

Appendix C

Field Notes



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
↳ NO ACCESS
↳ NO PICS
↳ NO GPS

Stantec

Station # 1-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 22/12 Time _____
 Weather conditions in previous 24 hrs hot & humid ~32°C +
 GPS Coordinates (Zone) 17T E N Datum Nad83
 Descriptive Location N of Rail line and Greenlane, west of Andrews Court

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25°C
 Time *in situ* measurements taken _____

no access

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.3 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2 (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%
 Adjacent Land Use orchard, early

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) _____
 Note any fish observations no access

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 access, seen from distance

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 2-1
 Watercourse Name unknown
 Photos _____
 Date June 22/12
 Weather conditions in previous 24 hrs hot humid ~32°C+
 GPS Coordinates (Zone) 17T E 621730 N 4781286 Datum Nad83
 Descriptive Location off of Kings Street, East of Thirty Rd

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Reene, K. Clayton
 Time 10:35

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 3.5 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock 40 Cobble _____ Sand 40 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) 75% trees, mature
 Adjacent Land Use residential, bushlot, roads

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent) dry - perched culvert
 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.

channel is defined - has boulders & cobble, overhanging veg is sumac, walnut, ruga-made, manitoba maple, grape

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



outside Project Loch Aug 26 mp.

REA X

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 2-2 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 22/12 Time 10:46
 Weather conditions in previous 24 hrs hot & humid, ~32°C+
 GPS Coordinates (Zone) 17T E 622067 N 4781132 Datum Nad83
 Descriptive Location _____

Water Quality

Dissolved Oxygen (mg/L) 8.00 pH 8.70 Conductivity (µS/cm) 835
 Water Temperature (°C) 20.10 Air Temperature (°C) 25°C
 Time *in situ* measurements taken 10:46

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth 0.20 (cm)
 Mean Bankfull Width 2.5 (m) Mean Water Depth 0.15 (cm)
50 % Riffle 30 % Pool 20 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 75%, trees, mature

Adjacent Land Use

bushlot, Road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) Spawning, nursery, foraging

Migratory Obstructions (seasonal, permanent) fairly dry

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.

a little trickle of water in channel - defined channel in lots of gravel & cobble shaded by jewelweed, walnuts & sugar maple. East side of Road is more open w/ rock piles along bank w/ soil falling on shaded by willow
 Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA ²⁷

Stantec

Station # 2-3 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 22/12 Time 10:55
 Weather conditions in previous 24 hrs hot & humid, ~32°C
 GPS Coordinates (Zone) 17T E 622300 N 4781050 Datum Nad83
 Descriptive Location off of King Street, east of 2-2

Water Quality

- dry
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

- dry
 Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock 50 Cobble _____ Sand 40 Silt _____ Muck _____
 Boulder 10 Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

75%, trees, mature
residential, Road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawning, nursery, foraging.
 Migratory Obstructions (seasonal, permanent) dry

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.

channel well defined in cobble & boulders, shaded by sumac, grape, virginia creeper, maples

Field Notes Authored by K. Clayton

Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 3-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Vegne, K. Clayton
 Date June 20/12 Time 11:19
 Weather conditions in previous 24 hrs hot & humid, ~32°C
 GPS Coordinates (Zone) 17T E 622156 N 4780325 Datum NAD83
 Descriptive Location off of Mainview Road, North of McLeod Rd

Water Quality

- Dry
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 4 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

- all vegetated
 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 _____
Typha Phragmites

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
85% Typha, early

Adjacent Land Use

grape vine orchard, woodlot, Road.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)
dry

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.

REA has deep defined channel along Road, dominated by Typha & Phragmites, on west side of Mainview channel flows into forest. Shaded by willow, maple, grape etc.

Field Notes Authored by K. Clayton

Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 3-2
 Watercourse Name unknown
 Photos see photo log
 Date June 22/12
 Weather conditions in previous 24 hrs hot & humid ~32°C+
 GPS Coordinates (Zone) 17T E 622170 N 4779879 Datum Nad83
 Descriptive Location off of Mainstay View Rd, NW of McCleod Street

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Keone, K. Clayton
 Time 11:33

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble 20 Sand 50 Silt _____ Muck _____
 Boulder _____ Gravel 10 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% trees, mature
 Adjacent Land Use backlot, Road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) dry - perched culvert - extreme slope
 Note any fish observations _____

Waterbody Notes

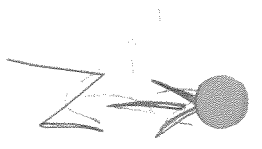
Natural Watercourse Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

channel is shallow, w grass made; Sumac surrounding it.

Field Notes Authored by K. Clayton

Field Notes QA/QCed by ME





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 3-3 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos see photo log Field Staff J. Keene, K. Clayton
 Date June 22/12 Time 12:00
 Weather conditions in previous 24 hrs Hot & humid, ~32°C +
 GPS Coordinates (Zone) 17T E 622189 N 4779381 Datum NAD83
 Descriptive Location off of Mountain view rd south of 2-2

Water Quality No water
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25°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 10 Sand 50 Silt _____ Muck _____
 Boulder 10 Gravel 30 Clay _____ Marl _____ Detritus _____

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

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
95% Typha, early
 Adjacent Land Use Residential, Road, garden nursery

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) dry
 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.
channel is diked however possibly due to garden center next door creating a berm next to it. Dominated by Typha. ON East side it's a potential REA, on west side it's not.

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

REA
↳ on west side
non-REA
grassy
on East side

Station # 4-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos see photo log Field Staff J. Keene, K. Clayton
 Date June 22/12 Time 12:12
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 622208 N 478942 Datum NAD83
 Descriptive Location off of Mainview Rd, south of 3-3.

Water Quality

Dissolved Oxygen (mg/L) _____ pH Dry Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.2 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 80 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) 15% typha, early
 Adjacent Land Use grape vines

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) dry
 Note any fish observations _____

Waterbody Notes

Natural Watercourse west side 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.

Small shallow channel w aquatic veg (Typha). - Water flowing on west side, vety dry on east. West side is in a bush lot w Virginia creeper, sumac, Walnut & grape.

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



No longer in Project Loc'n map.

REA X

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 5-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 22/12 Time 10:15
 Weather conditions in previous 24 hrs Hot humid, ~32°C+
 GPS Coordinates (Zone) 17T E 620602 N 4780419 Datum NAD83
 Descriptive Location off of Ridge Road East, west of Thirty Rd.

Water Quality

-Dry
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 10 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

100 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)
45%, RCGs, early
 Adjacent Land Use Residential, Road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent)
dry
 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.

deep, defined channel, bedrock on south side of Rd, cobbles/boulders on North side of Road & completely forested (100% shaded), south side open
↳ North side has summer Virginia Creeper, walnuts, river bank grape

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



No longer in Project Loch MP

X

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 5-2 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff K. Clay
 Date June 22/12 Time 10:21
 Weather conditions in previous 24 hrs hot & humid ~ 32°C
 GPS Coordinates (Zone) 17T E 620937 N 4780534 Datum Nad83
 Descriptive Location off of Thirty Rd, N of Elm tree Rd + Valentino Rd

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

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

Substrate (% cover)

Bedrock 50 Cobble _____ Sand 40 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% trees, mature

Adjacent Land Use

bushlot, orchard, road

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
dry - perched culvert & steep slope

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.

deep, defined channel /
 is Typha, has cobble & boulders as substrate w/ underlying silt.
 Channel goes through grape vine orchard & flows in bushlot
 portion of channel that goes through bushlot - surrounded by Barr wood, walnut,
 Junco, riverbank grape etc - very steep on bedrock

Field Notes Authored by K. Clayton

Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

*SD on West side of Thirty/1
Nov
*RA 2 or east side

Stantec

Station # 6-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 22/12 Time 9:48
 Weather conditions in previous 24 hrs Hot & humid, ~32°C
 GPS Coordinates (Zone) 17T E 620348 N 4779250 Datum NAD83
 Descriptive Location off of Thirty Rd, North of Kemp Rd East

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25°C
 Time *in situ* measurements taken _____

DM

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 10 (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 _____

RCG

Riparian Zone

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

Adjacent Land Use

soy, pasture, grape vines

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.

Reed canopy grass corridor
 • no real connection in culvert - lawn cut
 • East side doesn't have much channel definition but RCG has a distinct corridor. ↳ other than @ culvert

Field Notes Authored by K. Clayton

Field Notes QA/QCed by MF

MP



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 8-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 22/12 Time 9:14
 Weather conditions in previous 24 hrs hot & humid ~32°C
 GPS Coordinates (Zone) 17T E 622015 N 4769769 Datum Nad83
 Descriptive Location off of Thirty rd, ~800m N of Youngs earth of Mud street

Water Quality

no water

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 1.5 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt _____ Muck _____
 Boulder 10 Gravel 50 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% trees, mature

Adjacent Land Use

soy, woodlot

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawning, nursery, foraging

Migratory Obstructions (seasonal, permanent)

dry

Note any fish observations _____

Waterbody Notes

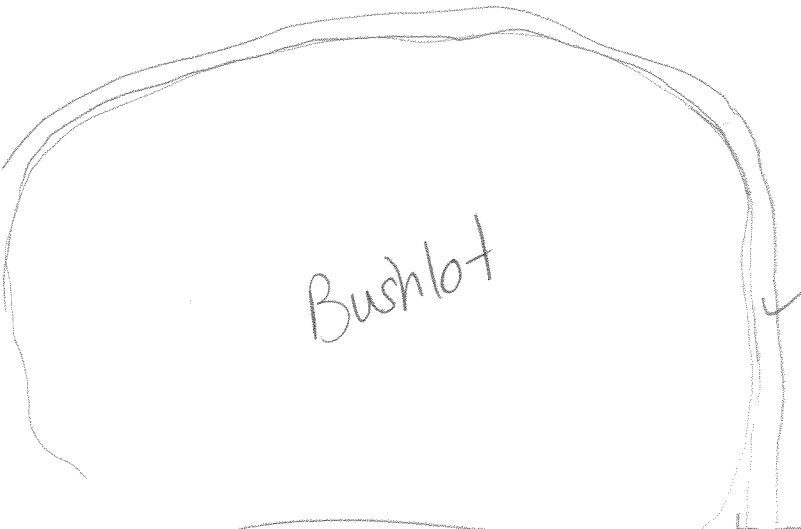
Natural Watercourse Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

REA waterbody that follows the woodlot w/ defined channel, undercut banks & dominated by aquatic vegetation

Field Notes Authored by K. Clayton

Field Notes QA/QCed by ME



Bushlot

← REA
8-1



— Thirty Rd —

N →



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
- More naturalized on west side of Rd
- Channelized - dam by tuffe

Stantec

Station # 9-1
Watercourse Name unknown
Photos -
Date June 20/12
Weather conditions in previous 24 hrs hot & humid
GPS Coordinates (Zone) 17T E 619250 N 4775456 Datum NAD83
Descriptive Location off of Rd 14, north of Smithville, north of Youngstreet (1st crossing north of Young)

Project Name Niagara Wind
Project # 160958269
Field Staff J. Keene, K. Clayton
Time 13:20

Water Quality
Dissolved Oxygen (mg/L) Dry pH - Conductivity (µS/cm) -
Water Temperature (°C) - Air Temperature (°C) 30+°C
Time *in situ* measurements taken -

Watercourse Dimensions & Morphology
Mean Watercourse Width - (m) Maximum Pool Depth - (cm)
Mean Bankfull Width 5-7 (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): 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) 100%, typha, early
Adjacent Land Use farmland, soy

Fish Habitat Potential
Critical Habitat (spawning or nursery areas, groundwater upwellings) potential spawning in spring
Migratory Obstructions (seasonal, permanent) -
Note any fish observations -

Waterbody Notes
Natural Watercourse ✓ on west side 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 K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non-REA ^{ml.}

Stantec

Station # 11-1
 Watercourse Name unknown
 Photos _____
 Date June 20/12
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 617710 N 4773937 Datum NAD83
 Descriptive Location off South Grimsby Rd, North of Rail Line

Project Name Niagara Wind
 Project # 160958269
 Field Staff Keene, K. Clayton
 Time 13:50

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2.5 (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%, typha, early

Adjacent Land Use Say

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

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.

does not qualify as intermittent stream

Field Notes Authored by K Clayton

Field Notes QA/QCed by ME

REA



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 11-2
 Watercourse Name unknown
 Photos _____
 Date June 20/12
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 617614
 Descriptive Location off of S. Grimshy Rd, south of Rail Rd tracks
- no access

trib of Pomile Creek

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Voone, K. Clayton
 Time 13:55

Water Quality

Dissolved Oxygen (mg/L) 7.21 pH 8.58 Conductivity (µS/cm) 1253
 Water Temperature (°C) 28.30 Air Temperature (°C) 30 °C
 Time *in situ* measurements taken 14:07

Watercourse Dimensions & Morphology

Mean Watercourse Width 10 (m) Maximum Pool Depth 150 (cm)
 Mean Bankfull Width ~15 (m) Mean Water Depth 0.8-1.00 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat

Evidence of eroding banks, Comments on bank stability a few undercutts, looks mostly stable - vegetated banks

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 50 Silt _____ Muck _____
 Boulder _____ Gravel 50 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% trees, mature
 Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent)
permanent ml.
 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.

turbid, slow moving
Giant floater mussel
leopard frog Killdeer

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non
REA

Stantec

Station # 12-1
 Watercourse Name unknown
 Photos _____
 Date June 20/12
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 6166208 N 4773130 Datum Nad83
 Descriptive Location off of S. Grimby Rd 6, south of 20 mile
Creek.

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Keene, K. Clayton
 Time 14:20

Water Quality

-dry

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 30 $^{\circ}$ C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2 (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

soy, wheat

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

dry

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 K. Clayton

Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # B-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 20/12 Time 14:30
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 616302 N 4772029 Datum Nad83
 Descriptive Location off of S. Grimby Rd 6, N of Smithville Rd

Water Quality - dry
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30°C +
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 25 (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 _____ *RCG Marsh marigold*

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100%, grasses, early
 Adjacent Land Use Cropland

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
in spring - potential spawning
 Migratory Obstructions (seasonal, permanent)
dry
 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 K. Clayton Field Notes QA/QCed by ME



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

NONREA
* shallow depression full of Aquatic Veg. no defined banks.

Station # 13-2 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 20/12 Time 14:48
 Weather conditions in previous 24 hrs hot + humid
 GPS Coordinates (Zone) 17T E 617082 N 477895 Datum Nad83
 Descriptive Location off of Tober Road, south of Smithville Rd.

Water Quality - no water
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width ~3m (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 _____
willow sedges PCG typha

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100%, typha, early
 Adjacent Land Use Residential, say, woodlot to N.

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) _____
 Note any fish observations dry

Waterbody Notes
 Natural Watercourse MP 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 K. Clayton Field Notes QA/QCed by ME

RBA



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 13-3 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos / Field Staff J. Keene, K. Clayton
 Date June 20/12 Time 14:50
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 617095 N 4771275 Datum Nad 83
 Descriptive Location off of Tober Rd, South of Smithville Road, South of
13-2

Water Quality

Dissolved Oxygen (mg/L) 13.04 pH 8.45 Conductivity (μ S/cm) 2884
 Water Temperature ($^{\circ}$ C) 23.06 Air Temperature ($^{\circ}$ C) 30 $^{\circ}$ C+
 Time *in situ* measurements taken 15:00

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 0.50 (cm)
 Mean Bankfull Width 12 (m) Mean Water Depth 0.30 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 40 Silt _____ Muck _____
 Boulder _____ Gravel 50 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

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

15%, tupha, early

Adjacent Land Use

soy

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawning, nursery, foraging

Migratory Obstructions (seasonal, permanent)

permanent

Note any fish observations unknown 'pin-head' 404/5.

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. Red wing BB

- frog-green

Field Notes Authored by K. Clayton

Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA
LSD

Stantec

Station # 14-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene & K. Clayton
 Date June 21/12 Time 9:04
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 617914 N4771492 Datum Nad83
 Descriptive Location off of Port Davidson Rd, south of Smithville Rd

Water Quality - no water
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30°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 Soy

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) dry
 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 K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non-REA
- driven through

Stantec

Station # 15-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 20/12 Time 15:19
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 617109 N 4770819 Datum Nad83
 Descriptive Location South of 13-3 on Tober Road, South of Smithville Road

Water Quality — no water
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30°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 no shading - crops
hay field, crops

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) dry
 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 K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non REA

Stantec

Station # 15-2 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos / Field Staff J. Keene, K. Clayton
 Date June 20/12 Time 15:27
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 617130 N 4769921 Datum Nad83
 Descriptive Location off of Tober Rd, N. of Sitten Road

Water Quality

- no water

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 30 $^{\circ}$ 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)
- crops

Adjacent Land Use

crops

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations dry

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

No longer in Proj. loc'n m.p.

REA X

Station # 16-1
Watercourse Name unknown
Photos
Date June 21/12
Weather conditions in previous 24 hrs
GPS Coordinates (Zone) 17T E 617924 N 4770895 Datum Nad83
Descriptive Location facing West looking @ REA, off of Pnt Davidson Rd

Project Name Niagara Wind
Project # 160958269
Field Staff J. Keene, K. Clayton
Time 9:34

Water Quality

Dissolved Oxygen (mg/L) 5.89 pH 7.95 Conductivity (µS/cm) 3236
Water Temperature (°C) 23.3 Air Temperature (°C) 30°C
Time in situ measurements taken 9:39

Watercourse Dimensions & Morphology

Mean Watercourse Width 6 (m) Maximum Pool Depth <1m (cm)
Mean Bankfull Width 10 (m) Mean Water Depth 0.50 (cm)
% Riffle % Pool 100 % Run % Flat
Evidence of eroding banks, Comments on bank stability all vegetated - fairly stable

Substrate (% cover)

Bedrock Cobble 10 Sand 40 Silt Muck
Boulder Gravel 50 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% RCG, early
Adjacent Land Use Corn

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning, nursery, foraging
Migratory Obstructions (seasonal, permanent)
permanent
Note any fish observations lots of carp! - 6 big individuals.

Waterbody Notes

Natural Watercourse [checked] 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. Heron

Field Notes Authored by K Clayton Field Notes QA/QCed by ME



Not longer in Proj. Lock up

WIND FARM WATERBODY RAPID ASSESSMENT FORM

X REA
East side
Non RE
West side

Stantec

Station # 16-2 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Voene, K. Clayton
 Date June 21/12 Time 9:47
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 617938 N 4770529 Datum Nad83
 Descriptive Location off of Port Davidson Rd, south of Smithville Rd, south of 16-1

Water Quality

-dry
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 1.5 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 40 Silt _____ Muck _____
 Boulder _____ Gravel 50 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)
0% on west side 20% on east side, RCG, early

Adjacent Land Use

farmland, say

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. SD on west side of PD. Road
is no over - could be ploughed through. On east side it's questionable
REA (couldn't drive through, has aquatic veg, defined channel).

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

No longer in Proj. Lochmup

REA

X

Station # 16-3
 Watercourse Name unknown
 Photos _____
 Date June 21/12
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 617946 N 4769975 Datum NAD83
 Descriptive Location off of Port Davidson Road, south of 16-2,
North of Sixteen Rd.

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Keene, Kelly Clayton
 Time 9:54

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 30 $^{\circ}$ C
 Time *in situ* measurements taken _____

-no water

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

100%, RCG, early

Adjacent Land Use residential, farmland

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

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.

narrow channel filled with Reed Canary grass & a little typha - no water

Field Notes Authored by K. Clayton

Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

West side of PDR
↳ SD^{no}
East side
↳ REA

Stantec

Station # 18-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 21/12 Time 10:00
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 617954 N 4769752 Datum Nad83
 Descriptive Location off of Port Davidson Rd, South of Sixteen Rd

Water Quality

-no water
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

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

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

50% (east) typha 90% (west) terrestrial scrub, early

Adjacent Land Use soy

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

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.

* east side is dominated by aquatic veg, defined channel - not plowed through. on the west side of PDR, its more of a SD - could drill through & more terrestrial plants than aquatic.

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME * small section along Port Davidson Rd by culvert on west side could be REA.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Nor REA
m.p.

Stantec

Station # 19-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keane, K. Clayton
 Date June 20/12 Time 15:46
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 616727 N 4768421 Datum NAD83
 Descriptive Location off of McCallum Rd, South of Sixteen Rd, N of Conc. 4.

Water Quality

~~-dry~~
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30°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 40 Sand 10 Silt _____ Muck _____
 Boulder _____ Gravel 50 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

hay field

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

Note any fish observations dry

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

see photos
defined channel m.p.
no aquatic veg.
could be driven through
large areas of surficial drainage

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non REA

Stantec

Station # 19-2
 Watercourse Name unknown
 Photos _____
 Date June 20/12
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 617179 N 4767651 Datum Nad83
 Descriptive Location off of Conc 4, east of McCollum Road

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Keene, K. Clayton
 Time 15:59

Water Quality

~~- no water~~

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity ($\mu\text{S}/\text{cm}$) _____
 Water Temperature ($^{\circ}\text{C}$) _____ Air Temperature ($^{\circ}\text{C}$) 30 $^{\circ}\text{C}$
 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)
100%, forest (trees), mature (on southside), early on northside of road
 Adjacent Land Use forest, farmland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) dry
 Note any fish observations _____

Waterbody Notes

Natural Watercourse MP 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 K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 19-3 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 20/12 Time 4:22 pm
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 616640 N 4767627 Datum NAD83
 Descriptive Location off of conc 4, west of port Davidson

Water Quality - no water
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 32°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2.5-3 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)
 _____ Bedrock _____ Cobble 10 ✓ Sand 40 ✓ Silt _____ Muck _____
 _____ Boulder _____ Gravel 50 ✓ 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)
85% typha, grasses, early
 Adjacent Land Use farm land

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) dry
 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.
on south side of conc 4 channel is deeply incised eroded banks. on north side of road it is heavily vegetated

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 19-4 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Yelmer, K. Clayton
 Date June 20/12 Time 4:31 pm
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 616320 N 4767608 Datum NAD83
 Descriptive Location off of conc 4, west of McCollum Road

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 32 $^{\circ}$ C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2 (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 typha
Overhanging Vegetation Woody Debris Boulder Other _____ PCA

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100%, typha, early
 Adjacent Land Use residential, farmland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) dry
 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.

deeply incised channel

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 19-S
 Watercourse Name unknown
 Photos _____
 Date June 20/12
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 617476 N 4767658 Datum Nad83
 Descriptive Location off of conc 4

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Keene, K. Clayton
 Time 4:46

Water Quality - a little water pooled @ culvert - no y/si
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 32°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 10 Sand 40 Silt _____ Muck _____
 _____ Boulder _____ Gravel 50 Clay _____ Marl _____ Detritus _____

In-water Cover
 Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic Veg ^{typha} RCG
Overhanging Vegetation Woody Debris Boulder Other algae

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 45%, trees, mature

Adjacent Land Use farmland (south side of conc 4)
forest (North side of conc 4)

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) possibly spawning, foraging, nursery
 Migratory Obstructions (seasonal, permanent) Seasonal
 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.
 _____ except @ culvert
 • leopard frogs
 • green frogs
 • on North side of road there is an online pond, on South side it is pooled @ culvert & then becomes dry
 • breaks off into side channel.

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

reaches are REA ~~East~~
East side
- Non or
west nyf.

Station # 20-1
Watercourse Name unknown
Photos /
Date June 21/12

Project Name Niagara Wind
Project # 160958269
Field Staff J. Keene, K. Clayton
Time :

Weather conditions in previous 24 hrs _____
GPS Coordinates (Zone) 17T E 618005 N 4768086 Datum Nad83
Descriptive Location off of Port Davidson Rd South of 16 Road
South of 18-1

Water Quality no water
Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 30
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 10 Sand 40 Silt _____ Muck _____
Boulder _____ Gravel 50 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%, typha, early
Adjacent Land Use hayfield

Fish Habitat Potential
Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
Migratory Obstructions (seasonal, permanent) dry
Note any fish observations _____

Waterbody Notes on east side
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. East side has a defined channel
with aquatic veg, can't drive through it. on the west side there
is a portion near the culvert that is channelized however the channel
disappears & the farmer has been driving through it - lots of typha
throughout.

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME

REA.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 20-2
Watercourse Name unknown
Photos _____
Date June 21/12

Project Name Niagara Wind
Project # 160958269
Field Staff J. Keene, K. Clayton
Time 10:47

Weather conditions in previous 24 hrs hot & humid
GPS Coordinates (Zone) 17T E 618771 N 4767712 Datum NAD83
Descriptive Location off of conc 4, east of Port Davidson Rd, east of old rail bed

Water Quality

~~-nowater.~~
Dissolved Oxygen (mg/L) _____
Water Temperature (°C) _____
Time *in situ* measurements taken _____

pH _____ Conductivity (µS/cm) _____
Air Temperature (°C) 30°C

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width 2 (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%, RCG, partly

Adjacent Land Use
Oats, hay

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)
dry

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.

on south side of conc 4 it is channelized by RCG in channel called a RFA. on opposite side of Rd channel is not there even though mapped by MNR.

Field Notes Authored by K. Clayton

Field Notes QA/QCed by ME



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 22-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 21/12 Time 13:27
 Weather conditions in previous 24 hrs Hot & humid
 GPS Coordinates (Zone) 17T E 617747 N 4765865 Datum Nad83
 Descriptive Location off of Port Davidson Road, just south of Silver Rd

Water Quality

Dissolved Oxygen (mg/L) 1.50 pH 8.19 Conductivity (µS/cm) 547
 Water Temperature (°C) 24.25 Air Temperature (°C) 32°C
 Time *in situ* measurements taken 13:30

Watercourse Dimensions & Morphology

Mean Watercourse Width 4 (m) Maximum Pool Depth 0.20 (cm)
 Mean Bankfull Width 8 (m) Mean Water Depth 0.10 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable - vegetated

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 50 Silt _____ Muck _____
 Boulder _____ Gravel 40 Clay _____ Marl _____ Detritus _____

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Woody Debris Undercut Banks _____ Deep Pool _____ Watercress _____ Aquatic Veg
 (Note: *duckweed, water hyacinth, typha* are also present)

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
West side = 55% RCG, early East = 35% RCG, early
 Adjacent Land Use farmland - wheat

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning, nursery & foraging
 Migratory Obstructions (seasonal, permanent)
permanent
 Note any fish observations fish coming to surface for air

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.

heron
water very murky! lots of duckweed on East side of PD Road

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non-REA³m

Stantec

Station # 24-1
 Watercourse Name unknown
 Photos _____
 Date June 21/12
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 617763 N 4764866 Datum NAD83
 Descriptive Location off of Vaughn Rd at Port Davidan intersection south of 22-1

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Keene, K. Clayton
 Time 13:42

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 32°C
 Time *in situ* measurements taken _____

no water

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 1m (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 RCG
 Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other _____

Riparian Zone

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

Adjacent Land Use

say, road, residential

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) dry

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.

- dominated by RCG
* - shallow channel, but defined only for short reach m.f.
* - channel @ Port Davidan Road is indistinct - RCG & typha corridor
↳ channel that 24-1 flows into

Field Notes Authored by K. Clayton

Field Notes QA/QCed by MUE

BEA 2/11



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 23-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 21/12 Time 14:05
 Weather conditions in previous 24 hrs Hot & humid
 GPS Coordinates (Zone) 17T E 616013 N 4764798 Datum Nad83
 Descriptive Location off of Vaughn Road, west of 24-1

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 32°C
 Time *in situ* measurements taken _____

no water

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 _____

- no real channel

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 _____

RCG

Riparian Zone

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

100%, RCG, early

Adjacent Land Use forest

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

dm

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.

Reed canopy grass right by road to a little channel
definition, further on no channel (≈ 10m)

Field Notes Authored by K. Clayton

Field Notes QA/QCed by ME



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

• REA on south side
• Non REA on N side of conc.

Station # 23-2
Watercourse Name unknown
Photos _____
Date June 21/12
Weather conditions in previous 24 hrs Hot & humid
GPS Coordinates (Zone) 17T E 6014945 N 4765288 Datum Nad83
Descriptive Location off of Concession #3

Project Name Niagara Wind
Project # 160958269
Field Staff J. Keene, K. Clayton
Time 14:19

Water Quality

Dissolved Oxygen (mg/L) 4.10 pH 8.18 Conductivity (μ S/cm) 674
Water Temperature ($^{\circ}$ C) 23.82 Air Temperature ($^{\circ}$ C) 30.0
Time *in situ* measurements taken 14:22

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m) Maximum Pool Depth 0.15 (cm)
Mean Bankfull Width 1.5 (m) Mean Water Depth 0.10 (cm)
_____ % Riffle 5 % Pool 100 % Run _____ % Flat
Evidence of eroding banks, Comments on bank stability stable

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 40 Silt _____ Muck _____
Boulder _____ Gravel 50 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
95-100%, RCG, early

Adjacent Land Use say

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
probably dries up in midsummer

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.

on N side of conc. 3 its a Non REA - SD
on S side its a REA w/ defined channel, aquatic veg,
• hybrid water.

Field Notes Authored by K. Clayton

Field Notes QA/QCed by ME



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 26-1
 Watercourse Name unknown
 Photos See photo log
 Date 2012 06 18
 Weather conditions in previous 24 hrs Minor precip
 GPS Coordinates (Zone) 17T E 0617964 N 4763459 Datum NA083
 Descriptive Location On Elcho Rd ~ 70 m east of Port Davidson Rd.

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, MF
 Time 14:07

Water Quality

Dissolved Oxygen (mg/L) 6.74 pH 8.03 Conductivity (µS/cm) 436
 Water Temperature (°C) 22.93 Air Temperature (°C) 30°C
 Time *in situ* measurements taken 14:11

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth ~1.5 (m)
 Mean Bankfull Width ~25 (m) Flood pl. Mean Water Depth ~30 (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 40 Muck _____
 Boulder _____ Gravel 20 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% grasses

Adjacent Land Use

Farm buildings, meadow fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Spawning habitat

Migratory Obstructions (seasonal, permanent)
dry @ times

Note any fish observations none

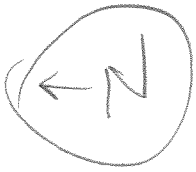
Waterbody Notes

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. Jumping fish sp

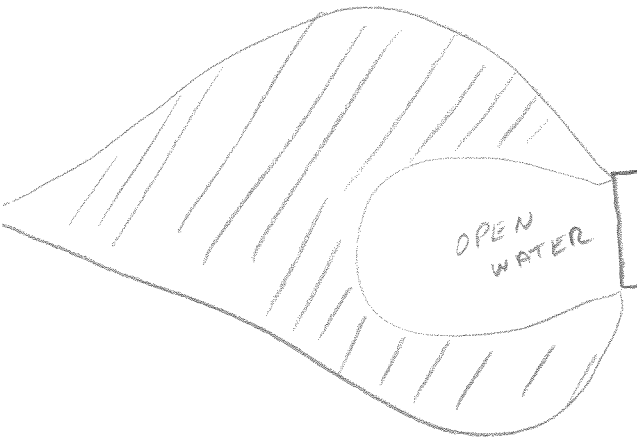
Field Notes Authored by MF

Field Notes QA/QCed by WFE

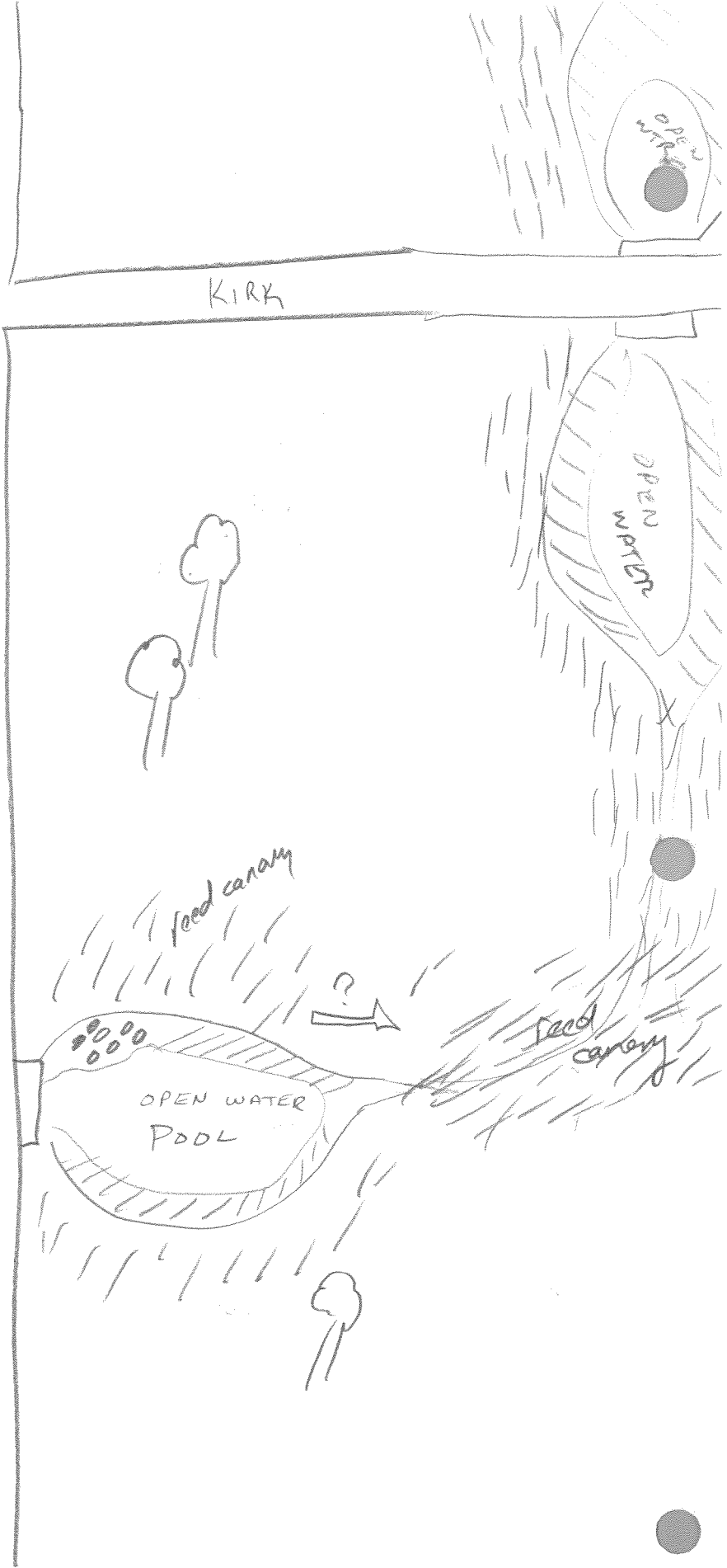


FARM

Meadow



ELCHO RD



 = algae/duckweed

oo = pond weed



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 27-1
 Watercourse Name unknown
 Photos see photo log
 Date 2012 06 18
 Weather conditions in previous 24 hrs Minor Precip
 GPS Coordinates (Zone) 17T E 0618419 N 4763474 Datum NAD83
 Descriptive Location on Elcho Rd ~ 450m west of Kirk rd on south side. No access, rd side survey

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME MF
 Time 14:00

No access

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)
25% ash sp, shrub sp
 Adjacent Land Use houses, rd

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) N/A
 Migratory Obstructions (seasonal, permanent) N/A
 Note any fish observations N/A

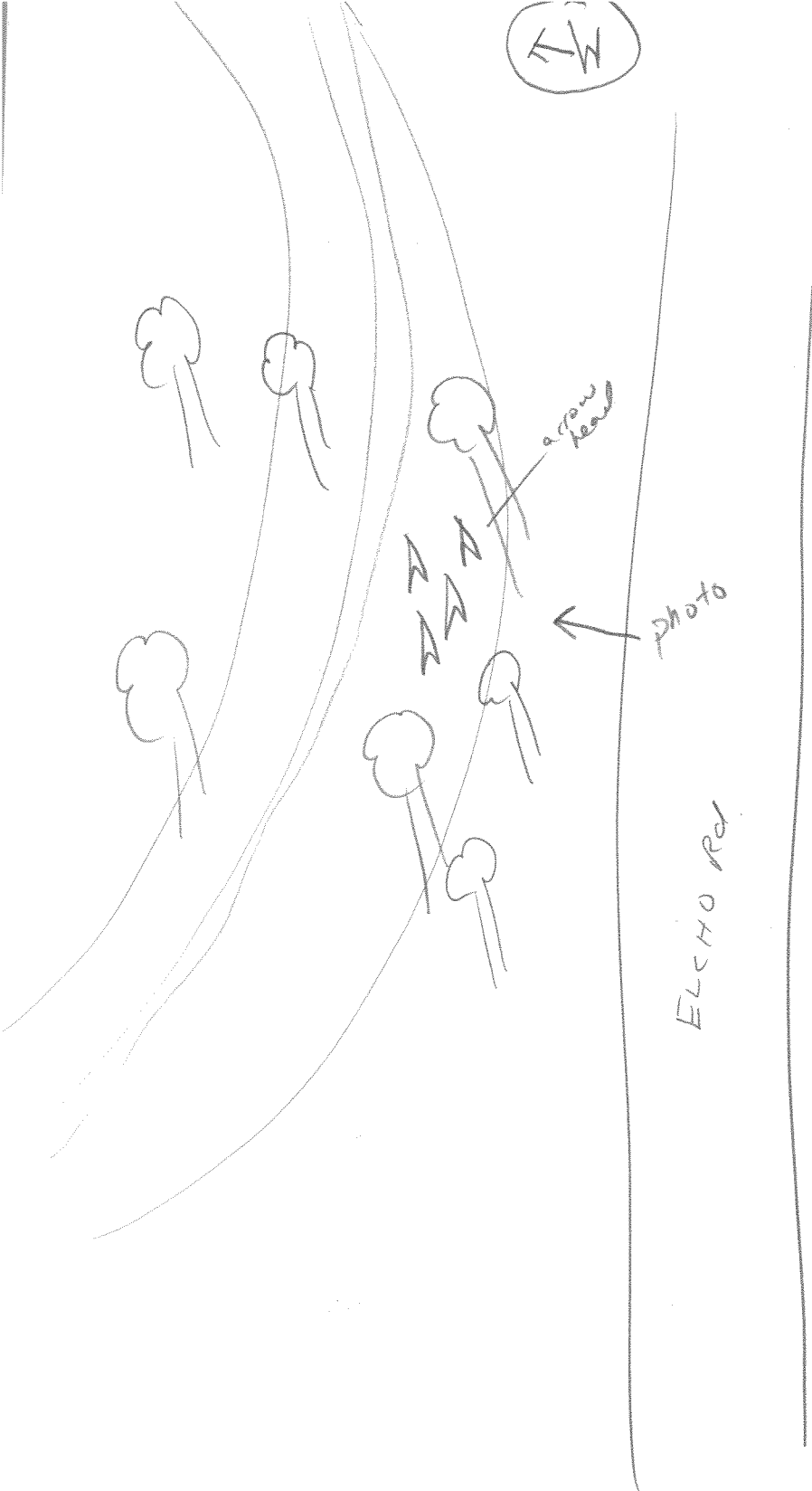
No access

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. songbird sp.

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



ELCHO Ref.



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

REA d/s but partial REA ups near culvert only.

Station # 28-1
Watercourse Name unknown
Photos see photo log
Date 2012 06 19

Project Name Niagara Wind
Project # 160950269
Field Staff ME, ME
Time 09:34

Weather conditions in previous 24 hrs minor precip
GPS Coordinates (Zone) 17T E 0617877 N 4762295 Datum NAD83
Descriptive Location On Post Davidson Rd ~ 400m north of Zumstein Rd.

Water Quality

Dissolved Oxygen (mg/L) 2.49 pH 7.78 Conductivity (μ S/cm) 1005
Water Temperature ($^{\circ}$ C) 23.82 Air Temperature ($^{\circ}$ C) _____
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m) Maximum Pool Depth 15.0 (cm)
Mean Bankfull Width 2.5 (m) Mean Water Depth 7.0 (cm)
_____ % Riffle 100 % Pool _____ % Run _____ % Flat
Evidence of eroding banks, Comments on bank stability none observed.

Substrate (% cover)

Bedrock _____ Cobble 20 Sand 40 Silt 30 Muck _____
Boulder _____ Gravel 10 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)
3% cattail

Adjacent Land Use

agr. rd.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
possible spawn

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. green frogs, hoppers

Field Notes Authored by ME

Field Notes QA/QCed by MEE



AS

Swale

Meadow sp

SANDY
H2O

Meadow sp

PORT DAVIDSON RD.

Meadow sp

OPEN WATER
STANDING

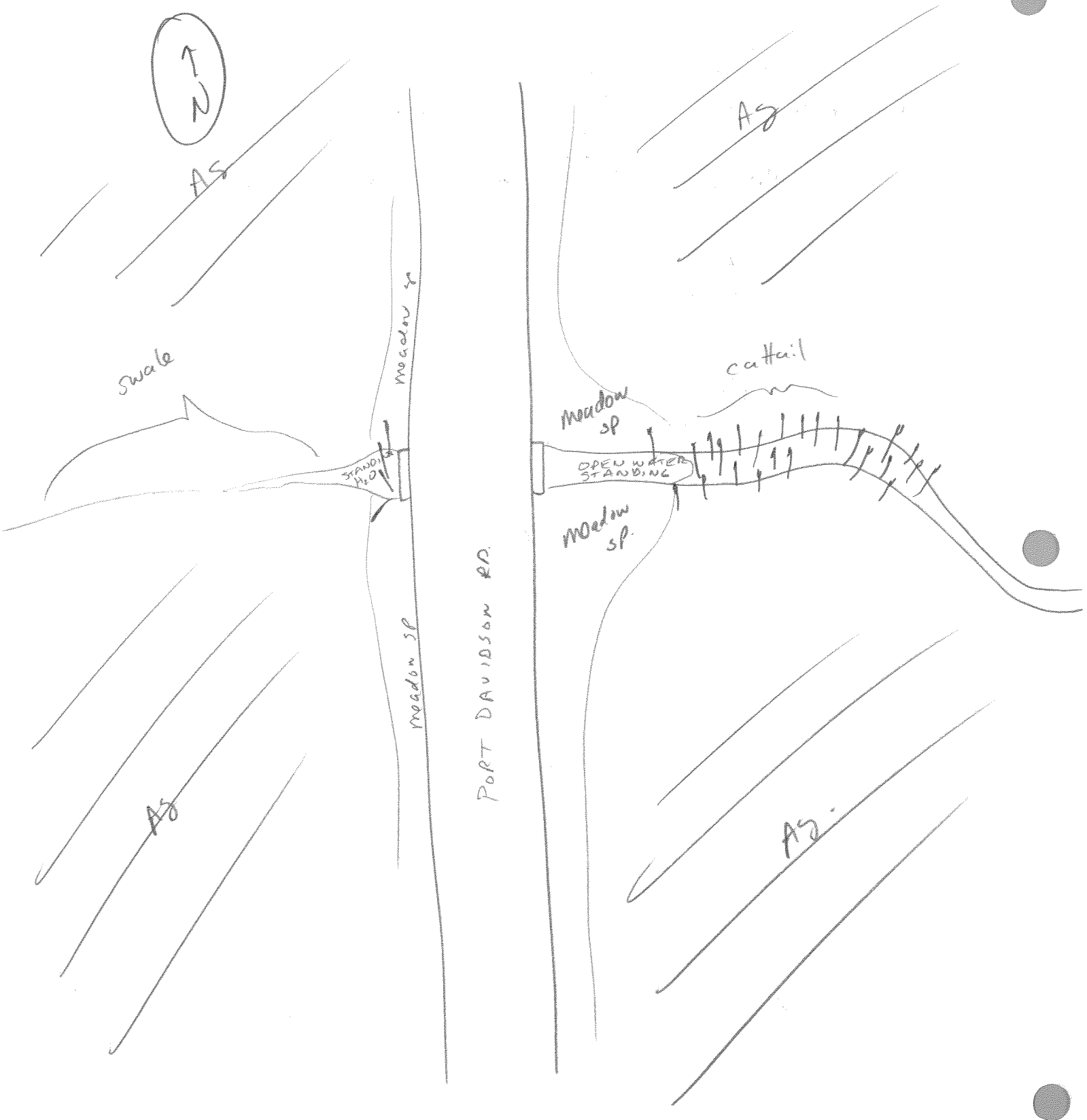
Meadow sp.

cattail

AS

AS

AS





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA 32

Road side access only.

Station # 29-1
 Watercourse Name unknown
 Photos See photo log
 Date 2012 06 19
 Weather conditions in previous 24 hrs minor precip
 GPS Coordinates (Zone) 17T E 0617859 N 4761426 Datum NAD83
 Descriptive Location On Port Davidson Rd ~700m north of Carborough Rd.

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, MF
 Time 09:23

DRY

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 DRY (cm)
 Mean Bankfull Width 1.5 (m) Mean Water Depth DRY (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability minor undercutts.

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 30 Silt 40 Muck _____
 Boulder _____ Gravel 30 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)
2% reed canopy grass.

Adjacent Land Use

agr. rds.

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

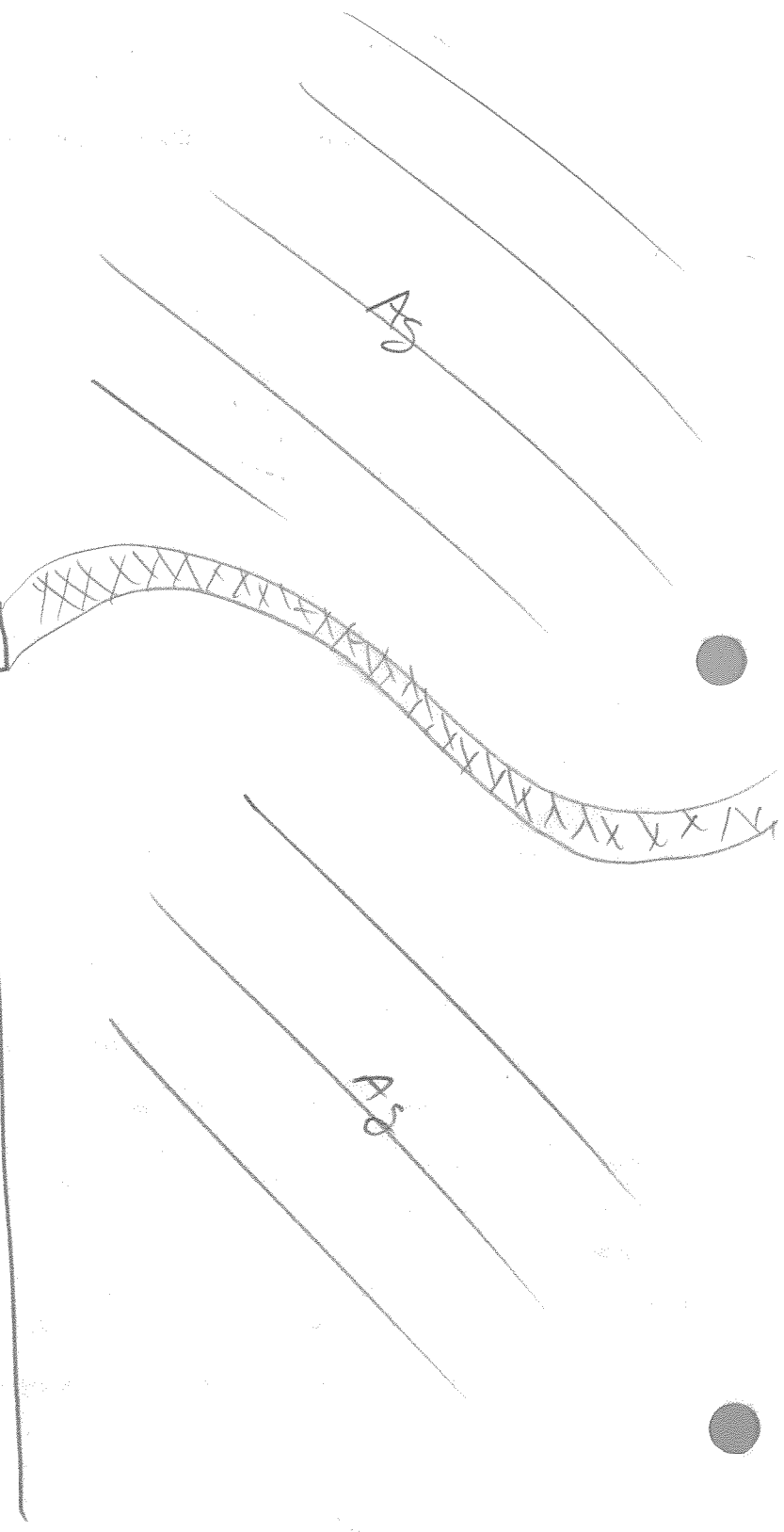
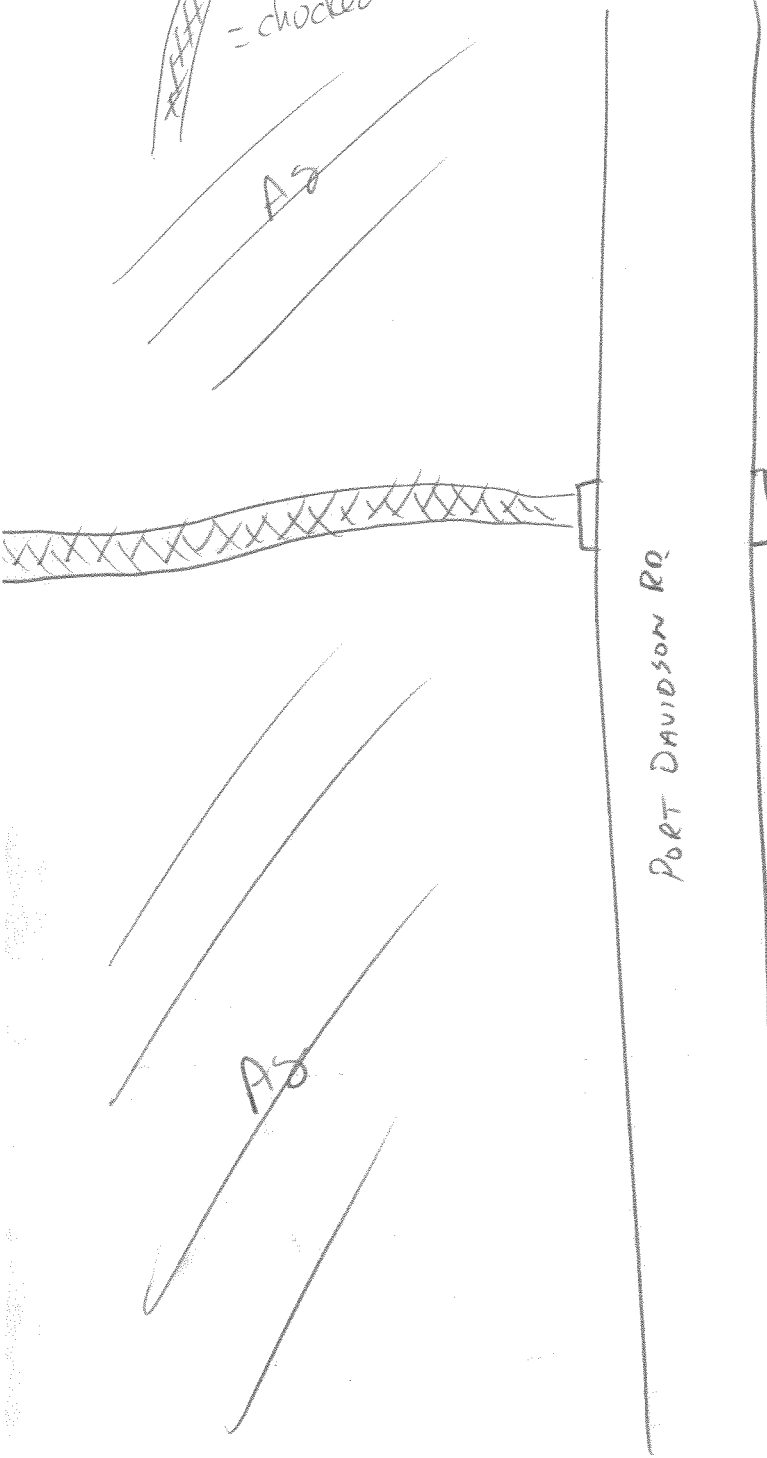
Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by MF

Field Notes QA/QCed by MEE



= chocked w reed canes grass



No access, Rd side view



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 30-1

Project Name Niagara Wind

Watercourse Name Trib of Welland Rv.

Project # 160950269

Photos See photo log

Field Staff ME, MF

Date 2012 06 09

Time 08:45

Weather conditions in previous 24 hrs minor precip.

GPS Coordinates (Zone) 17T E 0620075 N 4761299 Datum NAD83

Descriptive Location On Canborough Rd ~1km east of Krick Rd

Water Quality

Standing water too low.

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____

Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) _____

Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.05 (m) Maximum Pool Depth 0.20 (cm)

Mean Bankfull Width 6.0 (m) Mean Water Depth 0.10 (cm)

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

Evidence of eroding banks, Comments on bank stability minor undercut banks near bridge

Substrate (% cover)

Bedrock 20 Cobble _____ Sand 30 Silt 30 Muck _____
Boulder _____ Gravel 20 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)

10% mature/immature tree sp. seed canopy grass

Adjacent Land Use

agr. rds.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn.

Migratory Obstructions (seasonal, permanent)

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. _____

Song birds

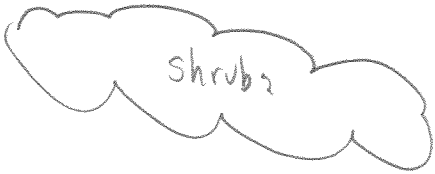
Field Notes Authored by MF

Field Notes QA/QCed by MEE

* = bullhead/arrowhead

= emerg. veg sp (thick)

// = sedge/meadow sp.



standing water



boulder rip/rap

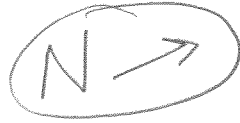
WILLIAMS RD

reed canopy
eg
sedges



manicured
grass

Cabotborough rd.





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Could not properly assess as area is off row.
Row = Non REA

Non REA
MP
OFF ROW

Station # 31-1
Watercourse Name unknown
Photos See photo log
Date June 21/12

Project Name Niagara Wind
Project # 160958269
Field Staff ME, MF
Time 10:31

Weather conditions in previous 24 hrs hot + humid
GPS Coordinates (Zone) 17T E 0622345 N 4761279 Datum Nad83
Descriptive Location On Creek Rd ~ 2km east of Erick Rd

DRY
OFF ROW

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 Watercross 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 _____

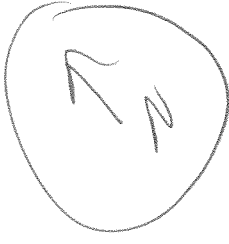
Waterbody Notes

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. Dry - none

Field Notes Authored by MF

Field Notes QA/QCed by MEE





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
DRY

Stantec

- defined channel o/s + d/s

Station # 31-2

Project Name Niagara Wind

Watercourse Name unknown

Project # 160958269

Photos See photo log

Field Staff ME, MF

Date June 21/12

Time 10:44

Weather conditions in previous 24 hrs no precipitation

GPS Coordinates (Zone) 17T E 0622462

N 4761306 Datum Nad83

Descriptive Location On Creek Rd ~ 2.4 km east of Krik Rd on Hardy

Property

DRY

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 0.25 (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 some undercut banks + scour

Substrate (% cover)

_____ Bedrock	_____ Cobble	<u>10</u>	_____ Sand	<u>30</u>	_____ Silt	<u>30</u>	_____ Muck
_____ Boulder	_____ Gravel	<u>30</u>	_____ 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)

30% = d/s + 2% = u/s mature trees + shrubs d/s, reed canopy u/s.

Adjacent Land Use

ag fields, house, rd

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

possible spawn at high water times

Migratory Obstructions (seasonal, permanent)

dry now.

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. bobolink

Field Notes Authored by MF

Field Notes QA/QCed by MEF

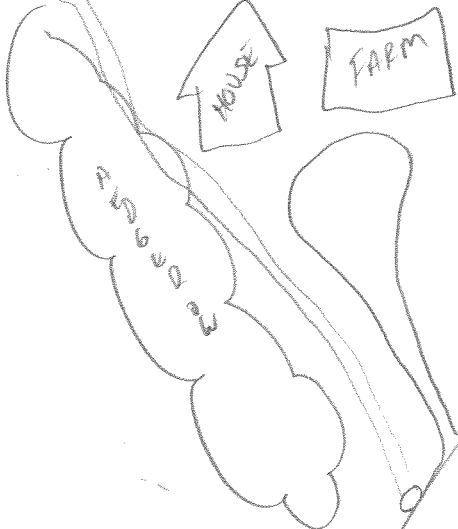
WELLS RD

N ↑

31-2

HOUSE ↑

FARM

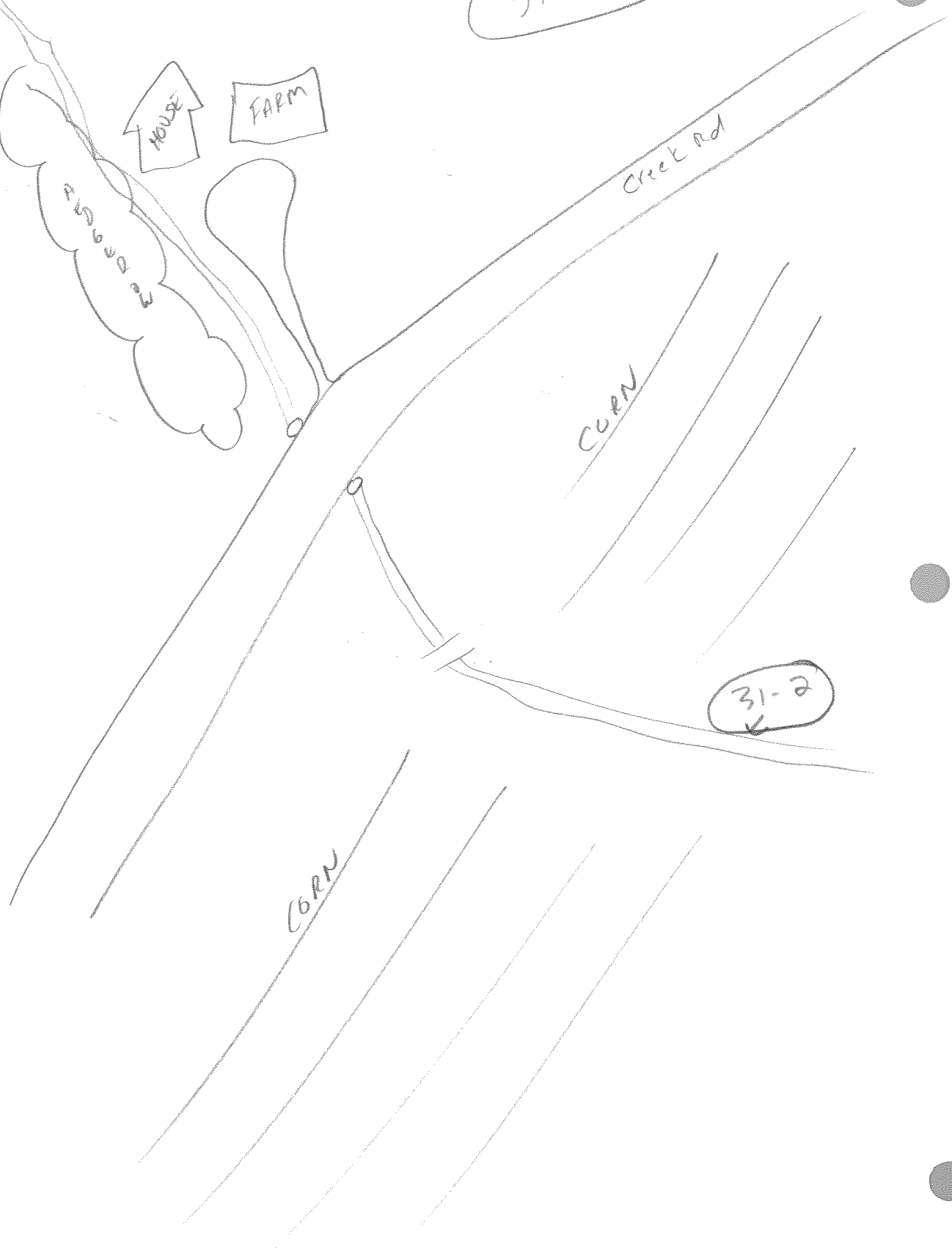


Creek Rd

CORN

31-2 ↓

CORN





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

STANDING WATER ONLY / STAGE

Station # 32-1
 Watercourse Name unknown
 Photos See photo log
 Date 2012 06 19
 Weather conditions in previous 24 hrs minor precip
 GPS Coordinates (Zone) 17T E 0623589 N 4761722 Datum NAD83
 Descriptive Location On Creek Rd ~ 250 m west of Wellandport Rd

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME/MP
 Time 10:15

Too shallow standing water

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 1.2 (m) Maximum Pool Depth 5 (cm)
 Mean Bankfull Width 2.5 (m) Mean Water Depth 2 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 30 Silt 40 Muck _____
 Boulder _____ Gravel 20 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% mainly @ v/s location w trees + shrubs.

Adjacent Land Use

farm, pasture, rds.

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
back of water

Note any fish observations none

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

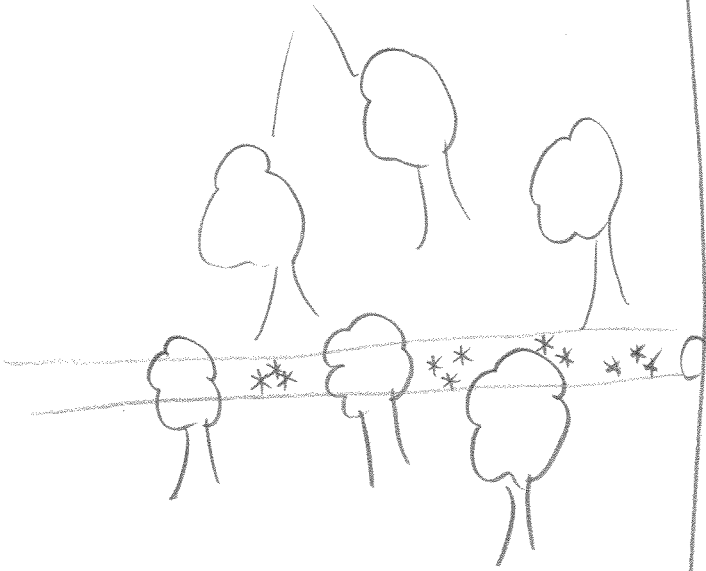
Field Notes Authored by ME

Field Notes QA/QCed by MEE



Horse pasture.

mature trees.

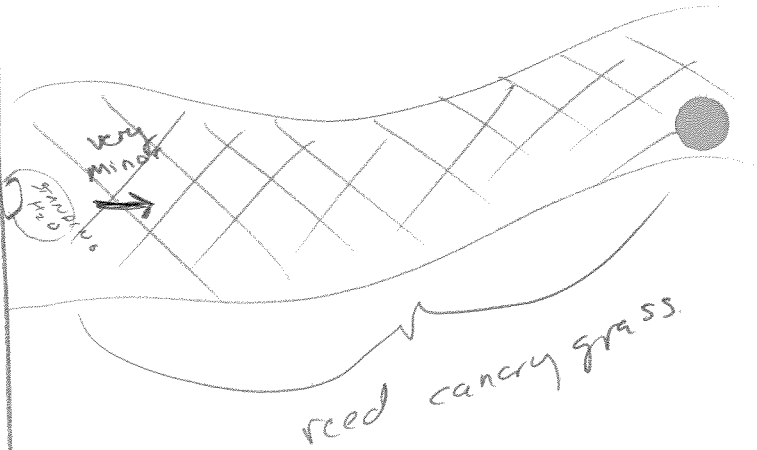


CREEK RD.

** = patches of emerg. aquatic veg. sp.

Meadow sp.

Welland Rv. →
150 m



REA



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 34-1
 Project Name Niagara Wind
 Watercourse Name unknown
 Project # 160958269
 Photos See photo log.
 Field Staff ME/MP
 Date June 20/12
 Time 09:10
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 0621197 N 4762726 Datum Nad83
 Descriptive Location On un-maintained rd of Baldwin ~ 800m

Water Quality

Dissolved Oxygen (mg/L) 2.40 → 0.35 pH 7.70 Conductivity (µS/cm) 401
 Water Temperature (°C) 23.14 Air Temperature (°C) 29.06
 Time *in situ* measurements taken 09:15

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m) Maximum Pool Depth ~150.0 (cm)
 Mean Bankfull Width 3.5 (m) Mean Water Depth ~150.0 (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability Minor scour along edg's

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 50 Silt 50 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)
10% mature trees/shrubs. Snags.

Adjacent Land Use

meadow, woodlot

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
forage, spawn, nursery

Migratory Obstructions (seasonal, permanent)
lack of flows/water

Note any fish observations Many fish caught in pool near old cement bridge. No water in stream u/s or d/s. 4 carp carcasses.

Waterbody Notes

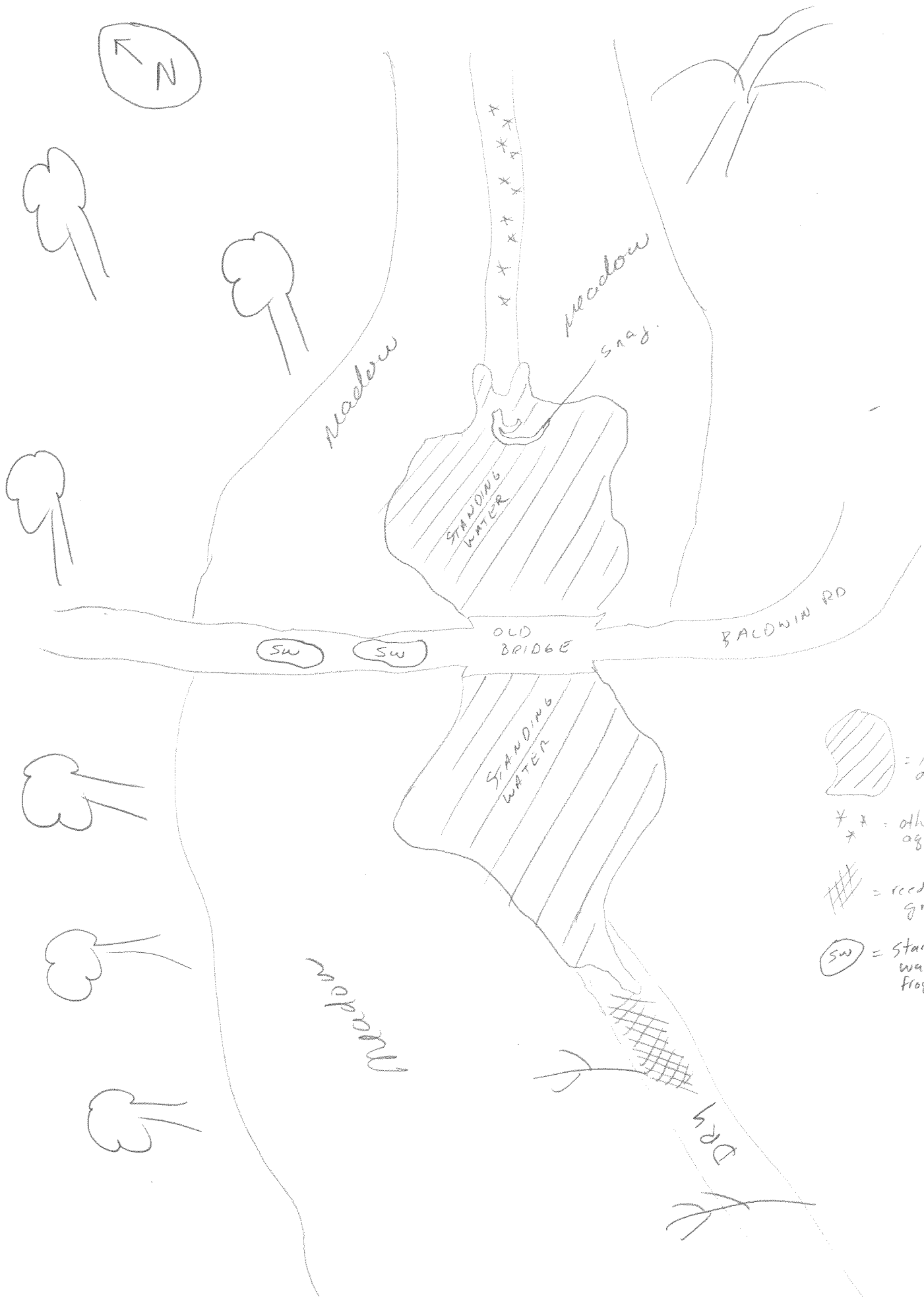
Natural Watercourse Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg Dry





Other Habitat Notes, Incidental Wildlife Observations, etc. Water @ bridge only.

Fish appear to be breaking surface and gulping air.
Many green frogs, leopard frogs.

Field Notes Authored by MP

Field Notes QA/QCed by MEE



-  = 100% duckweed
-  = other emergent aquatic veg.
-  = reed canary grass
-  = standing water with frogs/aquatic



Stantec

Landowner has possibly removed culvert which has caused old stream to pool east of potential collector table. Pool is being used by cows and has altered the banks and inlet. Inlet is a non-REA. No culvert found under Baldwin

WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON REA

Station # 34-2
Watercourse Name unknown
Photos See photo log
Date June 20/12

Project Name Niagara Wind
Project # 160958269
Field Staff ME/MF
Time 09:32

Weather conditions in previous 24 hrs no precip
GPS Coordinates (Zone) 17T E 0621159 N 4762268 Datum Nad83
Descriptive Location On unmaintained Rd of Baldwin ~ 400 m north of Carborough Rd

OFF ACCESS

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

Substrate (% cover)

Bedrock
Boulder
Cobble
Gravel
Sand
Clay
Silt
Marl
Muck
Detritus

In-water Cover

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

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

Other Habitat Notes, Incidental Wildlife Observations, etc. Meadow lark, eastern king bird.

Field Notes Authored by MF

Field Notes QA/QCed by MEE



Canborough Rd ↑
~400m

FARM

34-1 ↑



HEDGE ROW

BALDWIN RD
(unmaintained)

fence line

recently
disturbed



POND

graze / cows

graze / cows



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA on east side only

Stantec

Station # 35-1
Watercourse Name unknown
Photos See photo log
Date 2012 06 18

Project Name Niagara Wind
Project # 160950269
Field Staff ME, MF
Time 16:06

Weather conditions in previous 24 hrs mmw precip
GPS Coordinates (Zone) 17T E 0623624 N 4763083 Datum NAD83
Descriptive Location On Colver Rd ~30m south of Frevie Rd.

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 30 $^{\circ}$ C
Time *in situ* measurements taken _____

Dry @ Row
No access
to kno.

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.0 (m) Maximum Pool Depth 30 (cm)
Mean Bankfull Width 4.0 (m) Mean Water Depth 15 (cm)
% Riffle 100 % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability none observed.

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 50 Silt 50 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)
30% willow sp

Adjacent Land Use

houses, ag fields.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, forage, nursery.

Migratory Obstructions (seasonal, permanent)
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 _____

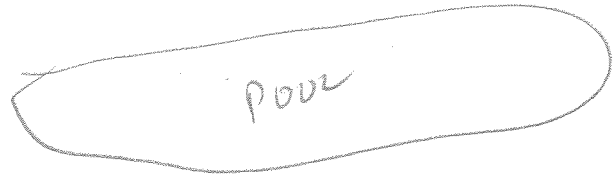
Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by MEE

Field Notes QA/QCed by MEE

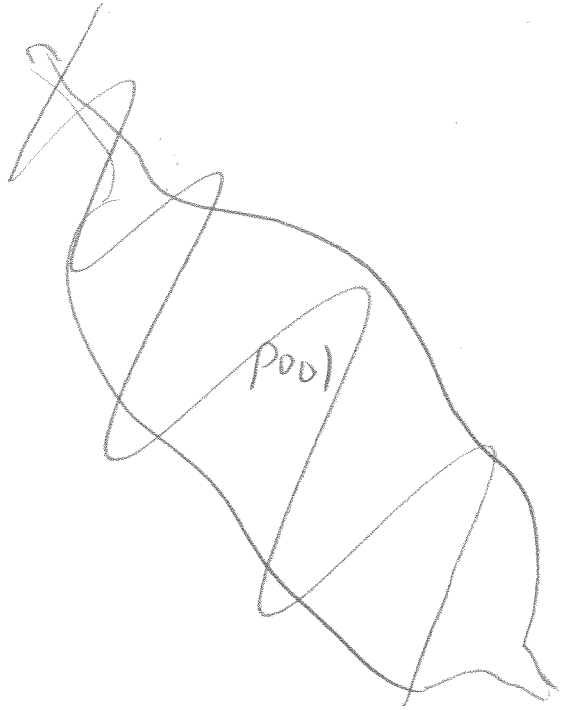


Monitored
grass



Freyre Rd

Collins Rd





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 35-2 Project Name Niagara Wind
 Watercourse Name Trib of Welland Rv. Project # 160950269
 Photos See photo log Field Staff ME, MF
 Date 2012 06 18 Time 16:30
 Weather conditions in previous 24 hrs minor precip.
 GPS Coordinates (Zone) 17T E 0623682 N 4762560 Datum NAD83
 Descriptive Location In RR 27 ~ 40m north of Carleton Place Rd.

No access. Color not log bridge from

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30°
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.0 (m) Maximum Pool Depth 7.100 (cm)
 Mean Bankfull Width 4.0 (m) Mean Water Depth ~50 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability none observed.

Substrate (% cover)

Bedrock 20 Cobble _____ Sand 40 Silt 20 Muck _____
 Boulder _____ Gravel 20 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)
30% ash sp, willow sp.

Adjacent Land Use

business, house, rds.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, nursery, forage.

Migratory Obstructions (seasonal, permanent)
none observed

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.

rose breasted goose hawk, frog sp.

Field Notes Authored by MF

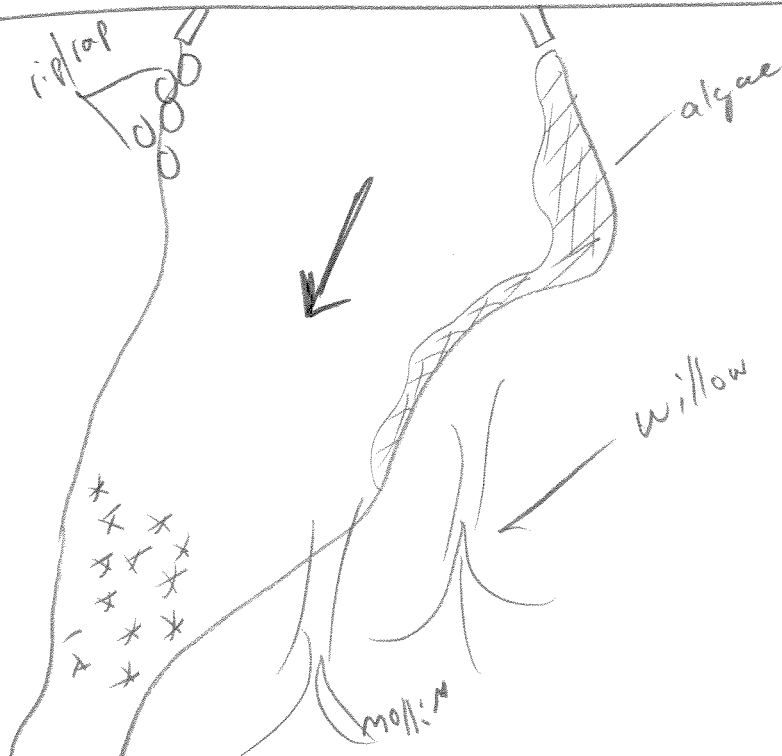
Field Notes QA/QCed by AME



Carborough rd.



R.D. #27





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
Welland Rv.

Station # 35-3
 Watercourse Name Welland Rv.
 Photos See photo log
 Date 2012 06 18
 Weather conditions in previous 24 hrs mmol precip
 GPS Coordinates (Zone) 17T E 0623724 N 4762460 Datum NAD83
 Descriptive Location On Riverside Dr. ~ 40m South of Carborough Rd.

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, MF
 Time 16:46

No access
Road to skunk
from bridge

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 30 (m) Maximum Pool Depth >100 (cm)
 Mean Bankfull Width 40 (m) Mean Water Depth >100 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 30? Silt 50? Muck _____
 Boulder _____ Gravel 20? 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% tree sp, reed canopy grass, willow sp.
 Adjacent Land Use Houses, rds

Fish Habitat Potential

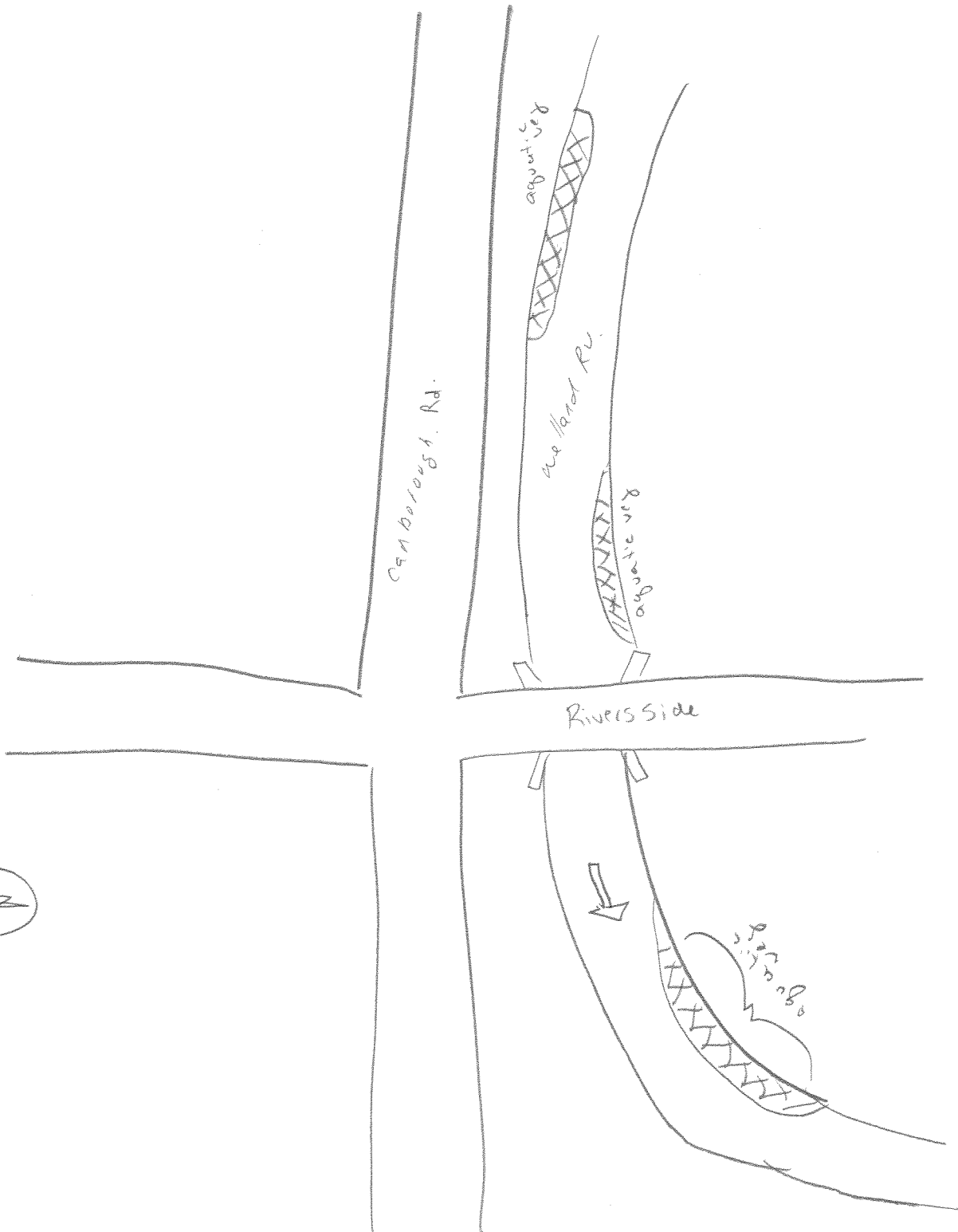
Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning, nursery, forage
 Migratory Obstructions (seasonal, permanent)
none observed
 Note any fish observations none

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 ME Field Notes QA/QCed by MEE





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 36-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950269
 Photos See photo log Field Staff ME ME
 Date 2012 06 19 Time 12:51
 Weather conditions in previous 24 hrs minor precip
 GPS Coordinates (Zone) 17T E 0621414 N 4763625 Datum NAD83
 Descriptive Location On Elcho Rd ~ 2km west of Roy Rd 27.

Water Quality

Dissolved Oxygen (mg/L) 7.13 pH 7.98 Conductivity (μ S/cm) 481
 Water Temperature ($^{\circ}$ C) 23.14 Air Temperature ($^{\circ}$ C) 28 $^{\circ}$ C
 Time *in situ* measurements taken 13:00

Watercourse Dimensions & Morphology

Mean Watercourse Width 4.0 (m) Maximum Pool Depth ~80 (cm)
 Mean Bankfull Width 5.5 (m) Mean Water Depth ~50 (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability none

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 30 Muck _____
 Boulder _____ Gravel 30 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)
2% reed canopy grass

Adjacent Land Use

Ag

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, forage, overcast

Migratory Obstructions (seasonal, permanent)
none observed

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. Barn Swallow

Field Notes Authored by ME

Field Notes QA/QCed by MEE



Ag

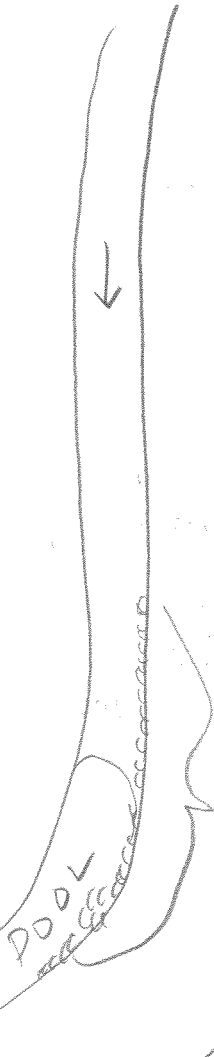
algae/duckweed



POOL



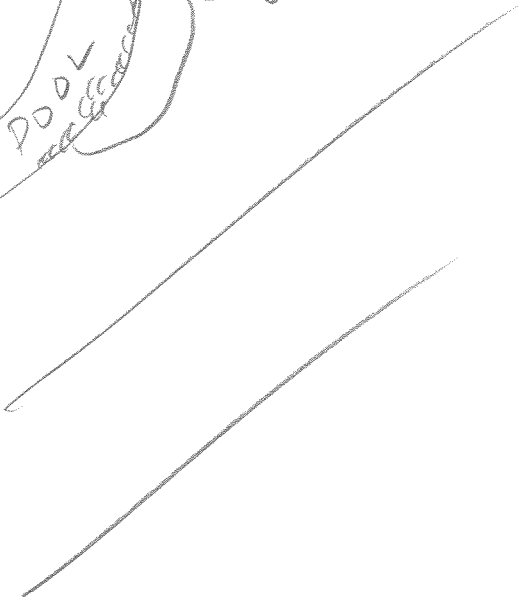
ECHO RD



POOL

algae/duckweed

wheat





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 36-2

Project Name Niagara Wind

Watercourse Name unknown

Project # 160950269

Photos see photo log

Field Staff ME, MF

Date 2012 06 18

Time 13:30

Weather conditions in previous 24 hrs hot & humid

GPS Coordinates (Zone) 17T E 0621701 N 4764279 Datum NAD83

Descriptive Location ~600m north in field from Fliche Rd

Water Quality

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

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

Time *in situ* measurements taken

Damp

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m) Maximum Pool Depth N/A (cm)

Mean Bankfull Width 3.0 (m) Mean Water Depth N/A (cm)

% Riffle % Pool % Run % Flat

Evidence of eroding banks, Comments on bank stability

DRY

DRY

Substrate (% cover)

Bedrock Cobble Sand 30 Silt 70 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

DRY

Riparian Zone

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

30% reed canopy grass

Adjacent Land Use

ag, small woodlot

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

possible 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. None

Field Notes Authored by MF

Field Notes QA/QCed by MEE

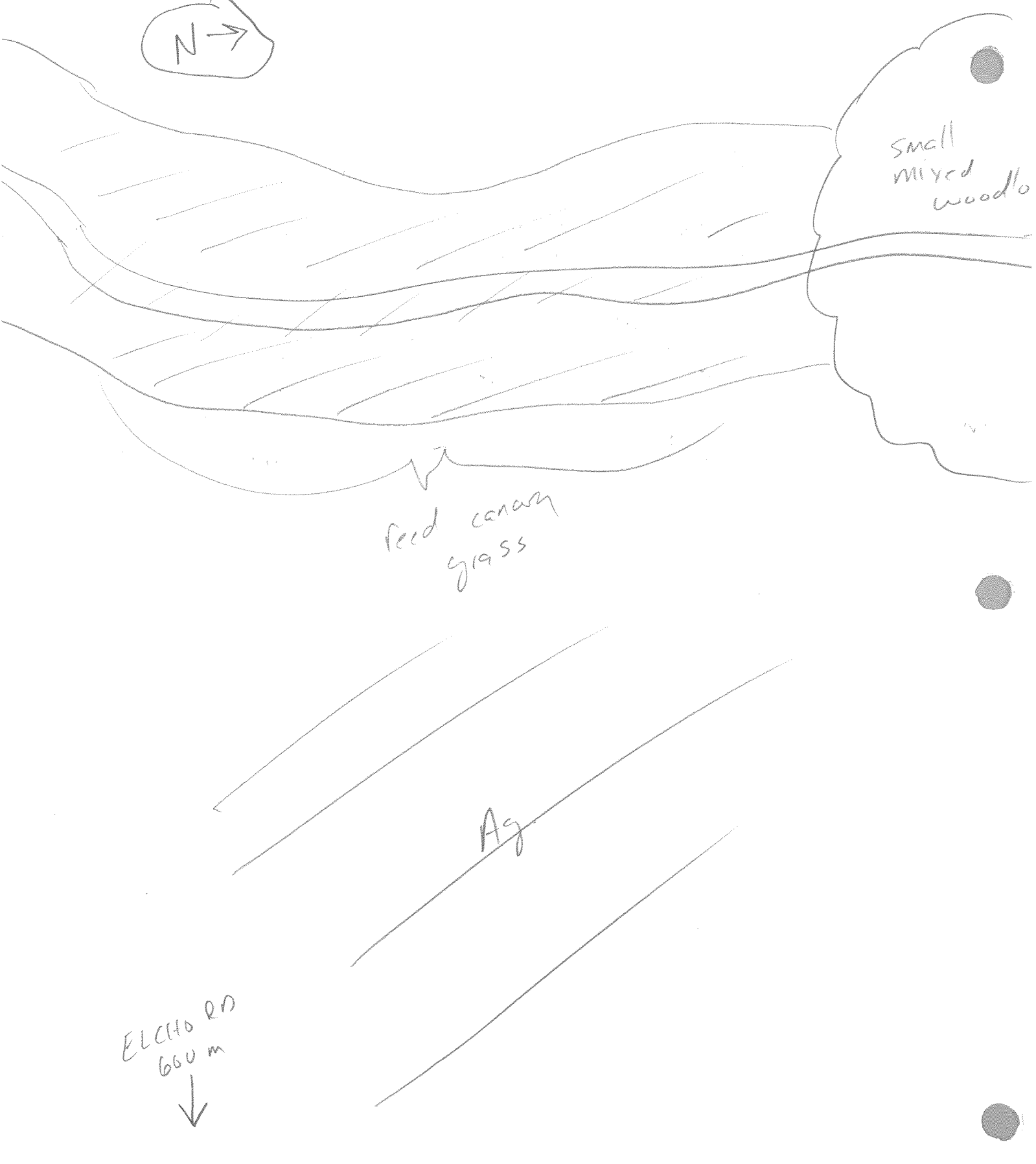
N →

Small mixed woodlot

reed canary grass

Ag

ELCHO RD
660 m
↓





REA

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 36-3
 Watercourse Name unknown
 Photos See photo log
 Date 2012 06-18
 Weather conditions in previous 24 hrs minor precip
 GPS Coordinates (Zone) 17T E 01020399 N 4763566 Datum NAD83
 Descriptive Location On Elcho Rd ~ 3km west of R.R. 27.

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME MF
 Time 13:46

Water Quality

Dissolved Oxygen (mg/L) 7.68 pH 8.09 Conductivity (µS/cm) 675
 Water Temperature (°C) 22.65 Air Temperature (°C) 30.2
 Time *in situ* measurements taken 13:49

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.0 (m) Maximum Pool Depth ~ 70 (cm)
 Mean Bankfull Width ~ 10 (m) ^{Flood plane} Mean Water Depth (cm)
 % Riffle 100 % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

Bedrock Cobble Sand 40 Silt 40 Muck
 Boulder Gravel 20 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% reed canopy grass

Adjacent Land Use

ag, farm, rd

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
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.

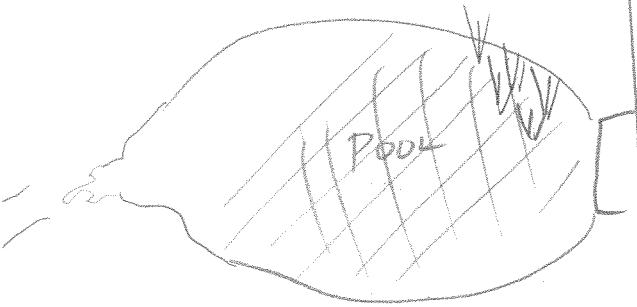
Field Notes Authored by MF

Field Notes QA/QCed by ME

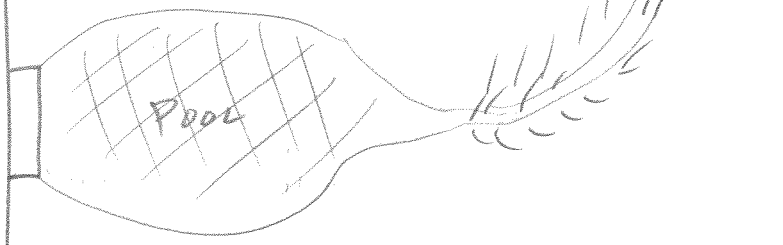


grazing

Ag





ECHO RD



Meadow

 = cattail

 = thick w algae / duckweed

 = reed canary grass



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 37-1 Project Name Niagara Wind
 Watercourse Name Unknown Project # 160950269
 Photos See photo log Field Staff ME, MF
 Date 2017 06 18 Time 12:40
 Weather conditions in previous 24 hrs Minor precipitation
 GPS Coordinates (Zone) 17T E 0622571 N 4763682 Datum NAD83
 Descriptive Location ~60m west of Regional Rd 27 on Elcho Rd.
Crosses under Elcho Rd.

Water Quality

Dissolved Oxygen (mg/L) 3.73 pH 7.57 Conductivity (μ S/cm) 1534
 Water Temperature ($^{\circ}$ C) 21.80 Air Temperature ($^{\circ}$ C) 28 $^{\circ}$ C
 Time *in situ* measurements taken 12:45

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.0 (m) Maximum Pool Depth ~ 70 (cm)
 Mean Bankfull Width ~ 30 (m) Mean Water Depth ~ 30 (cm)
 % Riffle 30 % Pool _____ % Run 70 % Flat _____
 Evidence of eroding banks, Comments on bank stability none. well vegetid

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 40 Muck _____
 Boulder _____ Gravel 20 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% reed canary grass
 Adjacent Land Use Houses, Rds

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Spawning, nursery
 Migratory Obstructions (seasonal, permanent)

None observed
 Note any fish observations Fish sp.

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.

Frog sp.

Field Notes Authored by MF


Field Notes QA/QCed by MEE

←N

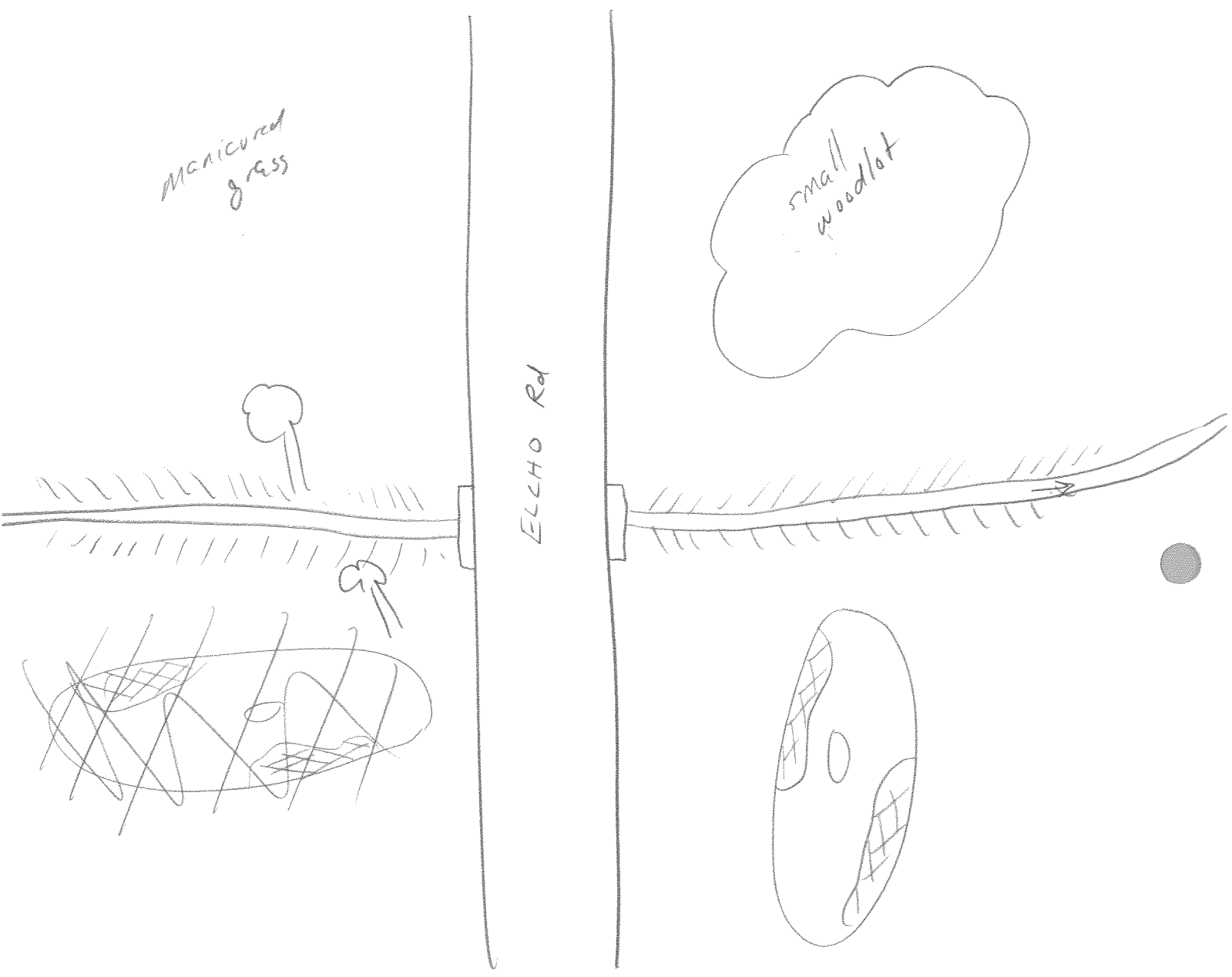
manicured
grass

ELCHO Rd

small
woodlot

 = duckweed

||||| = reed canary grass



Farm dikes through swale, plants, harvests

ml.
Non-REA @ east
Side of Row
only (4m long)
Non-REA on
west side



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 37-2
Watercourse Name unknown
Photos See photo log
Date June 21/12

Project Name Niagara Wind
Project # 160958269
Field Staff ME, MF
Time 11:23

Weather conditions in previous 24 hrs no precipitation
GPS Coordinates (Zone) 17T E 0622266 N 4764173 Datum NAD83
Descriptive Location On R.R 27 ~ 600 m north of Elcho Rd.

STANDING
WATER
ONLY

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 30°
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.40 (m) Maximum Pool Depth 20 (cm)
Mean Bankfull Width 1.0 (m) Mean Water Depth 20 (cm)
% Riffle _____ % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability minor undercut

pool @ u/s
culvert end
only

Substrate (% cover)

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

In-water Cover

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

@ culvert only

Riparian Zone

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

0% seed canopy grass
Adjacent Land Use ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none
Migratory Obstructions (seasonal, permanent)

dry through plowed fields on both sides
Note any fish observations _____

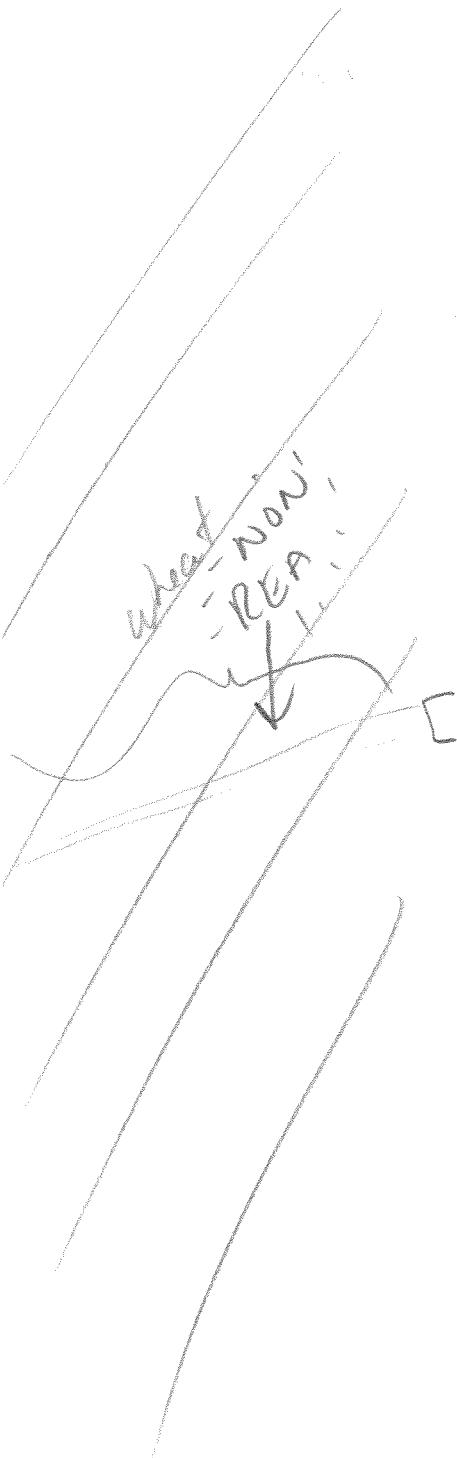
Waterbody Notes

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. leopard frog & green frogs

Field Notes Authored by ME

Field Notes QA/QCed by MGE



Row
Meadow

R.R. 27

Row
Meadow





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 38-1

Project Name Niagara Wind

Watercourse Name unknown

Project # 160950269

Photos See photo log

Field Staff ME, MF

Date 2012 06 18

Time 14:32

Weather conditions in previous 24 hrs Minor precip

GPS Coordinates (Zone) 17T E 0623841 N 4763744 Datum NAD83

Descriptive Location On Elcho Rd ~800m east of RR #27

Water Quality

Dissolved Oxygen (mg/L) 11.83 pH 8.16 Conductivity (µS/cm) 2926

Water Temperature (°C) 22.43 Air Temperature (°C) 30°C

Time *in situ* measurements taken 14:45

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.0 (m) Maximum Pool Depth 15 (cm)

Mean Bankfull Width 3.0 (m) Mean Water Depth 10 (cm)

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

Evidence of eroding banks, Comments on bank stability minor undercut

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 40 Muck _____
Boulder _____ Gravel 20 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% seed canopy grass

Adjacent Land Use
ag, houses, rds.

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
lack of water

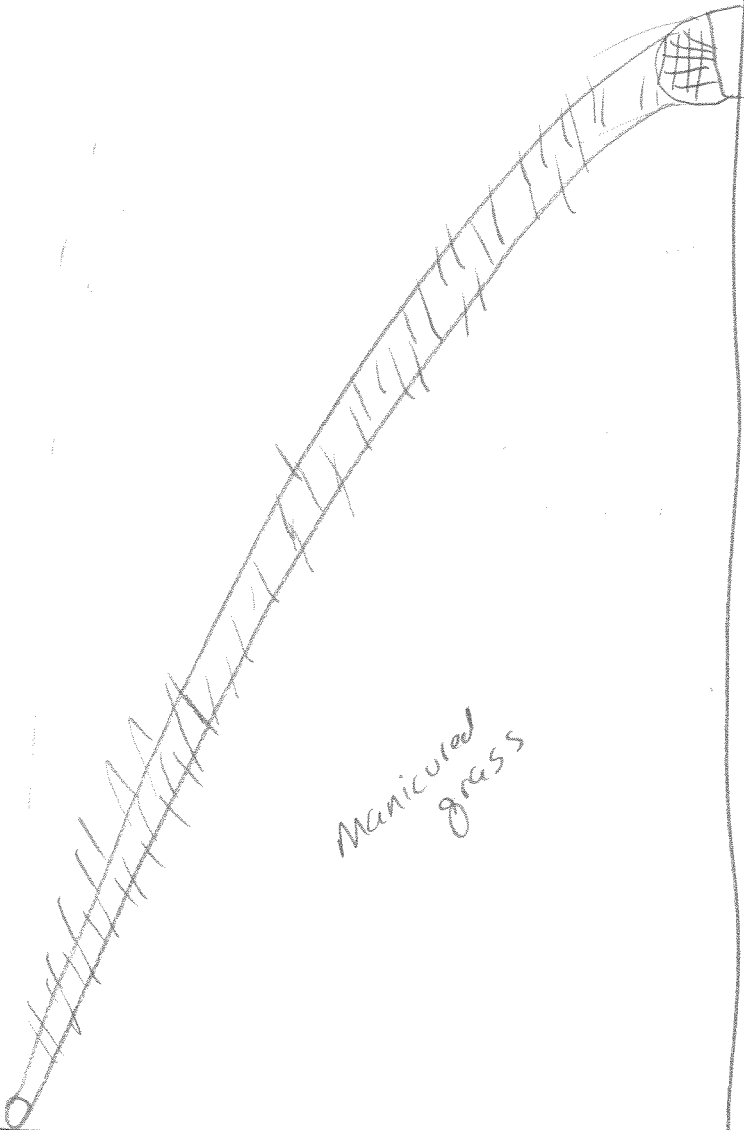
Note any fish observations Fish sp

Waterbody Notes

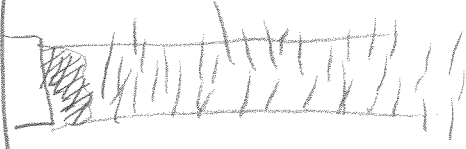
Natural Watercourse Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.
Frog sp

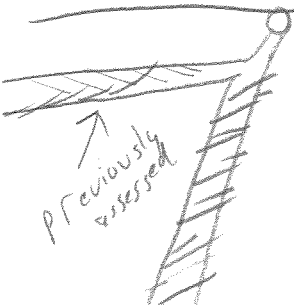
Field Notes Authored by MF Field Notes QA/QCed by MEE



ELCHO RD



DRIVEWAY



Standing
H₂O



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

~~AL~~

Station # 38-2
 Watercourse Name unknown
 Photos See photo log
 Date 2012 06 18
 Weather conditions in previous 24 hrs minor precip
 GPS Coordinates (Zone) 17T E 0624426 N 4763988 Datum NAD83
 Descriptive Location On Elcho Rd ~ 650m east of Colver Rd

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, MF
 Time 14:49

Water Quality

Dissolved Oxygen (mg/L) 5.18 pH 8.13 Conductivity (µS/cm) 1798
 Water Temperature (°C) 14.59 Air Temperature (°C) 30.2
 Time *in situ* measurements taken 14:55

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.0 (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width 2.0 (m) Mean Water Depth 155 (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 30 Silt 30 Muck _____
 Boulder _____ Gravel 30 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) 30% mature + immature oak sp, manitoba maple.
 Adjacent Land Use ag land

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) spawn, nursery, forage
 Migratory Obstructions (seasonal, permanent) may dry up
 Note any fish observations Species 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 ME Field Notes QA/QCed by MEE



ELCH RD.



Pool



Mixed woodlot





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 39-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950269
 Photos See photo log Field Staff ME, ME
 Date 2012 06 15 Time 15:08
 Weather conditions in previous 24 hrs minor precip
 GPS Coordinates (Zone) 17T E 06260022 N 4763874 Datum NAD 83
 Descriptive Location On Elcho Rd ~ 100m east of Heaslip Rd

Water Quality
 Dissolved Oxygen (mg/L) 14.64 pH 8.73 Conductivity (μ S/cm) 1401
 Water Temperature ($^{\circ}$ C) 27.75 Air Temperature ($^{\circ}$ C) 30%
 Time *in situ* measurements taken 15:15

Watercourse Dimensions & Morphology
 Mean Watercourse Width 2.5 (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width 3.0 (m) Mean Water Depth 10 (cm)
 % Riffle 20 % Pool 80 % Run 80 % Flat
 Evidence of eroding banks, Comments on bank stability minor scouf.

Substrate (% cover)
 Bedrock Cobble Sand 30 Silt 40 Muck
 Boulder Gravel 30 Clay Marl Detritus

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

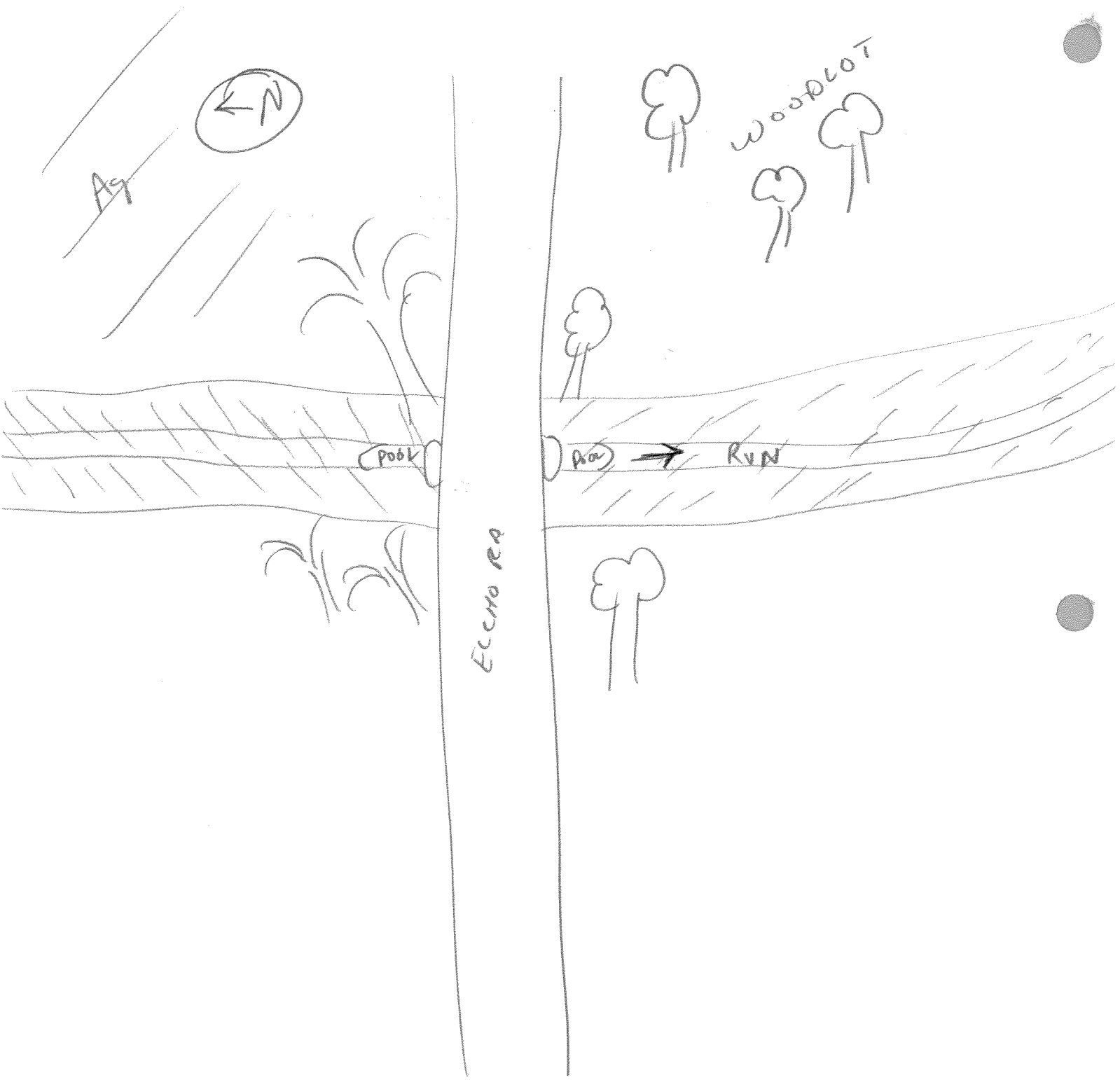
Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
5% seed canopy grass
 Adjacent Land Use ag fields

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn
 Migratory Obstructions (seasonal, permanent)
may dry up
 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 ME Field Notes QA/QCed by MEE





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 40-1
 Watercourse Name unknown
 Photos see photo log
 Date 2012 06 18
 Weather conditions in previous 24 hrs minor precip.
 GPS Coordinates (Zone) 17T E 0626874 N 4763925 Datum NAD83
 Descriptive Location On Elcho Rd ~ 100m west of Gee Rd.

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, MF
 Time 15:22

Water Quality

Dissolved Oxygen (mg/L) pH Conductivity (µS/cm)
 Water Temperature (°C) Air Temperature (°C) 30°C
 Time *in situ* measurements taken

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.0 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 2.5 (m) Mean Water Depth 8 (cm)
 % Riffle 100 % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability none observed.

Substrate (% cover)

 Bedrock Cobble Sand 30 Silt 40 Muck
 Boulder Gravel 30 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) 25% seed carrying grass, immature/mature mixed woodlot.
 Adjacent Land Use woodlot, rd, diag.

Fish Habitat Potential

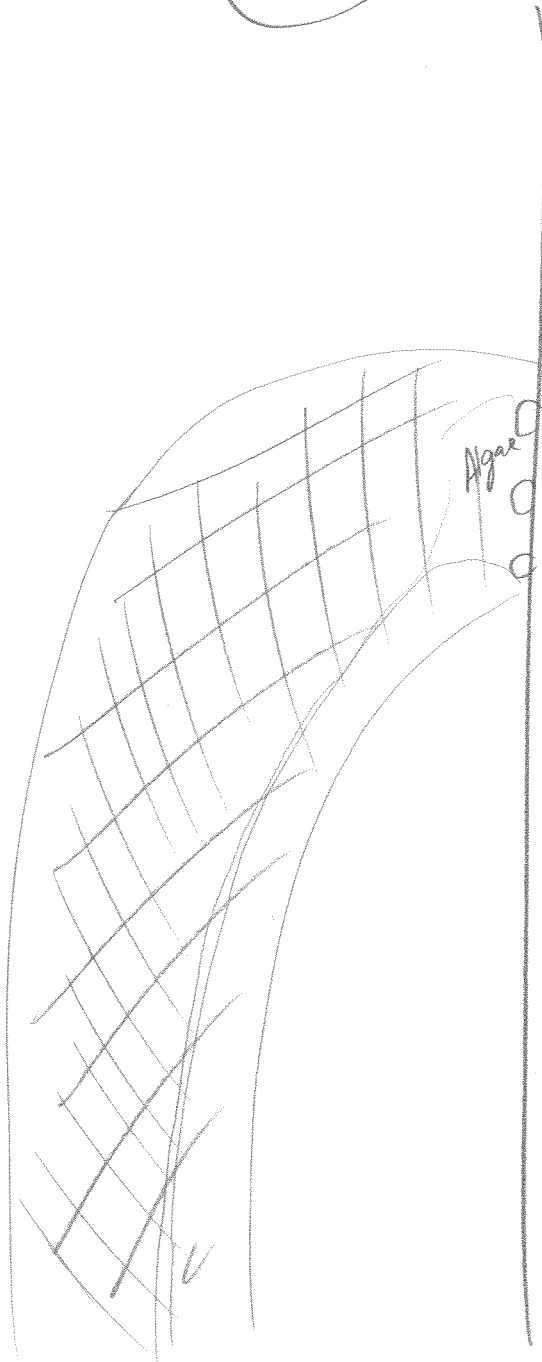
Critical Habitat (spawning or nursery areas, groundwater upwellings) spawn?
 Migratory Obstructions (seasonal, permanent)
 Note any fish observations none

Waterbody Notes

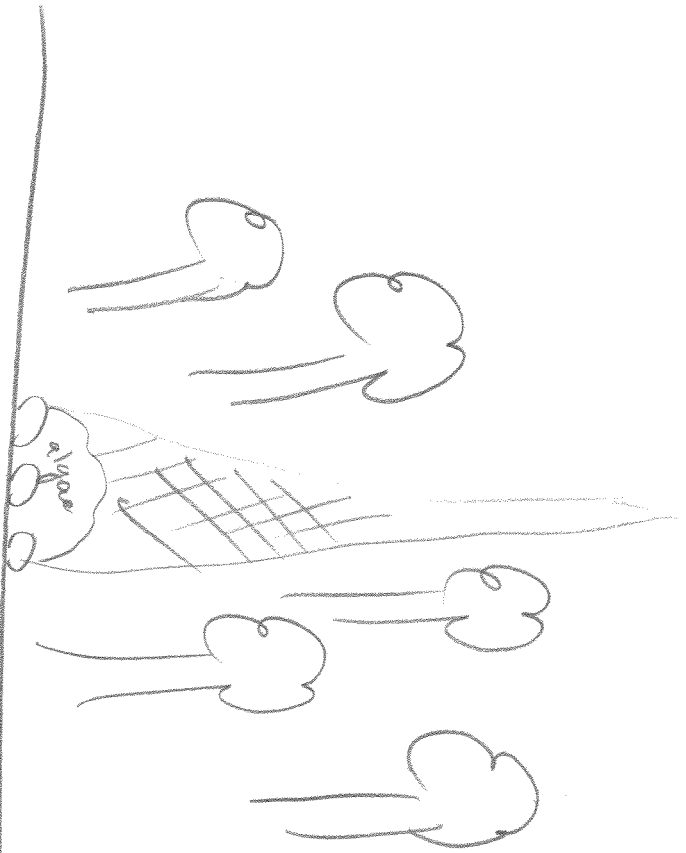
Natural Watercourse Trapezoidal Channel Grassed Swale Buried Tile
 Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc. frog sp.

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



ELUO RA



= reed canopy grass



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 421 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950269
 Photos see photo log Field Staff ME, MF
 Date 2012 06 19 Time 15:34
 Weather conditions in previous 24 hrs minor precip.
 GPS Coordinates (Zone) 17T E 629310 N 4764069 Datum NAD83
 Descriptive Location On Boyle Rd ~ 20 m south of Canborough Rd.
Channel on west side.

Water Quality
 Dissolved Oxygen (mg/L) 6.83 pH 8.37 Conductivity (μ S/cm) 819
 Water Temperature ($^{\circ}$ C) 24.04 Air Temperature ($^{\circ}$ C) 30.0
 Time *in situ* measurements taken 15:40

Watercourse Dimensions & Morphology
 Mean Watercourse Width 1.2 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 2.5 (m) Mean Water Depth 5 (cm)
 % Riffle 30 % Pool 70 % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability minor silt

Substrate (% cover)
 Bedrock _____ Cobble 20 Sand 30 Silt 20 Muck _____
 Boulder _____ Gravel 30 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)
3% red canopy grass.
 Adjacent Land Use pasture, houses, rds.

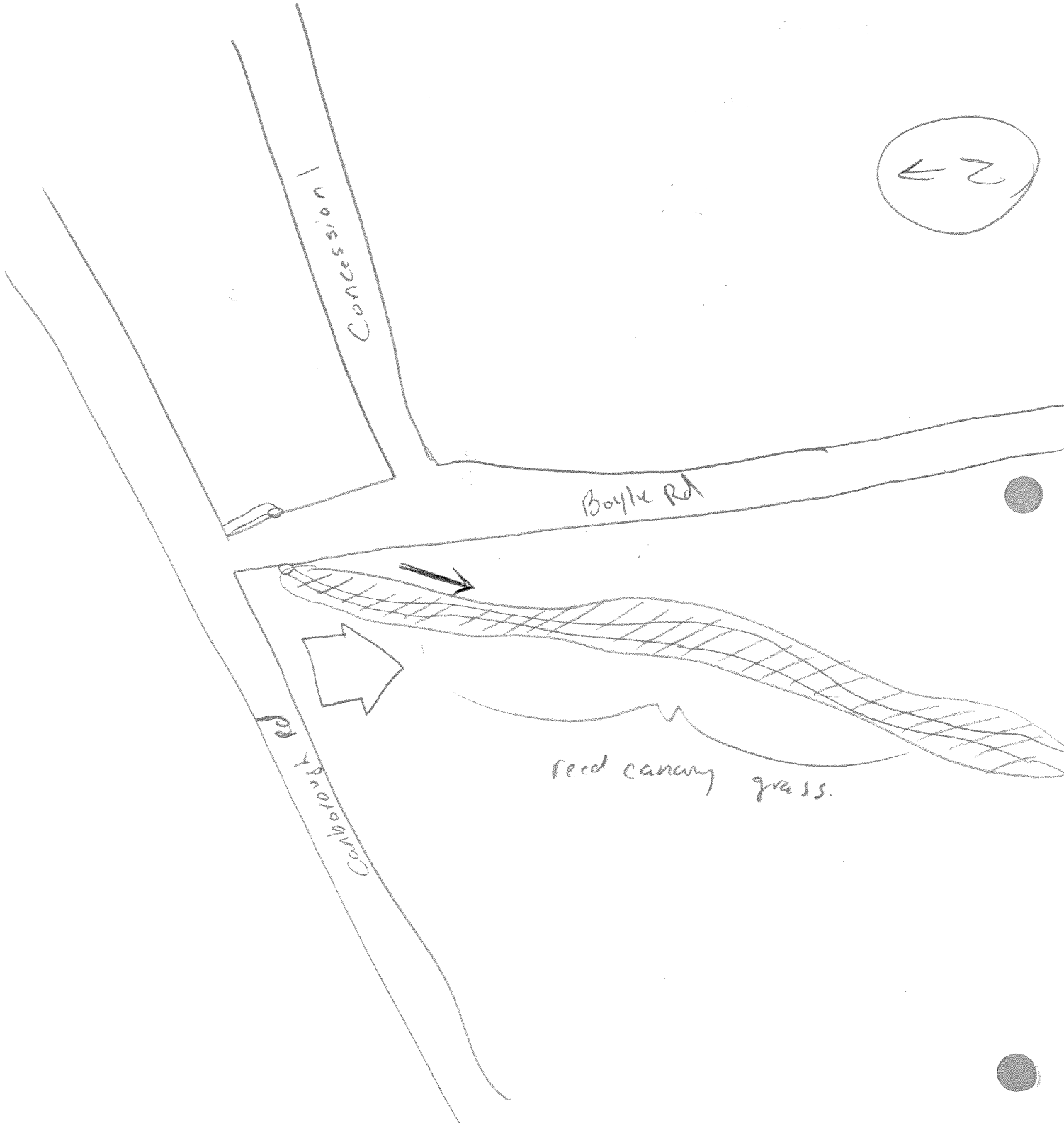
Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn?
 Migratory Obstructions (seasonal, permanent)
maybe
 Note any fish observations None.

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 MEF

22





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
10/11/12

Stantec

Station # 43-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keener, K. Clayton
 Date June 21/12 Time 8:51
 Weather conditions in previous 24 hrs Hot & humid 32°C
 GPS Coordinates (Zone) 17T E 620492 N 4764984 Datum Nad83
 Descriptive Location off of Vaughn Rd, East of Regional Rd 27

Water Quality

Dissolved Oxygen (mg/L) 1.10 pH _____ Conductivity (µS/cm) 443
 Water Temperature (°C) 22.85 Air Temperature (°C) 30°C
 Time *in situ* measurements taken 8:56

Watercourse Dimensions & Morphology

Mean Watercourse Width 1-3 (m) Maximum Pool Depth 0.30 (cm)
 Mean Bankfull Width 5 (m) Mean Water Depth 0.15 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability vegetated - stable

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 40 Silt _____ Muck _____
 Boulder _____ Gravel 50 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

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

59% Reed Canary grass, early
 Adjacent Land Use cropland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

pot. spawning nursery foraging in spring

Migratory Obstructions (seasonal, permanent) 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.

leopard frogs very turbid water w/ lots of algae, Northside
green frogs of REA flows through cropland & Southside

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME

Reed
Canary
grass



Vaughn Road





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 44-1
Watercourse Name unknown
Photos _____
Date June 20/12

Project Name Niagara Wind
Project # 160958269
Field Staff J. Keene, K. Clayton
Time 10:21

Weather conditions in previous 24 hrs hot + humid
GPS Coordinates (Zone) 17T E 622021 N 4765373 Datum Nad83
Descriptive Location West side of Regional Rd 27, North of Vaughn Rd

Water Quality

~~- no water~~
Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 30°C
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

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

Substrate (% cover)

Bedrock _____ Cobble 40 Sand 10 Silt _____ Muck _____
Boulder _____ Gravel 50 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
85% grasses, early

Adjacent Land Use

dry

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) dry

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 K. Clayton

Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 44-2 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keene, K. Clayton
 Date June 20/12 Time 10:30
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E 622021 N 4765373 Datum NAD83
 Descriptive Location off of Regional Rd 27 (East side),
north of Vaughn Rd.

Water Quality

dry
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 1-2 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble 40 Sand 10 Silt _____ Muck _____
 Boulder _____ Gravel 50 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
85%, grasses, early

Adjacent Land Use

crops - Alfalfa, soy

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
potential spawning in spring

Migratory Obstructions (seasonal, permanent)
dry

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 K Clayton

Field Notes QA/QCed by ME



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Central Welland River
↳ unnamed creek

NON
REA

Station # 45-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950269
 Photos 9123 - 9125 Field Staff K. Clayton, J. Keene
 Date June 20/12 Time 10:45
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 624027 E 4765154 N Datum NAD83
 Descriptive Location East of Turbine 76, off of Vaughn Rd ITT

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30
 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 50% grasses, early farmland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent) dry

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 K Clayton Field Notes QA/QCed by JK



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Unnamed creek to CWR

Non REA

Station # 45-2 Project Name Niagara Wind
 Watercourse Name Unknown Project # 160950269
 Photos 9126-9128 Field Staff K. Clayton, J. Keene
 Date June 20/12 Time 10:45
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 624331 E 4765169 N Datum ITM Nad.
 Descriptive Location East of 45-1, off of Vaughn Rd.

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 32
 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 _____ Typha RCG

Riparian Zone

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

Adjacent Land Use

Agricultural land

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations dm

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 K. Clayton

Field Notes QA/QCed by JKe



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 46-1
 Watercourse Name unknown
 Photos _____
 Date June 20/12
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 626828
 Descriptive Location N of Vaughn Rd, West of Green Road

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Keene, K. Clayton
 Time 11:19
 Datum NAD83

Water Quality

Dissolved Oxygen (mg/L) - Dry pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m)
 Mean Bankfull Width 3m (m)
 Maximum Pool Depth _____ (cm)
 Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 40 Silt _____ Muck _____
 Boulder _____ Gravel 50 Clay _____ Marl _____ Detritus _____

In-water Cover

Cover Types Present (circle):
 Overhanging Vegetation Woody Debris Undercut Banks _____ Deep Pool _____ Watercress _____
Aquatic Veg *red water lily*

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
75% grasses, early

Adjacent Land Use

Corn & soy

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
potential spawning in spring

Migratory Obstructions (seasonal, permanent)
dry - seasonal

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 K. Clayton

Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 47-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos _____ Field Staff J. Keen, K. Clayton
 Date June 21/12 Time 15:14
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 621983 N 4766607 Datum NAD83
 Descriptive Location off of corner of Regional Rd 20 #27

Water Quality

~~Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 32°C +
 Time *in situ* measurements taken _____~~ - no water

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable banks

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

100% typha, early
field, residential, road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

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.

along side road dominated by typha & Phragmites

Field Notes Authored by K. Clayton

Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

BEA

Station # 47-2
 Watercourse Name unknown
 Photos _____
 Date June 21/12
 Weather conditions in previous 24 hrs Hot & humid
 GPS Coordinates (Zone) 17T E 622651 N 4766473 Datum Nad83
 Descriptive Location off of regional Rd 20, E of 47-1

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Keene, K. Clayton
 Time 13:25

Water Quality

- dry

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 32°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
 Overhanging Vegetation Woody Debris Boulder Other _____ Aquatic Veg
 Typha RCG Phrag

Riparian Zone

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

Adjacent Land Use

Residential, Road, Sag

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) dry

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 K. Clayton

Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 47-3
 Watercourse Name unknown
 Photos _____
 Date June 21/12
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 623014 N 4766498 Datum Nad83
 Descriptive Location off of Regional Road 20, East of 47-2

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Keene, K. Clayton
 Time 15:30

Water Quality

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

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 1.5 (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
Overhanging Vegetation Woody Debris Boulder Other _____ Aquatic Veg

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
90% Typha, early
 Adjacent Land Use farmland, Road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) dry
 Note any fish observations _____

Waterbody Notes

Natural Watercourse *on south side* 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 K. Clayton Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Defined on south side
lack of definition not
less m.f. DRL

Station # 48-1
Watercourse Name unknown
Photos See photo log
Date June 22/12

Project Name Niagara Wind
Project # 160958269
Field Staff ME, MF
Time 10:31

Weather conditions in previous 24 hrs Minor precip
GPS Coordinates (Zone) 17T E 0623407 N 4766520 Datum Nad83
Descriptive Location On R.R. 20 ~ 1km east of R.R. 27

Water Quality

DRY
Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 28°C
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

DRY
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 _____

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 20 Silt 20 Muck _____
Boulder 10 Gravel 40 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)
2% mature trees, reed canopy grass
Adjacent Land Use
house, roads, hay fields

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. _____

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



Meadow



reed canopy grass
lack of det'n



R.R. 20

R.R. 27
↓ ~1km

cattail / reed canopy grass



MANICURED GRASS



MANICURED GRASS





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
Intermittent
well defined

Station # 49-1
Watercourse Name unknown
Photos See photo log
Date June 22/12

Project Name Niagara Wind
Project # 160958269
Field Staff ME, ME
Time 09:52

Weather conditions in previous 24 hrs minor precip.
GPS Coordinates (Zone) 17T E 0626247 N 4766926 Datum NAD83
Descriptive Location On Silverdale Rd ~ 200m north of R.R.20

Too shallow standing water

Water Quality
Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 25°C
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
Mean Watercourse Width 2.0 (m) Maximum Pool Depth 10 (cm) ← west e of culv opening
Mean Bankfull Width _____ (m) Mean Water Depth _____ (cm)
% Riffle _____ % Pool 100 % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability none. well veget'd.

Substrate (% cover)
Bedrock _____ Cobble _____ Sand 40 Silt 30 Muck _____
Boulder _____ Gravel 30 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)
2% mature trees near by
Adjacent Land Use ac fields, house, rds.

Fish Habitat Potential
Critical Habitat (spawning or nursery areas, groundwater upwellings)
possible spawn
Migratory Obstructions (seasonal, permanent)
Dry - water @ west end culvert only. - East end 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. Beau swallows, green frogs, tadpoles

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



R.R. 20

graze



DRY

SW

SILVERDALE RD.

DRY

MANICURED GRASS

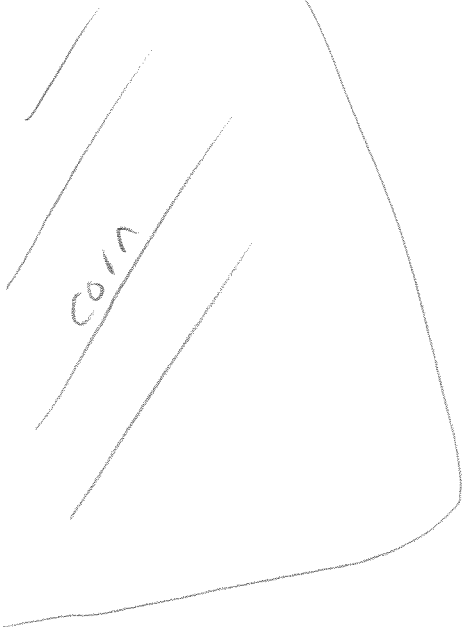


SOY



MANICURED GRASS

CORN





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Unnamed Creek
to CWR

Nor
REA

Station # 50-1
Watercourse Name Unknown
Photos _____
Date June 20/12

Project Name Niagara Wind
Project # 160950269
Field Staff K. Clayton J. Keene
Time 16:00

Weather conditions in previous 24 hrs hot & humid
GPS Coordinates (Zone) 621891 E 4767594 N Datum MTN
Descriptive Location Runs north & south along Regional Rd 20 of concession 4, west of 50-2

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 32
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

Road, farmland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
Migratory Obstructions (seasonal, permanent) _____
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. _____

Field Notes Authored by K. Clayton Field Notes QA/QCed by JK



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Unnamed Creek
to CWR

Na
RE

Station # 50-2
 Watercourse Name Unknown
 Photos _____
 Date June 20/12
 Weather conditions in previous 24 hrs Hot & humid
 GPS Coordinates (Zone) 622065 E 4767880 N
 Descriptive Location E of regional rd 20, of 50-1, off of concession 4

Project Name Niagara Wind
 Project # 10000069
 Field Staff K. Clayton, J. Kewic
 Time 16:05

Datum NAD 83

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30
 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

farmland

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations dry channel

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 K. Clayton

Field Notes QA/QCed by JK



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 51-31 ml.
 Watercourse Name unknown
 Photos _____
 Date June 21/12
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 621997
 Descriptive Location off of Regional Road

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Keene, K. Clayton
 Time 15:52

N 4768690 Datum Nad 83

Water Quality

Dissolved Oxygen (mg/L) _____ *no water*
 Water Temperature (°C) _____ pH _____ Conductivity (µS/cm) _____
 Air Temperature (°C) 33°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 4 (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):
Overhanging Vegetation Undercut Banks Deep Pool Watercress Aquatic Veg
 Woody Debris Boulder Other _____ *Typha RC*

Riparian Zone

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

Adjacent Land Use

soy, Road, forest

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) dry

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.

but Typha corridor - a little water, not enough to get 4s
ml moderately

Field Notes Authored by K. Clayton

Field Notes QA/QCed by MEE



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REF

Stantec

Station # 52-1
 Watercourse Name unknown
 Photos _____
 Date June 21/12
 Weather conditions in previous 24 hrs Hot + humid
 GPS Coordinates (Zone) 17T E 1022011 N 4769771 Datum NAD83
 Descriptive Location off of regional Rd 569, near intersection of RR 20

Project Name Niagara Wind
 Project # 160958269
 Field Staff J. Keene, K. Clayton
 Time 16:03

Water Quality

Dissolved Oxygen (mg/L) 2.10 pH 8.23 Conductivity (µS/cm) 1165
 Water Temperature (°C) 25.54 Air Temperature (°C) 32.0 C
 Time *in situ* measurements taken 16:05

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth 0.15 (cm)
 Mean Bankfull Width 5 (m) Mean Water Depth 0.10 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable - vegetated

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 40 Silt _____ Muck _____
 Boulder _____ Gravel 50 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
57%, Tundra, early
 Adjacent Land Use farmland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent)
permanent - (could be almost dry by end of summer)
 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. Turbid water

Field Notes Authored by K. Clayton Field Notes QA/QCed by WEE



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

non REA - south
north
south
REA
Use @ culvert on 4/4

Station # 54-1
Watercourse Name unknown
Photos See photo log
Date June 22/12

Project Name Niagara Wind
Project # 160958269
Field Staff MEE MF
Time 09:34

Weather conditions in previous 24 hrs Minor precip.
GPS Coordinates (Zone) 17T E 0626245 N 4769264 Datum Nad83
Descriptive Location On Fifteen Rd ~ 300m east of Silverdale Rd

STAND WATER only

Water Quality

Dissolved Oxygen (mg/L) pH Conductivity (µS/cm)
Water Temperature (°C) Air Temperature (°C) 24°C
Time in situ measurements taken

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.6 (m) Maximum Pool Depth 0.20 (cm)
Mean Bankfull Width 1.0 (m) Mean Water Depth 0.10 (cm)
 % Riffle 100 % Pool % Run % Flat
Evidence of eroding banks, Comments on bank stability mod def'n, minor scour

Substrate (% cover)

Bedrock Cobble Sand 40 Silt 30 Muck
Boulder Gravel 30 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) 2% reed canna grass
Adjacent Land Use ag fields, rd, farms.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) possible spawn, foliage, nursery
Migratory Obstructions (seasonal, permanent) dam @ times
Note any fish observations yes

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. frog sp, tadpoles, song sparrow

Field Notes Authored by MFP Field Notes QA/QCed by MRE



soy bean

red canary grass



SW

FIFTEEN RD

SW



red canary grass

v = cattail

soy bean

Silverdale Rd



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
DRY

Pond is ~~offering~~ flows providing

Station # 55-1
 Watercourse Name unknown
 Photos See photo log
 Date June 22/12
 Weather conditions in previous 24 hrs Minor amounts of rain
 GPS Coordinates (Zone) 17T E 0627007 N 4768151 Datum NAD83
 Descriptive Location On Concession 4 ~ 800m east of Beamer Rd.

Project Name Niagara Wind
 Project # 160958269
 Field Staff MF, ME
 Time 08:51

DRY

Water Quality

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

DRY

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.2 (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 scour near road

Silt = 10.

Substrate (% cover)

Bedrock	Cobble	Sand	Silt	Muck
Boulder	Gravel	Clay	Marl	Detritus

40 10 40

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% mature + immature trees + shrub species on both banks.
 Adjacent Land Use House, ag fields, rd.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
possible spawn.
 Migratory Obstructions (seasonal, permanent)
Dries up.
 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 _____

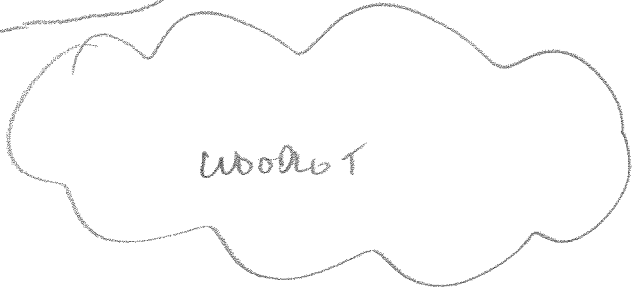
Other Habitat Notes, Incidental Wildlife Observations, etc. Green Heron, Green Frog.
Song birds.

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



✓ = cattail / reed canopy

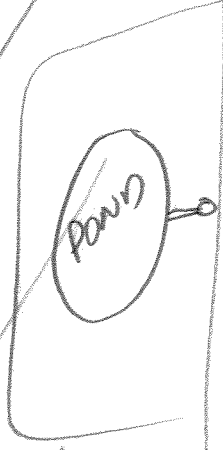
↑
Beamer Rd
~ 800m



WOODLOT

Concession 4

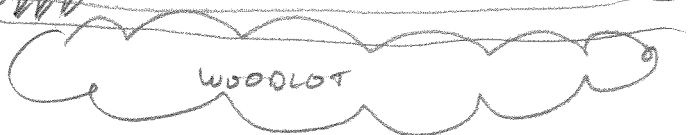
Flows ↓



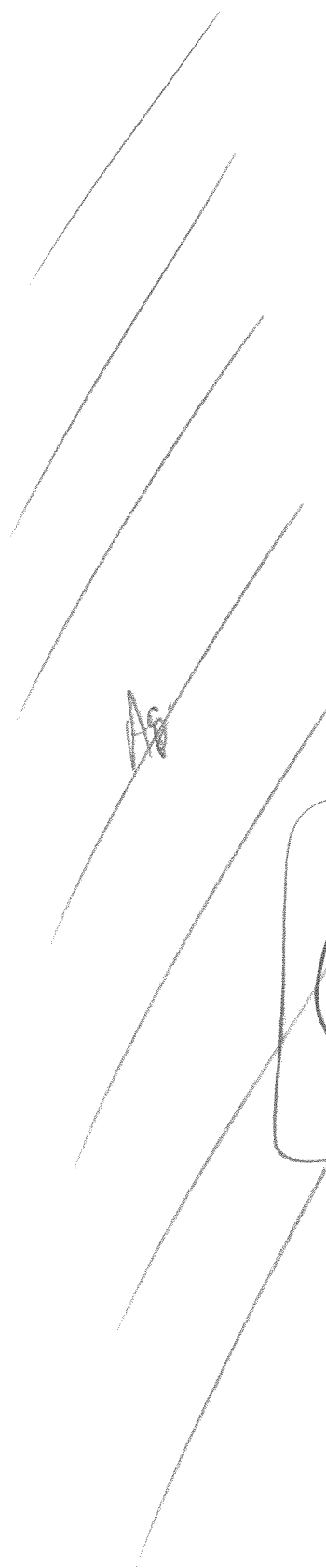
POND



HEDGROW



WOODLOT





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA DRY little definition

Station # 55-2 Project Name Niagara Wind
Watercourse Name unknown Project # 160958269
Photos See photo log Field Staff ME, MF
Date June 22/12 Time 09:18
Weather conditions in previous 24 hrs minor precip.
GPS Coordinates (Zone) 17T E 0625497 N 4768055 Datum Nad83
Descriptive Location On Con 4 ~ 600m west of Beamer Road

Water Quality

Dissolved Oxygen (mg/L) pH Conductivity (uS/cm)
Water Temperature (C) Air Temperature (C) 23.0
Time in situ measurements taken

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.0 (m) Maximum Pool Depth (cm)
Mean Bankfull Width 1.2 (m) Mean Water Depth (cm)
% Riffle % Pool % Run % Flat

Evidence of eroding banks, Comments on bank stability
50% north side 0% south side No mature trees

Substrate (% cover)

Bedrock Cobble Sand 50 Silt 10 Muck
Boulder Gravel 40 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% north side (mature trees) 0% south side through field

Adjacent Land Use

ag field, woodlot, rd

Fish Habitat Potential

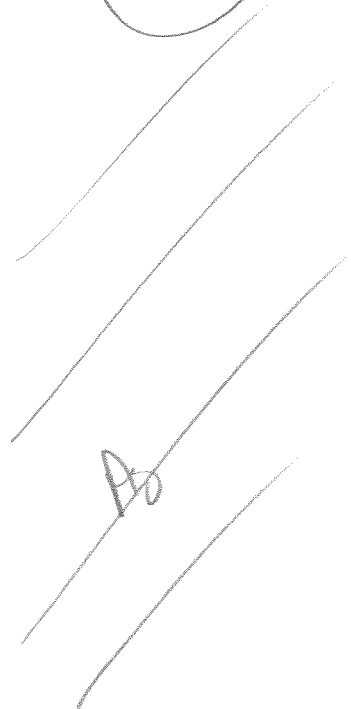
Critical Habitat (spawning or nursery areas, groundwater upwellings)
possible spawn
Migratory Obstructions (seasonal, permanent)
dry
Note any fish observations none

Waterbody Notes

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

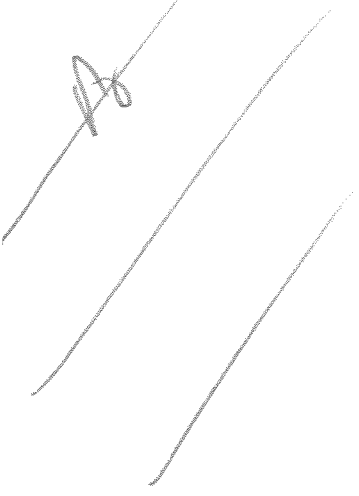
Other Habitat Notes, Incidental Wildlife Observations, etc.

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

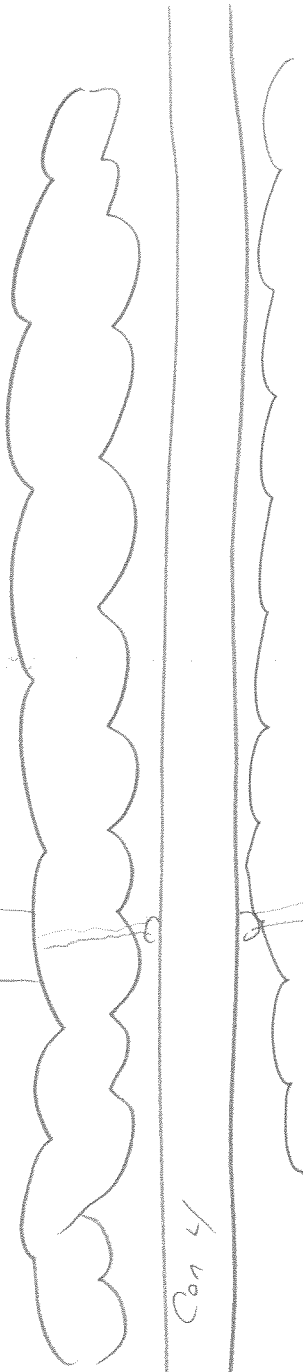


As

Reed cutting grass

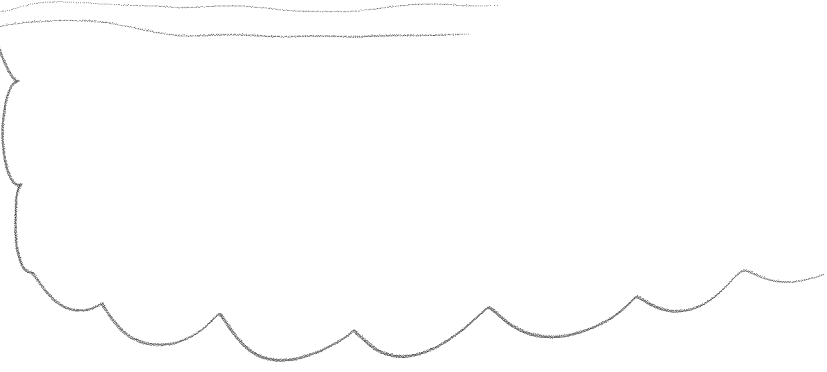


As



Can 4

Mixed woodlot



Silverdale Rd

Beamw Rd
↓



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA
No defin @ either end.

Terrestrial swale

Station # 56-1
 Watercourse Name unknown
 Photos See photo log
 Date June 21/12
 Weather conditions in previous 24 hrs No rain - hot + humid
 GPS Coordinates (Zone) 17T E 0628139 N 4768199 Datum Nad83
 Descriptive Location On Concession 4 ~ 500m east of Hodgking Rd.

Project Name Niagara Wind
 Project # 160958269
 Field Staff ME, MF
 Time 15:14

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 31°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

ag field, rd, house

Fish Habitat Potential

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

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. bobolink

Field Notes Authored by mi

Field Notes QA/QCed by MEE

← N/A



manicured
grass



need canopy
no dirt grass

Hodgkins Rd ~ 500 ↓



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

* Check w/ Katie + Joes notes

Now REA
Grass/Ag Swale
DRY

Station # 56-2
Watercourse Name unknown
Photos See photo log
Date June 21/12

Project Name Niagara Wind
Project # 160958269
Field Staff ME/MP
Time 15:23

Weather conditions in previous 24 hrs no rain
GPS Coordinates (Zone) 17T E 0627591 N 4768237 Datum Nad83
Descriptive Location On Hodgkin Rd ~ 30 m north of Concession 4.

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 31.0
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

Ag, fields, rds

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 MP

Field Notes QA/QCed by MEE



WOOD LOT

CORN

ditch

Hodgkin Rd

CORN

Concession 4

CORN

* Check w/ Katie + Joe notes



WIND FARM WATERBODY RAPID ASSESSMENT FORM

N6N-RE1
DRY

Stantec

Station # 56-3
Watercourse Name unknown
Photos See photos log
Date June 21/12

Project Name Niagara Wind
Project # 160958269
Field Staff ME, MF
Time 13:40

Weather conditions in previous 24 hrs No rain
GPS Coordinates (Zone) 17T E 0627688 N 4768178 Datum Nad83
Descriptive Location On Concession 4 ~ 70m east of Hodgkins Rd.

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 31°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

ag fields

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations _____

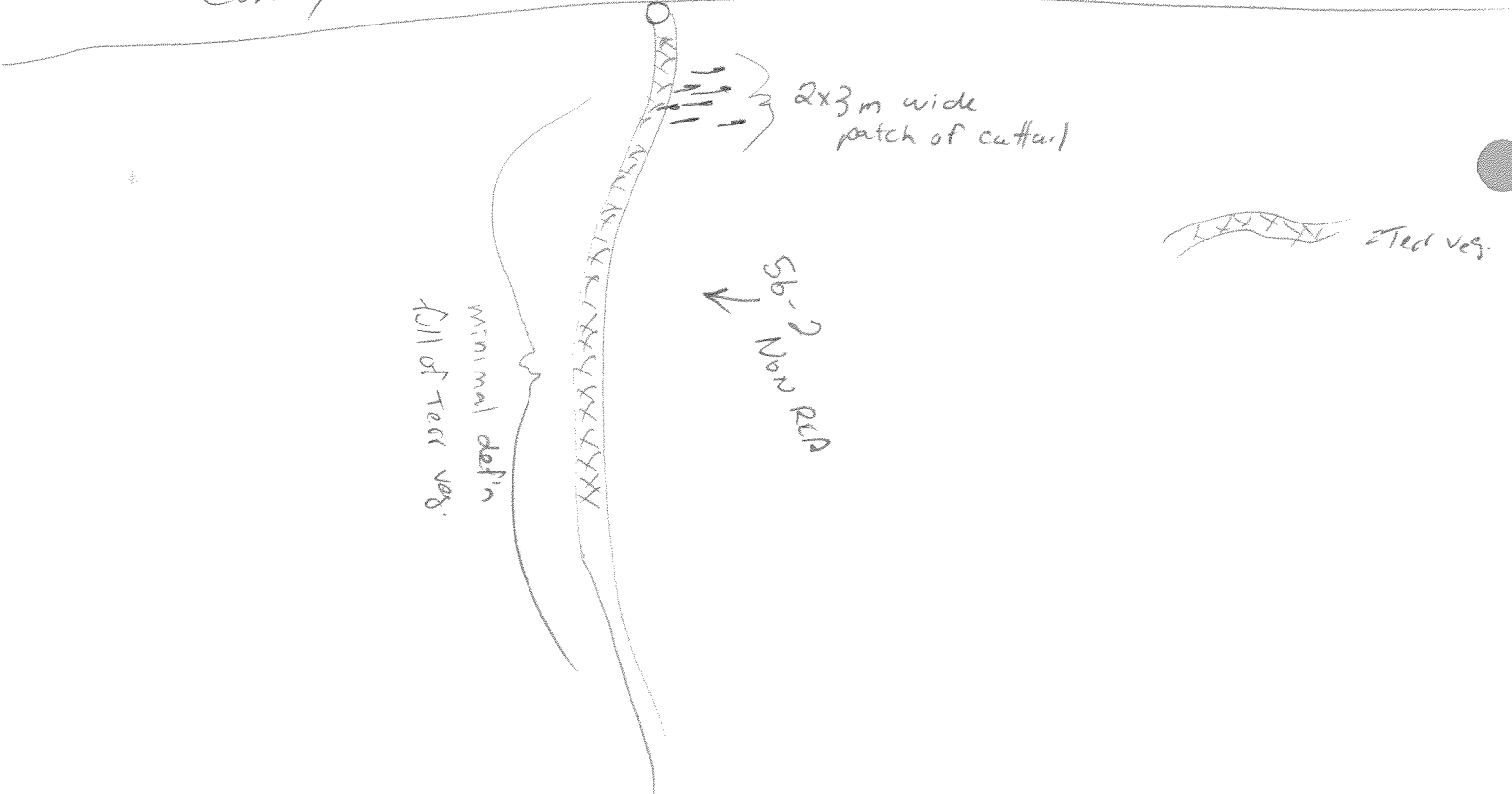
Waterbody Notes

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. Bobolink

Field Notes Authored by MF

Field Notes QA/QCed by MEE



Crown = Well mix of Aquatic veg + Terr veg. Defined through dredging.
Holmes = Ag Field, Planted + harvested, drives through it.



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
DRY

Station # 56-4 Project Name Niagara Wind
Watercourse Name unknown Project # 160958269
Photos See photos by Field Staff ME, MF
Date June 21/12 Time 16:10

Weather conditions in previous 24 hrs No rain
GPS Coordinates (Zone) 17T E 0627568 N 4768098 Datum Nad83
Descriptive Location Immediately south of Concession 4 + west of Hodgkin Rd. on the Crown property

Water Quality

DRY
Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 31°C
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

DRY
Mean Watercourse Width 2.0 (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width 2.5 (m) Mean Water Depth _____ (cm)
_____ % Riffle _____ % Pool _____ % Run _____ % Flat
Evidence of eroding banks, Comments on bank stability minor undercutting

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 30 Muck _____
Boulder _____ Gravel 30 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)
0%

Adjacent Land Use

ag field, house

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. snake sp.

Field Notes Authored by ME

Field Notes QA/QCed by MEE

As

Hood & Kin Road

CORN

Concession 4

BARN

ROAD

BEAN FIELD

Possible Non-REA?

REA

REA / NON-REA

HOLMES PROP.

CROWN PROP.

- planted & harvested in swale

CORN

- defn through dredging
- grass within



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON REA
57-1

Stantec

Station # 57-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos See photos log Field Staff ME, MF
 Date June 21/12 Time 14:02
 Weather conditions in previous 24 hrs no rain
 GPS Coordinates (Zone) 17T E 0630072 N 4768285 Datum Nad83
 Descriptive Location On Concession 4 ~ 600m east of Rosedene Rd

Water Quality

dry
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 31 $^{\circ}$ 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

agr field, rd

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.

None

Field Notes Authored by MF

Field Notes QA/QCed by MCE



Rosedene Rd



~ 600m

Soy bean

Concession 4

NON
REA

Meadow.



CUT FIELD



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 57-2
 Watercourse Name unknown
 Photos See photo log
 Date June 21/12
 Weather conditions in previous 24 hrs No rain - hot + humid
 GPS Coordinates (Zone) 17T E 0629477 N 4768259 Datum Nad83
 Descriptive Location On Concession 4 ~ 200m east of Rosedene Rd

Project Name Niagara Wind
 Project # 160958269
 Field Staff ME, MF
 Time 14:10

Water Quality

Dissolved Oxygen (mg/L) 7.77 pH 7.75 Conductivity (μ S/cm) 1517
 Water Temperature ($^{\circ}$ C) 24.30 Air Temperature ($^{\circ}$ C) 31 $^{\circ}$ C
 Time *in situ* measurements taken 14:20

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.5 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 6.0 (m) Mean Water Depth 10 (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability None observed

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 50 Silt 30 Muck _____
 Boulder _____ Gravel 20 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)

2% reed canopy grass, mature tree

Adjacent Land Use

house, ag, rds

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn, nursery, 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. many frog sp.

Field Notes Authored by MF

Field Notes QA/QCed by MEE



Rosedene Rd



manicured grass

standing water

reed canary grass



reed canary grass

manicured grass

compression 4

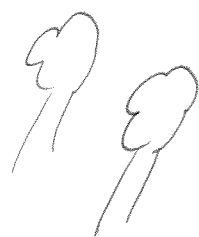
* = various aquatic veg.

ag

standing water

reed canary grass

reed canary grass





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Standing water @ culvert openings only. well defined

Station # 57-3
 Watercourse Name unknown
 Photos See photo log
 Date June 21/12
 Weather conditions in previous 24 hrs no rain
 GPS Coordinates (Zone) 17T E 0629269 N 4767882 Datum Nad83
 Descriptive Location On Rosedene Rd ~ 300m south of Concession 4

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, MF
 Time 14:24

Water Quality

Dissolved Oxygen (mg/L) 8.46 pH 8.02 Conductivity (µS/cm) 1674
 Water Temperature (°C) 23.18 Air Temperature (°C) 32°C
 Time *in situ* measurements taken 14:35

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 4.0 (m) Mean Water Depth 7 (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability minor scour.

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 30 Muck _____
 Boulder _____ Gravel 30 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)
2% seedcanary grass
 Adjacent Land Use house, off-line pond, ag.

Fish Habitat Potential

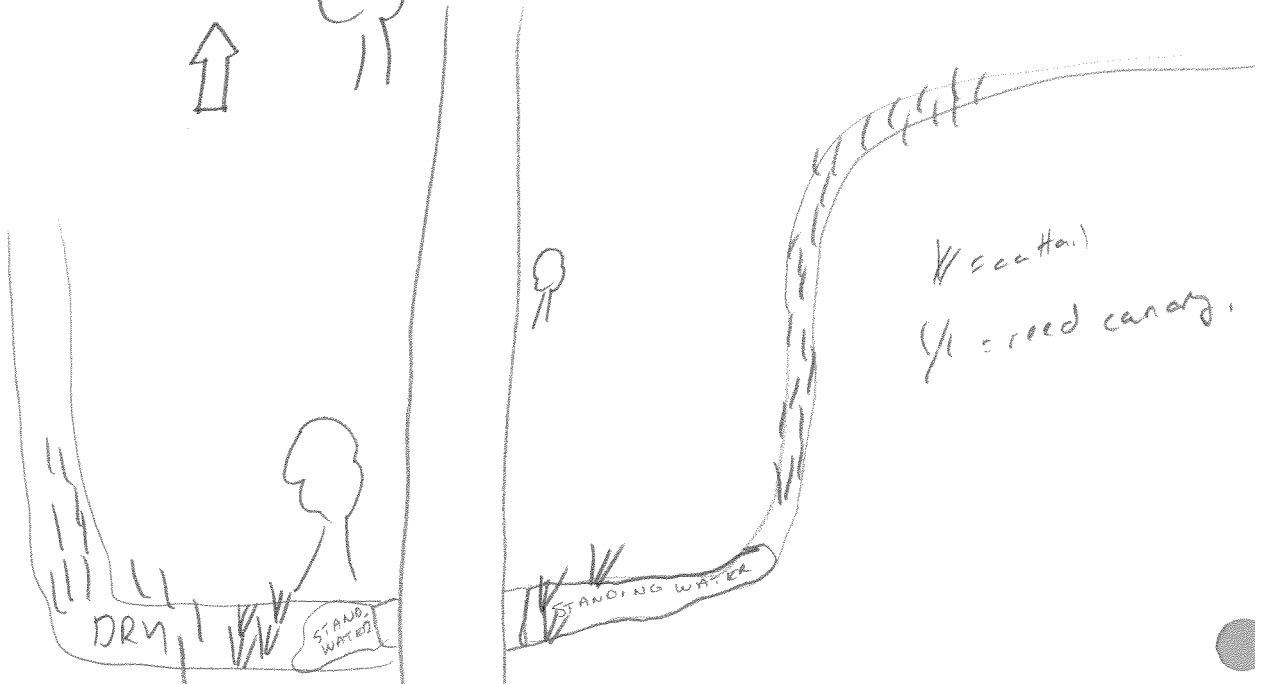
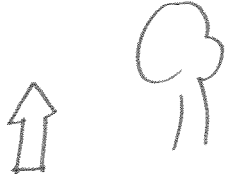
Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, forage, nursery
 Migratory Obstructions (seasonal, permanent)
dry
 Note any fish observations none none.

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 green frogs

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



W. scottall
1/2 = reed canopy.

STANDING WATER

OFF LINE POND

Rose dune Rd



conc. 4



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA on ea side only.

defined banks on east side only

DRY

Station # 98-1
 Watercourse Name unknown
 Photos See photo log
 Date June 21/12

Project Name Niagara Wind
 Project # 160958269
 Field Staff ME, MF
 Time 13:30

Weather conditions in previous 24 hrs no precipitation
 GPS Coordinates (Zone) 17T E 0631261 N 4768314 Datum Nad83
 Descriptive Location On Victoria Rd ~ 10m south of Concession 4

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 31°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (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 undercut banks - def. need

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 20 Silt 20 Muck _____
 Boulder 20 Gravel 20 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)
0% seed canopy grass

Adjacent Land Use

ag fields, rd, house.

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
dry

Note any fish observations none

Waterbody Notes

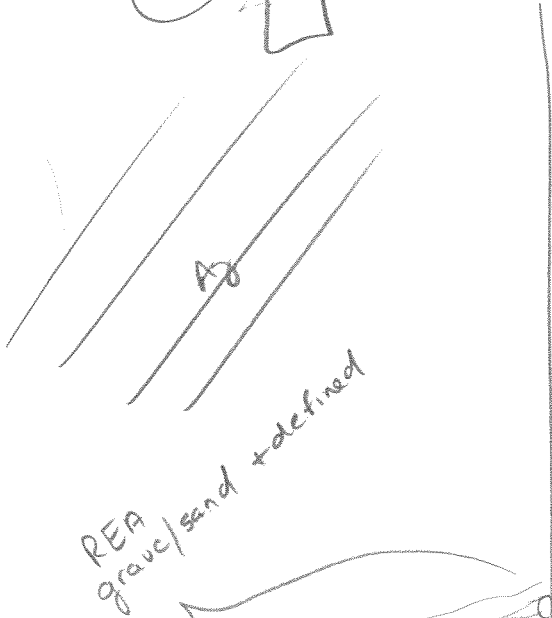
Natural Watercourse Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

↓ seed canopy

Field Notes Authored by MF

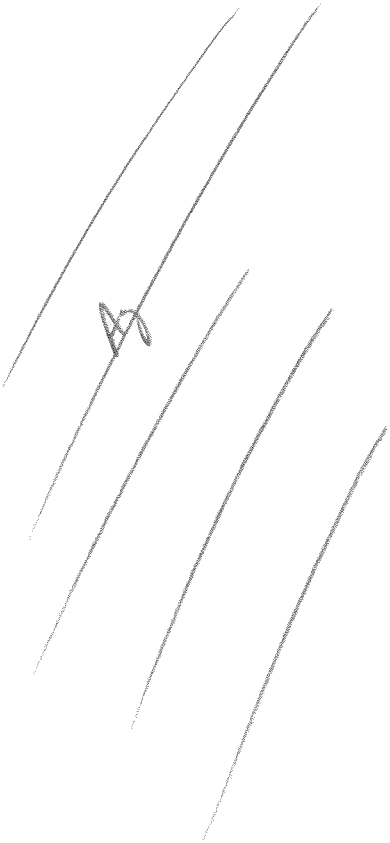
Field Notes QA/QCed by MEE



REA
gravel/sand + defined

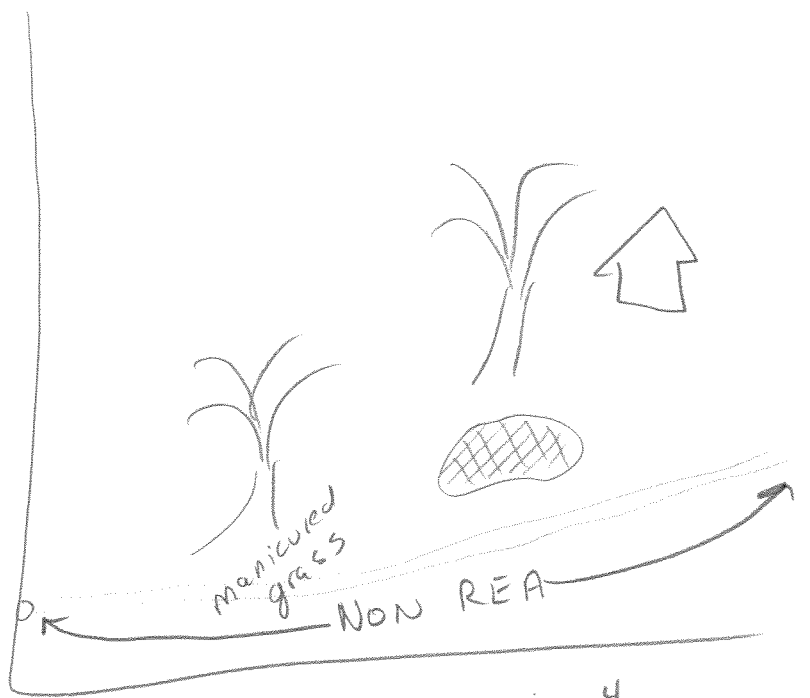


red cany grass
red cany grass



Ag

VICTORIA RD



manicured
grass

NON REA

Concession 4



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

FSEM - 15 mile Creek

Non
REA

Station # 59-1
 Watercourse Name Unknown
 Photos —
 Date June 20/13
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 631169 E 4770090 N Datum 17T N
 Descriptive Location off of Victoria Avenue, N of Kilman Road

Project Name Niagara Wind
 Project # 100950269
 Field Staff Marc Faiella, Mitch Ellan
 Time 10:30

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 32
 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 75% grasses, early
Transmission line, farmland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

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. _____

Field Notes Authored by M. Faiella

Field Notes QA/QCed by JK



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

FSEM 15 mile Creek

Nan
REI

Station # 59-2
 Watercourse Name unknown
 Photos _____
 Date June 20/15
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 631185 E 4769867 N Datum ITM
 Descriptive Location off of Victoria Avenue, West of Kilman Road
South of 59-1

Project Name Niagara Wind
 Project # 0160950269
 Field Staff K. Clouston, J. Keene
 Time 16:39

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 32
 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 _____
 Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other _____ Aquatic Veg RC

Riparian Zone

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

Adjacent Land Use

75% grasses, early farmland

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations any

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 M. Faiella

Field Notes QA/QCed by JK



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA on
South side
Grassed Swale
North side
DRY

Station # 58-2
Watercourse Name unknown
Photos See photo log
Date June 21/12

Project Name Niagara Wind
Project # 160958269
Field Staff ME, ME
Time 13:36

Weather conditions in previous 24 hrs no rain
GPS Coordinates (Zone) 17T E 0630566 N 4769308 Datum Nad83
Descriptive Location On Concession 4 ~ 500 m west of Victoria Rd

Water Quality

DRY
Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 31.0
Time in situ measurements taken _____

Watercourse Dimensions & Morphology

DRY
Mean Watercourse Width 0.30 (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 undercut on south side
scour

Substrate (% cover)

Bedrock _____ Cobble 20 Sand 25 Silt 25 Muck _____
Boulder 10 Gravel 20 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)
0% seed canary grass

Adjacent Land Use

houses, barn, rds

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
north
south

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by ME

Field Notes QA/QCed by ME

Dry

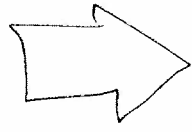
~~N~~ →

Red carpet grass

Red carpet grass

Manicured grass

Manicured grass



Concession 4

VICTORIA RD



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON REA

See back

Station # 58-3
Watercourse Name unknown
Photos See photo log
Date June 21/12

Project Name Niagara Wind
Project # 160958269
Field Staff ME, MF
Time 13:51

Weather conditions in previous 24 hrs no precipitation
GPS Coordinates (Zone) 17T E 0630494 N 4768306 Datum Nad83
Descriptive Location On Concession 4 ~ 700m west of Victoria Rd

Water Quality

DRY

Dissolved Oxygen (mg/L)
pH
Conductivity (uS/cm)
Water Temperature (C)
Air Temperature (C) 31C
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.

none

Field Notes Authored by MF

Field Notes QA/QCed by MEE

(N →)

graze

NON-REA

DRY

meadow

REA
DRY



NON-REA

MANICURED
GRASS
DRY

↑
58-3

POND

DRY

↑
NON-REA
58-2

CONVERSION 4

VICTORIA RD.



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Major watercourse
Permanent

Station # 60-1
Watercourse Name unknown
Photos see photo log
Date June 20/12

Project Name Niagara Wind
Project # 160958269
Field Staff ME, MF
Time 16:49

Weather conditions in previous 24 hrs no precip
GPS Coordinates (Zone) 17T E 0631123 N 4771392 Datum Nad83
Descriptive Location On Victoria Road ~ 500m north of Sixteen Rd

Water Quality

Dissolved Oxygen (mg/L) 3.44 pH 7.83 Conductivity (µS/cm) 610
Water Temperature (°C) 27.80 Air Temperature (°C) 32.0
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 8.0 (m) Maximum Pool Depth ~7100 (cm)
Mean Bankfull Width 9.0 (m) Mean Water Depth ~100 (cm)
_____ % Riffle _____ % Pool _____ % Run 90 % Flat
Evidence of eroding banks, Comments on bank stability minor undercut.

Too deep

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)
12% sparse shrubs on east + west side, some trees on west side
Adjacent Land Use _____

Fish Habitat Potential

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

Waterbody Notes

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

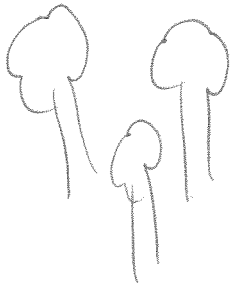
Other Habitat Notes, Incidental Wildlife Observations, etc. Carp (many), barn swallows

Field Notes Authored by MF

Field Notes QA/QCed by MEE



Campground

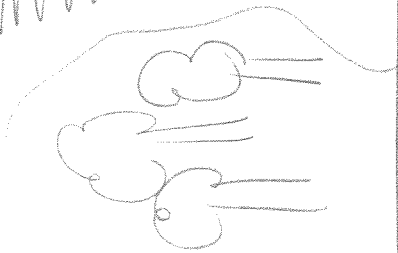


POOL



FLAT

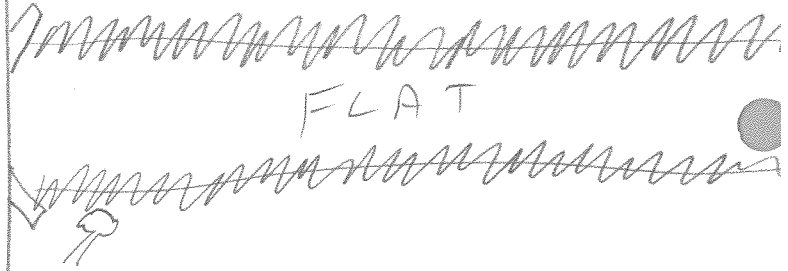
meadow



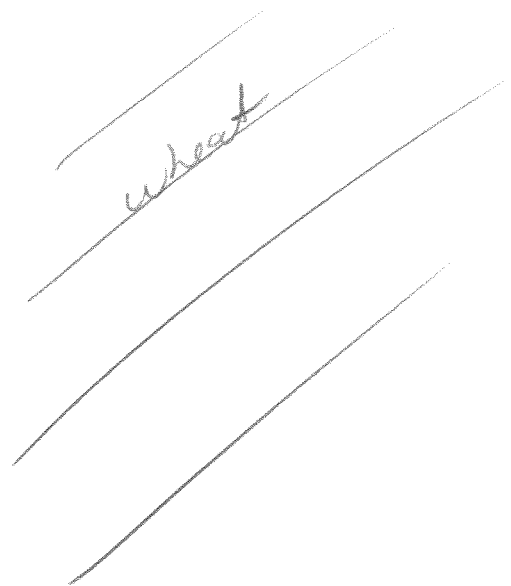
VICTORIA RD

MM = RCG

meadow



FLAT



wheat



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

RCG = Reed canary grass

REA

- former does not pour it

- very little depth within ROW
- dry channel but standing water within culvert
- full of RCG

Station # 6b-1
Watercourse Name unknown
Photos See photo log
Date 2012 06 20

Project Name Niagara Wind
Project # 160950269
Field Staff ME, MF
Time 16:35

Weather conditions in previous 24 hrs No precip
GPS Coordinates (Zone) 17T E 0631091 N 4771901 Datum NAD 83
Descriptive Location On Victoria ~ 800m South of Twenty Mile Rd.

Water Quality

DRY

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

Watercourse Dimensions & Morphology

DRY

Mean Watercourse Width 2.5 (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width > 20.0 (m) ^{Flood PI} Mean Water Depth _____ (cm)
% Riffle _____ % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability none observe

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

ag fields, rd

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. song birds
reed canary

Field Notes Authored by ME

Field Notes QA/QCed by MEE




BANK

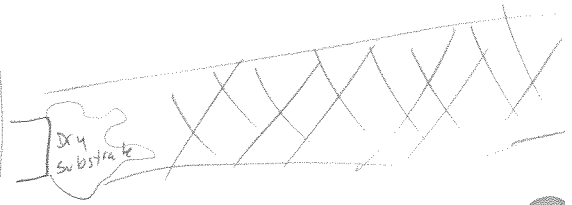
meadow sp

VICTORIA ROAD

BANK

meadow sp

 = feed canary sp





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

FSEM
15 mile Creek

Nor
REA

Station # 62-1
 Watercourse Name 15 mile Creek
 Photos _____
 Date June 20/12
 Weather conditions in previous 24 hrs wet & humid
 GPS Coordinates (Zone) 629389 E 4766813 N Datum 17T1
 Descriptive Location off of Regional Rd 20, east of
Peardene Rd/15 mile Road

Project Name Niagara Wind
 Project # 1100950269
 Field Staff M. Faiella, E. Elah
 Time 14:38

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 32 $^{\circ}$ 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):
 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)

Adjacent Land Use

farmland

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 M. Faiella Field Notes QA/QCed by TK



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

mp
NOT REA

Station # 63-1
 Watercourse Name UNKNOWN
 Photos See photo log
 Date 2012 06 19
 Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, ME
 Time 10:27
 Weather conditions in previous 24 hrs Minor precipitation
 GPS Coordinates (Zone) 17T E 0623118 N 4760378 Datum NAD83
 Descriptive Location In Sideroad 42 ~ 300 m north of Concession 6, on west side of road

Water Quality

DRY

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

Watercourse Dimensions & Morphology

DRY

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

Rd side ditch full of seed canopy grass w spots of cattail

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 ME

Field Notes QA/QCed by MEE



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 63-2
 Watercourse Name unknown
 Photos See photo log
 Date 2012 06 19
 Weather conditions in previous 24 hrs minor precip
 GPS Coordinates (Zone) 17T E 0623141 N 4759987 Datum NAD83
 Descriptive Location On Sideroad 42 ~ 500 m north of Concession 6

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, MF
 Time 10:40

Water Quality

Dissolved Oxygen (mg/L) 10.20 pH 8.37 Conductivity (μ S/cm) 676
 Water Temperature ($^{\circ}$ C) 28.27 Air Temperature ($^{\circ}$ C) 30 $^{\circ}$ C
 Time *in situ* measurements taken 10:50

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth 8.0 (cm)
 Mean Bankfull Width 5.0 (m) Mean Water Depth 2.0 (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability none observed, well veget'd

Substrate (% cover)

Bedrock	Cobble	Sand	Silt	Muck
Boulder	Gravel	Clay	Marl	Detritus

10 40 40
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)
0%

Adjacent Land Use

ag, rd, house

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
forage, spawn, nursery

Migratory Obstructions (seasonal, permanent)
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. goldfinch

Field Notes Authored by MF

Field Notes QA/QCed by MEE



soy bean

CORN

OPEN WATER

SIDEROAD 42

∨ = cattail

= patches of emerg. aquatic veg.

soy bean

CORN



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 65-1
 Watercourse Name unknown
 Photos See photo log
 Date 2012 06 19

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, MF
 Time 13:11

Weather conditions in previous 24 hrs minor precip
 GPS Coordinates (Zone) 17T E 6623837 N 4758126 Datum NAD83
 Descriptive Location Along Welland East Rd ~ 400 m south of Conc 5

Water Quality

Dissolved Oxygen (mg/L) 4.36 pH 7.8 Conductivity (μ S/cm) 3592
 Water Temperature ($^{\circ}$ C) 22.56 Air Temperature ($^{\circ}$ C) 30 $^{\circ}$ e
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth 25 (cm)
 Mean Bankfull Width 4.0 (m) Mean Water Depth 10 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability none observed.

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 40 Silt 30 Muck _____
 Boulder _____ Gravel 20 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)
10% mature/immature trees + shrub sp

Adjacent Land Use

agr. rds, houses.

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
lack of water

Note any fish observations none.

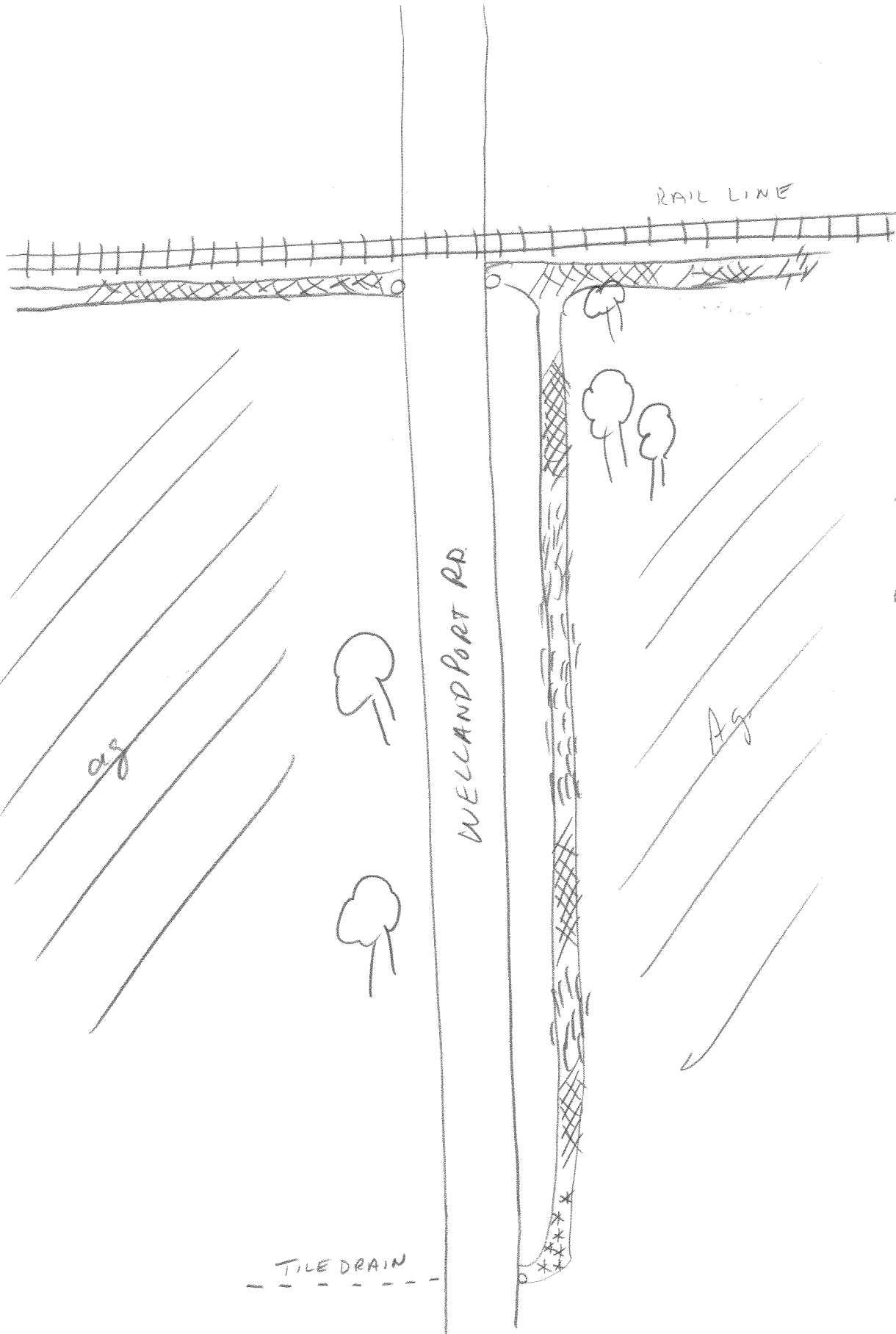
Waterbody Notes




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. _____

Field Notes Authored by MF

Field Notes QA/QCed by MEE



-  = cattail
-  = reed canary
-  = duckweed/arrowhead



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 65-2
 Watercourse Name unknown
 Photos see photo log
 Date 2012 06 19

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, ME
 Time 13:38

Weather conditions in previous 24 hrs windy precip.
 GPS Coordinates (Zone) 17T E 0623858 N 4757235 Datum NAD83
 Descriptive Location On Wellandport Rd - 500 m south of Conc 5

Water Quality

Dissolved Oxygen (mg/L) 4.24 pH 7.99 Conductivity (μ S/cm) 913
 Water Temperature ($^{\circ}$ C) 22.96 Air Temperature ($^{\circ}$ C) 30.0
 Time in situ measurements taken 13:50

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m) Maximum Pool Depth 25 (cm)
 Mean Bankfull Width 10.0 (m) flooded Mean Water Depth 10 (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

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

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool ^{re-adjust} Watercress Aquatic Veg
 Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other _____

Riparian Zone

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

10% immature/mature tree + shrub sp.

Adjacent Land Use

Ag fields, new house

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn, nursery

Migratory Obstructions (seasonal, permanent)

lack of water, thick w/ aquatic veg.

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 frogs

Field Notes Authored by ME

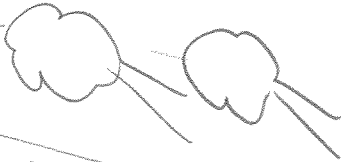
Field Notes QA/QCed by MEE



new house
new house



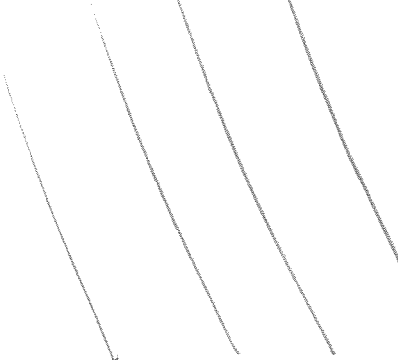
reed canary



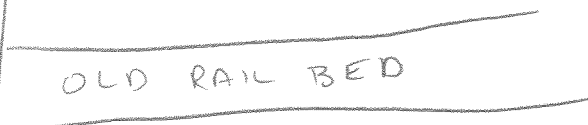
reed canary



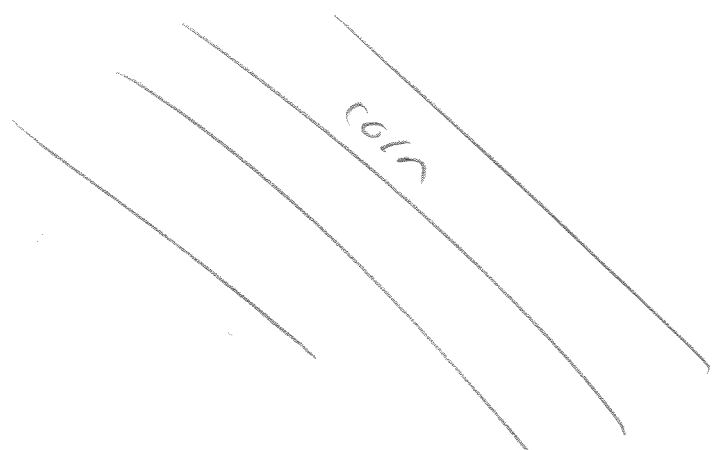
Ag.



OLD RAIL BED



corn

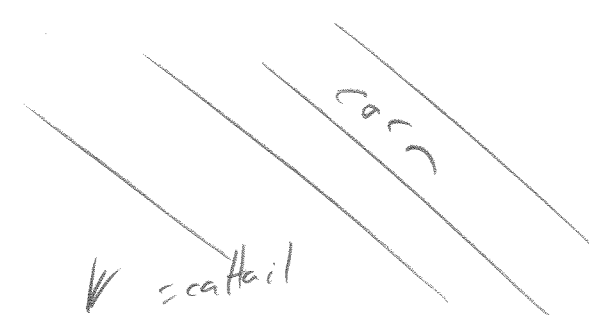


OPEN WATER

REED CANARY



corn



scattail

duckweed / pond weed

sedge sp.

WALLAND PORT RD.



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 653 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950269
 Photos see photo log Field Staff ME, MF
 Date 2012 06 19 Time 14:09
 Weather conditions in previous 24 hrs minor precip.
 GPS Coordinates (Zone) 17T E 0623013 N 4757840 Datum NAD83
 Descriptive Location On un-maintained rd of Shafly Rd ~ 250 m north of Con. 5

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 2.5 (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width 6.0 (m) Mean Water Depth 15 (cm)
 _____ % Riffle 10/10 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability none

Substrate (% cover)

Bedrock	Cobble	<u>10</u>	Sand	<u>30</u>	Silt	<u>40</u>	Muck
Boulder	Gravel	<u>20</u>	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)
10% mature trees/shrubs, reed canary grass
 Adjacent Land Use ag.

Fish Habitat Potential

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

Waterbody Notes

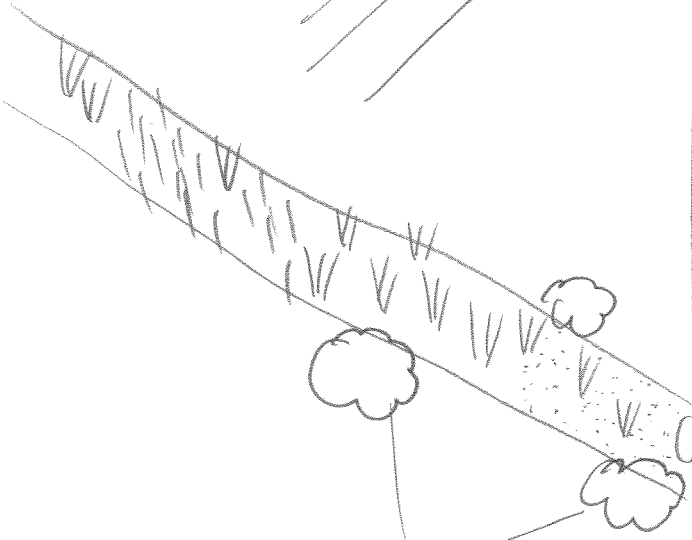
Natural Watercourse Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by MP Field Notes QA/QCed by MEE



corn

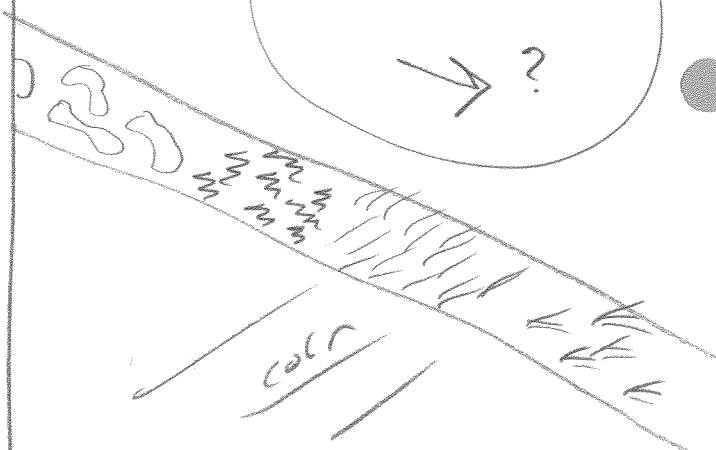
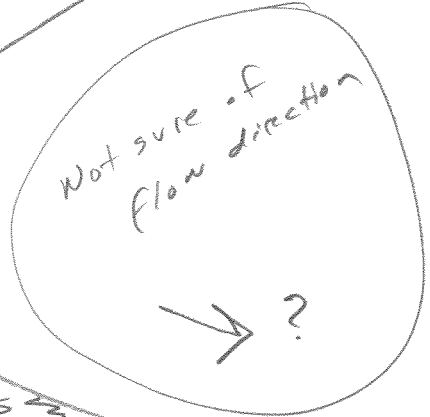


shrubs

corn

SHARLEY RA

corn



corn

- = sedge sp
- = algae mats.
- = cattail
- = reed canopy grass
- = duckweed



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

no flow

Station # 65-4
Watercourse Name unknown
Photos See photo log
Date 2012 06 19

Project Name Niagara Wind
Project # 160950269
Field Staff ME, ME
Time 14:24

Weather conditions in previous 24 hrs minor precip
GPS Coordinates (Zone) 17T E 0623036 N 4757316 Datum NAD83
Descriptive Location On Shafley Rd ~ 200m south of Con 5 within ROW

Water Quality

Dissolved Oxygen (mg/L) 3.10 pH 7.89 Conductivity (uS/cm) 733
Water Temperature (C) 23.41 Air Temperature (C) 30C
Time in situ measurements taken 14:35

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.0 (m) Maximum Pool Depth 30 (cm)
Mean Bankfull Width 7.0 (m) Mean Water Depth 20 (cm)
% Riffle 100 % Pool % Run % Flat
Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

Bedrock Cobble Sand 30 Silt 40 Muck
Boulder Gravel 20 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)

40% ash sp, elm sp, shrubs

Adjacent Land Use

house, ATV trails, rds, ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawning nursery areas

Migratory Obstructions (seasonal, permanent)

none observed

Note any fish observations none

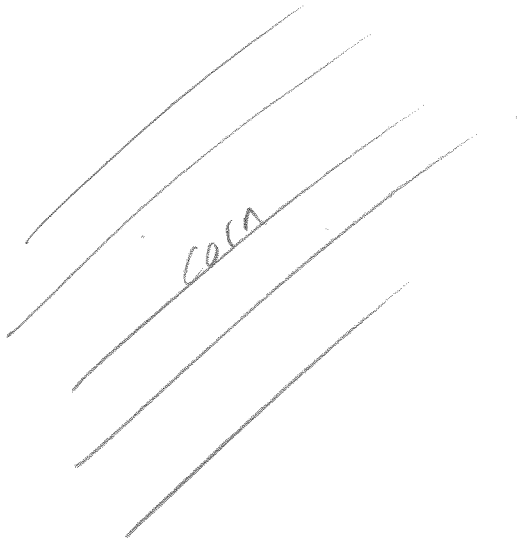
Waterbody Notes

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

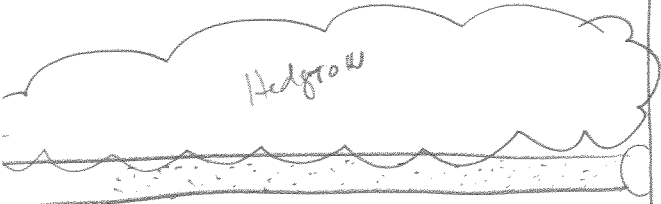
Other Habitat Notes, Incidental Wildlife Observations, etc. cardinals, green frogs

Field Notes Authored by ME

Field Notes QA/QCed by MEE



corn



Hedgerow



meadow



ATV TRAIL

SHARLEY RD.



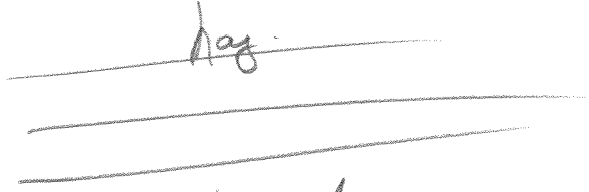
shrubs



MANICURED grass



reed canopy grass



hay

∨ = sedge

⋯ = duckweed



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

STANDING WATER

REA on E side only
Swale on S side

Station # 66-1
Watercourse Name unknown
Photos See photo log
Date 2012 06 19

Project Name Niagara Wind
Project # 160950269
Field Staff ME, MF
Time 12:18

Weather conditions in previous 24 hrs minor precip
GPS Coordinates (Zone) 17T E 0623903 N 4756462 Datum NAD83
Descriptive Location On Wellandport Rd (#4) ~ 800m north of Hwy 3

STANDING WATER OFF ROW

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 29°C
Time in situ measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth 30 (cm)
Mean Bankfull Width 3.5 (m) Mean Water Depth 10 (cm)
% Riffle 40 % Pool 60 % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 30 Muck _____
Boulder _____ Gravel 30 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) 0%

Adjacent Land Use

ag. house

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

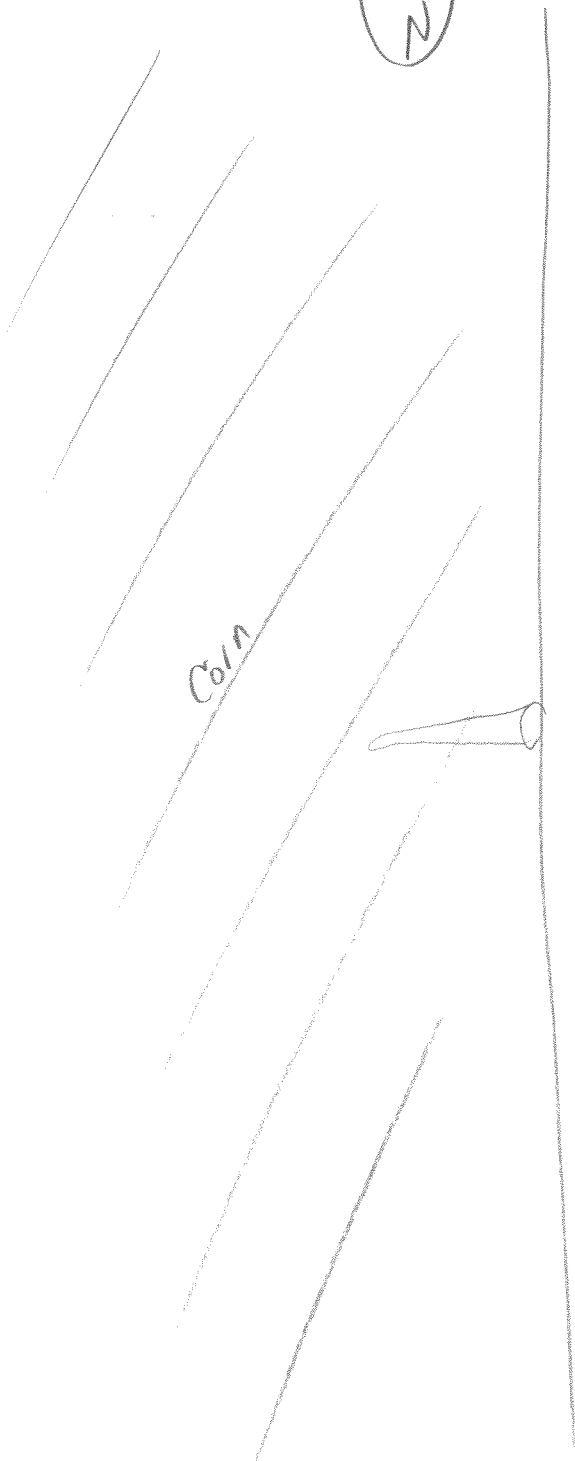
Waterbody Notes

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

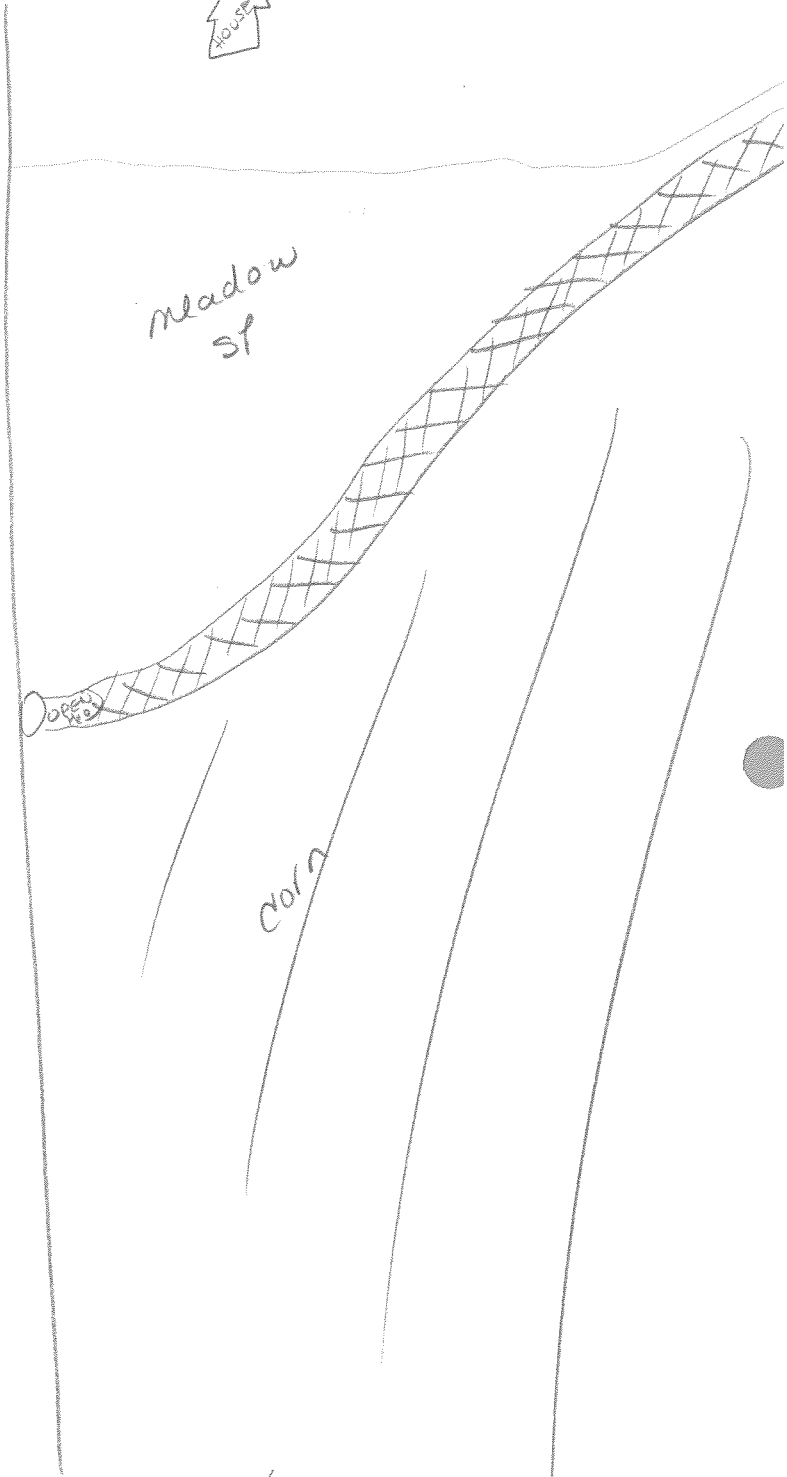
Other Habitat Notes, Incidental Wildlife Observations, etc. _____


Field Notes Authored by MF

Field Notes QA/QCed by ME



WALLANO PORT RD



 = thick w cattail / frogs



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 66-2
 Watercourse Name UNKNOWN
 Photos See photo log
 Date 2012 Oct 17

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, MF
 Time 12:45

Weather conditions in previous 24 hrs None

GPS Coordinates (Zone) 17T E 0623924 N 4755835 Datum NAD83

Descriptive Location On west side of Wellandport Rd (parallel) to Highway 3.

Water Quality

Dissolved Oxygen (mg/L) 3.24 pH 7.95 Conductivity (µS/cm) 717
 Water Temperature (°C) 22.19 Air Temperature (°C) 30°C
 Time *in situ* measurements taken 12:57

Watercourse Dimensions & Morphology

Mean Watercourse Width 30 (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width 50 (m) Mean Water Depth 15 (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability None. Well veget'd

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 40 Muck _____
 Boulder _____ Gravel 20 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

Rds, industrial buildings

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Spawning, nursery, refuge

Migratory Obstructions (seasonal, permanent)

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. None sp

Field Notes Authored by MF

Field Notes QA/QCed by MEE

July 3

Buildings

Mixed trees



Lead canopy veg

Agro-veg

Soy bean

Mixed poplar

Build

WELLAND FORT RD.



New REA (Tree veg through)

22



WIND FARM WATERBODY RAPID ASSESSMENT FORM

BFC - North Forks Drain Non REA

Stantec

Station # 67-1
Watercourse Name unknown
Photos _____
Date June 2012
Weather conditions in previous 24 hrs hot & humid
GPS Coordinates (Zone) 617552 E 4753776 N
Descriptive Location off of Hwy 3 (north of Hwy 3), west of 67-2

Project Name Niagara Wind
Project # 101950869
Field Staff M. Faiella, M. Ellak
Time 14:42

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity ($\mu\text{S}/\text{cm}$) _____
Water Temperature ($^{\circ}\text{C}$) _____ Air Temperature ($^{\circ}\text{C}$) 32
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

farmland

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

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. _____

Field Notes Authored by M. Faiella

Field Notes QA/QCed by TK



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

BFC -
North Forks
Drain

Non
REA

Station # 67-2
 Watercourse Name unknown
 Photos _____
 Date June 20/12
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 617802 E 4753890 N Datum 17T 1
 Descriptive Location N of Hwy 3, east of 67-1

Project Name Nidam-a-wind
 Project # 1609 50264
 Field Staff M. Faiella, M. Ellah
 Time 14:49

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 32
 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

farmland

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

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. _____

Field Notes Authored by M. Faiella

Field Notes QA/QCed by DK



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REF

Stantec

REA

Station # 68-1
Watercourse Name unknown
Photos see photo log
Date 2012 06 19

Project Name Niagara Wind
Project # 160950269
Field Staff ME, ME
Time 14:55

Weather conditions in previous 24 hrs minor precip
GPS Coordinates (Zone) 17T E 0620309 N 4755171 Datum NAD 83
Descriptive Location On Hutchinson Rd ~ 300m north of Hwy 3

Water Quality

Dissolved Oxygen (mg/L) 8.67 pH 8.07 Conductivity (μ S/cm) 860
Water Temperature ($^{\circ}$ C) 23.11 Air Temperature ($^{\circ}$ C) 30 $^{\circ}$ C
Time in situ measurements taken 15:01

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.0 (m) Maximum Pool Depth 20 (cm)
Mean Bankfull Width 7.0 (m) Mean Water Depth 15 (cm)
% Riffle 100 % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability none observed. Well veget'd

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 40 Silt 40 Muck _____
Boulder _____ Gravel 10 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)
15% shrubs, red canopy grass, mature tree sp. sedge
Adjacent Land Use school, rd, ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, boulder nursery
Migratory Obstructions (seasonal, permanent)
lack of water, thick veg
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 _____

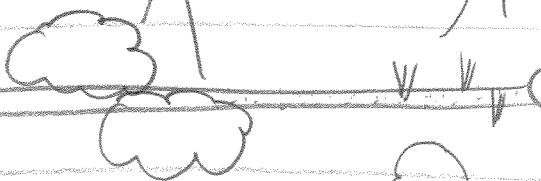
Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by ME Field Notes QA/QCed by MEE



old ag

shrubs



School yard

HUTCHINSON RA.

AG



Meadow sp

wheat

••••• = duckweed
v = sedge sp.
O = open water.



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 69-1
Watercourse Name unknown
Photos See photo log
Date 2012 Nov 19

Project Name Niagara Wind
Project # 160950269
Field Staff ME, MF
Time 15:11

Weather conditions in previous 24 hrs minor precip
GPS Coordinates (Zone) 17T E 0620694 N 4754549 Datum NAD83
Descriptive Location On Hutchinson Rd ~ 300m south of Hwy 3

Water Quality

Dissolved Oxygen (mg/L) 3.87 pH 7.69 Conductivity (µS/cm) 754
Water Temperature (°C) 24.97 Air Temperature (°C) 30°C
Time in situ measurements taken 15:16

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m) Maximum Pool Depth 30 (cm)
Mean Bankfull Width 7.0 (m) Mean Water Depth 15 (cm)
% Riffle 100 % Pool % Run % Flat
Evidence of eroding banks, Comments on bank stability none observed.

Substrate (% cover)

Bedrock Cobble 10 Sand 40 Silt 20 Muck
Boulder Gravel 20 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)
3% sparse shrubs, reed canopy
Adjacent Land Use ag, rds

Fish Habitat Potential

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

Waterbody Notes

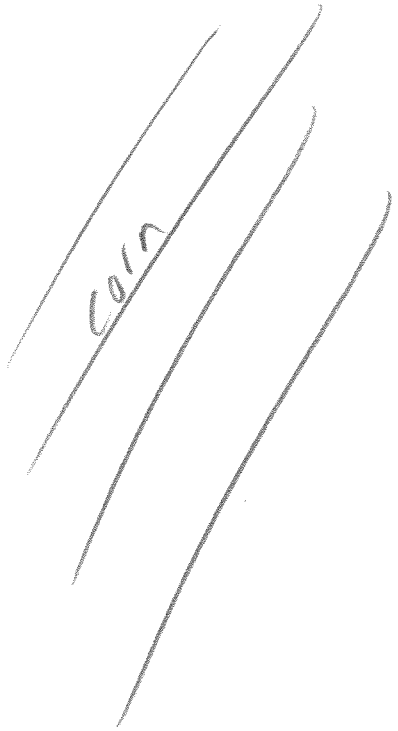
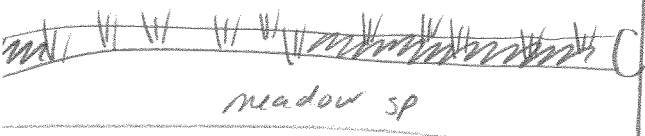
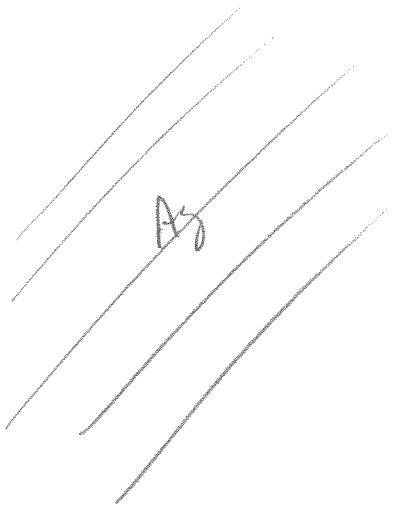
Natural Watercourse Trapezoidal Channel checked Grassed Swale Buried Tile
Surficial Drainage (i.e. furrows) Dugout Pond Dominated by Aquatic Veg checked Dry

Other Habitat Notes, Incidental Wildlife Observations, etc.

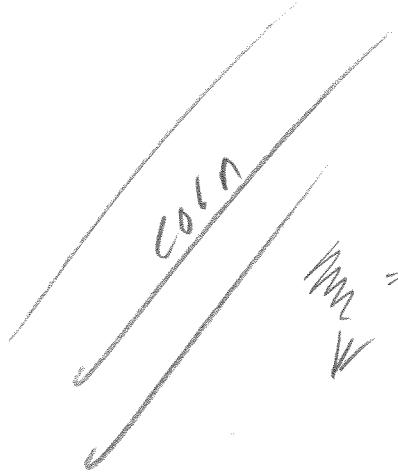
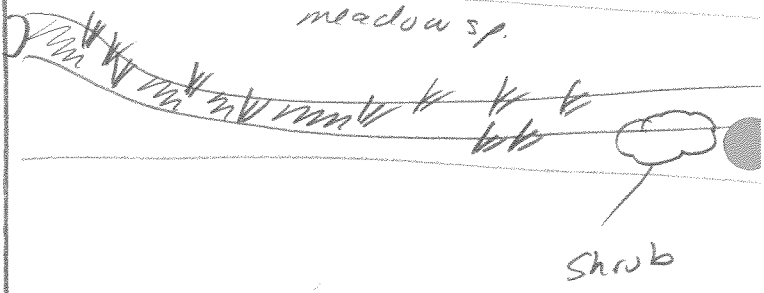
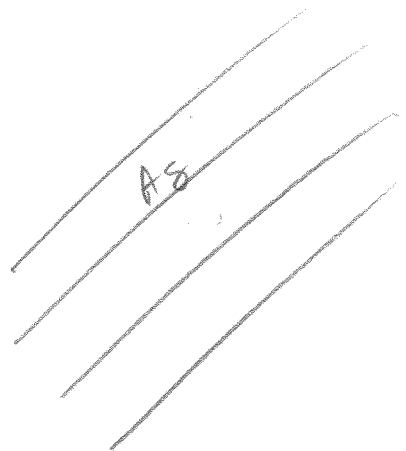
Field Notes Authored by MF

Field Notes QA/QCed by MEE

22
←



HUTCHINSON RP.



mm = thick duckweed
v = sedge sp.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # 69.2
 Watercourse Name unknown
 Photos See photo log
 Date 2012 06 19

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, MF
 Time 15:22

Weather conditions in previous 24 hrs minor precip
 GPS Coordinates (Zone) 17T E 0621122 N 4753870 Datum NAD83
 Descriptive Location Along Hutchinson Rd from ~ 50 south of Hwy 3 to ~ 100 m south of Jenny Jump Rd on West Side - Runs Parallel

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 30°C
 Time in situ measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 4.0 (m) Mean Water Depth 5 (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability No flow. No observed erosion

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 50 Silt 30 Muck _____
 Boulder _____ Gravel 10 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% mature + immature tree + shrub species, reed canopy
 Adjacent Land Use houses, rd, ag

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning foraging nursery
 Migratory Obstructions (seasonal, permanent)
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. _____

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



Jenny Jump

aquatic veg throughout
duckweed / cattail / reed cany

Hutchinson Rd



Cemetery

Hwy 3



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 70-1
Watercourse Name unknown
Photos see photo log
Date 2012 06 19

Project Name Niagara Wind
Project # 160950269
Field Staff ME, MF
Time 15:56

Weather conditions in previous 24 hrs hot + humid, minimal precip
GPS Coordinates (Zone) 17T E 0622993 N 4755428 Datum NAD83
Descriptive Location On Twinline Dunnville/Wainfleet rd - 800m south of Buckner Rd

Water Quality

Dissolved Oxygen (mg/L) 3.98 pH 7.93 Conductivity (uS/cm) 579
Water Temperature (C) 23.21 Air Temperature (C) 30.2
Time in situ measurements taken 16:03

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.0 (m) Maximum Pool Depth 50 (cm)
Mean Bankfull Width 6.0 (m) Mean Water Depth 30 (cm)
% Riffle 100 % Pool % Run % Flat

Evidence of eroding banks, Comments on bank stability none observed but recent dredging on south bank

Substrate (% cover)

Bedrock Cobble Sand 40 Silt 40 Muck
Boulder Gravel 20 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% mature/immature tree + shrub species.

Adjacent Land Use

green houses, houses.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, nursery, foraging

Migratory Obstructions (seasonal, permanent)
none observed

Note any fish observations none

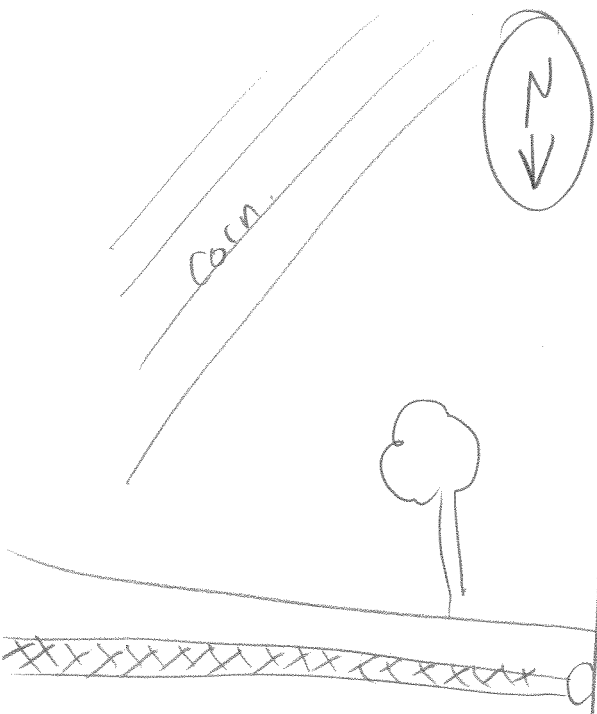
Waterbody Notes

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

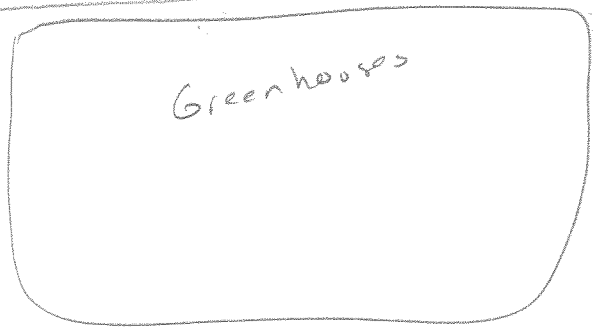
Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by MF

Field Notes QA/QCed by MFE



TOWNLINE DUNVILLE / WAINEFLORET



-XXXX = duckweed.



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 71-1
Watercourse Name unknown
Photos See photo log
Date 2012 06 19

Project Name Niagara Wind
Project # 160950269
Field Staff ME, MF
Time 16 22

Weather conditions in previous 24 hrs minor precip
GPS Coordinates (Zone) 17T E 0623948 N 4755150 Datum NAD83
Descriptive Location On Hendershot Rd ~ 400m south of Hwy 3. Near farm silos

Water Quality

Dissolved Oxygen (mg/L)
Water Temperature (°C)
Time in situ measurements taken
pH
Conductivity (µS/cm)
Air Temperature (°C) 28°C

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m)
Mean Bankfull Width 5.0 (m)
Maximum Pool Depth 8.0 (cm)
Mean Water Depth 5.0 (cm)
% Riffle 100 % Pool % Run % Flat
Evidence of eroding banks, Comments on bank stability none

Substrate (% cover)

Bedrock Cobble 10 Sand 40 Silt 30 Muck
Boulder Gravel 20 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) 3% seed canopy grass
Adjacent Land Use ag fields, rd.

Fish Habitat Potential

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

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

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



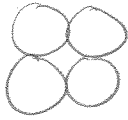
As

OPEN H₂O
(aquatic veg)

manicured
grass

As

FARM
OP.



reed canary grass

reed canary grass

HENDERSHOT RD

As

As



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Defined channel

REA

Station # 72-1
 Watercourse Name unknown
 Photos see photo log
 Date 2017 06 19

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, MF
 Time 15:37

Weather conditions in previous 24 hrs minor precip
 GPS Coordinates (Zone) 17T E 0621115 N 4753895 Datum NAD83
 Descriptive Location On Hutchinson Rd ~ 250m north of Jenny Jump Rd

OFF ROW

Water Quality

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

OFF ROW

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m) Maximum Pool Depth N/A (cm)
 Mean Bankfull Width 5.0 (m) Mean Water Depth N/A (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

OFF ROW

Substrate (% cover)

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

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)

2/3 seed canopy grass, sparse shrubs

Adjacent Land Use

as, houses

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

possible spawn

Migratory Obstructions (seasonal, permanent)

lack of water, thick veg.

Note any fish observations NONE - OFF ROW

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



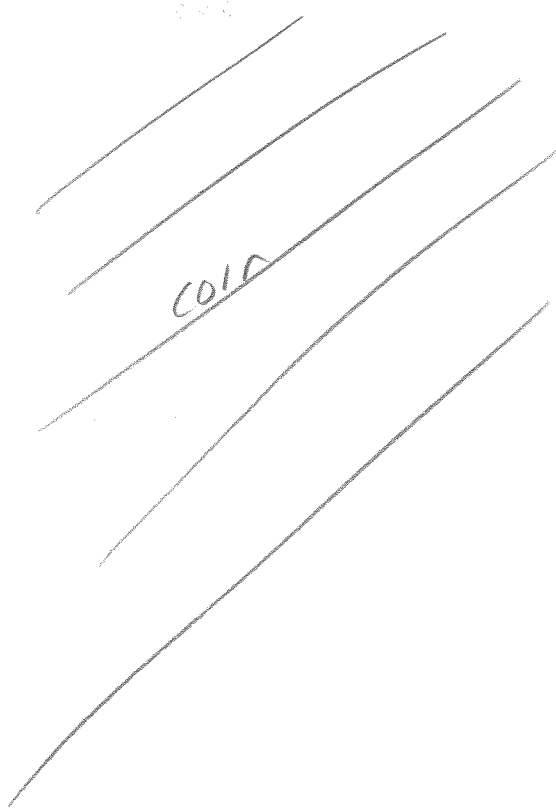
69-2

HUTCHINSON RD

soy bean

72-1
↓

thick with cattails.



COLA

Jenny Jump



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
DRY

Stantec

Station # 73-1
Watercourse Name unknown
Photos See photo log.
Date June 20/12.

Project Name Niagara Wind
Project # 160958269
Field Staff ME, MF
Time 09:20

Weather conditions in previous 24 hrs No precip
GPS Coordinates (Zone) 17T E 0623995 N 4754257 Datum Nad83
Descriptive Location On Henderson Rd ~ 400m north of Townline Dunville/Danf

Water Quality

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

Watercourse Dimensions & Morphology

DRY
Mean Watercourse Width 2.0 (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width 4.0 (m) Mean Water Depth _____ (cm)
_____% Riffle _____% Pool _____% Run _____% Flat
Evidence of eroding banks, Comments on bank stability None.

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 30 Muck _____
Boulder _____ Gravel 30 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)

4% cattail, reed, canary grass
Adjacent Land Use ag fields, houses.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

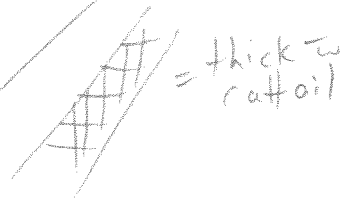
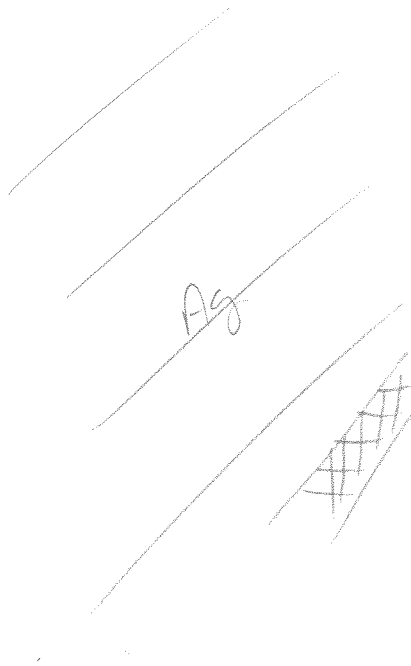
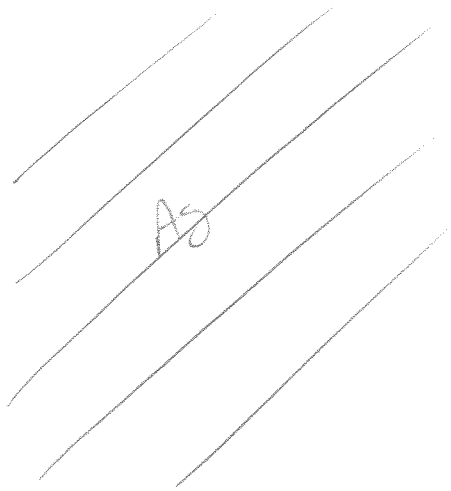
possible spawn
Migratory Obstructions (seasonal, permanent) dry @ times
Note any fish observations none - dry

Waterbody Notes

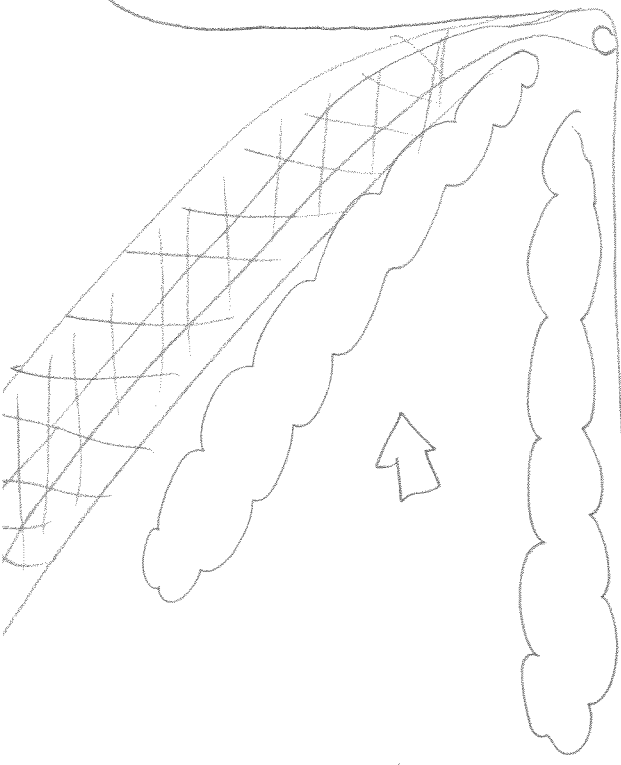
Natural Watercourse _____ Trapezoidal Channel Grassed Swale _____ Buried Tile _____
Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg Dry

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

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



Hendryshot Rd





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

BFC - East Kelly Drain Non R

Station # 73-2
Watercourse Name unknown
Photos _____
Date June 20/12

Project Name Niagara Wind
Project # 1
Field Staff M. Faiella, M. Ellah
Time 9:32

Weather conditions in previous 24 hrs hot & humid
GPS Coordinates (Zone) 623876E 4754036 N Datum IT
Descriptive Location off of Township Dunnville - Wainfleet, West of Henderson Rd, south of 73-1

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 32°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 Terrestrial Vegetation

Riparian Zone

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

Adjacent Land Use

farmland

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

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. _____

Field Notes Authored by M. Faiella Field Notes QA/QCed by JK



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

ENDS @ C
Bank Rd
Drains
can

Station # 74-1
 Watercourse Name unknown
 Photos See photo log
 Date June 20/12
 Project Name Niagara Wind
 Project # 160958269
 Field Staff ME, MF
 Time 10:31

Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17T E N Datum NAD83
 Descriptive Location On Hutchinson Rd on west side of road (parallel)
From ~600m north of Booker Rd to ~500m south of Booker Road.
 Start = 17T 0621757, 4752809 End = 17T 0623609, 4749927

Too shallow

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 3.0 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 6.0 (m) Mean Water Depth 5 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability some dredging @ northern end of reach

Substrate (% cover)
 Bedrock _____ Cobble 10 Sand 40 Silt 40 Muck _____
 Boulder _____ Gravel 10 Clay _____ Marl _____ Detritus _____

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

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
20% sumac, other shrubs, red canopy grass, cattail, pockets of mature trees
 Adjacent Land Use Rds, houses, ag fields

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn, nursery, forage
 Migratory Obstructions (seasonal, permanent)
thick aquatic veg & lack of water @ 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 _____

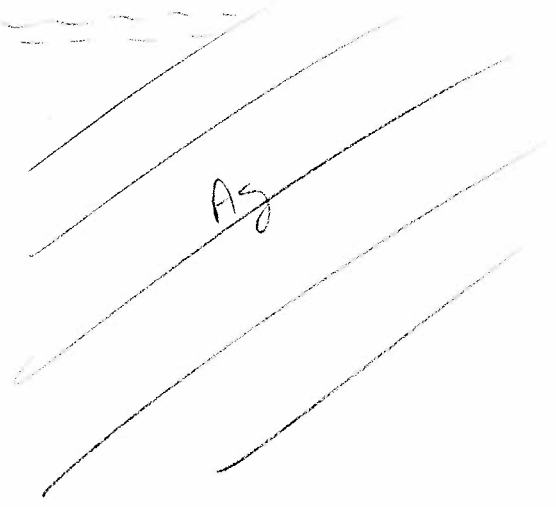
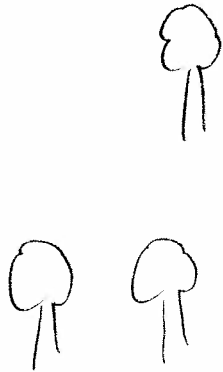
Other Habitat Notes, Incidental Wildlife Observations, etc. Barn swallows (20' ish)

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



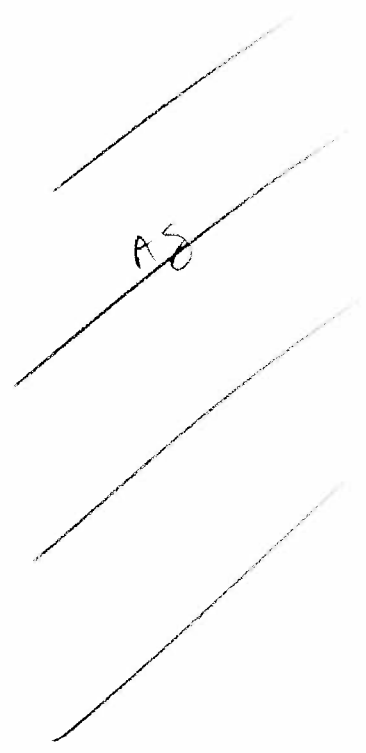
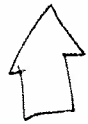
Canal Bank Rd
~ 5 km

Possible
T₁ off row
Thick with veg.



BOOKER RD

HUTCHINSON RD





WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA

Stantec

Station # 73-2
Watercourse Name unknown
Photos 913, 914, 915
Date June 12

Project Name Niagara Wind
Project # 160958269
Field Staff ME, ME
Time 09:40

Weather conditions in previous 24 hrs no precip
GPS Coordinates (Zone) 17T E N Datum NAD83
Descriptive Location connected to 73-1. Located south of REA (73-1) channel along townline Rd. Dredged on west property as well.

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 Channel has been dredged and is dominated by young terrestrial veg

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
Migratory Obstructions (seasonal, permanent) _____
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. _____

Field Notes Authored by ME Field Notes QA/QCed by ME

2
↑

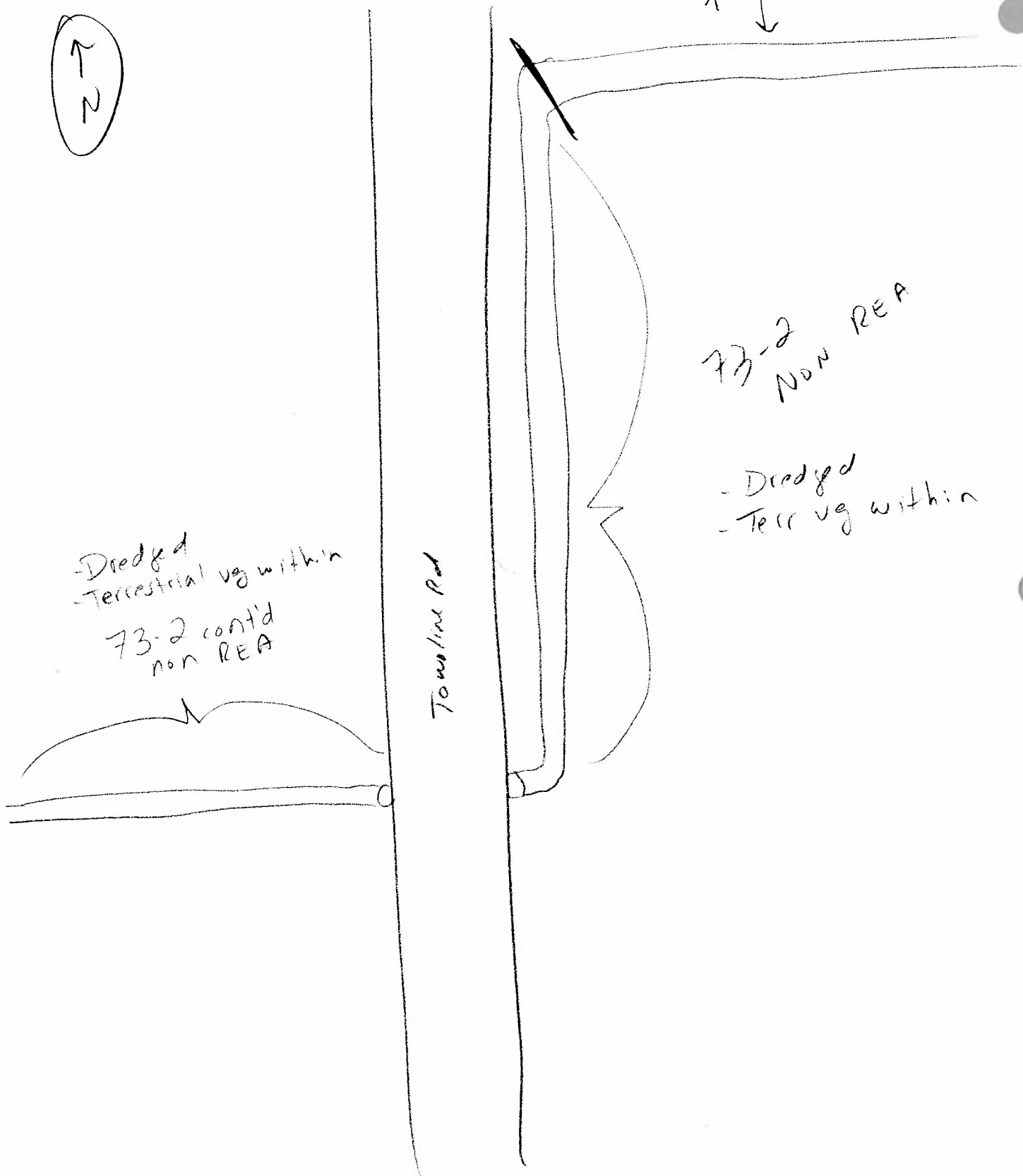
73-1 REA
↓

73-2 NON REA

- Dredged
- Terr veg within

- Dredged
- Terrestrial veg within
73-2 cont'd
non REA

Towline Pad





WIND FARM WATERBODY RAPID ASSESSMENT FORM

~~None~~ MF
REA
DRY

Stantec

Station # 75-1
Watercourse Name unknown
Photos See photo log
Date June 20/12

Project Name Niagara Wind
Project # 160958269
Field Staff ME/MF
Time 09:53

Weather conditions in previous 24 hrs None
GPS Coordinates (Zone) 17T E 0623721 N 4752879 Datum Nad83
Descriptive Location On Booker Rd ~ 800m west of Twinline Dunville/Wainfleet

DRY

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)
Channel with dogwood sp, poplar sp, sumac, red pine, other meadow sp.
Adjacent Land Use _____~~

Fish Habitat Potential

~~Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
Migratory Obstructions (seasonal, permanent) _____
Note any fish observations _____~~

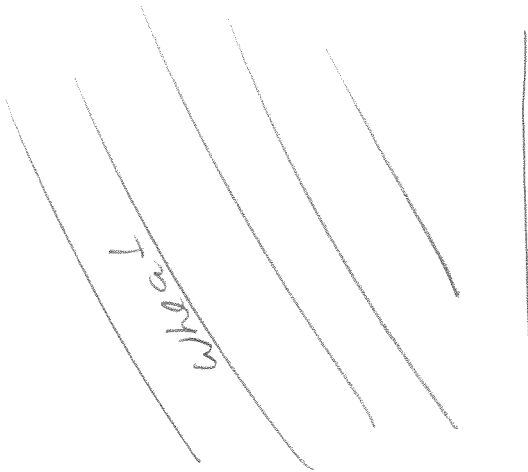
Waterbody Notes

~~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. trapezoidal channel with sedges and cattails mfp.~~

Field Notes Authored by MF

Field Notes QA/QCed by MEE



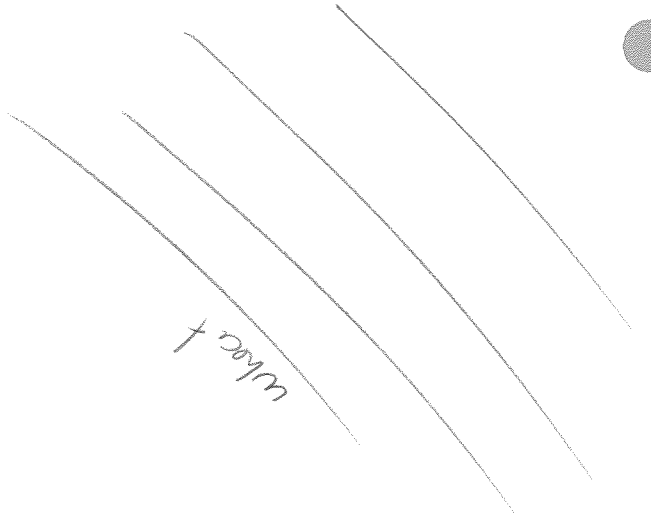
Wheat



reed canny grass



BOOKER RD.



Wheat



Meadow Jn

Meadow sp



plowed

Mix of
woodlot



REA



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 77-1
Watercourse Name UNKNOWN
Photos See photo log
Date 2012 06 26

Project Name Niagara Wind
Project # 160950269
Field Staff ME, ME
Time 13:00

Weather conditions in previous 24 hrs hot & humid
GPS Coordinates (Zone) 17T E 0621224 N 4749592 Datum NAD83
Descriptive Location On Bird Rd ~ 500m north of Canal Bank Rd.
on east side of rd. (parallel)

DRY

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) DRY
Mean Bankfull Width 3.0 (m) Mean Water Depth _____ (cm)
_____ % Riffle _____ % Pool _____ % Run _____ % Flat

Evidence of eroding banks, Comments on bank stability none
Full of cattail + sedge but dry

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 40 Muck _____
Boulder _____ Gravel 20 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)
10% native trees + shrubs along riparian zone

Adjacent Land Use

ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
possible spawn. Connected to feeder canal

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.

Field Notes Authored by MP Field Notes QA/QCed by MEE



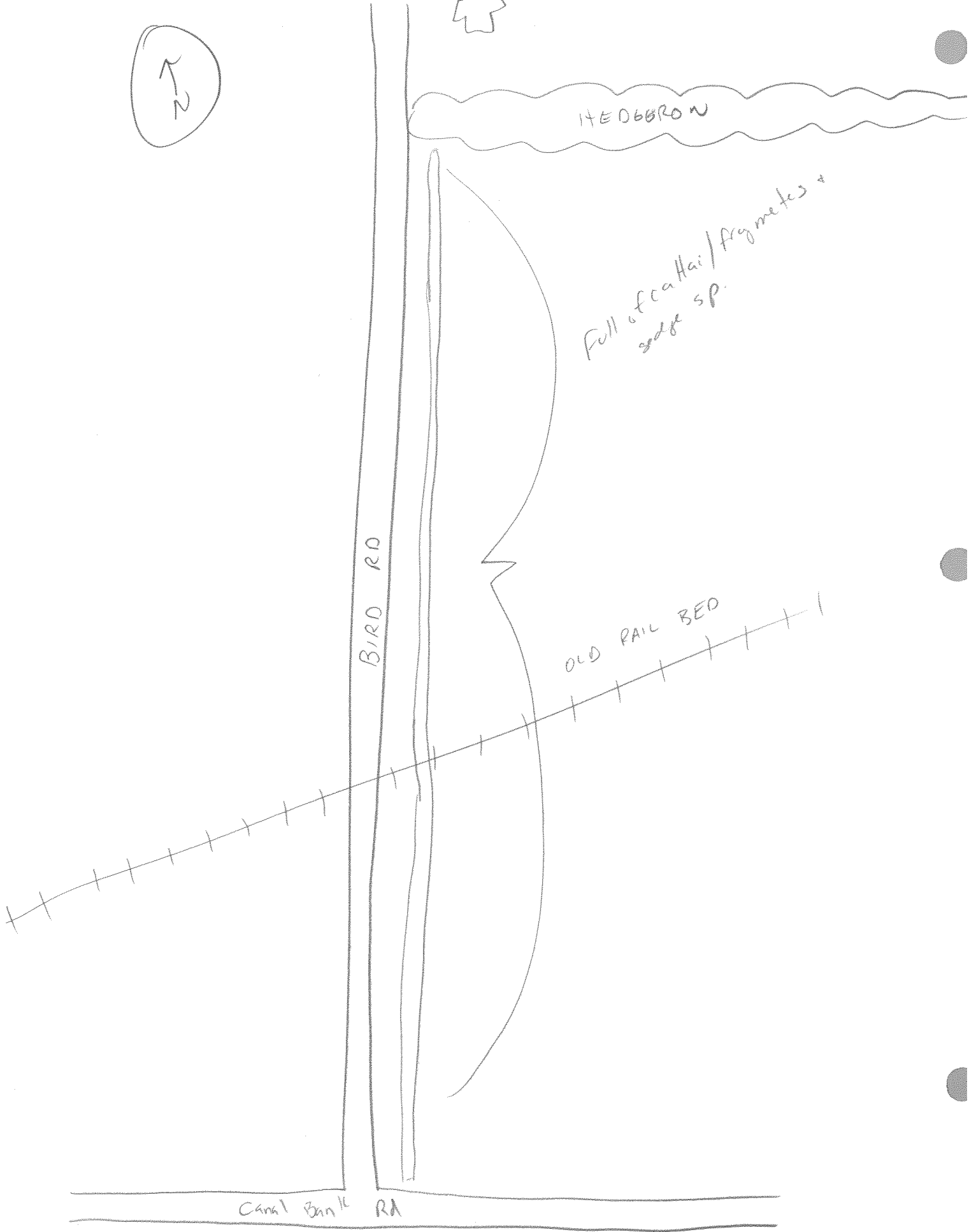
THE OBBROW

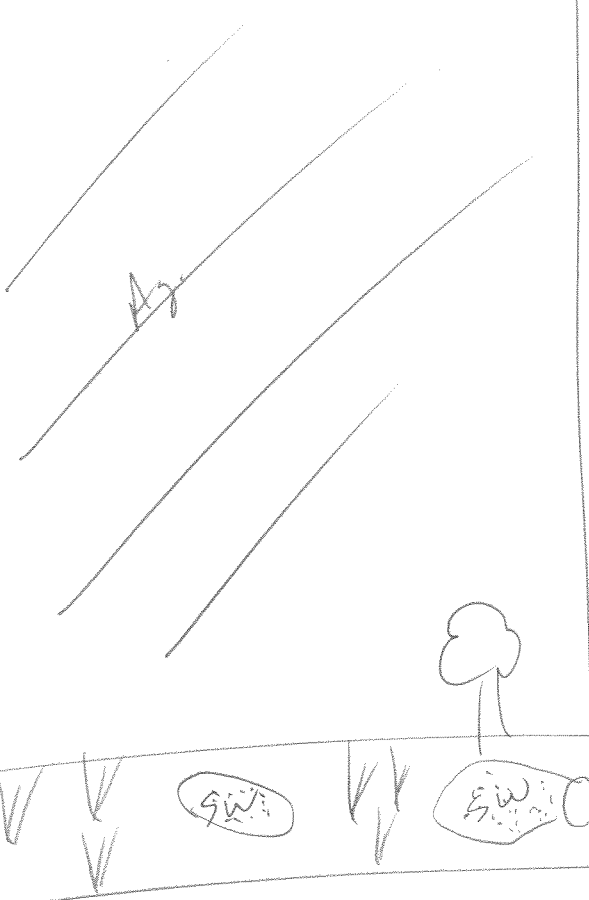
Full of feather / Argonites &
sedge sp.

BIRD RD

OLD RAIL BED

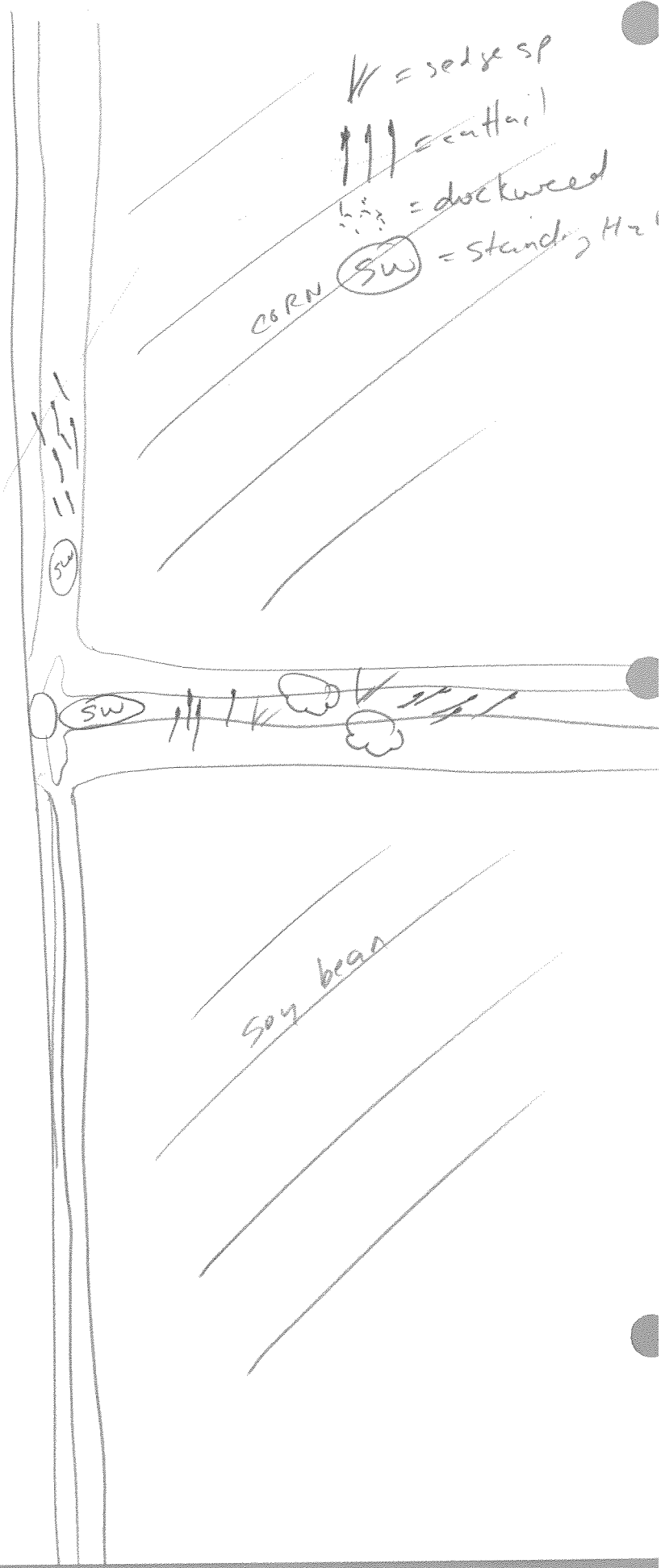
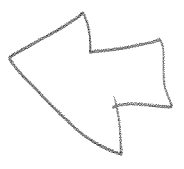
Canal Bank RA





As

Maintained
grass



// = sedge sp

||| = cut hair

⊙ = dockweed

CORN ⊙ = standing H₂O

Soy bean



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

off row. Could not properly assess. water observed.
Has been dredged but considered RBA waterbody REA

Station # 78-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950269
 Photos See photo log Field Staff ME, MF
 Date 2012 06 20 Time 13:38
 Weather conditions in previous 24 hrs No precip.
 GPS Coordinates (Zone) 17T E 0622481 N 4749465 Datum NAD83
 Descriptive Location On Canal Bank Rd ~ 1km east of Bird Rd

OFF ROW

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 2.5 (m) Maximum Pool Depth N/A (cm)
 Mean Bankfull Width _____ (m) Mean Water Depth N/A (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability none observed but recently dredged (1-2 years)

MA?

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)
0%

Adjacent Land Use
ag fields

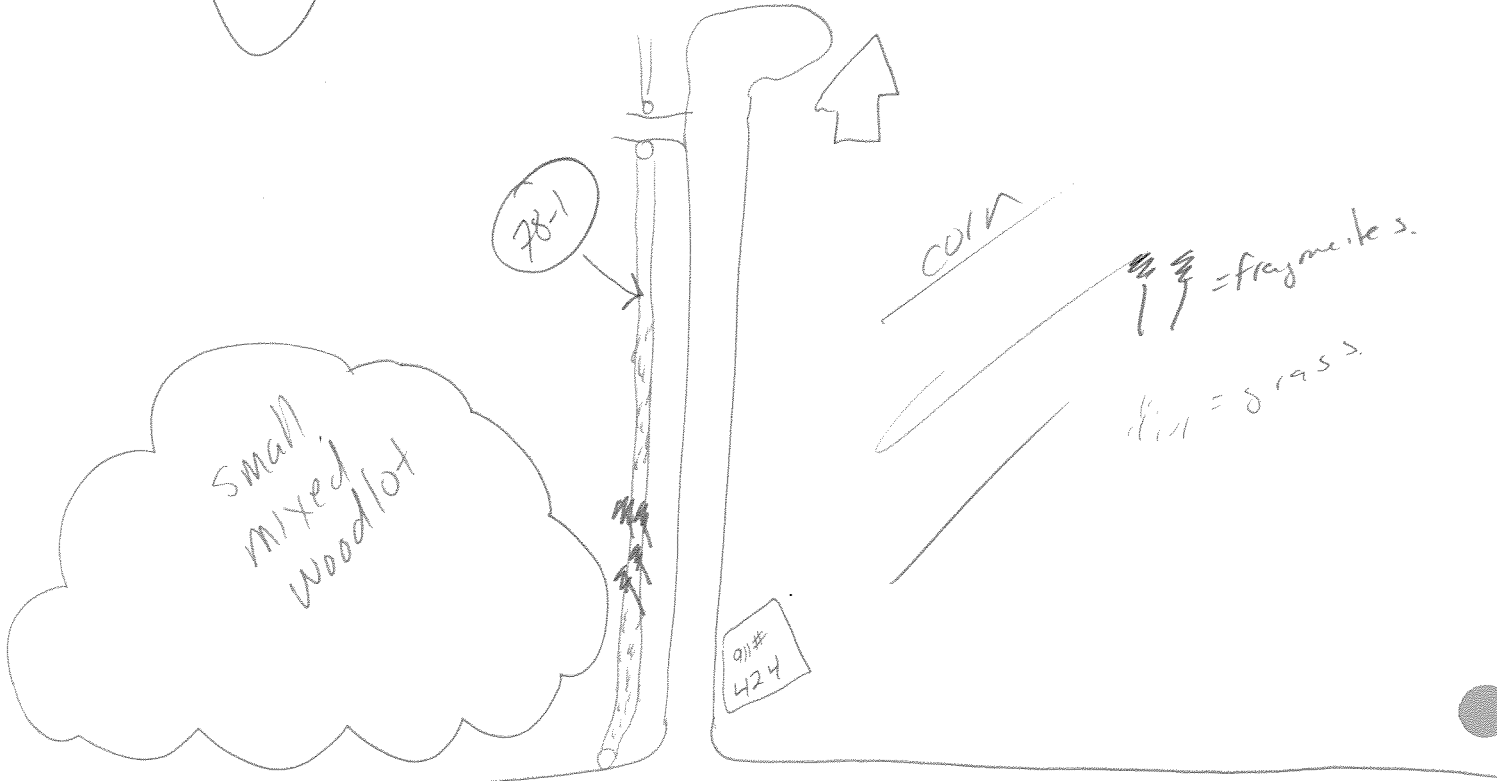
Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
possible spawn. Connected to Frederic Canal
 Migratory Obstructions (seasonal, permanent)

Note any fish observations None - off row

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



CANAL RD.

FEEDER CANAL



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
CANAL

Stantec

Station # 79-1
Watercourse Name unknown
Photos See photo log
Date June 20/12

Project Name Niagara Wind
Project # 160958269
Field Staff ME, ME
Time 11:12

Weather conditions in previous 24 hrs none - hot + humid
GPS Coordinates (Zone) 17T E 0622558 N 4249489 Datum NAD83
Descriptive Location On Canal Bank Rd. Canal runs along rd. Canal cons on west side of Canal Bank Rd.

Water Quality

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

OFF
20W

Watercourse Dimensions & Morphology

Mean Watercourse Width 8.0 (m) Maximum Pool Depth >100 (cm)
Mean Bankfull Width 10.0 (m) Mean Water Depth >50.0 (cm)
% Riffle 100 % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability none observed

Could n't
see flk

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 30 Silt 45 Muck _____
Boulder _____ Gravel 20 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)
40% immature/mature tree + shrub species throughout
Adjacent Land Use Houses, rds, ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Nuiser spawn, forage
Migratory Obstructions (seasonal, permanent)
none observed
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 ME Field Notes QA/QCed by MEE



CANAL

CANAL BANK RD



Stantec

Has been dredged recently but riparian full of cattails. Channel would have been full of cattails and will again

UMBREA

WIND FARM WATERBODY RAPID ASSESSMENT FORM

STANDING WAT + DRY SP

Station # 80-1
Watercourse Name unknown
Photos see photo log
Date 2012 06 20

Project Name Niagara Wind
Project # 160950269
Field Staff ME MP
Time 14:11

Weather conditions in previous 24 hrs no precip
GPS Coordinates (Zone) 17T E 0621309 N 4747055 Datum NAD83
Descriptive Location On Rymer Road ~ 200 m west of Dickhout Rd. Runs parallel with road on south side.

Top shallow

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 0.3 (m)
Mean Bankfull Width 3.0 (m)
Maximum Pool Depth 4 (cm)
Mean Water Depth 2 (cm)
% Riffle 100 % Pool % Run % Flat
Evidence of eroding banks, Comments on bank stability has been dredged recently

Substrate (% cover)

Bedrock Cobble Sand 40 Silt 40 Muck
Boulder Gravel 20 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)

10% from tree side mature trees.

Adjacent Land Use

ag fields, houses

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

possible spawning

Migratory Obstructions (seasonal, permanent)

dry @ times

Note any fish observations none

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

not connected to W.P. any water bodies within 2 km. Roadside ditch containing int. stream

Field Notes Authored by MP

Field Notes QA/QCed by MEE

DICKHOUT RD



CORN

RYMER RD



R117005



(*) = turbine



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Station # 81-1
 Watercourse Name UNKNOWN
 Photos See photo log
 Date 2012 06 20

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME, MF
 Time 13:52

Weather conditions in previous 24 hrs No precip
 GPS Coordinates (Zone) 17T E 0621911 N 4748513 Datum NAD83
 Descriptive Location On Burd Rd ~ 800m south of Canal Bank Rd

STAND. WATER

Water Quality

Dissolved Oxygen (mg/L) ~~26.71~~ 3.89 pH 7.80 Conductivity (µS/cm) 987
 Water Temperature (°C) 26.71 Air Temperature (°C) 29°C
 Time *in situ* measurements taken 14:00

Watercourse Dimensions & Morphology

Mean Watercourse Width 30 (m) Maximum Pool Depth 10 (cm) STANDING WATER
 Mean Bankfull Width 50 (m) Mean Water Depth 2 (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability none observed

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 30 Muck _____
 Boulder _____ Gravel 30 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)
2% cattail + meadow sp. Choked w/ cattails
 Adjacent Land Use ag fields, rd

Fish Habitat Potential

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

Field Notes Authored by MF

Field Notes QA/QCed by MFE

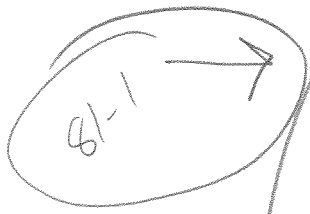
various aquatic veg

standing water



Previously accessed

Cattail + duckweed throughout



CHANNEL

BIRD RO.



|| = cattail

CANAL BANK RD



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Pockets of standing w
No flows.

Station # 83-1
Watercourse Name unknown
Photos see photo log
Date 2012 06 26

Project Name Niagara Wind
Project # 160950269
Field Staff MEIMF
Time 14:48

Weather conditions in previous 24 hrs no precipitation
GPS Coordinates (Zone) 17T E 0625918 N 4749203 Datum NAD83
Descriptive Location On Minor Rd ~ 15 m north of Hutchinson Rd

Water Quality

Very shallow

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 30°C
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m) Maximum Pool Depth 8 (cm) *very shallow*
Mean Bankfull Width 3.0 (m) Mean Water Depth 4 (cm)
% Riffle _____ % Pool _____ % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability
none observed

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 30 Muck _____
Boulder _____ Gravel 30 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)
30% mature + imat shrub + tree species.
Adjacent Land Use
rdg, houses, woodlot, ag. fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn (possible) to large.
Migratory Obstructions (seasonal, permanent)
dry @ times: pockets of standing 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. song birds, arrowhead, RCG

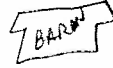
Field Notes Authored by ME Field Notes QA/QCed by MEE



83-2



HUTCHINSON RD

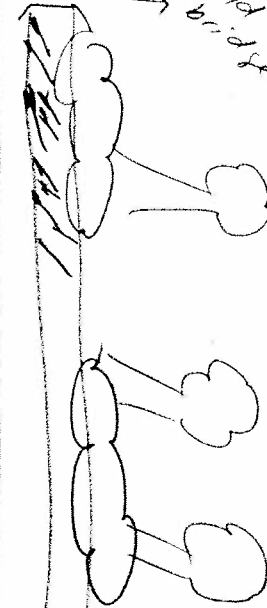


MINOR RD



old access
bridge

Woodlot



* = arrowhead
 [dots] = duckweed
 [vertical lines] = cattail
 [cloud shape] = shrubs



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

RBA

Station # 93-2
 Watercourse Name unknown
 Photos see photo log
 Date 2012 06 20

Project Name Niagara Wind
 Project # 160950269
 Field Staff ME MF
 Time 19:10

Weather conditions in previous 24 hrs no precipitation - hot + humid
 GPS Coordinates (Zone) 17T E 8222600 N 722200 Datum NAD83
 Descriptive Location Connects to 93-1 and continues SW away from
Hutchinson Rd.

E 0625899 N 4749162

Water Quality

Dissolved Oxygen (mg/L) 3.04 pH 7.90 Conductivity (μ S/cm) 500
 Water Temperature ($^{\circ}$ C) 22.34 Air Temperature ($^{\circ}$ C) 30 $^{\circ}$ C
 Time *in situ* measurements taken _____

Isitu good

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth 1.7600 (cm)
 Mean Bankfull Width 10.0 (m) Mean Water Depth 30.0 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability none observed.

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 30 Silt 40 Muck _____
 Boulder _____ Gravel 30 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)

15% wild grape, trees, shrubs

Adjacent Land Use

ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn, nursery

Migratory Obstructions (seasonal, permanent)

none observed

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 _____

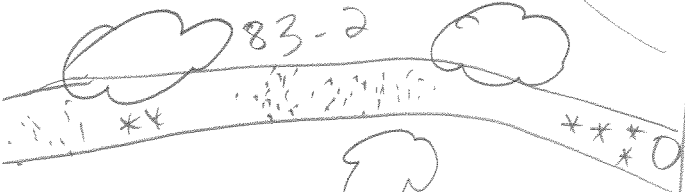
Other Habitat Notes, Incidental Wildlife Observations, etc. painter turtle

Field Notes Authored by MF

Field Notes QA/QCed by MEE



SEITZ
PROPERTY



HUTCHINSON RD



MINOR RD.



83-1

* = arrowhead
i.e. = duckweed.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # R11T082
Watercourse Name 2
Photos 8059-8067
Date 19 Sept 2012

Project Name Niagara Wind Farm
Project # 160960269
Field Staff Trevor Chandler, Hamish Aubrey
Time 12:45 pm

Weather conditions in previous 24 hrs Fine. Rain day prior
GPS Coordinates (Zone) 17T E 0613 2259 N 4754 28960 Datum NAD 83
Descriptive Location Corn field with watercourse 2 connecting downstream North of Hwy 3 by approx 700m, 600m East of Crown Rd

Water Quality NA - no surface water
Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 17°C
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
Mean Watercourse Width Dry (m) Maximum Pool Depth No pools - dry (cm)
Mean Bankfull Width 2-3 (m) Mean Water Depth Dry (cm)
% Riffle _____ % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability No evidence of fluvial erosion channel is adjacent fields are ploughed to top of bank

Substrate (% cover) → Soil

<input checked="" type="checkbox"/> Bedrock	<input checked="" type="checkbox"/> Cobble	<u>Yes - 10</u> Sand	<u>Yes - 70</u> Silt	<input checked="" type="checkbox"/> Muck
<input checked="" type="checkbox"/> Boulder	<input checked="" type="checkbox"/> Gravel	<u>Yes - 70</u> Clay	Yes - 70 Marl	<input checked="" type="checkbox"/> Detritus

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) _____
Adjacent Land Use Corn field, agricultural Agricultural weeds - 60% shaded - herbaceous exotics

Fish Habitat Potential No water, unlikely to bear fish
Critical Habitat (spawning or nursery areas, groundwater upwellings) _____

Migratory Obstructions (seasonal, permanent) Low - no flow
Note any fish observations No

Waterbody Notes
Natural Watercourse No Trapezoidal Channel Mostly Grassed Swale No Buried Tile Unlikely
Surficial Drainage (i.e. furrows) No Dugout Pond No Dominated by Aquatic Veg No Dry Yes

Other Habitat Notes, Incidental Wildlife Observations, etc. Straight trapezoidal channel along entire site. Channel bed does not appear to be planted but channel is used to drain agricultural fields. Water sourced from wetland situated north of channel. No aquatic plants

Field Notes Authored by Trevor + Hamish Field Notes QA/QCed by MAE



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # QL-SGR31 Project Name Niagara Wind Farm
 Watercourse Name Spring Creek Tributary 1 Project # 160960269
 Photos 8133 8134 8140 Field Staff Trewer + Hamish
 Date 19 Sept 2012 Time 5:35 pm
 Weather conditions in previous 24 hrs Fine - Rain, 15°C
 GPS Coordinates (Zone) 17T E 0620005 N 4775198 Datum Nad83
 Descriptive Location South Grimsby Rd 2 200 m north of Yonge St

Water Quality NA - Dry
 Dissolved Oxygen (mg/L) NA pH NA Conductivity (µS/cm) NA
 Water Temperature (°C) NA Air Temperature (°C) 17°C
 Time *in situ* measurements taken NA

Watercourse Dimensions & Morphology

Mean Watercourse Width Dry (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 100 Rip-rap in box culvert Cobble _____ Sand 100 (Soil) Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover

Cover Types Present (circle): 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) 30% shaded - grasses

Adjacent Land Use

Agricultural

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) unlikely

Note any fish observations no - low flow
no

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

Box culvert - approx 6m wide - some ponded water under culvert, otherwise channel is dry

Field Notes Authored by Hamish

Field Notes QA/QCed by MR



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # CL-SGR32/A Project Name Niagara Wind
 Watercourse Name Trib to Spring Creek 2 Project # 11609502/09
 Photos 8141-5 Field Staff Trevor Chandler & Hannah A
 Date Sept 19/12 Time 5:30
 Weather conditions in previous 24 hrs Rain
 GPS Coordinates (Zone) 17T E 0620261 N 4776015 Datum NAD83
 Descriptive Location South Grimsby Rd 3, 400m d of Cor 7

Water Quality

Dissolved Oxygen (mg/L) Dry pH ✓ Conductivity (µS/cm) ✓
 Water Temperature (°C) ✓ Air Temperature (°C) 17°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 Stable

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 100% 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)
10% agric pasture/grasses, early

Adjacent Land Use

agric/pasture

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. poorly defined channel in grassy field

Field Notes Authored by Trevor Chandler Field Notes QA/QCed by MS



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # CL-SAR 33
 Watercourse Name Spring creek
 Photos 8146 8147 8149
 Date 19 Sept 2012

Project Name Nagara Wind Project Farm
 Project # 160960259
 Field Staff Trevor & Hamish
 Time 6:05 pm

Weather conditions in previous 24 hrs Fine - Rain 15°C
 GPS Coordinates (Zone) 17T E 0620237 N 4776591 Datum NAD83
 Descriptive Location South Gainsley Road 3 - Fly Rd 20 m S of Fly Rd

Water Quality NA - Dry at Culvert
 Dissolved Oxygen (mg/L) pH Conductivity (µS/cm)
 Water Temperature (°C) Air Temperature (°C) 17°C
 Time *in situ* measurements taken

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth ~30 (cm)
 Mean Bankfull Width ~6 (m) Mean Water Depth 5cm (cm)
 % Riffle 100 % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability Stable

Substrate (% cover)

Bedrock Cobble Sand 100 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)
70% - shaded by grasses & trees & aquatic veg

Adjacent Land Use Rural residential, wooded area, agricultural field

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Migratory Obstructions (seasonal, permanent) *unlikely*
 Note any fish observations no *no - low flow & heavily vegetated*

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

Watch the poison ing! concrete box culvert - approx 4-5 m

Field Notes Authored by Hamish Field Notes QA/QCed by MR



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # CL-CR4 Project Name Niagara Wind
 Watercourse Name 1 Project # 160960269
 Photos 3069-3070 Field Staff Trevor & Hamish
 Date SEPT 19, 2012 Time 14:20
 Weather conditions in previous 24 hrs Rain, 15°C
 GPS Coordinates (Zone) 17T E 0613993 N 4767722 Datum Nad83
 Descriptive Location Confession Road 4 - 300 West of Minor Rd

Water Quality Dry
 Dissolved Oxygen (mg/L) pH Conductivity (µS/cm)
 Water Temperature (°C) Air Temperature (°C) 17°C
 Time *in situ* measurements taken

Watercourse Dimensions & Morphology
 Mean Watercourse Width Dry (m) Maximum Pool Depth dry (cm)
 Mean Bankfull Width <1m (m) Mean Water Depth dry (cm)
 % Riffle % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability Stable feature

Substrate (% cover)
 Bedrock Cobble Sand 100% (Soil) 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 Grass swale / agricultural waste

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Agricultural field (mowed) 1/2m on South
 Adjacent Land Use Agricultural + rural residential

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
Pool - none
 Migratory Obstructions (seasonal, permanent) low - no flow
 Note any fish observations no

Waterbody Notes
 Natural Watercourse N Trapezoidal Channel N Grassed Swale X (south of road) Buried Tile N
 Surficial Drainage (i.e. furrows) Yes Dugout Pond N Dominated by Aquatic Veg N Dry Y
North side of road

Other Habitat Notes, Incidental Wildlife Observations, etc. Surface drainage across
agricultural field disturbed by ploughing - north of road,
Grassed on south side of road.
~300m culvert - CSP

Field Notes Authored by Hamish Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # CL-CR4 Project Name Niagara Wind Farm
 Watercourse Name 2 Project # 1609
 Photos 8071 - 8074 Field Staff Hamish - Trevor
 Date 19 Sept 2012 Time 2:45 pm
 Weather conditions in previous 24 hrs Fine - Rain 15°C
 GPS Coordinates (Zone) 17T E 0619113 N 4767730 Datum NAD83
 Descriptive Location Concession Rd 4, 150 m West of minor rd

Water Quality Dry
 Dissolved Oxygen (mg/L) pH Conductivity (µS/cm)
 Water Temperature (°C) Air Temperature (°C) 17°C
 Time *in situ* measurements taken

Watercourse Dimensions & Morphology
 Mean Watercourse Width Dry (m) Maximum Pool Depth dry (cm)
 Mean Bankfull Width < 1m (m) Mean Water Depth dry (cm)
 % Riffle % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability Stable feature

Substrate (% cover)
 Bedrock Cobble Sand 100% (Soil) Silt Muck
 Boulder Gravel Clay Marl Detritus

in-water Cover Dry
 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% shaded - grass cover - early successional / agricultural
 Adjacent Land Use Agricultural / Road side ditch / wild herbaceous meadow

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Migratory Obstructions (seasonal, permanent) none
 Note any fish observations no

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

Other Habitat Notes, Incidental Wildlife Observations, etc. Upstream (south side of road)
grassed ditch, surface drainage across grassy meadow
3000 CSR

Field Notes Authored by Hamish Field Notes QA/QCed by MP



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # CL-CR4 Project Name Niagara Wind Farm
 Watercourse Name 3 Project # 160960269
 Photos 3075 - 3080 Field Staff Trevor - Hamish
 Date 19 Sept 2012 Time 2:55 pm
 Weather conditions in previous 24 hrs Fine - Rain 15°C
 GPS Coordinates (Zone) 17T E 0619353 N 4767739 Datum Nad83
 Descriptive Location Concession Rd 4 - 50 m East of Minor Rd

Water Quality

Dissolved Oxygen (mg/L) Dry pH 7.0 Conductivity (µS/cm) 170
 Water Temperature (°C) 17°C Air Temperature (°C) 17°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width Dry (m) Maximum Pool Depth Dry (cm)
 Mean Bankfull Width < 1 m (m) Mean Water Depth Dry (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable feature

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 100% (Soil) Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover

Cover Types Present (circle): 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)
70% - roadside grasses

Adjacent Land Use

Agricultural

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) no

Note any fish observations no

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

possibly equalization culvert under road, drainage feature may flow south through ag field. No defined channel observed. 100% vegetated with grasses & weeds. 300 mm CSD

Field Notes Authored by Hamish

Field Notes QA/QCed by MZ



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # CL-CR4 Project Name Niagara Wind Farm
 Watercourse Name 4 Project # 160960269
 Photos 3081 - 3086 Field Staff Hamish + Trevor
 Date 19 Sept 2012 Time 3:05 pm
 Weather conditions in previous 24 hrs Fire - Rain - Sec
 GPS Coordinates (Zone) 17T E 0619602 N 4767747 Datum NAD83
 Descriptive Location Concession Rd 4, 200 m East of Minor Rd

Water Quality Dry
 Dissolved Oxygen (mg/L) pH Conductivity (µS/cm)
 Water Temperature (°C) Air Temperature (°C) 17°C
 Time *in situ* measurements taken

Watercourse Dimensions & Morphology
 Mean Watercourse Width Dry (m) Maximum Pool Depth NA (cm)
 Mean Bankfull Width < 1m (m) Mean Water Depth NA (cm)
 % Riffle % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability Stable

Substrate (% cover)
 Bedrock Cobble Sand 100 (Soil) Silt Muck
 Boulder Gravel Clay Marl Detritus

In-water Cover Dry
 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% shaded - grasses + some aquatic grasses - cattails

Adjacent Land Use Agricultural + agricultural residential + road side ditch + wood lot

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) No
 Migratory Obstructions (seasonal, permanent) no - low flow
 Note any fish observations no

Waterbody Notes
 Natural Watercourse N Trapezoidal Channel N Grassed Swale Buried Tile N
 Surficial Drainage (i.e. furrows) N Dugout Pond N Dominated by Aquatic Veg N Dry Y
Grassed roadside ditch

Other Habitat Notes, Incidental Wildlife Observations, etc. ~200 mm CSP

Field Notes Authored by Hamish Aubrey Field Notes QA/QCed by



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # CL-CR4 Project Name Niagara Wind Farm
 Watercourse Name 5 Project # 160960269
 Photos 3087 - 8091 Field Staff Trevor + Hamish
 Date 19 Sep 2012 Time 3:15 pm
 Weather conditions in previous 24 hrs Fire - Rain, 15°C
 GPS Coordinates (Zone) 17T E 0619854 N 4767760 Datum NAD83
 Descriptive Location Concession road 4 - 300 m east of Minor Rd

Water Quality Dry
 Dissolved Oxygen (mg/L) / pH / Conductivity (µS/cm) /
 Water Temperature (°C) / Air Temperature (°C) 17°C
 Time *in situ* measurements taken /

Watercourse Dimensions & Morphology
 Mean Watercourse Width Dry (m) Maximum Pool Depth NA (cm)
 Mean Bankfull Width / (m) Mean Water Depth NA (cm)
 % Riffle / % Pool / % Run / % Flat /
 Evidence of eroding banks, Comments on bank stability Stable

Substrate (% cover)
 Bedrock / Cobble / Sand Soil (100%) Silt / Muck /
 Boulder / Gravel / Clay / Marl / Detritus /

In-water Cover Dry
 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% shaded - grassy cover
 Adjacent Land Use Agricultural

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) No
 Migratory Obstructions (seasonal, permanent) No
 Note any fish observations no - low

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

Other Habitat Notes, Incidental Wildlife Observations, etc. Defined channel associated with culvert, approx 900 mm in size, some aquatic grasses present but limited to roadside ditch.

Field Notes Authored by Hamish Field Notes QA/QCed by [Signature]



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # CL-CR4 Project Name Niagara Wind Farm
 Watercourse Name 6 Project # 160960269
 Photos 8092-8096 Field Staff Trevor & Hamish
 Date 19 Sept 2012 Time 3:25 pm
 Weather conditions in previous 24 hrs Fire - Rain 15°C
 GPS Coordinates (Zone) 17T E 0620212 N 4767775 Datum Nad83
 Descriptive Location Concession Road 4 - junction with Patterson Road

Water Quality Dry
 Dissolved Oxygen (mg/L) ✓ pH ✓ Conductivity (µS/cm) ✓
 Water Temperature (°C) ✓ Air Temperature (°C) 17°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width Dry (m) Maximum Pool Depth Dry (cm)
 Mean Bankfull Width ~1m (m) Mean Water Depth Dry (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability Stable

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 100 (Soil) Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover Dry
 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% shaded by grasses, some trees
 Adjacent Land Use Agricultural, roadside ditch

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) no
 Note any fish observations no - low flow

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

Other Habitat Notes, Incidental Wildlife Observations, etc. 600 mm culvert - approx 155
Drainage feature crosses perpendicular to road. Drainage feature present

Field Notes Authored by Hamish Aubrey Field Notes QA/QCed by NA



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # CL-CR 4 Project Name Niagara Wind Farm
 Watercourse Name 7 Project # 160966269
 Photos 8097 - 2400 Field Staff Hamish - Trevor
 Date 19 Sept 2012 Time 3:35 pm
 Weather conditions in previous 24 hrs Fire - Rain, 15°C
 GPS Coordinates (Zone) 17T E 0620335 N 4767783 Datum Nad83
 Descriptive Location Concession Road 4, 50 m East of Paterson Rd

Water Quality Dry
 Dissolved Oxygen (mg/L) ✓ pH ✓ Conductivity (µS/cm) ✓
 Water Temperature (°C) ✓ Air Temperature (°C) 17°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width Dry (m) Maximum Pool Depth Dry (cm)
 Mean Bankfull Width 21 m (m) Mean Water Depth Dry (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability no

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 100 (Soil) Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover Dry
 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% - grassed pasture + agricultural field

Adjacent Land Use
agriculture

Fish Habitat Potential Dry
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
no

Migratory Obstructions (seasonal, permanent)
no low flow

Note any fish observations no

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

Other Habitat Notes, Incidental Wildlife Observations, etc.
No defined channel, grassed swale on south side of road, ag field
& roadside drainage on north side
approx 300 mm CSP

Field Notes Authored by Hamish Field Notes QA/QCed by MR



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # CL-CR4 Project Name Niagara Wind Farm
 Watercourse Name 8 Project # 160960269
 Photos 8101-8104 Field Staff Trevor + Hamish
 Date 19 Sep 2012 Time 3:45 pm
 Weather conditions in previous 24 hrs Fine - Rain, 15°C
 GPS Coordinates (Zone) 17T E 0820519 N 476 7795 Datum NAD83
 Descriptive Location Concession Road 4 - 150 m East of Patterson

Water Quality Dry

Dissolved Oxygen (mg/L) pH Conductivity (µS/cm)
 Water Temperature (°C) Air Temperature (°C) 17°C
 Time *in situ* measurements taken

Watercourse Dimensions & Morphology

Mean Watercourse Width Dry (m) Maximum Pool Depth (cm)
 Mean Bankfull Width < 1 m (m) Mean Water Depth (cm)
 % Riffle % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability stable feature

Substrate (% cover)

 Bedrock Cobble Sand 100 (Soil) Silt Muck
 Boulder Gravel Clay Marl Detritus

In-water Cover Dry

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% - grasses + some trees

Adjacent Land Use

rural residential, agricultural, road

Fish Habitat Potential low

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

low/no flow

Note any fish observations None (Dry)

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

feature - flow through ~ 300mm CSP culvert

Field Notes Authored by Trevor Chandler

Field Notes QA/QCed by



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # CL-CR 4 Project Name Niagara Wind Farm
 Watercourse Name 9 Project # 160968269
 Photos 3105 - 3108 Field Staff Trevor + Hamish
 Date 19 Sept 2012 Time 3:55 pm
 Weather conditions in previous 24 hrs Fine - Rain 15°C
 GPS Coordinates (Zone) 17T E 0620608 N 4767792 Datum NAD83
 Descriptive Location Concession Road 4 - 400 m East of Patterson

Water Quality Dry
 Dissolved Oxygen (mg/L) pH Conductivity (µS/cm)
 Water Temperature (°C) Air Temperature (°C) 17°C
 Time *in situ* measurements taken

Watercourse Dimensions & Morphology
 Mean Watercourse Width Dry (m) Maximum Pool Depth (cm)
 Mean Bankfull Width < 1m (m) Mean Water Depth (cm)
 % Riffle % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability

Substrate (% cover)
 Bedrock Cobble Sand 100 (Soil) Silt Muck
 Boulder Gravel Clay Marl Detritus

In-water Cover Dry
 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)
30% - grasses are cut
 Adjacent Land Use rural residential, agricultural, roadside ditch drainage

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) no
 Migratory Obstructions (seasonal, permanent) no - low
 Note any fish observations no

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

Other Habitat Notes, Incidental Wildlife Observations, etc. Pastured Manicured grass lawns / roadside drainage - small drainage channels. Small wetland south of road receives drainage.

Field Notes Authored by Hamish Aubrey Field Notes QA/QCed by WJZ



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # CL-CR4
 Watercourse Name 10
 Photos 8110 - 8112
 Date 19 Sept 2012
 Weather conditions in previous 24 hrs Fine - Rain 15%
 GPS Coordinates (Zone) 17T E 062914 N 4767814 Datum Nad 83
 Descriptive Location Concession Road 4 - 500 West of Hwy 20

Project Name Niagara Wind Farm
 Project # 160960269
 Field Staff Trevor Hamish
 Time 4:15 pm

Water Quality Dry
 Dissolved Oxygen (mg/L) --- pH --- Conductivity (µS/cm) ---
 Water Temperature (°C) --- Air Temperature (°C) 17°C
 Time *in situ* measurements taken ---

Watercourse Dimensions & Morphology
 Mean Watercourse Width Dry (m) Maximum Pool Depth --- (cm)
 Mean Bankfull Width <1 m (m) Mean Water Depth --- (cm)
--- % Riffle --- % Pool --- % Run --- % Flat
 Evidence of eroding banks, Comments on bank stability Stable

Substrate (% cover)
 Bedrock --- Cobble --- Sand 100 (Soil) Silt --- Muck ---
 Boulder --- Gravel --- Clay --- Marl --- Detritus ---

In-water Cover Dry
 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)
South side of road - grasses, north side - manicured cut grass
 Adjacent Land Use Rural residential, agricultural

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) no
 Migratory Obstructions (seasonal, permanent) no - low flow
 Note any fish observations no

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

Other Habitat Notes, Incidental Wildlife Observations, etc. Roadside ditch (grasses)
& grassed swale. 300 mm approx

Field Notes Authored by Hamish Field Notes QA/QCed by MZ



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # CL-CR4 Project Name Niagara Wind Farm
 Watercourse Name 11 Project # 160960269
 Photos 3113 - 3118 Field Staff Trevors Hamish
 Date 19 Sept 2012 Time 4:25 pm
 Weather conditions in previous 24 hrs Fire - Rain, 15°C
 GPS Coordinates (Zone) 17T E 0620973 N 4767844 Datum NAD83
 Descriptive Location Concession Rd 4 - 475 m east West of Hwy 20

Water Quality

Dissolved Oxygen Dry (mg/L) pH Conductivity (µS/cm)
 Water Temperature (°C) Air Temperature (°C) 17°C
 Time *in situ* measurements taken

Watercourse Dimensions & Morphology

Mean Watercourse Width Dry (m) Maximum Pool Depth (cm)
 Mean Bankfull Width 1-2m (m) Mean Water Depth (cm)
 % Riffle % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability Stable - minor scour near culvert

Substrate (% cover)

Bedrock Cobble Sand 100 (Soil) Silt Muck
 Boulder Gravel Clay Marl Detritus

In-water Cover

Cover Types Present Dry (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)
10-20% - some grasses / trees
 Adjacent Land Use Agricultural & rural residential

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) no
 Migratory Obstructions (seasonal, permanent) no - low flow
 Note any fish observations no

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

North side of road is grassed swale, south side of road is dug channel, straight ~ 900 mm CSP culvert

Field Notes Authored by Hamish Aubrey Field Notes QA/QCed by MT



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # CL-CR4 Project Name Niagara Wind Farm
 Watercourse Name 12 Project # 160960269
 Photos 8120 - 8124 Field Staff Trevor + Hamish
 Date 19 Sept 2012 Time 4:40 pm
 Weather conditions in previous 24 hrs Fire - Rain 15°C
 GPS Coordinates (Zone) 17N E 0621210 N 4767828 Datum NAD83
 Descriptive Location Concession Rd 4 - 300 m west of Hwy 20

Water Quality Dry
 Dissolved Oxygen (mg/L) pH Conductivity (µS/cm)
 Water Temperature (°C) Air Temperature (°C) 17°C
 Time *in situ* measurements taken

Watercourse Dimensions & Morphology
 Mean Watercourse Width Dry (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 Stable

Substrate (% cover)
 Bedrock Cobble Sand 100 (Soil) Silt Muck
 Boulder Gravel Clay Marl Detritus

In-water Cover Dry
 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)
North side - 60-70% - agricultural grasses, south side 0% - dug out
 Adjacent Land Use Agricultural

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) no
 Migratory Obstructions (seasonal, permanent) no-low flow
 Note any fish observations no

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

Other Habitat Notes, Incidental Wildlife Observations, etc. Minor small packets of standing water
~ 900 mm CSP culvert, south side of channel dug in ag field

Field Notes Authored by Hamish Field Notes QA/QCed by WF



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # CL-CR4 Project Name Niagara Wind Farm
 Watercourse Name 13 Project # 160960269
 Photos 81 223 Field Staff Trevor + Hamish
 Date 19 Sept 2012 Time 4:50 pm
 Weather conditions in previous 24 hrs Fine - Rain 15°C
 GPS Coordinates (Zone) 17T E 0621786 N 4767353 Datum NAD83
 Descriptive Location Concession Road 4 - 50 m west of Hwy 20

Water Quality Dry
 Dissolved Oxygen (mg/L) ✓ pH ✓ Conductivity (µS/cm) ✓
 Water Temperature (°C) ✓ Air Temperature (°C) 17°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width Dry (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width < 1m (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability no

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand (soil) 100% Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover Dry
 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)
South side - 10% - grassed - North side - 80% - grasses / ag weeds
 Adjacent Land Use Agricultural, roading, rural residential

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) No
 Migratory Obstructions (seasonal, permanent) no - low flow
 Note any fish observations no

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

Other Habitat Notes, Incidental Wildlife Observations, etc.
~450 mm CSP culvert South side = grass swale - mowed
North side of road = grasses - agricultural weeds
channel is ploughed on south side

Field Notes Authored by Hamish Field Notes QA/QCed by M



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # CL-Younge Project Name Niagara Wind Farm
 Watercourse Name 1 Project # 160960269
 Photos 8130 - 8134 Field Staff Trevor + Hamish
 Date 19 Sept Time 5:20 pm
 Weather conditions in previous 24 hrs Fine - Rain 15°C
 GPS Coordinates (Zone) 17T E 0619315 N 4774960 Datum NAD83
 Descriptive Location Younge Rd St
Agricultural land, rural residential - 300 east of clayson road.

Water Quality NA -
 Dissolved Oxygen (mg/L) NA pH NA Conductivity (µS/cm) NA
 Water Temperature (°C) NA Air Temperature (°C) 17°C
 Time *in situ* measurements taken NA

Watercourse Dimensions & Morphology
 Mean Watercourse Width 1-15 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 10 (cm)
 % Riffle 100 % Pool NA % Run NA % Flat NA
 Evidence of eroding banks, Comments on bank stability stable

Substrate (% cover)
 Bedrock NA Cobble 10 Sand 80 Silt NA Muck NA
 Boulder NA Gravel 10 Clay NA Marl 10% Detritus NA

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

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 30% shade - grasses
 Adjacent Land Use Agricultural, roadside, rural residential

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) unlikely
 Migratory Obstructions (seasonal, permanent) low flows
 Note any fish observations no

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

Other Habitat Notes, Incidental Wildlife Observations, etc. NA little to no flow.
small culvert observed, adjacent to road on southside, not on northside
→ then flows southwards. Roadside drainage
300mm

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



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # CL-Fly Rd
 Watercourse Name Spring creek
 Photos 8156 8160
 Date 19 Sept 2012
 Weather conditions in previous 24 hrs Fine - Rain 15°C
 GPS Coordinates (Zone) 17T E 0620039 N 4776898 Datum Nad83
 Descriptive Location Fly Rd - 400 m West of South Grimsley Rd 3

Project Name Niagara ~~Area~~ Wind Farm
 Project # 160960269
 Field Staff Trevor & Hamish
 Time 6:30 pm

Water Quality NA - dry (mostly)
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 17°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width 3 (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width 6 (m) Mean Water Depth 10 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability Bank erosion south side of road, moderate amount

Substrate (% cover) under bridge
 Bedrock _____ Cobble _____ Sand 70 Silt _____ Muck _____
 Boulder _____ Gravel 30 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) 70% - trees & grasses
 Adjacent Land Use Wooded area, rural residential

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) none noted
 Migratory Obstructions (seasonal, permanent) _____
 Note any fish observations yes - one small one

Waterbody Notes
 Natural Watercourse Maybe 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. White tailed deer
Box culvert - ~ 4 m wide

Field Notes Authored by Hamish Field Notes QA/QCed by NO



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # CL-FLY rd 1 / B Project Name Niagara Wind
 Watercourse Name Trib to Spring Creek Project # 160950 269
 Photos 8150-5 Field Staff Trevor Chandler, Hannah Albrecht
 Date Sept 19/12 Time 6:10
 Weather conditions in previous 24 hrs rain -15°C
 GPS Coordinates (Zone) 17T E 0868 N 4776663 Datum NAD83
 Descriptive Location Fly Rd - south Grimshul Rd junction

Water Quality
 Dissolved Oxygen (mg/L) _____ pH Dry Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 17°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 3-4 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 100% 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)
60% pasture / roadside grasses, early
 Adjacent Land Use agricultural field / pasture / rural residential

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) _____
 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. pooled water in box
culvert (box culvert is ~2m wide)

Field Notes Authored by T. Chandler Field Notes QA/QCed by MOZ



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # CL FLY rd 2 / C Project Name Niagara Wind
 Watercourse Name Trib to Spring Creek Project # 160950269
 Photos 8/60-65 Field Staff T. Chandler, Hamish Abr...
 Date Sept 19/12 Time 6:40
 Weather conditions in previous 24 hrs 15°C, rain
 GPS Coordinates (Zone) 17 E 0620461 N 4776782 Datum NAD83
 Descriptive Location Fly rd, 300m west of South Grumbly rd

Water Quality
 Dissolved Oxygen (mg/L) dry pH dry Conductivity (µS/cm) dry
 Water Temperature (°C) _____ Air Temperature (°C) 17°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width 1 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 70 Silt _____ Muck _____
 Boulder _____ Gravel 20 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)
30-40% grasses, early
 Adjacent Land Use wooded lot, roadside ditch

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) none noted
 Migratory Obstructions (seasonal, permanent) _____
 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.
channel heavily dominated by grasses. Roadside drainage culvert, water, debris + muck under road

Field Notes Authored by T. Chandler Field Notes QA/QCed by MP



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # CL Fly Rd 3 / F Project Name Niagara Wind
 Watercourse Name Trih to Spring Creek Project # 160902609
 Photos 8166-8170 Field Staff T. Chandler Hamid Aubrey
 Date Sept 19/12 Time 6:55
 Weather conditions in previous 24 hrs Rain, 15°C
 GPS Coordinates (Zone) 17T E 0621010 N 4776610 Datum NAD83
 Descriptive Location Fly Road, 40 m east of South Grimbyed 3

Water Quality

Dissolved Oxygen (mg/L) dry pH 7 Conductivity (µS/cm) 1
 Water Temperature (°C) _____ Air Temperature (°C) 17°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 100% 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)
southside of road - 70% wetland grasses/northside is 10% mowed gr
 Adjacent Land Use rural residential/lawns/roadside ditch

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) none noted
 Migratory Obstructions (seasonal, permanent) dry 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. Box culvert, 1m, open bottom, straightened

Field Notes Authored by T. Chandler Field Notes QA/QCed by M



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # Walker Rd 1 / D Project Name Niagara Wind
 Watercourse Name Trib to Spring Creek Project # 160950269
 Photos 8171-75 Field Staff J. Chandler, Hamish Aubrey
 Date Sept 19/12 Time 7:05
 Weather conditions in previous 24 hrs rain 15°C
 GPS Coordinates (Zone) 17T E 0621418 N 477775 Datum NAD83
 Descriptive Location Walker Rd, 20 m N of Philo Rd

Water Quality

Dissolved Oxygen (mg/L) ORW / pH Conductivity (µS/cm)
 Water Temperature (°C) Air Temperature (°C) 17°C
 Time *in situ* measurements taken

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth (cm)
 % Riffle % Pool % Run % Flat
 Evidence of eroding banks, Comments on bank stability Stable

Substrate (% cover)

Bedrock Cobble Sand 100% 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)
70% grasses, earth

Adjacent Land Use

Ag. fields, rural residential

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
dry 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. 100mm CSP culvert, dry, frightened

Field Notes Authored by J. Chandler

Field Notes QA/QCed by



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # Walker Rd 2.1E Project Name Niagara Wind
 Watercourse Name Trib to Springcreek Project # 16090269
 Photos 8/16-82 Field Staff T. Chandler, Hamish Abbrey
 Date Sept 19/12 Time 7:15
 Weather conditions in previous 24 hrs rain, 15°C
 GPS Coordinates (Zone) 11T E 0621412 N 4777973 Datum NAD83
 Descriptive Location Walker Road, 100 m N of Philia Rd

Water Quality

Dissolved Oxygen (mg/L) dry pH dry Conductivity (µS/cm) dry
 Water Temperature (°C) dry Air Temperature (°C) 17°C
 Time *in situ* measurements taken dry

Watercourse Dimensions & Morphology

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

Substrate (% cover)

Bedrock dry Cobble dry Sand 100% Silt dry Muck dry
 Boulder dry Gravel dry Clay dry Marl dry Detritus dry

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

70% grasses, early
agricultural fields, rural residential

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) none noted

Note any fish observations dry channel
none

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc. 900mm csp culvert
some pooled water present

Field Notes Authored by T. Chandler

Field Notes QA/QCed by MS



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
R11 T001-1
fig 20

Station # R11 T001-1
 Watercourse Name _____
 Photos see log
 Date June 12 2012
 Weather conditions in previous 24 hrs rain
 GPS Coordinates (Zone) 17T E 623349 N 4765629 Datum _____
 Descriptive Location Vaughan Rd & SE-11

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE + SK
 Time 4:25 pm

Water Quality

Dissolved Oxygen (mg/L) 10.41 pH 7.81 Conductivity (μ S/cm) 1513
 Water Temperature ($^{\circ}$ C) 25.650 Air Temperature ($^{\circ}$ C) 30
 Time *in situ* measurements taken 4:25 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 5 (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability Stable + veg w/ RCG

Substrate (% cover)

Bedrock _____ Cobble 20 Sand _____ Silt _____ Muck _____
 Boulder _____ Gravel 80 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

AS

Fish Habitat Potential

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

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. incised drain

Field Notes Authored by KE Field Notes QA/QCed by John Moore



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

NON
REA

Station # RIITD 02

Project Name NIAGARA WIND

Watercourse Name 02-1

Project # 160950269

Photos 8850

Field Staff T. Chandler M. Ellah

Date June 7, 2012

Time 6:10 PM

Weather conditions in previous 24 hrs Light thunder showers and sunny

GPS Coordinates (Zone) 17T E 627172 N 4765995 Datum

Descriptive Location _____

Water Quality DRY - TILED

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

Water Temperature (°C) _____ Air Temperature (°C) 20

Time *in situ* measurements taken N/A

Watercourse Dimensions & Morphology Low Depression - ploughed & planted w corn

Mean Watercourse Width N/A (m) Maximum Pool Depth N/A (cm)

Mean Bankfull Width N/A (m) Mean Water Depth N/A (cm)

N/A % Riffle N/A % Pool N/A % Run N/A % Flat

Evidence of eroding banks, Comments on bank stability N/A

Substrate (% cover) DRY

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)

OPEN (0%)

Adjacent Land Use

CORNFIELD

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

NO WATER

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 T. Chandler

Field Notes QA/QCed by WF



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA

Stantec

Station # BILTD 02
 Watercourse Name 02-2
 Photos ~~885 ST 885~~ 8851
 Date JUNE 7, 2017
 Weather conditions in previous 24 hrs Light thunder showers ; Sunny
 GPS Coordinates (Zone) 17T E 627394 N 4765896 Datum
 Descriptive Location _____

Project Name NIAGARA WIND
 Project # 160950269
 Field Staff T. Chandler M. Ellah
 Time 6:35

Water Quality DRY - TILE DRAIN
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 20
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology DRY
 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) DRY
 Bedrock _____ Cobble _____ Sand _____ Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover DRY
 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%
 Adjacent Land Use CORNFIELD

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) _____
NO FLOW
 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 T. Chandler Field Notes QA/QCed by MP



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11002
 Watercourse Name 02-3
 Photos ~~8852-56~~ 8852-56
 Date JUN 7, 2012
 Weather conditions in previous 24 hrs —
 GPS Coordinates (Zone) E 627501 N476 5973 Datum
 Descriptive Location Along property line at east side of property.

Project Name NIAGARA WIND
 Project # 160950269
 Field Staff T. Chandler, M. Ellah
 Time 6:30 PM

Water Quality

Too Shallow

Dissolved Oxygen (mg/L) — pH — Conductivity (µS/cm) —
 Water Temperature (°C) — Air Temperature (°C) 20
 Time *in situ* measurements taken —

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth 5 (cm)
 Mean Bankfull Width 4 (m) Mean Water Depth 2 (cm)
— % Riffle 100 % Pool — % Run — % Flat
 Evidence of eroding banks, Comments on bank stability stable

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

60% shrubs + aquatic vegetation

Adjacent Land Use

Agricultural fields (w crops planted)

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

Low/no flow

Note any fish observations NONE

Waterbody Notes

Natural Watercourse NO Trapezoidal Channel Grassed Swale — Buried Tile —
 Surficial Drainage (i.e. furrows) NO Dugout Pond — Dominated by Aquatic Veg Dry —

Other Habitat Notes, Incidental Wildlife Observations, etc.

Lesser duckweed Sagittarium, sedges

Field Notes Authored by T. Chandler

Field Notes QA/QCed by ME



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # R11T003
 Watercourse Name _____
 Photos See Log
 Date June 11 / 2012
 Weather conditions in previous 24 hrs hot & Sunny
 GPS Coordinates (Zone) 17T E 639942
 Descriptive Location conc 1 approx 500m east of Boyle Rd.

Project Name Niagara Wind
 Project # 1100450269
 Field Staff KE JK
 Time 4:11 pm

N 4764072 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 _____ (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.

Surficial Drainage or Temp wet areas that are ploughed!

Field Notes Authored by KE

Field Notes QA/QCed by Joe Keene



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

RETA
R11T004-1
Pg 32

Station # R11T004-1
 Watercourse Name _____
 Photos see log
 Date June 12 2012
 Weather conditions in previous 24 hrs fair overcast
 GPS Coordinates (Zone) 17T E 627606 N 4768182 Datum NAD 83
 Descriptive Location conc. 4 @ Hodgkins Rd.

Project Name Niagara Wind
 Project # 160950269
 Field Staff RET JK
 Time 9:16 AM

Water Quality
 Dissolved Oxygen (mg/L) 5.4 pH 7.43 Conductivity (µS/cm) 984
 Water Temperature (°C) 18.55 Air Temperature (°C) 23
 Time *in situ* measurements taken 9:20 AM

Watercourse Dimensions & Morphology
 Mean Watercourse Width 2 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 4.5 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability some erosion

dry except in culvert

Substrate (% cover)
 Bedrock _____ Cobble 20 Sand _____ Silt _____ Muck _____
 Boulder _____ Gravel 80 Clay _____ Marl _____ Detritus _____

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

water plantain, juncus sp, RCS

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

Adjacent Land Use 10% Ag - soybean

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

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.
trapezoidal ditch line dominated by aquatic veg
barber's note

Field Notes Authored by KE Field Notes QA/QCed by [Signature]

1N

Hodgkins Rd

REA 2

REA-1

Conc. 4

11

REA-2

REA-6

loses definition
grassy swale
↓

Surficial
drainage

Non REA-5

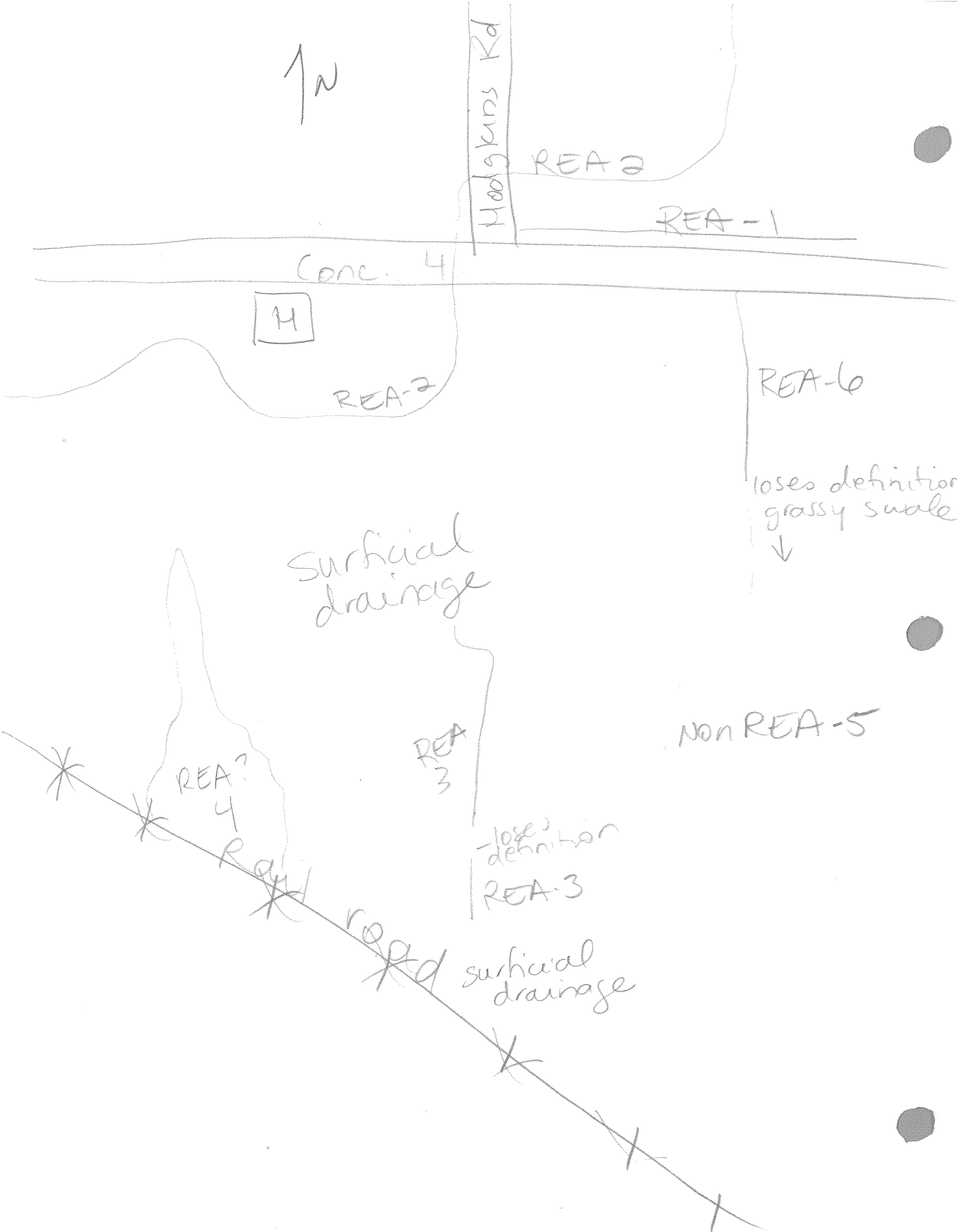
REA?
4

REA
3

loses
definition
REA-3

road

surficial
drainage





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

R11T004-2

Fig 32

Station # R11T004-2
Watercourse Name
Photos see log
Date June 12 2012
Weather conditions in previous 24 hrs None overnight
GPS Coordinates (Zone) 17T E 627568 N 4768172 Datum
Descriptive Location Conc. 4 @ Floodplain Rd

Project Name Niagara Wind
Project # 160950269
Field Staff KE + JK
Time 9:25 AM

Water Quality

Dissolved Oxygen (mg/L)
Water Temperature (°C)
Time in situ measurements taken
pH dry
Conductivity (µS/cm)
Air Temperature (°C) 23°C

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m)
Mean Bankfull Width 3.5 (m)
Maximum Pool Depth
Mean Water Depth
% Riffle % Pool % Run % Flat
Evidence of eroding banks, Comments on bank stability stable + vlg

Substrate (% cover)

Bedrock Cobble 10% Sand
Boulder 10 Gravel 100% 50 Clay Silt Muck
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%

Adjacent Land Use

307 field - Agricultural

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

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.

Defined channel, dug ditch w aquatic veg

Field Notes Authored by KE/JK

Field Notes QA/QCed by



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
R11T004-3
F132

Station # R11T004-3
Watercourse Name _____
Photos see log
Date June 12 2012
Weather conditions in previous 24 hrs rain
GPS Coordinates (Zone) 17T E 627611 N 4767868 Datum
Descriptive Location Conc 4 @ Hodgkins Rd, approx 400 m south of conc 4

Project Name Niagara Wind
Project # 160950269
Field Staff EE + JK
Time 9am

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ 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 veg + stable

Substrate (% cover)

Bedrock _____ Cobble 20 Sand _____ Silt _____ Muck _____
Boulder _____ Gravel 80 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

Ag, corn, soy & hay.

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.

-S. signicola Flode's shells + burrowing crayfish (Fallembous fobus)

Field Notes Authored by Kelce Fishley

Field Notes QA/QCed by Joe Hesse



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA 221.
R11T004-4
F332

Station # R11T004-4
 Watercourse Name _____
 Photos see log
 Date June 12 2012
 Weather conditions in previous 24 hrs rain
 GPS Coordinates (Zone) 17 E 627484 N 4767693 Datum
 Descriptive Location SW corner of Crown property by Rail Road tracks - south of Conv. 4 approx 600m

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE + JK
 Time 9:55 Am

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)
40% willows, shrubs

Adjacent Land Use
Ag

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

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations
connectivity?
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.
- low lying wet area dominated by cattails, willows
- watercourse in
- wet area in the middle, unsure about connectivity to
ups or d/s reaches, surficial drainage feeds into it

Field Notes Authored by KE Field Notes QA/QCed by JK



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non REF
R11T004-
F332 5

Station # R11T004-5
 Watercourse Name _____
 Photos _____
 Date June 12 2012
 Weather conditions in previous 24 hrs rain
 GPS Coordinates (Zone) _____ E _____ N _____ Datum _____
 Descriptive Location conc. 4 100 m east of Hodgkins Rd
& 400 m south in field

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE & JK
 Time 10:40

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ 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.

grassed swale w/ no channel definition, dominated
by RCG, but farmer could plough through,
leaves for surficial drainage

Field Notes Authored by KE

Field Notes QA/QCed by J. New



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
R117004-6
F432

Station # R117004-6
Watercourse Name _____
Photos see log
Date June 12 2012

Project Name Niagara Wind
Project # 160950269
Field Staff KE + JK
Time 10:29 am

Weather conditions in previous 24 hrs rain
GPS Coordinates (Zone) 17T E 627698 N 4768121 Datum _____
Descriptive Location conc. 4 approx 100 m east of Hodgkins Rd

Start of channel to road

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

Watercourse Dimensions & Morphology
Mean Watercourse Width 0.5 (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 _____

Substrate (% cover)
Bedrock _____ Cobble 20 Sand _____ Silt _____ Muck _____
Boulder _____ Gravel 80 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)
0%

Adjacent Land Use
soy & hay

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.
- some channel debris on near road for approx. 50 m & then becomes low lying swale w/ no debris on

Field Notes Authored by KE Field Notes QA/QCed by [Signature]



WIND FARM WATERBODY RAPID ASSESSMENT FORM

PEA ^{3/27/12}

Stantec

Station # R11T005-1

Project Name Niagara Wind

Watercourse Name UNKNOWN

Project # 160950269

Photos 131-143

Field Staff KC, MF

Date Apr 19/12

Time 4:25

Weather conditions in previous 24 hrs 12°C, overcast

GPS Coordinates (Zone) 17T E 0621299 N 4747673 Datum NAD83

Descriptive Location _____

Water Quality

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

Water Temperature (°C) _____ Air Temperature (°C) 20°C

Time *in situ* measurements taken _____

no water

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth 20 (cm)

Mean Bankfull Width 3 (m) Mean Water Depth 16 (cm)

_____ % Riffle _____ % Pool 10 % Run _____ % Flat

Evidence of eroding banks, Comments on bank stability stable

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

Adjacent Land Use ag. land

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations seasonal

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 KC

Field Notes QA/QCed by MF

bush lot

RT1100S-3
REA

NON
REA

RT1100S-1
REA

RT1100S-2



ag field

20m

ag. field.

non REA.

farm
path



non participant

Rymer Road

bush lot



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non
REA

Stantec

Station # RT11005-2
 Watercourse Name Unknown
 Photos 118-124
 Date Apr 19/12
 Weather conditions in previous 24 hrs 12°C, overcast
 GPS Coordinates (Zone) 17T E N Datum NAD83
 Descriptive Location 400m north of Rymer, 400m west of Dickhaut Rd

Project Name Niagara Wind
 Project # 100150269
 Field Staff KC, MF
 Time 4:30

Water Quality

~~Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time in situ measurements taken _____~~ *-no water*

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 < 5% grasses, early ag land~~

Fish Habitat Potential

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

~~Migratory Obstructions (seasonal, permanent)~~

~~Note any fish observations swale~~

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 KC

Field Notes QA/QCed by MF

Refer TO
RIIT005-3 or

RIIT005-1

for Drawing of
grassy wale



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # RIIT005-3 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950269
 Photos 125-130 Field Staff KC, MF
 Date Apr 19/12 Time 4:32
 Weather conditions in previous 24 hrs 12°C, overcast
 GPS Coordinates (Zone) 17T E 0621291 N 4748086 Datum NAD83
 Descriptive Location 500m north of Rymer Road, 400m west of Dickhate Road

Water Quality

Dissolved Oxygen (mg/L) 7.24 mg/L pH 8.37 Conductivity (μ S/cm) 96.3 μ S/cm
 Water Temperature ($^{\circ}$ C) 19.04 $^{\circ}$ C Air Temperature ($^{\circ}$ C) 20 $^{\circ}$ C
 Time *in situ* measurements taken 4:35

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 60 (cm)
 Mean Bankfull Width 6 (m) Mean Water Depth 40 (cm)
 % Riffle _____ % Pool 100 % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability stable - lots of vegetation

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) < 5%, grasses, early
 Adjacent Land Use ag. land

Fish Habitat Potential

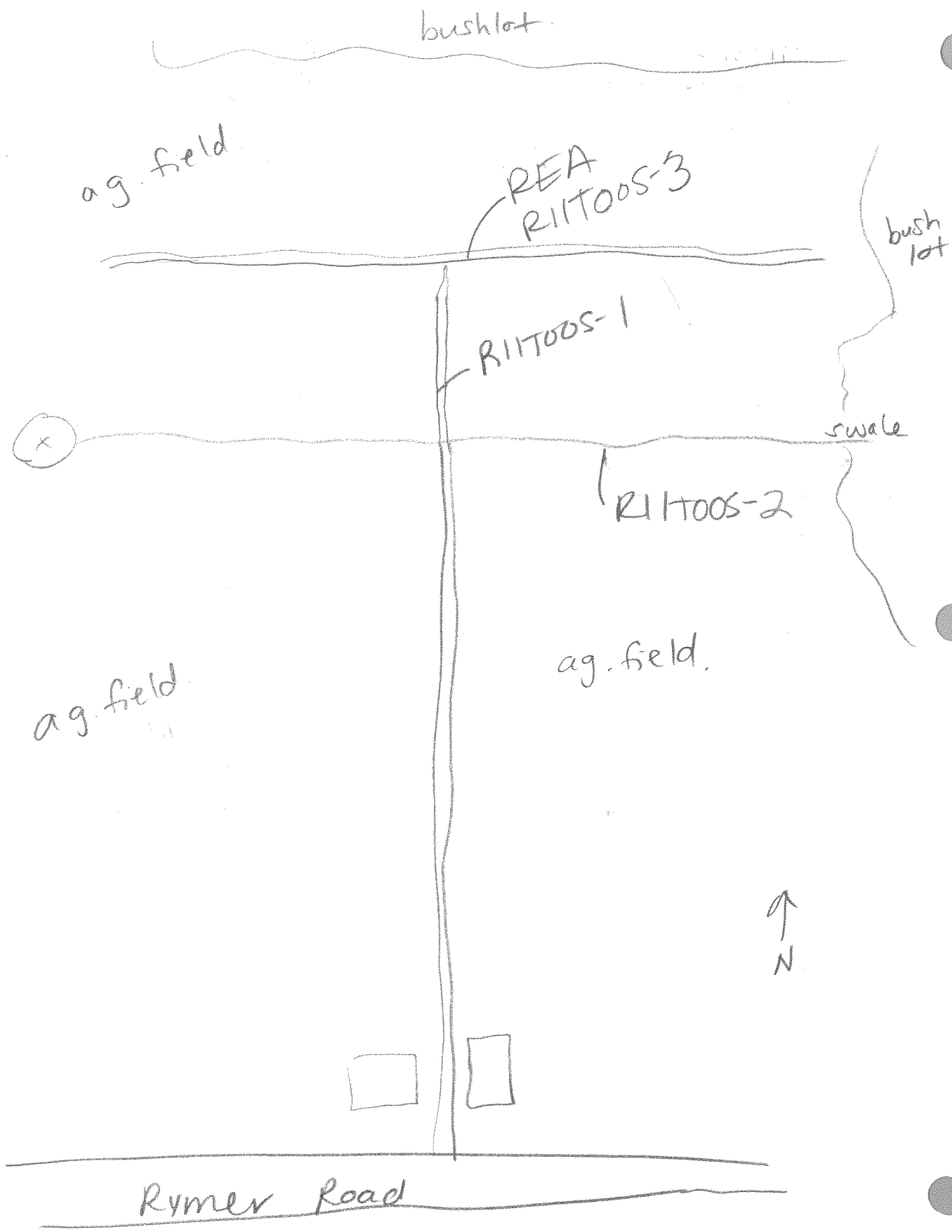
Critical Habitat (spawning or nursery areas, groundwater upwellings) Spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent) _____
 Note any fish observations intermittent school of cyprinidae

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. frogs - chorus

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





WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non REA

Stantec

Station # R11T006

Project Name Niagara Wind

Watercourse Name unknown

Project # 160950629

Photos 24-28

Field Staff K. Clayton, M. Farella

Date April 4, 2012

Time 10:40 am

Weather conditions in previous 24 hrs cloudy, 10°C

GPS Coordinates (Zone) 17T E 0623042 N 4767420 Datum NAD83

Descriptive Location 800m north of Regional Rd 20, approx 1.2 km east of Regional Rd 27

Water Quality - not enough water

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 5 (cm)

Mean Bankfull Width 0.50 (m) Mean Water Depth 5 (cm)

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

Evidence of eroding banks, Comments on bank stability dugout channel furrow m.p.

Substrate (% cover)

Bedrock	Cobble	Sand	Silt	Muck
Boulder	Gravel	Clay	Mari	Detritus

50 50

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

agricultural field.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

Note any fish observations seasonal - former dugout channel furrow m.p.

Waterbody Notes

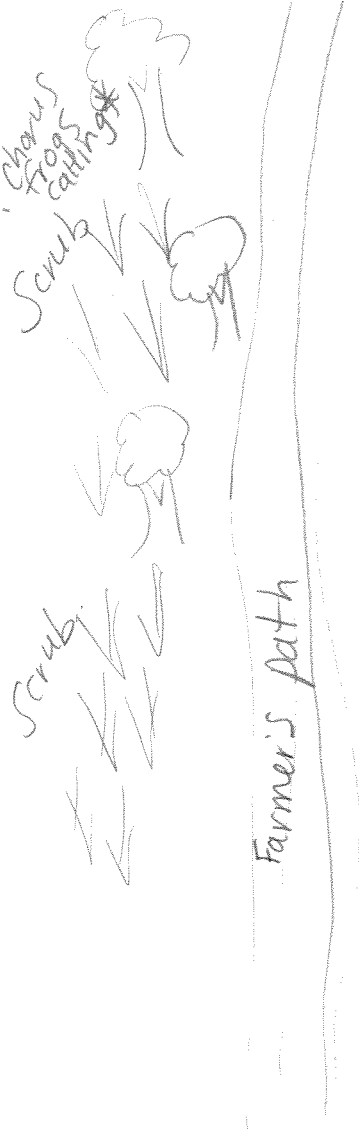
Natural Watercourse _____ Trapezoidal Channel Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. Chaus frog - full chaus, wild turkeys, white tail deer

Field Notes Authored by K. Clayton Field Notes QA/QCed by MF

R11T006

Woodlot



swale

(X) turbine

agricultural swale





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

tile 31

Nan REA

Station # RUIT007
 Watercourse Name unknown
 Photos —
 Date June 13/12
 Weather conditions in previous 24 hrs not sunny
 GPS Coordinates (Zone) 17T E 0618612 N 4704261 Datum NAD83
 Descriptive Location 2.1 km N of Elcho Road, 2.300m West of Erick Road

Project Name Niagara Wind
 Project # 160950269
 Field Staff K. Clayton, M. Faiella
 Time 3:30 pm

Water Quality
 Dissolved Oxygen (mg/L) — pH — Conductivity (µS/cm) —
 Water Temperature (°C) — Air Temperature (°C) 25
 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): 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) 75% grasses, early
 Adjacent Land Use reed canary grass, farmland

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) —
 Migratory Obstructions (seasonal, permanent) —
 Note any fish observations dry channel

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 K. Clayton Field Notes QA/QCed by —

R117007-1

dry channel
• surrounded by
reed canopy grass
• no channel
definition



Say beans

Krick Road

Elcho Road



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA

~~FILED~~

Stantec

Station # R110T08
 Watercourse Name 08-1A
 Photos 8895-96; 8899, 8900-02
 Date JUNE 8, 2012
 Weather conditions in previous 24 hrs Sunny w cloudy periods
 GPS Coordinates (Zone) 17T E 614528 N 4765440 Datum _____
 Descriptive Location _____

Project Name NIAGARA WIND
 Project # 160950269
 Field Staff T CHANDLER MELLAH
 Time 3:00 PM

Water Quality

DRY

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

DRY

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

AGRICULTURAL FIELD- TROPED

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

NO FLOW

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 T. CHANDLER

Field Notes QA/QCed by MF



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T008

Project Name NIAGARA WIND

Watercourse Name 08-1B

Project # 160950269

Photos 8903-09, 8910

Field Staff TCHANDLER MELLUAH

Date JUNE 8 2002

Time 3:40

Weather conditions in previous 24 hrs Sunny w cloudy periods

GPS Coordinates (Zone) 17T E 6146181 N 476 4676 Datum

Descriptive Location _____

Water Quality

Dissolved Oxygen (mg/L) 7.73 pH 8.34 Conductivity (µS/cm) 565

Water Temperature (°C) 28° Air Temperature (°C) 25

Time *in situ* measurements taken 3:50

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 30 (cm)

Mean Bankfull Width 3 (m) Mean Water Depth 5 (cm)

 % Riffle 100 % Pool % Run % Flat

Evidence of eroding banks, Comments on bank stability stable

Substrate (% cover)

 Bedrock Cobble Sand Silt 100 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)

60% grasses & aquatic vegetation, and trees (mature)

Adjacent Land Use

Agricultural field (to west) Woodlot to east and south & north

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

potential spawning or nursery habitat

Migratory Obstructions (seasonal, permanent)

Low/no flow

Note any fish observations NONE

Waterbody Notes

Natural Watercourse Likely dug 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, aquatic invertebrates, tree frog

Field Notes Authored by T. CHANDLER Field Notes QA/QCed by MF



WIND FARM WATERBODY RAPID ASSESSMENT FORM Non-REA

Stantec

Station # R11T008 Project Name NIAGARA WIND
 Watercourse Name 08-2 Project # 160950269
 Photos 8897-98 Field Staff T CHANDLER M ELLAN
 Date JUNE 8 2012 Time 3:20PM
 Weather conditions in previous 24 hrs Sunny & cloudy periods
 GPS Coordinates (Zone) 17T E 614503 N 4765222 Datum
 Descriptive Location _____

Water Quality

Dissolved Oxygen (mg/L) 2.11 pH 7.51 Conductivity (µS/cm) 2459
 Water Temperature (°C) 19.91 Air Temperature (°C) 25
 Time *in situ* measurements taken 3:20PM

Watercourse Dimensions & Morphology

SMALL POND - 1.5m x 5m
 Mean Watercourse Width POND (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width N/A (m) Mean Water Depth 10 (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability N/A

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Migratory Obstructions (seasonal, permanent)
MAY DRY OUT
 Note any fish observations NO

Waterbody Notes

SMALL POND AREA
 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.

LEOPARD & GREEN FROG
Lesser Duckweed - no outlet

Field Notes Authored by T. CHANDLER Field Notes QA/QCed by NR



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T008 Project Name NIAGARA WIND
 Watercourse Name 08-3A Project # 160950269
 Photos 8912-25 Field Staff TICHANDLER & M. ELLIOT
 Date JUNE 8, 2012 Time 4:10
 Weather conditions in previous 24 hrs Sunny w cloudy periods
 GPS Coordinates (Zone) 17T E 614339 N 4765160 Datum
 Descriptive Location _____

Water Quality ISOLATED WETLAND - MUDDY AROUND MARGINS
 Dissolved Oxygen (mg/L) NA pH NA Conductivity (µS/cm) NA
 Water Temperature (°C) NA Air Temperature (°C) 25
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology ~ 80 x 100 m
 Mean Watercourse Width NA (m) Maximum Pool Depth NA (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 100 Muck
 _____ Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus

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

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
30 Aquatic vegetation
 Adjacent Land Use Wooded area (west) Ploughed agricultural field (to east)

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) _____
Low/no water
 Note any fish observations NONE

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

Other Habitat Notes, Incidental Wildlife Observations, etc. Sedges, cattails, sagittarium, bullrush,

Field Notes Authored by TICHANDLER Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

RE A

Stantec

Station # R1108
 Watercourse Name 08-3B
 Photos 8911
 Date June 28, 2012
 Weather conditions in previous 24 hrs Sunny w cloudy periods
 GPS Coordinates (Zone) 17T E 614427 N 4765038 Datum
 Descriptive Location _____

Project Name Niagara Wind
 Project # 160950269
 Field Staff TCHANDLER, MELLAY
 Time 4:00

Water Quality

DRY
 Dissolved Oxygen (mg/L) N/A pH N/A Conductivity (µS/cm) N/A
 Water Temperature (°C) N/A Air Temperature (°C) 23
 Time *in situ* measurements taken N/A

Watercourse Dimensions & Morphology

Mean Watercourse Width DRY (m) Maximum Pool Depth N/A (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth N/A (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability recently dug, stable

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
20%

Adjacent Land Use

wooded area (west) ploughed agricultural field - to east

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

no 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.

terrestrial veg on dug out channel, dug to drain wetland @ 08-3A - upstream

Field Notes Authored by T. CHANDLER Field Notes QA/QCed by MF



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non-
REA mp.
- wetland / pore
water

Stantec

Station # R11T008
Watercourse Name 08-4
Photos 8926-27
Date June 8, 2012
Weather conditions in previous 24 hrs Sunny w/ cloudy periods
GPS Coordinates (Zone) 17T E 614445 N 4765266 Datum
Descriptive Location _____

Project Name Niagara Wind
Project # 160950288
Field Staff T. CHANDLER M. ECKHART
Time 4:25

Water Quality DRY (recently)

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 25
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology ~100m x 10m

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 100 Muck
Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus

In-water Cover DRY

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% Aquatic vegetation

Adjacent Land Use

Plowed agricultural field

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

low no water

Note 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.

low lying area in ag field w/ cattails, vegetation

Field Notes Authored by T. CHANDLER

Field Notes QA/QCed by MF



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON REA

RII1010+37

Fy 38

Station # RII1010+37
 Watercourse Name _____
 Photos see log
 Date June 13 2012
 Weather conditions in previous 24 hrs rain + sun
 GPS Coordinates (Zone) 17T E 682150 N 4759374 Datum _____
 Descriptive Location conc. to side road 42

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE + JK
 Time 4:30pm

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ 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.

no water features
isolated farm ponds

Field Notes Authored by KE

Field Notes QA/QCed by [Signature]



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

R11T012-1

Fig 12

Station # R11T012-1
 Watercourse Name _____
 Photos see log
 Date June 13 2012
 Weather conditions in previous 24 hrs rain
 GPS Coordinates (Zone) 17 E 621155 N 4756323 Datum
 Descriptive Location Plot 3, 1100 m west of Townline/Dunnville Whitefoot Rd. approximately 1 km west of Highway 3 - in field

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE + JK
 Time 9:07 AM

Water Quality

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

too little water (noist)

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 5 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble _____ Sand SD Silt _____ Muck _____
 Boulder _____ Gravel SD 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

5% man maple + willow
Ag - soy + hay

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.

- trapezoidal channel, noist, aquatic veg

Field Notes Authored by KE

Field Notes QA/QCed by Joe [Signature]



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non
REA

Stantec

Station # R11T013-1 Project Name 1609502695
 Watercourse Name unknown Project # Niagara Wind
 Photos 46-50 Field Staff K. Clayton, M. Faiella
 Date Apr 4/12 Time 14:20
 Weather conditions in previous 24 hrs 10°C cloudy
 GPS Coordinates (Zone) 17T E 0621405 N 4755803 Datum NAD83
 Descriptive Location approx 500 N of Hwy 3 approx 1.2 km West of Dunville - Wainfleet townline.

Water Quality - *Agricultural Swale*

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 K. Clayton

Field Notes QA/QCed by M. Faiella



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T013-2
Watercourse Name unknown
Photos 51-59
Date Apr 4/12

Project Name Niagara Wind
Project # 160950269
Field Staff K.C. M.F.
Time 14:30

Weather conditions in previous 24 hrs 10°C, cloudy
GPS Coordinates (Zone) 17T E 0621279 N 4755999 Datum Nad83
Descriptive Location approx 600m North of Hwy 3, 1.2km west of Dunville - Wainfleet turnline

Water Quality

Dissolved Oxygen (mg/L) 14.20 mg/L pH 8.72 Conductivity (µS/cm) 843
Water Temperature (°C) 11.22°C Air Temperature (°C) 12°C
Time in situ measurements taken 14:35

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth ~0.75 (cm)
Mean Bankfull Width 4 (m) Mean Water Depth 0.50 (cm)
% Riffle _____ % Pool 100 % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability
banks are covered in grass - very stable

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
59% grasses, algae, early

Adjacent Land Use

farmland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning & nursery, fragging

Migratory Obstructions (seasonal, permanent)
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. frog jumping into water

Field Notes Authored by K. Clayton

Field Notes QA/QCed by M. Faiella

KIITO13-2

ag. field

Riparian REA WATER BODY RITTO13-2

Scrub/Riparian

ag. field

RITTO13-1

agricultural swale
↳ non REA

ag. field.

Scrub line

greenhouses

Huby 3

↑
N



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

R11TO13-3

Fig 12

Station # R11TO13-3
 Watercourse Name _____
 Photos see log
 Date June 13 2012
 Weather conditions in previous 24 hrs rain
 GPS Coordinates (Zone) 17 E 622196 N 4755274 Datum
 Descriptive Location Approximately 700 m west of Townline Danville Waterflood Rd., 300 m south of highway 3

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE + JK
 Time 10:34 AM

Water Quality

Dissolved Oxygen (mg/L) 9.04 pH 7.82 Conductivity (µS/cm) 573
 Water Temperature (°C) 18.59 Air Temperature (°C) 20°
 Time in situ measurements taken 10:35 am

Watercourse Dimensions & Morphology

Mean Watercourse Width 4 (m) Maximum Pool Depth 40 (cm)
 Mean Bankfull Width 7 (m) Mean Water Depth 30 (cm)
 % Riffle _____ % Pool _____ % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability
steep, stable, veg

Substrate (% cover)

Bedrock	Cobble	Sand	Silt	Muck
Boulder	Gravel	Clay	Marl	Detritus

100 Cobble, 40 Gravel

In-water Cover

Cover Types Present (circle): 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)
40% silver maple, lots sumac, willows, RCG

Adjacent Land Use

Ag - soy

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)

none - probably permanent

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 heard (at least 3)
- channel covered in Lemna minor
- could not access within 120 m, so moved 3 forms away where we had access & assessed

Field Notes Authored by KE Field Notes QA/QCed by JK

?RFA-2

R/11013-2

F312



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # R11013-24
 Watercourse Name unknown
 Photos see below
 Date June 13, 2012

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE + JK
 Time 10:20

Weather conditions in previous 24 hrs rain
 GPS Coordinates (Zone) 17 E 1021554 N 4755566 Datum
 Descriptive Location July 3, 1100m west of Townline/Dunnville/Wantlet Rd, approximately 200m N of highway 3

Water Quality too little water to sample
 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 (m) Maximum Pool Depth 2 (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth 1 (cm)
 % Riffle _____ % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)
 Bedrock _____ Cobble 29 Sand _____ Silt _____ Muck _____
 Boulder _____ Gravel 50 Clay _____ Marl _____ Detritus _____

In-water Cover
 Cover Types Present (circle): Undercut Banks _____ Deep Pool _____ Watercress _____ Aquatic Veg *sedges, water plantain, RCG, phrag*
 Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other _____

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

Adjacent Land Use
Ag - soy + corn

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) none
 Migratory Obstructions (seasonal, permanent) seasonally 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.
grassed ag swale dominated by aquatic veg
minimal water probably result of yesterday's rain
not directly connected to other adjacent pond

Field Notes Authored by KE Field Notes QA/QCed by JLH



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T014, R11T015, R11T044, R11T043
 Project Name Nidaara Wind
 Watercourse Name unknown
 Project # 160950269
 Photos 100-106
 Field Staff K. Clayton, M. Faiella
 Date April 5/12
 Time 10:34 am
 Weather conditions in previous 24 hrs 12°C Sunny
 GPS Coordinates (Zone) 17T E 0624423 N 4748666 Datum NAD83
 Descriptive Location ~1 km south of Canal Bank Road, 2 km east of Bird Road

Water Quality

Dissolved Oxygen (mg/L) 11.21 mg/L pH 9.12 Conductivity (µS/cm) 263 µS/cm
 Water Temperature (°C) 6.27°C Air Temperature (°C) 3°C
 Time *in situ* measurements taken 10:40 am

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.75 (m) Maximum Pool Depth standing water (cm) *↳ no flow*
 Mean Bankfull Width 4m (m) Mean Water Depth 100 (cm)
 % Riffle ≠ % Pool 100 % Run 100 % Flat

Evidence of eroding banks, Comments on bank stability
banks are fully vegetated w/ grasses & crops
↳ banks could be less stable after plowed

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

farmland - ag. field

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
intermittent (says landowner)

Note any fish observations —

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 Dry 0

Other Habitat Notes, Incidental Wildlife Observations, etc. —

Field Notes Authored by K. Clayton

Field Notes QA/QCed by M. Faiella

R11T014, 15, 44 & 43



Canal Bank Road

* Railbed taken out by road - can access through Sertz's property *

Bird Road

Sertz's farm

back path

Bush lot

ag. field

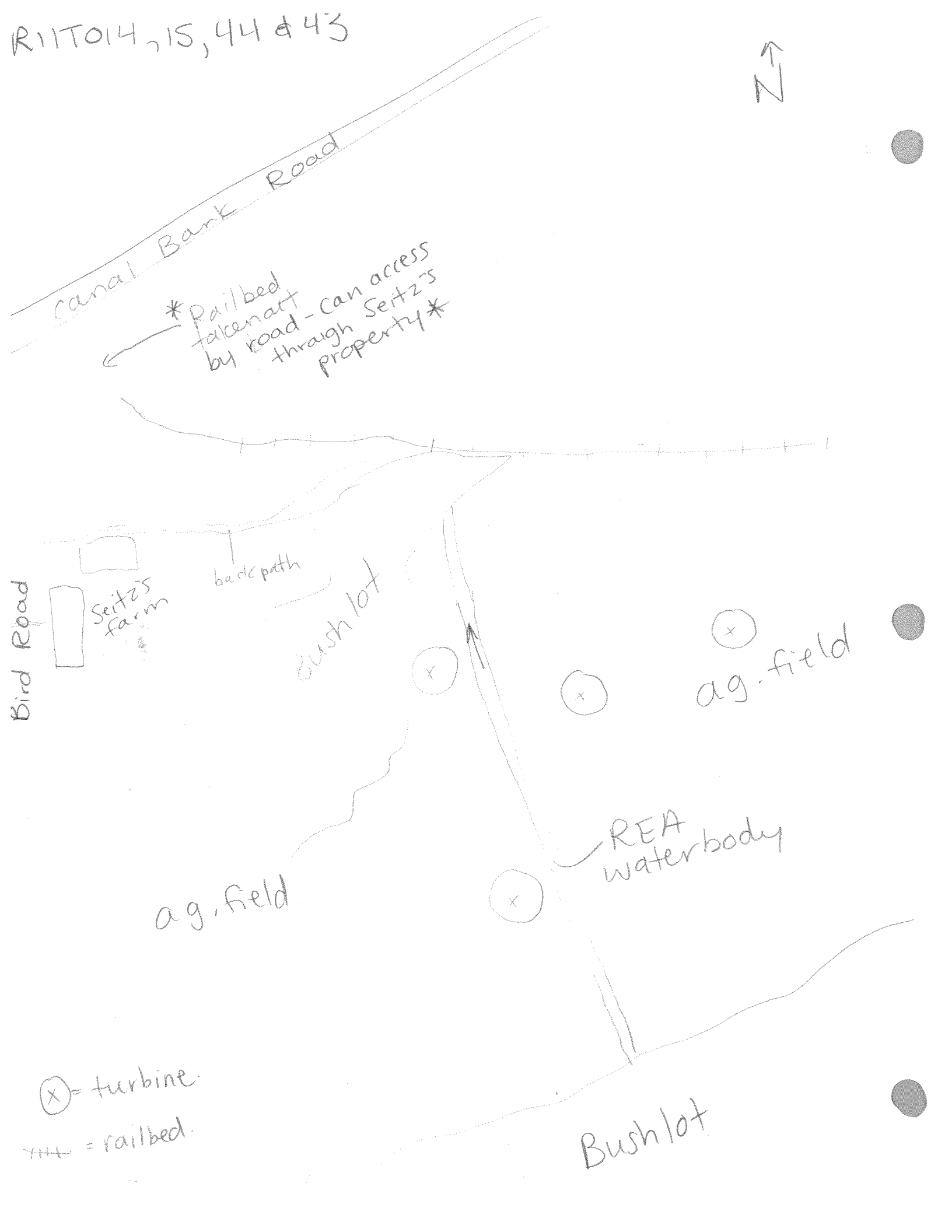
ag. field

REA waterbody

Bush lot

(X) = turbine

+++ = railbed





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T016-1

Project Name Niagara Wind

Watercourse Name Unknown

Project # 160950269

Photos 83-92

Field Staff KC & MF

Date April 19/20

Time 12:30

Weather conditions in previous 24 hrs cool sunny

GPS Coordinates (Zone) 17T E 0623656

N 4749832 Datum NAD83

Descriptive Location 10m south of Canal Bank Road, 2 km east

of Bid Road

Water Quality

Dissolved Oxygen (mg/L) 12.77

pH 8.75 Conductivity (μ S/cm) 462

Water Temperature ($^{\circ}$ C) 15.80

Air Temperature ($^{\circ}$ C) 12 $^{\circ}$ C

Time *in situ* measurements taken 12:39 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m)

Maximum Pool Depth _____ (cm)

Mean Bankfull Width 0 (m)

Mean Water Depth _____ (cm)

_____ % Riffle

_____ % Pool

_____ % Run

_____ % Flat

Evidence of eroding banks, Comments on bank stability

unstable banks

Substrate (% cover)

*very turbid!

Bedrock _____ Cobble _____

Sand 20 Silt 60 Muck _____

Boulder _____ Gravel 20 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)

Adjacent Land Use

<5% grass, early
ag. field.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Spawning, nursery, foraging

Migratory Obstructions (seasonal, permanent)

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 KC

Field Notes QA/QCed by MF



Canal Bank Road.

ag. field.

perched culvert

hardy any water

REA.
RIITD 16-1

⊗ proposed turbine

ag. field.

Bush lot

RIITD 6-1

ag. field.

Bush lot

||||| = Raillbed
⊗ proposed turbine



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T017 & R11T047 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950692
 Photos 69-89 Field Staff K.C. M.F.
 Date Apr 4/12 Time 16:30
 Weather conditions in previous 24 hrs 10°C cloudy
 GPS Coordinates (Zone) 17T E 0622792 N 4748529 Datum NAD83
 Descriptive Location 1 km East of Bird Rd & 1 km south of Canal Bank Road

Water Quality

Dissolved Oxygen (mg/L) 14.74 mg/L pH 9.03 Conductivity (µS/cm) 510 µS/cm
 Water Temperature (°C) 15.77°C Air Temperature (°C) 12°C
 Time *in situ* measurements taken 17:00

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 0.60 (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 0.50 (cm)
 % Riffle _____ % Pool _____ % Run 100 % Flat _____
 Evidence of eroding banks, Comments on bank stability stable banks, some erosion from adjacent land use.

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 50 Silt 10 Muck _____
 Boulder _____ Gravel 40 Clay _____ Marl _____ Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks _____ Deep Pool _____ Watercress _____ **Aquatic Veg** _____
 Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other algae _____
 *Canada anemones, milfoil, horse tail, bullrush!
 10/5/1

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) <5%, grasses, early
 Adjacent Land Use farm land.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) spawning nursery, foraging
 Migratory Obstructions (seasonal, permanent) seasonal / int.
 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. frogs - leopard, chorus
frogs

Field Notes Authored by K. clayton Field Notes QA/QCed by M. Faiella

Woodlot

disturbed area - placed
∴ no connection
to channel

agricultural
field

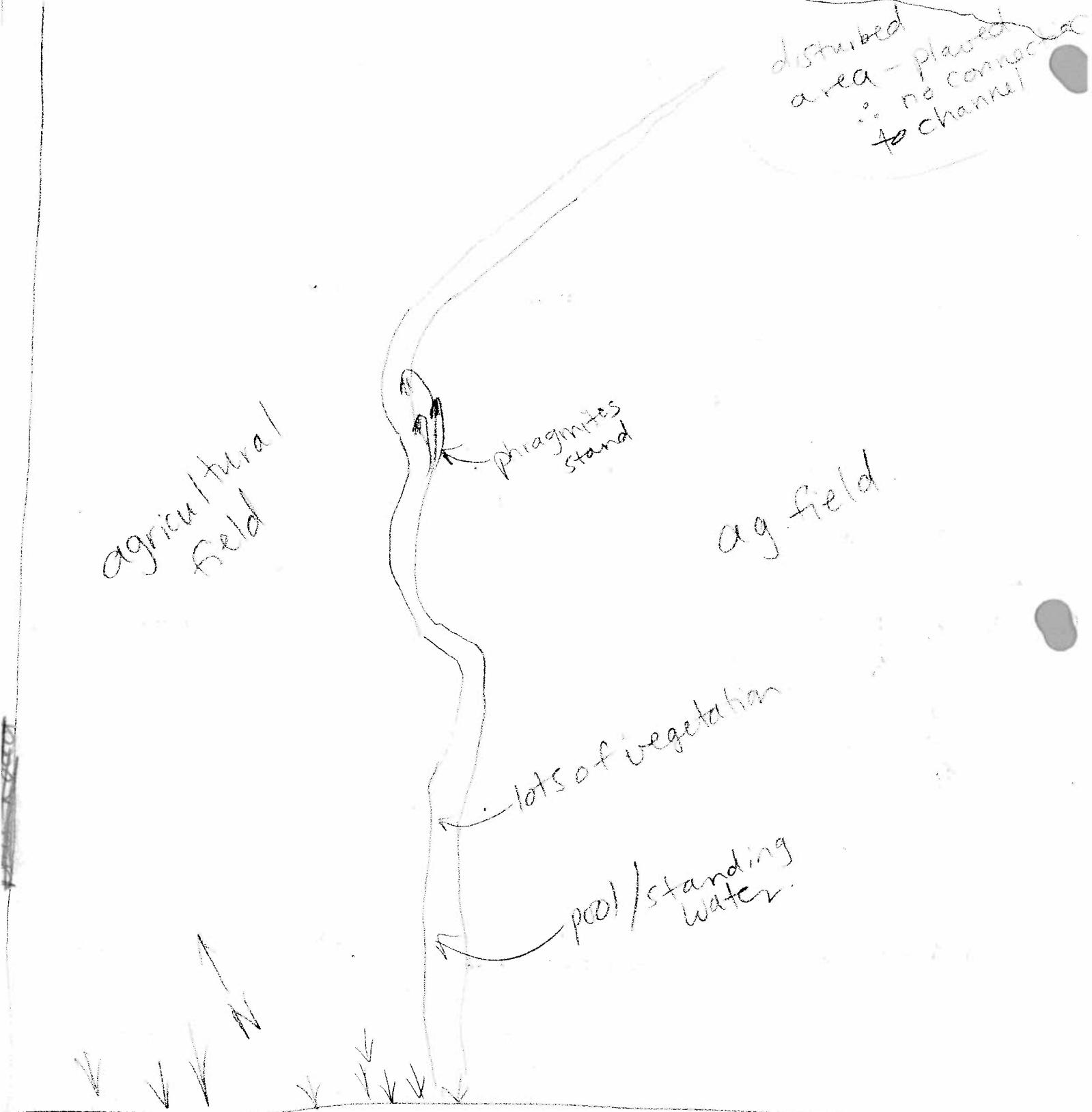
phragmites
stand

ag field

lots of vegetation

pool / standing
water

Bird Road





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REAS

Stantec

Station # R11T018 Project Name Niagara Wind
 Watercourse Name 18-1 Project # 160950269
 Photos 8837-38 Field Staff T Chandler M Ellah
 Date June 7, 2012 Time 4:25
 Weather conditions in previous 24 hrs Thunder showers in afternoon otherwise sunny
 GPS Coordinates (Zone) 17T E 629950 N 4766663 Datum
 Descriptive Location At proposed access Road crossing

Water Quality DRY
 Dissolved Oxygen (mg/L) / pH / Conductivity (µS/cm) /
 Water Temperature (°C) / Air Temperature (°C) 20
 Time *in situ* measurements taken N/A

Watercourse Dimensions & Morphology
 Mean Watercourse Width DRY (m) Maximum Pool Depth N/A (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth N/A (cm)
0 % Riffle 0 % Pool 0 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability NONE

Substrate (% cover)
 Bedrock / Cobble / Sand 100 Silt / Muck /
 Boulder / Gravel / Clay / Marl / Detritus /

In-water Cover DRY
 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% grass/shrub
 Adjacent Land Use Agricultural field

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Migratory Obstructions (seasonal, permanent) Low/no flow
 Note any fish observations None

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

Other Habitat Notes, Incidental Wildlife Observations, etc. Straightened drainage feature with well-defined bed & banks; cattails, sedges present but not common.

Field Notes Authored by T. Chandler Field Notes QA/QCed by [Signature]



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non-
REA ml.

Stantec

Station # R11T018 Project Name: Niagara Wind
 Watercourse Name 18-2 Project #: 160950269
 Photos 8839-44 Field Staff J Chandler M Ellah
 Date June 7, 2012 Time 4:40
 Weather conditions in previous 24 hrs. Light thunderstorms & sun
 GPS Coordinates (Zone) 17T E 629 834 N 476 6486 Datum
 Descriptive Location _____

Water Quality DRY
 Dissolved Oxygen (mg/L) N/A pH N/A Conductivity (µS/cm) N/A
 Water Temperature (°C) N/A Air Temperature (°C) 20
 Time *in situ* measurements taken N/A

Watercourse Dimensions & Morphology Gravel wet area 15x30m
 Mean Watercourse Width N/A (m) Maximum Pool Depth N/A (cm)
 Mean Bankfull Width N/A (m) Mean Water Depth N/A (cm)
0 % Riffle 0 % Pool 0 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability Stable

Substrate (% cover)
 Bedrock / Cobble / Sand 100 Silt / Muck /
 Boulder / Gravel / Clay / Marl / Detritus /

In-water Cover DRY
 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)
Bullrush - no water
 Adjacent Land Use Cornfield (planted)

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) DRY
 Note any fish observations NONE

Waterbody Notes Small depression with veg - not ploughed. - not dug.
 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. leopard frog.

Field Notes Authored by J. Chandler Field Notes QA/QCed by MP



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NOT A
REA

Stantec

Station # R11T018 Project Name NIAGARA WIND
 Watercourse Name 18-3 Project # 160950269
 Photos 8845-46 Field Staff T. Chandler, M. Ellah
 Date June 7, 2012 Time 4:55
 Weather conditions in previous 24 hrs Light thunder showers / sun
 GPS Coordinates (Zone) 17T E 629 837 N 4766384 Datum
 Descriptive Location Near RR Tracks

Water Quality

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

Watercourse Dimensions & Morphology

Mean Watercourse Width DRY (m) Maximum Pool Depth NIA (cm)
 Mean Bankfull Width -NIA (m) Mean Water Depth NIA (cm)
 % Riffle / % Pool / % Run / % Flat /
 Evidence of eroding banks, Comments on bank stability minor rill feature
(ploughed over)

Substrate (% cover)

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

In-water Cover

DRY
 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% - corn field
 Adjacent Land Use Cornfield

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

Low/no flow

Note any fish observations Ø

Waterbody Notes

DRY DRAINAGE FEATURE IN FIELD
 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. Ø

Field Notes Authored by T. Chandler

Field Notes QA/QCed by WE



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

ROA
R11T0194-
Fy 55

Station # R11T0194-1
Watercourse Name _____
Photos see log
Date June 13 2012
Weather conditions in previous 24 hrs rain
GPS Coordinates (Zone) 17 T E 620311 N 4755174 Datum
Descriptive Location East of Hutchinson Road, approximately 600m North of Highway 3

Project Name Niagara Wind
Project # 160950269
Field Staff KE + IK
Time 10:50 AM

Water Quality

Dissolved Oxygen (mg/L) 7.14 pH 7.76 Conductivity (µS/cm) 1520
Water Temperature (°C) 16.940 Air Temperature (°C) 25°
Time *in situ* measurements taken 10:55

Watercourse Dimensions & Morphology

Mean Watercourse Width 4 (m) Maximum Pool Depth 40 (cm)
Mean Bankfull Width 7 (m) Mean Water Depth 40 (cm)
% Riffle 100 % Pool _____ % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability

stable + veg

Substrate (% cover)

Bedrock _____ Cobble 20 Sand _____ Silt _____ Muck _____
Boulder _____ Gravel 80 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

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

40% - elm, Ash

Adjacent Land Use

AS - lawn

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none

Migratory Obstructions (seasonal, permanent)

none - permanent

Note any fish observations

observed - bait fish prob. Brook stickle back.

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.

- deep trapezoidal channel algae & aquatic veg

Field Notes Authored by KE

Field Notes QA/QCed by J. Rose



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

~~Not m.p.~~
REA
Tile

Station # RIIT020-1
Watercourse Name unknown
Photos 735-740
Date June 12/12

Project Name Niagara Wind
Project # 160950269
Field Staff K. Clayton, M. Faiella
Time 10:01

Weather conditions in previous 24 hrs Rain, hot, humid
GPS Coordinates (Zone) 17T E 0620271 N 4749143 Datum Nad83
Descriptive Location off of Inman Road (Aunt's property),
600m north of Canal Bank Road.

Water Quality - no water
Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 21
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
_____ % Riffle _____ % Pool _____ % Run _____ % Flat
Evidence of eroding banks, Comments on bank stability stable - vegetated

Substrate (% cover)
Bedrock _____ Cobble _____ Sand 50 Silt _____ Muck _____
Boulder _____ Gravel 50 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% scrub-vegetation small trees, early
Adjacent Land Use farmland

Fish Habitat Potential
Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
Migratory Obstructions (seasonal, permanent) no water
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 K. Clayton Field Notes QA/QCed by MF



ag. field.

ag. field.

Proposed
access Road

dry
channel

Non BEA?
RIITD 20-1

tailails
& Riparian
veg.

In man Road

N →



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Tile 52
REA

Stantec

Station # RIT024-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950269
 Photos See photo log Field Staff K. Clayton, M. Fairella
 Date June 12/12 Time 3:35 PM
 Weather conditions in previous 24 hrs Rain, hot humid.
 GPS Coordinates (Zone) 17T E 0627835 N 4749765 Datum NAD83
 Descriptive Location 1650m east of Buckett Road, on non-public Road

Water Quality

Dissolved Oxygen (mg/L) 7.37 pH 7.59 Conductivity (μ S/cm) 248
 Water Temperature ($^{\circ}$ C) 19.35 Air Temperature ($^{\circ}$ C) 27 $^{\circ}$ C
 Time *in situ* measurements taken 3:42

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 0.50 (cm)
 Mean Bankfull Width 6 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable - vegetated.

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 10 Muck _____
 Boulder _____ Gravel 50 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)
45% grasses, small trees, early

Adjacent Land Use

farmland

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
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 K. Clayton

Field Notes QA/QCed by MP

Bushlot →

(X)
RIIT024

ag. field

improved
access rd.

Bushlot

REA
RIIT024-1

REA
RIIT024-1

lots of
duckweed

unassumed Road

REA
RIIT024

Concess 1

really
thick
with
cattails

ag. field

Burkett
Road

Lakeshore

↑
N



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non REA

No feature

Station # R11T027
Watercourse Name unknown
Photos 29-33 (D, N, E, S, W)
Date Apr 4/12

Project Name Niagara Wind
Project # 160950269
Field Staff K. Clayton, M. Faiella
Time 12:35 pm

Weather conditions in previous 24 hrs Cloudy 10°C
GPS Coordinates (Zone) 17T E 0622533 N 4768838 Datum NAD83
Descriptive Location 50m West of Comfort Rd, 600m east of Regional Rd
20, 50m west of 'Choice one' access Road.

Water Quality - No water or features
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. Chorus Frogs in Bush lot

Field Notes Authored by K. Clayton Field Notes QA/QCed by M. Faiella



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Not REA? ^{MP}
entire April
EE

Stantec

Station # RIT028 Project Name Niagara Wind
 Watercourse Name unknown Project # 160958269
 Photos 34-45 Field Staff K. Clayton, M. Faiella
 Date Apr 4/12 Time 12:40 pm
 Weather conditions in previous 24 hrs cloudy, 10°C
 GPS Coordinates (Zone) 17T E 0622517 N 4769098 Datum NAD83
 Descriptive Location _____

Water Quality

No water

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 (m) Maximum Pool Depth 2 (cm)
 Mean Bankfull Width 1.2 (m) Mean Water Depth 2 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat

Evidence of eroding banks, Comments on bank stability little erosion, poor stability, exposed soil

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

agricultural land

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations Seasonal

Waterbody Notes

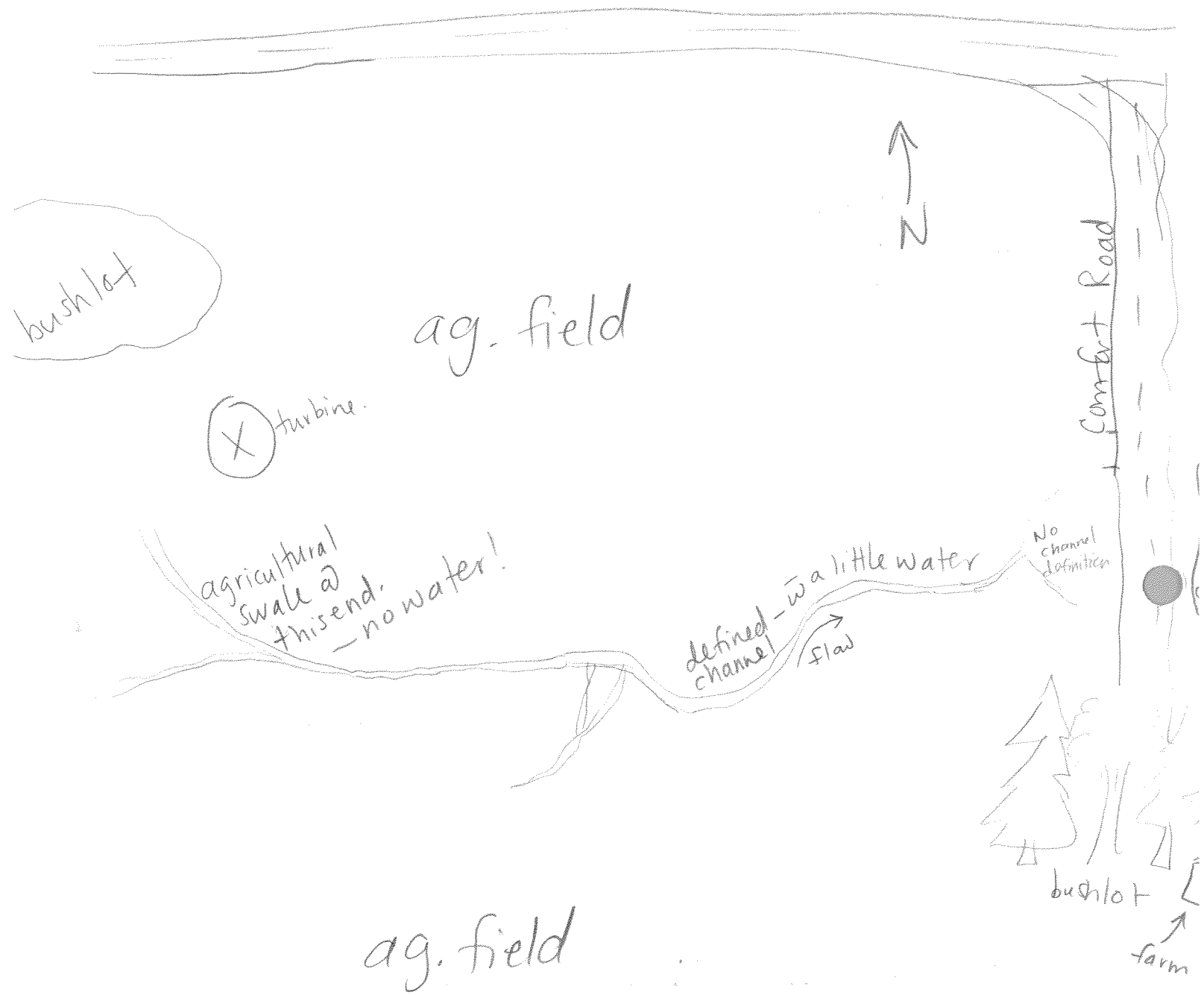
Natural Watercourse Trapezoidal Channel Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by K. Clayton

Field Notes QA/QCed by M. Faiella

R11T028





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11TD29 Project Name NIAGARA WIND
 Watercourse Name 29-1 Project # 160950269
 Photos 8865-69 Field Staff T. CHANDLER M ELLAH
 Date June 8, 2012 Time 10:55 AM
 Weather conditions in previous 24 hrs Sunny w cloudy periods. mk
 GPS Coordinates (Zone) 17T E 628602 N 4763603 Datum _____
 Descriptive Location _____

Water Quality DRY BUT SOIL WET

Dissolved Oxygen (mg/L) N/A pH N/A Conductivity (µS/cm) N/A
 Water Temperature (°C) N/A Air Temperature (°C) 25
 Time *in situ* measurements taken N/A

Watercourse Dimensions & Morphology

Mean Watercourse Width DRY (m) Maximum Pool Depth N/A (cm)
 Mean Bankfull Width 2.5 (m) Mean Water Depth 0 (cm)
N/A % Riffle N/A % Pool N/A % Run N/A % Flat
 Evidence of eroding banks, Comments on bank stability Minor scour along base of banks

Substrate (% cover)

Bedrock	Cobble	Sand	Silt	Muck
Boulder	Gravel	Clay	Marl	Detritus

1 19 60 20

In-water Cover DRY-

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
30% grass, early
 Adjacent Land Use Agricultural field - cropped

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) Low/no 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.

Straightened waterway. few sagittarium

Field Notes Authored by T. CHANDLER Field Notes QA/QCed by W



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA

Stantec

Station # R117029
 Watercourse Name 29-2
 Photos 8870-71
 Date JUNE 8, 2012
 Weather conditions in previous 24 hrs cloudy periods, Sunny
 GPS Coordinates (Zone) 17T E 628309 N 4763066 Datum
 Descriptive Location _____

Project Name NIAGARA WIND
 Project # 160950269
 Field Staff T. CHANDLER M. ELLAH
 Time 11:15 AM

Water Quality DRY
 Dissolved Oxygen (mg/L) NIA pH NIA Conductivity (µS/cm) NIA
 Water Temperature (°C) NIA Air Temperature (°C) 25
 Time *in situ* measurements taken NIA

Watercourse Dimensions & Morphology
 Mean Watercourse Width DRY (m) Maximum Pool Depth NIA (cm)
 Mean Bankfull Width NIA (m) Mean Water Depth NIA (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability Large rill feature
disturbed by ploughing

Substrate (% cover)
 _____ Bedrock _____ Cobble _____ Sand _____ Silt _____ Muck
 _____ Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus

In-water Cover DRY
 Cover Types (percent) (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%
 Adjacent Land Use Agricultural field - soybeans

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)

 Migratory Obstructions (seasonal, permanent)
No 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.

Field Notes Authored by T. CHANDLER Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # RUTO29
 Watercourse Name #29-3
 Photos 8872-76
 Date JUNE 8, 2012
 Weather conditions in previous 24 hrs Sunny with cloudy periods
 GPS Coordinates (Zone) 17T E 628560 N 4762922 Datum
 Descriptive Location _____

Project Name NIAGARA WIND
 Project # 160950269
 Field Staff T. CHANDLER, M. ELLAH
 Time 11:35

Water Quality

Dissolved Oxygen (mg/L) 6.30 pH 7.95 Conductivity (µS/cm) 1608
 Water Temperature (°C) 15.17 Air Temperature (°C) 25
 Time *in situ* measurements taken 11:40

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 40 (cm)
 Mean Bankfull Width 6 (m) Mean Water Depth 5 (cm)
30 % Riffle 50 % Pool 10 % Run 10 % Flat
 Evidence of eroding banks, Comments on bank stability MINOR BASAL SCOUR; SOME TREES WITH BENT TRUNKS

Substrate (% cover)

Bedrock / Cobble 40 Sand 20 Silt / Muck /
 Boulder 35 Gravel / Clay 10 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) 95% - Mature trees
 Adjacent Land Use Woodlot - mature

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) Spawning & nursery potential
 Migratory Obstructions (seasonal, permanent) low/no flow
 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.

Green Frog
Naturally sinuous channel with well defined valley
Flow observed (<1L/s)

Field Notes Authored by T. CHANDLER Field Notes QA/QCed by NR



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

NOT RE
R117031
1-4, 97
21.7, 97
Fig 35

Station # R117031 1-4, 73
Watercourse Name _____
Photos see log
Date June 11 2010
Weather conditions in previous 24 hrs hot & sunny
GPS Coordinates (Zone) 17 E 625089 N 476507 Datum
Descriptive Location Vaughan Rd 100m west of Hwasup 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 _____ (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.

-surficial drainage through soy field

Field Notes Authored by KE

Field Notes QA/QCed by [Signature]



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
R11T031
-8
F1335

Station # R11T031-8
 Watercourse Name _____
 Photos see log
 Date June 11 2012
 Weather conditions in previous 24 hrs hot & sunny
 GPS Coordinates (Zone) 17 E 625104 / N 4765094 Datum
 Descriptive Location Vaughan Rd, 600 m west of Measlip Rd

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE + JK
 Time 4:57 pm

Water Quality

Dissolved Oxygen (mg/L) dry one pool w/ too much algae to do reading
 pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) _____
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 3.5 (m) Mean Water Depth 0 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable & veg

Substrate (% cover)

Bedrock _____ Cobble _____ Sand _____ Silt _____ Muck
 Boulder _____ Gravel 100 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

Adjacent Land Use

soy + pig barn

Fish Habitat Potential

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

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.

- channel that is mainly dry w/ a few small pools filled w/ algae
- some aquatic veg. * some reaches more channelized than others.
- green frogs

Field Notes Authored by KE Field Notes QA/QCed by JK



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

not REA
R11T031
-10
FB 35

Station # R11T031-10
Watercourse Name _____
Photos see log
Date June 11 2012
Weather conditions in previous 24 hrs hot + sunny
GPS Coordinates (Zone) 17T E 625024 N 4765209 Datum _____
Descriptive Location Vaughan 600m west of Hardslip

Project Name Niagara Wind
Project # 160950269
Field Staff KE TJK
Time 5:20pm

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.

-south of Vaughan Rd this mapped watercourse
is just surficial drainage through a corn
field - no defined channel

Field Notes Authored by KE

Field Notes QA/QCed by J. [unclear]



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
R11 T031-11
F035

Station # R11 T031-11
Watercourse Name _____
Photos see log
Date June 11 2012
Weather conditions in previous 24 hrs suny clt
GPS Coordinates (Zone) 17T E 625024 N 4765209 Datum
Descriptive Location Vaughan Rd 650m west of Headup Rd

Project Name Niagara Wind
Project # 160950269
Field Staff KE + JK
Time 5:30pm

Water Quality
Dissolved Oxygen (mg/L) 12.48 pH 8.10 Conductivity (μ S/cm) 210
Water Temperature ($^{\circ}$ C) 25.77 Air Temperature ($^{\circ}$ C) 28
Time *in situ* measurements taken 5:30pm

Watercourse Dimensions & Morphology
Mean Watercourse Width 0.5 (m) Maximum Pool Depth 10 (cm)
Mean Bankfull Width 1.5 (m) Mean Water Depth 5 (cm)
% Riffle _____ % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability slightly eroded, but veg.

Substrate (% cover)
Bedrock _____ Cobble 40 Sand _____ Silt _____ Muck _____
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 @ culvert Other _____

Riparian Zone
Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 10%
Adjacent Land Use Ag - corn

Fish Habitat Potential
Critical Habitat (spawning or nursery areas, groundwater upwellings) na
Migratory Obstructions (seasonal, permanent) seasonal
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.
within Vaughan Rd allowance, south side, small section is channelized b/w culvert + field w/ clear standing water - is a WB.

Field Notes Authored by KE Field Notes QA/QCed by J. K.



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non REA EMP

R11T031
12

Fig 35

Station # R11T031-12 Project Name Niagara Wind
 Watercourse Name _____ Project # 160950269
 Photos see log Field Staff KE + JK
 Date June 11 2012 Time 5:45 pm
 Weather conditions in previous 24 hrs sunny & hot
 GPS Coordinates (Zone) 17N E 1625217 N 4765216 Datum
 Descriptive Location Vaughan Rd 550m west of Measlip Rd

Water Quality
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 20.0
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width 1 (m) Maximum Pool Depth dry (cm)
 Mean Bankfull Width 1.5 (m) Mean Water Depth _____ (cm)
 % Riffle _____ % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)
 Bedrock _____ Cobble 40 Sand _____ Silt _____ Muck _____
 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)
15%

Adjacent Land Use
Ag + rural residential

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.
- typha + RCG, culvert over access road.
- seasonal wet
- minimal channel definition (ill-defined) MP

Field Notes Authored by KE Field Notes QA/QCed by J. Keen



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # RIIT032 Project Name Niagara Wind
 Watercourse Name Unknown Project # 160950269
 Photos 8-23 Field Staff KC, MF
 Date April 4, 2012 Time 9:20 am
 Weather conditions in previous 24 hrs Cloudy, 10°C on Apr 3rd
 GPS Coordinates (Zone) 17T E 0624862 N 4764452 Datum NAD83
 Descriptive Location ~800m North of Elcho Rd + ~1.4km NE of Culver Rd.

Water Quality

Dissolved Oxygen (mg/L) 13.5/mg/L pH 9.36 Conductivity (µS/cm) 1603
 Water Temperature (°C) 5.05°C Air Temperature (°C) 10°C
 Time *in situ* measurements taken 9:35 am.

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 3.0 (m) Mean Water Depth 15 (cm)
 % Riffle 30 % Pool _____ % Run 70 % Flat _____
 Evidence of eroding banks, Comments on bank stability Undercut, minor slumping exposed soil.

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 50 Silt _____ Muck _____
 Boulder _____ Gravel 50 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%, mainly overhanging riparian grasses.
 Adjacent Land Use agriculture.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Foraging, nursery
 Migratory Obstructions (seasonal, permanent)
Non REA section d/s is diffuse, lack of definition may cause obstruction
 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.

many bird species.

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

⊗ = turbine location
↓ = seed canopy grass

ECHO RD

diffuse

NOU REA

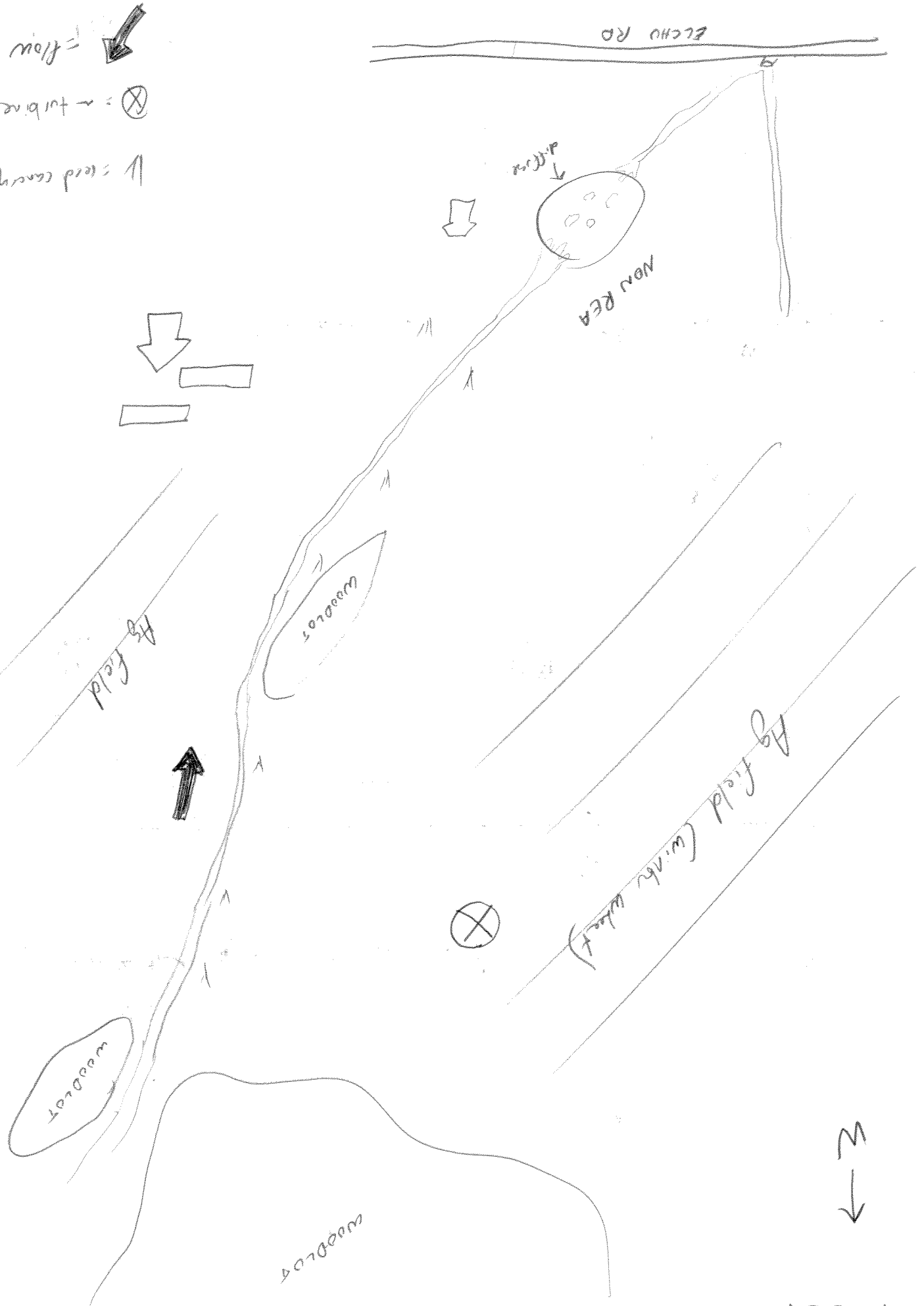
Ag field

Ag field (with wheat)

wetland

wetland

W →





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T033 Project Name NIAGARA WIND
 Watercourse Name 33-1 Project # 160950269
 Photos 9857-61, 8862deleted, 8863-64 Field Staff T. Chandler & M. Ellah
 Date June 7, 2012 Time 6:55 PM
 Weather conditions in previous 24 hrs Light thunder showers and sunny
 GPS Coordinates (Zone) 17N E 626876 N 4765898 Datum
 Descriptive Location _____

Water Quality

Dissolved Oxygen (mg/L) 7.41 pH 8.55 Conductivity (µS/cm) 2258
 Water Temperature (°C) 19.45 Air Temperature (°C) 20
 Time *in situ* measurements taken 7:00 PM

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 4 (m) Mean Water Depth 3-4 (cm)
0 % Riffle 70 % Pool 30 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability MINOR BANK SCOUR

Substrate (% cover)

<u>1</u> Bedrock <u>4</u>	Cobble <u>10</u>	Sand <u>60</u>	Silt <u>1</u>	Muck
<u>1</u> Boulder <u>5</u>	Gravel <u>20</u>	Clay <u>1</u>	Marl <u>1</u>	Detritus

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

Ploughed Agricultural field w crops planted

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
potential spawning & nursery areas

Migratory Obstructions (seasonal, permanent)
low/no flow

Note any fish observations None

Waterbody Notes

Natural Watercourse ✓? may have been straightened 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
No flow - water ponded. Watercourse flows along Gee Road along its downstream section.

Field Notes Authored by T. Chandler

Field Notes QA/QCed by MP

ROTO33
33-1

PROPERTY LINE

↑
N

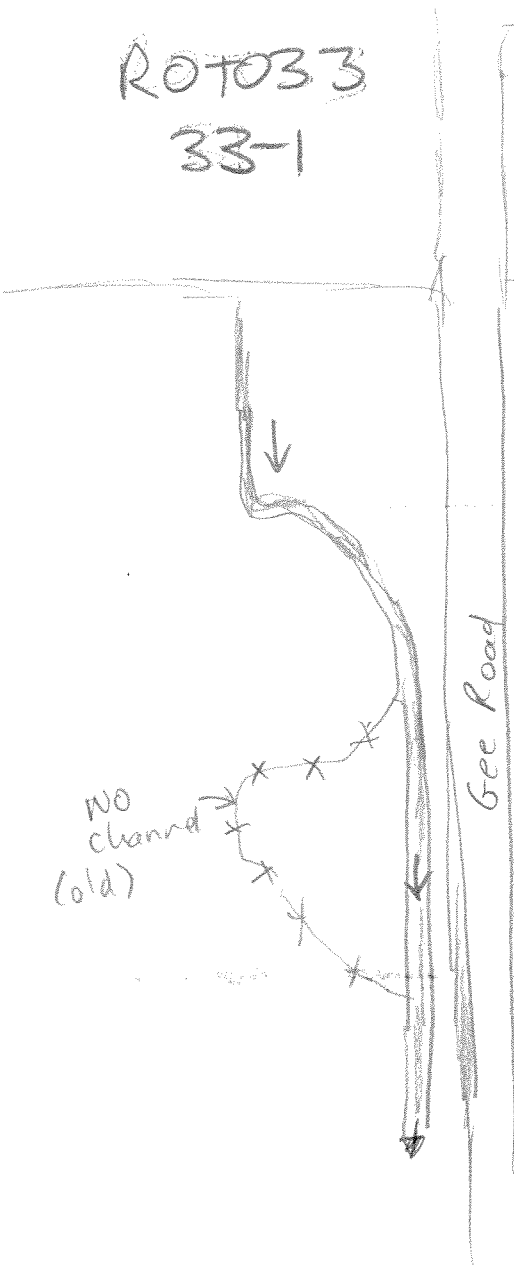
Watercourse has been
realigned along Gee Rd.

100' at 1/4"

NO
channel
(old)

Gee Road

□ FARM
HOUSE



NOT REA



WIND FARM WATERBODY RAPID ASSESSMENT FORM

R11T034
SE 12

Stantec

Station # R11T034
Watercourse Name
Photos see log
Date June 11
Weather conditions in previous 24 hrs sunny, clear
GPS Coordinates (Zone) 17 E 626494 N 4763909 Datum
Descriptive Location Elcho Rd, approx 500m west of
Gee Rd

Project Name Niagara Wind
Project # 160950269
Field Staff KEFK
Time 2:40 pm

F1545

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.

- mowed field corn + soybean
- no RWB, just surficial drainage

Field Notes Authored by RE

Field Notes QA/QCed by



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

not REA
RII1035H

Station # RII1035H Project Name Niagara Wind
 Watercourse Name - Project # 160950269
 Photos see log Field Staff KE & JK
 Date June 11 2012 Time 1:50 pm
 Weather conditions in previous 24 hrs sunny & hot
 GPS Coordinates (Zone) 17T E 627169 N 4764532 Datum
 Descriptive Location Grac Rd south of Vaughan

FG 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 _____ (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.

no waterbodies, only surficial drainage that has been ploughed

Field Notes Authored by KE

Field Notes QA/QCed by JK



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
R11T0354

SE 13
tile 45

Station # R11T0354 property SE13 Project Name Niagara Wind
 Watercourse Name / Project # 160950269
 Photos see log Field Staff KE + JK
 Date June 11 2012 Time 2:10 pm
 Weather conditions in previous 24 hrs hot + sunny
 GPS Coordinates (Zone) 17 E 626883 N 4764568 Datum
 Descriptive Location gee rd south of Vaughan

F345

Water Quality

Dissolved Oxygen (mg/L) 22.830 pH 7.61 Conductivity (µS/cm) 701
 Water Temperature (°C) 18.87° Air Temperature (°C) 25°
 Time in situ measurements taken 2:20 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 1m (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 5 (m) Mean Water Depth 35 (cm)
 % Riffle / % Pool 100 % Run / % Flat /

Evidence of eroding banks, Comments on bank stability
mostly stable + vegetated w/ RCG along edge

Substrate (% cover)

Bedrock	Cobble	Sand	Silt	Muck
Boulder	Gravel <u>100</u>	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)
0%

Adjacent Land Use

corn field

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
n/a

Migratory Obstructions (seasonal, permanent)
low flow or seasonally 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.

- dug channel w/ tile drainage inputs
- standing water dominated by algae

Field Notes Authored by KE

Field Notes QA/QCed by JK

file 25
REA
D/S in bushland
Not REA
outside of bushland



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # R11T036-1 Project Name Niagara Wind
 Watercourse Name unknown - Beaver Creek? Project # 160950269
 Photos see photo log Field Staff K. Clayton, M. Farrella
 Date June 13/12 Time 2:20pm
 Weather conditions in previous 24 hrs Hot & humid
 GPS Coordinates (Zone) 17 E 0621694 N 476.3476 Datum NAD 83
 Descriptive Location ~200m south of Elcho Road, off old road, west of Janssens property

Water Quality
 Dissolved Oxygen (mg/L) 6.01 pH 8.19 Conductivity (μ S/cm) 384
 Water Temperature ($^{\circ}$ C) 17.70 Air Temperature ($^{\circ}$ C) 21 $^{\circ}$ C
 Time *in situ* measurements taken 2:35

Watercourse Dimensions & Morphology
 Mean Watercourse Width 5 (m) Maximum Pool Depth 0.60 (cm)
 Mean Bankfull Width 7 (m) Mean Water Depth 0.40 (cm)
 % Riffle _____ % Pool 100 % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability fairly stable banks - vegetated w/ grasses

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 40 Silt 50 Muck _____
 Boulder _____ Gravel 10 Clay _____ Marl _____ Detritus _____

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

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 15% trees & grasses, (D/S) mature (N/S) early
 Adjacent Land Use farmland

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) Spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent) 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.
very turbid.

Field Notes Authored by K. Clayton Field Notes QA/QCed by MIF

Allred
Canary
grass

Farm
path

ITT
062748
4763474

Water
disappears
into seed
canary
grass

RIITO 36-1
REA

non REA?

Janssens

bushlets
Old
Road

Elcho Road

N
1.



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Tile 28

ADD AREA
Non m.f.

Station # RIIT038-1
 Watercourse Name unknown
 Photos see photo log
 Date June 13/12
 Weather conditions in previous 24 hrs hot 29°
 GPS Coordinates (Zone) 17T E 0620900 N 476000 Datum Nad 83
 Descriptive Location North of Silver St

Project Name Niagara Wind
 Project # 160950269
 Field Staff K. Clayton, M. Faiella
 Time 11:30

Water Quality - no water
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 20°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width 1m (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 50 Silt 50 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)
40% grasses, early

Adjacent Land Use soy beans

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

Migratory Obstructions (seasonal, permanent) _____
no water

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 reed canary grass

Field Notes Authored by K. Clayton Field Notes QA/QCed by MF

lot

Bush lot

Bush

say
beans.

R11038-2

R11038-1

R11038-1

pooled H₂O

(continues)
(onto the other
property)

willows



↓
N

silver street



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non
REA
tile 28

Stantec

Station # R11T038-2 Project Name Niagara Wind
 Watercourse Name unknow Project # 160950269
 Photos See photo log Field Staff K. Clayton & M. Faiella
 Date June 13/12 Time 12:20
 Weather conditions in previous 24 hrs Hot & humid
 GPS Coordinates (Zone) 17T E 062750 N 476950 Datum NAD83
 Descriptive Location ~700m south of Silver Street

Water Quality *no water*
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) _____
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width 1.5 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 50 Silt 50 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 45% grasses, early soy beans

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. Coyote to chicken

Field Notes Authored by K. Clayton Field Notes QA/QCed by MF

See map
on R11T038-1



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non
RFA

Station # R11#039
 Watercourse Name unknown
 Photos 708-714
 Date June 11/12
 Weather conditions in previous 24 hrs no rain, cloudy, light breeze hot, 30°
 GPS Coordinates (Zone) 17T E N Datum NAD83
 Descriptive Location South of Vaughn Road, West of Port Davidson Road

Project Name Niagara Wind
 Project # 160958269
 Field Staff K. Clayton M. Farilla
 Time 13:00

Water Quality Dry
 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 50 Muck _____
 Boulder _____ Gravel 50 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) 0%
 Adjacent Land Use farmland

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) dry channel
 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. completely dry, surficial drainage, plowed through - non RFA

Field Notes Authored by K. Clayton Field Notes QA/QCed by VMF



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non REA

RIIT041-

Fig 22

Station # RIIT041-1

Project Name Niagara Wind

Watercourse Name _____

Project # 160950269

Photos see log

Field Staff KE + JK

Date June 13 2012

Time 9:31 AM

Weather conditions in previous 24 hrs rain

GPS Coordinates (Zone) 17 E 621127 N 4756992 Datum

Descriptive Location Spore A Road, approx 200m SW of tracks + 700m east into field

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____

Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ 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. _____

surficial drainage through corn field

Field Notes Authored by KE

Field Notes QA/QCed by [Signature]



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

41-2^{ml}

Station # R11T073
 Watercourse Name Unknown
 Photos 60-68
 Date Apr 4/12
 Weather conditions in previous 24 hrs 10°C, cloudy
 GPS Coordinates (Zone) 17T E 0619971
 Descriptive Location E of Gore Rd A

Project Name Niagara Wind
 Project # 160950629
 Field Staff K. Clayton, M. Faiella
 Time 15:15
 Datum NAD83

Water Quality

Dissolved Oxygen (mg/L) 10.47 mg/L pH 8.84 Conductivity (µS/cm) 758 µS/cm
 Water Temperature (°C) 11.63°C Air Temperature (°C) 12°C
 Time *in situ* measurements taken 15:16

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.4 (m) Maximum Pool Depth 0.20 (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 0.10 (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability fairly stable - covered in vegetation

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 60 Silt 10 Muck _____
 Boulder _____ Gravel 40 Clay _____ Marl _____ Detritus _____

In-water Cover

Cover Types Present (circle):
 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) 59% grasses, early
 Adjacent Land Use Farmland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent) intermittent
 Note any fish observations small fish - cyprinidae sp.

Waterbody Notes

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

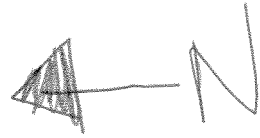
Other Habitat Notes, Incidental Wildlife Observations, etc.

frogs, small cyprinidae

Field Notes Authored by K. Clayton Field Notes QA/QCed by M. Faiella

R11T073

Bush lot



agricultural field

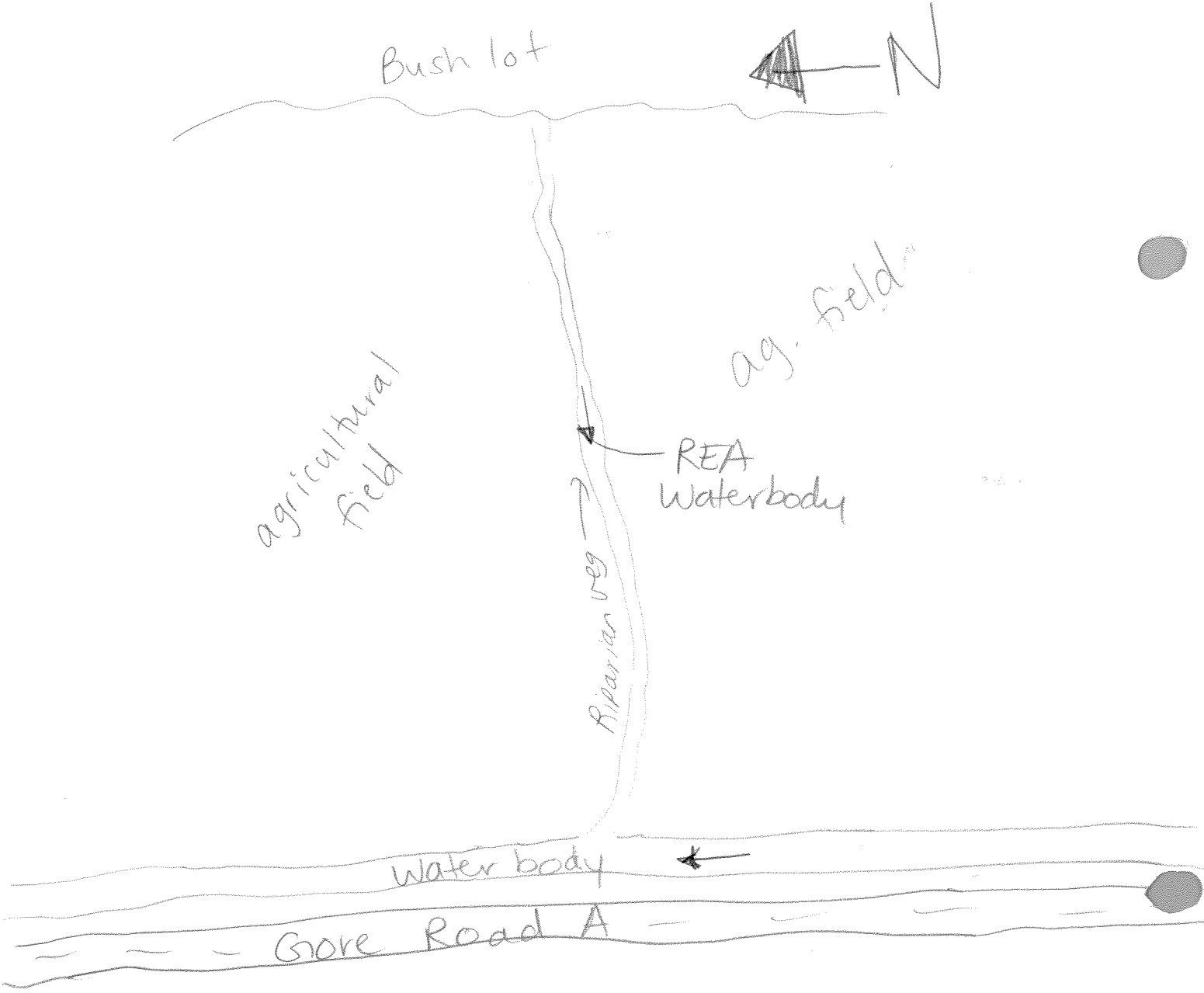
ag. field

REA Waterbody

Riparian veg

Water body

Grove Road A





WIND FARM WATERBODY RAPID ASSESSMENT FORM

-agricultural swale

Stantec

Non REA

Station # R11T042-1

Watercourse Name unknown

Photos 90-94

Date Apr 5/12

Weather conditions in previous 24 hrs Sunny 12°C

GPS Coordinates (Zone) 17T E 0619947

Descriptive Location 1.2 km south of Hwy 3, ~ 1.4 km west of Hutchinson Road.

Project Name Niagara Wind

Project # 160950269

Field Staff K. Clayton, M. Faiella

Time 9:00 am

N 4753627 Datum NAD 83

Water Quality - no water - ag. swale

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 - ag. land

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.

lots of Red wing black birds calling

Field Notes Authored by K. Clayton

Field Notes QA/QCed by M. Faiella



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # RIT042-2

Watercourse Name unknown

Photos 95-99

Date Apr 5/12

Weather conditions in previous 24 hrs Cool, 12°C

GPS Coordinates (Zone) 17T E 0619857

Descriptive Location 1 km south of Hwy 3, ~1.4 km west of Hutchison Rd.

Project Name Niagara Wind

Project # 160950269

Field Staff K.C. M.F.

Time 9:10

N 4753762 Datum NAD83

Water Quality

Dissolved Oxygen (mg/L) 11.85 mg/L pH 8.61 Conductivity (μ S/cm) 716 μ S/cm

Water Temperature ($^{\circ}$ C) 5.79 $^{\circ}$ C Air Temperature ($^{\circ}$ C) 3 $^{\circ}$ C

Time *in situ* measurements taken 9:20am

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m)

Mean Bankfull Width 6 (m)

% Riffle % Pool

Maximum Pool Depth 0.40 (cm) ^{standing H₂O}

Mean Water Depth 0.60 (cm)

Evidence of eroding banks, Comments on bank stability 100 % Run % Flat

stable banks - lots of riparian vegetation

Substrate (% cover)

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

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Deep Pool Watercress Aquatic Veg ^{Duckweed milfoil horse tail etc}
Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 20% grasses, early

Adjacent Land Use farmland - also lots of Redwing Dogwood & poplars

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) 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. Redwing blackbirds

Field Notes Authored by K. Dayton

Field Notes QA/QCed by M. Faralla

R11T042-2.

Bush lot

Bush lot

⊗ Turbine

agricultural
swale R11T042-1

REA
water
course.

R11T042-2

ag. field

ag. field

back
path

Hutchison Rd.

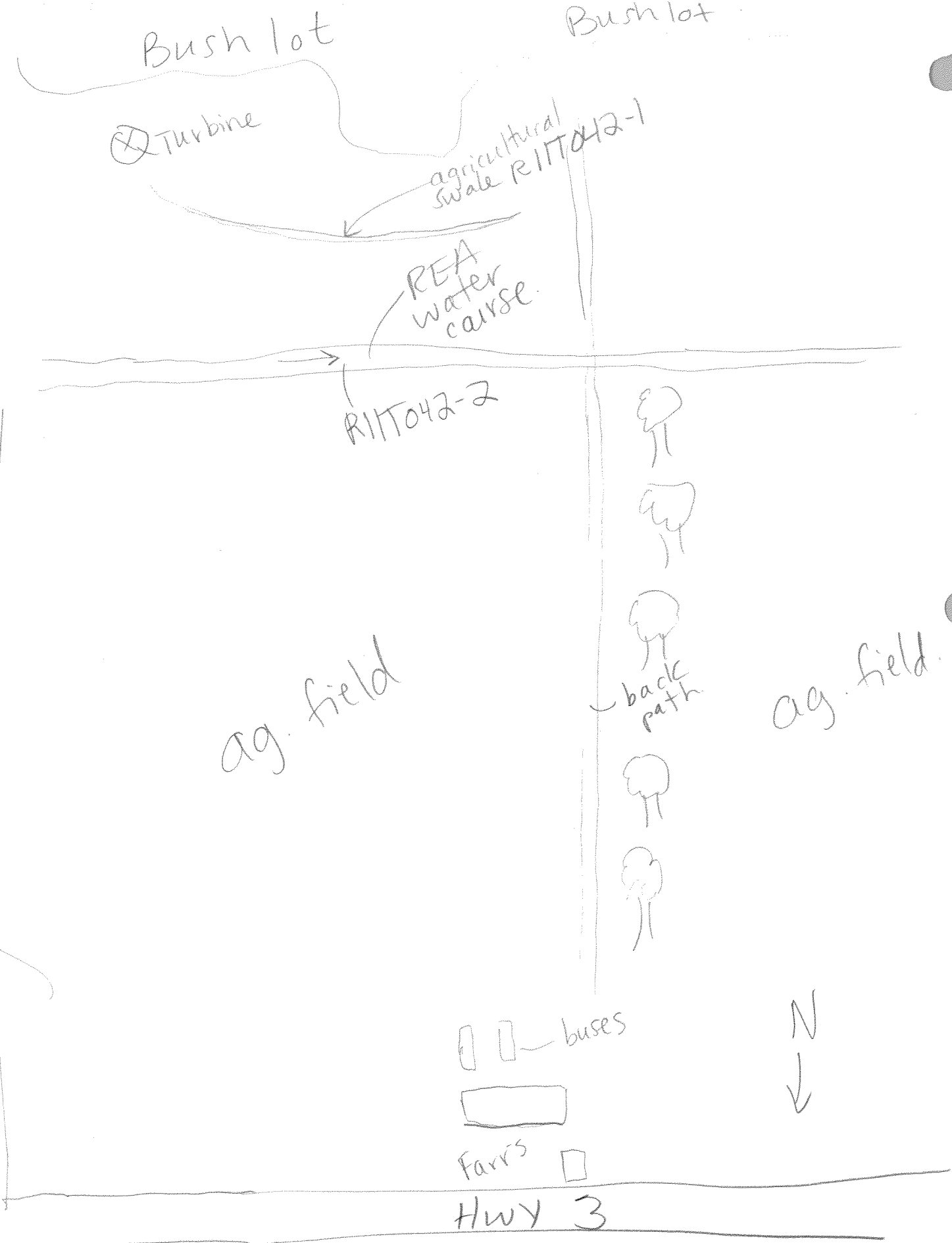
buses



Farris



Hwy 3





WIND FARM WATERBODY RAPID ASSESSMENT FORM

R11T042-3
Non
REA
By you can
drive through
terrestrial
veg
channel
is not
well def
R11T042-4
↳ RET
*not win
120m
band

Stantec

Station # R11T042-3 & 042-4 Project Name Niagara Wind
Watercourse Name unknown Project # 160950269
Photos 34-41 Field Staff K. Clayton, M. Faiella
Date Apr 19/12 Time 9:25
Weather conditions in previous 24 hrs 12°C, overcast
GPS Coordinates (Zone) 17T E 0619984 N 4753674 Datum NAD83
Descriptive Location 600m south of Hwy 3, 1km east of Crown Road

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 0.5m (m) Maximum Pool Depth 0.30 (cm)
Mean Bankfull Width 1.5m (m) Mean Water Depth 0.25 (cm)
_____ % Riffle _____ % Pool 100 % Run _____ % Flat
Evidence of eroding banks, Comments on bank stability
fairly shallow banks, - stable w/ vegetation

Substrate (% cover)
Bedrock _____ Cobble _____ Sand _____ Silt 50 Muck _____
Boulder _____ Gravel _____ Clay _____ Marl 50 Detritus _____

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

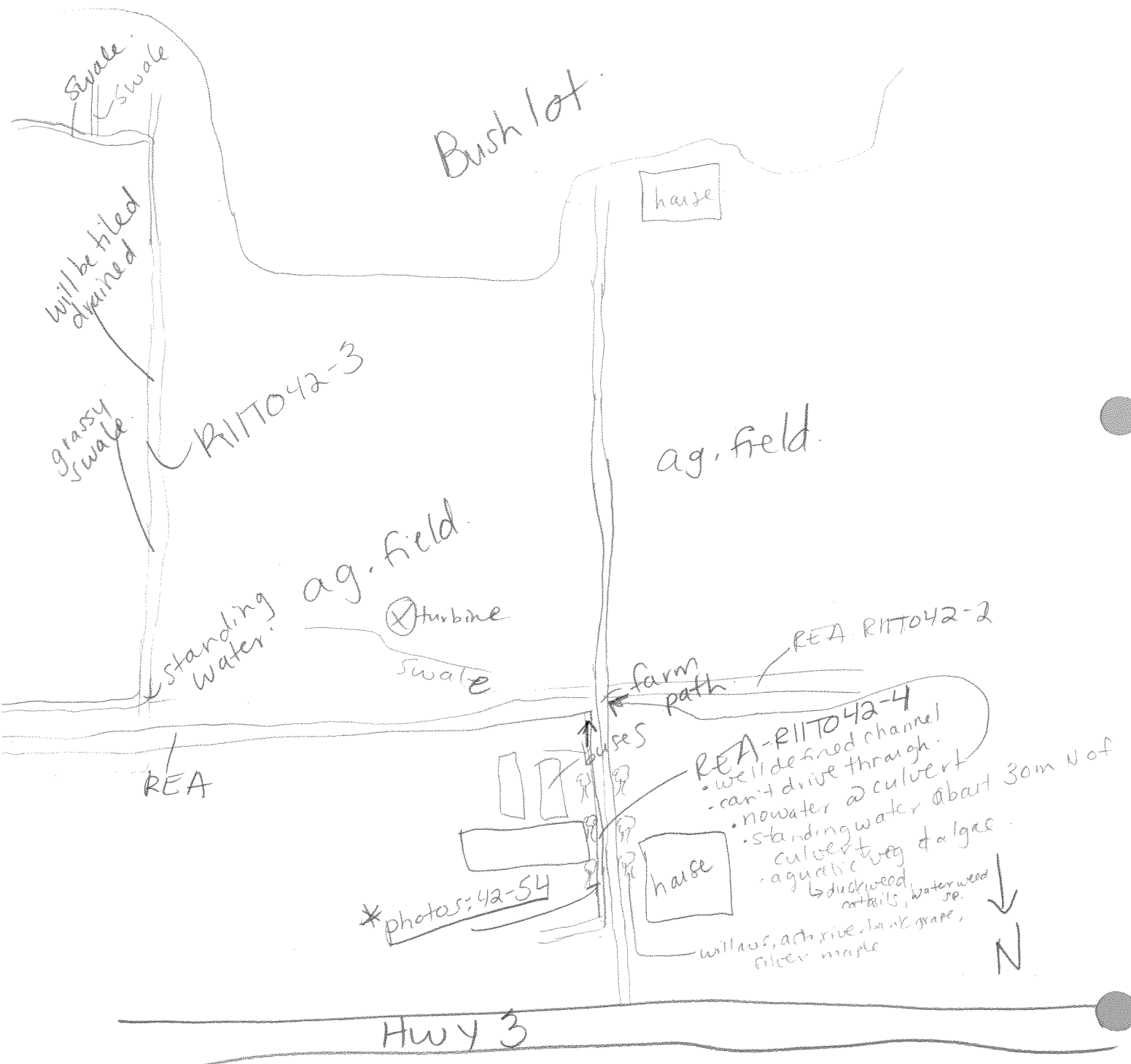
Riparian Zone
Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
<5% grasses, cane & willow saplings
Adjacent Land Use
ag. field

Fish Habitat Potential
Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
Migratory Obstructions (seasonal, permanent) seasonal
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 K. Clayton Field Notes QA/QCed by M. Faiella



Swale

Bush lot

house

will be filled
drained

grassy
swale

R11T042-3

ag. field

ag. field

standing
water

Turbine

swale

farm
path

REA R11T042-2

REA

houses

REA-R11T042-4
 • well defined channel
 • car + drive through
 • no water @ culvert
 • standing water about 30m N of
 culvert

house

*photos: 42-54

• aquatic veg & algae
 ↳ duckweed, waterweed
 cattails, re.
 willow, ash, pine, bank grape,
 silver maple

N

Hwy 3



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T044 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950269
 Photos 93-101 Field Staff CC & MF
 Date Apr 19/12 Time 12:40pm
 Weather conditions in previous 24 hrs 12°C, overcast
 GPS Coordinates (Zone) 17T E 0624474 N 4748433 Datum NAD83
 Descriptive Location 2 km South of Canal Bank Rd, 1 km East of Bird Rd

Water Quality

Dissolved Oxygen (mg/L) 7.92 mg/L pH 8.96 Conductivity (μ S/cm) 300 μ S/cm
 Water Temperature ($^{\circ}$ C) 13.85 $^{\circ}$ C Air Temperature ($^{\circ}$ C) 12 $^{\circ}$ C
 Time *in situ* measurements taken 12:45

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 60 (cm)
 Mean Bankfull Width 6 (m) Mean Water Depth 50 (cm)
 % Riffle _____ % Pool 100 % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability fairly stable banks

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 80% Ash, willow, mature
 Adjacent Land Use farmland & bush lot

Fish Habitat Potential

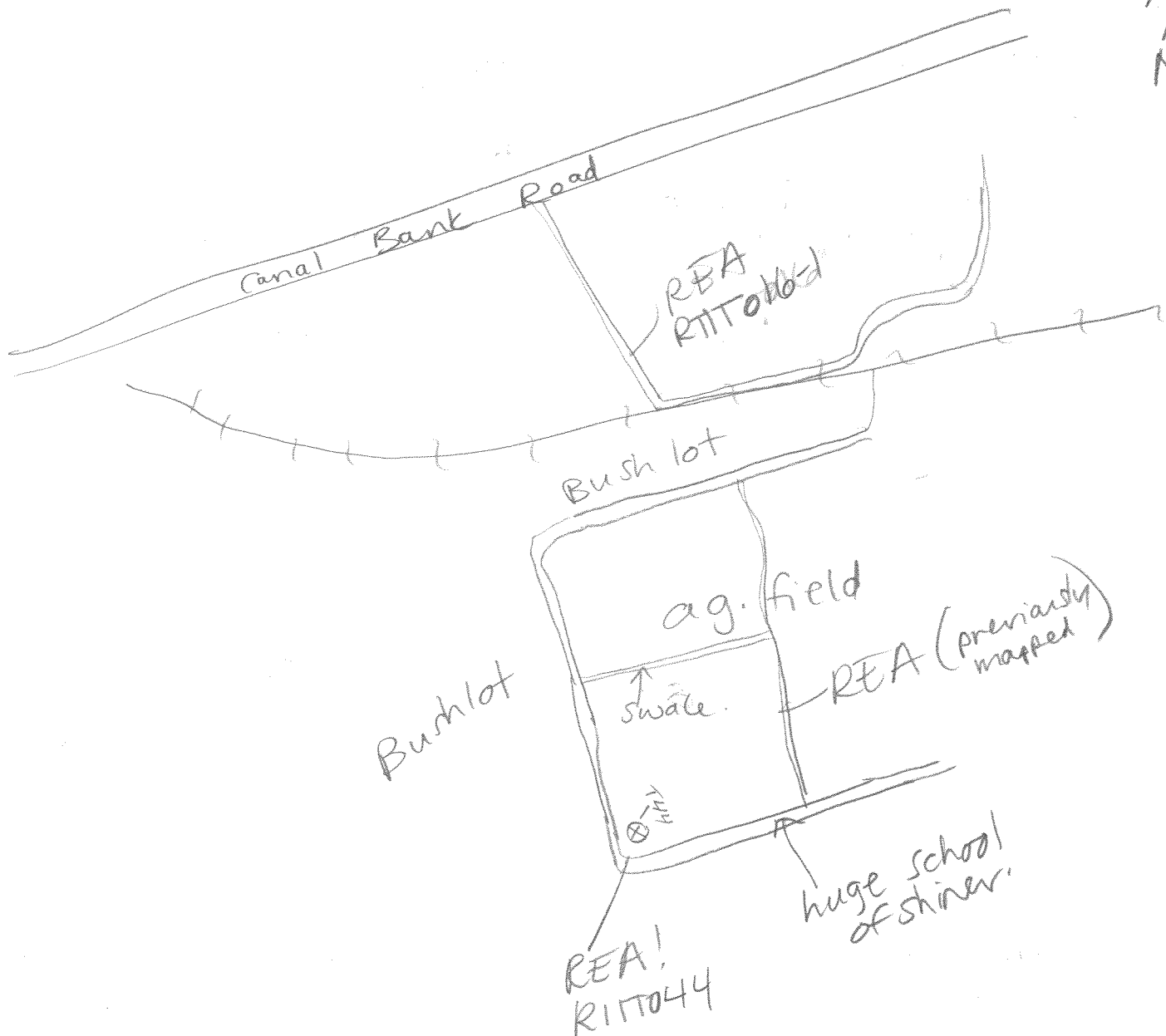
Critical Habitat (spawning or nursery areas, groundwater upwellings) spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent) _____
 Note any fish observations huge school of shiners

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. hundreds of shiners
Leopard frog

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





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # RI1T045-1

Project Name Niagara Wind

Watercourse Name unknown

Project # 160950269

Photos 66-70

Field Staff KE & MF

Date Apr 19/12

Time 11:43

Weather conditions in previous 24 hrs 12°C overcast

GPS Coordinates (Zone) 17T E 2622842 N 4748406 Datum NA83

Descriptive Location 600m south of Canal Bank Rd, 500m east of Bid Road

Water Quality

Dissolved Oxygen (mg/L) 9.15 pH 9.09 Conductivity (μ S/cm) 220

Water Temperature ($^{\circ}$ C) 11.06 Air Temperature ($^{\circ}$ C) 12 $^{\circ}$ C

Time in situ measurements taken 11:45

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 0.40 (cm) *Standing water*

Mean Bankfull Width 6m (m) Mean Water Depth 0.30 (cm)

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

Evidence of eroding banks, Comments on bank stability stable w/ vegetation

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

5% terrestrial shrubs, early

Adjacent Land Use farmland - ag. field

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) 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. heard chorus frogs

Field Notes Authored by K. Clayton

Field Notes QA/QCed by M. Faiella

Canal Bank Rd



Railway bed

set's farm

REA (previously mapped)

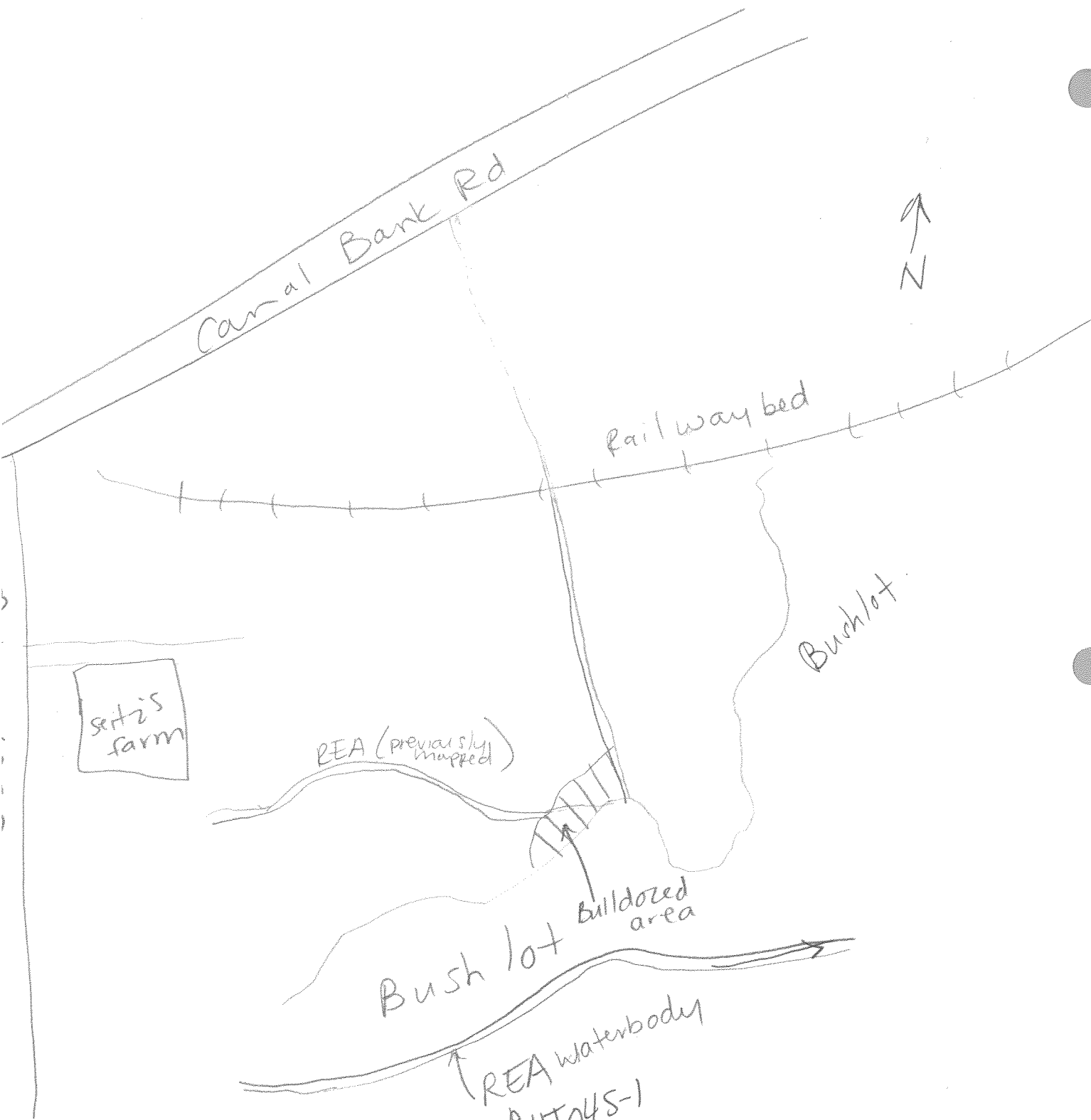
Bush lot



bulldozed area

Bush lot

REA waterbody
R111045-1





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REBA

Stantec

Station # R11T045-2

Project Name Niagara Wind

Watercourse Name unknown

Project # 160950269

Photos 71-76

Field Staff KC & MF

Date Apr 19 / 12

Time 11:55

Weather conditions in previous 24 hrs 12°C, overcast

GPS Coordinates (Zone) 17T E 0622729

N 4748832

Datum NAD 83

Descriptive Location 500m south of Canal Bank Rd., 500m east of Bird Road.

Water Quality

Dissolved Oxygen (mg/L) standing water pH Conductivity (µS/cm)

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

Time *in situ* measurements taken

Watercourse Dimensions & Morphology

Mean Watercourse Width 2m (m) Maximum Pool Depth 20 (cm)

Mean Bankfull Width 4m (m) Mean Water Depth 15 (cm)

 % Riffle % Pool 100 % Run % Flat

Evidence of eroding banks, Comments on bank stability Stable banks

Substrate (% cover)

Bedrock Cobble Sand 20 Silt 60 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

reed
cattails
algae
Phragmites

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 50%, grasses, reeds

Adjacent Land Use farm land

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) seasonal

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 K. Clayton

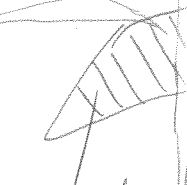
Field Notes QA/QCed by M. Faiella

Canal Bank Rd

Rail bed



REA (Previously mapped)



bulldozed section

REA RIIT04S-2

- standing water
- can't drive through it.
- dominated by aquatic veg.

Bushlot



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # P11T045-3 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950269
 Photos 77-82 Field Staff KE & MF
 Date Apr 19/12 Time 12:08
 Weather conditions in previous 24 hrs 12°C overcast
 GPS Coordinates (Zone) 17N E0623107 N 4749128 Datum NAD83
 Descriptive Location 400m south of Canal Bank Rd

Water Quality

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

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 2m (m) Mean Water Depth 15 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 40 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)
25%, cattails, early

Adjacent Land Use

ag. field

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
intermittent or permanent

Note any fish observations _____

- little water, but aquatic veg in channel

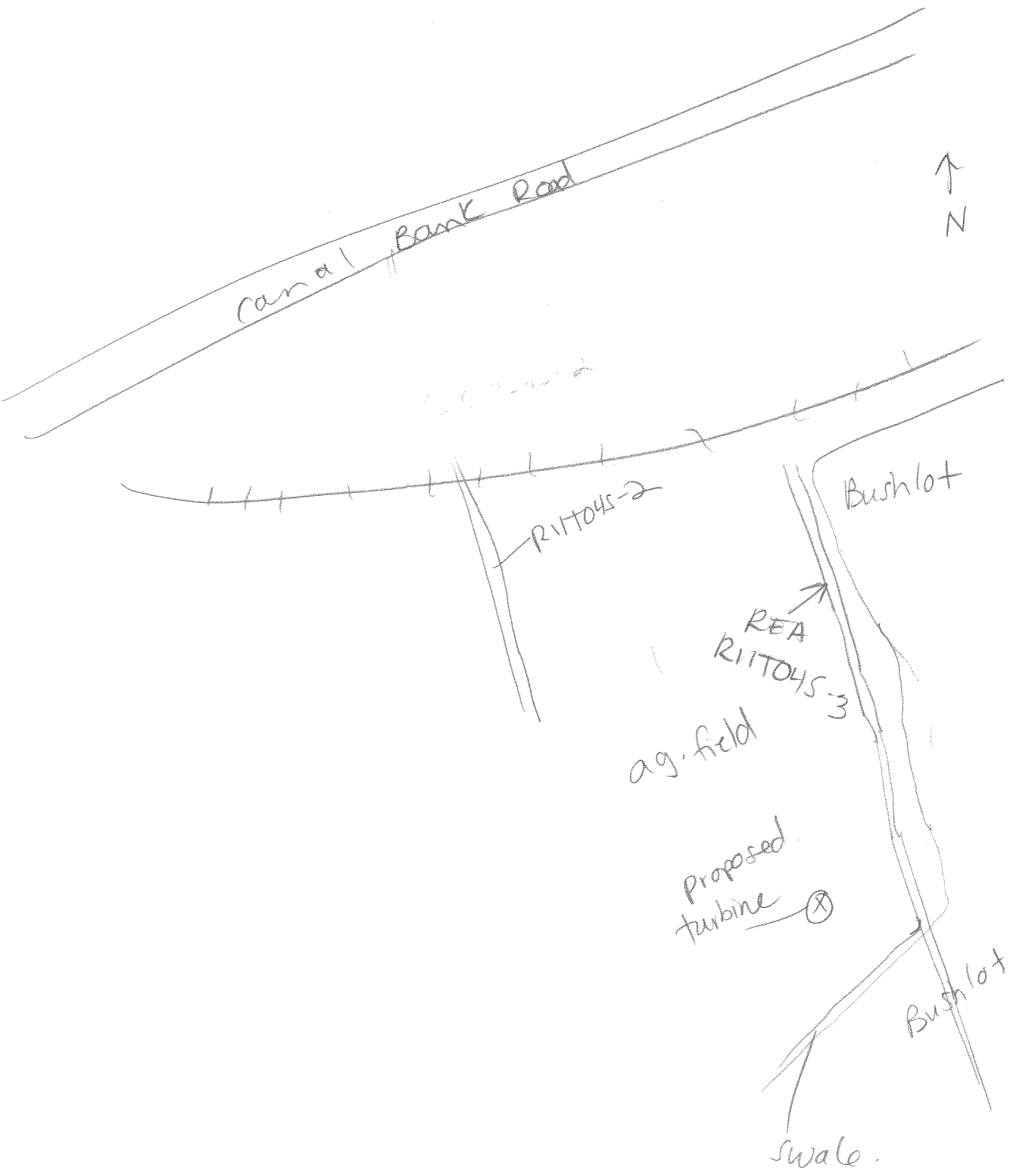
Waterbody Notes

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. frogs

Field Notes Authored by K. Clayton

Field Notes QA/QCed by M. Faiella



Canal Bank Road



R117045-2

Bush lot

REA
R117045-3

ag. field

Proposed turbine

Bush lot.

swale.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
Tile #51

Stantec

Station # RIT049-1
Watercourse Name unknown
Photos See photo log
Date June 12/18

Project Name Niagara Wind
Project # 160950269
Field Staff K. Clayton, M. Farrela
Time 4:45 pm

Weather conditions in previous 24 hrs Rain, hot & humid
GPS Coordinates (Zone) 17T E 0626974 N 4748779 Datum NAD83
Descriptive Location ~1 km north of Lakeshore Road, ~300m north of old Railbed

Water Quality

~~Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 27°C
Time *in situ* measurements taken _____~~ - no water

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width 6 (m) Mean Water Depth _____ (cm)
_____ % Riffle _____ % Pool _____ % Run _____ % Flat
Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 50 Silt 40 Muck _____
Boulder _____ Gravel _____ Clay _____ Marl 10 Detritus _____

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

Corn field

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) Potential spawning, nursery & foraging

Migratory Obstructions (seasonal, permanent) Seasonal

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 K. Clayton Field Notes QA/QCed by MP

• would be great habitat if there was water (ie. in spring)
- lots of woody debris, shaded channel.

minor Road.

old Rail bed.



ⓧ R11T049

R11T049-1

ⓧ R11T023

corn field.

mature riparian area.

agr. field.

Veldhuizer Property



path

N
↑

old Road

Lake shore Road.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA
DUG POND

Stantec

Station # R11T052-1
Watercourse Name 52-1
Photos 8885
Date JUNE 8, 2017
Weather conditions in previous 24 hrs Sunny & cloudy periods.
GPS Coordinates (Zone) 17T E 614259 N 4766482 Datum
Descriptive Location _____

Project Name NIAGARA WIND
Project # 160950269
Field Staff T CHANDLER M ELLAN
Time 2:00 PM

Water Quality

DUGOUT POND

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 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 T. CHANDLER Field Notes QA/QCed by WE



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA

~~FILED~~

Stantec

Station # RIIT052
 Watercourse Name 52-2
 Photos 8886-88
 Date JUNE 8 2017
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 614161 N 4766482 Datum _____
 Descriptive Location _____

Project Name NIAGARA WIND
 Project # 160950269
 Field Staff TCHANDLER, M. ELLAH
 Time 2:05

Water Quality

DRY
 Dissolved Oxygen (mg/L) N/A pH N/A Conductivity (µS/cm) N/A
 Water Temperature (°C) N/A Air Temperature (°C) 25
 Time *in situ* measurements taken N/A

Watercourse Dimensions & Morphology

LOW AREA IN PLOUGHED FIELD
 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 _____

Riparian Zone

DRY
 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% - SOY BEAN

Adjacent Land Use

AGRICULTURAL FIELD

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

NO FLOW

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 TCHANDLER

Field Notes QA/QCed by WR



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA
← TILED

Stantec

Station # RL1T052

Project Name NIAGARA WIND

Watercourse Name 52-3

Project # 160950269

Photos 8889

Field Staff TCHANDLER M ELLEN

Date JUNE 8 2012

Time 2:25

Weather conditions in previous 24 hrs _____

GPS Coordinates (Zone) 17T E 614366 N 4766321 Datum _____

Descriptive Location _____

Water Quality

DRY - TILED

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____

Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ 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

Other 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

PLOUGHED ARI FIELD

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 TCHANDLER Field Notes QA/QCed by NR



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA

Stantec

~~TILED~~

Station # R11T05B
 Watercourse Name 52-4
 Photos 8890
 Date JUNE 9, 2012
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 614423 N 4766319 Datum _____
 Descriptive Location _____

Project Name NIAGARA WIND
 Project # 160950269
 Field Staff T. CHANDLER M. ELLIOTT
 Time 2:20 PM

Water Quality

DRY - TILED

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

PROHIBITED AGRIC. FIELD

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

NO FLOW

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 T. CHANDLER Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA
~~TILED~~

Stantec

Station # R11T052

Project Name NIAGARA WIND

Watercourse Name 52-S

Project # 160950269

Photos 8891-92

Field Staff T CHANDLER M ELIAH

Date JUNE 8, 2012

Time 2:30 PM

Weather conditions in previous 24 hrs cloudy periods, sun

GPS Coordinates (Zone) 17T E 614295 N 4766060 Datum

Descriptive Location _____

Water Quality DRY - TILED

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

Water Temperature (°C) _____ Air Temperature (°C) 25

Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology DRY

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: _____ 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

PLOUGHED AGRICULTURAL FIELD

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

NO FLOW

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 T CHANDLER Field Notes QA/QCed by MP



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA

Stantec

~~TILED~~

Station # RI1T052
 Watercourse Name 52-6
 Photos 8893-94
 Date JUNE 8, 2012
 Weather conditions in previous 24 hrs Sunny w cloudy periods
 GPS Coordinates (Zone) 17T E 614492 N 4766082 Datum
 Descriptive Location _____

Project Name NIAGARA WIND
 Project # 160950769
 Field Staff T CHANDLER M ELLAH
 Time 2:45

Water Quality

DRY - TILED

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 25
 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 _____

Water Cover

DRY

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

CORN FIELD

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

NO FLOW

Note any fish observations _____

Waterbody Notes

DRY

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. Ø

Field Notes Authored by T. CHANDLER

Field Notes QA/QCed by ME



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Tile # 29

Non REAS

Station # RUT054
 Watercourse Name unknown
 Photos _____
 Date June 13/12
 Weather conditions in previous 24 hrs hot & humid
 GPS Coordinates (Zone) 17H E N Datum NAD83
 Descriptive Location ~ m from Vaughn Road

Project Name Niagara Wind
 Project # 160950269
 Field Staff K. Clayton, M. Faiella
 Time _____

Water Quality

- no water
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ 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.

** heard bald eagle calling in bushlet across the road from Vitucci's farm
observed red-tailed hawk flying over corn field

Field Notes Authored by K. Clayton

Field Notes QA/QCed by MF



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11 TOSS Project Name Niagara Wind
 Watercourse Name unknown Project # 160950269
 Photos 116-122 Field Staff K. Clayton, M. Faiella
 Date Apr 5/12 Time 12:20 pm
 Weather conditions in previous 24 hrs 12°C, sunny
 GPS Coordinates (Zone) 17T E 0623818 N 4764372 Datum Nad 83
 Descriptive Location ~600m north of Elcho Road ~1 km east of Regional Rd 27

Water Quality

Dissolved Oxygen (mg/L) 12.04 pH 8.75 Conductivity (µS/cm) 345
 Water Temperature (°C) 6°C Air Temperature (°C) 5°C
 Time *in situ* measurements taken 12:31

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.60 (m) Maximum Pool Depth 0.20 (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth 0.15 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability Riparian vegetation banks are stable from

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt _____ Muck _____
 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)
5% grasses, early
 Adjacent Land Use farmland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent) _____
 Note any fish observations _____

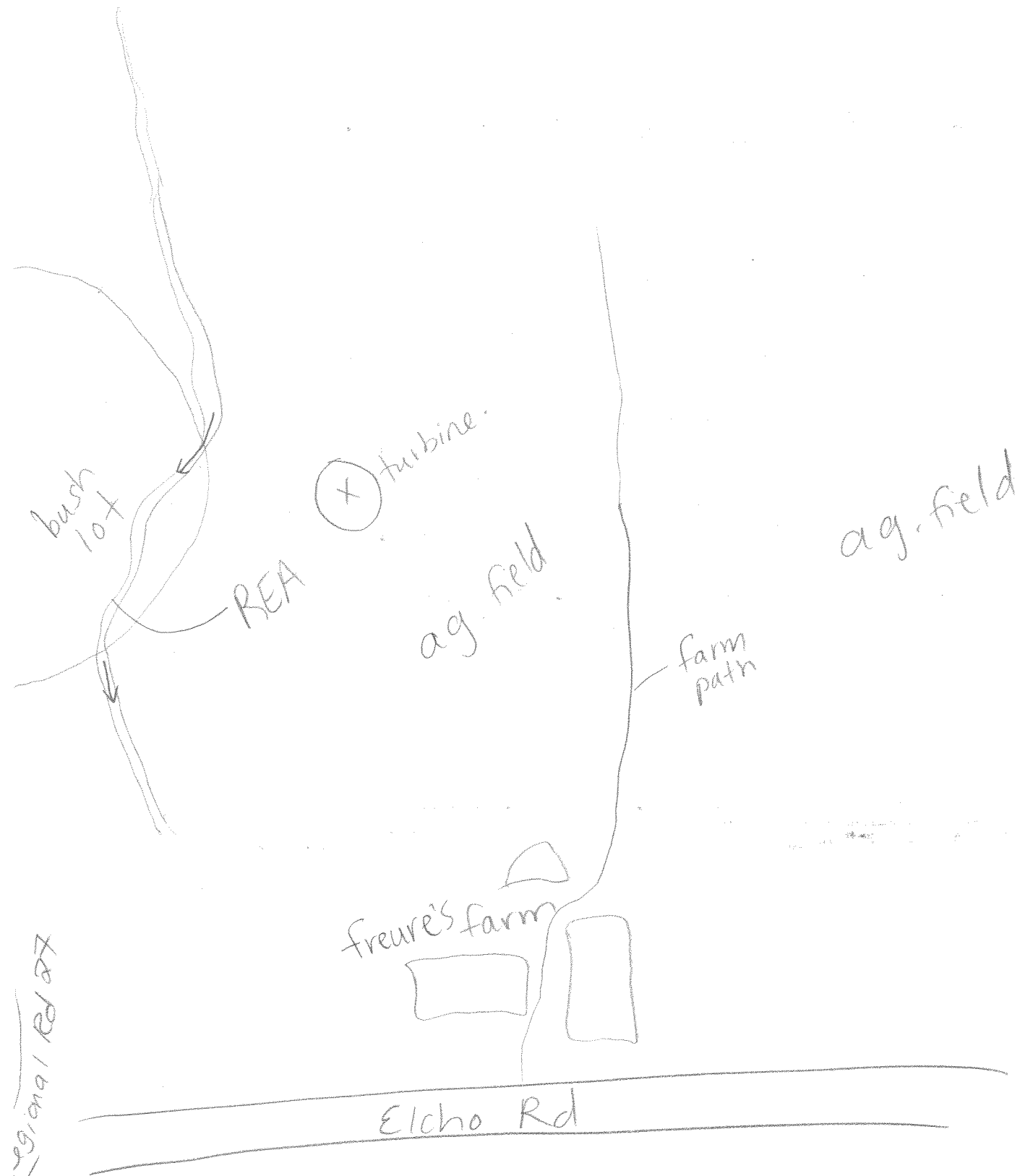
Waterbody Notes

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. Red wing blackbirds, Red tailed hawk

Field Notes Authored by K.C. Field Notes QA/QCed by M.F.

RITTOSS 1



Regional Rd 27





WIND FARM WATERBODY RAPID ASSESSMENT FORM

NOT
A REA

Stantec

Station # R11T056H Project Name NIAGARA WIND
 Watercourse Name 56H-1 Project # 160950269
 Photos 8847-49 Field Staff J. Chandler M. Ellah
 Date June 7, 2012 Time 5:30
 Weather conditions in previous 24 hrs Hot, sunny
 GPS Coordinates (Zone) 17T E 626273 N 4769267 Datum
 Descriptive Location _____

Water Quality

DAY
 Dissolved Oxygen (mg/L) N/A pH N/A Conductivity (µS/cm) N/A
 Water Temperature (°C) N/A Air Temperature (°C) 20
 Time *in situ* measurements taken N/A

Watercourse Dimensions & Morphology

Low area w no definition
 Mean Watercourse Width N/A (m) Maximum Pool Depth N/A (cm)
 Mean Bankfull Width N/A (m) Mean Water Depth N/A (cm)
0 % Riffle 0 % Pool 0 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

DRY
 Bedrock / Cobble / Sand / Silt / Muck
 Boulder / Gravel / Clay / Marl / Detritus

In-water Cover:

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

Riparian Zone

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

Adjacent Land Use

Agricultural field - planted w crops.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

No flow

Note 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.

No Access to drainage feature except along Fifteen Road.

Field Notes Authored by J. Chandler

Field Notes QA/QCed by NA



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Not REA
RIIT057
Tile 46
F346

Station # RIIT057
Watercourse Name _____
Photos see log
Date JUNE 12 2012
Weather conditions in previous 24 hrs Rain
GPS Coordinates (Zone) 17 E 625140 N 4768603 Datum
Descriptive Location Book Rd just south of Rail tracks

Project Name Niagara Wind
Project # 160950269
Field Staff KE + JK
Time 2:44pm

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ 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.

- no watercourse or water body, just surficial drainage
- ATV trail at back of second property near turbine

Field Notes Authored by KE

Field Notes QA/QCed by Joe Kene



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

RCA
R11T0584
-1
F333

Station # R11T0584-1
Watercourse Name -
Photos see log
Date June 12 2012

Project Name Niagara Wind
Project # 160950269
Field Staff KE + JK
Time 11:11 am

Weather conditions in previous 24 hrs rain
GPS Coordinates (Zone) E 628432 N 4767522 Datum
Descriptive Location conc. 4 blue crowns + Rowdene Rd
approx 800m south in field

Water Quality mostly dry or too little water to sample
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 _____ (cm) dry
Mean Bankfull Width _____ (m) Mean Water Depth _____ (cm)
% Riffle _____ % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)
Bedrock _____ Cobble 20 Sand _____ Silt _____ Muck _____
Boulder _____ Gravel 80 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)
10% shrub near bush lot

Adjacent Land Use
corn, soy, hay

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.
shallow
narrow
- shallow, degraded channel filled with grasses + juncus &
some carex sp + cane blue joint
- noted burrowing crayfish burrows

Field Notes Authored by KE Field Notes QA/QCed by Julie

→ OVER

- shallow, narrow defined channel along back edge of field
- 1008s definition definition + ploughed through in adjacent field
- BOBOLNK observed in hay field
~ 10-20.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON REA outside woodlot
REA inside

Stantec

Station # R11T059 Project Name NIAGARA WIND
 Watercourse Name S9-2 Project # 160950269
 Photos 8828-29 Field Staff J Chandler M ELLAN
 Date JUNE 7, 2012 Time 2:25 PM
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17N E 629920 N 4767524 Datum _____
 Descriptive Location _____

Water Quality DRY
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 25
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width NO WATER (m) Maximum Pool Depth NA (cm)
 Mean Bankfull Width ~2 (m) Mean Water Depth NA (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability Poorly defined swale w/s
of woodlot - defined channel in woodlot

Substrate (% cover) NIA
 Bedrock _____ Cobble _____ Sand _____ Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover NO WATER
 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)
NO watercourse w/s woodlot; 100% shaded in woodlot
 Adjacent Land Use Hay field w/s woodlot; woodlot

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) dry/no flow
 Note any fish observations NO FISH

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. Babalinks in area.

Field Notes Authored by J Chandler Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NOT ME
REA

Stantec

Station # R11T059 Project Name NIAGARA WIND
 Watercourse Name 59-3 Project # 160950269
 Photos 8833 8830 Field Staff T. Chandler M. Ellah
 Date June 7, 2012 Time 2:45
 Weather conditions in previous 24 hrs Rain
 GPS Coordinates (Zone) 17T E 629280 N 4767449 Datum
 Descriptive Location _____

Water Quality Isolated pool at d/s end of CSP culvert @ Rosedene Rd.
 Dissolved Oxygen (mg/L) 1.74 pH 7.79 Conductivity (µS/cm) 4380
 Water Temperature (°C) 21.66 Air Temperature (°C) 27
 Time *in situ* measurements taken 2:45 PM

Watercourse Dimensions & Morphology DRY - u/s Road.
 Mean Watercourse Width dry (m) Maximum Pool Depth N/A (cm)
 Mean Bankfull Width 2-3 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 100 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)
90% - cattails
 Adjacent Land Use Pasture (to east) Rosedene Rd (to west)

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) _____
dry/low flow - perched culvert at Rosedene Rd. ~10cm
 Note any fish observations NONE

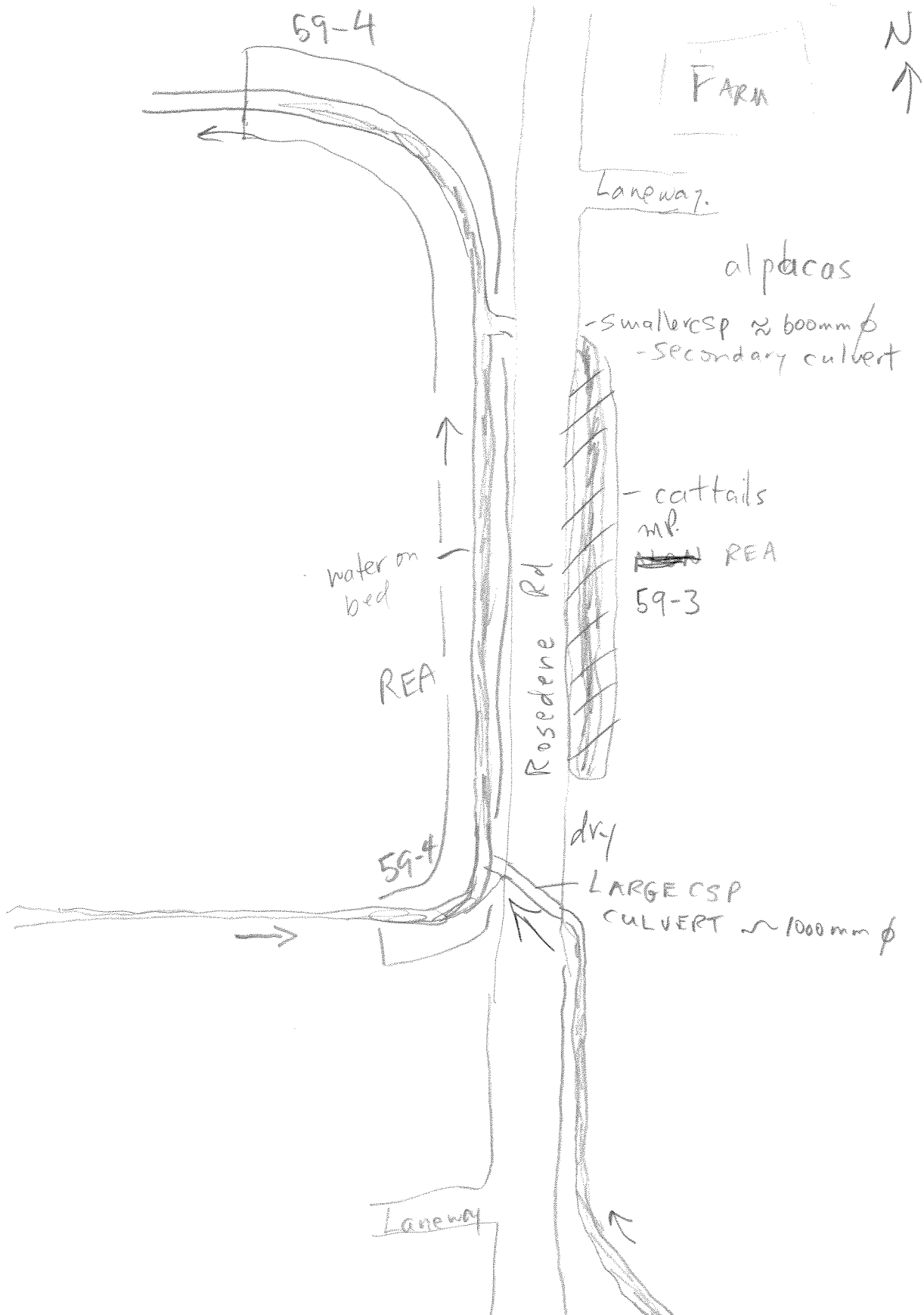
Waterbody Notes Intermittent waterbody along roadside ditch.
 Natural Watercourse _____ Trapezoidal Channel _____ Grassed Swale _____ Buried Tile _____
 Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by M. Ellah Field Notes QA/QCed by ME

R117059

59-3





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # RI0T59 Project Name: NIAGARA WIND
 Watercourse Name 59-4 Project #: 160950269
 Photos 8831-32, 34, 35, 36 Field Staff T. Chandler, M. Ellah
 Date JUNE 7, 2012 Time 2:55
 Weather conditions in previous 24 hrs. Thundershowers previous evening, then sunny
 GPS Coordinates (Zone) 17T E 629274 N 476 7433 Datum
 Descriptive Location _____

Water Quality

Dissolved Oxygen (mg/L) 8.00 pH 8.17 Conductivity (μ S/cm) 4062
 Water Temperature ($^{\circ}$ C) 27.15 Air Temperature ($^{\circ}$ C) _____
 Time *in situ* measurements taken 3:00 PM

Watercourse Dimensions & Morphology

- Vegetation-dominated morphology.
 Mean Watercourse Width 1.5 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 2.5 (m) Mean Water Depth 5 (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability Evidence of minor basal scour.

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 60 Silt _____ Muck _____
 Boulder _____ Gravel 30 Clay _____ Marl _____ Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks minor 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% grass, early

Adjacent Land Use

Road to east, pasture hayfield to west of drainage feature

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
potential spawning or nursery area

Migratory Obstructions (seasonal, permanent)
low/no 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.

Intermittent channel along roadside ditch. Lots of water, no evidence of flow. very slight flow evident.

Field Notes Authored by T. Chandler

Field Notes QA/QCed by MBZ

Tilesy REA



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # RIIT061-1 Project Name Niagara Wind
 Watercourse Name Unknown Project # 160950269
 Photos See photo log Field Staff K. Clayton, M. Faiella
 Date June 18/12 Time 2:50
 Weather conditions in previous 24 hrs Rain, hot/humid
 GPS Coordinates (Zone) 17T E 0625279 N 4747894 Datum NAD83
 Descriptive Location ~800m north of Lake Shore Road

Water Quality
 Dissolved Oxygen (mg/L) 3.51 pH 7.66 Conductivity (µS/cm) 535
 Water Temperature (°C) 22.26 Air Temperature (°C) 27°C
 Time *in situ* measurements taken 3:02

Watercourse Dimensions & Morphology
 Mean Watercourse Width 2 (m) Maximum Pool Depth 0.75 (cm) *in pool as field entrance*
 Mean Bankfull Width 3.5 (m) Mean Water Depth 0.40 (cm)
 % Riffle 10 % Pool 90 % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability Fairly stable - lots of vegetation

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 40 Silt 10 Muck _____
 Boulder _____ Gravel 50 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% grasses (reed canary grass, early)
 Adjacent Land Use farmland

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent) 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.
leopard frog

Field Notes Authored by K. Clayton Field Notes QA/QCed by MF



ag field

ag field

EEA
R11T061-1

channel opens
up into a little
pond/pool.

Some
mature
trees, but
mostly grass.

lots of Riparian
veg.

ag. field/
corn

ag. field/
corn

path

Barrick's
yellow shed

Lakeshore
Road



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Tile 5
REA
both are REAS
* notes for 211062: on ba

Station # R11T062-14-2 Project Name Niagara Wind
 Watercourse Name unkn Project # 160950269
 Photos See photo log Field Staff E. Clayton, M. Farella
 Date June 12/12 Time 10:43
 Weather conditions in previous 24 hrs Rain, hot & humid
 GPS Coordinates (Zone) 17N E 0621903 N 4751418 Datum Nad 83
 Descriptive Location ~600m west of Hutchinsan Road

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 21
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 0.60 (cm)
 Mean Bankfull Width 5 (m) Mean Water Depth 0.50 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable - vegetated

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 10 Muck _____
 Boulder _____ Gravel 50 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 75% small trees & scrub, early farmland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Spawning nursery foraging
 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 K. Clayton Field Notes QA/QCed by _____

bush lot.

(x) R11T063

bush lot

(x) R11T062 swale

REA R11T062-1

ag. field

ag. field

ag. field

* very little water in channel - too low for YSI reading.
width = 2.5
bank fill = 4.5
100% shaded
dominated by cattails.

Riparian veg.

cattails.

Riparian veg

cattails

Small trees.

REA R11T062-2

Hutchinson Road

17T 0622513 475621

N →



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
R11T065-

Station # R11T0-65-1
Watercourse Name
Photos see log
Date June 13 2012
Weather conditions in previous 24 hrs rain & sun
GPS Coordinates (Zone) 17T E 623340 N 4754876 Datum
Descriptive Location along Townline Dunnville waterfoot, just north of Jenny dump Rd

Project Name Niagara Wind Fig 6
Project # 160950269
Field Staff KE + JK
Time 12:12 pm

Water Quality
Dissolved Oxygen (mg/L) 8.84 pH 8.30 Conductivity (µS/cm) 701
Water Temperature (°C) 18.41 Air Temperature (°C) 28°
Time in situ measurements taken 12:15 pm

Watercourse Dimensions & Morphology
Mean Watercourse Width 2.5 (m) Maximum Pool Depth 30 (cm)
Mean Bankfull Width 5 (m) Mean Water Depth 20 (cm)
 % Riffle 100 % Pool % Run % Flat
Evidence of eroding banks, Comments on bank stability sleep, but stable + vegetated.

Substrate (% cover)
Bedrock Cobble 40 Sand Silt Muck
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) 30% cottonwood, ash, sumac, grape, phragmites, dogwood
Adjacent Land Use Ag - corn & soy

Fish Habitat Potential
Critical Habitat (spawning or nursery areas, groundwater upwellings) none
Migratory Obstructions (seasonal, permanent) permanent
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.
- incised channel flows east/west & connects to incised channel along Townline that flows to Jenny dump Rd

Field Notes Authored by KE Field Notes QA/QCed by Joe/Kee

Bush lot



Jenny sump Rd

corn

soy

✓

REA-1

REA-1

REA-1

REA-1

town line



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T02-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 100950269
 Photos 107-117 Field Staff KC MF
 Date Apr 19/12 Time 3:16
 Weather conditions in previous 24 hrs 12°C, overcast
 GPS Coordinates (Zone) 17T E 0620444 N 4756980 Datum NAD83
 Descriptive Location 500m east of Gore Rd, 600 North of Hutchinson Road

Water Quality
 Dissolved Oxygen (mg/L) 1.0 ^{standing H₂O} pH 7.0 Conductivity (µS/cm)
 Water Temperature (°C) 12 Air Temperature (°C)
 Time *in situ* measurements taken

Watercourse Dimensions & Morphology
 Mean Watercourse Width 1.5 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 4 (m) Mean Water Depth 15 (cm)
 % Riffle % Pool % Run 100 % Flat
 Evidence of eroding banks, Comments on bank stability stable

Substrate (% cover)
 Bedrock Cobble Sand 50 Silt 50 Muck
 Boulder Gravel Clay Marl Detritus

In-water Cover
 Cover Types Present (circle): Undercut Banks Deep Pool Watercress
 Overhanging Vegetation Woody Debris Boulder Other
Aquatic Veg *Terrestrial mostly terrestrial grasses, some duckweed & algae*

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 55%, grasses, early
 Adjacent Land Use farmland

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) spawning, nursery area, foraging
 Migratory Obstructions (seasonal, permanent) seasonal
 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. - frogs

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

Bush lot

REA
R11T072-1

ag. field

⊗ turbine

REA
R11T072-1

REA

haftstede
farm

GORE ROAD





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non REA
R11T076
Fryzo

Station # R11T076
Watercourse Name Unknown
Photos _____
Date June 12 2017
Weather conditions in previous 24 hrs rain
GPS Coordinates (Zone) 17 E 623502 N 4765881 Datum
Descriptive Location north of Vaughan Rd.

Project Name Niagara Wind
Project # 160950269
Field Staff KE + JK
Time 4:50

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.

- low lying weedamp area w/ minimal surficial
drainage into
- no other water bodies

Field Notes Authored by KE

Field Notes QA/QCed by Jr Rose



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
R11T0784

Fig 3

Station # R11T0784-1
Watercourse Name -
Photos See log
Date June 12 2012
Weather conditions in previous 24 hrs rain
GPS Coordinates (Zone) 17T E 628928 N 4765051 Datum
Descriptive Location Vaughan Rd, 800m west of Doyle Rd. on South side.

Project Name Niagara Wind
Project # 160950269
Field Staff KE + JK
Time 4 pm

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 1 (m) Maximum Pool Depth _____ (cm) dry
Mean Bankfull Width 1.5 (m) Mean Water Depth _____ (cm)
% Riffle _____ % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble 20 Sand _____ Silt _____ Muck _____
Boulder _____ Gravel 80 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)
0%

Adjacent Land Use

Ag hay

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.

- incised channel - dry

Field Notes Authored by KS

Field Notes QA/QCed by Jr/Ker



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non REA
R11T078H

Station # R11T078H-2
Watercourse Name _____
Photos see log
Date June 12 2012

Project Name Niagara Wind
Project # 160950269
Field Staff KE + JJK
Time 3:50 pm

-2
Fig 3

Weather conditions in previous 24 hrs rain
GPS Coordinates (Zone) 17T E 628466 N 4765214 Datum _____
Descriptive Location Vaughan Rd 800m west of Bayle Rd

Water Quality

Dissolved Oxygen (mg/L) _____ pH dry 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 dry (cm)
Mean Bankfull Width 0.75 (m) Mean Water Depth _____ (cm)
% Riffle _____ % Pool _____ % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble 20 Sand _____ Silt _____ Muck _____
Boulder _____ Gravel 80 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)
0%

Adjacent Land Use

As hay +

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.

- very shallow, narrow defined channel, veg w/ rocks on banks.
- farmer could plough (does at one point for access) but probably leaves for surficial drainage

Field Notes Authored by KE

Field Notes QA/QCed by JJK



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R111079 Project Name Niagara Wind
 Watercourse Name 79-1 Project # 160950269
 Photos 8807-09 Field Staff T.Chandler M.Ellah
 Date June 7, 2012 Time 10:55 AM
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 630771 N 4772424 Datum _____
 Descriptive Location _____

Water Quality

Dissolved Oxygen (mg/L) 4.40 pH 8.30 Conductivity (µS/cm) 766
 Water Temperature (°C) 16.22 Air Temperature (°C) 25
 Time *in situ* measurements taken 11:05 AM

Watercourse Dimensions & Morphology

Mean Watercourse Width 4 (m) Maximum Pool Depth 100 (cm)
 Mean Bankfull Width 8 (m) Mean Water Depth 50 (cm)
0 % Riffle 100 % Pool 0 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability minor scour (basal) along outside of meander - not excessive

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
50% shaded, grasses, early successional
 Adjacent Land Use Scrubland, mostly open/grass with few trees

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Spawning & nursery area
 Migratory Obstructions (seasonal, permanent)
Low flow (possible) - no water movement observed.
 Note any fish observations Non 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. Walnuts close by, Green frog, judd poles, red bellied wood pecker, yellow warbler.

Field Notes Authored by T. Chandler Field Notes QA/QCed by ME



REA

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # B11T079 Project Name NIAGARA wind
 Watercourse Name 79-2A Project # 160950269
 Photos 8810-8817, 8818 Field Staff T. Chandler, M. Ellah
 Date JUNE 7, 2012 Time 11:35
 Weather conditions in previous 24 hrs Thundershowers late yesterday
 GPS Coordinates (Zone) 17 T E 630210 N 4771506 Datum _____
 Descriptive Location _____

Water Quality MOSTLY DRY - SMALL PONDED AREAS
 Dissolved Oxygen (mg/L) 7.22 pH 9.34 Conductivity (µS/cm) 1413
 Water Temperature (°C) 27.34 Air Temperature (°C) 25
 Time *in situ* measurements taken 11:35

Watercourse Dimensions & Morphology - 30% Pool - 70% DRY
 Mean Watercourse Width 1.0 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 2.0 (m) Mean Water Depth 2 (where ponded) (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability Well defined channel w/ evidence of recent bank scour - banks ~0.5m high - NOT PLOUGHED
Vertical incision occurring along channel - exposed drain tile.

Substrate (% cover)

Bedrock	<u>2</u>	Cobble	<u>20</u>	Sand	<u>50</u>	Silt	/	Muck
Boulder	<u>8</u>	Gravel	<u>20</u>	Clay	/	Marl	/	Detritus

In-water Cover
 Cover Types Present (circle): 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)
5% shaded - early successional - grasses
 Adjacent Land Use Agricultural field

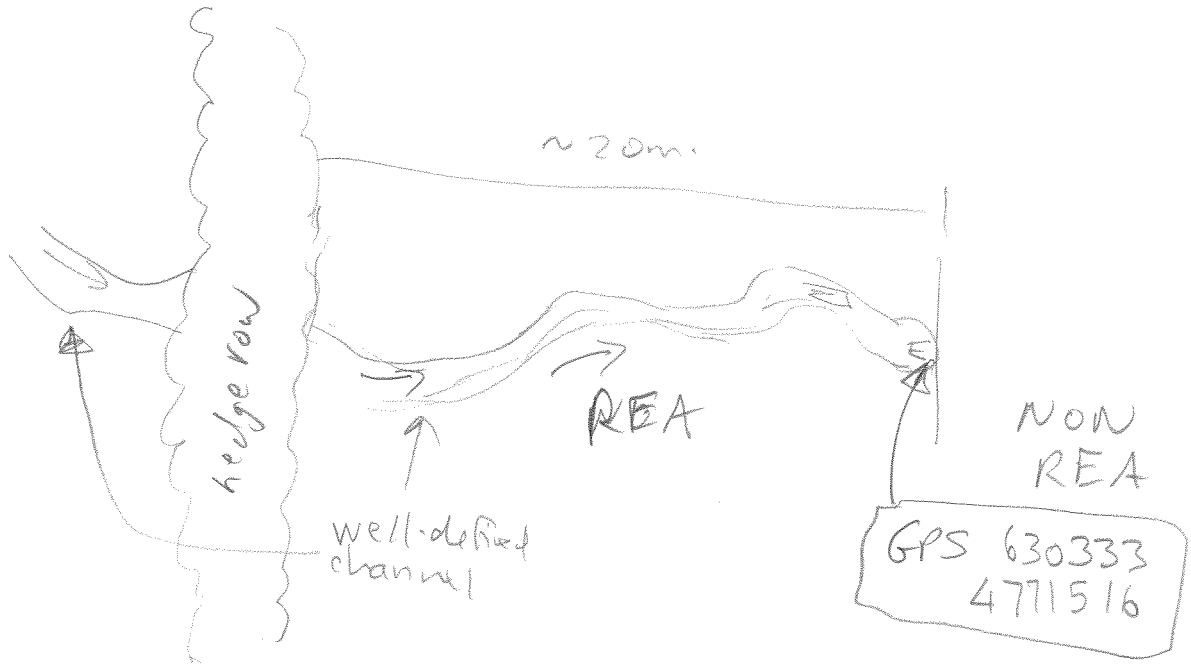
Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) Low/no flow
 Note any fish observations None

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. None.
- Tile system failing. - exposed, broken tiles.

Field Notes Authored by T. Chandler Field Notes QA/QCed by NS

R11 TO 79
79-2A.





WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA

Stantec

Station # R11T079
 Watercourse Name 79-2B
 Photos 8819
 Date JUNE 7, 2012
 Weather conditions in previous 24 hrs Thursday Thundershowers in area yesterday evening
 GPS Coordinates (Zone) 12T E 630431 N 4771591 Datum
 Descriptive Location _____

Project Name NIAGARA WIND
 Project # 160950269
 Field Staff T. Chandler, M. Ellah
 Time 12:05

Water Quality NO WATER - DRY

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 25
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

NO CHANNEL - poorly defined swale
 Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm) - Tiled
 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

Agricultural Field

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. Flycatchers

Field Notes Authored by T. Chandler

Field Notes QA/QCed by MS



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R114079
 Watercourse Name 79-2C
 Photos 8820, 8822, 8823
 Date JUNE 7, 2012
 Weather conditions in previous 24 hrs Thunder storms previous evening
 GPS Coordinates (Zone) 17N E 630436 N 4771699 Datum
 Descriptive Location _____

Project Name NIAGARA WIND
 Project # 160950269
 Field Staff T Chandler M ELLAN
 Time 12:15 pm

Water Quality

Dissolved Oxygen (mg/L) 6.05 pH 8.15 Conductivity (µS/cm) 967
 Water Temperature (°C) 19.35 Air Temperature (°C) 25
 Time *in situ* measurements taken 12:25

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.0 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 2.5 (m) Mean Water Depth 2 (cm)
0 % Riffle 40 % Pool 0 % Run 60 % Flat
 Evidence of eroding banks, Comments on bank stability minor undercut minor basal scour

Substrate (% cover)

Bedrock / Cobble 20 Sand 80 Silt / Muck /
 Boulder / Gravel 20 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% - grasses etc, trees etc

Adjacent Land Use

Scrubland then ploughed agricultural field farther west - wooded area to east.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning/nursery potential

Migratory Obstructions (seasonal, permanent)
Low/no 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 _____

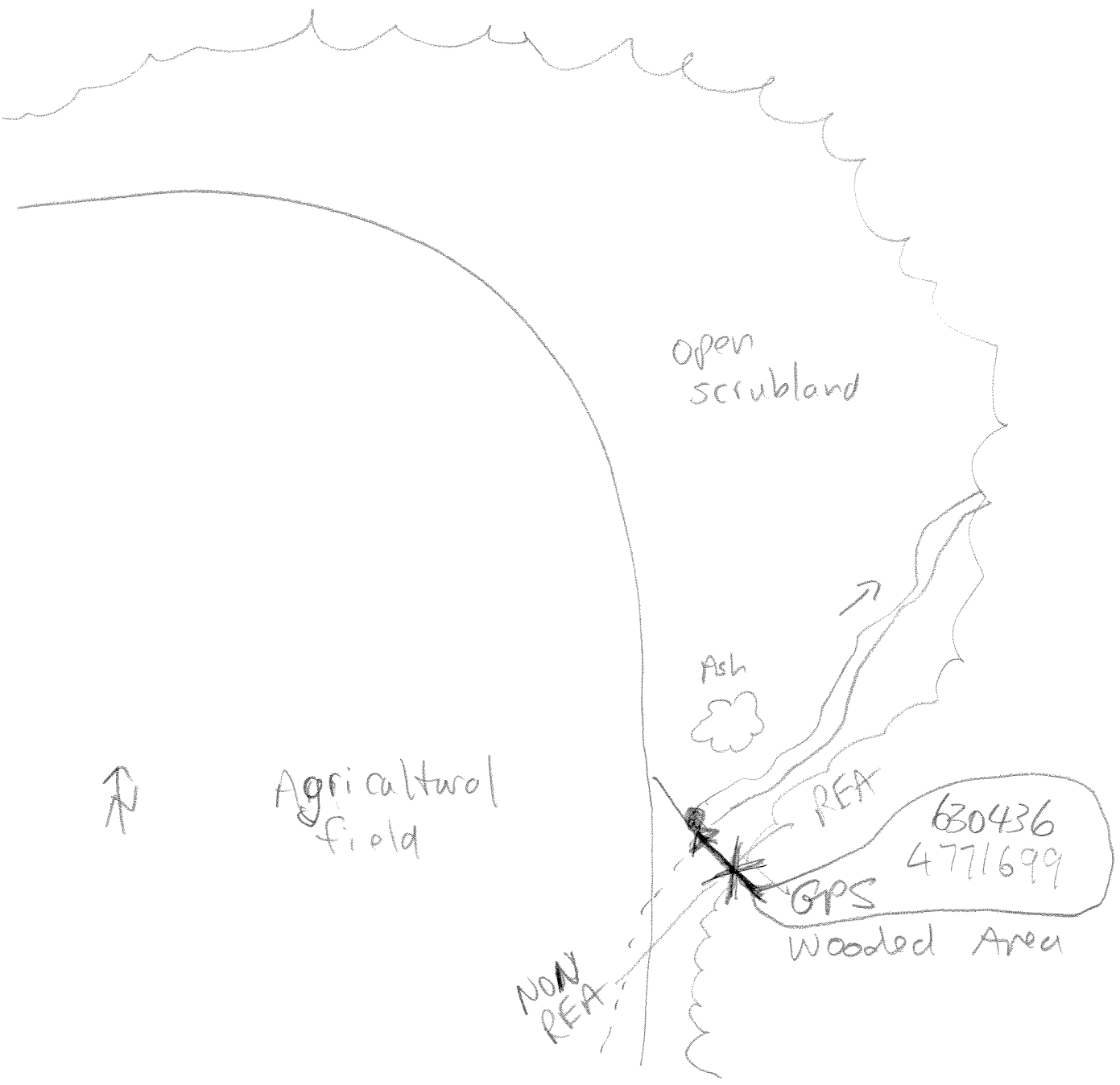
Other Habitat Notes, Incidental Wildlife Observations, etc.

green frog, slagbark hickory - green frog heard in wooded area d/sy agricultural field.

Field Notes Authored by T. Chandler

Field Notes QA/QCed by WT

RWT079
79-2c





WIND FARM WATERBODY RAPID ASSESSMENT FORM

file 58

WB

Stantec

Station # R11081a
Watercourse Name unknown trib.
Photos See photos
Date June 17/12

Project Name Niagara Wind
Project # 160950269
Field Staff K. Clayton, M. Faiella
Time 4:04 pm

Weather conditions in previous 24 hrs Sunny & hot
GPS Coordinates (Zone) 17T E 0616324 N 4767607 Datum NAD 8
Descriptive Location off of concession 4 ~ 300m east of Jarlin Road & 600m west of McCollum Road

Water Quality

~~Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) _____
Time in situ measurements taken _____~~ - no water

Watercourse Dimensions & Morphology

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

Substrate (% cover)

Bedrock _____ Cobble 20 Sand 70 Silt 10 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)
95%, cattails & grasses, early successional
Adjacent Land Use farm field - hay

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
potential spawning
Migratory Obstructions (seasonal, permanent)
Seasonal
Note any fish observations _____

Waterbody Notes

Natural Watercourse ✓ Trapezoidal Channel ✓ mp 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 K. Clayton Field Notes QA/QCed by Mark Pomroy

—N

McCullum Road

concession

Hay field

RHT081a
REA
dry
channel





WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T082
 Watercourse Name Unknown
 Photos 108-115
 Date Apr 5/12
 Weather conditions in previous 24 hrs 12°C, Sunny
 GPS Coordinates (Zone) 17T E 0618492 N 4754806 Datum Nad83
 Descriptive Location ~800m north of Hwy 3, ~800m east of Crown Rd

Project Name Niagara Wind
 Project # 160952069
 Field Staff K.C., M.F.
 Time 11:25 am

Water Quality

Dissolved Oxygen (mg/L) 11.2 mg/L pH 8.90 Conductivity (μ S/cm) 320
 Water Temperature ($^{\circ}$ C) 6.20°C Air Temperature ($^{\circ}$ C) 3°C
 Time *in situ* measurements taken 11:40 am

Watercourse Dimensions & Morphology

Mean Watercourse Width 2m (m) Maximum Pool Depth 0.80 (cm) *standing water*
 Mean Bankfull Width 7 (m) Mean Water Depth 0.60 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable banks from riparian veg.

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 10 Muck _____
 Boulder _____ Gravel 50 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

50% shrubs/grasses, early agricultural field

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent) spawning, nursery, fishing permanent

Note any fish observations _____

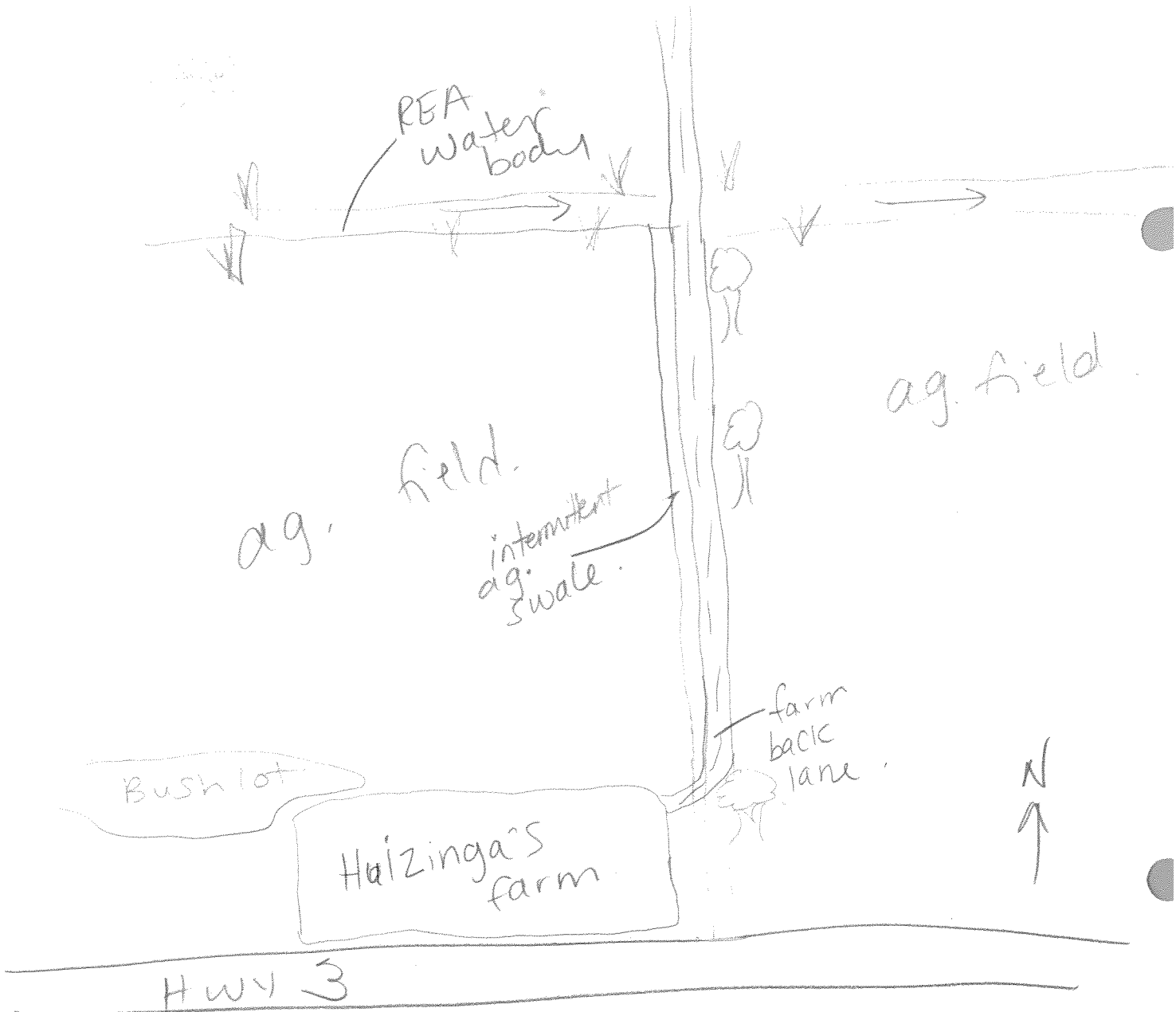
Waterbody Notes

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. Chorus frogs

Field Notes Authored by K. Clayton Field Notes QA/QCed by M. Farella

R1170.82





WIND FARM WATERBODY RAPID ASSESSMENT FORM

* REA?
↳ 110m N of culvert is REA

Stantec

Station # R11T082-2
Watercourse Name unknown
Photos 01-16
Date April 19/12
Weather conditions in previous 24 hrs overcast, 12°C
GPS Coordinates (Zone) 17T E 0618379
Descriptive Location 500m N of 3 Hwy, 1km west of Hutchison Rd.

Project Name Niagara Wind
Project # 160950269
Field Staff KC, MF
Time 8:15am

Datum NAD83

Water Quality

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

- no water

Watercourse Dimensions & Morphology

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

- no water

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 50 Silt 50 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 < 5% shrubby veg & grasses, early agricultural field

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) potentially spawning in early spring
Migratory Obstructions (seasonal, permanent) seasonal/intermittent
Note any fish observations _____

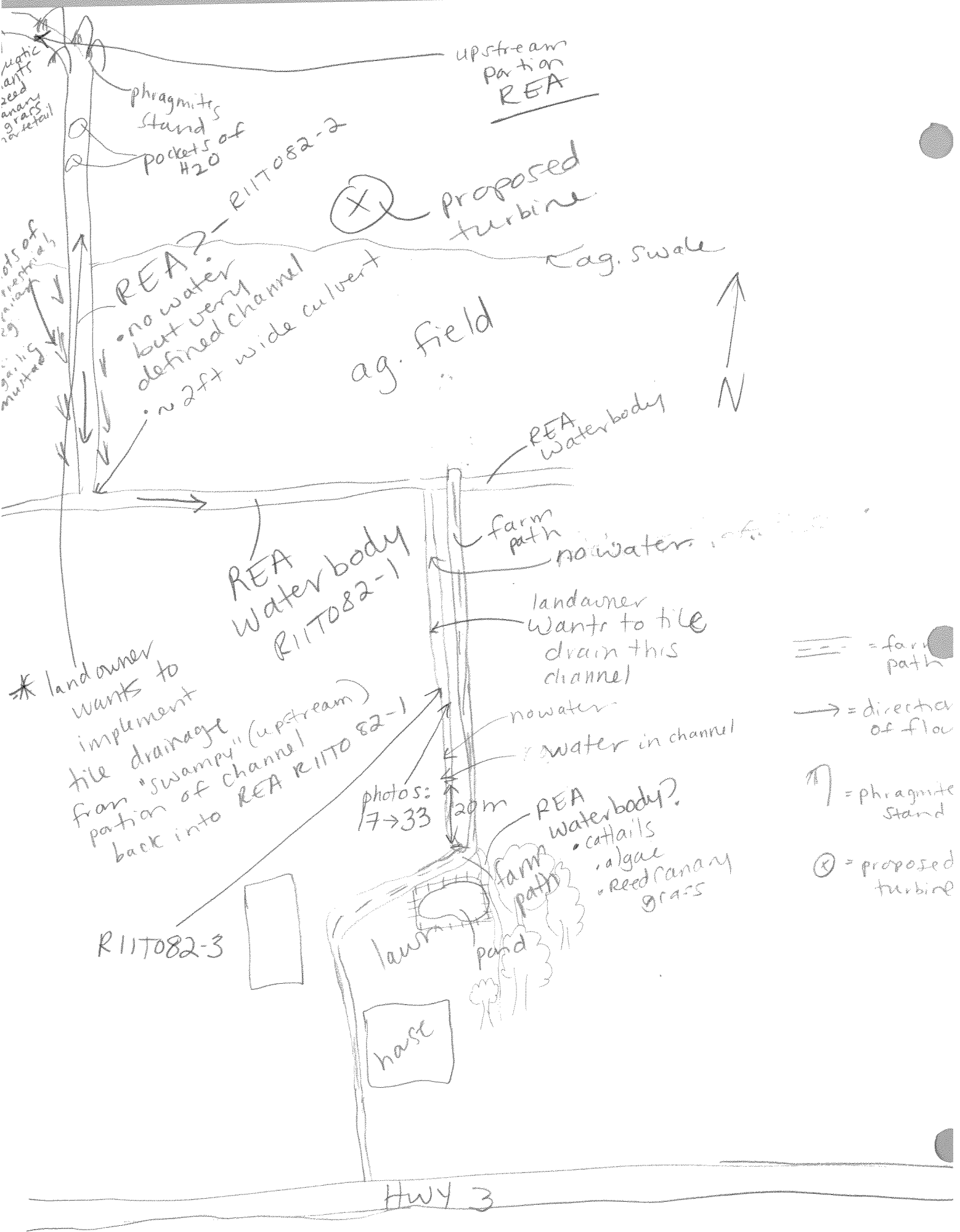
Waterbody Notes

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. red wing black birds, leopard frogs (in upstream portion)

Field Notes Authored by K. Clayton

Field Notes QA/QCed by M. Faiella





WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON REA

Stantec

Station # R11T083
Watercourse Name 83-1,2,3
Photos 876A-72+73
Date JUNE 6, 2012

Project Name: Niagara
Project #: 160950269
Field Staff Mitch Ellah, Trevor Chandler
Time 1:40 PM

Weather conditions in previous 24 hrs. Sun + cloud
GPS Coordinates (Zone) 17T E 615843 N 4770614 Datum
Descriptive Location 500-1000m due south of the southern terminus of Woods Road.

Water Quality NO WATER
Dissolved Oxygen (mg/L) 0 pH N/A Conductivity (µS/cm) 0
Water Temperature (°C) 0 Air Temperature (°C) 0
Time *in situ* measurements taken 0

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth N/A (cm)
Mean Bankfull Width N/A (m) Mean Water Depth N/A (cm)
N/A % Riffle N/A % Pool N/A % Run N/A % Flat
Evidence of eroding banks, Comments on bank stability Some channel development in areas not recently ploughed. Channel v. poorly defined in ploughed field.

Substrate (% cover)

0 Bedrock 0 Cobble 20 Sand 55 Silt 0 Muck
0 Boulder 5 Gravel 20 Clay 0 Marl 0 Detritus

In-water Cover

N/A
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)
ploughed field w winter wheat

Adjacent Land Use

Agricultural field (cropped)

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)
low/no flow

Note any fish observations N/A - no water

Waterbody Notes

NIA DRY
Natural Watercourse 0 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.

beds/banks ploughed through. poorly defined channel

Field Notes Authored by Trevor Chandler Field Notes QA/QCed by MS



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # RIIT084-1 & 84-2 Project Name Niagara Wind
 Watercourse Name unknam Project # 160950269
 Photos 55-65 Field Staff KC & MF
 Date April 19/12 Time 11:00
 Weather conditions in previous 24 hrs 120C overcast
 GPS Coordinates (Zone) 17T E 0622705 N 4753525 Datum NAD83
 Descriptive Location 600m south of Jenny jump Rd,

REA Non REA swale notes

Water Quality

Dissolved Oxygen (mg/L) -standing water 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 15 (cm) *standing H2O*
 Mean Bankfull Width 5m (m) Mean Water Depth 5-10 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 50 Silt 50 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)
25% grasses & mature trees

Adjacent Land Use

farmland

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
seasonal / 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. _____

Field Notes Authored by K. Clayton

Field Notes QA/QCed by M. Faiella

Jenny Jump Rd.



Hutchinson Rd.

tree line



Kelly Residence

farm path

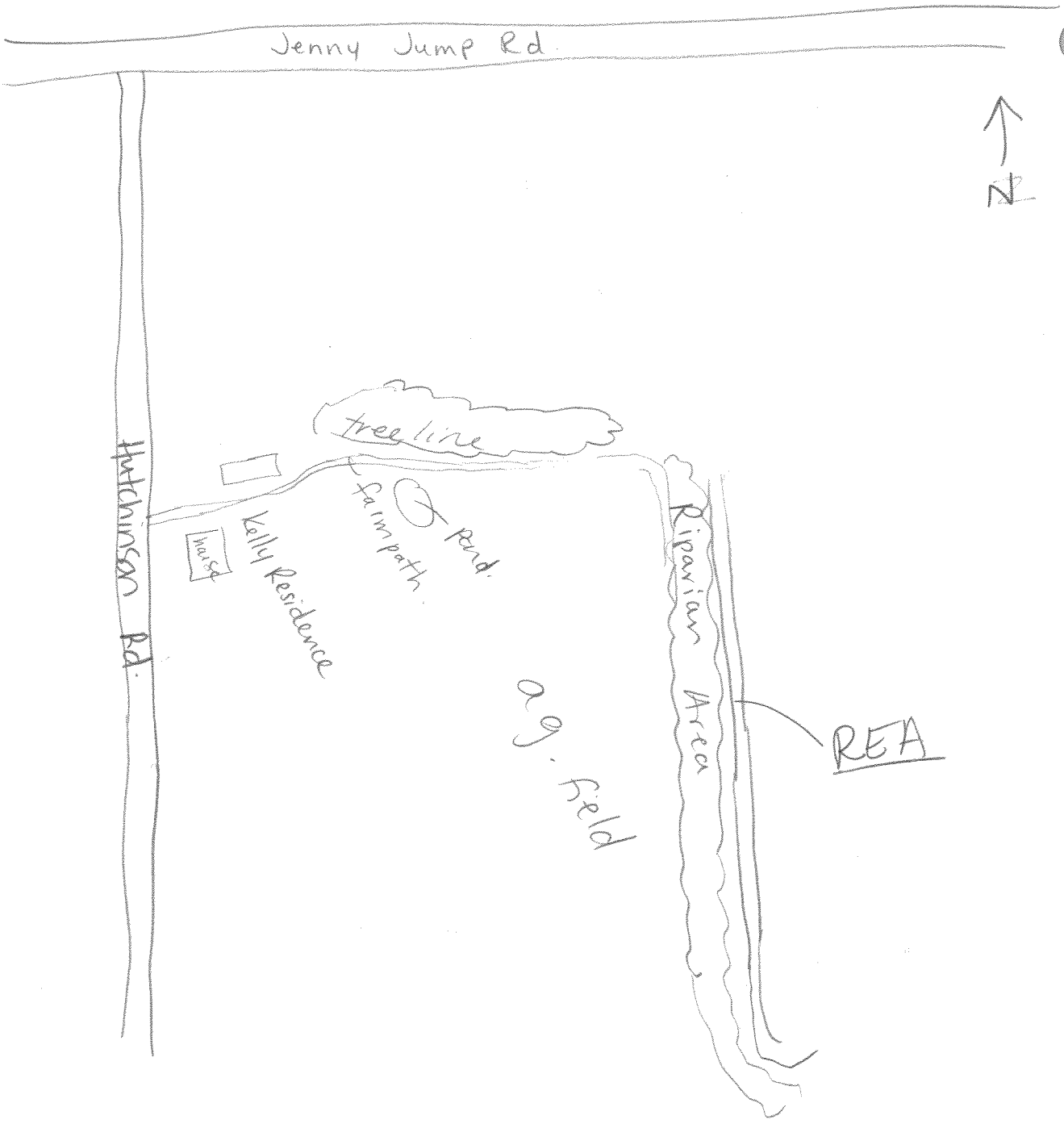


pond

ag. field

Riparian Area

REA





WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non
REA

Stantec

Station # R11T085-1 Project Name Niagara Wind
 Watercourse Name unknown swale Project # 160950269
 Photos 700, 701 Field Staff K. Clayton Marc Faiella
 Date June 11/12 Time 2:35pm
 Weather conditions in previous 24 hrs Sunny, hot
 GPS Coordinates (Zone) 17T E 0619222 N 4769671 Datum
 Descriptive Location south of Sixteen Rd, on Minor Road

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 KC

Field Notes QA/QCed by [Signature]



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
non
RE

Stantec

Station # R11 T088 T088-1B
Watercourse Name T088-1B
Photos 8774-76
Date June 6, 2017

Project Name: Niagara Wind.
Project #: 160950269
Field Staff Trevor Chandler, Mitch Ellah
Time 12:00 PM (NOON)

Weather conditions in previous 24 hrs. Sun + cloudy
GPS Coordinates (Zone) 17N E 615860 N 4771425 Datum
Descriptive Location At Southern terminus of Woods Rd. DIS ME - WB U/S of terminus - non-WB

Water Quality NO WATER - GRASSED WATERWAY
Dissolved Oxygen (mg/L) 0 pH 0 Conductivity (µS/cm) 0
Water Temperature (°C) 0 Air Temperature (°C) 0
Time *in situ* measurements taken 0

Watercourse Dimensions & Morphology - Morphology vegetation controlled.
Mean Watercourse Width 0.5 (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width N/A (m) Mean Water Depth _____ (cm)
N/A % Riffle N/A % Pool N/A % Run N/A % Flat
Evidence of eroding banks, Comments on bank stability NO

Substrate (% cover) Grass lined
Bedrock _____ Cobble _____ Sand _____ Silt _____ Muck _____
Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover N/A
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) grass-lined
Adjacent Land Use Agricultural fields (cropped)

Fish Habitat Potential
Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
Migratory Obstructions (seasonal, permanent) low/no flow
Note any fish observations None

Waterbody Notes N/A.
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

Field Notes Authored by Trevor Chandler Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

MP
~~REA~~
non R

Stantec

Station # R11T088
Watercourse Name T088-1A
Photos 8777-79
Date June 6, 2012

Project Name: Niagara Wind
Project #: 160950269
Field Staff Trevor Chandler, Mitch Ellah
Time 12:30

Weather conditions in previous 24 hrs. Sunny + clouds -
GPS Coordinates (Zone) 17T E 615670 N 4771150 Datum
Descriptive Location 200 M South of Farm at S end of Woods Road
at concrete box culvert (ruins) - 0.8 hrs, 0.15 hrs at S end.

Water Quality - taken outside study area/project loc'n
Dissolved Oxygen (mg/L) 3.51 pH 7.81 Conductivity (µS/cm) 1753
Water Temperature (°C) 16.75 Air Temperature (°C) 20
Time *in situ* measurements taken 12:40

Watercourse Dimensions & Morphology no
Mean Watercourse Width 1.0 (m) Maximum Pool Depth 50 (cm)
Mean Bankfull Width 2.0 (m) Mean Water Depth 5 (cm)
0 % Riffle 20 % Pool 0 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability
Morphology poorly defined. Deeper pools immed. up & d/s of concrete culvert where watercourse enters Devries property. 20% pool - the rest is dry.

Substrate (% cover)
0 Bedrock 5 Cobble 30 Sand 40 Silt 0 Muck
5 Boulder 10 Gravel 10 Clay 0 Marl 0 Detritus

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

Riparian Zone
Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
20% shade, grasses & cattails
Adjacent Land Use
Agricultural fields

Fish Habitat Potential
Critical Habitat (spawning or nursery areas, groundwater upwellings)
Migratory Obstructions (seasonal, permanent)
low/no flow
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. Many frogs observed.
WB only occurs to west of study area.

Field Notes Authored by Trevor Chandler Field Notes QA/QCed by [Signature]



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA ✓

REA

Stantec

Station # B117D88
Watercourse Name 88-2
Photos 8780-8781
Date June 6, 2012

Project Name: Niagara Wind
Project #: 160950269
Field Staff Trevor Chandler, Mitch Ellah
Time 12:50

Weather conditions in previous 24 hrs. sun + cloud,
GPS Coordinates (Zone) 17T E 615867 N 4771469 Datum
Descriptive Location 30 m north of southern terminus of Woods Rd.

Water Quality NO WATER

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

Watercourse Dimensions & Morphology DRY

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 flat sinuous swale
through fields - ploughed over. - some channel definition.

Substrate (% cover)

Bedrock ∅ Cobble 20 Sand 80 Silt ∅ Muck ∅
Boulder ∅ Gravel ∅ Clay ∅ Marl ∅ Detritus ∅

In-water Cover N/A

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)
Crops, winter wheat

Adjacent Land Use

Agricultural field

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
N/A

Migratory Obstructions (seasonal, permanent)
low/no flow

Note any fish observations None

Waterbody Notes Not a water body U/S.

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 T. Chandler

Field Notes QA/QCed by WPC



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
RIIT089-

F310

Station # RIIT089-2
 Watercourse Name _____
 Photos sectors
 Date June 13 2012
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17 E 624167 N 4753064 Datum
 Descriptive Location Booker Rd, 400m west of townline

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE + JK
 Time 2:38 pm

Water Quality

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

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth X (cm) dry
 Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat

Evidence of eroding banks, Comments on bank stability

steep, stable + veg

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 20 Silt _____ Muck _____
 Boulder _____ Gravel 80 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

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

30% elm, Ash etc along

Adjacent Land Use

Ag - corn, soy

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none

Migratory Obstructions (seasonal, permanent)

permanent

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.

- incised channel, moist or dominated w/ aquatic veg

Field Notes Authored by KE

Field Notes QA/QCed by Joe Ker

REA -1

COIL

FARM

Boover Rd

REA-2



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
R11T089-
FB10

Station # R11T089-3
 Watercourse Name _____
 Photos sat
 Date June 13 2012
 Weather conditions in previous 24 hrs rain + sun
 GPS Coordinates (Zone) 17T E 623124 N 4753082 Datum
 Descriptive Location west of townline / Dunnville Westfield rd, North of Peeler rd (parallel to it) 915m north of Peeler

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE + JK
 Time 3:10 pm

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

Watercourse Dimensions & Morphology
 Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm) dry
 Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
 % Riffle _____ % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 20 Silt _____ Muck _____
 Boulder _____ Gravel 80 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)
hedgerow - elm, RCG, maple, ASH

Adjacent Land Use
soy, wheat

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
rare
 Migratory Obstructions (seasonal, permanent)
dry
 Note any fish observations
note

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

Other Habitat Notes, Incidental Wildlife Observations, etc.
- shallow channel in hedgerow w/ detrital bed + bank
- not a likely seasonal drainage to RBA-1 + 2

Field Notes Authored by KE Field Notes QA/QCed by J. Miller



REA-

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # RIIT091 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950629
 Photos 102-106 Field Staff KC & MF
 Date Apr 19 / 12 Time 3:02
 Weather conditions in previous 24 hrs 12°C, overcast
 GPS Coordinates (Zone) 17T E 0620509 N 4756692 Datum NAD 83
 Descriptive Location 500m east of Gore Rd, 600m N of Hutchins

Water Quality -standing water
 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 50 (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 30 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability fairly stable due to vegetation

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 30 Silt 30 Muck _____
 Boulder _____ Gravel 30 Clay _____ Marl 10 Detritus _____

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

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
< 1%, grasses, early
 Adjacent Land Use agricultural field

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
Spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent)
seasonal
 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 KC Field Notes QA/QCed by MF



ag. field.

ag. field.

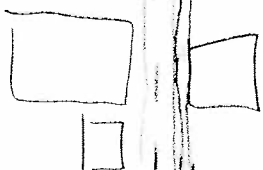
pooled
H₂O

dry for
~150m

farm
path

REA
RIITO91

contains
water
very channelized
algae.



GORE Road.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA

Stantec

Station # B11T093H Project Name Niagara Wind
 Watercourse Name 93-1a Project # 160950269
 Photos 8796-98 Naphoto8745 Field Staff T. Chandler, M. Ellah
 Date June 6, 2012 Time 9:40 PM
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 618372 N 4767446 Datum _____
 Descriptive Location _____

Water Quality NO WATER
 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 poorly defined swale
in ploughed field

Substrate (% cover)
 _____ Bedrock _____ Cobble 20 Sand 20 Silt _____ Muck _____
 _____ Boulder _____ Gravel _____ Clay 20 Marl _____ Detritus _____

In-water Cover NO WATER
 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) _____
Agricultural field
 Adjacent Land Use _____

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) No 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 X

Other Habitat Notes, Incidental Wildlife Observations, etc. Field recently ploughed
planted w soy beans.

Field Notes Authored by T. Chandler Field Notes QA/QCed by WR



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T093H Project Name Niagara Wind
 Watercourse Name 93-1b Project # 160950269
 Photos 8799-8801 Field Staff T. Chandler, M. Ellah
 Date June 6, 2012 Time 4:50 PM
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17N E 618502 N 4767151 Datum _____
 Descriptive Location _____

Water Quality

Dissolved Oxygen (mg/L) 7.13 pH 9.29 Conductivity (μ S/cm) 794
 Water Temperature ($^{\circ}$ C) 21.20 Air Temperature ($^{\circ}$ C) 20 $^{\circ}$ C
 Time *in situ* measurements taken 4:50pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 15 (m) Maximum Pool Depth 50 (cm)
 Mean Bankfull Width N/A (m) Mean Water Depth 20 (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable
Area of ponded water along

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 80 Silt _____ Muck _____
 Boulder _____ Gravel 20 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
40% shaded (by algae)
 Adjacent Land Use Agricultural field

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) _____
 Note any fish observations ponded area - may dry up
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. dragonfly's, common yellowthroat
low area with ponded water, Gray tree frogs.

Field Notes Authored by T. Chandler Field Notes QA/QCed by MP



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T093H
 Watercourse Name q3-2
 Photos 8802-06
 Date June 6, 2012
 Weather conditions in previous 24 hrs Sun + cloud
 GPS Coordinates (Zone) 17T E 618263 N 4767030 Datum
 Descriptive Location _____

Project Name Niagara Wind
 Project # 160950289
 Field Staff T. Chandler M. Ellah
 Time 5:00 PM

Water Quality Too SHALLOW
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 25
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width 4 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 8 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability Stable - veg dominated

Substrate (% cover)
 _____ Bedrock _____ Cobble _____ Sand _____ Silt 100 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)
70% sedges, shrubs
 Adjacent Land Use Agricultural fields - Soy bean & winter wheat

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) Dry/low 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. Green frogs
Wooded area d/s. - watercourse not ploughed up stream (wgt)
in wheat field.

Field Notes Authored by T. Chandler Field Notes QA/QCed by MP



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R117094
 Watercourse Name 94-1
 Photos 8790-91
 Date June 6, 2012
 Weather conditions in previous 24 hrs. Sunny & cloud.
 GPS Coordinates (Zone) 17T E 618420 N 4768015 Datum
 Descriptive Location Along Scott Road (Allowana)

Project Name: Niagara Wind
 Project #: 160950269
 Field Staff T. Chandler M. Ellah
 Time 3:20

Water Quality NO WATER

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 2 (m) Mean Water Depth / (cm)
/ % Riffle / % Pool / % Run / % Flat
 Evidence of eroding banks, Comments on bank stability Minor scour around trees & roots and where disturbed by ATV crossings

Substrate (% cover)

/ Bedrock 5 Cobble 20 Sand 70 Silt / Muck /
/ Boulder 5 Gravel / Clay / Marl / Detritus /

In-water Cover N/A

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% - grasses (trees at Scott Rd. crossing)
 Adjacent Land Use Agricultural fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
/
 Migratory Obstructions (seasonal, permanent)
low/no 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.

Wooded area at Scott Rd. Shagbark hickory.

Field Notes Authored by T. Chandler

Field Notes QA/QCed by WP



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA

Stantec

Station # R11T094
 Watercourse Name 94-2
 Photos 8792-94
 Date June 6, 2012
 Weather conditions in previous 24 hrs. Sunny, cloudy
 GPS Coordinates (Zone) 17T E 618459 N 4768466 Datum
 Descriptive Location _____

Project Name: Niagara Wind
 Project #: 160950269
 Field Staff T. Chandler M. Elijah
 Time 3:40

Water Quality NO WATER
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology NIA
 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 NONE

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 100 Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover NO WATER
 Cover Types Present (circle): Undercut Banks Deep Pool Watercross Aquatic Veg
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
0% shaded
 Adjacent Land Use Agricultural field

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) _____
 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. Depression in plowed field, recently driven through - Dimension: 10 x 10 m

Field Notes Authored by T. Chandler Field Notes QA/QCed by [Signature]



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non REA
Tile 13
ag swale
(on Hardy prop)

Station # R11T095-1
Watercourse Name unknown
Photos 801-810
Date June 13/12
Weather conditions in previous 24 hrs hot & humid
GPS Coordinates (Zone) 17T E 0622684 N 4760950 Datum Nad83
Descriptive Location 650m south of Creek Rd 2.5 km west of side road 42

Project Name Niagara Wind
Project # 160950269
Field Staff K Clayton, M Fiorella
Time 9:30

Water Quality
Dissolved Oxygen (mg/L) _____
Water Temperature (°C) _____
Time *in situ* measurements taken _____
pH _____ Conductivity (µS/cm) _____
Air Temperature (°C) 17°C

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

Substrate (% cover) - soil - filled
Bedrock _____ Cobble _____ Sand _____ Silt _____ Muck _____
Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

In-water Cover
Cover Types Present (circle): _____
Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Deep Pool _____ Watercress _____ Aquatic Veg _____
Other _____

Riparian Zone
Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) _____
Adjacent Land Use farmland

Fish Habitat Potential
Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
Migratory Obstructions (seasonal, permanent) _____
Note any fish observations no water

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 KC Field Notes QA/QCed by MA

Bushlo

hedge row

swale

agricultural swale

hedge row

Non
REA

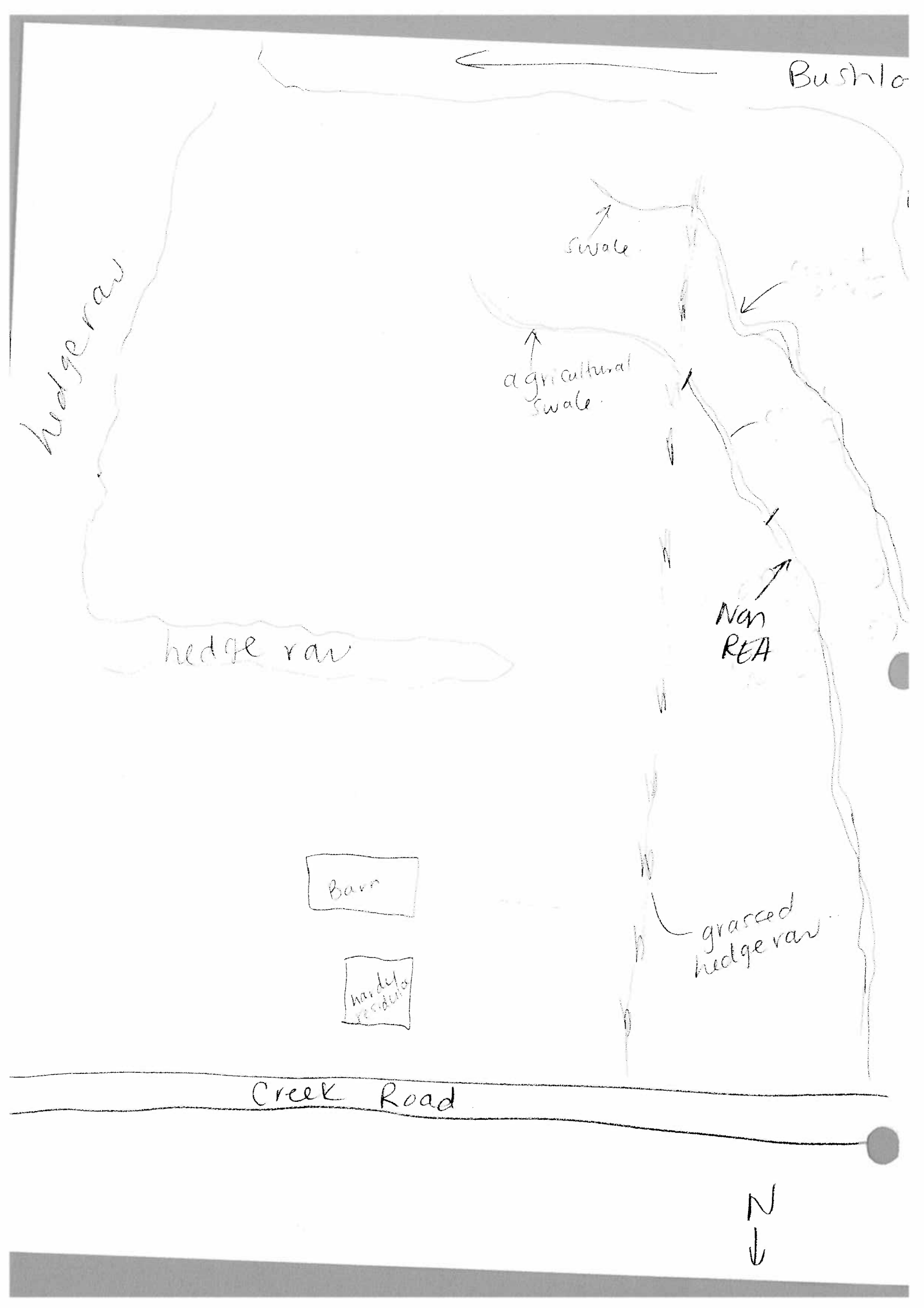
Barn

handy
residents

grassed
hedge row

Creek Road

N
↓



Tile # 15

W.P. REA



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # R11T096-1 Project Name Niagara Wind
 Watercourse Name unknown Project # 160950269
 Photos 754-762 Field Staff K. Clayton, M. Favella
 Date June 12/12 Time 11:45
 Weather conditions in previous 24 hrs Rain, hot, humid
 GPS Coordinates (Zone) 17T E 0620885 N 4750464 Datum Nad83
 Descriptive Location 100m from Bird Road

Water Quality *- no water*
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (μ S/cm) _____
 Water Temperature ($^{\circ}$ C) _____ Air Temperature ($^{\circ}$ C) 21
 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 100 Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl _____ Detritus _____

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

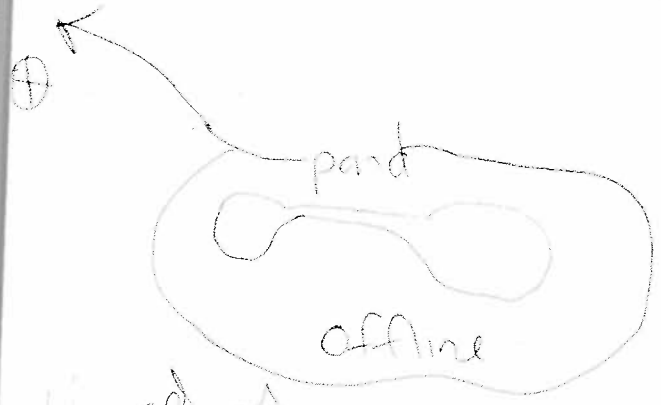
Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 45% trees, mature
 Adjacent Land Use pasture

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) seasonal
 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 K. Clayton Field Notes QA/QCed by ME



pond

offline

reed
carr
grass

Unaquatic
leg

- no water
- surrounded by mature trees
- probably lots of water in spring of year

farmland.

RIT096-1

pasture



Bird Road

← N



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA

Stantec

Station # R11T097
 Watercourse Name 97-1
 Photos 8787
 Date June 6, 2012
 Weather conditions in previous 24 hrs Sunny + cloud
 GPS Coordinates (Zone) 17N E 617224 N 4765666 Datum
 Descriptive Location 600m south of Silver Street and 600m west of Port Davidson Rd.

Project Name Niagara Wind
 Project # 160950269
 Field Staff T. Chandler M. Ellah
 Time 1:30 PM

Water Quality NO WATER
 Dissolved Oxygen (mg/L) Ø pH Ø Conductivity (µS/cm) Ø
 Water Temperature (°C) Ø Air Temperature (°C) Ø
 Time *in situ* measurements taken Ø

Watercourse Dimensions & Morphology
 Mean Watercourse Width NIA (m) Maximum Pool Depth Ø (cm)
 Mean Bankfull Width NIA (m) Mean Water Depth Ø (cm)
 % Riffle Ø % Pool Ø % Run Ø % Flat Ø
 Evidence of eroding banks, Comments on bank stability swale in ploughed field.

Substrate (% cover)
 Bedrock Ø Cobble Ø Sand 20 Silt 80 Muck Ø
 Boulder Ø Gravel Ø Clay Ø Marl Ø Detritus Ø

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

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) Ø
 Adjacent Land Use plough agricultural field.

Fish Habitat Potential NIA
 Critical Habitat (spawning or nursery areas, groundwater upwellings) Ø
 Migratory Obstructions (seasonal, permanent) no flow
 Note any fish observations No

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

Other Habitat Notes, Incidental Wildlife Observations, etc. None

Field Notes Authored by T. Chandler Field Notes QA/QCed by MSZ



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

Station # R11T097
 Watercourse Name 97-2
 Photos 8783-85
 Date June 6, 2012
 Weather conditions in previous 24 hrs. Sunny cloud
 GPS Coordinates (Zone) 17T E 617231 N 4766234 Datum
 Descriptive Location At Silver Street, 500m west of Pond Davidson Rd

Project Name: Niagara Wind
 Project #: 160950269
 Field Staff T. Chandler M. Ellah
 Time 2:00 PM

Water Quality

Dissolved Oxygen (mg/L) 6.18 pH 8.38 Conductivity (µS/cm) 2630
 Water Temperature (°C) 14.27 Air Temperature (°C) 20
 Time *in situ* measurements taken 2:10 PM

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.0 (m) Maximum Pool Depth 0 (cm)
 Mean Bankfull Width 1.5 (m) Mean Water Depth 0 (cm)
0 % Riffle 10 % Pool 90 % Run 0 % Flat
 Evidence of eroding banks, Comments on bank stability Morphology Vegetation dominated - good channel development w water

Substrate (% cover)

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

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Deep Pool Watercress Other Aquatic Veg rip rap at Silver St Xing.
Woody Debris Boulder

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 50, grass cover.
 Adjacent Land Use grassed area (manicured lawn) but mainly scrubland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Migratory Obstructions (seasonal, permanent) low/no flow
 Note any fish observations none seen

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.

Large grassed buffer on either side of channel, wooded area to north of Silver Street

Field Notes Authored by T. CHANDLER Field Notes QA/QCed by ME



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non
REA

Stantec

Station # R11T097
 Watercourse Name 97-3
 Photos 8786-88, +89
 Date June 6, 2012
 Weather conditions in previous 24 hrs. Sun & Cloud.
 GPS Coordinates (Zone) 17T E 617166 N 4765985 Datum
 Descriptive Location Pond ~ 20x40m + dry swale that drains to west.
800m west of Port Davidson Rd. 100-300m south of Silver Street.

Project Name: Niagara Wind
 Project #: 160950269
 Field Staff T. Chandler M. Ellal
 Time 2:20 PM

Water Quality

Dissolved Oxygen (mg/L) 5.20 pH 8.18 Conductivity (μ S/cm) 1073
 Water Temperature ($^{\circ}$ C) 26.83 Air Temperature ($^{\circ}$ C) 20 $^{\circ}$ C
 Time in situ measurements taken 2:35 pm

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 pond feature w swale
draining to west. Swale is ploughed regularly

Substrate (% cover)

Bedrock Cobble Sand Silt 100 Muck
 Boulder Gravel Clay Marl Detritus

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)
0% shaded
 Adjacent Land Use pasture

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Migratory Obstructions (seasonal, permanent)
Pond may dry out in summer. Water turbid.
 Note any fish observations None seen. Pond seems natural

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.

Mallard ducks in pond
Cattle & horses have access to pond. No evidence of excavation
(e.g. soil piles)
no water outlet by the pond

Field Notes Authored by T. Chandler Field Notes QA/QCed by WSE



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

RI1T098-1
4 NBS
REA

Fy 2

Station # RI1T098-1
 Watercourse Name _____
 Photos see log
 Date June 13 2012
 Weather conditions in previous 24 hrs rain
 GPS Coordinates (Zone) 17T E 617 672 N 47535 87 Datum _____
 Descriptive Location Hwy 3 Dlw crown + Marshagan

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE + JK
 Time 11:15 AM

Water Quality

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

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m)
 Mean Bankfull Width 3 (m)
 Maximum Pool Depth _____ (cm)
 Mean Water Depth _____ (cm)
 % Riffle _____ % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

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

In-water Cover

Cover Types Present (circle):
 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)
30% trees + prairie grape vine

Adjacent Land Use

rural residential + corn fields

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.

- shallow channel w/ defined bed + banks +
- dominated by prairie
- behind house to west of access road it takes definite
+ becomes a grass swale that is named then connect
w/ # 3.

Field Notes Authored by KE

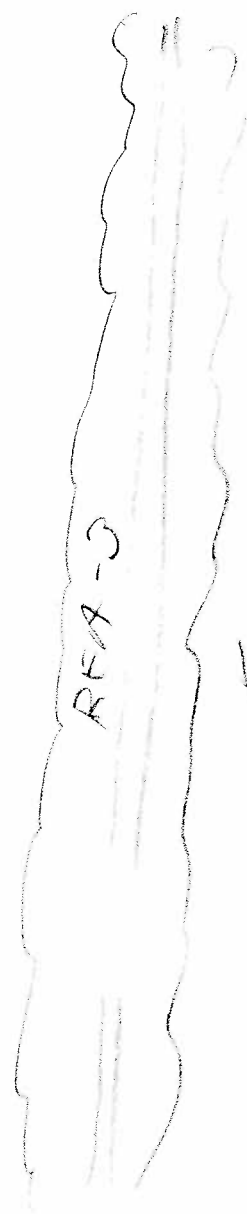
Field Notes QA/QC'd by _____

Surficial
Drainage

REA-2
surficial drainage

CORN

2/



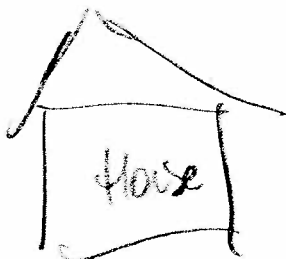
Hodgson

REA-1

grassed swale

no
access

proposed
access
road





Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

NON
REA

RIIT098-2

Fig 2

Station # RIIT098-2
 Watercourse Name _____
 Photos see logs
 Date June 13 2012
 Weather conditions in previous 24 hrs rain
 GPS Coordinates (Zone) 17 E 817746 N 4753438 Datum
 Descriptive Location flow 3 b/w crown & Marshagan
approx 300 m south

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE & JK
 Time 11:10 AM

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

Watercourse Dimensions & Morphology
 Mean Watercourse Width _____ (m)
 Mean Bankfull Width _____ (m)
 Maximum Pool Depth _____ (cm)
 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):
 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) _____

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. _____

surficial drainage
entire field ploughed & planted w/ corn

Field Notes Authored by KE

Field Notes QA/QCed by [Signature]



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA
R11T098-
F152

Station # R11T098-3
 Watercourse Name _____
 Photos see log
 Date June 13 2012
 Weather conditions in previous 24 hrs rain
 GPS Coordinates (Zone) 17 E 617663 N 4753360 Datum
 Descriptive Location Hwy 3 b/w crown Rd + Marshagan Rd

Project Name Niagara Wind
 Project # 160950269
 Field Staff KE + JK
 Time 11:30 AM

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) dry
 Mean Bankfull Width 4 (m) Mean Water Depth _____ (cm)
 % Riffle _____ % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability stable w/ some vegetation

Substrate (% cover)
 Bedrock _____ Cobble 40 Sand _____ Silt _____ Muck _____
 Boulder _____ Gravel 40 Clay _____ Marl 20 Detritus _____

In-water Cover
 Cover Types Present (circle): 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) 80% - elm, cottonwood, grape

Adjacent Land Use Ag - corn

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.
- somewhat shallow channel w/ degraded bed + bank in a bedrock possibly dug years ago but has naturalised

Field Notes Authored by KE Field Notes QA/QCed by JK



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # R11T099-1 Project Name Niagara Wind
 Watercourse Name unknown trib. Project # 160950269
 Photos See photo log Field Staff K. Clayton, M. Farrella
 Date June 12/12 Time 9:30
 Weather conditions in previous 24 hrs Rain - hot & humid
 GPS Coordinates (Zone) 17T E 0619087 N 4749101 Datum NAD83
 Descriptive Location west of Inman Road (~1 km)

Water Quality
 Dissolved Oxygen (mg/L) 3.70 pH 7.72 Conductivity (µS/cm) 589
 Water Temperature (°C) 20.08 Air Temperature (°C) 21
 Time *in situ* measurements taken 9:35

Watercourse Dimensions & Morphology
 Mean Watercourse Width 2.5 (m) Maximum Pool Depth 0.5 (cm)
 Mean Bankfull Width 6 (m) Mean Water Depth 0.4 (cm)
 % Riffle _____ % Pool 100 % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability Staple vegetated

Substrate (% cover)
 Bedrock _____ Cobble 50 Sand 40 Silt 10 Muck _____
 Boulder _____ Gravel 50 Clay _____ Marl _____ Detritus _____

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

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
85% - Sumac & grasses, early successional
 Adjacent Land Use agricultural field

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent) _____
 Note any fish observations Brook stickleback

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 K. Clayton Field Notes QA/QCed by MR

ag. field.

Riparian veg

dominated
by arrow
head &
duckweed

REA
R11T099-1



ag. field.

ag. field.

path

Inman Road

N →



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # R11T099-2
 Watercourse Name unknown
 Photos 727-734
 Date June 12/12
 Weather conditions in previous 24 hrs Rain, hot & humid
 GPS Coordinates (Zone) 17T E 0620096 N 4749360 Datum NAD83
 Descriptive Location off of Inman Road

Project Name Niagara Wind
 Project # 160950269
 Field Staff K. Clayton, M. Farella
 Time 9:47

Water Quality

Dissolved Oxygen (mg/L) 5.90 pH 7.71 Conductivity (μ S/cm) 870
 Water Temperature ($^{\circ}$ C) 18.08 Air Temperature ($^{\circ}$ C) 21
 Time *in situ* measurements taken 9:50

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth 0.50 (cm)
 Mean Bankfull Width 6 (m) Mean Water Depth 0.40 (cm)
 % Riffle _____ % Pool 100 % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability Stable - vegetated

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 40 Silt 10 Muck _____
 Boulder _____ Gravel 50 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 95%, grasses & small trees, early
 Adjacent Land Use farmland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) spawning, nursery, foraging
 Migratory Obstructions (seasonal, permanent) _____
 Note any fish observations _____

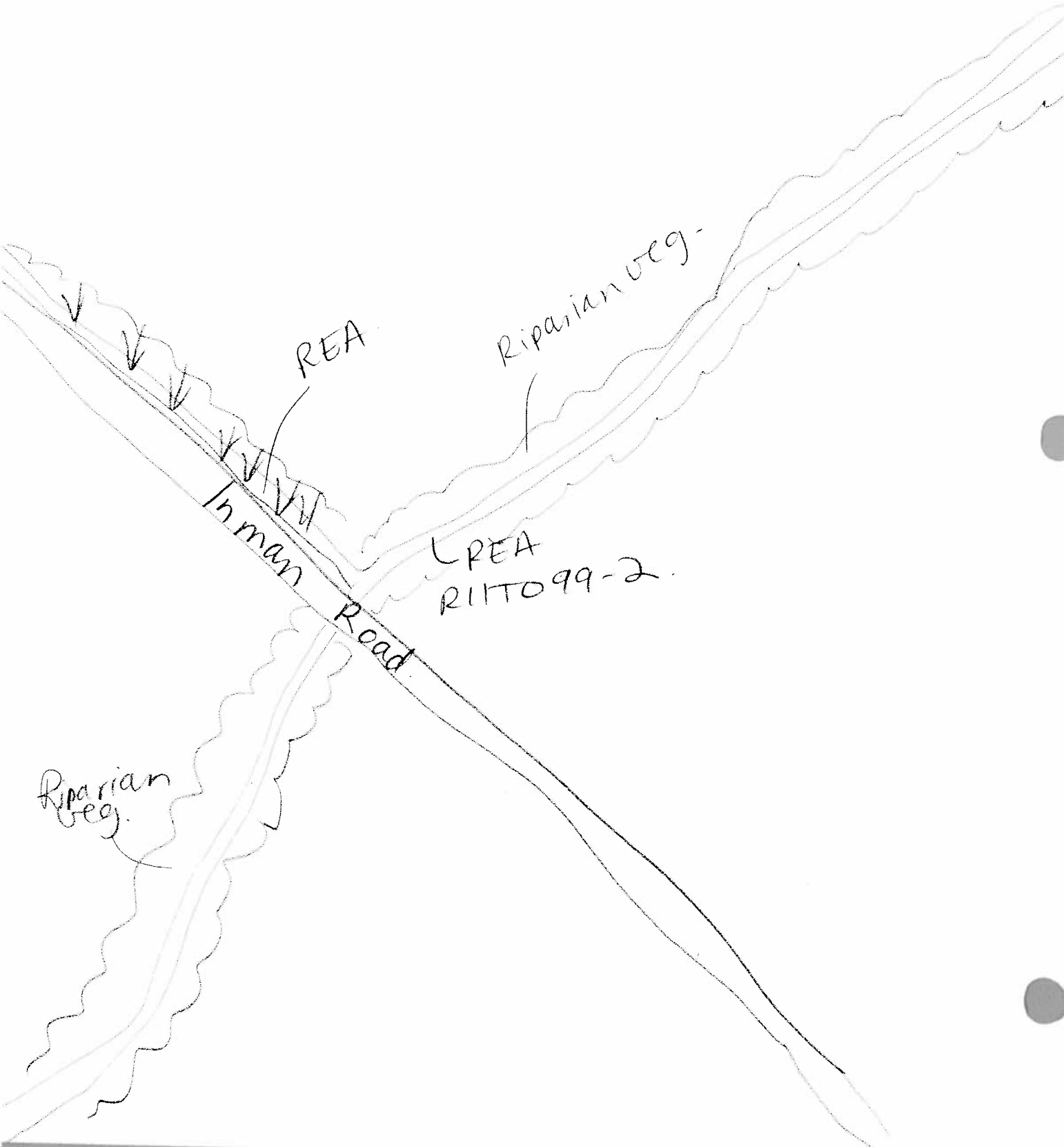
Waterbody Notes

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 K. Clayton Field Notes QA/QCed by MF

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N





RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Stantec

Project Niagara Wind Project # 160950269
 Station # 13-6 Field Staff K. March M. Faiella
 Photos Taken - Date Oct 22/12
 GPS Coordinates 17T 0625873 4750847 Time 11:35
 Descriptive Location South of Canal bank Rd, East of
Dunnville / Wainfleet Road!

Water Quality

Dissolved Oxygen (mg/L) not enough for 401 pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 10°C
 Weather conditions in previous 24 hrs Sunny, 15°C

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 15 (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable

Substrate – Upstream (% cover)

Bedrock _____ Silt 40 Boulder _____ Clay 50 Cobble _____
5 Muck _____ Gravel _____ Marl _____ Sand _____ Detritus 15

Substrate – Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks _____
 Woody Debris _____ Deep Pool Boulder _____
 Vascular Plants Typha Other _____

Riparian Zone

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

Upstream meadow, pebbles, typha, grasses
 Downstream _____

Adjacent Land Use

Upstream ag land, canal, road, forest
 Downstream _____

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream _____
 Downstream _____

Migratory Obstructions (seasonal, permanent)

Upstream dry
 Downstream _____

Note any fish observations none observed

Other Habitat Notes, Incidental Wildlife Observations, etc. Trapezoidal

• channel dominated by Typha
 • Intermittent flow



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 3-4
 Watercourse Name unnamed tributary
 Photos 331-336
 Date Oct 22/12
 Weather conditions in previous 24 hrs Sunny - 15°C
 GPS Coordinates (Zone) 17T E 0615310 N 4764195 Datum NAD83
 Descriptive Location off of Coistor Gainsborough Townline, South of Vaughan Road

Project Name Niagara Wind
 Project # 160980269
 Field Staff K. Mason, M. Farella
 Time 10:36

Water Quality

Dissolved Oxygen (mg/L) 11.24 pH 7.99 Conductivity (µS/cm) 1185
 Water Temperature (°C) 8.38 Air Temperature (°C) 15°C
 Time *in situ* measurements taken 10:40

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 60 (cm)
 Mean Bankfull Width 4 (m) Mean Water Depth 40 (cm) *standing water*
 % Riffle _____ % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability all grassed - stable

Substrate (% cover)

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

In-water Cover

Overhanging Vegetation _____ Woody Debris _____ Boulder _____
 Deep Pools _____ Waterweeds _____ *algae*
 Aquatic veg _____ *ducksweed, Typha, RCG*

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 15% grasses, early

Adjacent Land Use

residential, road, ag. field

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) potential for ayonhida

Migratory Obstructions (seasonal, permanent) Thick vegetation

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. Riparian area comprised of Typha, grasses, willows. Channel @ culvert is very wide (~7m wide) however narrower 5m from culvert to 22m wide.

Field Notes Authored by K. Mason

Field Notes QA/QCed by MF



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 4-2
 Watercourse Name unnamed tributary
 Photos 337-342
 Date Oct 22/12
 Weather conditions in previous 24 hrs sunny, 15c
 GPS Coordinates (Zone) 17T E 0618971 N 4764056 Datum Nad 83
 Descriptive Location off of Kriick Road, N of Elcho Road, South of Vaughan Rd.

Project Name Niagara Wind
 Project # 1100950269
 Field Staff K. Mason, M. Fairlla
 Time 11:04

Water Quality

Dissolved Oxygen (mg/L) 6.93 pH 8.38 Conductivity (μ S/cm) 799
 Water Temperature ($^{\circ}$ C) 9.80 Air Temperature ($^{\circ}$ C) 15.00
 Time in situ measurements taken 11:06

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth 50 (cm)
 Mean Bankfull Width 4 (m) Mean Water Depth 45 (cm)
 Evidence of eroding banks, Comments on bank stability all grassed - stable

standing water

Substrate (% cover)

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

In-water Cover

Cover Types Present (circle):
 Overhanging Vegetation duckweeds, sedges Undercut Banks _____ Deep Pool _____ Watercress _____
 Woody Debris _____ Boulder _____ Other _____ Aquatic veg RCG

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
10% grasses, early

Adjacent Land Use

corn & bushlot, road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

Note any fish observations low water, 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.

channel is pooled/flooded at culvert & narrows away from culvert. Turbid water once away from culvert channel is grassed & fairly dry, however channel is defined.

Field Notes Authored by K. Mason

Field Notes QA/QCed by ML



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 4-3
 Project Name Niagara Wind
 Watercourse Name unnamed Tributary Project # 160950 269
 Photos 343-348 Field Staff K. Mason, M. Faiella
 Date Oct 22/12 Time 11:18
 Weather conditions in previous 24 hrs sunny, 15°C
 GPS Coordinates (Zone) 17T E 0619208 N 4764925 Datum NAD83
 Descriptive Location off of Vaughan Road, east of Krick Road,
west of 4-3 102012

Water Quality

Dissolved Oxygen (mg/L) 8.62 pH 8.22 Conductivity (µS/cm) 784
 Water Temperature (°C) 9.22 Air Temperature (°C) 15°C
 Time in situ measurements taken 11:22

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth 50 (cm) standing H₂O
 Mean Bankfull Width ~4 (m) Mean Water Depth 40 (cm)
 % Riffle _____ % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability stable - all grassed

Substrate (% cover)

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

In-water Cover

Cover Types Present (circle): Undercut Banks subvent Deep Pool subvent Watercress _____
 Overhanging Vegetation duckweed Woody Debris _____ Boulder _____ Other algae Aquatic veg RCG

Riparian Zone

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

Adjacent Land Use

ag. fields, road, rural residential

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)

low water / thick vegetation

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.

includes online pond on
DIS side of road. With all the grassed, channel banks
are hard to define

Field Notes Authored by K. Mason

Field Notes QA/QCed by mf.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 4-4 10.2012 Project Name Niagara Wind
 Watercourse Name Unnamed Tributary Project # 160950269
 Photos 349-352 Field Staff K. Mason, M. Farrell
 Date Oct 20/12 Time 11:30
 Weather conditions in previous 24 hrs Sunny, 15°C
 GPS Coordinates (Zone) 17T E 0619735 N 4764957 Datum NAD83
 Descriptive Location off of Vaughan Rd, east of 4-2 10.2012

Water Quality

Dissolved Oxygen (mg/L) not enough for YSI pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 15°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 5 (m) Maximum Pool Depth 20 (cm) standing water
 Mean Bankfull Width 7 (m) Mean Water Depth 15 (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable - vegetation

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

road, rural residential, corn, bush lot

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) Thick vegetation, low water

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. U/s side the drainage feature is ill defined. D/s you can see a Typha corridor, channel may be more defined downstream

Field Notes Authored by K. Mason Field Notes QA/QCed by ml



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 5.3 1022012
 Watercourse Name unnamed Trib.
 Photos 353-357
 Date Oct 22/12
 Weather conditions in previous 24 hrs Sunny, 15°C
 GPS Coordinates (Zone) 17T E 0619028 N 4763161 Datum NAD83
 Descriptive Location off of Krick Road, South of Elcho Road.

Project Name Niagara Wind
 Project # 160950269
 Field Staff K. Mason, M. Fairilla
 Time 11:44

Water Quality

Dissolved Oxygen (mg/L) 9.19 pH 8.04 Conductivity (µS/cm) 1389
 Water Temperature (°C) 10.22 Air Temperature (°C) 15°C
 Time *in situ* measurements taken 11:50

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 80 (cm) *standing H₂O*
 Mean Bankfull Width 3 (m) Mean Water Depth 30 (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable - well vegetated.

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

road, ag. field, pasture

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
potential cyprinid spawning

Migratory Obstructions (seasonal, permanent)
thick vegetation

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.

channel is wider @ culvert (~10m wide). Riparian includes grasses, willows, & scrubby vegetation. water in channel is murky & covered w/ duckweed

Field Notes Authored by K. Mason

Field Notes QA/QCed by mlf.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 6-2
 Watercourse Name unnamed trib
 Photos 358-361
 Date Oct 22/12
 Weather conditions in previous 24 hrs sunny, 15°C
 GPS Coordinates (Zone) 17T E 0619046 N 4762088 Datum NAD83
 Descriptive Location off Krick Road, south of Elcho Road, N of Zumstein Road

Project Name Niagara Wind
 Project # 10040269
 Field Staff K. Mason, M. Farrell
 Time 12:01

Water Quality

Dissolved Oxygen (mg/L) dry pH dry Conductivity (µS/cm) dry
 Water Temperature (°C) dry Air Temperature (°C) 15
 Time in situ measurements taken dry

Watercourse Dimensions & Morphology

Mean Watercourse Width dry (m) Maximum Pool Depth dry (cm)
 Mean Bankfull Width 1.5 (m) Mean Water Depth dry (cm)
 % Riffle dry % Pool dry % Run dry % Flat dry
 Evidence of eroding banks, Comments on bank stability dry

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 95%, grasses, early

Adjacent Land Use

ag. fields, road

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) dry

Note any fish observations dry - none

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

very minor channel definition - possibly more D/S
UIS side is piped

Field Notes Authored by K. Mason

Field Notes QA/QCed by mf



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 6-3
 Watercourse Name unnamed trib
 Photos 362-367
 Date Oct 22/12
 Project Name Niagara Wind
 Project # 160950869
 Field Staff K. Mason, M. Faella
 Time 12:12
 Weather conditions in previous 24 hrs Sunny, 15°C
 GPS Coordinates (Zone) 17T E 0619064 N 4761625 Datum Nad83
 Descriptive Location off of Krick Road, south of Zumstein
& of 6-1

Water Quality

Dissolved Oxygen (mg/L) 7.22 pH 8.16 Conductivity (µS/cm) 610
 Water Temperature (°C) 8.88 Air Temperature (°C) 17°C
 Time *in situ* measurements taken 12:15

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width 8 (m) Mean Water Depth 20 (cm) *standing water*
 % Riffle _____ % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability stable - well vegetated

Substrate (% cover)

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

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Watercress Aquatic veg
Overhanging Vegetation Woody Debris Boulder Other _____ *RCCG, Typha*

Riparian Zone

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

Adjacent Land Use

ag field, road

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
none

Note any fish observations low water, thick vegetation
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. channel is more defined away from culvert
water pooled at culvert. Riparian area includes grasses, Typha
dogwoods. Channel widens away from culvert & has
potential to flood 220m wid.

Field Notes Authored by K. Mason Field Notes QA/QCed by M.P.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 8-2 Project Name Niagara Wind
 Watercourse Name unnamed tributary Project # 160950269
 Photos 368-372 Field Staff K. Mason, H. Farella
 Date Oct 22/12 Time 13:43
 Weather conditions in previous 24 hrs Sunny, 15°C
 GPS Coordinates (Zone) 17T E 0623116 N 4760425 Datum NAD83
 Descriptive Location off of side road 42, north of Concession 6

Water Quality

no water
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 18°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

moist
 Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable - all grassed & hard to define

Substrate (% cover)

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

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% , terrestrial grasses, early

Adjacent Land Use

road, corn

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
low water, thick vegetation

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.

slight channel definition in all terrestrial grasses in channel minimal water
Riparian area comprised of terrestrial grasses, dogwoods, trembling aspen etc.

Field Notes Authored by K. Mason

Field Notes QA/QCed by m.p.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 8-31
 Watercourse Name unnamed Tributary
 Photos 373-377
 Date Oct 22/12
 Weather conditions in previous 24 hrs Sunny, 15°C
 GPS Coordinates (Zone) 17T E 062234d N 4759602 Datum Nad83
 Descriptive Location off of Concession 6, west of sideroad 42 east of Sideroad 44

Project Name Niagara Wind
 Project # 100950269
 Field Staff K. Mason, M. Faiella
 Time 13:56

Water Quality

Dissolved Oxygen (mg/L) _____ pH dry Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 18°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability well vegetated

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 95% grasses & Typha, early sedge

Adjacent Land Use

road, scrubland, pasture

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations low water / thick vegetation 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. Riparian area is comprised of dogwoods, grasses, Typha meadow species. Channel runs along Concession 6.

Field Notes Authored by K. Mason Field Notes QA/QCed by MLP



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 9-2nd
 Watercourse Name unnamed Trib
 Photos 380 - 384
 Date Oct 22/12
 Weather conditions in previous 24 hrs Sunny, 15°C
 GPS Coordinates (Zone) 17T E 0622156 N 4758617 Datum NAD83
 Descriptive Location off of Sid. road 44, South of corner

Project Name Niagara Wind
 Project # 160950269
 Field Staff K. Mason H. Farilla
 Time 14:16

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 18°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

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

Evidence of eroding banks, Comments on bank stability stable banks - well vegetated in grasses, Typha & meadow species.

Substrate (% cover)

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

In-water Cover

Cover Types Present (circle): Undercut Banks _____ Deep Pool _____ Watercress _____
Overhanging Vegetation Woody Debris _____ Boulder _____ Other _____ Aquatic veg
soil ✓ *Typha sedges*

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
50%, Typha, etc.

Adjacent Land Use

pasture, road, ag field

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations dry channel, thick vegetation
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.

deeply incised channel - dry at the time of survey.

Field Notes Authored by K. Mason

Field Notes QA/QCed by ml.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 10-114 Project Name Niagara wind
 Watercourse Name unnamed tributary Project # 160950269
 Photos 385-390 Field Staff K. Mason, M. Faiella
 Date Oct 22/12 Time 14:25
 Weather conditions in previous 24 hrs Sunny, 15°C
 GPS Coordinates (Zone) 17T E 0622190 N 4757736 Datum NAD83
 Descriptive Location off of side road 44 south of 9-110201

Water Quality

Dissolved Oxygen (mg/L) 7.50 pH 7.66 Conductivity (µS/cm) 3470
 Water Temperature (°C) 11.35 Air Temperature (°C) 18°C
 Time *in situ* measurements taken 14:30

→ water quality is from pooled culvert

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth rest is dry (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable - well vegetated

Standing water @ culvert

Substrate (% cover)

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

In-water Cover

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

RCG

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 15% small trees, intermediate

Adjacent Land Use

agricultural fields, road

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) dry channel / thick vegetation

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. standing water at culvert, however dry for the rest

Field Notes Authored by K. Mason

Field Notes QA/QCed by mf



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 11-3 Project Name Niagara Wind
 Watercourse Name unnamed tributary Project # 11.0950269
 Photos 394-398 Field Staff K. Masan M. Farella
 Date Oct 22/12 Time 14:50

Weather conditions in previous 24 hrs sunny, 15°C
 GPS Coordinates (Zone) 17T E 0623924 N 4750842 Datum NAD83
 Descriptive Location off of Wellandport Road, south of concession 5, North of Hwy 3

Water Quality

Dissolved Oxygen (mg/L) _____ pH dry Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 15°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability vegetated stable banks - well

Substrate (% cover)

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

In-water Cover

Cover Types Present (circle):
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) 85%
 Adjacent Land Use ag. fields, road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
 Migratory Obstructions (seasonal, permanent) _____
 Note any fish observations dry 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. Waterbody on east side of road, grassed swale on west

Field Notes Authored by K. Masan Field Notes QA/QCed by MP



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # 12-2 Project Name Niagara Wind
 Watercourse Name unnamed Trib. Project # 160930269
 Photos 408-413 Field Staff K. Mason, M. Fairella
 Date Oct 23/12 Time 9:25
 Weather conditions in previous 24 hrs Sunny, 18°C
 GPS Coordinates (Zone) 17 E 0623228 N 4754513 Datum NAD83
 Descriptive Location off of Jenny Jump Road alongside corn field west of Tawline Road

Water Quality
 Dissolved Oxygen (mg/L) 8.21 pH 8.88 Conductivity (µS/cm) 253
 Water Temperature (°C) 11.48 Air Temperature (°C) 10°C
 Time *in situ* measurements taken 9:35

Watercourse Dimensions & Morphology
 Mean Watercourse Width 2 (m) Maximum Pool Depth 25 (cm)
 Mean Bankfull Width 6 (m) Mean Water Depth 20 (cm)
 % Riffle 100 % Pool 0 % Run 0 % Flat 0
 Evidence of eroding banks, Comments on bank stability some erosion & scouring

Substrate (% cover)
 Bedrock 0 Cobble 0 Sand 40 Silt 10 Muck 0
 Boulder 0 Gravel 40 Clay 0 Marl 10 Detritus 0

In-water Cover
 Cover Types Present (circle): 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) 20% grasses & meadow species, early

Adjacent Land Use corn & unmaintained road

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

Migratory Obstructions (seasonal, permanent) low water

Note any fish observations none observed

Waterbody Notes
 Natural Watercourse 0 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. defined trapezoidal channel

Field Notes Authored by K. Mason Field Notes QA/QCed by M.F.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 13-4
Watercourse Name unnamed
Photos 414-419
Date Oct 23/12

Project Name Niagara Wind
Project # 160950269
Field Staff K. Mason, M. Faiella
Time 9:45

Weather conditions in previous 24 hrs Sunny, 18°C
GPS Coordinates (Zone) 17T E 0624235 N 4753084 Datum Nad83
Descriptive Location off of Booker Road, west of Dunnville/Wainfleet Townline

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 _____ (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width 9 (m) Mean Water Depth _____ (cm)
% Riffle _____ % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability Sand scouring

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 80 Silt 10 Muck _____
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) 100% RCG, early

Adjacent Land Use

ag field, road

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) none

Note any fish observations low water & thick vegetation
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. deeply defined channel
dominated by RCG
Riparian area consists of poplars, meadow sp., dogwood etc

Field Notes Authored by K. Mason Field Notes QA/QCed by M.P.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 13-5
Watercourse Name unnamed
Photos 420-423
Date Oct 23/12

Project Name Niagara wind
Project # 160950269
Field Staff K. Mason, M. Faella
Time 9:57

Weather conditions in previous 24 hrs Sunny, 18°C
GPS Coordinates (Zone) 17T E 0623722 N 4752888 Datum NAD83
Descriptive Location off of Booker Road west of 13-1 102012 & Dunnville/Wainfleet townline

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 _____ (m)~~ ~~Maximum Pool Depth _____ (cm)~~
~~Mean Bankfull Width 2.5 (m)~~ ~~Mean Water Depth _____ (cm)~~
~~_____ % Riffle~~ ~~_____ % Pool~~ ~~_____ % Run~~ ~~_____ % Flat~~
~~Evidence of eroding banks, Comments on bank stability stable banks - all vegetated.~~

Substrate (% cover)

~~Bedrock _____~~ ~~Cobble _____~~ ~~Sand _____~~ ~~Silt 100~~ ~~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)
80% meadow sp & Phragmites, early

Adjacent Land Use

ag. field, road, bushlot

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
dry & thick vegetation

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 1

Other Habitat Notes, Incidental Wildlife Observations, etc.

defined channel dominated by Phragmites. Riparian area consists of Phragmites, white pine, meadow species etc.

Field Notes Authored by K. Mason

Field Notes QA/QCed by md.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 13-6
 Watercourse Name unnamed Trib
 Photos 424-427
 Date Oct 23/12
 Weather conditions in previous 24 hrs Sunny 18°C
 GPS Coordinates (Zone) 17T E 0622258 N 4752708 Datum NAD83
 Descriptive Location off of Booker Road, west of 13-2 & 13-1, running along bushlot (to the N)

Project Name Niagara Wind
 Project # 160950269
 Field Staff K. Mason, M. Faiella
 Time 10:07

Water Quality
 Dissolved Oxygen (mg/L) not enough for YSI pH not enough for YSI Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 10°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width 1.5 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 2 (m) Mean Water Depth 10 (cm) standing H₂O
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability well vegetated.

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 80 Silt 10 Muck _____
 Boulder _____ Gravel _____ Clay _____ Marl 10 Detritus _____

In-water Cover
 Cover Types Present (circle): Undercut Banks Deep Pool Watercress
Overhanging Vegetation Woody Debris Boulder Other _____ Aquatic veg RCCG Typha

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 75% meadow species & poplars, intermediate
 Adjacent Land Use road, ag. field, bushlot

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings) none
 Migratory Obstructions (seasonal, permanent) low water
 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. waterbody on south side of Booker Road, non-waterbody on north side. Riparian area consists of poplars, Dogwoods, grasses, meadow species etc.

Field Notes Authored by K. Mason Field Notes QA/QCed by ML



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Station # 13-7

Watercourse Name unnamed trib

Photos 428-430

Date Oct 23/12

Weather conditions in previous 24 hrs Sunny, 18°C

GPS Coordinates (Zone) 17T E

Descriptive Location off of Dunnville/Wainfleet Tangle

Project Name Niagara Wind

Project # 160950269

Field Staff K. Maon, M. Faiella

Time 10:39

Datum NAD83

0624592 N 4752861

South of Booker Road

Water Quality

Dissolved Oxygen (mg/L) 8.50

pH 8.32 Conductivity ($\mu\text{S}/\text{cm}$) 1058

Water Temperature ($^{\circ}\text{C}$) 11.69

Air Temperature ($^{\circ}\text{C}$) 10°C

Time in situ measurements taken 10:41

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m)

Maximum Pool Depth 25 (cm)

Mean Bankfull Width 6 (m)

Mean Water Depth 10 (cm)

0 % Riffle 0 % Pool

0 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability well vegetated - stable

Substrate (% cover)

Bedrock 0 Cobble 0 Sand 60 Silt 0 Muck 0
Boulder 0 Gravel 40 Clay 0 Marl 0 Detritus 0

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) < 5%, meadow species & sumac, early

Adjacent Land Use

ag. land, road, rural residential

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) potential spawning for cyprinid sp.

Migratory Obstructions (seasonal, permanent) low water

Note any fish observations none observed

Waterbody Notes

Natural Watercourse 0 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. deeply incised channel
surrounded by meadow/riparian vegetation. lots of
Duckweed

Field Notes Authored by K. Maon

Field Notes QA/QCed by mf.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 13-8
 Watercourse Name unnamed
 Photos 431-435
 Date Oct 23/12
 Weather conditions in previous 24 hrs Sunny 15°C
 GPS Coordinates (Zone) 17T E 0624976
 Descriptive Location off of Peth Road, west of Dunnville / Wainfleet Taxline

Project Name Niagara Wind
 Project # 160950269
 Field Staff K. Mason, M. Favella
 Time 10:50

Water Quality

Dissolved Oxygen (mg/L) 9.13 pH 8.74 Conductivity (μ S/cm) 273-
 Water Temperature ($^{\circ}$ C) 11.92 Air Temperature ($^{\circ}$ C) 10°C
 Time *in situ* measurements taken 10:55

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 30 (cm) *standing H₂O*
 Mean Bankfull Width 4 (m) Mean Water Depth 20 (cm)
 % Riffle _____ % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability stable banks - well vegetated

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 60%

Adjacent Land Use meadow sp & pine, intermediate road, ag field

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) _____

Note any fish observations low water, thick grasses, 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. Riparian area consist of meadow sp, pine, poplars, dogwood & willow sp.

Field Notes Authored by K. Mason Field Notes QA/QCed by mf



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 14-6
 Watercourse Name unnamed
 Photos 440-444
 Date Oct 23/12
 Weather conditions in previous 24 hrs Sunny, 18°C
 GPS Coordinates (Zone) 17T E 0625305 N 4751761 Datum NAD83
 Descriptive Location off of Dunnville/Wainfleet townline, south of 13-5102013 & Poth Road.

Project Name Niagara Wind
 Project # 12-000 160950269
 Field Staff K. Mason, M. Failla
 Time 11:16

Water Quality

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

out of Right-of-way

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 30 (cm) standing water
 Mean Bankfull Width 2.5 (m) Mean Water Depth 25 (cm) water
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable banks - well vegetated

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 75% scrubland & grasses, early

Adjacent Land Use

road, ag. field

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) thick vegetation, low water

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.

Water body on east side of Dunnville/Wainfleet townline, non-water body on west side.

Field Notes Authored by K. Mason

Field Notes QA/QCed by m.p.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 15-3
 Watercourse Name unnamed
 Photos 445-449
 Date Oct 23/12
 Weather conditions in previous 24 hrs Sunny, 18°C
 GPS Coordinates (Zone) 17T E 0625873 N 4750847 Datum Nad83
 Descriptive Location off of Dunnville/Wainfleet Townline
N of intersection w/ Canal bank rd.

Project Name Niagara Wind
 Project # 160950269
 Field Staff K. Mason, M. Fairlie
 Time 11:32

Water Quality

Dissolved Oxygen (mg/L) 9.73 pH 8.38 Conductivity (µS/cm) 608
 Water Temperature (°C) 12.77 Air Temperature (°C) 10°C
 Time *in situ* measurements taken 11:33

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 25 (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 15 (cm) *standing H₂O*
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable banks - well vegetated

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
95%, Typha, early

Adjacent Land Use

canal, road, corn

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
low water, thick vegetation

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. Trapezoidal defined channel dominated by cattails.

Field Notes Authored by K. Mason

Field Notes QA/QCed by mf



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 15-4

Project Name Niagara Wind

Watercourse Name unnamed

Project # 160950269

Photos 452-454

Field Staff K. Mason, M. Farrell

Date Oct 23/12

Time 11:52

Weather conditions in previous 24 hrs Sunny, 18°C

GPS Coordinates (Zone) 17T E 0625245 N 4750584 Datum NAD83

Descriptive Location off of Canal Bank rd, west of Dunnville
Wainfleet Townline

Water Quality

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

Water Temperature (°C) _____ Air Temperature (°C) 10°C

Time *in situ* measurements taken _____

off of Right-away (no access)

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m)

Maximum Pool Depth 20 (cm)

Mean Bankfull Width 4.5 (m)

Mean Water Depth 15 (cm)

% Riffle _____

% Pool _____

% Run 100

% Flat _____

Evidence of eroding banks, Comments on bank stability stable banks -
all grassed

Substrate (% cover)

Bedrock _____

Cobble _____

Sand 80

Silt 10

Muck _____

Boulder _____

Gravel 10

Clay _____

Marl _____

Detritus _____

In-water Cover

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

Riparian Zone

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

12% grasses & typha, early

Adjacent Land Use

road, residential

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none

Migratory Obstructions (seasonal, permanent)

low water

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. mowed grass up to
channel edge, very defined channel

Field Notes Authored by K. Mason

Field Notes QA/QCed by M.P.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 15-5
Watercourse Name unnamed
Photos 455-456
Date Oct 23/12

Project Name Niagara Wind
Project # 100950269
Field Staff K. Moran, M. Faiella
Time 12:03

Weather conditions in previous 24 hrs Sunny 18°C
GPS Coordinates (Zone) 17T E 0624439 N 4750255 Datum NAD83
Descriptive Location off of Hutchinson Road, west of Canal Bank Rd # 15-2

Water Quality

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

off the right away (no access)

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width 4 (m) Mean Water Depth _____ (cm)
% Riffle _____ % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability well vegetated

Substrate (% cover)

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

can't investigate

In-water Cover

Cover Types Present (circle): 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) 15% forest, mature

Adjacent Land Use

ag field, canal

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) low 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.

Riparian area consists of mature trees & small shrubs has a well defined channel

Field Notes Authored by K. Moran Field Notes QA/QCed by m.f.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Non REA

Stantec

Station # 1-2 Project Name Niagara Wind
 Watercourse Name unknown Project # 16095026.9
 Photos _____ Field Staff R. Clayton, J. Keene
 Date June 22/12 Time 11:10
 Weather conditions in previous 24 hrs hot & humid ~ 32°C
 GPS Coordinates (Zone) 17T E 0622161 N 4782044 Datum NAD83
 Descriptive Location North of intersection of Greenlane & Mountcharley Road.

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) 32°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)
scrubby vegetation
 Adjacent Land Use Residential, farmland, road.

Fish Habitat Potential

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

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by R. Clayton Field Notes QA/QCed by JK



REA

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 1-3 Project Name Niagara Wind
 Watercourse Name unknown Project # 100950269
 Photos _____ Field Staff J. Greene, K. Clayton
 Date June 22/13 Time 11:15
 Weather conditions in previous 24 hrs hot & humid ~32°C
 GPS Coordinates (Zone) 17T E 0622116 N 478192 Datum NAD83
 Descriptive Location near intersection of Greenlane & Maintainview Road

Water Quality

Dissolved Oxygen (mg/L) 8.10 pH 8.70 Conductivity (µS/cm) 835
 Water Temperature (°C) 20.10 Air Temperature (°C) 32°C
 Time *in situ* measurements taken 11:16

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth 0.20 (cm)
 Mean Bankfull Width 2.5-3 (m) Mean Water Depth 0.15 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 15% trees, grasses, intermediate
 Adjacent Land Use Road, ag. land

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) potential trout spawning
 Migratory Obstructions (seasonal, permanent) almost dry channel
 Note any fish observations _____

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by K. Clayton Field Notes QA/QCed by JK



WIND FARM WATERBODY RAPID ASSESSMENT FORM

REA

Stantec

13-6 mp.

Station # 752

Project Name Niagara Wind

Watercourse Name unknown

Project # 160958269

Photos see photo log

Field Staff ME, MF

Date June 20/12

Time 10:05

Weather conditions in previous 24 hrs hot & humid

GPS Coordinates (Zone) 17T E 0623260 N 4752701 Datum Nad83

Descriptive Location On Booker Rd ~ 1km west of Townline Dunn/Wain

Water Quality

Dissolved Oxygen (mg/L) 5.56 pH 7.90 Conductivity (µS/cm) 498

Water Temperature (°C) 21.57 Air Temperature (°C) 29°C

Time *in situ* measurements taken 10:10

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.75 (m) Maximum Pool Depth 20 (cm)

Mean Bankfull Width 30 (m) Mean Water Depth 15 (cm)

% Riffle 50 % Pool 50 % Run 50 % Flat

Evidence of eroding banks, Comments on bank stability none. well veget'd

Substrate (% cover)

Bedrock 0 Cobble 0 Sand 40 Silt 40 Muck

Boulder 0 Gravel 20 Clay 0 Marl 0 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks 0 Deep Pool 0 Watercress 0 Aquatic Veg

Overhanging Vegetation Woody Debris 0 Boulder 0 Other 0

Riparian Zone

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

70% mature / immature poplars, willow, shrubs.

Adjacent Land Use

ag. rd.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn, foraging, nursery

Migratory Obstructions (seasonal, permanent)

lack of water

Note any fish observations school of yoy of possible brook stickleback.

Waterbody Notes

Natural Watercourse 0 Trapezoidal Channel Grassed Swale 0 Buried Tile 0

Surficial Drainage (i.e. furrows) 0 Dugout Pond 0 Dominated by Aquatic Veg Dry 0

Other Habitat Notes, Incidental Wildlife Observations, etc. Song bird sp.

Field Notes Authored by ME

Field Notes QA/QCed by MEE



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 13-6

Project Name Niagara Wind

Watercourse Name unnamed Trib

Project # 160950269

Photos 424-427

Field Staff K. Mason, M. Faiella

Date Oct 23/12

Time 10:07

Weather conditions in previous 24 hrs Sunny 18°C

GPS Coordinates (Zone) 17T E 0622258 N 4752708 Datum NAD83

Descriptive Location off of Booker Road, west of 13-2 #13-1, running along bushlot (to the N)

Water Quality

Dissolved Oxygen (mg/L) not enough for YSI pH Conductivity (µS/cm)

Water Temperature (°C) Air Temperature (°C) 10°C

Time in situ measurements taken

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 15 (cm)

Mean Bankfull Width 2 (m) Mean Water Depth 10 (cm) standing H₂O

 % Riffle % Pool % Run % Flat

Evidence of eroding banks, Comments on bank stability well vegetated

Substrate (% cover)

Bedrock	Cobble	Sand	Silt	Muck
Boulder	Gravel	Clay	Marl	Detritus
		<u>80</u>	<u>10</u>	

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 75% meadow species & poplars, intermediate

Adjacent Land Use road, ag field, bushlot

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent) low water

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. waterbody on south side of Booker Road, non-waterbody on north side - reach 75-2 riparian area consists of poplars, Dogwood, grasses, meadow species etc.

Field Notes Authored by K. Mason Field Notes QA/QCed by ML



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

~~No longer in Proj. Lockout~~

REA

X

Station # 16-3
Watercourse Name unknown
Photos _____
Date June 21/12

Project Name Niagara Wind
Project # 160958269
Field Staff J. Keene, Kelly Clayton
Time 9:54

Weather conditions in previous 24 hrs _____
GPS Coordinates (Zone) 17T E 617946 N 4769975 Datum Nad83
Descriptive Location off of Port Davidson Road, south of 16-2, North of Sixteen Rd

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) 30°C
Time *in situ* measurements taken _____

-no water

Watercourse Dimensions & Morphology

Mean Watercourse Width _____ (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width 3 (m) Mean Water Depth _____ (cm)
% Riffle _____ % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

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

In-water Cover

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

RCG

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100%, RCG, early
Adjacent Land Use residential, farmland

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) _____
Migratory Obstructions (seasonal, permanent) _____
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.

narrow channel full of Reed Canary grass & a little typha - no water

Field Notes Authored by K. Clayton Field Notes QA/QCed by ME

Appendix D

DFO Operational Statements



HIGH-PRESSURE DIRECTIONAL DRILLING

Fisheries and Oceans Canada
Ontario Operational Statement

Version 3.0

For the purpose of this Operational Statement, the term High-Pressure Directional Drilling (HPDD) means trenchless methods of crossing a watercourse using pressurized mud systems. HPDD is used to install cables and pipelines for gas, telecommunications, fibre optics, power, sewer, oil and water lines underneath watercourses and roads. This method is preferable to open-cut and isolated crossings since the cable or pipeline is drilled underneath the watercourse with very little disturbance to the bed or banks. HPDD involves drilling a pilot bore hole underneath the watercourse towards a surface target, back-reaming the bore hole to the drill rig while pulling the pipe along through the hole. This process typically uses the freshwater gel mud system composed of a mixture of clean, freshwater as the base, bentonite (clay-based drilling lubricant) as the viscosifier and synthetic polymers.

The general order of preference for carrying out a cable or pipeline stream crossing in order to protect fish and fish habitat is: a) a punch or bore crossing (see *Punch & Bore Crossings* Operational Statement), b) HPDD crossing, c) dry open-cut crossing, and d) isolated open-cut crossing (see *Isolated or Dry Open-cut Stream Crossings* Operational Statement). This order must be balanced with practical considerations at the site.

One of the risks associated with HPDD is the escape of drilling mud into the environment as a result of a spill, tunnel collapse or the rupture of mud to the surface, commonly known as “frac-out”. A frac-out is caused when excessive drilling pressure results in drilling mud propagating toward the surface. The risk of a frac-out can be reduced through proper geotechnical assessment practices and drill planning and execution. The extent of a frac-out can be limited by careful monitoring and having appropriate equipment and response plans ready in the event that one occurs. HPDD can also result in excessive disturbance of riparian vegetation and sedimentation and erosion due to operation of equipment on the shoreline or fording to access the opposite bank.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your

high-pressure directional drill project without a DFO review when you meet the following conditions:

- the crossing technique will not damage the stream bed and thereby negatively impact fish or fish habitat,
- the crossing is not a wet open-cut crossing,
- you have an emergency frac-out response plan and a contingency crossing plan in place that outline the protocol to monitor, contain and clean-up a potential frac-out and an alternative method for carrying out the crossing, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when High-Pressure Directional Drilling* listed below in this Operational Statement.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list) or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain an opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact one of the agencies listed above.

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Ontario Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when High-Pressure Directional Drilling

1. Use existing trails, roads or cut lines wherever possible, as access routes to avoid disturbance to the riparian vegetation.
2. Design the drill path to an appropriate depth below the watercourse to minimize the risk of frac-out and to a depth

to prevent the line from becoming exposed due to natural scouring of the stream bed. The drill entry and exit points are far enough from the banks of the watercourse to have minimal impact on these areas.

3. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to access the construction site. This removal should be kept to a minimum and within the road or utility right-of-way.
4. Machinery fording the watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. A *Temporary Stream Crossing* Operational Statement is also available.
 - 4.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.
 - 4.2. Grading of the stream banks for the approaches should not occur.
 - 4.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
 - 4.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Ontario In-Water Construction Timing Windows*).
 - 4.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
5. Operate machinery on land above the ordinary high water mark (see definition below) and in a manner that minimizes disturbance to the banks of the watercourse.
 - 5.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.
 - 5.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water.
 - 5.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
 - 5.4. Restore banks to original condition if any disturbance occurs.
6. Construct a dugout/settling basin at the drilling exit site to contain drilling mud to prevent sediment and other deleterious substances from entering the watercourse. If this cannot be achieved, use silt fences or other effective sediment and erosion control measures to prevent drilling mud from entering the watercourse. Inspect these measures regularly during the course of construction and make all necessary repairs if any damage occurs.
 - 6.1. Dispose of excess drilling mud, cuttings and other waste materials at an adequately sized disposal

facility located away from the water to prevent it from entering the watercourse.

7. Monitor the watercourse to observe signs of surface migration (frac-out) of drilling mud during all phases of construction.

Emergency Frac-out Response and Contingency Planning

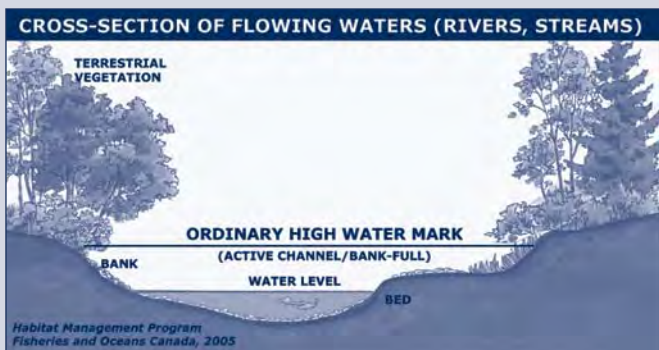
8. Keep all material and equipment needed to contain and clean up drilling mud releases on site and readily accessible in the event of a frac-out.
9. Implement the frac-out response plan that includes measures to stop work, contain the drilling mud and prevent its further migration into the watercourse and notify all applicable authorities, including the closest DFO office in the area (see Ontario DFO office list). Prioritize clean up activities relative to the risk of potential harm and dispose of the drilling mud in a manner that prevents re-entry into the watercourse.
10. Ensure clean up measures do not result in greater damage to the banks and watercourse than from leaving the drilling mud in place.
11. Implement the contingency crossing plan including measures to either re-drill at a more appropriate location or to isolate the watercourse to complete the crossing at the current location. See *Isolated or Dry Open-cut Stream Crossings* Operational Statement for carrying out an isolated trenched crossing.
12. Stabilize any waste materials removed from the work site to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with preferably native grass or shrubs.
13. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 13.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Definition:

Ordinary high water mark – The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial

vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

For the Great Lakes this refers to the 80th percentile elevation above chart datum as described in DFO's *Fish Habitat and Determining the High Water Mark on Lakes*.



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Thunder Bay and Kenora

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Aussi disponible en français

http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/epmp-pmpe/index_f.asp

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NOTIFICATION FORM

Fisheries and Oceans Canada
Ontario Operational Statement

Version 3.1

PROPONENT INFORMATION

NAME: STREET ADDRESS:
CITY/TOWN: PROVINCE/TERRITORY: POSTAL CODE:
TEL. NO. (RESIDENCE): TEL. NO. (WORK):
FAX NO: EMAIL ADDRESS:

CONTRACTOR INFORMATION (provide this information if a Contractor is working on behalf of the Proponent)

NAME: STREET ADDRESS:
CITY/TOWN: PROVINCE/TERRITORY: POSTAL CODE:
TEL. NO. (RESIDENCE): TEL. NO. (WORK):
FAX NO: EMAIL ADDRESS:

PROJECT INFORMATION

Select Operational Statements that are being used (check all applicable boxes):

- | | | |
|---|---|---|
| <input type="checkbox"/> Beach Creation for Residential Use | <input type="checkbox"/> Ice Bridges and Snow Fills | <input type="checkbox"/> Public Beach Maintenance |
| <input type="checkbox"/> Beaver Dam Removal | <input type="checkbox"/> Isolated Pond Construction | <input type="checkbox"/> Punch & Bore Crossings |
| <input type="checkbox"/> Bridge Maintenance | <input type="checkbox"/> Isolated or Dry Open-cut Stream Crossings | <input type="checkbox"/> Routine Maintenance Dredging |
| <input type="checkbox"/> Clear-Span Bridges | <input type="checkbox"/> Maintenance of Riparian Vegetation in Existing Rights-of-Way | <input type="checkbox"/> Submerged Log Salvage |
| <input type="checkbox"/> Culvert Maintenance | <input type="checkbox"/> Mineral Exploration Activities | <input type="checkbox"/> Temporary Stream Crossing |
| <input type="checkbox"/> Dock and Boathouse Construction | <input type="checkbox"/> Moorings | <input type="checkbox"/> Underwater Cables |
| <input type="checkbox"/> High-Pressure Directional Drilling | <input type="checkbox"/> Overhead Line Construction | |

Select the type of water body or watercourse at or near your project:

- | | | |
|---|---|----------------------------------|
| <input type="checkbox"/> River, Stream, Creek | <input type="checkbox"/> Marine (Ocean or Sea) | <input type="checkbox"/> Estuary |
| <input type="checkbox"/> Lake (8 hectares or greater) | <input type="checkbox"/> Pond or wetland (pond is less than 8 hectares) | |

PROJECT LOCATION (S) (fill out this section if the project location is different from Proponent Information; append multiple project locations on an additional sheet if necessary)

Name of water body or watercourse	Coordinates of the Project (UTM co-ordinate or Degrees, Minutes, Seconds), if available Easting: Northing: Latitude: Longitude:
Legal Description (Plan, Block, Lot, Concession, Township)	Directions to Access the Project Site (i.e., Route or highway number, etc.)
Proposed Start Date (YYYY/MM/DD):	Proposed Completion Date (YYYY/MM/DD):

We ask that you notify DFO, preferably 10 working days before starting your work, by filling out and sending in, by mail or by fax, this notification form to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to the Operational Statement.

I, _____ (print name) certify that the information given on this form is, to the best of my knowledge, correct and complete.

Signature _____ Date _____

Note: If you cannot meet all of the conditions and cannot incorporate all of the measures in the Operational Statement then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list), or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain more information on the possible options you should consider to avoid contravention of the *Fisheries Act*. For activities carried out under the *Crown Forest Sustainability Act*, the requirements of the applicable Operational Statements are addressed through an existing agreement and the Ontario Ministry of Natural Resources is the first point of contact.

Information about the above-noted proposed work or undertaking is collected by DFO under the authority of the *Fisheries Act* for the purpose of administering the fish habitat protection provisions of the *Fisheries Act*. Personal information will be protected under the provisions of the *Privacy Act* and will be stored in the Personal Information Bank DFO-SCI-605. Under the *Privacy Act*, individuals have a right to, and on request shall be given access to, any personal information about them contained in a personal information bank. Instructions for obtaining personal information are contained in the Government of Canada's Info Source publications available at www.infosource.gc.ca or in Government of Canada offices. Information other than "personal" information may be accessible or protected as required by the provisions of the *Access to Information Act*.

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Fax: (807) 346-8545
Email: ReferralsThunderBay@DFO-MPO.GC.CA

Aussi disponible en français

http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/epmp-pmpe/index_f.asp



ISOLATED OR DRY OPEN-CUT STREAM CROSSINGS

Fisheries and Oceans Canada
Ontario Operational Statement

Version 1.0

For the purpose of this Operational Statement, the term “Isolated Crossing” means a temporary stream crossing technique that allows work (e.g., trenched pipeline or cable installation) to be carried out “in-the-dry” while diverting the natural flow around the site during construction. These types of open trenched crossings are isolated using flume or dam and pump techniques (see *Pipeline Associated Watercrossings*, 2005 at http://www.capp.ca/default.asp?V_DOC_ID=763&PubID=96717).

The term “Dry Open-cut Stream Crossing” means a temporary stream crossing work (e.g., trenched pipeline or cable installation) that is carried out during a period when the entire stream width is seasonally dry or is frozen to the bottom.

The risks to fish and fish habitat associated with *isolated* open cut stream crossings include the potential for direct damage to substrates, release of excessive sediments, loss of riparian habitat, stranding of fish in dewatered areas, impingement/entrainment of fish at pump intakes, and disruption of essential fish movement patterns. Similarly, *dry* open-cut stream crossings pose a risk to fish and fish habitat due to potential harmful alteration of substrates, loss of riparian habitat, and release of excessive sediment once stream flows resume.

The order of preference for carrying out a cable or pipeline stream crossing, in order to protect fish and fish habitat, is: a) punch or bore crossing (see *Punch & Bore Crossings* Operational Statement); b) high-pressure directional drill crossing (see *High-Pressure Directional Drilling* Operational Statement); c) *dry* open-cut crossing; and d) *isolated* open-cut crossing. This order must be balanced with practical considerations at the site.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your isolated or dry open-cut stream crossing project without a DFO review when you meet the following conditions:

- if working within the Thames River, Sydenham River, Ausable River, Grand River, or Maitland River, you have contacted your Conservation Authority or local DFO Office (see Ontario

DFO office list) to ensure that your project will not impact Schedule I mussel species at risk under the federal *Species at Risk Act* (SARA), before proceeding,

- for dry, open-cut crossings the watercourse is dry or frozen completely to the bottom at the site,
- for isolated crossings, the channel width of the watercourse at the crossing site is less than 5 meters from ordinary high water mark to ordinary high water mark (HWM) (see definition below),
- the isolated crossing does not involve the construction or use of an off-stream diversion channel, or the use of earthen dams,
- the isolated crossing ensures that all natural upstream flows are conveyed downstream during construction, with no change in quality or quantity,
- the site does not occur at a stream location involving known fish spawning habitat, particularly if it is dependent on groundwater upwelling,
- the use of explosives is not required to complete the crossing, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated or Dry Open-cut Stream Crossing* listed below.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list) or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain an opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial and federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with SARA (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact one of the agencies listed above.

We ask that you notify DFO, preferably 10 working days before starting your work, by filling out and sending the Ontario Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-oo/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated or Dry Open-Cut Stream Crossing

1. Use existing trails, roads or cut lines wherever possible, as access routes to avoid disturbance to the riparian vegetation.
2. Locate crossings at straight sections of the stream, perpendicular to the banks, whenever possible. Avoid crossing on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in the erosion and scouring of the stream bed.
3. Complete the crossing in a manner that minimizes the duration of instream work.
4. Construction should be avoided during unusually wet, rainy or winter thaw conditions.
5. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to access the construction site. This removal should be kept to a minimum and within the utility right-of-way.
6. Machinery fording a flowing watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and is to occur only if an existing crossing at another location is not available or practical to use. Operational Statements are also available for *Ice Bridges and Snow Fills*, *Clear-Span Bridges*, and *Temporary Stream Crossing*.
 - 6.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.
 - 6.2. Grading of the stream banks for the approaches should not occur.
 - 6.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation is likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
 - 6.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Ontario In-Water Construction Timing Windows*).
 - 6.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
7. Operate machinery in a manner that minimizes disturbance to the watercourse bed and banks.
 - 7.1. Protect entrances at machinery access points (e.g., using swamp mats) and establish single site entry and exit.
 - 7.2. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.

- 7.3. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent deleterious substances from entering the water.
- 7.4. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.

8. Install effective sediment and erosion control measures before starting work to prevent entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
9. Stabilize any waste materials removed from the work site, above the HWM, to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.
10. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent soil erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 10.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Measures to Protect Fish and Fish Habitat when Carrying Out an Isolated Crossing

Temporary isolation is used to allow work “in-the-dry” while maintaining the natural downstream flow by installing dams up and downstream of the site and conveying all of the natural upstream flow into a flume, or pumping it around the isolated area. In addition to measures 1 to 10, the following measures should be carried out when conducting an isolated stream crossing:

11. Time isolated crossings to protect sensitive fish life stages by adhering to fisheries timing windows (see Measure 6.4).
12. Use dams made of non-earthen material, such as water-inflated portable dams, pea gravel bags, concrete blocks, steel or wood wall, clean rock, sheet pile or other appropriate designs, to separate the dewatered work site from flowing water.
 - 12.1. If granular material is used to build dams, use clean or washed material that is adequately sized (i.e., moderately sized rock and not sand or gravel) to withstand anticipated flows during the construction. If necessary, line the outside face of dams with heavy poly-plastic to make them impermeable to water. Material to build these dams should not be taken from below the HWM of any water body.
 - 12.2. Design dams to accommodate any expected high flows of the watercourse during the construction period.

13. Before dewatering, rescue any fish from within the isolated area and return them safely immediately downstream of the worksite.

13.1. You will require a permit from DFO to relocate any aquatic species that are listed as either endangered or threatened under SARA. Please contact your Conservation Authority or the DFO office in your area to determine if an aquatic species at risk is in the vicinity of your project and, if appropriate, use the DFO website at www.dfo-mpo.gc.ca/species-especies/permits/sarapermits_e.asp to apply for a permit.

14. Pump sediment laden dewatering discharge into a vegetated area or settling basin, and prevent sediment and other deleterious substances from entering any water body.

15. Remove accumulated sediment and excess spoil from the isolated area before removing dams.

16. Stabilize the **streambed** and restore the original channel shape, bottom gradient and substrate to pre-construction condition before removing dams.

17. Ensure **banks** are stabilized, restored to original shape, adequately protected from erosion and re-vegetated, preferably with native species.

18. If rock is used to stabilize banks, it should be clean, free of fine materials, and of sufficient size to resist displacement during peak flood events. The rock should be placed at the original stream bank grade to ensure there is no infilling or narrowing of the watercourse.

19. Gradually remove the downstream dam first, to equalize water levels inside and outside of the isolated area and to allow suspended sediments to settle.

20. During the final removal of dams, restore the original channel shape, bottom gradient and substrate at these locations.

21. Pumped Diversion

Pumped diversions are used to divert water around the isolated area to maintain natural downstream flows and prevent upstream ponding.

21.1. Ensure intakes are operated in a manner that prevents streambed disturbance and fish mortality. Guidelines to determine the appropriate mesh size for intake screens may be obtained from DFO (e.g., *Freshwater Intake End-of-Pipe Fish Screen Guideline* (1995), available at www.dfo-mpo.gc.ca/Library/223669.pdf).

21.2. Ensure the pumping system is sized to accommodate any expected high flows of the watercourse during the construction period. Pumps should be monitored at all times, and back-up pumps should be readily available on-site in case of pump failure.

21.3. Protect pump discharge area(s) to prevent erosion and the release of suspended sediments downstream, and remove this material when the works have been completed.

Measures to Protect Fish and Fish Habitat when Carrying Out a Dry Open-Cut Stream Crossing

In addition to measures 1 to 10, the following measures should be carried out when conducting a dry open-cut stream crossing:

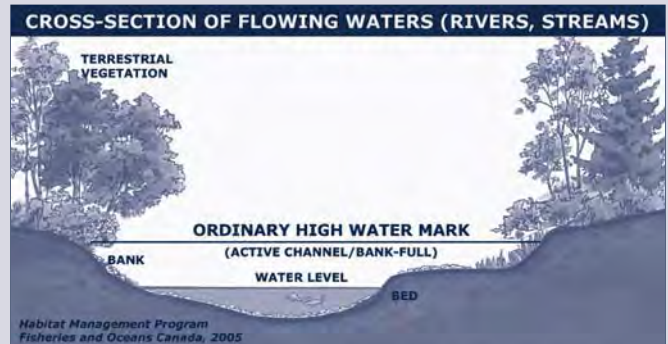
22. Stabilize the **streambed** and restore the original channel shape, bottom gradient and substrate to pre-construction condition.

23. Ensure **banks** are stabilized, restored to original shape, adequately protected from erosion and re-vegetated, preferably with native species.

Definition:

Ordinary high water mark (HWM) - The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the "active channel/bank-full level" which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

For the Great Lakes this refers to the 80th percentile elevation above chart datum as described in DFO's Fish Habitat and Determining the High Water Mark on Lakes.



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OVERHEAD LINE CONSTRUCTION

Fisheries and Oceans Canada Ontario Operational Statement

Version 3.0

Overhead lines are constructed for electrical or telecommunication transmission across many watercourses that range in size from small streams and ponds to large rivers, lakes and reservoirs. This Operational Statement applies to selective removal of vegetation along the right-of-way to provide for installation and safe operation of overhead lines, and passage of equipment and materials across the water body.

Although fish habitat occurs throughout a water system, it is the riparian habitat that is most sensitive to overhead line construction. Riparian vegetation occurs adjacent to the watercourse and directly contributes to fish habitat by providing shade, cover, and spawning and food production areas. It is important to design and build your overhead line project to meet your needs while also protecting riparian areas. Potential impacts to fish and fish habitat include excessive loss of riparian vegetation, erosion and sedimentation resulting from bank disturbance and loss of plant root systems, rutting and compaction of stream substrate at crossing sites, and disruption of sensitive fish life stages.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your overhead line project without a DFO review when you meet the following conditions:

- it does not require the construction or placement of any temporary or permanent structures (e.g. islands, poles, crib works, etc.) below the ordinary high water mark (HWM) (see definition below), and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Constructing Overhead Lines* listed below in this Operational Statement.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case,

you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list) or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain an opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact one of the agencies listed above.

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Ontario Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-ao/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Constructing Overhead Lines

1. Installing overhead lines under frozen conditions is preferable in all situations. On wet terrains (e.g., bogs), lines should be installed under frozen conditions, where possible, or using aerial methods (i.e., helicopter).
2. Design and construct approaches so that they are perpendicular to the watercourse wherever possible to minimize loss or disturbance to riparian vegetation.
3. Avoid building structures on meander bends, braided streams, alluvial fans, active floodplains or any other area that is inherently unstable and may result in erosion and scouring of the stream bed or overhead line structures.
 - 3.1. Wherever possible, locate all temporary or permanent structures, such as poles, sufficiently above the HWM to prevent erosion.
4. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to accommodate the overhead line. This removal

should be kept to a minimum and within the road or utility right-of-way.

5. Machinery fording the watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. A *Temporary Stream Crossing Operational Statement* is also available.

5.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.

5.2. Grading of the stream banks for the approaches should not occur.

5.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation is likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.

5.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Ontario In-Water Construction Timing Windows*).

5.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.

6. Operate machinery on land and in a manner that minimizes disturbance to the banks of the watercourse.

6.1. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.

6.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water.

6.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.

6.4. Restore banks to original condition if any disturbance occurs.

7. Install effective sediment and erosion control measures before starting work to prevent entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.

7.1. Avoid work during wet, rainy conditions or use alternative techniques such as aerial methods (i.e., helicopter) to install overhead lines.

8. Stabilize any waste materials removed from the work site to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.

9. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g.,

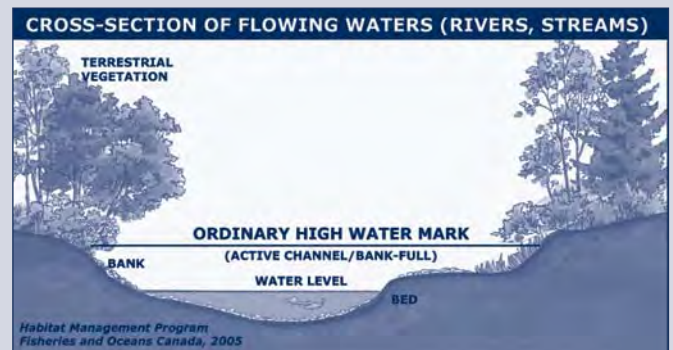
cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.

9.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Definition:

Ordinary high water mark (HWM) – The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank-full level” which is often the 1:2 year flood return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

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PUNCH & BORE CROSSINGS

Fisheries and Oceans Canada
Ontario Operational Statement

Version 3.0

For the purpose of this Operational Statement, the term punch and bore refers to a trenchless crossing method which involves the excavation of a vertical bell hole or shallow depression on either side of the watercourse. Horizontal punching or boring between the two points, at an appropriate depth below the watercourse, completes the creation of a passage-way for the crossing. Punch and bore crossings allow cables and pipelines to be installed under watercourses without imparting any disturbance to the bed and banks. Punch and bore crossings differ from high-pressure directional drilled crossings, in that no pressurized mud systems are required, thereby avoiding the risk of sediment release due to frac-out.

Punch and bore crossings can negatively impact fish and fish habitat due to erosion and sedimentation from site disturbance and dewatering of bell holes or the collapse of the punch or bore hole under the stream. Disturbing riparian vegetation can reduce important shoreline cover, shade and food production areas. Machinery fording the stream can disturb bottom and bank substrates, disrupt sensitive fish life stages, and introduce deleterious substances if equipment is not properly maintained. Impacts can be reduced if an emergency response plan and clean-up materials are in place.

The general order of preference for carrying out a cable or pipeline stream crossing in order to protect fish and fish habitat is: a) a punch or bore crossing, b) high-pressure directional drill crossing (see *High-Pressure Directional Drilling Operational Statement*), c) dry open-cut crossing, and d) isolated open-cut crossing (see *Isolated or Dry Open-cut Stream Crossings Operational Statement*). This order must be balanced with practical considerations at the site.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat across Canada. Under the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out below you will be in compliance with subsection 35(1) of the *Fisheries Act*.

The purpose of this Operational Statement is to describe the conditions under which it is applicable to your project and the measures to be incorporated into your project in order to avoid negative impacts to fish habitat. You may proceed with your punch or bore crossing project without a DFO review when you meet the following conditions:

- the crossing is not a wet open-cut crossing,

- the crossing technique will not damage the stream bed or bank and thereby negatively impact fish or fish habitat,
- the site does not occur at a stream location involving known fish spawning habitat, particularly if it is dependent on groundwater upwelling, and
- you incorporate the *Measures to Protect Fish and Fish Habitat when Conducting Punch and Bore Crossings*, listed below.

If you cannot meet all of the conditions listed above and cannot incorporate all of the measures listed below then your project may result in a violation of subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact your Conservation Authority, or the DFO office in your area (see Ontario DFO office list) or Parks Canada if the project is located within its jurisdiction, including the Trent-Severn Waterway and the Rideau Canal, if you wish to obtain an opinion on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial or federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* (www.sararegistry.gc.ca). If you have questions regarding this Operational Statement, please contact one of the agencies listed above.

We ask that you notify DFO, preferably 10 working days before starting your work by filling out and sending the Ontario Operational Statement notification form (www.dfo-mpo.gc.ca/regions/central/habitat/os-oo/prov-terr/index_e.htm) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to this Operational Statement.

Measures to Protect Fish and Fish Habitat when Conducting Punch and Bore Crossings

1. A punch or bore crossing can be conducted at any time of the year provided there is not a high risk of failure and it does not require in-water activities such as machinery fording.
2. Design the punch or bore path for an appropriate depth below the watercourse to prevent the pipeline or cable from becoming exposed due to natural scouring of the stream bed.

3. While this Operational Statement does not cover the clearing of riparian vegetation, the removal of select plants may be necessary to access the construction site and to excavate the bell holes. This removal is to be kept to a minimum and within the utility right-of-way.
4. Install effective sediment and erosion control measures before starting work to prevent entry of sediment into the water body. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
5. Machinery fording the watercourse to bring equipment required for construction to the opposite side is limited to a one-time event (over and back) and should occur only if an existing crossing at another location is not available or practical to use. A *Temporary Stream Crossing Operational Statement* is also available.
 - 5.1. If minor rutting is likely to occur, stream bank and bed protection methods (e.g., swamp mats, pads) should be used provided they do not constrict flows or block fish passage.
 - 5.2. Grading of the stream banks for the approaches should not occur.
 - 5.3. If the stream bed and banks are steep and highly erodible (e.g., dominated by organic materials and silts) and erosion and degradation are likely to occur as a result of equipment fording, then a temporary crossing structure or other practice should be used to protect these areas.
 - 5.4. Time the one-time fording to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see the *Ontario In-Water Construction Timing Windows*).
 - 5.5. Fording should occur under low flow conditions and not when flows are elevated due to local rain events or seasonal flooding.
6. Operate machinery on land above the ordinary high water mark (HWM) (see definition below) and in a manner that minimizes disturbance to the banks of the watercourse.
 - 6.1. Machinery is to arrive on-site in a clean condition and is to be maintained free of fluid leaks.
 - 6.2. Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water.
 - 6.3. Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.
7. Excavate bell holes beyond the HWM, far enough away from any watercourse to allow containment of any sediment or deleterious substances above the HWM.
 - 7.1. When dewatering bell holes, remove suspended solids by diverting water into a vegetated area or settling basin, and prevent sediment and other deleterious substances from entering the watercourse.

- 7.2. Stabilize any waste materials removed from the work site (including bell holes) to prevent them from entering the watercourse. This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs.
- 7.3. After suitably backfilling and packing the bell holes, vegetate any disturbed areas (see Measure 11).
8. Monitor the watercourse to observe signs of malfunction during all phases of the work.
9. For the duration of the work, keep on-site and readily accessible, all material and equipment needed to contain and clean-up releases of sediment-laden water and other deleterious substances.
10. Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance. This plan is to include measures to:
 - a) stop work, contain sediment-laden water and other deleterious substances and prevent their further migration into the watercourse;
 - b) notify all applicable authorities in the area, including the closest DFO office;
 - c) promptly clean-up and appropriately dispose of the sediment-laden water and deleterious substances; and
 - d) ensure clean-up measures are suitably applied so as not to result in further alteration of the bed and/or banks of the watercourse.
11. Vegetate any disturbed areas by planting and seeding preferably with native trees, shrubs or grasses and cover such areas with mulch to prevent erosion and to help seeds germinate. If there is insufficient time remaining in the growing season, the site should be stabilized (e.g., cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring.
 - 11.1. Maintain effective sediment and erosion control measures until re-vegetation of disturbed areas is achieved.

Definition:

Ordinary high water mark (HWM) – The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to change the characteristics of the land. In flowing waters (rivers, streams) this refers to the “active channel/bank-full level” which is often the 1:2 year flood flow return level. In inland lakes, wetlands or marine environments it refers to those parts of the water body bed and banks that are frequently flooded by water so as to leave a mark on the land and where the natural vegetation changes from predominately aquatic vegetation to terrestrial vegetation (excepting water tolerant species). For reservoirs this refers to normal high operating levels (Full Supply Level).

For the Great Lakes this refers to the 80th percentile elevation above chart datum as described in DFO’s *Fish Habitat and Determining the High Water Mark on Lakes*.

Eastern Ontario District

Peterborough

Fisheries and Oceans Canada
501 Towerhill Road, Unit 102
Peterborough, ON K9H 7S3
Telephone: (705) 750-0269
Fax: (705) 750-4016
Email: ReferralsPeterborough@DFO-MPO.GC.CA

Prescott

Fisheries and Oceans Canada
401 King Street West
Prescott, ON K0E 1T0
Telephone: (613) 925-2865
Fax: (613) 925-2245
Email: ReferralsPrescott@DFO-MPO.GC.CA

Northern Ontario District

Parry Sound

Fisheries and Oceans Canada
28 Waubeek Street
Parry Sound, ON P2A 1B9
Telephone: (705) 746-2196
Fax: (705) 746-4820
Email: ReferralsParrySound@DFO-MPO.GC.CA

Sudbury and Sault Ste. Marie

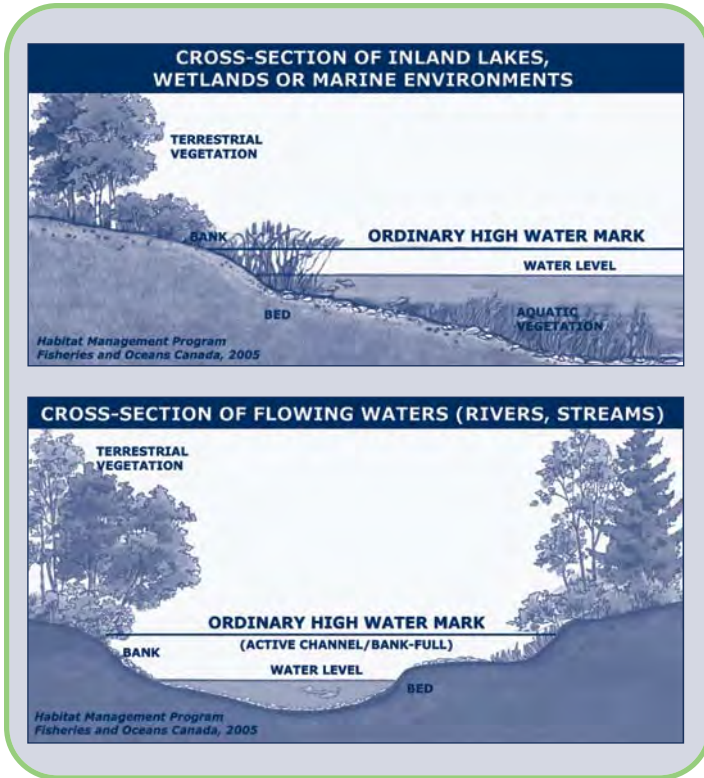
Fisheries and Oceans Canada
1500 Paris Street, Unit 11
Sudbury, ON P3E 3B8
Telephone: (705) 522-2816
Fax: (705) 522-6421
Email: ReferralsSudbury@DFO-MPO.GC.CA

Thunder Bay and Kenora

Fisheries and Oceans Canada
Thunder Bay Office
100 Main Street, Suite 425
Thunder Bay, ON P7B 6R9
Telephone: (807) 346-8118
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Aussi disponible en français

http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/epmp-pmpe/index_f.asp



FISHERIES AND OCEANS CANADA OFFICES IN ONTARIO

Southern Ontario District

Burlington

Fisheries and Oceans Canada
3027 Harvester Road, Suite 304
P.O. Box 85060
Burlington, ON L7R 4K3
Telephone: (905) 639-0188
Fax: (905) 639-3549
Email: ReferralsBurlington@DFO-MPO.GC.CA

London

Fisheries and Oceans Canada
73 Meg Drive
London, ON N6E 2V2
Telephone: (519) 668-2722
Fax: (519) 668-1772
Email: ReferralsLondon@DFO-MPO.GC.CA

Appendix E

Curricula vitae

Kathleen's experience is focused in aquatic biology, including stream, lake and wetland assessments, benthic macroinvertebrate identification and biomonitoring, and fisheries habitat studies. She has experience conducting environmental impact studies, environmental effects monitoring programs, baseline studies and watershed plans. Using ecosystem based approaches, typical multidisciplinary project involvement includes Class EAs and infrastructure siting/routing studies, evaluating alternative design concepts and developing mitigative solutions to minimize impacts to the natural environment.

Kathleen has acquired an understanding of federal and provincial legislation, policies and procedures for natural heritage features, particularly regarding working in and around fish habitat in Ontario. She is experienced in the Fisheries Act Authorization process, including evaluating the effects of development on aquatic habitat, designing fish habitat mitigation measures, and negotiating Fisheries Compensation Strategies. In addition, Kathleen serves as a team leader for aquatic science staff in Ontario, including professionals in the fields of fisheries biology, fluvial geomorphology, and aquatic invertebrate taxonomy.

EDUCATION

M.Sc., Watershed Ecosystems, Trent University,
Peterborough, Ontario, 2003

B.Sc. (Env.), Environmental Sciences, University of
Guelph, Guelph, Ontario, 1997

Certified in the Ecological Land Classification (ELC)
System for Southern Ontario, Ontario Ministry of Natural
Resources, Turkey Point, Ontario, 2000

Qualified Southern and Northern Ontario Wetlands
Evaluator, Ontario Ministry of Natural Resources, North
Bay, Ontario, 2000

Fisheries Assessment Specialist and Fisheries Contracts
Specialist, MTO/DFO/OMNR Fisheries Protocol Course,
Downsview, Ontario, 2006

Ontario Freshwater Mussel Identification Workshop /
Fisheries and Oceans Canada, Burlington, Ontario,
2008

Qualified Electrofishing Operator (Class 2), Ontario
Ministry of Natural Resources, Guelph, Ontario, 2010

MEMBERSHIPS

Member, North American Benthological Society

PROJECT EXPERIENCE

Environmental Assessments

Northwest Area Planning and Servicing Review,
Welland, Ontario* (Environmental Scientist)

Conducted a review of natural heritage features and identified development-related constraints in a newly designated urban area.

Willoughby Lands Golf Course Facility, Niagara Region,
Ontario* (Aquatic Ecologist)

Obtained Fisheries Act Authorization for development of a golf course facility. Supervised an underwater dive investigation to survey aquatic habitat along a series of alternative Niagara River water intake pipe alignments. The study lands also support habitat for a rare aquatic plant and an extensive program was proposed to ensure its protection. Environmental monitoring during construction was conducted.

* denotes projects completed with other firms

Kathleen R. O. Todd M.Sc.

Aquatic Ecologist / Project Manager

Municipal Water and Wastewater EAs, Various Sites, Ontario* (Aquatic Ecologist)

Evaluated natural heritage features in terms of ecological sensitivity and watermain and/or trunk sewer construction feasibility options (tunnel vs. open cut). Aquatic habitat conditions were assessed at all potential watercourse crossings and recommendations were provided regarding Fisheries Act requirements, construction mitigation measures and timing restrictions on in-water works. Also responsible for siting a chlorine booster station, surface water treatment plants and pumping stations, and mitigating impacts from emergency overflow of chlorinated water into adjacent watercourses.

Water and wastewater experience includes:

- City of Barrie, Surface Water Treatment Plant Class EA & Impact Assessment
- Region of Niagara (Point Abino), Water Supply Class EA
- Region of Peel (Brampton), West Brampton Reservoir, Pumping Station & Watermain Class EA
- Region of York (Etobicoke), Steeles Avenue West Forcemain Class EA
- Region of York (Markham), Southeast Collector Trunk Sewer Class EA

Natural Sciences & Heritage Resources

Environmental Impact Studies for Land Development, Various Sites, Ontario (Project Manager)

Assessed potential environmental impacts from land development proposals. Conducted ecological community inventories in watercourses, wetlands and woodlots. Prepared Environmental Management Plans providing net effects analyses, mitigation solutions to minimize impacts to the natural environment, buffer zone recommendations, and re-vegetation and restoration activities. Participated in consultation to address agency concerns. EIS experience includes:

- Block 34 East Landowners Group Inc., Block 34 East Natural Environment Report, Vaughan, Ontario
- Block 41-28W Development Group Inc., Block 41 Natural Environment Report, Vaughan, Ontario
- Boca East Investments Limited, Block 64 Master Environmental Servicing Plan (Natural Environment Chapter), Vaughan, Ontario
- Georgian International Land Corp., Buffalo Springs Development Environment Report, Township of Oro-Medonte
- Keirland Developments Inc., Meadows of Bear Creek Subdivision Phases 2 & 3 EIS, Barrie, Ontario
- Kleinburg Heights Holdings Inc., Kleinburg Heights Natural Environment Report, Vaughan, Ontario

Environmental Impact Studies for Land Development, Various Sites, Ontario* (Project Manager)

Assessed potential environmental impacts from land development proposals. Conducted ecological community inventories in watercourses, wetlands and woodlots. Prepared Environmental Management Plans providing net effects analyses, mitigation solutions to minimize impacts to the natural environment, buffer zone recommendations, re-vegetation and restoration activities, proposed trail routes and community stewardship programs. Participated in public open houses to address the concerns of local residents. Where required, environmental monitoring during construction was conducted. EIS experience includes:

- City of London, Dearness Home for Seniors Redevelopment EIS, London, Ontario
- Fieldgate Developments, Tresstown Subdivision EIS, Stouffville, Ontario
- Grey Gables School, Proposed Private School Site, Ecological Assessment, St. Catharines
- Lebovic-Fieldgate Developments, Functional Servicing Plan, Ecological Component, Stouffville, Ontario
- Norwest Land Corp., Kains Road East Development EIS, London, Ontario
- Quinte's Isle Campark, Scoped EIS, Prince Edward County, Ontario
- Sifton Properties Ltd., Equestrian Condominium Communities, Development Assessment Reports, Township of Middlesex Centre & Municipality of West Middlesex
- Sifton Properties Ltd., River Bend Community Phases 1&2 EIS, London, Ontario
- St. Joseph's Health Care Centre, Parkwood Hospital Scoped EIS, London, Ontario
- Westhill Redevelopment Company Limited, Aurora Golf Course Community EIS, Aurora, Ontario

River Bend Community Phases 1 & 2, Environmental Monitoring Protocol & Baseline Study*, London, Ontario (Environmental Scientist)

Established baseline aquatic, terrestrial and soils conditions in the vicinity of a golf course community. Subsequently, the Environmental Monitoring Program - Year 1 and, later, Year 3, were submitted to document any potential impacts.

* denotes projects completed with other firms

Kathleen R. O. Todd M.Sc.

Aquatic Ecologist / Project Manager

Ecological Risk Assessment of Residual Heavy Oil in a Wetland*, Drumbo, Ontario (Environmental Scientist)

Analyzed stream and wetland data to determine potential aquatic food chain impacts of a historical heavy oil release. Analyzed invertebrate community structure and identified exposure pathways and community end-points. Considered site remediation options on the basis of these data.

Proposed Acton Quarry Extension, Dufferin Aggregates, Acton, Ontario (Aquatic Ecologist / Project Manager)

The extension of the existing Acton Quarry is proposed to meet the need for additional close-to-market aggregate resources of high quality Amabel Dolostone. The area of focus encompasses approximately 615 ha, across two Conservation Authority watersheds within the Regional Municipality of Halton Hills. Kathleen has participated in extensive ecological field work, including aquatic species surveys and habitat assessments, inventories for potential Species at Risk habitat, and aquatic rehabilitation planning. She has co-authored technical reports produced in accordance with the PPS and ARA application requirements, as well as participated in interdisciplinary consultation with agencies and agency-appointed committees.

Otonabee Landfill Site Biological Assessment Study*, Peterborough, Ontario (Wetlands Ecologist)

Prepared a 'Surface Water Quality Study' to address background water quality and aquatic habitat conditions and a 'Natural Environment Report' to identify baseline wetland and terrestrial environment conditions. The study was designed to identify potential impacts from existing landfill operations and to predict future impacts from proposed landfill site expansion.

Forest City Industrial Lands, Wetland Evaluation & Environmental Assessment*, London, Ontario (Wetlands Ecologist)

Evaluated a locally significant wetland according to the Ontario Wetland Evaluation System and revised the existing boundaries of a provincially significant wetland in cooperation with MNR.

West Nile Virus Information Package, Ballantrae, Ontario (Environmental Scientist)

Designed a pamphlet to educate residents and golfers regarding West Nile virus, the status of the virus in York Region, and the client's proactive mosquito monitoring program.

Confidential Client, Environmental Baseline and Feasibility Study for a Decommissioned Gold Mine*, Northern, Ontario (Environmental Scientist)

Conducted aquatic and terrestrial habitat inventories to determine the environmental feasibility of re-opening a gold mine. Assessed streams, wetlands and woodlots. Conducted invertebrate and fish collections, avifauna and wildlife surveys, and vegetation community inventories.

Transportation Planning

MTO Aquatic and Terrestrial Biology Retainer Services, Southwestern Ontario (Project Manager / Fisheries Specialist)

Under the terms of two 2-year Retainer Agreements (2004-2006, 2007-2009) eleven individual assignments were completed, involving: characterizing existing ecological conditions, assessing site sensitivities and impacts related to proposed bridge/culvert repairs and highway improvements, recommending environmental mitigation measures, and conducting during/post-construction monitoring. Value added components included: fluvial geomorphological services, design and implementation of bio-engineered slope stabilization solutions, Permit to Take Water applications, and site rehabilitation and Planting Plans. Extensive agency liaison was required with staff from numerous Conservation Authority, MNR and DFO offices.

Municipal Road Improvement Projects, Various Sites, Ontario (Environmental Scientist)

Collected aquatic and terrestrial habitat field data, conducted environmental impact assessments, and obtained required agency approvals related to municipal transportation projects, including:

- City of Hamilton, Bridge & Culvert Master Plan*
- City of London, Airport Road Widening*
- City of London, Bradley Avenue Extension
- City of London, Western Road Widening
- Town of Markham, Woodbine Avenue By-Pass*
- Township of Wilmot, Haysville Bridge Replacement*

Natural Sciences Reports Related to MTO Highway Improvement Works, Various Sites, Ontario (Fisheries Specialist)

Produced numerous Natural Sciences reports related to highway improvement works. Where required, Fisheries Act Authorization was obtained and Fish Habitat Compensation Plans were developed. Potential impacts to aquatic habitat, terrestrial vegetation, wetlands and wildlife were described for the following studies:

* denotes projects completed with other firms

Kathleen R. O. Todd M.Sc.

Aquatic Ecologist / Project Manager

- Highway 6 (Flamborough)*
- Highway 6 (Guelph)
- Highway 6 By-Pass (Caledonia)*
- Highway 7 (Marmora)*
- Highway 7 (Peterborough)*
- Highway 7A/28/115 (Peterborough)*
- Highway 8 (Dublin)*
- Highways 11/17 (North Bay)
- Highways 11/17 (Thunder Bay)
- Highways 11/101 (Matheson)
- Highway 17 (Stonecliffe)*
- Highway 17/Municipal Road 55 (Sudbury)
- Highway 17 Southwest By-Pass (Sudbury)
- Highways 17/531 (North Bay)*
- Highway 21 (Bluewater)
- Highway 21 (Grand Bend)
- Highway 23 (Palmerston)
- Highway 24 Interchange Improvements (Cambridge)
- Highway 26 (Meaford)
- Highway 26 (Owen Sound)
- Highway 63 (Bancroft)*
- Highway 63 (North Bay)*
- Highway 401/403 (Woodstock)
- Highway 401/County Road 41 (Napanee)*
- Highway 518 (Orville)*

West Nile Virus Surveillance Program, Various Sites, Central Ontario (Aquatic Ecologist)

Evaluating the potential for MTO owned/managed properties (e.g. stormwater ponds) to be mosquito breeding habitats, and recommended suitable strategies to curtail mosquito breeding success.

Bridge Widening, CN Rail Mile 119.6*, Kingston, Ontario (Aquatic Ecologist)

Procured federal Fisheries Act Authorization related to a rail line widening project over a warmwater creek. Conducted a post-construction monitoring program to confirm the viability of the habitat compensation measures.

Environmental Data Collection, CN Rail Corridor*, Toronto to Hornepayne, Ontario (Environmental Scientist)

Identified, collected and assessed secondary source natural heritage data for a study area that followed the CNR corridor from Toronto to Hornepayne. The data were then transferred to a GIS database, to be used during emergency planning.

Water Resources Management

Minnow Lake Restoration*, Sudbury, Ontario (Aquatic Ecologist)

Coordinated a lake-wide monitoring program to evaluate the degree of water pollution resulting from stormwater discharge to an urban lake. Participated in frequent public consultation to liaise with residents of the Minnow Lake Restoration Group.

Fort Creek Restoration*, Sault Ste. Marie, Ontario (Aquatic Ecologist)

In consultation with DFO, completed a restoration plan for an urban creek that outlets to Lake Huron and provides salmon spawning habitat. Habitat enhancement involved the removal of in-stream debris, channel stabilization, riparian plantings, substrate enhancement, and creation of refuge areas. Fisheries Act Authorization was obtained, and environmental monitoring during construction was conducted.

Environmental Effects Monitoring Programs for Mining Sector Clients, Various Sites, Canada (Benthic Ecologist)

Contributed benthic ecology chapter to numerous EEM reports for Canadian metal mines. Analyzed and reported on invertebrate data to determine whether the respective mine effluent was responsible for an aquatic community level effect. EEM experience includes:

- Hudson Bay Mining & Smelting Co. Ltd., Chisel North Mine, Snow Lake, Manitoba
- Hudson Bay Mining & Smelting Co. Ltd., Snow Lake Mill / Anderson Tailings, Snow Lake, Manitoba
- Hudson Bay Mining & Smelting Co. Ltd., Flin Flon Tailings Impoundment System and Trout Lake Mine, Flin Flon, Manitoba
- Hudson Bay Mining & Smelting Co. Ltd., Ruttan Mine, Leaf Rapids, Manitoba
- Hudson Bay Mining & Smelting Co. Ltd., Konuto Lake Mine, Denare Beach, Saskatchewan
- SMC (Canada) Ltd., McAlpine Mill, Cobalt, Ontario

Environmental Effects Monitoring Programs for Pulp and Paper Sector Clients, Various Sites, Canada (Benthic Ecologist)

Contributed the benthic ecology chapter to numerous EEM reports for Canadian pulp and paper mills. Statistically analyzed and reported on invertebrate data, according to Environment Canada biological monitoring protocols, to determine whether the respective mill effluent was responsible for an aquatic community level effect. EEM project experience includes:

- Cascades Fine Papers Group Thunder Bay Inc., Lake Superior, Thunder Bay, Ontario

* denotes projects completed with other firms

Kathleen R. O. Todd M.Sc.

Aquatic Ecologist / Project Manager

- Georgia-Pacific Canada Inc., Lake Gibson, Thorold, Ontario
- Kimberly-Clark Incorporated, Lake Superior, Terrace Bay, Ontario
- Marathon Pulp Inc., Lake Superior, Marathon, Ontario
- Nexfor Fraser Papers, Saint John River, Edmunston, New Brunswick
- Norampac Inc., Lake Superior, Red Rock, Ontario
- Spruce Falls Inc., Kapuskasing River, Kapuskasing, Ontario
- Stora Enso Port Hawkesbury Limited, Strait of Canso, Port Hawkesbury, Nova Scotia
- Tembec Industries Inc., Mattagami River, Smooth Rock Falls, Ontario

Watershed Based Biomonitoring Program for Urban Development, Oakville, Ontario (Benthic Ecologist)

Sampled and analyzed the Fourteen Mile Creek invertebrate community to establish baseline conditions, prior to the development of a housing subdivision. Six subsequent years of during-construction monitoring were conducted.

North and South Meade Creeks Subwatershed Plan*, Peterborough, Ontario (Aquatic Ecologist)

Conducted fish collections and population analyses, invertebrate sampling and identification, and collected and analyzed water chemistry samples. The information was used to predict the ecological sensitivity of Meade Creek and to provide recommendations regarding the extent and type of future development permitted in the watershed.

Pike River Aquatic Impact Assessment*, Field, Ontario (Benthic Ecologist)

Sampled fish, invertebrates and benthic sediments within the vicinity of a chlorinated discharge zone to determine the extent of chlorine related effects to the aquatic environment.

Biological Impact Assessment of a Closed Landfill on the Maitland River, Wingham, Ontario (Benthic Ecologist)

Analyzed Maitland River invertebrate community data within the vicinity of a closed landfill to determine the potential impact of landfill leachate.

Receiver Biomonitoring Program, Elmira, Ontario (Benthic Ecologist)

Analyzed invertebrate community data to determine the viability of an industrial contaminated groundwater collection and treatment system which discharges treated water to Canagagigue Creek.

Shekak River Post Impoundment Environmental Monitoring for the Shekak-Nagagami Hydroelectric Development, Hearst, Ontario (Aquatic Ecologist)

Addressed agency concerns regarding environmental monitoring in the headpond area of a river impoundment. Evaluated shoreline erosion and the viability of fish habitat compensation measures, including a walleye spawning shoal and aquatic invertebrate enhancement works.

Environmental Effects Monitoring Program for the Antamina Mine & Port Facility, Peru (Benthic Ecologist)

Analyzed biological (metal concentrations in fish and shellfish tissues, fish health, benthic invertebrate community structure) and physical (water and sediment chemistry) data collected in the vicinity of both an inland mine (freshwater environment) and a coastal mining port facility (marine environment) to determine if the local ecosystems were being adversely affected by mining/shipping operations.

Benthic Invertebrate Monitoring Program*, Caledonia, Ontario (Benthic Ecologist)

Assessed the Fox Creek invertebrate community to determine if the stream habitat was being adversely affected by adjacent mining effluent discharge.

* denotes projects completed with other firms

Kathleen R. O. Todd M.Sc.

Aquatic Ecologist / Project Manager

PUBLICATIONS

Todd, K.R.O., M.G. Fox and D.C. Lasenby. Presented at the 52nd Annual Meeting of the North American Benthological Society. Seasonal influence of riparian vegetation on stream macroinvertebrate community structure. *North American Benthological Society, Vancouver, B.C. (June 6-10), 2004.*

Todd, K.R.O. The Influence of Deciduous and Coniferous Riparian Vegetation on Aquatic Macroinvertebrate Community Structure in Low Order Streams of South Central Ontario. *M.Sc. Thesis, Trent University, 2003.*

Mark has 14 years of experience designing, coordinating, and implementing small and large scale aquatic habitat and impact assessments, encompassing numerous habitat types including lakes, ponds, large rivers, warmwater and coldwater streams. Mark has also developed and implemented many monitoring, mitigation, compensation and inventory processes. Past employment with Fisheries and Oceans Canada (DFO), and both the Grand River and St. Clair Region Conservation Authorities contributes to Mark's extensive working experience with regulatory and approvals processes related to the *Fisheries Act*, the *Conservation Authorities Act* and the *Drainage Act*. Mark's familiarity with *Fisheries Act* mitigation and compensation includes an understanding of the Habitat Alteration Assessment Tool (HAAT). He has extensive experience involving permitting and issues resolution related to the federal *Species at Risk Act* and the provincial *Endangered Species Act*. His experience also includes several transportation-related Environmental Assessments.

EDUCATION

Honours B.Sc. (Agriculture), University of Guelph /
Natural Resources Management, Guelph, Ontario, 2000

Royal Ontario Museum / Freshwater Fish Identification
Course, Toronto, Ontario, 2011

Class 1 Electrofishing Certificate / Ministry of Natural
Resources, Waterloo, Ontario, 2010

Ontario Freshwater Mussel Identification Workshop /
Fisheries and Oceans Canada - Canada Centre for
Inland Waters, Burlington, Ontario, 2007

Fisheries Assessment Specialist and Fisheries Contracts
Specialist, MTO/DFO/OMNR Fisheries Protocol Course,
Downsview, Ontario, 2006

PROJECT EXPERIENCE

Environmental Assessments

Locks 24 and 25 – VLH Turbine Installation, Canadian
Projects Limited, Lakefield, Ontario (Aquatic Biologist)
*Conducted aquatic assessments including walleye and bass
spawning and habitat surveys in support of an Environmental
Assessment (EA) for the installation of Very Low Head (VLH)
turbines at Dams 24 and 25 on the Otonabee River. As part of
the EA, will provide an analysis of impacts to walleye and bass
spawning habitat and habitat use by small-bodied fish. The
impact assessment will also be used as during the assessment of
the project using the Fisheries & Oceans Canada (DFO) Risk
Management Framework.*

Pier 27 Dockwall and Dredging, Hamilton Port Authority,
Hamilton, Ontario (Aquatic Biologist)

*Coordinated and conducted aquatic assessments in support of
the installation of a new dockwall and dredging to facilitate
shipping traffic. Coordinated with DFO regarding need for
Fisheries Act approval.*

Pier 22 Environmental Assessment, Hamilton Port
Authority, Hamilton, Ontario (Aquatic Biologist)

*Coordinated and conducted aquatic assessments in support of
site improvements. Negotiated compensation measures and
drafted letter of intent in pursuit of Fisheries Act Authorization.*

Bruce to Milton Transmission Line, Various, Ontario
(Fisheries Biologist)

*Planned, coordinated and assisted with execution of large-scale
fisheries field program to assess potential impacts of proposed
hydroelectric corridor reinforcement project and provided
relevant input to the provincial environmental assessment
process as well as the Fisheries Act and Conservation
Authorities Act permitting processes. Managed data entry,
analysis and completed reporting of aquatic resources sections.
Coordination of multi-disciplinary team and regulatory agencies
for acquisition of appropriate permits and approvals.*

Yellow Falls Hydroelectric Project, Smooth Rock Falls,
Ontario (Aquatic Biologist)

*Planned, coordinated and assisted with execution of fisheries
field program to assess potential impacts of proposed
hydroelectric dam project. Facilitated acquisition of permits and
approvals from relevant agencies. Assisted with fish, benthos,
habitat, water and sediment sampling. Authored significant
portions of the technical appendix related to aquatic study
results.*

Mark C. Pomeroy B.Sc.

Fisheries Biologist / Project Manager

Environmental Impact Assessments

Georgia Pacific Thorold Cycle 4 EEM, Thorold, Ontario (Aquatic Ecologist)

Assisted in field sampling of fish, benthos, water and sediment for federally regulated pulp and paper environmental effects monitoring.

Spruce Falls Cycle 4 EEM, Kapuskasing, Ontario (Aquatic Ecologist)

Assisted in field sampling of fish, benthos, water and sediment for federally regulated pulp and paper environmental effects monitoring.

Smooth Rock Falls Cycle 4 EEM, Smooth Rock Falls, Ontario (Aquatic Ecologist)

Assisted in field sampling of fish, benthos, water and sediment for federally regulated pulp and paper environmental effects monitoring.

Highway and Transportation

King Street and Fountain Street Improvements Class Environmental Assessment Study, Cambridge, Ontario (Fisheries Biologist)

Planned, coordinated and conducted field investigations to assess aquatic habitat at watercourse crossings within the project study area. Data collected during field investigations was used to assess potential impacts of preferred option. Drafted text for relevant sections of Class EA document.

Franklin Boulevard Widening Class Environmental Assessment Study, Cambridge, Ontario (Fisheries Biologist)

Planned, coordinated and conducted field investigations to assess aquatic habitat at watercourse crossings within the project study area. Data collected during field investigations was used to assess potential impacts of preferred option. Drafted text for relevant sections of Class EA document.

Highway 69 - Patrol Yards between Parry Sound and Sudbury, Ontario (Fisheries Biologist)

Planned, coordinated and conducted field investigations to assess aquatic habitat at watercourses within the project study area. Data collected during field investigations was used to assess potential impacts of proposed maintenance patrol yards located adjacent to Highway 69. Drafted text for inclusion in Fisheries and Aquatic Ecosystems Report. All work was conducted in accordance with the MTO/DFO/MNR Protocol (2006).

Highway 11 - High Falls Road Access Improvements Class Environmental Assessment, Bracebridge, Ontario (Fisheries Biologist)

Planned and conducted field investigations to assess aquatic habitat at watercourse crossings within the project study area. All work was conducted in accordance with the MTO/DFO/MNR Protocol (2006).

Highway 11 - Intersection Improvements, Powassan, Ontario (Fisheries Biologist)

Planned, coordinated and conducted field investigations to assess aquatic habitat at watercourse crossings within the project study area. Data collected during field investigations was used to assess potential impacts of preferred option, including potential impacts to Brook Trout. Drafted text for inclusion in Fisheries and Aquatic Ecosystems Report. All work was conducted in accordance with the MTO/DFO/MNR Protocol (2006).

Highway 3 - Rehabilitation between Jarvis and Renton, Ontario (Fisheries Biologist)

Planned, coordinated and conducted field investigations to assess aquatic habitat at watercourse crossings within the project study area. Data collected during field investigations was used to assess potential impacts of preferred option, including potential impacts to Brook Trout. Drafted Fisheries and Aquatic Ecosystems Report. All work was conducted in accordance with the MTO/DFO/MNR Protocol (2006), and included preparation and submission of "no HADD forms" to satisfy Fisheries Act requirements.

Highway 69 - Key River Bridge Replacement, Britt, Ontario (Fisheries Biologist)

Planned, coordinated and conducted field investigations to assess aquatic habitat in Key River at proposed location of bridge replacement. Data collected during field investigations was used to assess potential impacts of bridge replacement activities. Drafted Fisheries and Aquatic Ecosystems Report. All work was conducted in accordance with the MTO/DFO/MNR Protocol (2006), and included preparation and submission of "no HADD forms" to satisfy Fisheries Act requirements.

Replacement of Coutts Line Bridge over Baptiste Creek, Tilbury, Ontario (Fisheries Biologist)

Facilitated acquisition of provincial Endangered Species Act (ESA) approval (letter of advice) through provision of advice regarding construction techniques. Planned, coordinated and conducted field investigations to assess freshwater mussel community and habitat at bridge site.

* denotes projects completed with other firms

Mark C. Pomeroy B.Sc.

Fisheries Biologist / Project Manager

Replacement of Dawn Mills Bridge over Sydenham River Creek, Dresden, Ontario (Fisheries Biologist)

Dawn Mills Bridge is located over a reach of the Sydenham River known to contain one of the largest number of taxa of federally regulated Species at Risk fish and mussels in Canada. Facilitated acquisition of federal approvals (Fisheries Act and Species at Risk Act, letter of advice) through provision of advice regarding construction techniques. Planned, coordinated and conducted field investigations to assess freshwater mussel habitat at bridge site.

Chinguacousy Road Widening, Brampton, Ontario (Fisheries Biologist)

Conducted fish community assessment to determine presence of Redside Dace (a provincially Endangered species). Drafted applications for Fisheries Act Authorization, Conservation Authorities Act approval, and Endangered Species Act approval. Provided input to engineering design for compensation measures related to Redside Dace habitat.

Detroit Windsor Truck Ferry Improvements (Design) (GWP 3071-06-00), Windsor, Ontario (Fisheries Biologist)

Provided aquatic community and habitat assessment services as well as input regarding project design, construction staging and silt and sediment control planning. Acquired approvals under Fisheries Act and Conservation Authorities Act related to fish habitat. Negotiated compensation measures with Conservation Authority prior to project design change, resulting in no HADD.

Highway 24 - Intersection Improvements, Cambridge, Ontario (Fisheries Biologist)

Provided fish rescue services. Performed environmental inspection duties related to implementation of the Fisheries Act compensation plan and resolution of onsite issues related to construction.

Detroit Windsor Truck Ferry Improvements (Contract Administration) (WP 3071-06-00), Windsor, Ontario (Fisheries Biologist)

Construction monitoring services related to Fisheries Act implications (fish removals, species at risk identification training for contract staff, staging and implementation design review), provision of advice regarding alternative staging/construction operations to prevent impacts to aquatic habitat/organisms.

Fanshawe Park Road Widening, London, Ontario (Fisheries Biologist)

Facilitated acquisition of approvals from DFO for the realignment of Heard Drain/Snake creek during the expansion of Fanshawe Park Road. Performed construction inspection services, resolved onsite implementation issues related to the Fisheries Act.

Natural Resource Services

Municipal Drain Classification Program*, Various, Ontario (Drain Assessment Technician)

Planned and implemented large scale sampling protocol designed by DFO to assess the sensitivity of various municipal drains to disturbance. Sampling program encompassed all drains within the Grand River watershed and consisted of habitat, thermal and fish community characterization based on extensive field sampling. Analyzed substantial quantities of field data, summarized results and produced interim and final reports.

Fish Habitat Study*, Strathroy, Ontario (Biological Technician)

Planned and implemented field program to sample fish community in reservoirs managed by the St. Clair Region Conservation Authority. Responsible for writing final report concerning existing fish habitat status and providing recommendations based on field data. Participated in water quality and benthic community field sampling programs.

Various Environmental Assessments*, Sarnia, Ontario (Fish Habitat Biologist)

Assessed project proposals for impacts to fish habitat as defined in the Fisheries Act. Issued Letters of Advice and Authorization under the Fisheries Act. Carried out screening level environmental assessments of proposed projects under the Canadian Environmental Assessment Act. Participated in outreach programs and inter-agency work groups regarding Species at Risk recovery. Acquired familiarity with the Habitat Alteration Assessment Tool (HAAT).

Renewable Energy

St. Columban Wind Project, Huron County, Ontario (Fisheries Biologist)

Planned, coordinated and conducted field investigations to assess potential aquatic impacts resulting from proposed wind project consisting of fifteen turbines. Drafted Water Assessment and Water Body Report as mandated under Ontario Reg. 359/09.

* denotes projects completed with other firms

Mark C. Pomeroy B.Sc.

Fisheries Biologist / Project Manager

Plateau Wind Project, Grey County, Ontario (Fisheries Biologist)

Planned, coordinated and conducted field investigations to update previous field work to assess potential aquatic impacts resulting from proposed wind project consisting of eighteen turbines. Drafted relevant sections of the Environmental Screening Report (ESR) as mandated under Ontario Reg. 116/01. Provided advice concerning provincial species at risk concerns.

Grand Renewable Energy Park, Haldimand County, Ontario (Fisheries Biologist)

Planned, coordinated and conducted field investigations to assess potential aquatic impacts resulting from proposed wind and solar project consisting of sixty-seven turbines and 425,000 solar panels. Drafted Water Assessment and Water Body Report as mandated under Ontario Reg. 359/09.

Springwood Wind Project, Belwood, Ontario (Fisheries Biologist)

Conducted field investigations to assess potential aquatic impacts resulting from proposed wind project consisting of and assisted with draft Water Assessment and Water Body Report under Ontario Reg. 359/09.

Whittington Wind Project, Dufferin County, Ontario (Fisheries Biologist)

Planned and coordinated field investigations to assess potential aquatic impacts resulting from proposed wind project consisting of three turbines. Drafted Water Assessment and Water Body Report as mandated under Ontario Reg. 359/09.

Fairview Wind Project, Stayner, Ontario (Fisheries Biologist)

Planned and coordinated field investigations to assess potential aquatic impacts resulting from proposed wind project consisting of eight turbines. Drafted Water Assessment and Water Body Report as mandated under Ontario Reg. 359/09.

White Pines Wind Project, Prince Edward County, Ontario (Fisheries Biologist)

Planned, coordinated and conducted field investigations to assess potential aquatic impacts resulting from proposed wind project consisting of twenty-nine turbines. Drafted Water Assessment and Water Body Report as mandated under Ontario Reg. 359/09 (in progress).

Urban Land

Berczy Dam Removal, Markham, Ontario (Fisheries Biologist)

Provided fish rescue services, including resolution of issues related to Species at Risk.

Medway Sanitary Trunk Sewer Extension, London, Ontario (Fisheries Biologist)

Drafted Fisheries Act application and Endangered Species Act application for pipeline crossing of Medway Creek. Coordinated and completed aquatic habitat assessment and relocation of freshwater mussels. Negotiated compensation measures prior to project design change, resulting in no HADD.

Fox Hollow Subdivision, London, Ontario (Fisheries Biologist)

Facilitated acquisition of approvals from DFO for the realignment of the Heard Drain/Snake Creek and the installation of a stormwater management pond in relation to construction of the Fox Hollow Subdivision. Performed construction inspection services, resolved onsite implementation issues related to the Fisheries Act.

Katie Easterling is an Aquatic Ecologist with Stantec's Environmental Services group in Kitchener. She has approximately 6 years of field experience in both the aquatic and terrestrial disciplines. Previous fieldwork includes: fish habitat assessments, fish community sampling, fish salvages, REA water body assessments, trout spawning surveys, walleye spawning surveys and baseline aquatic surveys for various pipeline, rail line, transportation, renewable energy and municipal projects. Furthermore, she has experience conducting preliminary or baseline terrestrial habitat assessments, Species at Risk surveys, and breeding bird surveys. Reporting skills include: aquatic existing conditions reports, REA water assessment and water body reports, terrestrial existing conditions reports, Environmental Screening/Review Reports, Natural Heritage Evaluations (NHE) and Environmental Impact Statements (EIS). Additionally, Katie has consulted with First Nations, municipal, provincial and federal government agencies as part of fieldwork or reporting activities.

Katie is proficient in a variety of fish sampling techniques, including: Fall Walleye Index Netting (FWIN), Near Shore Community Index Netting (NSCIN), fyke netting, seine netting, gill netting and boat and backpack electrofishing. She has experience PIT tagging, anesthetizing fish, weighing, measuring, sexing, determining gonadal condition, removing aging structures (otoliths and scales) and aging fish. She also holds a certificate in radio telemetry and is certified in Ecological Land Classification (ELC). Her educational background focused on terrestrial, wildlife and aquatic biology, and includes a degree in Zoology and a Fish and Wildlife diploma. Prior to joining Stantec, Katie worked as an Ecological Research Assistant with Parks Canada, a Conservation Interpreter with the Long Point Region Conservation Authority and has previous consulting experience working as a Research Assistant for The Impact Group and a Biologist for URS. She also spent a summer work term at the OPG Nanticoke Plant working as an Assistant Mechanical Maintainer.

EDUCATION

Diploma – Fish and Wildlife Technician, Fleming College, Lindsay, Ontario, 2007

Hon.B.Sc– Major Zoology, Minor Biology, University of Toronto, Toronto, Ontario, 2003

PROFESSIONAL ASSOCIATIONS

Canadian Environmental Certifications and Approvals Board – Environmental Professional-in-Training (EPt) 2009-present

MEMBERSHIPS/ASSOCIATIONS

American Fisheries Society, Ontario Chapter Member, 2007 – present

American Fisheries Society, Ontario Chapter Executive Committee – Treasurer, 2011 - present

SPECIALIZED TRAINING

MTO/DFO/OMNR Fisheries Protocol Training Session for Fisheries Specialists, 2011

ROM Fish Identification Course, 2011

MNR Renewable Energy Natural Heritage Assessment Training, 2011

MNR Bat Monitoring Workshop for Wind Power Projects, 2010

Certified Traffic Control Technician, 2010

Class Two (II) Electrofishing Crew Leader Certification Course, 2006 and 2009

Contractor Orientation Course, CN Rail, 2009

Bat Acoustic Analysis Course, 2008

Ecological Land Classification, 2006

Radio Telemetry Certificate, 2006

Wetland Classification, 2006

Pleasure Craft Operators Course, 2006

PROJECT EXPERIENCE

Ministry of Transportation (MTO)

Aquatic

Detail Design, Highway 35, WP 102-99-01 Trent Canal Bridge Rehabilitation, Site 32-065 (Rosedale), MTO Eastern Region (2011 & 2012) (Role: Aquatic Ecologist)

Prepared the Aquatic Existing Conditions Report as part of the Detailed Design process for the Highway 35 site at the Trent Severn Waterway.

Detail Design, Highway 35, WP 4166-09-01 Corben Creek Structural Culvert Replacement, Site 32-165C, WP 4165-09-01 Martin Creek Structural Culvert Rehabilitation, Site 32-063BC and WP 4075-09-01 South McLaren Creek Structural Culvert Rehabilitation, Site 32-072BC, MTO Eastern Region (2011 & 2012) (Role: Aquatic Ecologist)

Conducted fish habitat and fish community assessments at 3 locations in the area surrounding Hwy 35 outside Lindsay, Ontario. This involved using a backpack electrofisher or minnow traps (where applicable) to determine fish species and habitat present in order to assess the community structure and supplement watercourse sensitivity information provided by the MNR. Reporting tasks included the Aquatic Existing Conditions Report

Detail Design, Highway 7, WP 4007-08-01/02 Mariposa Creek Structural Culvert Rehabilitation, Site 32-124BC and Mariposa Brook Structural Culvert Replacement, Site 32-161C, MTO Eastern Region (2011 & 2012) (Role: Aquatic Ecologist)

Conducted fish habitat and fish community assessments at 2 locations in the area surrounding Hwy 7 outside Lindsay Ontario. This involved using a backpack electrofisher or minnow traps (where applicable) to determine fish species and habitat present in order to assess the community structure and supplement watercourse sensitivity information provided by the MNR. Reporting tasks included the Aquatic Existing Conditions Report

Route Planning – Highway 144 Bypass around Chelmsford (GWP 5023-03-00), MTO Northeast Region (2011) (Role: Aquatic Ecologist)

Conducted fish habitat and fish community assessments at 63 locations in the area surrounding Hwy 144 near Chelmsford, Ontario. This involved using a backpack electrofisher or minnow traps (where applicable) to determine fish species and habitat present in order to assess the community structure and supplement watercourse sensitivity information provided by the MNR. Reporting tasks included the Aquatic Existing Conditions Report

Route Planning – Hwy 17 Sudbury to Markstay (GWP 5031-09-00), MTO Northeast Region (2011) (Role: Aquatic Ecologist)

Prepared the Aquatic Existing Conditions Report as part of the preliminary route planning study for Highway 17 between Sudbury and Markstay.

Highway 3, 6 and 24 Fish Community and Fish Habitat Assessment for Detailed Design (GWP 3115-09-00, GWP 3048-03-00 and GWP 362-98-00), MTO Southwest Region (2011) (Role: Aquatic Ecologist)

Conducted a detailed spring, summer and fall fish community and fish habitat assessment of 20 watercourse crossings for the rehabilitation/resurfacing of Highways 3, 6 and 24 surrounding the communities of Simcoe, Delhi and Port Dover. Reporting tasks included the Aquatic Existing Conditions Report and Impact Assessment Report for each highway.

Hwy 6 Fish Salvage, MTO Southwest Region (2009) (Role: Project Biologist)

Conducted a fish salvage as part of an MTO highway widening project located along Hwy 6 near Varney, ON. Fish collected were identified, measured and released downstream of the in-water work area.

Terrestrial

Route Planning – Hwy 144 Bypass around Chelmsford (GWP 5023-03-00), MTO Northeast Region (2011) (Role: Project Biologist)

Classified the vegetation communities within the Study Area based on FEC and ELC guidelines in addition to identifying potential SAR habitat for a proposed bypass route around Chelmsford.

Highway 401 Interchanges GWP 3070-09-00, MTO Southwest Region (2011) (Role: Project Biologist)

Prepared the terrestrial existing conditions report as part of the detail design stage for three Highway 401 interchanges between Woodstock and London.

Windsor-Essex Parkway Owner's Engineer, MTO Southwest Region (2010-2011) (Role: Project Biologist).*

Project Biologist for the acquisition of a Design, Build, Finance and Maintain consortia for the Windsor-Essex Parkway (WEP) which extends Highway 401 through Windsor below grade and includes an at-grade Highway 3. Conducted and reported on the Ecological Land Classification (ELC) and habitat availability for plant Species at Risk within the Windsor-Essex Parkway footprint as a requirement of ESA 17(2) B, ESA 17(2) C and ESA 17(2) D permits. Assisted with the preparation of Management, Monitoring and Habitat Restoration Plans for multiple Species at Risk, as required in the ESA 17 D permit. Co-ordinated and participated in one of the largest transplantation efforts for plant Species at Risk, which involved locating and identifying various plant Species at Risk within the Windsor-Essex Parkway footprint and transplanting to a region outside the area of impact.

Hwy 11 Madill-Church Road Interchange, MTO Northeast Region (2011) (Role: Project Biologist).*

Compiled and reported on the effectiveness of various wildlife detection/avoidance systems as part of a value added study for MTO.

Renewable Energy Aquatic

Niagara Region Wind Corporation (2012) (Role: Aquatic Ecologist)

Conducted the REA water assessment at multiple locations across the project area.

Hydroelectric Facilities - Lock 24 and 25 Dams on the Trent-Severn Waterway, Coastal HydroPower (2012) (Role: Aquatic Ecologist)

Conducted 4 Walleye spawning surveys at Lock 24 and 25 to determine if suitable habitat is present at the locks and the number of staging/spawning Walleye within the project footprint.

Cedar Point REA Water Body Assessment, Suncor Energy Products Inc. (2011) (Role: Aquatic Ecologist)

Conducted the REA water body assessment for a renewable energy project, which involved fish habitat assessments at 99 locations across the Study Area.

Adelaide REA Water Body Assessment, Suncor Energy Products Inc. (2011) (Role: Aquatic Ecologist)

Conducted the REA water assessment and prepared the water body report for a renewable energy project, which involved fish habitat assessments at 41 locations across the Study Area.

Napier Wind Project REA Water Body Assessment, wpd Canada Corporation (2011) (Role: Aquatic Ecologist)

Conducted the REA water assessment and prepared the water body report for a renewable energy project, which involved fish habitat assessments at 3 locations across the Study Area.

Amherst Island REA Water Body Assessment, Windlectric Inc. (2011) (Role: Aquatic Ecologist)

Conducted the REA water assessment and prepared the water body report for a renewable energy project on Amherst Island, which involved fish community and a preliminary fish habitat assessment at 39 locations across the Island.

Fish Habitat Assessment, SkyPower (2009) (Role: Project Biologist)

As part of a wind farm Environmental Assessment under O.Reg. 116, a fish habitat assessment was conducted to determine the baseline conditions and watercourse sensitivity according to the DFO matrix at each of the proposed watercourse crossings.

Terrestrial

Pre-Construction Bat Monitoring Surveys, Clients included Suncor Energy Products Inc., Acciona, RES Canada and SkyPower (2007-2009) (Role: Project Biologist)

Under O.Reg. 116 AnaBat detectors were installed on MET towers and design/constructed/installed multiple ground AnaBat detector units at various wind farms in Southern Ontario. Monitored pre-construction bat activity and identified species using spectrogram analysis to report on the activity level surrounding the proposed wind farms.

Post-Construction Bird and Bat Mortality Monitoring, Suncor (2008) and Enbridge (2009 and 2010) (Role: Project Biologist)

Conducted post-construction bird and bat mortality monitoring, scavenger impact trials and searcher efficiency trials at the Ripley and Enbridge Ontario Wind Farms near Kincardine, Ontario as a requirement under O.Reg. 116.

Winter Bird Surveys, Suncor Energy Products Inc. (2009) (Role: Project Biologist)

As a requirement of O.Reg. 116, avian monitoring surveys were conducted to characterize the bird community of two sites in Southern Ontario during the over-wintering period.

Oil and Gas Pipeline

Aquatic

Detailed Fish Habitat Assessment and Reporting, Nova Chemicals (2011) (Role: Aquatic Ecologist)

Fish habitat was assessed at 9 proposed crossings for a pipeline route and existing conditions were summarized as part of an EA.

Detailed Fish Habitat Assessment and Reporting, TransCanada Pipeline Ltd (2009 & 2011) (Role: Project Biologist)

As part of a pipeline expansion project, a detailed fish habitat survey was conducted following MTO protocols at 10 watercourse crossings. Methodology included detailed habitat mapping 50 m upstream and 100 m downstream. Fish habitat conditions were summarized and watercourse sensitivity determined according to the DFO matrix in the Fish and Fish Habitat Assessment Report as part of a CEEA Environmental Assessment.

Baseline Aquatic Survey, Enbridge Gas Distribution Inc. (2009) (Role: Project Biologist)

As part of the Pipeline to Serve York Energy Centre LP Environmental Assessment, aquatic baseline conditions at all watercourse crossings were summarized as part of the preliminary assessment of reasonable routing opportunities for the proposed pipeline.

Fish Salvage and Construction Monitoring, Enbridge Pipelines (2008 and 2009) (Role: Project Biologist)

In-water construction work was monitored and fish salvages were conducted at various watercourses across Ontario as part of a pipeline maintenance or repair project. The fish collected were identified, measured and released downstream of the in-water work area.

Baseline Aquatic Habitat Survey, TransCanada Pipeline Ltd (2009) (Role: Project Biologist)

As part of an Environmental Assessment for the proposed Thorold Sales Meter Station to connect the TransCanada Mainline to the Enbridge Gas Distribution pipeline, baseline aquatic conditions were assessed as part of the report.

Terrestrial

Ecological Land Classification, TransCanada Pipelines Ltd (2011) (Role: Biologist)

Ecological Land Classification (ELC) surveys were conducted along the proposed pipeline expansion route, which documented the vegetation communities present.

**Species at Risk Survey, TransCanada Pipelines Ltd (2009)
(Role: Project Biologist)**

Species at Risk surveys were conducted at four work areas along a pipeline right-of-way between Belleville and Brockville, Ontario. Surveys included looking for and assessing possible habitat conditions for Butternut, Henslow's Sparrow, Grey Fox, Blanding's Turtle, Eastern Milksnake and Eastern Ratsnake.

**Herptile Rescue, Enbridge Pipeline Inc. (2009) (Role:
Project Biologist)**

As part of a large pipeline maintenance project situated within a beaver pond located near the Ganouque River, a herptile rescue was performed to remove any snakes, turtles and frogs from the trench-box once in-filling was started. All species found within or immediately adjacent to the trench-box were removed and relocated within the beaver pond but outside of the work zone.

**Terrestrial Assessment, Enbridge Pipelines Inc. (2008)
(Role: Project Biologist)**

Preliminary aquatic and terrestrial assessments of various dig sites along a pipeline in Southern Ontario were conducted to establish the existing baseline conditions. Surveys involved recording bird species observed, vegetation cover species found at the dig site and assessing any aquatic habitat found on-site.

**Nesting Bird Surveys, TransCanada Summer (2007) (Role:
Project Biologist)**

Nesting bird surveys were performed at various remote locations throughout Northern Ontario, which included finding and identifying any active and inactive nests within and surrounding the proposed work area along a pipeline right-of-way.

**Railroad
Aquatic**

**Fish Salvage and Construction Monitoring, Canadian
National Railway (2010) (Role: Project Biologist)**

As part of a railway expansion project, in-water construction work was monitored and multiple fish salvages were performed at various bridge and culvert construction locations.

**Detailed Fish Community and Habitat Surveys and
Reporting, Canadian National Railway (2009) (Role: Project
Biologist)**

As part of a railway expansion project, detailed fish community and habitat surveys were conducted following MTO protocols at over 20 watercourse crossings. Methodology included detailed habitat mapping 50 m upstream and 100 m downstream, electrofishing to determine fish community present in the stream and water chemistry sampling. Fish community and habitat conditions were summarized and watercourse sensitivity determined according to the DFO matrix in the Fish and Fish Habitat Assessment Report as part of a CEEA Environmental Screening.

**Fish Habitat Surveys and Reporting, Canadian Pacific (CP)
Railway (2009) (Role: Project Biologist)**

As part of a CEEA Environmental Screening Report, a fish habitat and aquatic baseline survey was conducted along a proposed rail siding within a wetland. The assessment consisted of a visual assessment of water depth, aquatic vegetation, available cover, substrate and the presence of barriers to fish movement within the area of the proposed siding.

Terrestrial

**Nesting Bird Surveys, Canadian National Railway (2010)
(Role: Project Biologist)**

Nesting bird surveys were performed along various stretches of CN's RoW to find and identify any active or inactive nests within the proposed work area.

Municipal

Aquatic

**Arnell Well Field Adaptive Management Plan (AMP), City of
Guelph (2011) (Role: Aquatic Ecologist)**

As part of a yearly monitoring program, fish habitat was assessed using the OSAP protocol at four monitoring stations outside the city of Guelph.

Trout Spawning Surveys (2010) (Role: Project Biologist)

Conducted multiple trout spawning surveys along two coldwater creeks in the eastern region of the GTA for two municipal road expansion projects. Fieldwork involved surveying the creeks 50 m upstream and 100 m downstream to determine if Rainbow Trout were staging or spawning in the creek and within the vicinity of the bridge.

Aquatic Habitat Surveys, Town of Ajax (2009-2010) (Role: Project Biologist)

The Town of Ajax is committed to improving water quality along its Lake Ontario waterfront and in Duffins Creek and Duffins Marsh. As part of this, preliminary fieldwork was conducted to assess the existing conditions at each of the stormwater outfalls, including terrestrial and aquatic habitat. The assessment consisted of a visual assessment of water depth, aquatic and terrestrial vegetation, available cover, substrate and the presence of barriers to fish movement upstream or downstream.

Baseline Aquatic Survey, Regional Municipality of York (2009) (Role: Project Biologist)

As part of an Environmental Assessment for Cole Engineering Group Limited (Cole Engineering), a baseline terrestrial and aquatic survey was conducted for the Fairy Lake Garden Pond Maintenance Project in the Town of Newmarket. The assessment consisted of a visual assessment of water depth, aquatic vegetation, available cover, substrate and the presence of barriers to fish movement upstream or downstream of Garden Pond; which was used to assess Garden Pond's function as fish habitat both within the pond and the pond's function within the Fairy Lake/East Holland River watershed.

Fish Sampling, Durham-York Region (2008) (Role: Project Biologist)

Various stations along Tooley Creek in Durham Region were electrofished to obtain composite samples of whole fish that were identified, weighed, measured and bagged for a metals analysis as part of a human health risk report for the proposed Durham-York Residual Waste Study.

Terrestrial

Habitat Assessment, Durham-York Region July (2007) (Role: Project Biologist)

Multiple sites around the regions were assessed for wildlife usage, fisheries and ideal browse, nesting and cover habitat. Recommendations for a preferred site were given based on a combination of these factors and how the potential loss of habitat through development would affect the local wildlife.

Other Experience

Aquatic

Phase 3 Environmental Effects Monitoring (EEM): Periodic Monitoring, Kirkland Lake, ON (2011) (Role: Aquatic Ecologist)

This EEM program began in 2010 (continuing through 2012) and involved the collection of water, sediment, fish and benthos to assess possible environmental effects caused by the mine and followed federal Metal Mining Effluent Regulation (MMER) guidelines. Fyke nets and a boat electrofisher were used to capture target small-bodied species. The fish were dissected, sexed, livers and gonads were weighed and eggs were collected.

Lake Gibson Angler Survey, Ontario Power Generation, Thorold, Ontario (2011) (Role: Aquatic Ecologist)

Lake Gibson is a hydro-electric reservoir owned and operated by Ontario Power Generation (OPG). As detailed in the OPG Risk Management Plan, OPG is required to monitor the persistence of sediment contamination and its expression in the environment within Lake Gibson. The program was designed to identify, quantify and compare the levels of contamination over time and the impact on sediments, water, benthic invertebrates, and fish in the system. Katie was involved as a field biologist interviewing anglers at Lake Gibson to assess the effectiveness of OPG's communication with the public regarding the contamination of Lake Gibson sediment and fishes.

Piles Development (Keswick) Corporation - DFO authorization PE 07-0957 (2011) (Role: Aquatic Ecologist)

An evaluation of fish habitat, fish passage and the fish community was conducted within the channel realignment to confirm the compensation measures and structures are

functioning as designed and are providing fish habitat. Fish community sampling was conducted using a backpack electrofisher.

Box Grove - DFO Authorization for Works Affecting Fish and Fish Habitat No. BU-04-3082 (2011) (Role: Aquatic Ecologist)

This survey was conducted to satisfy conditions included in the Department of Fisheries and Oceans (DFO) Authorization for Works Affecting Fish and Fish Habitat (DFO Authorization No. BU-04-3082). Condition 4.2 of the Authorization is to enhance fish passage through the creation of a low flow channel following the removal of a 30 m long culvert. The culvert removal and new channel construction were completed in spring 2010. This survey was conducted as part of the post construction monitoring program required by the DFO Authorization.

Benthic Invertebrate and Water Quality Sampling, Fox Meadows Estates (2009) (Role: Project Biologist)

Benthic invertebrate sampling was conducted following the OBBN protocol and water quality samples were collected and submitted for testing. Results from the sampling effort were summarized and compared to previous years in an effort to gage and mitigate potential impacts from a residential development expansion.

Fish Community Survey (2006) (Role: Fisheries Field Biologist)*

FWIN, NSCIN, gill netting and Seine netting techniques were used to perform a fish surveys on a lake and rivers in the Kawartha Lakes system. Processing of the sampled fish included weighing, measuring, sexing, determining gonadal condition, removing aging structures and aging.

Terrestrial

Preliminary Aquatic and Terrestrial Assessment, Canada Post (2008) (Role: Project Biologist)

Preliminary aquatic and terrestrial assessments of various sites in Southern Ontario were conducted to establish the existing baseline conditions. Surveys involved recording bird species observed, vegetation cover species found on the site and assessing potential impacts on nearby Valued Ecosystem Components (VECs) and any aquatic systems.

Category B Class EA, Ontario Realty Corporation (ORC) (2008) (Role: Project Biologist)

Conducted the background research and evaluation of existing natural heritage baseline conditions for multiple ORC properties situated across Ontario.

Preliminary Aquatic and Terrestrial Assessment, Canada Post (2008) (Role: Project Biologist).

Preliminary aquatic and terrestrial assessments of various sites in Southern Ontario were conducted to establish the existing baseline conditions. Surveys involved recording bird species observed, vegetation cover species found on the site and assessing potential impacts on nearby Valued Ecosystem Components (VECs) and aquatic systems.

Ecological Receptors of Concern Surveys, Various Clients. (2008) (Role: Project Biologist).

Conducted biological surveys of flora and fauna on potentially contaminated sites to assess the current site conditions.

Soil Sampling Survey, Brampton Brick (2007) (Role: Project Biologist)

Collected soil samples to assess the impact of emissions on the surrounding terrestrial environment as part of the phytotoxicology assessment of the Brampton Brick facility.

Forest and Wetland Classification, Parks Canada (2006) (Role: Ecological Research Assistant)*

Performed rapid assessments of 400 m forest plots and 100 m wetland plots to evaluate and classify sites along the Trent-Severn Waterway from Rice Lake to Canal Lake. Classification was based on biological features such as flora and fauna present and physiological features such as soil and drainage. Data collected was used to create a mapping inventory of the Trent-Severn system for Parks Canada and the Ministry of Natural Resources.

**Denotes experience with other firms*

Joel (Joe) Keene has 14 years of extensive marine and freshwater experience, including mark recapture studies and species inventory projects investigating fish population stability, species identification, measurement and marking of fish collected. He has processed over 11,000 samples from over 400 freshwater and marine projects, both in Canada and internationally. Joe has performed fecundity analysis on several fish species and marine mussels, and is experienced in the collection of soil, sediments, water, fish, crayfish, clam and benthic samples in the field using a variety of techniques and equipment. In addition, Joe is experienced with morphological and histological analysis, as well as detailed necropsies and dissection. He has been involved with a number of projects involving freshwater mussel species at risk (SAR) in Ontario and is familiar with both provincial and federal approvals processes for surveys and moves related to these organisms.

Joe's expertise includes compilation and statistical analysis of benthic data to derive various biological indices, including, but not limited to, Hilsenhoff Biodiversity Index, Percent Model Affinity, Simpson's Diversity and Evenness indices, EPT indices and BioMAP. He has researched and prepared scientific reports, studies, presentations and reviews relating to benthic studies and aquatic biology including Environmental Effects Monitoring (EEM) programs.

EDUCATION

M.Sc., University of Guelph / Aquaculture, Guelph, Ontario, 1997

B.Sc. (Specialized Honours), University of Guelph / Marine Biology, Guelph, Ontario, 1994

Certificate, Royal Ontario Museum / Fish Identification, Toronto, Ontario, 2001

Certification, Ontario Freshwater Mussel Identification Workshop, Guelph, Ontario, 2008

Class 2 Electrofishing Crew Leader, Class 2 Electrofishing Training Course, Guelph, Ontario, 2010

MEMBERSHIPS

Member, North American Benthological Society

PROJECT EXPERIENCE

Aquatic Ecology

Middle - Grand River WWTP Assimilative Capacity Study, Kitchener, Ontario (Aquatic Ecologist)

Joe assisted with the planning and implementation of a field program to map and quantitatively sample aquatic vegetation to provide estimates of macrophyte biomass, used in the GRCA's GRSM Model in support of the ACS for the Kitchener wastewater treatment plant. Joe was involved in completing routine surface water sampling on the Grand River as part of this project.

Proposed Burlington Quarry Expansion, Burlington, Ontario (Aquatic Ecologist)

Joe participated in the implementation and delivery of a multi year Natural Environment Existing Conditions program and report. The report was included as part of the application for the proposed Burlington Quarry expansion. The program involved the establishment of appropriate sampling stations for fish, benthos, water, thermal conditions and discharge.

Periodic Monitoring EEM Program, Kirkland Lake, Ontario (Benthic Taxonomist / Aquatic Ecologist)

Joe conducted the analysis, interpretation and reporting of benthic data produced for the Environmental Effects Monitoring (EEM) program in 2008 which was conducted to assess the impacts of mine effluent on the receiving waters at the KLG site. He was also involved in the interpretation and reporting of water quality, sediment and fisheries data.

Magnitude and Extent Environmental Effects Monitoring, Flin Flon and Snow Lake, Manitoba (Aquatic Ecologist / Field Crew / Benthic Taxonomist)

*Joe was involved in the planning and benthic site selection for three Environmental Effects Monitoring (EEM) projects in the Flin Flon and Snow Lake areas of Manitoba for Hudson Bay Mining and Smelting. He collected benthic, sediment and water samples and processed, enumerated and identified organisms from the benthic samples. He performed the QA/QC and statistical analysis of the benthic data for each of the three EEM programs. Joe also assisted with the design and implementation of a tissue metal concentration study in amphipods (*Hyaella*) collected from several sites in the Flin Flon and Snow Lake areas.*

* denotes projects completed with other firms

Joel L. Keene B.Sc., M.Sc. (Aqua)

Aquatic Ecologist / Benthic Taxonomist

Georgia-Pacific Cycle 5 Environmental Effects Monitoring - Investigation of Cause, Thorold, Ontario (Aquatic Ecologist/Field Crew Leader)

*As part of an Environmental Effects Monitoring (EEM) program on Beaverdams Creek and Lake Gibson in Thorold, Ontario, Joe was involved in the planning, experimental design and site selection for a caged bivalve study to determine the effects of pulp and paper mill effluent on growth, survival and reproductive success in mussels (*Lasmigona compressa*). He collected water samples during the collection, deployment and retrieval of the mussels to test for a variety of parameters including metals, pH, conductivity, turbidity, nutrients and chlorophyll. He also conducted an effluent plume delineation survey within Lake Gibson.*

Freshwater Mussel Detection and Relocation in Medway Creek and the Grand River, London, Ontario (Aquatic Ecologist)

Involved in the identification and relocation of freshwater mussel species at risk from Medway Creek in London, Ontario and the Grand River in Kitchener-Waterloo, Ontario.

Environmental Youth Corps, University of Guelph, Guelph, Ontario* (Aquatic Ecologist)

*Conducted histological analyses of Sea lamprey (*Petromyzon marinus*) for use in fecundity and sex determination studies.*

Mark Recapture and Species Inventory Project*, North Shore of Lake Ontario (Aquatic Ecologist)

Electrofished several rivers, investigating the effects of low head barrier dams on fish distribution. Performed species identification, measuring and marking of fish, and collection of stream physical data.

American eel (*Anguilla rostrata*) downstream migration and discrimination study for New York Power Authority*, New York (Aquatic Ecologist)

Performed eel collection using hoop nets and electrofishers, morphological analysis of external characteristics, and detailed necropsies including the collection of otoliths, blood, ovary and eel muscle tissues. He also conducted histological analysis of ovary tissue, focusing on oocyte developmental stage and diameters.

Mark Recapture Study and Species Inventory Project, Mill Creek, Guelph, Ontario* (Aquatic Ecologist)

Participated in project investigating fish population stability. Performed species identification, measuring, weighing and marking of fish collected using an electrofisher.

Benthic Services

Spencer Creek Invertebrate Study, Flamborough, Ontario (Benthic Taxonomist/Field Crew Leader)

Joe has coordinated the field program of benthic sampling in Spencer Creek near Flamborough, Ontario from 2006 to 2010 which monitors effects of a housing development on the benthic communities in the area. He has been responsible for the sorting and identification of benthic macroinvertebrates from the site and has performed the analysis of the resulting data. He was responsible for quality assurance/quality control analysis and the production of reports summarizing current conditions for each year, as well as an analysis of trends or changes over time.

14 Mile Creek Invertebrate Study, Oakville, Ontario (Benthic Taxonomist/Field Crew Leader)

Joe has coordinated the field program of benthic sampling in 14 Mile Creek near Oakville, Ontario from 2006 to 2010 which monitors effects of a housing development on the benthic communities in the area. He has been responsible for the sorting and identification of benthic macroinvertebrates from the site and has performed the analysis of the resulting data. He was responsible for quality assurance/quality control analysis and the production of reports summarizing current conditions for each year, as well as an analysis of trends or changes over time.

DFO Small Bodied Fish Gut Content Analysis, Ontario (Benthic Taxonomist)

Joe conducted gut content analysis on 736 small bodied fish for Fisheries and Oceans, Canada. The study involved weights and measures of fish and gut contents as well as detailed identification and enumeration of benthic macroinvertebrates from the stomach and intestinal tract of dissected fish. Data will be used to compare resident fish diets both before and after Round Goby introduction.

Acton Quarry Expansion, Acton, Ontario (Aquatic Biologist)

As an Aquatic Biologist, Joe participated in field studies for a multi-year Natural Environment Existing Conditions program and report. The report was included as a part of the application for the proposed Acton Quarry expansion. The program involved establishing appropriate sampling stations for baseline monitoring of fish, benthos, water, thermal conditions and discharge. He was also responsible for the sorting and identification of benthic macroinvertebrates collected as part of the multi-year field surveys, as well as the subsequent analysis and reporting of benthic community data.

* denotes projects completed with other firms

Joel L. Keene B.Sc., M.Sc. (Aqua)

Aquatic Ecologist / Benthic Taxonomist

Proposed Burlington Quarry Expansion, Burlington, Ontario (Aquatic Ecologist)

Joe participated in the implementation and delivery of a multi year Natural Environment Existing Conditions program and report. The report was included as part of the application for the proposed Burlington Quarry expansion. The program involved the establishment of appropriate sampling stations for fish, benthos, water, thermal conditions and discharge.

Mount Forest Waste Water Treatment Plant (WWTP) Study*, Mount Forest, Ontario (Benthic Taxonomist / Field Crew)

Joe was responsible for the collection and identification of benthic macroinvertebrates upstream and downstream of existing and proposed Waste Water Treatment Plant (WWTP) discharge locations to establish baseline environmental conditions on the South Saugeen River.

2006 Biomonitoring-Crompton, Elmira, Ontario (Benthic Taxonomist)

Joe participated in the field program of benthic sampling in Canagagigue Creek near Elmira, Ontario from 2006 to 2008 which monitors effects of a polluted site near the creek on the benthic communities in the area. He has been responsible for the sorting and identification of benthic macroinvertebrates from the site and has performed the analysis of the resulting data. He was responsible for quality assurance/quality control analysis and the production of reports summarizing current conditions for each year, as well as an analysis of trends or changes over time. Prior to 2006, he was responsible for the sorting and identification of the benthic samples through a different firm.

Tembec Enterprises Inc. Cycle 5 EEM, Kapuskasing, Ontario (Benthic Taxonomist)

As part of an Environmental Effects Monitoring (EEM) program on the Kapuskasing River, Ontario, Joe was involved in the planning, collection, sorting and identification of benthic samples for the purpose of characterizing the benthic communities upstream and downstream of a pulp and paper mill on the Kapuskasing River. He also collected water and sediment samples at each benthic station and assessed physical parameters such as pH, conductivity, dissolved oxygen, temperature and flows. He has performed statistical analysis of the resulting benthic data and produced reports summarizing current conditions for each year, as well as an analysis of trends or changes over time.

Proposed Quarry, Flamborough, Flamborough, Ontario (Benthic Taxonomist/Field Crew)

Joe has been involved in several aspects of the surface water monitoring of lands adjacent to the proposed quarry in an effort to provide a picture of the background ecology and hydrology. He has collected, processed, identified and analyzed benthic samples from Flamboro and Mountsberg Creeks and their tributaries over several years. He has conducted bimonthly monitoring of a number of surface water stations in the area for water depth, flow and water quality. He has also taken part in a pump test which required daily assessments of flow, depth, turbidity, pH, temperature, dissolved oxygen, conductivity, metals and bacterial samples and was responsible for coordinating daily laboratory water sample deliveries and dissemination of results to stakeholders.

Wescast Invertebrate Study, Wingham, Ontario (Benthic Taxonomist/Field Crew Leader)

Joe has coordinated the field program of benthic sampling in the Maitland River near Wingham, Ontario from 2006 to 2009 which monitors effects of a historic landfill on the benthic communities in the area. He has been responsible for the sorting and identification of benthic macroinvertebrates from the site and has performed the analysis of the resulting data. He was responsible for quality assurance/quality control analysis and the production of reports summarizing current conditions for each year, as well as an analysis of trends or changes over time. Prior to 2006, he was responsible for the sorting and identification of the benthic samples through a different firm.

Bridge Street Bridge Rehabilitation, Kitchener, Ontario (Field Crew Leader/Benthic Taxonomist)

*Joe was involved in the identification, collection and relocation of freshwater mussels from the Grand River in Kitchener, Ontario. This mussel move was performed to minimize impacts of bridge reconstruction and repair on local mussel populations which included the wavyrayed lampmussel (*Lampsilis fasciola*); a freshwater species at risk (SAR). Joe was involved in the planning, collection, identification and relocation aspects of this mussel move.*

Extensive Variety of Taxonomic Experience, 1999-2011 (Aquatic Invertebrate Taxonomist)

Joe has processed over 11,000 samples from over 400 projects in 12 years. Joe is skilled in the identification of benthic macroinvertebrates from lentic and lotic environments. His experience encompasses marine and freshwater systems across Canada and internationally.

* denotes projects completed with other firms

Joel L. Keene B.Sc., M.Sc. (Aqua)
Aquatic Ecologist / Benthic Taxonomist

PUBLICATIONS

Sonnenberg, H., J. Keene, R. Park, K. Bernard, and S. Dickieson. Challenges overcome and lessons learned from using freshwater bivalves during two Investigation of Cause (IOC) Environmental Effects Monitoring (EEM) studies. *Presented at the 37th Annual Aquatic Toxicity Workshop, Toronto, Ontario, 2010.*

Are the costs to meet environmental effects monitoring (EEM) benthic sample precision and accuracy criteria justified?. *Proceedings of the 32nd Annual Aquatic Toxicity Workshop, 2005.*

Holloway, A.C., J. Keene, D.G. Noakes, R.D. Moccia. Effects of clove oil and MS-222 on blood hormone profiles in rainbow trout, *Oncorhynchus mykiss* (Walbaum). *Aquaculture Research*, 35: 1025-1030, 2004.

Keene, J.L., D.L.G. Noakes, R.D. Moccia, C.G. Soto. The efficacy of clove oil as an anaesthetic for rainbow trout, *Oncorhynchus mykiss* (Walbaum). *Aquaculture Research*, 29: 89-101, 1998.

Kelly Clayton B.Sc. (Env.)

Ecologist



Kelly Clayton is a member of the Environmental Management Group at Stantec Consulting with four years of industry experience. She has a Graduate Certificate in Ecosystem Restoration and a Bachelor of Environmental Science, majoring in environmental geography and area of emphasis in biotic systems. Kelly has gained valuable experience through her formal employment and her extensive participation in volunteer projects in Ontario, as well as the United States of America. Her experience at teaching college-level environmental monitoring has imbued Kelly with a practical ability to apply Ecological Monitoring and Assessment Network (EMAN) and Ontario Stream Assessment Protocol (OSAP) protocols.

Kelly has conducted a wide array of environmental monitoring that includes bird migration surveys, salmon spawning counts, butterfly and odonate surveys, as well as fish assessment and vegetation surveys. She is familiar with the use of all manner of such survey equipment as GPS and radio telemetry equipment, seine nets, hoop nets, gill nets, fyke nets, minnow traps, basking traps and spring haul traps. Kelly is experienced at the identification of flora and fauna, and is capable of handling wildlife. Certified in ELC (Ecological Land Classification), Class II Electrofishing, and Ontario Benthic Biomonitoring Network, Kelly has the ideal background to support a wide variety of both Terrestrial and Aquatic natural heritage studies. Her laboratory experience has honed Kelly's skills in data processing and analysis, and she has a demonstrated ability to interpret and report findings accurately.

EDUCATION

B.Sc. (Env.), University of Guelph / Environmental Science, Guelph, Ontario, 2007

Graduate Certificate, Niagara College / Ecosystem Restoration, Niagara-on-the-Lake, Ontario, 2009

Class II Electrofishing Certificate, Niagara College / Ecosystem Restoration, St. Catharines, Ontario, 2008

Ontario Benthic Biomonitoring Network Certificate, Niagara College / Ecosystem Restoration, St. Catharines, Ontario, 2009

Certificate, Ecological Land Classification (ELC), Lindsay, Ontario, 2010

Certificate, Tallgrass Ontario / Seed Collector, Burlington, Ontario, 2010

Certificate, Ontario Wildlife Rehabilitation Network (OWREN), London, Ontario, 2010

Certificate, St. Johns Ambulance / CPR and First Aid, Burlington, Ontario, 2010

Workplace Hazardous Materials Information System (WHMIS), Burlington, Ontario, 2010

Licence, Boat Smart / Pleasure Craft Operators, Orangeville, Ontario, 2008

Certificate, ROM / Ontario Fish Identification Workshop, Toronto, Ontario, 2011

PROJECT EXPERIENCE

Education

Niagara College Environmental Monitoring Program*, Niagara-on-the-Lake, Ontario (Part-time Teacher)

Taught two sections of students at a second-year, college level. Demonstrated and explained Ontario Stream Assessment Protocol (OSAP) and Ontario Benthic Biomonitoring (OBBN) protocols. Discussed proper field and lab sampling/analysis techniques for water, sediment, and benthos. Prepared assignments, lectures, and exams (both written and practical). Evaluated students based on performance.

Linear Infrastructure

Thunder Bay Generating Station Pipeline Project, Thunder Bay, Ontario (Aquatic Ecologist)

Researched and summarized data for existing conditions report as part of the EA process.

* denotes projects completed with other firms

Kelly Clayton B.Sc. (Env.)

Ecologist

Union Gas Pipeline Construction, Nanticoke, Ontario (Aquatic Ecologist)

Researched and summarized data for existing conditions report as part of the EA process.

Mining

Environmental Effects Monitoring (EEM) Program: Vale Inco, Sudbury, Ontario (Aquatic Ecologist)

Collected fish and water samples for toxicity testing.

Environmental Effects Monitoring (EEM) Program: Hudson Bay Mining and Smelting, Flin Flon, Manitoba (Aquatic Ecologist)

Collected Hyalella, water samples and sediment samples for toxicity testing.

Natural Sciences & Heritage Resources

Proposed Melancthon Quarry, Melancthon, Ontario (Aquatic Ecologist)

Conducted fish community surveys (electrofishing).

New Hamburg Oxbow, New Hamburg, Ontario (Aquatic Ecologist)

Collected water samples and water quality data twice monthly.

Blue Springs Creek Ground and Surface Water Monitoring, Arkell, Ontario (Aquatic Ecologist)

Downloaded weekly temperature and water level data and performed stream discharge measurements.

Ontario Power Generation - Lake Gibson Project, Thorold, Ontario (Aquatic Ecologist)

Collected benthic invertebrate and water samples. Safety boat operator.

Mill Creek Surface Water Monitoring Program, Milton, Ontario (Aquatic Ecologist)

Performed monthly stream discharge measurements and downloaded water level and temperature logger data. Graphed hydrological data.

Greenhouse Effluent Filtration Design Team, Niagara College*, Niagara-on-the-Lake, Ontario (Biologist)

Conducted environmental impact assessment on receiving stream and suggested several filtration design methods.

Bird Studies Canada Marsh Monitoring Program*, Hamilton, Ontario (Volunteer)

Conducted amphibian surveys on Royal Botanical Gardens property. Aided in the development of the BSC database.

Species at Risk Inventory at Legends on the Niagara Golf Course*, Chippewa, Ontario (Student Consultant)

Designed and conducted survey methods. Produced research and consultant proposals. Made recommendations for further restoration efforts.

St. Clair River Horizontal Directional Drill, Sarnia, Ontario (Aquatic Ecologist)

Performed analysis and presentation of in-situ and laboratory water quality data. Reported on results of water quality monitoring program.

Island Lake Conservation Area, Credit Valley Conservation*, Orangeville, Ontario (Conservation Technician)

Served as a client services representative, which entailed conservation awareness education. Maintained conservation area grounds.

Royal Botanical Gardens*, Hamilton, Ontario (Restoration Ecologist)

Coordinated summer students and assisted in the planning and implementation of restoration activities. Participated in habitat rehabilitation strategies (cattail and waterlily plantings). Maintained floodplain connections.

Assisted the Species at Risk Biologist in the creation of snake hibernacula. Assisted in turtle monitoring using radio telemetry, basking traps and hoop nets. Assisted Terrestrial Ecologist with Prairie grassland rehabilitation techniques (Prescribed burns and Prairie plantings). Conducted environmental monitoring (salmon spawning count, waterfowl migration count, aquatic vegetation surveys, butterfly and odonate counts).

Performed wildlife population management (carp (Cyprinus carpio) seining in Cootes Paradise Marsh and RBG ponds, electrofishing for carp), and beaver dam maintenance. Operated Cootes Paradise Fishway carp barrier (to separate non-native species from native) and ran educational presentations at Cootes Paradise Fishway.

Collected water quality measurements and performed data entry, data quality control and analysis, in addition to report writing. Assisted in development of educational materials (pamphlets and signage).

* denotes projects completed with other firms

Kelly Clayton B.Sc. (Env.)

Ecologist

Various Environmental Effects Monitoring (EEM) Studies, Ontario (Aquatic Ecologist)

Conducted fish population monitoring, benthic invertebrate identification and report writing/data management in support of various EEM studies for both Mining and Pulp and Paper industry projects.

Renewable Energy

White Pines Wind Farm, Picton, Ontario (Aquatic Ecologist)

Performed water-body assessments on mapped watercourses.

Fairview Wind Farm, Stayner, Ontario (Aquatic Ecologist)

Performed water-body assessments on mapped watercourses.

Pristine Power Wind Power, St. Columban, Ontario (Aquatic Ecologist)

Conducted fish community surveys (electrofishing).

Algonquin Power Wind Project, Amherst Island, Ontario (Aquatic Ecologist)

Conducted shoreline habitat mapping and fish community surveys.

Solar Power Plan Design Team, University of Guelph, City of Guelph*, Guelph, Ontario (Student)

Designed a solar power plan for the City of Guelph to coordinate with Community Energy Plan. Conducted public surveys on solar power interest. Coordinated with key stakeholders. Conducted cost/benefit analysis, baseline research regarding solar power use, prepared proposal, and presented plan to key stakeholders.

Port Dover Wind Farm, Port Dover, Ontario (Assistant Aquatic Ecologist)

Fish population monitoring (electrofishing).

Melancthon Wind Power Project, Melancthon and Amaranth Townships, Ontario (Biologist)

Conducted bat and bird mortality monitoring studies and raptor monitoring (winter raptor counts) as well as habitat assessments and data analysis.

Transportation Planning

MTO Highway 3, 6 and 24, Simcoe, Ontario (Aquatic Ecologist)

Conducted fish community surveys (electrofishing).

* denotes projects completed with other firms

Kelly Clayton B.Sc. (Env.)

Ecologist

PUBLICATIONS

Fuller, M.M., K. Clayton, N. Ward. Project Paradise Season Summary Report 2009. *Royal Botanical Gardens. Hamilton, Ontario. RBG Report No. 2010-01*, 2010.

Clayton, K. Carroll's Bay Recovery and Management Strategy. *Royal Botanical Gardens. Hamilton, Ontario*, 2010.

Clayton, K. Recovery and Management Strategy for Carroll's Bay Marsh. *Presentation at the Project Paradise Workshop*, 2010.

Marc Faiella's experience has included industry and development sector projects. He has conducted field investigations, liaised with representatives of government agencies, regulators and worked with First Nations, synthesized data and produced reports. Marc's specific areas of expertise include Environmental Effects Monitoring (EEM), Environmental Impact Studies (EIS) and Fish Habitat Assessments. He has assessed potential impacts to aquatic habitats at a number of mining and development-related sites, such as metal mines, quarries, pulp and paper mills, subdivisions, city drainage systems and wind energy projects. Marc's technical experience has focused mainly on aquatic habitats. He has conducted fisheries inventories and Species at Risk project surveys based on provincial protocols, trout spawning surveys, collected benthic invertebrate samples, and collected water, sediment and non-lethal and lethal fish tissue samples for mercury. Marc has gained practical experience with all construction phases of DFO applied work sites. In addition, Marc has on-site experience at remote northern sites where access is gained via helicopter, ATV, boat and hiking.

EDUCATION

Tech. Dipl., Sir Sanford Fleming College / Ecosystem Management, Lindsay, Ontario, 2005

Training Certificate, Royal Ontario Museum Fish Identification Workshop, Royal Ontario Museum, Ontario, 2006

Certificate, MTO/DFO/OMNR Protocol, Toronto, Ontario, 2006

Certificate, St. John Ambulance / First Aid and CPR, Guelph, Ontario, 2010

P.A.L. and Firearms, Brampton, Ontario, 2005

Sir Sanford Fleming College / Short Wave Radio, Lindsay, Ontario, 2004

Sir Sanford Fleming College / Chainsaw Operator, Lindsay, Ontario, 2004

Certificate, Pleasure Craft Operator, Toronto, Ontario, 2005

Training Certificate, Class 1 Electrofishing Certificate, MNR, Ministry of Natural Resources, Ontario, 2012

Fisheries and Oceans Canada / Ontario Freshwater Mussel Identification Workshop, Burlington, Ontario, 2011

MEMBERSHIPS

Canadian Environmental Practitioner In Training (CEPIT),
Canadian Environmental Certification Approvals Board

PROJECT EXPERIENCE

Environmental Assessments

Communal Irrigation Study, Township of Melancthon, Ontario (Crew Lead)

Obtained appropriate licences to conduct presence / absence and fish utility surveys within the Pine and Noisy River watersheds. Served as crew lead, overseeing fish surveys that were conducted in 2008 and preparations for proposed surveys in the spring / summer of 2009. Responsible for assembling report figures, maps and analysis of collected fisheries data, in tandem with Stantec's in-house GIS / graphics department.

Bruce to Milton Transmission Reinforcement Project, Multiple Sites, Ontario (Crew Lead)

Key member of the study team for the proposed hydro corridor expansion from Bruce Nuclear to a Milton, Ontario. Liaised with several Ministry of Natural Resources offices to coordinate issuance of permits and processing of historical fisheries data requests. Worked directly with the project manager to complete a work plan to safely and efficiently complete spring and summer fisheries surveys along the approximate 180 km corridor. Led a 2-person crew to conduct stream cross section surveys used to determine appropriate sizing of culverts. Coordinated production of detailed mapping and figures upon completion of the surveys, in tandem with Stantec's in-house GIS / graphics department, and was key in production of the independent Class EA report.

Marc A. Faiella Tech. Dipl., CEPIT

Environmental Technician

Port Alma Wind Power Project, Port Alma, Ontario (Field Crew / Data Analyst)

Exclusively responsible for conducting background topography research. Performed tree measurements for entire survey area, identified and mapped tree species locations using aerial photo base. Constructed tests for future heights (software) and produced reports detailing results. These results had significant bearing on wind turbine selection and placement.

Brampton MESP, Phase I, Springdale Environmental Site Assessment, Brampton, Ontario (Habitat Assessor)

Responsible for obtaining background information and conducted field work to assess study area. Compiled field notes and detailed data using an air photo base. Prepared final technical memorandum for submission.

Environmental Site Management

Randall Drain Branch A Restoration, Environment Inspection and Post-construction Monitoring, Waterloo, Ontario (Environmental Inspector)

Responsible for overseeing that approved plans to remediate a damaged watercourse on the City of Waterloo's airport property, as outlined by The Department of Fisheries and Oceans, Grand River Conservation Authority and Stantec Consulting Ltd., were carried out accordingly. Works included properly diverting flow downstream, efficiently dewatering the damaged area and relocating any stranded aquatic species downstream. Worked closely with the construction crew to ensure all remediation phases met Fisheries Act requirements. Prepared final report.

Mining

Vale Technology Development - Hydrology and Aquatic Assessment, Sudbury, Ontario (Aquatic Technician)

Marc was part of a two person crew that conducted a fishery presence/absence survey in a number of lakes associated with mining practices. Fish were identified, measured and tissue samples were collected for laboratory analysis.

Environmental Effects Monitoring (EEM) Program: Periodic Monitoring Phase, Hudson Bay Mining and Smelting, 2007, Flin Flon, Manitoba (Aquatic Technician)

Participated in metal mine EEM Periodic Monitoring phase, involving fisheries and benthic invertebrate surveys. Collected benthic and water samples in the field as well as fish, using various collection techniques. Completed habitat assessments, plume measurements and fish necropsies. Upon completion of field work, performed data analysis and reporting for the EEM report.

Environmental Effects Monitoring (EEM) Program: Focused Monitoring Phase, Hudson Bay Mining and Smelting, 2009, Flin Flon, Manitoba (Aquatic Technician)

Participated in metal mine EEM Focused Monitoring phase, involving fisheries and benthic invertebrate surveys. Collected benthic and water samples in the field as well as fish, using various collection techniques. Completed habitat assessments, plume measurements and fish necropsies. Upon completion of field work, performed data analysis and reporting for the final EEM report.

Environmental Effects Monitoring (EEM) Program: Periodic Monitoring Phase, Hudson Bay Mining and Smelting, 2007, Snow Lake, Manitoba (Aquatic Technician)

One of a 2-person crew stationed in Snow Lake for metal mine EEM Periodic Monitoring phase, involving fisheries and benthic invertebrate surveys. Collected benthic and water samples in the field as well as fish, using various collection techniques. Completed habitat assessments, plume measurements and fish necropsies. Upon completion of field work, performed data analysis and reporting for the EEM report.

Environmental Effects Monitoring (EEM) Program: Focused Monitoring Phase, Hudson Bay Mining and Smelting, 2009, Snow Lake, Manitoba (Aquatic Technician)

One of a 2-person crew stationed in Snow Lake for metal mine EEM Focused Monitoring phase, involving fisheries and benthic invertebrate surveys. Collected benthic and water samples in the field as well as fish, using multiple collection techniques. Completed habitat assessments, plume measurements and fish necropsies. Upon completion of field work, performed data analysis and reporting for the final EEM report.

Natural Sciences & Heritage Resources

Hydro One Series Capacitor Station (Project Manager)

Responsible for a fisheries sampling survey to determine the presence or absence of fish species near a proposed capacitor station. Secured a Fish Collection Licence from OMNR, compiled maps to assist in field investigations, assembled field staff, initiated survey and prepared report for internal and external circulation.

* denotes projects completed with other firms

**Melancthon Wind Energy Project Tree Surveys,
Melancthon, Ontario (Aquatic Technician)**

Measured tree heights and the species identified with use of a laser-sighted measuring device. Performed a desktop exercise, whereby heights were projected over a 20 year period. These projections were then synthesized on aerial photos, showing potential hazards to turbines, thus assisting with selection of wind turbine placement and selection of site-appropriate turbine models.

Oil & Gas

**Enbridge Pipeline Crossing, Sarnia, Ontario (Aquatic
Construction Monitor)**

Marc was responsible for monitoring the St. Clair River for "frack-outs" that may occur during the horizontal drilling and pipe line installation under the St. Clair River. Marc was also responsible for collecting water samples for laboratory analysis and recording current river conditions using a YSI water quality meter.

Power

**Biological Monitoring for the Shekak-Nagagami
Generating Station, Hearst, Ontario (Field Crew Lead)**

Responsible for compiling appropriate field gear to complete the Year-13 monitoring study along the Shekak and Nagagami Rivers in the vicinity of a hydroelectric dam. Participated in surveys, which included: fish inventories through electrofishing, fish tissue collection via gillnets, benthic sampling and water quality and sediment quality collection through several collection techniques. Performed data analysis and completion of the report. Worked closely with Brookfield Power, the MNR and Hearst employees to obtain necessary information and data to complete the project.

**Hydro One Series Capacitor Station, Huntsville, Ontario
(Project Management / Crew Leader)**

Undertook a fisheries sampling survey to determine the presence or absence of fish species near a proposed capacitor station. Duties included securing fisheries permits from related agencies, compilation of maps to assist with surveys, assembly of staff, planned and implemented the field program and prepare report for internal and external circulation.

**Yellow Falls Hydroelectric Project, Smooth Rock Falls,
Ontario (Aquatic Technician)**

Crew member responsible for extensive fish, benthic, water and habitat surveys along the Matagami River. Fish surveys included setting and retrieving gillnets, electrofishing, identification of fish species, retrieving age indicators from fish, characteristic measurements and collecting non-lethal samples for mercury analysis. Collected benthic invertebrates using various sampling techniques for later sorting and identification. Collected water samples and substrate samples using various sampling techniques and equipment for lab testing. Worked closely with a First Nations crew member for the duration of the project and, upon completion of the field surveys, performed data analysis and report writing.

Roads and Highways

**Highway 11 Access Improvements. Preliminary Design.
MTO Northeastern Region, Huntsville, Ontario (Fisheries
Specialist)**

Marc conducted an inventory of aquatic resources adjacent to the existing highway. The fish and fish habitat investigations were completed on three watercourses in the Study Area, and were conducted in accordance with the 2006 MTO/DFO/OMNR Protocol

**Highway 11 Access Improvements. Preliminary Design.
MTO Northeastern Region, Huntsville, Ontario (Fisheries
Specialist)**

Marc conducted an inventory of aquatic resources adjacent to the existing highway. The fish and fish habitat investigations were completed on three watercourses in the Study Area, and were conducted in accordance with the 2006 MTO/DFO/OMNR Protocol

**Highway 8 and Highway 401 Interchange
Improvements. Preliminary Design. MTO Southwestern
Region, Kitchener, Ontario (Fisheries Specialist)**

Marc conducted an inventory of aquatic resources within the study area. The fish and fish habitat investigations were completed following the 2006 MTO/DFO/OMNR Protocol. An exception to this occurred at the Grand River, where fish inventories were not conducted in order to avoid disturbances to mussel Species at Risk that are known to occur in the area

**Highway 3 Rehabilitation, Renton to Jarvis. Detail
Design. MTO West Region, Ontario (Fisheries Specialist)**

Marc participated in detailed Natural Heritage features assessments and a Fish Habitat Existing Conditions Report in accordance with the 2006 MTO/DFO/OMNR Protocol. Three major water crossings (Nanticoke Creek and two crossings of Black Creek) were assessed in addition to other smaller crossings

Marc A. Faiella Tech. Dipl., CEPIT

Environmental Technician

Wind Power

White Pines Wind Energy, Prince Edward County,
Ontario (Field Crew Lead)

Marc conducted aquatic habitat assessments and a fisheries presence/absence surveys to determine aquatic features under REA (Renewable Energy Act). He also assisted in producing a photo log and figures that assisted in the application process for construction work permits.

Fairview Wind Energy, Staynor, Ontario (Field Crew
Lead)

Marc conducted aquatic habitat assessment surveys to assess their designation under the REA (Renewable Energy Act). In addition, Marc conducted electrofishing surveys to assess the presence or absence of fish species and was also part responsible for producing a photo log and figures to assist in the application process for associated construction work permits.

Port Dover Wind Energy, Port Dover, Ontario (Aquatic
Technician)

Marc conducted field surveys to assess aquatic features and to determine its designation under the REA (Renewable Energy Act). Marc was also part responsible for producing reports, photo logs and figures to aid in the application process to gain associated construction work permits.

Amherst Island Wind Energy, Amherst, Ontario (Field
Crew Lead)

Responsible for collecting fisheries habitat characteristics along the proposed shoreline of Lake Ontario to aid in obtaining associated construction work permits. Marc was also responsible for conducting a presence/absence survey using several capture methods such as, gill nets, boat electrofishing, Fyke nets and minnow traps.



Mitch Allah is an aquatic ecologist who serves Stantec's Environmental Services group. He has significant experience conducting field research in the Canadian Arctic and various locations in southern and northern Ontario and Quebec. Mitch has been involved in all aspects of aquatic and terrestrial projects, including the review of background data, correspondence with government agencies, site investigation and data collection, and report writing. He is knowledgeable in, and proficient at field surveys and standardized protocols involving data collection for water quality and quantity, benthic macroinvertebrates, fish, bird, herpetofauna, aquatic plants and forest communities. Mitch has performed vegetation surveys using Ecological Land Classification (ELC) and Ontario Wetland Evaluation (OWES) protocols. He has excellent fish identification skills, and is proficient at conducting aquatic habitat and fish community assessments using electrofishing equipment, gill nets, fyke nets, seine nets and minnow traps. Mitch worked progressively for three field seasons in the Canadian Arctic investigating treatment wetlands in Nunavut and NWT Inuit communities. Mitch's knowledge of ecology and biotic identification, his strong communication skills and proven abilities at multi-discipline teamwork are complemented by his research experience, providing him with valuable technical expertise to meet a variety of project needs.

EDUCATION

B.Sc. (Honours), Trent University / Environmental Resource Science, Peterborough, Ontario, 2011

Tech. Dipl., Sir Sandford Fleming College / Environmental Technologist Diploma, Lindsay, Ontario, 2009

Tech. Dipl., Sir Sandford Fleming College / Environmental Technician Diploma, Lindsay, Ontario, 2008

Certificate, Ministry of Natural Resources / Ontario Wetland Evaluation System (OWES), Lindsay, Ontario, 2009

Certificate, Royal Ontario Museum / Fish Identification Workshop, Toronto, Ontario, 2011

Certificate, Stantec Consulting Ltd. / Class 2 Electrofishing Training, Guelph, Ontario, 2012

PROJECT EXPERIENCE

Natural Sciences & Heritage Resources

Hydro One Clarington Transformer Station, Clarington, Ontario (Field Ecologist)

Conducted fisheries and aquatic habitat assessment for proposed transformer station development

Shell Oil and Gas, Montreal, Quebec (Field Ecologist)

Conducted site investigation for amphibian and reptile populations, and amphibian breeding call surveys

Natural Heritage Site Inventories and Reporting*, Various Locations (Field Ecologist)

Bat maternity roost surveys in forest settings, various wildlife surveys including amphibians, reptiles, mammals, and birds; data collection and report writing for renewable energy REA environmental assessment projects; ELC vegetation community and wildlife habitat assessments; online database research for technical report preparation, including MNR Biodiversity Index and various atlases

Proposed Melancthon Quarry, Melancthon, Ontario (Field Ecologist)

Conducted species at risk surveys targeting Whip-poor-will using standardized MNR protocol

* denotes projects completed with other firms

Mitch Ellah Tech. Dipl., B.Sc. (Hons.)

Aquatic Ecologist

Proposed Simpson's Quarry EA, Bancroft, Ontario (Field Ecologist)

Conducted field sampling, including breeding bird, waterfowl breeding, and amphibian surveys, aquatic assessments, habitat characterizations, as well as species at risk surveys that included Blanding's Turtle and Whip-poor-will

Renewable Energy

Niagara Region Wind Corp. Wind Farm, Niagara Region, Ontario (Field Ecologist)

Conducted aquatic assessments using REA water body designations, fish community presence/absence study and habitat characterization related to proposed wind farm

Bow Lake Wind Farm, Montreal River Harbour, Ontario (Field Ecologist)

Conducted fieldwork related to natural heritage terrestrial assessment that included locating bat maternity roosts, amphibian surveys, and habitat delineation. Aquatic fieldwork included habitat characterization and water body determination congruent with the Renewable Energy Act (REA) and fish community assessments

Cedar Point Wind Farm, Middlesex County, Ontario (Field Ecologist)

Conducted snake cover board searches to determine presence/absence of snake population and diversity

Capital Power (K2) Wind Farm, Goderich, Ontario (Field Ecologist)

Conducted aquatic assessments using REA water body designations, fish community presence/absence study and habitat characterization related to proposed wind farm

Research / Laboratories

Centre for Alternative Wastewater Treatment (CAWT), Sir Sandford Fleming College*, Baker Lake, Nunavut (Arctic Field and Laboratory Research Technician)

Remote study site in Baker Lake, NU; researcher for an International Polar Year project and United Nations Environmental Program

Centre for Alternative Wastewater Treatment (CAWT), Sir Sandford Fleming College*, Various Sites, Nunavut and Northwest Territories (Arctic Field and Laboratory Research Technologist)

Remote study sites in Baker Lake, NU, Gjoa Haven, NU and Holman, NT; results used for the continuation of the International Polar Year research project

Centre for Alternative Wastewater Treatment (CAWT), Sir Sandford Fleming College*, Alert, Nunavut (Arctic Field and Laboratory Research Technician)

A partnership project with Department of National Defense and Environment Canada Wastewater Division; remote study site in Alert, NU; sole researcher to plan, research, organize equipment, work with partners and set-up laboratory; conducted bird surveys for Environment Canada

Water

Komoka Wastewater Treatment Plant, Komoka, Ontario (Field Ecologist)

Conducted benthic macroinvertebrate and water quality sampling for wastewater treatment plant discharge

Fox Meadow Subdivision EEM, Peterborough, Ontario (Field Ecologist)

Conducted benthic macroinvertebrates and water quality sampling for EEM of subdivision encroachment on PSW

Canagagigue Creek EEM, Elmira, Ontario (Field Ecologist)

Water quality and quantity measuring, benthic macroinvertebrate, and fish community assessment at chemical plant discharge site

Blue Springs EEM, Guelph, Ontario (Field Ecologist)

Routine flow measurement, monitoring and maintenance of rain gauges, Barologgers, air temperature loggers and in-stream water level loggers to assess potential effects of aggregate operations and groundwater draw down on fish habitat in a coldwater stream

Mill Creek EEM, Guelph, Ontario (Field Ecologist)

Routine flow measurement, monitoring and maintenance of rain gauges, Barologgers, air temperature loggers and in-stream water level loggers to assess potential effects of aggregate operations and groundwater draw down on fish habitat in a coldwater stream

* denotes projects completed with other firms

Mitch Allah Tech. Dipl., B.Sc. (Hons.)

Aquatic Ecologist

PUBLICATIONS

Chemical and Biological Changes in an Arctic Treatment Watershed to Assess the Value of Macroinvertebrate Biomonitoring. *Undergraduate Thesis, Trent University, Peterborough, Ontario, 2011.*

Trevor Chandler is a geomorphologist, with 18 years experience, working in concert with Stantec's Aquatic Group. He has participated in a number of environmental and fluvial investigations that have included Environmental Effects Monitoring and effluent plume delineations for Pulp and Paper and Mining Sector clients, natural channel design and restoration, channel stability studies, erosion threshold and meander belt assessments for planning, and post impoundment monitoring and fisheries mortality investigations at hydroelectric facilities. Current projects include delineation of mining effluent in central Manitoba, the restoration of a degraded urban watercourse to support Redside Dace, an at-risk fish species, meander belt assessments, channel stability and fluvial erosion threshold analyses, and an investigation of meander planform evolution along a large southern Ontario river.

EDUCATION

M.Sc., University of Guelph / Fluvial Geomorphology, Guelph, Ontario, 1992

B.E.S. (Honors Co-op), University of Waterloo / Environmental Studies, Waterloo, Ontario, 1990

Certificate, Wildland Hydrology Inc. / River Morphology & Applications (Level II), Asheville, North Carolina, 2011

Wildland Hydrology Inc. / Applied Fluvial Geomorphology Course (Level I), Guelph, Ontario, 1993

PROJECT EXPERIENCE

Environmental Assessments

Plume Delineation Investigation, Spruce Falls, Ontario (Environmental Scientist)

In situ conductivity and river and effluent discharge records were used to delineate the effluent plume concentrations along the Kapuskasing River over a period of one year.

Sedimentation Investigation, Humber Arm, Newfoundland (Environmental Scientist)

Custom sedimentation towers were designed, constructed and deployed for two weeks to collect inorganic sediments in a 40 m deep marine environment. The towers consisted of an array of duplicate collectors spaced at four different depths in the water column. One array was deployed in the vicinity of pulp and paper and municipal discharges and the other in an undisturbed reference area.

Environmental Effects Monitoring (EEM) Plume Investigations, Various Sites, Ontario, Quebec and Newfoundland (Environmental Scientist)

Eight separate plume investigations, using rhodamine WT as an active tracer, were conducted at eight pulp and paper mills in Ontario, Quebec and Newfoundland. Receiving environments included large rivers, lakes, tidal estuaries, and marine environments.

Environmental Effects Monitoring (EEM), Flin Flon, Manitoba (Environmental Scientist)

Mining effluent plume investigations, using in situ conductivity, were undertaken along an effluent plume flowpath that extended over 100 km from the end-of-pipe through a variety of hydraulic environments.

Geomorphologic Assessments

Estimated Meander Belt Delineation, Credit Valley Watershed*, Southwestern Ontario (Geomorphologist)

All permanent and intermittent watercourses within the Credit River System upstream of Mississauga, ON were delineated into distinct reaches. Meander belts were estimated along all reaches using detailed topographic mapping and high resolution aerial photography.

Sydenham River Fluvial Geomorphology Assessment*, Southwestern Ontario (Geomorphologist)

The mainstem and all tributary watercourses in the basin were delineated into geomorphically and hydrologically distinct reaches and the stability of each reach assessed by field survey. Recommendations were made to enhance channel stability and improve water quality.

* denotes projects completed with other firms

Trevor Chandler M.Sc.

Fluvial Systems Specialist

Mini-Regional Curve Analysis, Brampton, Ontario (Geomorphologist)

A series of small to medium-sized streams west of Brampton were surveyed to develop a regional curve. The purpose of the analysis was to develop a tool to predict appropriate bankfull and inner-bank dimensions for the restoration of highly disturbed watercourses.

Ontario Stream Assessment Protocol, Highland Creek*, Toronto, Ontario (Geomorphologist)

Fisheries habitat was systematically inventoried throughout the watershed in each of 22 channel reaches.

Highland Creek Geomorphology Study*, Toronto, Ontario (Geomorphologist)

A series of detailed geomorphological field investigations were systematically undertaken in each of the 22 delineated reaches in the watershed. Measurements in each reach included total station survey of 10 cross-sections of channel and floodplain, long profile survey, Wolman pebble counts and bank geometry and materials characterization.

Waterloo Creek Geomorphic Inventory*, Waterloo, Ontario (Geomorphologist)

All watercourses within the City were identified and delineated into distinct morphological and hydrological reaches. All watercourses were walked, erosion sites identified, and reach stability assessed using Rapid Geomorphic Assessment technique.

Greater Toronto Airports Authority (GTAA) Fluvial Geomorphology Study, Etobicoke, Ontario (Geomorphologist)

A fluvial geomorphology study of the Etobicoke Creek was undertaken to address creek stability issues that posed a potential risk to runways and other airport infrastructure. Problem areas were identified and potential solutions presented.

Shekak-Nagagami Erosion Assessment, Hearst, Ontario (Geomorphologist)

Fluvial investigations for a hydroelectric generating station, monitoring design and implementation of the field program (e.g. fishing efforts, water/sediment sampling and erosion pin installation), desktop analyses and historical assessment of the Shekak and Nagagami Rivers for the purpose of quantifying system-wide, long-term bank erosion rates and directions.

Mining

Effluent Plume Study, Lake Gibson, St. Catharines, Ontario (Environmental Scientist)

Effluent concentrations were measured using in situ conductivity in a highly modified receiving environment affected by artificial pumping.

Mine Closure Investigations, Poirier and Selbaie, Quebec (Environmental Scientist)

Mining effluent concentrations were measured using in situ conductivity throughout the baseline and post-closure monitoring phases of the project.

Environmental Effects Monitoring (EEM), Snow Lake, Manitoba (Environmental Scientist)

Mining plume delineation surveys were conducted using in situ conductivity on an embayment on a large inland lake. Effluent discharge rates and weather conditions were monitored to determine the effect on the concentration, size, and shape of the effluent plume in the receiving environment.

Environmental Effects Monitoring (EEM), Snow Lake, Manitoba (Environmental Scientist)

A mining plume delineation survey, using in situ conductivity, was undertaken along the effluent flow path which traversed a variety of hydraulic environments ranging from a small watercourse to large lakes.

Stream Restoration

Northrup Creek Channel Restoration, Greece, New York (Geomorphologist)

A two kilometre section of watercourse is being re-aligned in order to alleviate the effects of long term fill placement within the floodplain. The field investigations involved geomorphic assessments conducted to determine appropriate watercourse dimensions. The Bank Erosion Hazard Index (BEHI) and Near Bank Stress (NBS) models were utilized to assess existing bank stability and potential for future erosion. The restored watercourse will exhibit a natural planform that alleviates flooding and incorporates a variety of natural hydraulic habitats, such as woody debris bank treatments and rock constructed riffles.

* denotes projects completed with other firms

Trevor Chandler M.Sc.

Fluvial Systems Specialist

Laurel Creek Geomorphic Assessment, Waterloo, Ontario (Geomorphologist)

A 400 metre section of watercourse is being restored which will involve the removal of a channel constriction and vertical gabion banks, improvements to floodplain connection and the installation of a rock constructed riffle over an existing exposed sanitary sewer crossing. BEHI and NBS models were applied to isolate sections of the watercourse where bank treatments were deemed necessary.

Credit River Tributary Restoration, Brampton, Ontario (Geomorphologist)

A 260 m section of concrete-lined watercourse is being restored using the principles of natural channel design. The restored watercourse will exhibit a variety of natural hydraulic habitats, such as woody debris bank treatments and riffles, functional over a range of flows. The design includes deep pools and other habitat features considered beneficial to Redside Dace, an at-risk fish species.

Snake Road Tributary Restoration, Burlington, Ontario (Geomorphologist)

A fluvial assessment and topographical survey were undertaken to restore a small section of watercourse affected by erosion that had exposed a formerly buried gas pipeline.

Tributary to Grand River Culvert Removal, Cambridge, Ontario (Geomorphologist)

A derelict corrugated steel pipe culvert is being removed and the channel and floodplain are being restored to a natural condition. A topographical survey of the stable watercourse upstream and downstream of the crossing was utilized to guide the restoration.

Tributary to Fairchild Creek, Brantford, Ontario (Geomorphologist)

A fluvial geomorphological investigation and topographical survey was undertaken to restore fish passage to a watercourse affected by invasive exotic vegetation growth.

Tributary to Nichol Drain Restoration, Elora, Ontario (Geomorphologist)

An existing online pond is to be filled and the pre-existing channel restored to reduce thermal impacts to the watercourse. Water levels in an existing upstream wetland feature are to be maintained.

Fourteen Mile Creek W2 Tributary Restoration, Oakville, Ontario (Geomorphologist)

An unstable section of the tributary was restored using a combination of pools, riffles and log drop structures to dissipate energy. The design incorporates natural materials and live woody vegetation to further control bank erosion.

Trevor Chandler M.Sc.

Fluvial Systems Specialist

PUBLICATIONS

Chandler, T.J., M. Geenen, D. Bidelspach, and D. Charlton. Specialized Stream Restoration Software Tools Applied to an Unstable Urban Watercourse, Brampton, Ontario. *Proceedings of the 4th International Conference on Natural Channel Systems, Mississauga, Ontario, 2010.*

Chandler, T.J. Erosion Threshold Analysis of Lucky Creek, Town of Sutton, ON. *Report to Sutton Landowners Group, 2007.*

Aquafor Beech Ltd. Fluvial Processes along the Nagagami River in the Vicinity of Shekak-Nagagami Hydroelectric Generating Station. *Report for Beaver Power Corporation, 2005.*

Chandler, T.J. and M. Prent-Pushkar. Estimated Meander Belt Delineation: Credit Valley Watershed. *Report to Credit Valley Conservation, 2005.*

Chandler, T.J. and M. Prent-Pushkar. Estimated Slope Hazard Mapping 2005. *Report to Credit Valley Conservation, 2005.*

Chandler, T.J. and J. Parish. Errol Creek Restoration Study. *Report to St. Clair Conservation Authority, 2001.*

Chandler, T.J. and J. Parish. Fluvial Geomorphology Study of Etobicoke and Spring Creek within the grounds of Lester B. Pearson International Airport. *Report to the Greater Toronto Airports Authority, 2000.*

Chandler, T.J., and J. Parish. Sydenham River Fluvial Geomorphology Assessment. *Report to Ontario Ministry of Natural Resources and St. Clair Region Conservation Authority, 2000.*

Anderson, P.G., C.H.J. Franklin and T.J. Chandler. Natural gas pipeline crossing of a coldwater stream: impacts and recovery. *Proceedings of the 6th International Symposium, Environmental Concerns in Right-of-Way Management, 1997.*

Chandler, T.J. and R.A. Kostaschuk. A test of selected bed-material transport models, Nottawasaga River, Ontario, Canada. *Canadian Journal of Civil Engineering. 21:770-777, 1994.*