried Tile —
 Surficial Drainage (i.e. furrows) — Dugout Pond — Dominated by Aquatic Veg — Dry —

Other Habitat Notes, Incidental Wildlife Observations, etc.

Evidence of hunting - shells. - ducks

Field Notes Authored by Joe Kane

Field Notes QA/QCed by Mitch Ellah



Stantec

Fishing Record and Catch Results (passive collection methods) Page 1 of 1

Project Number 160960771

Station Number 9F-10

Project Name: Bow Lake

Lift / Haul / Pass No. 1

Waterbody Name: W47- unnamed lake

Date (yyyymmdd): 2012/08/27

Field Staff: Tue Kane & Mitch Ellah

Fishing Method (check one) and Gear Specs: ☐ Gillnet No. of Panels: Mesh Sizes:
☐ Trap Net
☐ Hoop Net
☒ 2x Minnow Trap
☐ Other (specify)

Descriptive Location of Station Lake 47 on southeast shoreline beside cottage.

UTM Coordinates: Zone 16T Easting 688607 Northing 6227591

SET: Date: 2012/08/27 LIFT: Date: 2012/08/28 Total Netting Hours (approx.) 21 hrs
Time: 1:36 pm Time: 10:20 am

Station Depth (m): Max: 0.7 Min: 0.6

Supporting Measurements (recorded at time of net set)

Depth (m)	Temp. (°C)	D.O. (mg/L)	pH	Cond. (µS/cm)
0.4 - 0.8	23.74	8.51	6.86	16

Time 1:33

Additional Catch Data on Separate Sheet?: Y/N

Detailed Fish Measurements on Separate Sheet? Y/N

Catch Data

Mesh Size	Species	Number	Comments (i.e. age, disease, etc.)
Trap #1	No catch		
Trap #2	No catch		



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9F-9 Project Name Osw Lake
 Watercourse Name V-48 Project # 160960771
 Photos 9723 9729 Field Staff Joe Kase MSUch
 Date 2012/08/27 Time 12:37 pm
 Weather conditions in previous 24 hrs Scattered Showers, Fog in morning
 GPS Coordinates (Zone) 16T E 688850 N 5227497 Datum NAD83
 Descriptive Location Creek & in-line pond between W47 Lake & W49 Lake

Water Quality

Dissolved Oxygen (mg/L) 8.25 pH 7.35 Conductivity (µS/cm) 15
 Water Temperature (°C) 24.46 Air Temperature (°C) 26°C
 Time in situ measurements taken 12:48 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width dry (m) Maximum Pool Depth 2m+ (cm)
 Mean Bankfull Width 4m (m) Mean Water Depth 21m (cm)
 % Riffle 100 % Pool 0 % Run 0 % Flat 0
 Evidence of eroding banks, Comments on bank stability undercuts, erosion along banks

Substrate (% cover)

Bedrock 30 Cobble 20 Sand 20 Silt 0 Muck 0
 Boulder 30 Gravel 0 Clay 0 Marl 0 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder 0 Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

Creek 80% shaded, pond 25% shaded

Adjacent Land Use

Natural Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

refuge pool for creek

Migratory Obstructions (seasonal, permanent)

Dry creek bed w/ sds of pond. beaver dams along creek

Note any fish observations Cyprinids in pond

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☐ Dry ☒ creek

Other Habitat Notes, Incidental Wildlife Observations, etc.

Looks like alot of sediment transport happens in this creek during Freshet.
Green Frogs

Field Notes Authored by Joe Kase

Field Notes QA/QCed by MSUch



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9F-8 Project Name Bow Lake
 Watercourse Name W-49 Lake - Unknown Project # 160960771
 Photos 9717-9722 Field Staff Joe Kure Mitch Elah
 Date 2012/08/27 Time 12:10 pm
 Weather conditions in previous 24 hrs Saturated Shores, Fog in morning
 GPS Coordinates (Zone) 16T E 689091 N 5227433 Datum NAD83
 Descriptive Location Lake W49 @ SE End of Project Area west of W53 & W55

Water Quality

Dissolved Oxygen (mg/L) 7.27 pH 7.18 Conductivity (µS/cm) 30
 Water Temperature (°C) 24.52°C Air Temperature (°C) 25°C
 Time in situ measurements taken 12:12 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width Lake (m) Maximum Pool Depth 2 m + (cm)
 Mean Bankfull Width Lake (m) Mean Water Depth 0.5 - 1 m est. (cm)
 % Riffle 100 % Pool 0 % Run 0 % Flat 0
 Evidence of eroding banks, Comments on bank stability stable, guessed

Substrate (% cover)

Bedrock 20 Cobble 20 Sand 0 Silt 20 Muck 0
 Boulder 20 Gravel 0 Clay 0 Marl 20 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
25%

Adjacent Land Use

Natural Forest, mixed

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Cypriids

Migratory Obstructions (seasonal, permanent)
none observed

Note any fish observations Cypriids schools,
Pike observed in previous visit.

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel ☐ Grassed Swale ☐ Buried Tile ☐
 Surficial Drainage (i.e. furrows) ☐ Dugout Pond ☐ Dominated by Aquatic Veg ☒ Dry ☐

Other Habitat Notes, Incidental Wildlife Observations, etc. pables of Nuphar & Potamogeton +
nymphs

Field Notes Authored by Joe Kure

Field Notes QA/QCed by MEH



Stantec

Fishing Record and Catch Results (passive collection methods) Page 1 of 1

Project Number: 160960771
 Project Name: Bow Lake
 Waterbody Name: W49 - Unknown Lake
 Field Staff: Ove Rene Mitch Ellah

Station Number: 9F-8
 Lift / Haul / Pass No.: 1
 Date (yyyymmdd): 2012/08/27

Fishing Method (check one) and Gear Specs:

Gillnet _____ No. of Panels: _____ Mesh Sizes: _____
 Trap Net _____
 Hoop Net _____
 2x Minnow Trap _____
 Other (specify) _____

Descriptive Location of Station _____

UTM Coordinates: Zone 16T Easting 689091 Northing 5227433

SET: Date: 2012/08/27 LIFT: Date: 2012/08/27 Total Netting Hours (approx.) 21.5 hrs.
 Time: 12:17 pm Time: 9:45 am

Station Depth (m): Max: 1.4m Min: 0.30

Supporting Measurements (recorded at time of net set)

Depth (m)	Temp. (°C)	D.O. (mg/L)	pH	Cond. (µS/cm)
0.20	24.52	7.27	7.18	30

Time 12:17 pm

Additional Catch Data on Separate Sheet?: Y/N

Detailed Fish Measurements on Separate Sheet? Y/N

Catch Data

Mesh Size	Species	Number	Comments (i.e. age, disease, etc.)
Try #1	Creek Chub	☒☒☒☒☒☒☒	
	Northern Pike		
	Fathead Minnow		
Try #2	Creek Chub	☒☒	Larger - good condition
	White Sucker		



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9F-1 Project Name Bow Lake Wind Farm
 Watercourse Name unnamed Project # 1609 60734
 Photos 1106 - 1110 Field Staff Mike Johns, Mitch Ellah
 Date July 11/12 Time 15:20
 Weather conditions in previous 24 hrs Hot, mostly clear, no rain
 GPS Coordinates (Zone) 16T E 689307 N 5227552 Datum NAD83 WPT 9F-1
 Descriptive Location ~ 60m SE of intersection of Mile 67 Road and Trim Lake Road

Water Quality

Dissolved Oxygen (mg/L) 9.64 pH 6.21 Conductivity (µS/cm) 20
 Water Temperature (°C) 17.20 Air Temperature (°C) ~24°C
 Time in situ measurements taken 15:25

Watercourse Dimensions & Morphology

Mean Watercourse Width 2m (m) Maximum Pool Depth ~30 (cm)
 Mean Bankfull Width 5m (m) Mean Water Depth ~5 (cm)
50 % Riffle 10 % Pool 20 % Run 20 % Flat
 Evidence of eroding banks, Comments on bank stability Some undercut banks, but generally stable due to boulder, large organic debris and root mass

Substrate (% cover)

Bedrock	<u>30</u>	Cobble	<u>20</u>	Sand		Silt		Muck
<u>20</u> Boulder	<u>25</u>	Gravel		Clay		Marl	<u>5</u>	Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% shaded, Mature Deciduous

Adjacent Land Use

Natural - Forest, lake

Fish Habitat Potential Possible Brook Trout spawning habitat in lower reach near lake.
 Critical Habitat (spawning or nursery areas, groundwater upwellings)

None but may support downstream thermal regimes

Migratory Obstructions (seasonal, permanent)

low flow, steep gradient

Note any fish observations Some small fish observed, minnow traps set

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

conduct fall spawning survey here. Cray fish present.

Field Notes Authored by Mike Johns

Field Notes QA/QCed by Mellish



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9-F-7 Project Name Bow Lake
 Watercourse Name Unknown W53 Project # 160960771
 Photos 9713 - 9716 Field Staff Dakota Mott, Ella
 Date 2012/06/27 Time 11:45 am
 Weather conditions in previous 24 hrs scattered showers - fog in morning
 GPS Coordinates (Zone) 16T E 689456 N 5227803 Datum NAD83
 Descriptive Location W53 Lake - dry - only creek remains - west of W55, south of access road
@ SE end of project area

Water Quality

Dissolved Oxygen (mg/L) 6.91 pH 7.49 Conductivity (µS/cm) 29
 Water Temperature (°C) 20.39 Air Temperature (°C) 25.02
 Time *in situ* measurements taken 11:44 am

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.2-1.5 (m) Maximum Pool Depth 0.5 m (cm)
 Mean Bankfull Width Flood plain - lake (m) 0.5 Mean Water Depth 0.3 m (cm)
25% % Riffle 25% % Pool 50% % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability no eroding banks but well vegetated

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 20 Silt _____ Muck _____
<5% Boulder _____ Gravel 30 Clay _____ Marl 35 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

50% - riparian veg - Red Pine, Weeds, grasses

Adjacent Land Use

Cultivated, forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Cyprinid spawning - nursery & feeding common

Migratory Obstructions (seasonal, permanent)

Note any fish observations Cyprinids in pools

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg ☒ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by Dakota

Field Notes QA/QCed by MSM



Fishing Record and Catch Results (passive collection methods) Page 1 of 1

Project Number 160960771
 Project Name: Dow Lake
 Waterbody Name: W53 - Unknown Creek
 Field Staff: Joe Keane & Mitch Ellah

Station Number 9F-7
 Lift / Haul / Pass No. 1
 Date (yyyymmdd): 2012/08/27

Fishing Method (check one) and Gear Specs: ☐ Gillnet No. of Panels: Mesh Sizes:
☐ Trap Net
☐ Hoop Net
☒ Minnow Trap
☐ Other (specify)

Descriptive Location of Station West of W-55 Lake. Os of Beaver Dam @ Lake W53

UTM Coordinates: Zone 16T Easting 689456 Northing 5227803

SET: Date: 2012/08/27 LIFT: Date: 2012/08/28 Total Netting Hours (approx.) 22
 Time: 11:45 am Time: 9:30 am

Station Depth (m): Max: 0.5 m Min: 0.3 m

Supporting Measurements (recorded at time of net set)

Depth (m)	Temp. (°C)	D.O. (mg/L)	pH	Cond. (µS/cm)
0.1 m	20.39	6.91	7.49	29

Time 11:44 am

Additional Catch Data on Separate Sheet?: Y/N

Detailed Fish Measurements on Separate Sheet? Y/N

Photos # 9749-9751

Catch Data

Mesh Size	Species	Number	Comments (i.e. age, disease, etc.)
Trap #1	Brook Trout	1	
	Northern Redbelly Dace	11	
	Creek Chub	1	
Trap #2	Brook Trout	1	
	Northern Redbelly Dace	22	
	Creek Chub	1	



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9F-2 Project Name Bow Lake Wind Farm
 Watercourse Name unnamed Project # 1609 60734
 Photos 1111 - 1114 Field Staff Mike Johns, Mitch Ellah
 Date July 12/12 Time 9:40 AM
 Weather conditions in previous 24 hrs sunny, no precipitation, light winds
 GPS Coordinates (Zone) 16T E 689519 N 5228 021 Datum NAD83
 Descriptive Location Wetland area upstream from 9F-1 and between two small lakes, ~560 m SSE of proposed Turbine #39 location, on east side of road.

Water Quality

Dissolved Oxygen (mg/L) 6.90 pH 5.82 Conductivity (µS/cm) 19
 Water Temperature (°C) 22.2°C Air Temperature (°C) 20°C
 Time in situ measurements taken 09:50, July 12, 2012

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.7 (m) Maximum Pool Depth 70 (cm)
 Mean Bankfull Width 2.0 (m) Mean Water Depth 10 (cm)
10 % Riffle 10 % Pool 10 % Run 70 % Flat
 Evidence of eroding banks, Comments on bank stability No eroding banks.
Stable banks in wetland area

Substrate (% cover)

Bedrock 5 Cobble 30 Sand 5 Silt _____ Muck _____
 Boulder 30 Gravel _____ Clay _____ Marl 30 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder _____ Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
10% cover Riparian cover
 Adjacent Land Use Natural (wetland, forest) and gravel road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Provides habitat for all life stages of resident fish/cyprinids
 Migratory Obstructions (seasonal, permanent) _____

Note any fish observations Northern Redbelly Dace observed, see fish collection form

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg ☒ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. Bullhead Lillies
Ribbon leaf pond weed, sedges

Field Notes Authored by Mike Johns

Field Notes QA/QCed by MEllah



VPT 9E-7 UTM coordinates 689519 easting 5228021 northing zone 16T

Notes By: No diagram
(Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9F-6 Project Name Bow Lake
 Watercourse Name Unknown Lake W55 Project # 160960771
 Photos 9708-9712 Field Staff Joe Kane Mitch Ellak
 Date 2012/08/27 Time 11:10 am
 Weather conditions in previous 24 hrs Scattered Showers, heavy fog
 GPS Coordinates (Zone) 16T E 689656 N 5228076 Datum NAD 83
 Descriptive Location Pond W55 on south side of access Road @ SE end of
Project Location

Water Quality

Dissolved Oxygen (mg/L) 8.80 pH 8.57 Conductivity (µS/cm) 16
 Water Temperature (°C) 23.4 Air Temperature (°C) 24.0
 Time in situ measurements taken 11:17 am

Watercourse Dimensions & Morphology

Mean Watercourse Width Lake (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width Lake (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable, grassy

Substrate (% cover)

Bedrock 20 Cobble 20 Sand 20 Silt 10 Muck
 Boulder 40 Gravel 40 Clay _____ Marl 10 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder _____ Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
< 5% along shoreline, riparian trees
 Adjacent Land Use Natural Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
30 x 20 cm Redd near beaver dam
 Migratory Obstructions (seasonal, permanent)
Beaver dam to the west
 Note any fish observations several cypriids in shallows

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. schools of cypriids & redds

Field Notes Authored by Joe Kane

Field Notes QA/QCed by MSellak



Fishing Record and Catch Results (passive collection methods) Page 1 of 1

Stantec

Project Number 160960771
 Project Name: Bow Lake
 Waterbody Name: W55 - Unknown Lake
 Field Staff: Joe Kern & Mitch Ellah

Station Number 9F-6
 Lift / Haul / Pass No. 1
 Date (yyyymmdd): 2012/08/27

Fishing Method (check one) and Gear Specs: ☐ Gillnet No. of Panels: Mesh Sizes:
☐ Trap Net
☐ Hoop Net
☒ Minnow Trap
☐ Other (specify)

Descriptive Location of Station NW end of lake near road access by turn-around

UTM Coordinates: Zone 16T Easting 68956 689656 Northing 5228076

SET: Date: 2012/08/27 LIFT: Date: 2012/08/28 Total Netting Hours (approx.) 22 hrs.
 Time: 11:15am Time: 9:07

Station Depth (m): Max: 0.65 Min: 0.30

Supporting Measurements (recorded at time of net set)

Depth (m)	Temp. (°C)	D.O. (mg/L)	pH	Cond. (µS/cm)
0.10	23.4	8.80	8.57	16.

Time 11:17am

Additional Catch Data on Separate Sheet?: Y/N

Detailed Fish Measurements on Separate Sheet? Y/N

Catch Data

Mesh Size	Species	Number	Comments (i.e. age, disease, etc.)
1/2" #1	Worthern Rock Bass	1: (65)	
1/2" #2	Worthern Rock Bass	1: (20)	
	Rock Bass	1	



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9F-3

Watercourse Name unnamed

Photos 1120 → 1129

Date July 12/12

Project Name Bow Lake Wind Farm

Project # 1609 60734

Field Staff Mike Johns, Mitch Ellah

Time 10:30

Weather conditions in previous 24 hrs sunny, no precip, light winds

GPS Coordinates (Zone) 16T E 689 793 N 5 228 283 Datum NAD83

Descriptive Location 820 m NE of intersection of Trim Lake Road and mile 67 Road

Water Quality

Dissolved Oxygen (mg/L) 8.47 pH 6.15 Conductivity (µS/cm) 28

Water Temperature (°C) 14.75 Air Temperature (°C) ~24

Time *in situ* measurements taken 10:30 AM

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.2 (m) Maximum Pool Depth 40 (cm)

Mean Bankfull Width 1.6 (m) Mean Water Depth 10 (cm)

10 % Riffle 40 % Pool 5 % Run 45 % Flat

Evidence of eroding banks, Comments on bank stability Undercut, but stabilized by boulders and root mass

Substrate (% cover)

10 Bedrock 30 Cobble 25 Sand 10 Silt 10 Muck
Boulder 25 Gravel 10 Clay 10 Marl 10 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg

Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 100% (except for very short section where channel crosses road)

Adjacent Land Use Forest, forest access road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) Potential Brook Trout spawning in lower reaches of watercourse

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations you Brook Trout observed and captured by dip net. No further fishing conducted.

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. No culvert at road. very low flow July 12, 2012 and water flows sub-surface at present time, and slow rate. During higher waters, stream would flow over road.

Field Notes Authored by Mike Johns

Field Notes QA/QCed by MEllah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9F-4 Project Name Bow Lake Wind Farm
 Watercourse Name unnamed Project # 1609 60734
 Photos 1130 - 1132 (see photo log) Field Staff Mike Johns, Mitch Ellah
 Date July 12 / 12 Time 11:05 AM
 Weather conditions in previous 24 hrs clear, hot, no rain
 GPS Coordinates (Zone) 16T E 6898 20 N 5228 502 Datum NAD83
 Descriptive Location ~520 m east of proposed Turbine 39 location
Tributary to 9F-3

Water Quality

Dissolved Oxygen (mg/L) 9.69 pH 6.09 Conductivity (µS/cm) 20
 Water Temperature (°C) 16.70 Air Temperature (°C) ~24
 Time *in situ* measurements taken 11:15 AM, July 12, 2012

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.7 (m) Maximum Pool Depth 25 (cm)
 Mean Bankfull Width 3.5 (m) Mean Water Depth 5 (cm)
5 % Riffle 40 % Pool 5 % Run 50 % Flat
 Evidence of eroding banks, Comments on bank stability well vegetated, bedrock banks

Substrate (% cover)

<u>25</u>	Bedrock	<u>20</u>	Cobble	<u>10</u>	Sand		Silt		Muck
<u>15</u>	Boulder	<u>20</u>	Gravel		Clay		Marl	<u>10</u>	Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)

100% Riparian Shading, mature maple stand

Adjacent Land Use

Forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Potential Brook Trout spawning

Migratory Obstructions (seasonal, permanent)

Low Flow - isolated pools

Note any fish observations Brook Trout observed in isolated pools.

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. upstream of 9F-4 start: at
689733E, 5228563N. (9F4-US). Bedrock near surface prevents
deep channel erosion and channel is very wide for a first
order stream.

Field Notes Authored by Mike Johns

Field Notes QA/QCed by MEllah



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9-F-5 Project Name Bow Lake
 Watercourse Name unnamed Project # 160960771
 Photos 2704-2707 Field Staff JK, ME
 Date 2012/08/27 Time 10:40 AM
 Weather conditions in previous 24 hrs fraggy, light rain, light winds
 GPS Coordinates (Zone) 16T E 690105 N 5229060 Datum 16T NAD83
 Descriptive Location SE end of project location @ NE end of chain of lakes

Water Quality

Dissolved Oxygen (mg/L) 6.62 pH 8.46 Conductivity (μ S/cm) 22
 Water Temperature ($^{\circ}$ C) 21.68 $^{\circ}$ C Air Temperature ($^{\circ}$ C) 22 $^{\circ}$ C
 Time in situ measurements taken 10:40 am

Watercourse Dimensions & Morphology

Mean Watercourse Width — (m) pond Maximum Pool Depth 1 m est (cm)
 Mean Bankfull Width — (m) Mean Water Depth 0.5 m (cm)
— % Riffle 100 % Pool — % Run — % Flat
 Evidence of eroding banks, Comments on bank stability stable gussy banks

Substrate (% cover)

Bedrock — Cobble — Sand 40 Silt — Muck —
 Boulder — Gravel — Clay — Marl 60 Detritus —

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other —

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
< 50% @ shores

Adjacent Land Use

Natural Forest - logging

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

Isolated beaver pond

Note any fish observations none observed

Waterbody Notes

Natural Watercourse ☒ Trapezoidal Channel — Grassed Swale — Buried Tile —
 Surficial Drainage (i.e. furrows) — Dugout Pond — Dominated by Aquatic Veg — Dry —

Other Habitat Notes, Incidental Wildlife Observations, etc. shallow wetland pond, lots of
dead trees - beaver pond? old. - green frogs - some algae

Field Notes Authored by Ove Kees

Field Notes QA/QCed by mitcheled



QAQC: mcll