

Appendix D

Field Notes



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Bonnie Doon Creek

27-3
WB

Stantec

Project C.P Project # 160960709
 Station # 27-3 Field Staff KE + MF
 Photos Taken 252-256 Date Nov 21 2011
 GPS Coordinates N 4704652 408268 Time 10 AM
 Descriptive Location Egment @ Fisher Line

Water Quality

Dissolved Oxygen (mg/L) 13.19 pH 8.06 Conductivity (µS/cm) 742
 Water Temperature (°C) 5.52 Air Temperature (°C) 6°
 Weather conditions in previous 24 hrs cold + sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 6 (m) Mean Water Depth 15 (cm)
30 % Riffle 1 % Pool 70 % Run 1 % Flat

Evidence of eroding banks, Comments on bank stability slight undercut banks but vegetated

South

Substrate - Upstream (% cover)

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

North

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle):
 Overhanging Vegetation Undercut Banks Deep Pool Vascular Plants
Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
 Upstream 60% wooded riparian zone
 Downstream 40% wooded riparian zone at road

Adjacent Land Use

Upstream _____
 Downstream Residential

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Upstream _____
 Downstream gravel/cobble limiting

Migratory Obstructions (seasonal, permanent)

Upstream none
 Downstream _____

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- fast flow, slightly turbid, diverse substrates, riffle d/s at cobble
- med. wide + meandering

Bonnie Doon Creek

27-3



Stantec Consulting Ltd - Electrofishing Record and Catch Results

Project Name Suncor Energy- Cedar Point Wind Project Station Number 27-3

Project Number 160960709 Pass No. (if applicable) 1

Photos See back Date (yyyymmdd): 2012 05 09

Descriptive Location Just north of intersection of Egremont & Fisher Line.

UTM coordinates 0408271 easting 4764653 northing zone 17T

Fishing Method (circle one): Backpack Boat Unit Model/Make Mohr ER-12

Sampling Method (circle one): even habitat transect spot

Effort (Electrofishing Seconds): 320 Number of Netters: 1 Number of Anodes: 1

Settings
Frequency (Hz) 30 Voltage (volts) 600 Current (Amps) ✓ Power (Watts) ✓

Station Information

Length of Stream Surveyed (m) ~ 75m

Station Characteristics:
Width (m): Range 2.5 - 3.5 Average: 3.0
Depth (m): Range 0.10 - 0.40 Average: 0.30

Water Clarity/Colour: brown/turbid Water Velocity if Measured (m/s): N/A Time 14:03
Temperature (°C) 14.10 Conductivity (uS/cm) 672
pH 8.35 Dissolved Oxygen (mg/L) 8.42

Catch Data

Species	Number of Fish	Comments (Ls. age, disease, etc):
Crkchub	### ## (36)	
WASC	1	(1)
BRST	1	(1)
Pumpkinseed	11	(2)
NRBD	11	(2)
John. Dt.	1	(1)
Con. Shn	11	(2)
Fathead Mn.	###	(3)
BK. Side Dt.	11	(2)
Note: turbid & fast from last evening rain.		
knocked on door. No answer		

Fish Measurements on Separate Sheet? Y/N

Field Staff: N. Burnett, M. Faiella Notes By: MF



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Bonne Boon Cr. 27-4
WB

Stantec

Project C.P Project # 160960709
Station # 27-4 Field Staff KE + MF
Photos Taken 382-386 Date Nov. 25 2011
GPS Coordinates 174765616 408120 Time 8:10
Descriptive Location Egremont, 1.2 km west of oil ventage
1.3 km north in fields to old rail tracks.

Water Quality

Dissolved Oxygen (mg/L) 13.22 pH 7.96 Conductivity (µS/cm) 815
Water Temperature (°C) 5.28 Air Temperature (°C) 4°
Weather conditions in previous 24 hrs cold & overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 8 (m) Maximum Pool Depth 775 (cm)
Mean Bankfull Width 13 (m) Mean Water Depth 250 (cm)
0 % Riffle 0 % Pool 100 % Run 0 % Flat
Evidence of eroding banks, Comments on bank stability slight undercut some erosion

Substrate - Upstream (% cover)

Bedrock 30 Silt 0 Boulder 60 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 10 Detritus 0

Substrate - Downstream (% cover)

Bedrock 30 Silt 0 Boulder 60 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 10 Detritus 0

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Vascular Plants 0
Overhanging vegetation Woody Debris Boulder Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 70% wooded riparian area
Downstream 60% wooded riparian area
Adjacent Land Use
Upstream Ag fields
Downstream Ag fields

Fish Habitat Potential

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

- lots of cover habitat w/ woody debris
- wide, slow run
- turbid appears quite deep, clay banks w/ some silt deposit
- entire reach KE lined with deciduous riparian trees



Stantec Consulting Ltd - Electrofishing Record and Catch Results

Bonnie Doon 27-4
CR

Project Name Suncor Energy- Cedar Point Wind Project Station Number 27-4
 Project Number 160960709 Pass No. (if applicable) 1
 Photos See back Date (yyyymmdd): 2012 05 09
 Descriptive Location ~ 1 km north Egremont Rd + ~ 1 km west of Oil Heritage Rd.
 UTM coordinates 0403111 easting 4765761 northing zone 17T

Fishing Method (circle one): Backpack Boat _____ Unit Model/Make model LR-12
 Sampling Method (circle one): even habitat transect spot
 Effort (Electrofishing Seconds): 100 Number of Netters: 1 Number of Anodes: 1
 Settings
 Frequency (Hz) 30 Voltage (volts) 600 Current (Amps) / Power (Watts) /

Station Information

Length of Stream Surveyed (m) 20m of Shoreline
 Station Characteristics: Width (m): Range 10-14m Average: 12m
 Depth (m): Range 0.10->1.0 Average: >1.0

Water Clarity/Colour: brown / turbid Water Velocity if Measured (m/s): N/A Time 17:15
 Temperature (°C) 15.36 Conductivity (uS/cm) 559
 pH 8.46 Dissolved Oxygen (mg/L) 9.25

Catch Data

Species	Number of Fish	Comments (i.e. age, disease, etc):
Calc chub	### ## III	(13)
WHSC	II	(2)
Com. Shn.	II	(2)
Jhn. Dt	I	(1)
Water is very high and turbid. Flooded w very slick shoreline. Unsafe to enter water. Shocked shoreline only		
Note: Spoke w landowner. Said was okay to enter property		

Fish Measurements on Separate Sheet? Y

Field Staff: N. Burnett, M. Faiella

Notes By: MIF

(Station Diagram on Back)



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Sardine Brain 27-1 WB

Stantec

Project CIP Station # 27-1 Photos Taken 242-246 GPS Coordinates 17 47 65 297 409 027 Descriptive Location Oil Heritage, 750 m north of Egremont Project # 1100960709 Field Staff KE + MF Date Nov. 24 2011 Time 9:30

Water Quality

Dissolved Oxygen (mg/L) 12.64 pH 7.93 Conductivity (uS/cm) 682 Water Temperature (C) 5.92 Air Temperature (C) 50 Weather conditions in previous 24 hrs cold + sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m) Maximum Pool Depth 15 (cm) Mean Bankfull Width 6 (m) Mean Water Depth 15 (cm) % Riffle % Pool 100 % Run % Flat Evidence of eroding banks, Comments on bank stability stable + veg.

Substrate - Upstream (% cover) thick w/ RCG + cattails Bedrock Muck Silt Gravel Boulder Marl Clay Sand Cobble Detritus 20 80

Substrate - Downstream (% cover) thick w/ cattails Bedrock Muck Silt Gravel Boulder Marl Clay Sand Cobble Detritus 20 80

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants cattails Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) Upstream 0% Downstream 5% few trees at culvert

Adjacent Land Use

Upstream Downstream Ag fields

Fish Habitat Potential

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

mod. fast flow, clear water, narrow, flowing through cattail + RCG filled incised channel



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Jardine Drain

35-2

Stantec

Project CP Project # 160960709
 Station # 35-2 Field Staff KE + MF
 Photos Taken 211-215 Date Nov. 23 2011
 GPS Coordinates 17 4764218 410864 Time 4:40
 Descriptive Location Hillsboro Rd, 400 m south of Fisher Line

Water Quality

Dissolved Oxygen (mg/L) 12.03 pH 7.72 Conductivity (µS/cm) 592
 Water Temperature (°C) 8.35 Air Temperature (°C) 6
 Weather conditions in previous 24 hrs Cold + rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 50 (cm)
 Mean Bankfull Width 4 (m) Mean Water Depth 40 (cm)
 % Riffle — % Pool — 100 % Run — % Flat —
 Evidence of eroding banks, Comments on bank stability stable + vegetated

east Substrate - Upstream (% cover) turbid, lots of veg

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

west Substrate - Downstream (% cover) turbid, lots of veg

Bedrock — Silt — Boulder 20 Clay — Cobble —
 Muck — Gravel — Marl — Sand 80 Detritus —

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Vascular Plants cattails d/s
 Overhanging Vegetation — Woody Debris — Boulder — Other —

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
 Upstream 5% overhanging veg
 Downstream 15% scattered trees + overhanging veg.

Adjacent Land Use

Upstream As Fields
 Downstream —

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
 Downstream —

Migratory Obstructions (seasonal, permanent)

Upstream seasonal?
 Downstream —

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

-slow flow, narrow, incised, mod. thickly vegetated



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Greendees
Drain

25-5

Stantec

Station # 25-5
 Watercourse Name Greendees Drain
 Photos 9702 & 9703
 Date July 25 2012
 Weather conditions in previous 24 hrs hot + dry
 GPS Coordinates (Zone) 17T E 408245
 Descriptive Location Immediately South of Abercrombie Line + 500 - West of Oil Heritage Road

Project Name C.P.
 Project # 1609160709
 Field Staff RE + JK
 Time 3:20pm

N 4767358 Datum NAD 83

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 (m) Maximum Pool Depth dry (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 40 Sand _____ Silt _____ Muck _____
 Boulder _____ Gravel 60 Clay _____ Marl _____ Detritus _____
muck cattails

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 Op

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent) none

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.

-existing crossing

Field Notes Authored by KS

Field Notes QA/QCed by [Signature]



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Greendees Drain

25-2
WB

Stantec

Project CIP
Station # 25-2
Photos Taken 259-262
GPS Coordinates 17 476 7320 407882
Descriptive Location Aberarder 1 km west of Oil Heritage

Project # 160960709
Field Staff KE + MF
Date Nov. 24 2011
Time 10:25

Water Quality

Dissolved Oxygen (mg/L) 12.22 pH 7.95 Conductivity (µS/cm) 734
Water Temperature (°C) 7.41 Air Temperature (°C) 10°
Weather conditions in previous 24 hrs cold + sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 15 (cm)
Mean Bankfull Width 3 (m) Mean Water Depth 15 (cm)
 % Riffle 100 % Pool % Run % Flat
Evidence of eroding banks, Comments on bank stability stable & mg.

east

Substrate - Upstream (% cover)

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

west

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants cattails
Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 20%
Downstream 5% > trees along drain

Adjacent Land Use

Upstream _____
Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Upstream none
Downstream _____
Migratory Obstructions (seasonal, permanent)
Upstream dry in summer?
Downstream _____
Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- cattail filled, incised channel w/ negligible flows
- south side of Aberarder ure runs east/west



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

30 Creek Drain
23-1
WB

Stantec

Project c.p Project # 100960709
 Station # 23-1 Field Staff KE + ME
 Photos Taken 304-307 Date Nov. 24 2011
 GPS Coordinates 174768863 408220 Time 1:30 pm
 Descriptive Location Abercrombie 1 km west of Oil Plantage
& 1.8 km north to woodlot.

Water Quality

Dissolved Oxygen (mg/L) 9.85 pH 7.7 Conductivity (μ S/cm) 724
 Water Temperature ($^{\circ}$ C) 7.99 Air Temperature ($^{\circ}$ C) 4^o
 Weather conditions in previous 24 hrs cold, sunny & fog

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 5 (m) Mean Water Depth 15 (cm)
 % Riffle — % Pool — % Run 100 % Flat

Evidence of eroding banks, Comments on bank stability _____

Substrate - Upstream (% cover)

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

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle):
 Overhanging Vegetation ○ Undercut Banks ○ Deep Pool _____ Vascular Plants _____
 Woody Debris ○ Boulder _____ Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
 Upstream _____
 Downstream 80% woodlot

Adjacent Land Use

Upstream _____
 Downstream Ag & woodlot

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Upstream none observed
 Downstream _____
 Migratory Obstructions (seasonal, permanent)
 Upstream dry in summer?
 Downstream _____
 Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- incised channel, negligible flow, clay & lots of leaf litter substrate
 - lots of woody debris



Stantec

RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

33-1
Aberarder Creek WB

Project C.P.
Station # 33-1
Photos Taken 273-277
GPS Coordinates 17 47 270 911134
Descriptive Location Aberarder 100m east of Hillsboro Rd.

Project # 160960709
Field Staff KE + MF
Date Nov. 24 2011
Time 10

Water Quality

Dissolved Oxygen (mg/L) 13.4 pH 8.1 Conductivity (µS/cm) 699
Water Temperature (°C) 5.56 Air Temperature (°C) 4°
Weather conditions in previous 24 hrs cold, sunny & fog

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 40 (cm)
Mean Bankfull Width 6 (m) Mean Water Depth 30 (cm)
— % Riffle 10 % Pool 90 % Run — % Flat
Evidence of eroding banks, Comments on bank stability stable + veg

Substrate - Upstream (% cover) turbid assumed clay
Bedrock — Silt — Boulder 600 Clay — Cobble —
Muck — Gravel — Marl — Sand 40 Detritus —

Substrate - Downstream (% cover) turbid assumed clay
Bedrock — Silt — Boulder 10 Clay — Cobble —
Muck — Gravel — Marl — Sand 30 Detritus —

In-water Cover

Cover Types Present (circle):
Overhanging Vegetation Undercut Banks Woody Debris Deep Pool — Vascular Plants RCG
Boulder — Other —

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 30% riparian trees
Downstream 40% riparian trees

Adjacent Land Use

Upstream Ag fields
Downstream —

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream —

Migratory Obstructions (seasonal, permanent)

Upstream none
Downstream —

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc. -tile drainage inputs somewhat wide fast flowing, slightly meandering creek in shallow valley



Stantec

RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Aberarder creek 32-1 WB

Project CIP
Station # 32-1
Photos Taken 278-282
GPS Coordinates 17 4767660 410975
Descriptive Location Hillsboro Rd, 300 m north of Aberarder

Project # 100960709
Field Staff KE + MF
Date Nov 24 2011
Time 11:05

Water Quality

Dissolved Oxygen (mg/L) 13.45 pH 8.09 Conductivity (uS/cm) 702
Water Temperature (C) 5.67 Air Temperature (C) 4
Weather conditions in previous 24 hrs cold, sunny + fog

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 40 (cm)
Mean Bankfull Width 6 (m) Mean Water Depth 30 (cm)
20 % Riffle 1 % Pool 80 % Run 1 % Flat

Evidence of eroding banks, Comments on bank stability stable, vegetated + some boulders

Substrate - Upstream (% cover)

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

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 20% riparian trees
Downstream 15% riparian trees

Adjacent Land Use

Upstream Ag fields
Downstream

Fish Habitat Potential

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

-riffle d/s created by boulders placed in stream
-tile drainage inputs
-fast flow
-shallow valley



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Abercrombie creek 22-1
WB

Stantec

Project CIP
Station # 22-1
Photos Taken 292-297
GPS Coordinates 174769428 409187
Descriptive Location oil Pentape, 700 m south of Douglas

Project # 1100960209
Field Staff KE+MF
Date Nov. 24 2011
Time 11:55

Water Quality

Dissolved Oxygen (mg/L) 12.85 pH 8.1 Conductivity (µS/cm) 675
Water Temperature (°C) 5.76 Air Temperature (°C) 5°
Weather conditions in previous 24 hrs cold, sunny + fog

Watercourse Dimensions & Morphology

Mean Watercourse Width 5 (m) Maximum Pool Depth 40 (cm)
Mean Bankfull Width 8 (m) Mean Water Depth 30 (cm)
20 % Riffle — % Pool 80 % Run — % Flat

Evidence of eroding banks, Comments on bank stability erosion due to high flows, minimal undercut

Substrate - Upstream (% cover)

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

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle):
Overhanging Vegetation — Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants —
Other —

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 75% woodlot
Downstream 80% woodlot

Adjacent Land Use

Upstream —
Downstream woodlot + Ag Field

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Upstream large boulders limiting?
Downstream —

Migratory Obstructions (seasonal, permanent)

Upstream —
Downstream none

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

island under bridge restricts flows creating riffle 5m d/s of boulders
- lots of large boulders placed in stream & along banks d/s
- fast flows, turbid - no instream veg + little hangings over.



WIND FARM WATERBODY RAPID ASSESSMENT FORM

WB
22-5

Stantec

Aberard

Station # 22-5

Project Name C.P

Watercourse Name Aberard

Project # 160900709

Photos 1139-1141

Field Staff CE+NB

Date Dec. 3 2012

Time 4:05

Weather conditions in previous 24 hrs 10/d

GPS Coordinates (Zone) 17 T E 409472 N 4769168 Datum

Descriptive Location oil Heritage, South of Douglas

Water Quality

Dissolved Oxygen (mg/L) 12.08 pH 8.24 Conductivity (μ S/cm) 529

Water Temperature ($^{\circ}$ C) 7.08 Air Temperature ($^{\circ}$ C) 50

Time in situ measurements taken 4:05 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 4 (m) Maximum Pool Depth 60 (cm)

Mean Bankfull Width 15 (m) Mean Water Depth 50 (cm)

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

Evidence of eroding banks, Comments on bank stability
Some reaches steep & eroding

Substrate (% cover)

Bedrock	<u>30</u>	Cobble		Sand	<u>10</u>	Silt		Muck	
Boulder	<u>30</u>	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)
40% Elm, Ash, Maple, Sumac

Adjacent Land Use
AG

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
n

Note any fish observations
n

Waterbody Notes

Natural Watercourse Trapezoidal 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 KE

Field Notes QA/QCed by _____



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Barnister Drain

34-2

WB

Stantec

Project C.P
Station # 34-2
Photos Taken 222-225
GPS Coordinates 17 4765883 410921
Descriptive Location Hillsboro Rd, 25m south of wright line

Project # 160960709
Field Staff KE + MF
Date Nov 23 2011
Time 5pm

Water Quality

Dissolved Oxygen (mg/L) 12.15 pH 7.85 Conductivity (µS/cm) 568
Water Temperature (°C) 7.72 Air Temperature (°C) 5
Weather conditions in previous 24 hrs cold + rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5m (m) Maximum Pool Depth 15 (cm)
Mean Bankfull Width 3.0 (m) Mean Water Depth 10 (cm)
0 % Riffle 30 % Pool 70 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability stable + vegetated, some boulder near w/s culvert.

Substrate - Upstream (% cover)

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

Substrate - Downstream (% cover)

turbid assumed
Bedrock 0 Silt 0 Boulder 10 Clay 40 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 0 Detritus 50

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Vascular Plants cattails + RCG
Overhanging Vegetation 0 Woody Debris 0 Boulder 0 Other 0

Riparian Zone

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

Upstream 0%
Downstream 5% overhanging veg

Adjacent Land Use

Upstream Ag fields
Downstream Ag field + residence

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream 0

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?
Downstream 0

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- narrow, incised, vegetated channel (cattails + RCG)
- pool at d/s culvert formed by cattails, slow run continues d/s
- u/s slow run at tiled drainage input



WIND FARM WATERBODY RAPID ASSESSMENT FORM

WB
Bannister braun 22-6

Stantec

Station # 22-6 Project Name CIP
 Watercourse Name Bannister braun Project # 160960709
 Photos 1142-1144 Field Staff KE + NB
 Date APR 3 2012 Time 4:25
 Weather conditions in previous 24 hrs rain - last wk
 GPS Coordinates (Zone) 17 + E 409144 N 4768710 Datum
 Descriptive Location Oil Heritage - South of Douglas

Water Quality

Dissolved Oxygen (mg/L) 12.44 pH 8.12 Conductivity (μ S/cm) 605
 Water Temperature ($^{\circ}$ C) 7.51 Air Temperature ($^{\circ}$ C) 11
 Time *in situ* measurements taken 16:22

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.0 (m) Maximum Pool Depth 6.0 (cm)
 Mean Bankfull Width 6.0 (m) Mean Water Depth 4.0 (cm)
 _____ % Riffle _____ % Pool slow m - 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability Some scouring

Substrate (% cover)

Bedrock	<u>20</u>	Cobble		Sand	<u>0</u>	Silt	<u>5</u>	Muck	
Boulder	<u>20</u>	Gravel	<u>40</u>	Clay	<u>3</u>	Marl	<u>10</u>	Detritus	

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
seed grass, goldenrod, basswood, Hawthorn, 40% shaded
 Adjacent Land Use Ag

Fish Habitat Potential

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

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by N. Burnett Field Notes QA/QCed by _____



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Bannister Drain 26-2 WB

Stantec

Project C.P. Station # 26-2 Project # 160960709 Field Staff KE + MF Photos Taken Date Nov. 24 2011 GPS Coordinates 17 4767318 409693 Time 10:40 Descriptive Location Aberarder line 500m east of O.I Heritage

Water Quality

Dissolved Oxygen (mg/L) 13.02 pH 8.02 Conductivity (µS/cm) 657 Water Temperature (°C) 5.99 Air Temperature (°C) 5 Weather conditions in previous 24 hrs cold, sunny + fog

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth 20 (cm) Mean Bankfull Width 4 (m) Mean Water Depth 15 (cm) % Riffle % Pool 100% Run % Flat Evidence of eroding banks, Comments on bank stability vegetated + stable

south

Substrate - Upstream (% cover)

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

north

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants cattails Other

Riparian Zone

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

Upstream 0% Downstream 20% trees + overhanging veg

Adjacent Land Use

Upstream Ag fields Downstream

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none Downstream

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer? Downstream

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

-mod fast flow, tile drainage inputs, slightly turbid, narrow -cattail somewhat thick in channel, esp dls



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Fannister brain

24-1

Stantec

Project C.P. Station # 24-1 Photos Taken 287-291 GPS Coordinates 17 4768596 409153 Descriptive Location Oil Heritage, 1.5 km south of Douglas line

Project # 160960709 Field Staff KE + MF Date Nov. 24 2011 Time 11:30

Water Quality

Dissolved Oxygen (mg/L) 13.29 pH 8.26 Conductivity (uS/cm) 652 Water Temperature (C) 5.86 Air Temperature (C) 4 Weather conditions in previous 24 hrs cold, sunny + fog

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.5 (m) Maximum Pool Depth 30 (cm) Mean Bankfull Width 7 (m) Mean Water Depth 30 (cm) 20% Riffle 80% Run Evidence of eroding banks, Comments on bank stability slight undercut but vegetated

east

Substrate - Upstream (% cover) turbid Bedrock 20 Silt 20 Boulder 60 Clay Cobble Muck 20 Gravel Marl Sand Detritus

west

Substrate - Downstream (% cover) turbid Bedrock 20 Silt 30 Boulder Clay 10 Cobble Muck 20 Gravel Marl Sand 20 Detritus

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks slight Woody Debris Deep Pool Boulder Vascular Plants RCG + phra Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) Upstream 40% riparian trees + shrubs north side Downstream 60% treed riparian buffer Adjacent Land Use Upstream Ag fields + woodlot Downstream

Fish Habitat Potential

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

-cobble/boulder in stream 25 m d/s creates riffle -mod. fast flow -incised -treed riparian buffer -turbid.



Stantec Consulting Ltd - Electrofishing Record and Catch Results

Project Name Suncor Energy- Cedar Point Wind Project Station Number 24-1
 Project Number 160960709 Pass No. (if applicable) 1
 Photos See back Date (yyyymmdd): 2012 05 10
 Descriptive Location On Oil Heritage Rd ~1.5 km south of Douglas Line on West side
 UTM coordinates 4768596 ^{easting} 409153 ^{northing} zone 17T

Fishing Method (circle one): Backpack Boat _____ Unit Model/Make ER-12
 Sampling Method (circle one): even habitat _____ transect _____ spot _____
 Effort (Electrofishing Seconds): 400 Number of Netters: 1 Number of Anodes: 1
 Settings
 Frequency (Hz) 60 Voltage (volts) 600 Current (Amps) ✓ Power (Watts) ✓

Station Information
 Length of Stream Surveyed (m) ~ 80 m
 Station Characteristics: Width (m): Range 3.0 - 4.0 Average: 3.5
 Depth (m): Range 0.25 - 0.50 Average: 0.35

Water Clarity/Colour: clear Water Velocity if Measured (m/s): N/A Time 13:50
 Temperature (°C) 15.97 Conductivity (uS/cm) 596
 pH 8.68 Dissolved Oxygen (mg/L) 11.97

Catch Data

Species	Number of Fish	Comments (i.e. age, disease, etc):
Crk chub	18 + IIII IIII IIII IIII (39)	
WHSC	7 + IIII (15)	
Cmn Shn	11 (2)	Some w/ minor black spot
BRST	III (3)	
Rainb. Dt.	III (5)	
Jhn. Dt.	III (6)	
Fathead Min.	1 (1)	

Fish Measurements on Separate Sheet? Y^N
 Field Staff: N. Burnett, M. Faiella Notes By: MF
 (Station Diagram on Back)



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Bannister Drain 62-2
Bannister-WFB
Drain

Station # 62-2 Project Name CP
 Watercourse Name Bannister Drain Project # 100960709
 Photos 802-805 Field Staff KE + JK
 Date Oct 3 2012 Time 12:46
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17 T E 412059 N 4765247 Datum _____
 Descriptive Location _____

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 6 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable + vegetated

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 Solidago, RCG
 Overhanging Vegetation Aquatic Veg Woody Debris Boulder Other _____

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
15% overhanging rebs, willow, grape, elm, maple
 Adjacent Land Use Ag

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

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

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



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Bannister Drain-1 62-3 WB

Stantec

Station # 62-3 Project Name CP
Watercourse Name Bannister Drain -1 Project # 160960709
Photos 806-809 Field Staff KE+JK
Date Oct. 3 2012 Time 12:55
Weather conditions in previous 24 hrs warm + rain
GPS Coordinates (Zone) 17T E 411529 N 4765581 Datum
Descriptive Location Wright Lane, east of Hillsboro

Water Quality

Dissolved Oxygen (mg/L) pH Conductivity (uS/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 3 (m) Mean Water Depth (cm)
% Riffle % Pool % Run % Flat
Evidence of eroding banks, Comments on bank stability
stable, treed

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

Ag

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
none (seasonal)

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.

trapezoidal channel starting to naturalize w/in
tree line

Field Notes Authored by KE

Field Notes QA/QCed by



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Byrnes-Sutton 45-2
Drain

WA

Station # 45-2 Project Name C.P.
Watercourse Name unknown Byrnes-Sutton Drain Project # 160960709
Photos 617-ids 648-ids 649-ids Field Staff NB, MF
Date 2012 06 07 Time 09:10

Weather conditions in previous 24 hrs no precip.
GPS Coordinates (Zone) 17T E 413853 N 4766200 Datum ITMAD83
Descriptive Location ~500m east of Blue Heron Rd ~500m south of
Abercrombie in field

Water Quality
Dissolved Oxygen (mg/L) 9.73 pH 7.98 Conductivity (µS/cm) 701
Water Temperature (°C) 14.41 Air Temperature (°C) 17°C
Time *in situ* measurements taken 09:00

Watercourse Dimensions & Morphology
Mean Watercourse Width 1.5 (m) Maximum Pool Depth 0.65 (cm)
Mean Bankfull Width 3.0 (m) Mean Water Depth 0.25 (cm)
20 % Riffle 10 % Pool 20 % Run 50 % Flat
Evidence of eroding banks, Comments on bank stability minor scour + slumping.

Substrate (% cover)
Bedrock 5 Cobble 50 Sand 50 Silt Muck
5 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

Riparian Zone
Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
5% small shrubs, grasses
Adjacent Land Use ag, woodlot.

Fish Habitat Potential
Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning, nursery, foraging
Migratory Obstructions (seasonal, permanent)
low water levels.
Note any fish observations many, captured 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.

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



Stantec Consulting Ltd - Electrofishing Record and Catch Results

Project Name C.P. Station Number 457-2
 Project Number 160960709 Pass No. (if applicable) 1
 Photos 647=id 648=0/s 649=d/s Date (yyyymmdd): 2012 06 07
 Descriptive Location ~500m east of Blue Heron + ~500m south of
Abelarder in Field
 UTM coordinates 413953 easting 4766200 northing zone 17T

Fishing Method (circle one): Backpack Boat Unit Model/Make ER-12
 Sampling Method (circle one): even habitat transect spot
 Effort (Electrofishing Seconds): 198 Number of Netters: 1 Number of Anodes: 1
 Settings
 Frequency (Hz) 60 Voltage (volts) 700 Current (Amps) Power (Watts)

Station Information
 Length of Stream Surveyed (m) ~60
 Station Characteristics: Width (m): Range 0.75-3.0 Average: 1.5
 Depth (m): Range 0.10-0.60 Average: 0.25
 Water Clarity/Colour: tea Water Velocity if Measured (m/s): N/A Time 08:30
 Temperature (°C) 14.41 Conductivity (uS/cm) 701
 pH 7.98 Dissolved Oxygen (mg/L) 9.73

Catch Data

Species	Number of Fish	Comments (i.e. age, disease, etc):
Crk chub	+ +9+20+9+20+20 (92)	
Fathead Mn	1 (6)	
John Dt.	(9)	
WHSC	(12)	
Comn Shn	(20)	
Bluntnose Mn	(1)	
Majority of fish captured @ d/s culvert pool. Dt's captured in riffle		

Fish Measurements on Separate Sheet? Y(N)
 Field Staff: NB, MF Notes By: MF
 (Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Byrnes-sutton 45-3
Drain-1 WB

Stantec

Station # 45-3 Project Name C.P.
 Watercourse Name unknown Byrnes-sutton Drain Project # 160960709
 Photos 654=rid 655=culs 656=d/s 657+658=instream Field Staff NB, MF
 Date 2012 06 07 Time 09:30
 Weather conditions in previous 24 hrs no precipitation
 GPS Coordinates (Zone) 17T E 4765979 N 0413986 Datum NAD83
 Descriptive Location 80m east of proposed access rd for CP46.

Water Quality

Dissolved Oxygen (mg/L) 10.61 pH 8.27 Conductivity (µS/cm) 674
 Water Temperature (°C) 14.93 Air Temperature (°C) 17°C
 Time *in situ* measurements taken 09:35

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.75 (m) Maximum Pool Depth 0.10 (cm)
 Mean Bankfull Width 1.75 (m) Mean Water Depth 0.05 (cm)
 % Riffle 80 % Pool _____ % Run 20 % 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)
5% small shrubs, terr grass

Adjacent Land Use

ag. Channel is dredged periodically

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
may dry up.

Note any fish observations 6 creek chub captured.

Waterbody Notes

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

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

Field Notes Authored by MF

Field Notes QA/QCed by JK



WIND FARM WATERBODY RAPID ASSESSMENT FORM

10th Conc. Drain 46-2
33-2
WRB

Stantec

Station # 33-2 Project Name Cedar Point
 Watercourse Name 10th Conc. Drain Project # 1009160709
 Photos _____ Field Staff JE + JK
 Date July 3 2012 Time 4:12 pm
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17 T E 411206 N 4767246 Datum _____
 Descriptive Location Abercrombie line east of Fullsboro

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 _____ (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 _____

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 cattails
 Overhanging Vegetation astus Woody Debris Boulder Other _____ Aquatic Veg

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
20% trees
 Adjacent Land Use Ag.

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.
dug & cleared
connected to Abercrombie Creek

Field Notes Authored by KE Field Notes QA/QCed by JK



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Aberarder - 1

32-3
WBM

Stantec

Project C.P Project # 160960709
 Station # 32-3 Field Staff KE + MF
 Photos Taken 707 - 713 Date Nov. 29 2011
 GPS Coordinates 174167340 410962 Time 2:30 pm
 Descriptive Location Hillsboro rd, 50 m north of Aberarder line

Water Quality

Dissolved Oxygen (mg/L) 10.68 pH 7.79 Conductivity (µS/cm) 325
 Water Temperature (°C) 16.64 Air Temperature (°C) 4
 Weather conditions in previous 24 hrs cold + lots of rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.75 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 1.5 (m) Mean Water Depth 10 (cm)
 % Riffle % Pool 100 % Run % Flat

Evidence of eroding banks, Comments on bank stability
stable over

Substrate - Upstream (% cover)

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

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Deep Pool Vascular Plants RCG + cattails
 Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

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

Upstream 0%
 Downstream 0%

Adjacent Land Use

Upstream Ag fields
 Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
 Downstream none

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?
 Downstream dry in summer?

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- old rail line ditch, but dominated by RCG + cattails
 - incised, slow, turbid flow
 - flows from Aberarder into Aberarder creek (just east)



Stantec

RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Unknown basin 22-3
d/s WB
a/s NWB

Project CP
Station # 22-3
Photos Taken 308-312
GPS Coordinates 174769422 410417
Descriptive Location Douglas Line
1200m south East of Oil Heritage Rd

Project # 160960709
Field Staff ICE + MF
Date Nov 24 2011
Time 1:50 pm
700m south of Douglas Line

Water Quality

Dissolved Oxygen (mg/L) 11.6 pH 7.85 Conductivity (µS/cm) 724
Water Temperature (°C) 9.2 Air Temperature (°C) 9
Weather conditions in previous 24 hrs cold, sunny fog

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth 10 (cm)
Mean Bankfull Width 3.5 (m) Mean Water Depth 10 (cm)
— % Riffle 100 % Pool — % Run — % Flat
Evidence of eroding banks, Comments on bank stability stable banks + vegetated

east

Substrate - Upstream (% cover) tiled field, tile drainage
Bedrock — Silt — Boulder — Clay — Cobble —
Muck — Gravel — Marl — Sand — Detritus —

west

Substrate - Downstream (% cover)
Bedrock — Silt — Boulder — Clay 80 Cobble —
Muck — Gravel — Marl — Sand — Detritus 20

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks — Deep Pool — Vascular Plants cattails
Woody Debris — Boulder — Other —

Riparian Zone

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

Adjacent Land Use

Upstream —
Downstream Ashfields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Upstream None
Downstream —
Migratory Obstructions (seasonal, permanent)
Upstream dry in summer
Downstream —
Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

tiled u/s, narrow, incised channel w/ cattails, negligible fl.



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Unknown Drain 22-2
WB

Stantec

Project C.P
Station # 22-2
Photos Taken 298-303
GPS Coordinates 17 4770041 409822
Descriptive Location Douglas Line, 700 m east of o.l Heritage

Project # 160960709
Field Staff KE + MF
Date Nov 24 2011
Time 12:05 p

Water Quality

Dissolved Oxygen (mg/L) 12.38 pH 8.06 Conductivity (µS/cm) 816
Water Temperature (°C) 7.54 Air Temperature (°C) 4°
Weather conditions in previous 24 hrs cold, sunny, fog

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 30 (cm)
Mean Bankfull Width 5 (m) Mean Water Depth 30 (cm)
— % Riffle 100 % Pool 40 % Run — % Flat

Evidence of eroding banks, Comments on bank stability erosion noted d/s banks

South Substrate - Upstream (% cover)

Bedrock — Silt — Boulder 50 Clay — Cobble —
Muck — Gravel — Marl — Sand 50 Detritus — RCC + leaf lit

north Substrate - Downstream (% cover)

Bedrock — Silt — Boulder 20 Clay — Cobble —
Muck — Gravel — Marl — Sand 80 Detritus — leaf lit

In-water Cover

Cover Types Present (circle):
Overhanging Vegetation — Undercut Banks — Deep Pool — Vascular Plants RCC
Woody Debris — Boulder — Other —

Riparian Zone

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

Upstream 30% silver maples
Downstream 5% open through pasture

Adjacent Land Use

Upstream Ag + residential
Downstream pasture

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream —

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?
Downstream —

Note any fish observations cyprinids sp.

Other Habitat Notes, Incidental Wildlife Observations, etc.

narrow, meandering, slightly incised, negligible flow



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Aberarder Railway 32-4
Drain
NWB

Stantec

Station # 32-4 Project Name C.P.
Watercourse Name Aberarder Railway Drain Project # 1100960709
Photos _____ Field Staff KE & NB
Date APR. 3 2012 Time _____
Weather conditions in previous 24 hrs _____
GPS Coordinates (Zone) 17 T E 411128 N 4767448 Datum _____
Descriptive Location _____

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

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by KE

Field Notes QA/QCed by _____



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Highland Cr.

48-1
WB.

Stantec

Station # 48-1 Project Name C.P.
 Watercourse Name Highland Creek Project # 160960709
 Photos _____ Field Staff KE + JK
 Date July 5 2012 Time 10:20
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17 T E 416592 N 4769145 Datum NAD 83
 Descriptive Location Brush Road, south of Douglas Live

Water Quality

Dissolved Oxygen (mg/L) 2.55 pH 8.03 Conductivity (µS/cm) 297
 Water Temperature (°C) 22.1 Air Temperature (°C) 32
 Time in situ measurements taken 10:45 AM

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 0.4 (cm)
 Mean Bankfull Width 5 (m) Mean Water Depth 0.2 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat

Evidence of eroding banks, Comments on bank stability
some erosion on south banks.

Substrate (% cover)

Bedrock	Cobble	30	Sand	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 _____

Riparian Zone

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

Adjacent Land Use

Ag

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
permanent

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.

-large pool @ culvert, dries up 5m west of culvert
then large pool

Field Notes Authored by KE Field Notes QA/QCed by JK



Highland Creek 48-1
Page 1 of 1

Stantec Consulting Ltd - Electrofishing Record and Catch Results

Project Name C.P. Station Number 48-1
 Project Number 160960709 Pass No. (if applicable) 1
 Photos _____ Date (yyyymmdd): July 5 2012
 Descriptive Location Brush Rd, south of Douglas @ Highland Creek
Crossing
 UTM coordinates 416592 easting 4769145 northing zone 17T

Fishing Method (circle one): Backpack Boat _____ Unit Model/Make LR-24
 Sampling Method (circle one): even habitat transect _____ spot _____
 Effort (Electrofishing Seconds): 179 Number of Netters: 1 Number of Anodes: 1
 Settings
 Frequency (Hz) 60 Voltage (volts) 275 Current (Amps) _____ Power (Watts) _____

Station Information
 Length of Stream Surveyed (m) 40 m
 Station Characteristics:
 Width (m): Range 2.5 - 3.5 Average: 3
 Depth (m): Range 0.5 - 0.4 Average: 0.25

Water Clarity/Colour: turbid Water Velocity if Measured (m/s): slow Time 10:45
 Temperature (°C) 22.1 Conductivity (uS/cm) 297
 pH 8.03 Dissolved Oxygen (mg/L) 2.55

Catch Data

Species	Number of Fish	Comments (i.e. age, disease, etc):
White Sucker	2 = (2)	A
Johnny Darter	2 + 6 + 1 + 2 = (15) ^{10ths YOY}	A + Juv + YOY
Rainbow Darter	4 = (4)	A
Creek chub	22 + 5 + 1 + 4 = (32) ^{10ths YOY}	Juv + A + YOY
Fathead	2 + 1 + 1 = (4)	A
Spottail		
Mibrow Traps	(possibly set by landowner) unknown duration	
Creek chub	100 estimate	
Fathead	1	

Fish Measurements on Separate Sheet? Y/N
 Field Staff: KE + JK Notes By: KE

(Station Diagram on Back)

* T-storm hit, limited E-fishing time out of field



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Highland Cr 31-3 WJB

Stantec

Project C.P. Station # 31-3 Photos Taken 324-328 GPS Coordinates 17476977 911706 Descriptive Location Douglas Line 5700 m east of Hillsboro. Project # 160960709 Field Staff KE + MF Date Nov. 24 2011 Time 2:45 pm

Water Quality

Dissolved Oxygen (mg/L) 13.31 pH 8.25 Conductivity (uS/cm) 736 Water Temperature (C) 10.36 Air Temperature (C) 40 Weather conditions in previous 24 hrs cold, sunny, overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 70 (cm) Mean Bankfull Width 8 (m) Mean Water Depth 60 (cm) % Riffle % Pool 100 % Run % Flat

Evidence of eroding banks, Comments on bank stability erosion mainly u/s but not really undercut

Substrate - Upstream (% cover) turbid, assume mostly clay.

Bedrock 20 Silt Boulder 80 Clay Cobble Muck Gravel Marl Sand Detritus

Substrate - Downstream (% cover) turbid assume clay + detritus

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

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants RCG Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) Upstream 20% riparian tree Downstream 5% tree

Adjacent Land Use

Upstream Ag fields Downstream

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none Downstream

Migratory Obstructions (seasonal, permanent)

Upstream none Downstream

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

1/5 wider & slow flow (4.5m) d/s braided flow through islands of RCG, construction flow velocity



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Highland Cr

21-1
WB

Stantec

Project CIP
Station # 21-1
Photos Taken 333-337
GPS Coordinates 17 4770718 411081
Descriptive Location Millsboro 1 km north of Douglas Line

Project # 160960709
Field Staff KE + MF
Date Nov. 24 2011
Time 3:20pm

Water Quality

Dissolved Oxygen (mg/L) 13.52 pH 8.26 Conductivity (µS/cm) 722
Water Temperature (°C) 6.2 Air Temperature (°C) 40
Weather conditions in previous 24 hrs cold, sunny & overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.5 (m) Maximum Pool Depth 80 (cm)
Mean Bankfull Width 10 (m) Mean Water Depth 70 (cm)
15 % Riffle 0 % Pool 85 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability mostly stable, some erosion

east

Substrate - Upstream (% cover)

0 Bedrock 10 Silt 0 Boulder 70 Clay 20 Cobble
0 Muck 0 Gravel 0 Marl 0 Sand 0 Detritus

west

Substrate - Downstream (% cover)

0 Bedrock 0 Silt 0 Boulder 80 Clay 20 Cobble
0 Muck 0 Gravel 0 Marl 0 Sand 0 Detritus

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants RCC
Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 5% mostly open meadow
Downstream 50% riparian trees

Adjacent Land Use

Upstream pasture
Downstream Ag fields

Fish Habitat Potential

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

incised valley through pasture + ag
-mod. fast flow, turbid, meandering slightly



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Highland Creek NB 64-2

Station # 64-2
Watercourse Name Highland Creek
Photos 1126-1128
Date Dec 3/12

Project Name Cedar Point
Project # 1160960709
Field Staff NB, KE
Time 14:25

Weather conditions in previous 24 hrs rain-latest
GPS Coordinates (Zone) 17 E 0912915 N 4769576 Datum NAD83
Descriptive Location Along Douglas Line (south of), west of (Hoxeter), East of Hillsboro

Water Quality

Dissolved Oxygen (mg/L) 10.37 pH 8.34 Conductivity (µS/cm) 582
Water Temperature (°C) 8.46 Air Temperature (°C) 10
Time *in situ* measurements taken 14:25

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.0 (m) Maximum Pool Depth 50 (cm)
Mean Bankfull Width 10.0 (m) Mean Water Depth 30 (cm)
% Riffle 30 % Pool slow - 10 % Run % Flat
Evidence of eroding banks, Comments on bank stability minimal, bank mostly protected by reed and yellow goldenrods

Substrate (% cover)

Bedrock 10 Cobble Sand 20 Silt Muck
Boulder Gravel 60 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 - some

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
reed, some grass, raspberry, blackberry 10% over-shaded water plants some algae
Adjacent Land Use Agriculture

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
potential pile spawning, reed, some grass floodplain
Migratory Obstructions (seasonal, permanent)
none
Note any fish observations none

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by N. Burnett

Field Notes QA/QCed by



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NWB

64-1
Highland Creek - 1

Stantec

Station # 64-1

Project Name CIP

Watercourse Name Douglas Drain

Project # 160960209

Photos _____

Field Staff KE + NB

Date Dec 3 2012

Time _____

Weather conditions in previous 24 hrs cool & ran

GPS Coordinates (Zone) 17T E 412912 N 4770301 Datum _____

Descriptive Location Souglas line, north of Ag field, west of Hillsboro

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 surface aquatic present in field

Field Notes Authored by KE

Field Notes QA/QCed by _____



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

James Wilkerson
DRAIN

31-2
WB

Stantec

Project C.P
Station # 31-2
Photos Taken 318-323
GPS Coordinates 17 4769989 411372
Descriptive Location Douglas Line

Project # 160960709
Field Staff KE + MF
Date Nov. 24 2011
Time 2:25 PM
150 m west of Komjan Lane

Water Quality

Dissolved Oxygen (mg/L) 13.16 pH 8.24 Conductivity (µS/cm) 678
Water Temperature (°C) 6.2 Air Temperature (°C) 4°
Weather conditions in previous 24 hrs cold, sunny, overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 4 (m) Maximum Pool Depth 10 (cm)
Mean Bankfull Width 4 (m) Mean Water Depth 7 (cm)
10 % Riffle — % Pool 90 % Run — % Flat

Evidence of eroding banks, Comments on bank stability erosion + undercut
esp. d/s

Substrate - Upstream (% cover)

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

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants RCG
Other —

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 40% riparian trees on west bank
Downstream 20% scattered riparian trees

Adjacent Land Use

Upstream —
Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream None
Downstream —

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?
Downstream —

Note any fish observations Brook stickleback d/s culvert

Other Habitat Notes, Incidental Wildlife Observations, etc.

incised channel, slow flow, thick w/ RCG



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

James - wilkinson
Brain 467
NW3

Station # 46-1 Project Name CP
Watercourse Name James wilkinson brain Project # 11009100709
Photos _____ Field Staff KE + JLC
Date July 3 2012 Time 4:20 pm
Weather conditions in previous 24 hrs T-storm
GPS Coordinates (Zone) 17 E 413723 N 4767183 Datum NAD83
Descriptive Location Aberarder, east of Blue Haven

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.

filled

Field Notes Authored by KE

Field Notes QA/QCed by JK



WIND FARM WATERBODY RAPID ASSESSMENT FORM

NWB
55-2

James Wilkenson drain

Stantec

Station # 55-2 Project Name C.P
 Watercourse Name James Wilkenson Project # 100910709
 Photos 1135 Field Staff KE + RB
 Date Dec 3 2012 Time _____
 Weather conditions in previous 24 hrs cool + rain
 GPS Coordinates (Zone) 17T E 412864 N 4768484 Datum _____
 Descriptive Location rough line, south 1 km

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 surface feature present - east

Field Notes Authored by KE

Field Notes QA/QCed by _____



WIND FARM WATERBODY RAPID ASSESSMENT FORM

WB

55-3

James Wilkenson Brain

Stantec

Station # 55-3 Project Name C.P
 Watercourse Name James Wilkenson Brain Project # 160960709
 Photos 1136-1138 Field Staff KE + NB
 Date Dec 3 2017 Time 3:25
 Weather conditions in previous 24 hrs cloud
 GPS Coordinates (Zone) 17T E 412820 N 4768505 Datum
 Descriptive Location _____

Water Quality

Dissolved Oxygen (mg/L) 10.54 pH 8.09 Conductivity (µS/cm) 705
 Water Temperature (°C) 9.07 Air Temperature (°C) 5°
 Time *in situ* measurements taken 3:25

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 1.5 (m) Mean Water Depth 7 (cm)
 % Riffle 100 % Pool starting with % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability stable + veg

Substrate (% cover)

Bedrock	<u>10</u>	Cobble	<u>20</u>	Sand		Silt		Muck	
Boulder	<u>30</u>	Gravel	<u>40</u>	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) 40% Dogwood, raspberry, RCG, goldenrod, buckthorn, Ash
 Adjacent Land Use As

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) no
 Migratory Obstructions (seasonal, permanent) seasonal?
 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.

field drainage or field east of utm
trap channel west of utm

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



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Hartley Drain 32-2 WR

Stantec

Project C.P Station # 32-2 Photos Taken 283-286 GPS Coordinates 17 47 68 S 31 41 00 W Descriptive Location Hillsboro Rd, 1.5 km south of Douglas L. Project # 160960709 Field Staff KE + MI Date Nov 24 2011 Time 11:10

Water Quality

Dissolved Oxygen (mg/L) 11.46 pH 7.86 Conductivity (uS/cm) 658 Water Temperature (C) 9 Air Temperature (C) 40 Weather conditions in previous 24 hrs cold, sunny & fog

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 30 (cm) Mean Bankfull Width 4 (m) Mean Water Depth 25 (cm) % Riffle 100 % Pool % Run % Flat Evidence of eroding banks, Comments on bank stability stable & vegetated

Substrate - Upstream (% cover)

Bedrock Muck Silt Gravel Boulder Marl Clay Sand Cobble Detritus

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants Other watercross cattails

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) Upstream Downstream 5% riparian tree Adjacent Land Use Upstream Downstream Ag fields & woodlot

flows north along road

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) Upstream Downstream watercross, large patch then thick w/ cattails Migratory Obstructions (seasonal, permanent) Upstream Downstream thick cattails Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

-inused channel, narrow, watercross, groundwater inputs -negligible flows -some reaches thick with cattails



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Hartley Drain 31-1
WB

Stantec

Project C.P
Station # 31-1
Photos Taken 313-327
GPS Coordinates 174769946 911067
Descriptive Location Douglas Line @ Pillsboro

Project # 160960709
Field Staff KE + MI
Date Nov. 24 2011
Time 2:15 pm

Water Quality

Dissolved Oxygen (mg/L) 12.29 pH 8.13 Conductivity (µS/cm) 681
Water Temperature (°C) 7.26 Air Temperature (°C) 4°
Weather conditions in previous 24 hrs cloud, sunny + overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth 20 (cm)
Mean Bankfull Width 4 (m) Mean Water Depth 15 (cm)
0 % Riffle 0 % Pool 100 % Run 0 % Flat
Evidence of eroding banks, Comments on bank stability slight erosion

SE

Substrate - Upstream (% cover) thick w cattails

0 Bedrock 0 Silt 0 Boulder 20 Clay 0 Cobble
0 Muck 0 Gravel 0 Marl 0 Sand 80 Detritus

NW

Substrate - Downstream (% cover)

0 Bedrock 0 Silt 0 Boulder 20 Clay 0 Cobble
0 Muck 0 Gravel 0 Marl 0 Sand 80 Detritus

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Vascular Plants cattails
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

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

Upstream 30% riparian trees
Downstream 10% scattered riparian trees

Adjacent Land Use

Upstream Ag fields
Downstream

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream None
Downstream

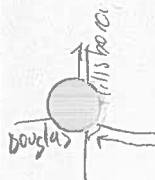
Migratory Obstructions (seasonal, permanent)

Upstream Dry in summer?
Downstream

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

incised channel, thick with cattails, slow flow





Stanec

RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Cates Drain

31-4
NW8

Project C.P
Station # 31-4
Photos Taken 329-332
GPS Coordinates 17 4769969 912119
Descriptive Location Douglas Line 1 km east of Hillsboro

Project # 160960709
Field Staff KE + MF
Date Nov. 24 2011
Time 2:55 pm

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) _____
Weather conditions in previous 24 hrs _____

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 - Upstream (% cover)

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

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): _____ Undercut Banks _____ Deep Pool _____ Vascular Plants
Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream _____
Downstream _____
Adjacent Land Use
Upstream _____
Downstream _____

Fish Habitat Potential

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

Note any fish observations _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

- road ditch drainage north side
- surficial drainage south through field to watercourse at 31
- grassed swale



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Kernohan - O'Donnell Drain
60-1
WB

Stantec

Station # 60-1 Project Name Cedar Point
 Watercourse Name Unknown Project # 160960709
 Photos 820-824 Field Staff JLK KFE
 Date 2012/10/03 Time 4:20 pm
 Weather conditions in previous 24 hrs Fog in am
 GPS Coordinates (Zone) 17T E 46514 N 4767222 Datum NAD83
 Descriptive Location On Brush Line, North of Alexander Rd.

Water Quality

Dissolved Oxygen (mg/L) 7.32 pH 8.15 Conductivity (µS/cm) 1602
 Water Temperature (°C) 15.4°C Air Temperature (°C) 20°C
 Time *in situ* measurements taken 4:08 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.7 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 6.0 (m) Mean Water Depth 5 (cm)
 % Riffle 10 % Pool 90 % Run 0 % Flat 0
 Evidence of eroding banks, Comments on bank stability - banks stabilized with RCC

Substrate (% cover)

Bedrock 0 Cobble 10 Sand 0 Silt 20 Muck 0
 Boulder 0 Gravel 0 Clay 70 Marl 0 Detritus 0

In-water Cover

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

Riparian Zone

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

25% none - grassy - cattail on west side

Adjacent Land Use

Ag - corn (W) wheat (N) - Black walnut plantation.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

refuge pool

Migratory Obstructions (seasonal, permanent)

Dry

Note any fish observations

2x minnow traps set Creek Chub & Cyprinids in refuge pool under road.

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

Trapezoidal channel, naturally successional
Dry with refuge pool @ road.

Field Notes Authored by JLK

Field Notes QA/QCed by _____

Fishing Record and Catch Results (passive collection methods) Page 1 of 1



Project Number 160960709

Station Number 60-1

Project Name: Cedar Point

Lift / Haul / Pass No. 1

Waterbody Name: unknown

Date (yyyymmdd): 2012/10/03

Field Staff: J K K E I

Fishing Method (check one) and Gear Specs: Gillnet No. of Panels: _____ Mesh Sizes: _____
 Trap Net _____
 Hoop Net _____
 2x Minnow Trap _____
 Other (specify) _____

Descriptive Location of Station on Brush Line, south of Aberdeen Rd.

UTM Coordinates: Zone 17T Easting 416514 Northing 4767222

SET: Date: 2012/10/03 LIFT: Date: Oct. 4 2012 Total Netting Hours (approx.) 19 h
 Time: 4:08 pm Time: 11:34 AM

Station Depth (m): Max: 15 cm Min: 5 cm

Supporting Measurements (recorded at time of net set)

Depth (m)	Temp. (°C)	D.O. (mg/L)	pH	Cond. (µS/cm)
0.15	15.4°C	7.32	8.15	1602

Time 4:08

Additional Catch Data on Separate Sheet?: Y/N
 Detailed Fish Measurements on Separate Sheet? Y/N

Catch Data

Mesh Size	Species	Number	Comments (i.e. age, disease, etc.)
	<u>Creek chubs</u>	<u>32 + 32 = 64</u>	<u>Adults + Juvs</u>



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

WB.

55-1
Kernohan O'Donnell Drain

Station # 55-1 Project Name C.P
 Watercourse Name _____ Project # 100960709
 Photos 1133-1134 Field Staff KE + MS
 Date Dec 3 2012 Time 3:05
 Weather conditions in previous 24 hrs cloud
 GPS Coordinates (Zone) 17T E 413199 N 4709050 Datum _____
 Descriptive Location boundary line 800m south into field +
west of upper section.

Water Quality

Dissolved Oxygen (mg/L) 11.22 pH 8.11 Conductivity (µS/cm) 578
 Water Temperature (°C) 7.36 Air Temperature (°C) 5
 Time *in situ* measurements taken 3:05 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 60 (cm)
 Mean Bankfull Width 8 (m) Mean Water Depth 50 (cm)
 % Riffle 30 % Pool 70 % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability
Stable veg

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 FCS
 Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
20% RCG, Ash

Adjacent Land Use

AS

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
no

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.

deep pool @ culvert could be refuge in low flow

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



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Kernohan O'Sonnell
Drain

WB
64-3

Station # 64-3
Watercourse Name _____
Photos 129-131
Date Dec 3 2012

Project Name CIP
Project # 160960709
Field Staff KE & NB
Time 2:44

Weather conditions in previous 24 hrs cloud
GPS Coordinates (Zone) 17T E 412904 N 4769144 Datum
Descriptive Location Douglas Line - South

Water Quality

Dissolved Oxygen (mg/L) 12.79 pH 8.27 Conductivity (µS/cm) 551
Water Temperature (°C) 7.22 Air Temperature (°C) 5°
Time *in situ* measurements taken 2:45 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth 40 (cm)
Mean Bankfull Width 6 (m) Mean Water Depth 25 (cm)
% Riffle _____ % Pool 100 % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability
mostly stable, some undercut

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
10% Goldenrod, Hawthorn, Ash

Adjacent Land Use

Ag

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
no

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. _____

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



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Douglas Drain 56-1
NW13

Stantec

Station # 56-1 Project Name CIP
 Watercourse Name Douglas Drain Project # 160960209
 Photos _____ Field Staff KE + JK
 Date July 3 2012 Time 5:45 pm
 Weather conditions in previous 24 hrs T-storm
 GPS Coordinates (Zone) 17T E 414162 N 4770446 Datum NAD83
 Descriptive Location Douglas west of Whitaker

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 KE

Field Notes QA/QCed by JK



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Douglas Drain 18-5
WRB

Stantec

Station # 18-5 Project Name C.P.
 Watercourse Name Douglas Drain Project # 160960709
 Photos _____ Field Staff KE + JK
 Date July 4 2012 Time 10:30 AM
 Weather conditions in previous 24 hrs T-storm, hot + sunny
 GPS Coordinates (Zone) 17 E 412202 N 4271657 Datum NAD83
 Descriptive Location Hubbard Line (km east of Pullsboro
1 km back (south) to forest area

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
20% from adjacent wooded area (sycamore, hickory, ash)
 Adjacent Land Use Forest + soybean

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 KE Field Notes QA/QCed by JK



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Douglas Brain 18-1 WB

Stantec

Project C.P.
Station # 18-1
Photos Taken 345-350
GPS Coordinates 17 4772621 411143
Descriptive Location Hillsboro 15m

Project # 160960709
Field Staff KE & MF
Date Nov. 24 2011
Time 3:30 pm
south of lakeshore

Water Quality

Dissolved Oxygen (mg/L) 14.5 pH 8.58 Conductivity (µS/cm) 624
Water Temperature (°C) 7.51 Air Temperature (°C) 6°
Weather conditions in previous 24 hrs cold, sunny + overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 20 (cm)
Mean Bankfull Width 5 (m) Mean Water Depth 20 (cm)
0 % Riffle 0 % Pool 100 % Run 0 % Flat
Evidence of eroding banks, Comments on bank stability stable + veg-

east

Substrate - Upstream (% cover)

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

west

Substrate - Downstream (% cover)

Bedrock 20 Silt 0 Boulder 40 Clay 20 Cobble 20
Muck 0 Gravel 0 Marl 0 Sand 20 Detritus 0
some plywood 15m d/s

In-water Cover

Cover Types Present (circle):
Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants cattails
Other grasses

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 5%
Downstream 40% riparian trees

Adjacent Land Use

Upstream Ag fields
Downstream Ag fields

Fish Habitat Potential

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

the drainage inputs
-mod. fast run large concrete deflection wall 15m d/s
-u/s. cattails + grasses in channel
-inured



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Douglas Drain-1

18-3
WB

Stantec

Project C.P Project # 160960709
 Station # 18-3 Field Staff KE + MF
 Photos Taken 356-361 Date Nov 24 2011
 GPS Coordinates 17 4772746 411358 Time 3:50 pm
 Descriptive Location Lake shore + Hubbard

Water Quality not enough water to sample
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Weather conditions in previous 24 hrs _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.5 (m) Maximum Pool Depth 3 (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 3 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable + vegetated

Substrate - Upstream (% cover)

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

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Vascular Plants cattails
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
 Upstream _____
 Downstream 30% some riparian trees

Adjacent Land Use

Upstream _____
 Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Upstream None
 Downstream _____
 Migratory Obstructions (seasonal, permanent)
 Upstream Dry in summer
 Downstream _____
 Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- ditch along lakeshore (crossing Hubbard), incised channel, standing water + cattails fine channel
 - meets definition of waterbody under RFA



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Hickory cr.

58-1
WB.

Stantec

Station # 58-1 Project Name CP.
 Watercourse Name Hickory Creek Project # 160960709
 Photos _____ Field Staff KE + JK
 Date July 5 2012 Time 11:30
 Weather conditions in previous 24 hrs Hot & Hazy
 GPS Coordinates (Zone) 17 E 416722 N 4771944 Datum NAD83
 Descriptive Location Brush rd south of Hubbard Line

Water Quality

Dissolved Oxygen (mg/L) 6.33 pH 8.28 Conductivity (µS/cm) 623
 Water Temperature (°C) 24.37 Air Temperature (°C) 33
 Time *in situ* measurements taken 11:49

Watercourse Dimensions & Morphology

Mean Watercourse Width 4 (m) Maximum Pool Depth 0.3 (cm)
 Mean Bankfull Width 6 (m) Mean Water Depth 0.15 (cm)
3 % Riffle 20 % Pool ~~100~~ % Run ~~100~~ % Flat
 Evidence of eroding banks, Comments on bank stability some erosion + undercut

Substrate (% cover)

Bedrock	Cobble	20	Sand	Silt	Muck
Boulder	20	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 _____

u/s right bank from side channel

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
30% willow, poplar + RCG
 Adjacent Land Use Ag.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings) none
 Migratory Obstructions (seasonal, permanent) permanent
 Note any fish observations Rock bass, creek chub in unknown minnow traps

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

- natural watercourse in shallow valley
- small refuse pool @ outlet to manure drain
- lots of rock + juv. Brown trout under road

Field Notes Authored by KB Field Notes QA/QCed by JK

Hickory Cr. 58-1

Fishing Record and Catch Results (passive collection methods) Page 1 of 1



Project Number: 160960709
 Project Name: C.R.
 Waterbody Name: Hickory Creek
 Field Staff: KE + dk

Station Number: 58-1
 Lift / Haul / Pass No.: 1
 Date (yyyymmdd): July 5 2012

Fishing Method (check one) and Gear Specs: Gillnet No. of Panels: _____ Mesh Sizes: _____
 Trap Net _____
 Hoop Net _____
 Minnow Trap 2
 Other (specify) _____

Descriptive Location of Station: Brush Rd south of Hubbard Line

UTM Coordinates: Zone 17T Easting 416722 Northing 4771946

SET: Date: July 5/12 LIFT: Date: July 5/12 Total Netting Hours (approx.) 2.5 h.
 Time: 11:40 AM Time: 2:15 PM

Station Depth (m): Max: 20 Min: _____

Supporting Measurements (recorded at time of net set)

Depth (m)	Temp. (°C)	D.O. (mg/L)	pH	Cond. (µS/cm)
	<u>24.37</u>	<u>10.33</u>	<u>8.28</u>	<u>623</u>

Time 11:44

Additional Catch Data on Separate Sheet?:
 Detailed Fish Measurements on Separate Sheet?

Catch Data

Mesh Size	Species	Number	Comments (i.e. age, disease, etc.)
	<u>No Catch</u>		



Stantec

Stantec Consulting Ltd - Electrofishing Record and Catch Results

Weko-creek

58-1

Project Name C.P. Station Number 58-1

Project Number 160960709 Pass No. (if applicable) 1

Photos _____ Date (yyyymmdd): July 5 2012

Descriptive Location Brush Road, South of Hubbard Ln

UTM coordinates 416722 easting 4771946 northing zone 17T

Fishing Method (circle one): Backpack Boat Unit Model/Make LR-24

Sampling Method (circle one): even habitat transect spot

Effort (Electrofishing Seconds): 257 Number of Netters: 1 Number of Anodes: 1

Settings

Frequency (Hz) 60 Voltage (volts) 250 Current (Amps) ~~600~~ Power (Watts) _____

Station Information

Length of Stream Surveyed (m) Row - 20m

Station Characteristics: Width (m): Range 2.5-5 Average: 3

Depth (m): Range 0.1-0.25 Average: 0.15

Bottom End of Manning Drain where Brown Trout was

Water Clarity/Colour: clear Water Velocity if Measured (m/s): underwater Time 2:24pm

Temperature (°C) 22.9°C Conductivity (uS/cm) 718 uS/cm

pH 8.33 Dissolved Oxygen (mg/L) 6.22 mg/L

Catch Data

Species	Number of Fish	Comments (i.e. age, disease, etc):
Brown Trout	2	at blackspot A + Juv
Creek chub	11 + 9 + 9 + 5 + 6 9 + 2 + 2 + 4 + 4 + 7 + 7 + 8 + 1 + 4	all Blackspot Y04, Juv + 1
Johnny darters	17 = 16	Juv + A
Bluntnose	22 = 21	A
Blackside darter	= 1	A
Rock Bass	= 1	Juv
white sucker	17 = 16	Juv
Common Shiner	= 1	A
Rainbow darter	= 2	Juv.

Fish Measurements on Separate Sheet? Y N

Field Staff: KE + JK

Notes By: KE



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Hickory cr

20-3
WB

Stantec

Station # 20-3 Project Name CP
 Watercourse Name Hickory Creek Project # 160960709
 Photos _____ Field Staff KE + JK
 Date July 3 2012 Time 4:57 pm
 Weather conditions in previous 24 hrs T-storm
 GPS Coordinates (Zone) 17T E 415917 N 4772579 Datum NAD83
 Descriptive Location 1100m East of UHoxeter Rd on Hubbard Line crossing of Hickory creek

Water Quality

Dissolved Oxygen (mg/L) _____ pH see 20-12 Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

Mean Watercourse Width 5 (m) Maximum Pool Depth 30+ (cm)
 Mean Bankfull Width 8 (m) Mean Water Depth 30 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability erosion & steep banks, minimal undercut.

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 algae
 Overhanging Vegetation Woody Debris Boulder Other Aquatic Veg _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
60% Ash, grape, willow, Man maple, Bl. Walnut, etc
 Adjacent Land Use Ag.

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
no
 Migratory Obstructions (seasonal, permanent)
permanent
 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. _____

Field Notes Authored by KE Field Notes QA/QCed by JK



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Hickory Cr

20-1
WB

Stantec

Project C.P
Station # 20-1
Photos Taken 304-400
GPS Coordinates 17 4772610 415188
Descriptive Location Hubbard Line

Project # 160960709
Field Staff KE + MF
Date Nov. 25 2011
Time 9:35
250 m east of Uthore

Water Quality

Dissolved Oxygen (mg/L) 13.11 pH 8.19 Conductivity (µS/cm) 776
Water Temperature (°C) 5.15 Air Temperature (°C) 5°
Weather conditions in previous 24 hrs cold, overcast & sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 8 (m) Maximum Pool Depth 50+ (cm)
Mean Bankfull Width 12 (m) Mean Water Depth 30 (cm)
0 % Riffle 0 % Pool 100 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability
erosion + steep banks, minimal undercuts

Substrate - Upstream (% cover) turbid

Bedrock 0 Silt 0 Boulder 80 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 20 Detritus 0

Substrate - Downstream (% cover) turbid

Bedrock 0 Silt 0 Boulder 80 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 20 Detritus 0

In-water Cover

Cover Types Present (circle): Overhanging Vegetation little Undercut Banks Woody Debris deep water Deep Pool Boulder Vascular Plants little RCG Other RCG

Riparian Zone

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

Upstream 30% riparian trees + shrubs
Downstream 40% riparian trees + shrubs

Adjacent Land Use

Upstream AG + pasture
Downstream AG + pasture

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream none

Migratory Obstructions (seasonal, permanent)

Upstream permanent
Downstream permanent

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- mod. fast flow, turbid, wide, meandering
- one small RCG island 20 m d/s
- little complexity
- 2 nests in tree next to road stump of basswood picture



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Hickory Cr. 19-2 WB

Stantec

Project C.P. Station # 19-2 Photos Taken 367-371 GPS Coordinates 17 4772676 414230 Descriptive Location Hubbard line, 600 m west of W. Hoick Rd Project # 160960709 Field Staff KE + MF Date Nov. 24 2011 Time 4:25 pm

Water Quality

Dissolved Oxygen (mg/L) 13.7 pH 8.25 Conductivity (µS/cm) 697 Water Temperature (°C) 16.1 Air Temperature (°C) 5 Weather conditions in previous 24 hrs sunny, cold, overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 6 (m) Maximum Pool Depth 40 (cm) Mean Bankfull Width 10 (m) Mean Water Depth 40 (cm) % Riffle % Pool 100% Run % Flat Evidence of eroding banks, Comments on bank stability slight undercut some erosion

Substrate - Upstream (% cover) turbid assumed clay based on banks Bedrock 20 Silt Boulder 80 Clay Cobble Muck Gravel Marl Sand Detritus

Substrate - Downstream (% cover) turbid assumed clay based on bank Bedrock 20 Silt Boulder 80 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 Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) Upstream 60% Ash swamp / woodland Downstream Adjacent Land Use Upstream Ag field Downstream

Fish Habitat Potential

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

wide, shallow, meandering, mod-fast flowing



Stantec

Stantec Consulting Ltd - Electrofishing Record and Catch Results

Mickony Cr 119-2

Project Name Suncor Energy- Cedar Point Wind Project Station Number 19-2
 Project Number 160960709 Pass No. (if applicable) 1
 Photos See back Date (yyyymmdd): 2012 05 10
 Descriptive Location On Hubbard Line ~ 600m west of ~~Hubbard~~ Exeter rd
 UTM coordinates 0414248 easting 4772683 northing zone 17T

Fishing Method (circle one): Backpack Boat _____ Unit Model/Make protek ER-12
 Sampling Method (circle one): even habitat _____ transect _____ spot _____
 Effort (Electrofishing Seconds): 510 Number of Netters: 1 Number of Anodes: 1
 Settings
 Frequency (Hz) 60 Voltage (volts) 600 Current (Amps) ✓ Power (Watts) ✓

Station Information
 Length of Stream Surveyed (m) ~ 80m
 Station Characteristics: Width (m): Range 5.0 - 6.0 Average: 5.5
 Depth (m): Range 0.4 - 0.7 Average: 0.5

Water Clarity/Colour: yellow/brown Water Velocity if Measured (m/s): N/A Time 09:45
 Temperature (°C) 11.86 Conductivity (uS/cm) 704
 pH 8.48 Dissolved Oxygen (mg/L) 9.15

Catch Data

Species	Number of Fish	Comments (i.e. age, disease, etc):
WHSC	12 (adult males)	
WHSC	######	
Crk chub	15 + 6 + ### + ### + ### + 8	mod black spot
Cmn shn	###-###-###-###-###	mod black spot
Rock Bass	###-###	
Blunt nose Min	###-##	
Rainb. Dt.	###-##	
John Dt.	###-###-###-##	
Iowa Dt.	1	
Blackside Dt.		
Blackside Dt.	1	
Rainbow trout ?	### (see pictures)	(0.20 - 0.30m)
Note: Fished main channel north of Hubbard around steel bridge.		

Fish Measurements on Separate Sheet? Y/N
 Field Staff: N. Burnett, M. Faiella Notes By: MF
 (Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

17-5

Hickory Creek

Startec

Station # 17-5
 Watercourse Name Hickory
 Photos 9685 → 9691
 Date July 25 2012
 Weather conditions in previous 24 hrs hot + dry
 GPS Coordinates (Zone) 17T E 413121
 Descriptive Location Stinsley Road, 100 yds of crossing of Hickory Creek

Project Name C.P.
 Project # 100960709
 Field Staff RS + JD
 Time 12:00
 Datum NAD83

Water Quality *confirmed similar to 17-1*
 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 5 (m) Maximum Pool Depth 40 (cm)
 Mean Bankfull Width 7 (m) Mean Water Depth 30 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability
steep banks along south side

Substrate (% cover)
 Bedrock 40 Cobble _____ Sand 20 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 _____

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
100% - dec. wooded area

Adjacent Land Use
woods + Ag

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.

Field Notes Authored by [Signature] Field Notes QA/QCed by [Signature]



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Hickory Cr. 17-1
WB

Stantec

Project CIP Project # 160960709
Station # 17-1 Field Staff KE + MF
Photos Taken 372-376 Date Nov. 24 2011
GPS Coordinates 174773338 415029 Time 4:35 pm
Descriptive Location Elmsley Rd., 750 m south of
lakeshore

Water Quality

Dissolved Oxygen (mg/L) 14.05 pH 8.25 Conductivity (µS/cm) 683
Water Temperature (°C) 5.89 Air Temperature (°C) 5°
Weather conditions in previous 24 hrs cold, sunny, overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 10 (m) Maximum Pool Depth 60 (cm)
Mean Bankfull Width 20 (m) Mean Water Depth 50 (cm)
30 % Riffle 0 % Pool 70 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability erosion + some undercutts

east

Substrate - Upstream (% cover) turbid

Bedrock 10 Silt 100 Boulder 40 Clay 20 Cobble
Muck _____ Gravel _____ Marl _____ Sand _____ Detritus

west

Substrate - Downstream (% cover) turbid

Bedrock _____ Silt _____ Boulder 30 Clay 60 Cobble
Muck _____ Gravel _____ Marl _____ Sand _____ Detritus

In-water Cover

Cover Types Present (circle): Overhanging vegetation Undercut Banks Woody Debris Deep Pool _____ Vascular Plants _____
Boulder _____ Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 60%
Downstream 40%

Adjacent Land Use

Upstream _____
Downstream Ag + woodlot

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Upstream none Riffle complex limiting?
Downstream _____

Migratory Obstructions (seasonal, permanent)

Upstream permanent
Downstream _____

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- wide, somewhat shallow, meandering
- 1 riffle complex 40 m ups - steep, eroded bank 60 m dls.
- 2 n. riffle complex 15 m + 60 m dls. at bend.



Stantec Consulting Ltd - Electrofishing Record and Catch Results

Project Name C.P. Station Number 17-1
 Project Number 160960709 Pass No. (if applicable) 1
 Photos 466-id 466-ols 467-d/s, 468-sub Date (yyyymmdd): 2012 06 04
 Descriptive Location On Elmsley, south of Townsend, north of Hubbard Line.
 UTM coordinates 4773338 easting 413029 northing 171 zone

Fishing Method (circle one): Backpack Boat Unit Model/Make ER-12
 Sampling Method (circle one): even habitat transect spot
 Effort (Electrofishing Seconds): 225 Number of Netters: 1 Number of Anodes: 1
 Settings
 Frequency (Hz) 60 Voltage (volts) 700 Current (Amps) / Power (Watts) /

Station Information
 Length of Stream Surveyed (m) ~40.0
 Station Characteristics:
 Width (m): Range 9.0-10.0 Average: 9.5
 Depth (m): Range 0.15-0.75 Average: 0.40
 Water Clarity/Colour: Teal yellow Water Velocity if Measured (m/s): n/a Time 13:40
 Temperature (°C) 16.6 Conductivity (uS/cm) 680
 pH 8.32 Dissolved Oxygen (mg/L) 11.93

Catch Data

Species	Number of Fish	Comments (i.e. age, disease, etc.)
Brown Trout	1	(photos taken)
Rain Dt.	19	
Cik chub	21	
Com. shn.	11	
Blk. sd. dt	1	
WHSC	2	
Rock bass	3	
Blunhose Mn.	4	
John. dt	5	
Note: o/s fishing only allowed		
Fish photos: 469-480		

Fish Measurements on Separate Sheet? Y

Field Staff: ND, MF

Notes By: MF



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

WB
19-4
McKinley Drain

Station # 19-4
Watercourse Name McKinley Drain
Photos 1/2 3/125
Date Dec 3/12

Project Name 60960709
Project # cedar Point
Field Staff NB, KE
Time 13:42

Weather conditions in previous 24 hrs rain - last eve
GPS Coordinates (Zone) 17 E 0413113 N 4771705 Datum NA83
Descriptive Location end of Elmsley, South of corner of Elmsley + Hubbard

Water Quality

Dissolved Oxygen (mg/L) 10.71 pH 7.98 Conductivity (µS/cm) 390
Water Temperature (°C) 7.09 Air Temperature (°C) 11
Time *in situ* measurements taken 18:45

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.50 (m) Maximum Pool Depth 15 (cm)
Mean Bankfull Width 6.0 (m) Mean Water Depth 7 (cm)
% Riffle _____ % Pool (Standing Water) % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability Stable

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 25 Silt _____ Muck _____
Boulder _____ Gravel 25 Clay _____ Marl 50 Detritus _____

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) 10% shaded, buckthorn, raspberry

Adjacent Land Use Agriculture

Fish Habitat Potential

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

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 NB, KE Field Notes QA/QCed by _____



WIND FARM WATERBODY RAPID ASSESSMENT FORM

McKinley Drain 56-2
WB

Stantec

Station # 56-2 Project Name CP
Watercourse Name McKinley Drain Project # 160960709
Photos - Field Staff KE + JK
Date July 3 2012 Time 10 pm
Weather conditions in previous 24 hrs T storm
GPS Coordinates (Zone) 17 E 414796 N 4770714 Datum NAD83
Descriptive Location upstream, north of Saylor's

Water Quality

Dissolved Oxygen (mg/L) 10.11 pH 8.38 Conductivity (µS/cm) 778
Water Temperature (°C) 19.33 Air Temperature (°C) 28
Time in situ measurements taken 6 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 25 (cm)
Mean Bankfull Width 5 (m) Mean Water Depth 20 (cm)
% Riffle 100 % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability veg + stable

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)

Adjacent Land Use nightshade, cattails, grape
Ag

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

no

Migratory Obstructions (seasonal, permanent)

perm

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.

- catch basin + field to east

Field Notes Authored by KE Field Notes QA/QCed by OK

McKinley
Brain 56-2

Fishing Record and Catch Results (passive collection methods) Page 1 of 1



Project Number 160960709
 Project Name: CP.
 Waterbody Name: McKinley Drain
 Field Staff: KE & JK

Station Number 56-2
 Lift / Haul / Pass No. 1
 Date (yyyymmdd): 2012_07-03

Fishing Method (check one) and Gear Specs: Gillnet No. of Panels: _____ Mesh Sizes: _____
 Trap Net _____
 Hoop Net _____
 Minnow Trap _____
 Other (specify) _____

Descriptive Location of Station 850m North of Douglas Line, @ Uxbridge Rd.

UTM Coordinates: Zone 17 Easting 414726 Northing 4770714

SET: Date: July 3 Time: 6:01 pm
 LIFT: Date: July 4/12 Time: 3:50 pm
 Total Netting Hours (approx.) 21.5 hrs.

Station Depth (m): Max: 25 cm Min: _____

Supporting Measurements (recorded at time of net set)

Depth (m)	Temp. (°C)	D.O. (mg/L)	pH	Cond. (µS/cm)
0.25	19.3	10.11	8.38	728

Time 6 pm

Additional Catch Data on Separate Sheet? Y/N
 Detailed Fish Measurements on Separate Sheet? Y/N

Catch Data

Mesh Size	Species	Number	Comments (i.e. age, disease, etc.)
	Brook Stickleback	42 + 95	Adult



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

McKinley ~~Drain~~ Drain

19-1
WB

Stantec

Project C.P
Station # 19-1
Photos Taken 362-366
GPS Coordinates 17 47 26.74, 41 29 32
Descriptive Location Hubbard, 100 m east of Elmley.

Project # 1609100709
Field Staff KE + MF
Date Nov. 24 2011
Time 4:05 pm

Water Quality

Dissolved Oxygen (mg/L) 13.45 pH 8.4 Conductivity (µS/cm) 1098
Water Temperature (°C) 10.24 Air Temperature (°C) 5
Weather conditions in previous 24 hrs cold, sunny overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 50 (cm)
Mean Bankfull Width 5 (m) Mean Water Depth 30 (cm)
% Riffle % Pool 100 % Run % Flat
Evidence of eroding banks, Comments on bank stability stable irreg

South

Substrate - Upstream (% cover) cleared, clay bottom
Bedrock 20 Silt Boulder 80 Clay Cobble
Muck Gravel Marl Sand Detritus

North

Substrate - Downstream (% cover) turbid assumed clay
Bedrock 20 Silt Boulder 80 Clay Cobble
Muck Gravel Marl Sand Detritus

In-water Cover

Cover Types Present (circle):
Overhanging vegetation Undercut Banks Deep Pool Vascular Plants
Woody Debris Boulder Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 0% open
Downstream 30% trees + shrub

Adjacent Land Use

Upstream Ag field
Downstream woodlot

Fish Habitat Potential

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

- tiled drainage input
- narrow + shallower ups, clear
- slightly wider + deeper d/s, more turbid.
- incised channel



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Fisher
Drain

20-2
WB
NWB

Stantec

Project CIP
Station # 20-2
Photos Taken 401-407
GPS Coordinates 17 4772592 415127
Descriptive Location Hubbard line 200 m east of ultraxeter

Project # 160960709
Field Staff KE & MF
Date Nov. 24 2011
Time 9:45

Water Quality

Dissolved Oxygen (mg/L) 12.0 pH 7.99 Conductivity (µS/cm) 707
Water Temperature (°C) 9.39 Air Temperature (°C) 5°
Weather conditions in previous 24 hrs cold, sunny & overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 30 (cm)
Mean Bankfull Width _____ (m) Mean Water Depth 20 (cm)
0 % Riffle 20 % Pool 80 % Run _____ % Flat
Evidence of eroding banks, Comments on bank stability stable & veg., slight erosion

Substrate - Upstream (% cover)

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

Substrate - Downstream (% cover)

Bedrock _____ Silt _____ Boulder _____ Clay _____ Cobble _____
Muck _____ Gravel _____ Marl _____ Sand _____ Detritus _____
culvert to adjacent WB

In-water Cover

Cover Types Present (circle):
Overhanging Vegetation Undercut Banks _____ Deep Pool _____ Vascular Plants algae
Woody Debris _____ Boulder _____ Other _____

Riparian Zone

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

Adjacent Land Use

Upstream _____
Downstream Ag & pasture

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Upstream none
Downstream _____
Migratory Obstructions (seasonal, permanent)
Upstream dry in summer?
Downstream _____
Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- WB only 30m up from road & then tiled
- part of old channel blocked off w/ concrete & not functioning as WC & filled w/ terrestrial veg
- tile drainage inputs from field



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Fisher Drain 4/9-4
WB

Stantec

Station # 49-4 Project Name CP
 Watercourse Name Fisher Drain Project # 160960309
 Photos 810-813 Field Staff KE + SK
 Date Oct. 3 2012 Time 3:20
 Weather conditions in previous 24 hrs warm & rain
 GPS Coordinates (Zone) 17 T E 416126 N 4771204 Datum
 Descriptive Location off Brush Rd

Water Quality

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

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 + veg

Substrate (% cover)

Bedrock _____ Cobble 50 Sand _____ 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%

Adjacent Land Use

Ag

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.

dry, incised channel populated by asters, N. aster, grasses, solidago, gramae, weeds.

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



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Unknown Drain 2
19-3
WB

Stantec

Station # 19-3
Watercourse Name _____
Photos 862-865
Date Oct. 4 2012

Project Name CP
Project # 160960709
Field Staff KE + JK
Time _____

Weather conditions in previous 24 hrs norm
GPS Coordinates (Zone) 17T E 413059 N 4772671 Datum _____
Descriptive Location Hubbard, just east of Elmley

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

Substrate (% cover)

Bedrock _____ Cobble 30 Sand 30 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 _____

Riparian Zone

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

Adjacent Land Use

AS, 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.

catch basin on west side of Elmley & flows along south side of Hubbard
Ends @ 17T 413841 4772644

Field Notes Authored by KE

Field Notes QA/QCed by _____



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

19-5
Sadler
Drain Nu

Station # 19-5

Watercourse Name Sadler Drain

Photos _____

Date Dec 3 2012

Weather conditions in previous 24 hrs _____

GPS Coordinates (Zone) 17T E 413012 N 472635 Datum _____

Descriptive Location Elmstey Rd + Hubbard Line

Project Name C.P.

Project # 11009100709

Field Staff KE + NB

Time _____

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 Seep _____

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

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by KE

Field Notes QA/QCed by _____



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Unknown Drain 3 19-6 NWB

Stantec

Station # 19-6 Project Name C.P.
Watercourse Name Unknown Drain 3 Project # 160960709
Date Dec 3 2012 Field Staff KE & NB
Weather conditions in previous 24 hrs
GPS Coordinates (Zone) 17T E 414243 N 4772632 Datum
Descriptive Location Hubbard Ave, east of Elmsley on south side

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by [Signature] Field Notes QA/QCed by



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Unknown Drain 4 17-6
NRB

Stantec

Station # 17-6 Project Name CIP
Watercourse Name Unknown Drain 4 Project # 100910209
Photos _____ Field Staff KE & NB
Date Dec 3 2018 Time _____
Weather conditions in previous 24 hrs _____
GPS Coordinates (Zone) 17 T E 414142 N 4773526 Datum _____
Descriptive Location Townsend Line, east of Elmsley 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 Seep _____
Surficial Drainage (i.e. furrows) _____ Dugout Pond _____ Dominated by Aquatic Veg _____ Dry _____

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by RE

Field Notes QA/QCed by _____



Stantec

RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Anderson
Arain

16-5
WB

Project C.P Project # 160960709
 Station # 16-5 Field Staff KE + MP
 Photos Taken 486-690 Date Nov-29-2011
 GPS Coordinates N 47.2703 414891 Time 12:03 pm
 Descriptive Location Townsend & utto meter

Water Quality

Dissolved Oxygen (mg/L) 11.93 pH 7.79 Conductivity (µS/cm) 435
 Water Temperature (°C) 7.29 Air Temperature (°C) 4°
 Weather conditions in previous 24 hrs cold & lots of rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth 8 (cm)
 Mean Bankfull Width 1.5 (m) Mean Water Depth 8 (cm)
0 % Riffle 0 % Pool 100 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability

stable & veg

Substrate - Upstream (% cover)

Bedrock 0 Silt 0 Boulder 0 20 Clay 0 Cobble 0
 Muck 0 Gravel 0 Marl 0 Sand 80 Detritus 0

Substrate - Downstream (% cover)

Bedrock 0 Silt 0 Boulder 0 20 Clay 0 Cobble 0
 Muck 0 Gravel 0 Marl 0 Sand 80 Detritus 0

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool 0 Vascular Plants cattails
 Other 0

Riparian Zone

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

Adjacent Land Use

Upstream Ag fields
 Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream None
 Downstream None

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer
 Downstream dry in summer

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- ups & d/s (red) w/ cattails
- only flowing b/c of rain, but was standing noted day before
- meets definition of WB; incised & dominated by aquatic v

* mapping needs to be adjusted, closer to road



Stantec

RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Anderson
Brown

17-2
~~17-2~~

Project C.P

Project # 160960709

Station # 17-2

Field Staff KE + ME

Photos Taken 377 + 378

Date Nov 24 2011

GPS Coordinates 17 4773884 414198

Time 4:50 pm

Descriptive Location Townsend Line

1.4 km east of lakeshore

Water Quality

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

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

Weather conditions in previous 24 hrs _____

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 - Upstream (% cover)

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

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Vascular Plants
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

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

Upstream _____

Downstream _____

Adjacent Land Use

Upstream _____

Downstream _____

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream _____

Downstream _____

Migratory Obstructions (seasonal, permanent)

Upstream _____

Downstream _____

Note any fish observations _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

filled drainage

*ditch along Townsend (south side) filled w/ cattails + some standing water. Meets REA waterbody



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Anderson Brain

17-3
17-2
17-4

Stantec

Project C.P
Station # 172, 173, 174
Photos Taken _____
GPS Coordinates 17-3 (17 4773825 414422)
Descriptive Location 17-2 (17 4773944 413978)
17-4 (17 477071 413462)
4774071

Project # 160960709
Field Staff KE + MF
Date NOV 29 2011
Time 12:17 pm

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
Water Temperature (°C) _____ Air Temperature (°C) _____
Weather conditions in previous 24 hrs _____

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 - Upstream (% cover)

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

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): _____ Undercut Banks _____ Deep Pool _____ Vascular Plants
Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other _____

Riparian Zone

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

Adjacent Land Use

Upstream _____
Downstream _____

Fish Habitat Potential

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

Note any fish observations _____

Other Habitat Notes, Incidental Wildlife Observations, etc.

confirmed similar habitat as 16-5 - incised cattail channels
stopped to confirm us @ each proposed crossing



Stantec

RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Elliot Branch
& rain

16-4
WB

Project CIP
Station # 16-4
Photos Taken 680-685
GPS Coordinates 17 47 34.03 416/20
Descriptive Location Townsend Ave, 400 m East of Delmage

Project # 160960709
Field Staff KE + MF
Date Nov. 29 2011
Time 11:52

Water Quality

Dissolved Oxygen (mg/L) 11.75 pH 7.96 Conductivity (µS/cm) 325
Water Temperature (°C) 6.55 Air Temperature (°C) 4°C
Weather conditions in previous 24 hrs cold = rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.0 (m) Maximum Pool Depth 60 (cm)
Mean Bankfull Width 2 (m) Mean Water Depth 60 (cm)
0 % Riffle 60 % Pool 40 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability

W/S + stable

south

Substrate - Upstream (% cover) turbid

Bedrock 0 Silt 0 Boulder 0 Clay 20 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 80 Detritus 0

north

Substrate - Downstream (% cover) turbid

Bedrock 0 Silt 0 Boulder 0 Clay 20 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 80 Detritus 0

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks 0 Deep Pool 0 Vascular Plants cattails
Woody Debris 0 Boulder 0 Other 0

Riparian Zone

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

Upstream 0%
Downstream 0%

Adjacent Land Use

Upstream Ag fields
Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream none

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer
Downstream dry in summer

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- incised cattail lined channel, slow, turbid flow
- functions as ~ wb. (standing water day before rain)
- wf flows along south side of road

Field Notes Authored by KE

Field Notes QA/QCed by JK

Page 1 of 1

- d/s flows along north side of road
- despite north of road crossing (culvert)

* B/c watercourse lie
should be mapped next



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Elliot Drain 16-1 EWB

Stantec

Project CIP Station # 16-1 Photos Taken 408-414 GPS Coordinates 17 473538 415573 Descriptive Location Townsend Line, 150 m west of Delmage Rd Project # 160960709 Field Staff KE & MF Date Nov. 25 2011 Time 10:00

Water Quality

Dissolved Oxygen (mg/L) 13.17 pH 8.11 Conductivity (µS/cm) 760 Water Temperature (°C) 5.66 Air Temperature (°C) 5° Weather conditions in previous 24 hrs cold, sunny & overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 20 (cm) Mean Bankfull Width 3 (m) Mean Water Depth 15 (cm) % Riffle % Pool 100 % Run % Flat Evidence of eroding banks, Comments on bank stability recently cleared

south

Substrate - Upstream (% cover)

Bedrock Silt Boulder 400 Clay Cobble Muck Gravel Marl Sand Detritus

north

Substrate - Downstream (% cover)

Bedrock Silt Boulder 90 Clay 10 Cobble Muck Gravel Marl Sand Detritus

In-water Cover none, recently cleared

Cover Types Present (circle): Undercut Banks Deep Pool Vascular Plants Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

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

Adjacent Land Use

Upstream Ag fields Downstream

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer? Downstream

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

narrow, incised, channel, veg cleared out - flow from cattails north side



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Elliot Drain 16-2

EWB

Stantec

Project CP

Project # 160900709

Station # 16-2

Field Staff KE + MF

Photos Taken 415-420

Date Nov 25 2011

GPS Coordinates 174774407 414909

Time 10:20

Descriptive Location Townsend line + Attaxeter, 1 km back in field

Water Quality

Dissolved Oxygen (mg/L) 12.08 pH 8.08 Conductivity (µS/cm) 879

Water Temperature (°C) 7.37 Air Temperature (°C) 6°

Weather conditions in previous 24 hrs cold, sun + overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 15 (cm)

Mean Bankfull Width 3 (m) Mean Water Depth 10 (cm)

0 % Riffle 0 % Pool 100 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability dug recently

Substrate - Upstream (% cover) east

Bedrock 0 Silt 0 Boulder 100 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 0 Detritus 0

Substrate - Downstream (% cover) west

Bedrock 0 Silt 0 Boulder 100 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 0 Detritus 0

In-water Cover dug

Cover Types Present (circle): Overhanging Vegetation 0 Undercut Banks 0 Deep Pool 0 Vascular Plants 0
Woody Debris 0 Boulder 0 Other 0

Riparian Zone

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

Upstream 0%

Downstream 0%

Adjacent Land Use

Upstream Ag fields

Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none

Downstream none

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?

Downstream dry in summer?

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc. sandhill cranes! V formation heard calling

- dug channel, tile drainage input
- recently cleared
- slow run



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

North St. Brain

58-3

WB

Stantec

Project C.P. Project # 160960709
 Station # 58-3 Field Staff KE + ME
 Photos Taken 427-429 Date Nov 25 2011
 GPS Coordinates 174773088 417334 Time 10:57
 Descriptive Location Townsend, 400 m west of Fuller Rd

Water Quality confirm similar hab.
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Weather conditions in previous 24 hrs _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width 1 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 10 (cm)
 _____ % Riffle _____ % Pool 100% Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable + veg

Substrate - Upstream (% cover)
 _____ Bedrock _____ Silt _____ Boulder 70 Clay _____ Cobble
 _____ Muck _____ Gravel _____ Marl _____ Sand 60 Detritus

Substrate - Downstream (% cover) appears to be recently cleared
 _____ Bedrock _____ Silt _____ Boulder 40 Clay _____ Cobble
 _____ Muck _____ Gravel _____ Marl _____ Sand 60 Detritus

In-water Cover
 Cover Types Present (circle): Overhanging Vegetation Undercut Banks _____ Deep Pool _____ Vascular Plants Phrag + cattail
 _____ Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other _____

Riparian Zone
 Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
 Upstream 0%
 Downstream 20% riparian trees

Adjacent Land Use
 Upstream Ag
 Downstream residential

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Upstream none
 Downstream _____

Migratory Obstructions (seasonal, permanent)
 Upstream dry in summer?
 Downstream _____

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.
- confirmed WB up of turbine crossings
- incised channel w/ veg.



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

North Street Drain

16-3
WB

Stantec

Project CIP

Project # 160960709

Station # 16-3

Field Staff KE + ME

Photos Taken 421-426

Date Nov. 25 2011

GPS Coordinates N 4774630 415729

Time 10:40

Descriptive Location Dolmige Rd

1.5 km north of Townsend

Water Quality

Dissolved Oxygen (mg/L) 13.36 pH 8.16 Conductivity (µS/cm) 827

Water Temperature (°C) 5.89 Air Temperature (°C) 16°

Weather conditions in previous 24 hrs cold, sunny + overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.0 (m) Maximum Pool Depth 30 (cm)

Mean Bankfull Width 5.0 (m) Mean Water Depth 20 (cm)

% Riffle % Pool % Run 100% Flat

Evidence of eroding banks, Comments on bank stability erosion + dis end

5m d/b at bend

east Substrate - Upstream (% cover) leaf litter lined channel

Bedrock Silt Boulder 20 Clay Cobble

Muck Gravel Marl Sand 80 Detritus

west Substrate - Downstream (% cover)

Bedrock Silt Boulder 20 Clay Cobble

Muck Gravel Marl Sand 80 Detritus

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Vascular Plants
Boulder Other

Riparian Zone

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

Upstream 80% dec. woodlot

Downstream

Adjacent Land Use

Upstream Ag + woodlot

Downstream Ag + woodlot

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none

Downstream

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?

Downstream

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- min flow over leaf litter lined channel
- probably clear last year



WIND FARM WATERBODY RAPID ASSESSMENT FORM

woods creek

10-1
WB

Stantec

Station # 10-1 Project Name CIP
 Watercourse Name woods creek Project # 160960709
 Photos _____ Field Staff KE + JK
 Date July 9 2012 Time 2:23 pm
 Weather conditions in previous 24 hrs f-storm hot & sunny
 GPS Coordinates (Zone) 17 E 420630 N 4779334 Datum NAD83
 Descriptive Location 1300m west of Knappa Rd, 700m south of Cedar Pt Ln @ woods creek

Water Quality

Dissolved Oxygen (mg/L) 8.20 pH 8.34 Conductivity (µS/cm) 726
 Water Temperature (°C) 24.04 Air Temperature (°C) 41
 Time *in situ* measurements taken 2:26

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.5 (m) Maximum Pool Depth 50 (cm)
 Mean Bankfull Width 6 (m) Mean Water Depth 30 (cm)
 _____ % Riffle _____ % Pool _____ % Run 100 % Flat

Evidence of eroding banks, Comments on bank stability
not slightly unstable ybt bank, some erosion

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

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

70% maple, reynold, white pine

Adjacent Land Use

Ag. & woodlot

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

weed beds

Migratory Obstructions (seasonal, permanent)

perm

Note any fish observations

creek chub

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

- nice natural meandering channel through wooded area

Field Notes Authored by KE

Field Notes QA/QCed by JK

woods creek 10-1

Fishing Record and Catch Results (passive collection methods) Page 1 of 1



Project Number: 160960709
Project Name: CR
Waterbody Name: Woods Creek
Field Staff: KE + JK

Station Number: 10-1
Lift / Haul / Pass No.:
Date (yyyymmdd): July 4 2012

Fishing Method (check one) and Gear Specs:
Gillnet _____ No. of Panels: _____ Mesh Sizes: _____
Trap Net _____
Hoop Net _____
Minnow Trap _____
 Other (specify) dep net

Descriptive Location of Station _____

UTM Coordinates: Zone 17 Easting 420630 Northing 4774334

SET: Date: _____ LIFT: Date: _____ Total Netting Hours (approx.) 10 mins.
Time: _____ Time: _____

Station Depth (m): Max: _____ Min: _____

Supporting Measurements (recorded at time of net set)

Depth (m)	Temp. (°C)	D.O. (mg/L)	pH	Cond. (µS/cm)
0.1	24.04	8.2	8.34	720

Time 2:25 pm

Additional Catch Data on Separate Sheet?: Y/N
Detailed Fish Measurements on Separate Sheet? Y/N

Catch Data

Mesh Size	Species	Number	Comments (i.e. age, disease, etc.)
	<u>creek chub</u>	<u>30 +</u>	<u>Y08, JUV</u>



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

roads Creek 11-1

WB.

Stantec

Project C.P.

Project # 160960709

Station # 11-1

Field Staff KE + MF

Photos Taken 477-483

Date Nov. 25 2011

GPS Coordinates 17 47 06.341 914813

Time 2 pm

Descriptive Location Cedar point line, 1.5 km west of Rawlings Rd

Water Quality

Dissolved Oxygen (mg/L) 7.42

pH 8.1

Conductivity (µS/cm) 930

d/s of manure spill

Water Temperature (°C) 6.69

Air Temperature (°C) 6°

Weather conditions in previous 24 hrs cold + sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m)

Maximum Pool Depth 40 (cm)

Mean Bankfull Width 5 (m)

Mean Water Depth 30 (cm)

% Riffle % Pool

100 % Run % Flat

Evidence of eroding banks, Comments on bank stability stable + veg - concrete wall u/s NW side to divert flow into culvert

South

Substrate - Upstream (% cover)

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

North

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Deep Pool Boulder Vascular Plants RCG
Other straw + tie d/s
very few at culvert

Riparian Zone

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

Upstream 20% riparian trees

Downstream 5%

Adjacent Land Use

Upstream Ag fields
Downstream

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream

Migratory Obstructions (seasonal, permanent)

Upstream permanent
Downstream

Note any fish observations dead creek chub on bank
- mussel shells on culvert - Not resident species - dumped on site

Other Habitat Notes, Incidental Wildlife Observations, etc.

- u/s slow mod wide flow (2m)
- d/s flow constricted through RCG (0.5-1m)
- tile drain inputs



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Woods Creek / 14-2
WB.

Stantec

Project C.P
Station # 14-2
Photos Taken 454-459
GPS Coordinates 17 4756516 417811
Descriptive Location Fuller Rd, 1 km north of Cedar Point line

Project # 160960709
Field Staff KE + MF
Date Nov. 25 2011
Time 1:00 pm

Water Quality

Dissolved Oxygen (mg/L) 11.16 pH 8.16 Conductivity (µS/cm) 891
Water Temperature (°C) 16.30 Air Temperature (°C) 16°
Weather conditions in previous 24 hrs cold + sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 20 (cm)
Mean Bankfull Width 4 (m) Mean Water Depth 15 (cm)
0 % Riffle 0 % Pool 100 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability stable + vegetated

east

Substrate - Upstream (% cover)

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

west

Substrate - Downstream (% cover)

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

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Vascular Plants SV ^{veg} culvert
Overhanging Vegetation Woody Debris Boulder Other

Riparian Zone

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

Upstream 0% open
Downstream 5% riparian trees

Adjacent Land Use

Upstream AG fields
Downstream AG fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream none

Migratory Obstructions (seasonal, permanent)

Upstream permanent
Downstream permanent

Note any fish observations

Other Habitat Notes, Incidental Wildlife Observations, etc.

- substrate diversity confined to area around culvert
- very slight meander
- incised, clear flow, slow run



Stantec Consulting Ltd - Electrofishing Record and Catch Results

Project Name C.P. Station Number 14-2
 Project Number 160960709 Pass No. (if applicable) 1
 Photos 512=id 513=0/1s 514=4/s. Date (yyyymmdd): 2012 06 05
 Descriptive Location on Fuller Rd ~1 km north of Cedar Point Line

UTM coordinates 4978656 ~~easting~~ 417811 ~~nothing~~ nothing zone 17T

Fishing Method (circle one): Backpack Boat Unit Model/Make ER 12
 Sampling Method (circle one): even habitat transect spot

Effort (Electrofishing Seconds): 229 Number of Netters: 1 Number of Anodes: 1

Settings
 Frequency (Hz) 60 Voltage (volts) 700 Current (Amps) Power (Watts)

Station Information
 Length of Stream Surveyed (m) ~150
 Station Characteristics: Width (m): Range 1.5-2.2 Average: 1.8
 Depth (m): Range 0.10-0.20 Average: 0.15

Water Clarity/Colour: tea colour Water Velocity if Measured (m/s): N/A Time 09:45
 Temperature (°C) 16.28 Conductivity (uS/cm) 1001
 pH 8.35 Dissolved Oxygen (mg/L) 13.64

Catch Data

Species	Number of Fish	Comments (i.e. age, disease, etc):
Creek chub	###-### (10)	
BRST	(2)	
WHSC	1 (juvenile) (1)	
BK. nose dace	(4)	
Rainb. Dt.	1 (1)	
Common Sh.	1 (1)	
Note: Hundreds of BRST + Creek chub YOY observed throughout.		

Fish Measurements on Separate Sheet? Y/N
 Field Staff: NB, MF Notes By: MF



WIND FARM WATERBODY RAPID ASSESSMENT FORM

woods creek 14-4 WB

Stantec

Station # 14-4
Watercourse Name woods Creek
Photos _____
Date July 4 2012
Weather conditions in previous 24 hrs f-storm
GPS Coordinates (Zone) 17 E 417732 N 4775925 Datum NAD83
Descriptive Location 950m South of Prof Hwy 700m West of Fuller Road

Project Name C.P
Project # 160960709
Field Staff KE JK
Time 9:25

Water Quality

Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____ *not taken*
Water Temperature (°C) _____ Air Temperature (°C) _____
Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology

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

Evidence of eroding banks, Comments on bank stability _____

stable & 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 Other _____ *grasses*

Riparian Zone

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

15% scattered riparian

Adjacent Land Use

Ag

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

none

Migratory Obstructions (seasonal, permanent)

almost 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.

confined WB reach

Field Notes Authored by KE

Field Notes QA/QCed by JK



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

13-2
woods creek WB

Stantec

Project C.P.
Station # 13-2
Photos Taken 469-476
GPS Coordinates 17 4776341 414213
Descriptive Location lakeshore, 150 m east of Cedar Point W

Project # 160960709
Field Staff KE + MF
Date Nov. 25 2011
Time 1:40 pm

Water Quality

Dissolved Oxygen (mg/L) 13.27 pH 8.31 Conductivity (µS/cm) 811
Water Temperature (°C) 6.07 Air Temperature (°C) 6
Weather conditions in previous 24 hrs cold + sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 30 (cm)
Mean Bankfull Width 6 (m) Mean Water Depth 20 (cm)
20 % Riffle 10 % Pool 70 % Run % Flat

Evidence of eroding banks, Comments on bank stability little erosion + undercut
up side

Substrate - Upstream (% cover)

 Bedrock 30 Silt Boulder 60 Clay 10 Cobble
 Muck Gravel Marl Sand Detritus

Substrate - Downstream (% cover)

 Bedrock 20 Silt Boulder 80 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 RCS
Other

Riparian Zone

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

Upstream 10%
Downstream 10% occasional trees.

Adjacent Land Use

Upstream
Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream

Migratory Obstructions (seasonal, permanent)

Upstream
Downstream permanent

Note any fish observations none (but known fish community according to land owner)

Other Habitat Notes, Incidental Wildlife Observations, etc.

- tiny riffle 25 m d/s near bend, gravel/cobble substrate under bridge
- possible ground water upwelling in SE ^{side} embankment (photo)
- up braided flow through RCS islands

Field Notes Authored by KE Field Notes QA/QCed by JK Page 1 of 1

- riffle just up of bridge
- med. wide, somewhat meandering watercourse

lacks silt control & evidence of flowings

bridge constructed into creek



Stantec Consulting Ltd - Electrofishing Record and Catch Results

Project Name C.P. Station Number 13-2
 Project Number 160960709 Pass No. (if applicable) 1
 Photos 496=id 497=u/s 498=d/s 499-svb Date (yyyymmdd): 2012 06 04
 Descriptive Location On: Lakeshore Rd ~ 200 m NE of Cedar Point
Liv.
 UTM coordinates 4776341 ~~easting~~ 414873 ~~northing~~ 17T

Fishing Method (circle one): Backpack Boat Unit Model/Make LR-12
 Sampling Method (circle one): even habitat transect spot
 Effort (Electrofishing Seconds): 100 Number of Netters: 1 Number of Anodes: 1

Settings
 Frequency (Hz) 60 Voltage (volts) 700 Current (Amps) Power (Watts)

Station Information
 Length of Stream Surveyed (m) ROW (~4.0 m u/s + d/s) + 10m (under bridge) 18m Total
 Station Characteristics: Width (m): Range 1.1 - 3.0 Average: 1.5
 Depth (m): Range 0.10 - 0.25 Average: 0.15

Water Clarity/Colour: clearish/yellow Water Velocity if Measured (m/s): Time 16:20
 Temperature (°C) 15.92 Conductivity (uS/cm) 757
 pH 8.58 Dissolved Oxygen (mg/L) 11.90

Catch Data

Species	Number of Fish	Comments (i.e. age, disease, etc):
John. Dt	### 1 (6)	
Rainb. Dt	### ## 11 (12)	
Crk chub	### ## ## 1 (16)	
Com Shn	1 (1)	
WASC	1 (1)	
Blk Nose Dace	### ## (10)	

Fish Measurements on Separate Sheet? Y
 Field Staff: NB, MF Notes By: MF
 (Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Woods Creek-1 11-2
WB

Stantec

Station # 11-2
Watercourse Name Woods Creek-1
Photos 1
Date 2012 06 07

Project Name QPoint
Project # 160960909
Field Staff NB, MF
Time 16:12

Weather conditions in previous 24 hrs No precip
GPS Coordinates (Zone) 17T E 419 767 N 477 5015 Datum NAD83
Descriptive Location 100m west of Rawlings Road on south side of Cedar Point Lm

Water Quality

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

Watercourse Dimensions & Morphology

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

Substrate (% cover)

Bedrock _____ Cobble 35 Sand _____ Silt _____ Muck _____
Boulder _____ Gravel 65 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% Open

Adjacent Land Use

Ag

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

? Isolated ditch - Indirect

Migratory Obstructions (seasonal, permanent)

Indirect fish habitat

Note any fish observations Dry - none

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc. No direct connection to Woods Creek

Field Notes Authored by MF

Field Notes QA/QCed by [Signature]



WIND FARM WATERBODY RAPID ASSESSMENT FORM

42-1

Malley Drain
WRB

Stantec

Station # 42-1
Watercourse Name Malley Drain
Photos 860-001
Date Oct. 4 2012

Project Name C.P
Project # 160900709
Field Staff KE FJK
Time 10:50

Weather conditions in previous 24 hrs _____
GPS Coordinates (Zone) 17 T E 421890 N 4773510 Datum _____
Descriptive Location Kinnaird, north of dura line

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 _____ (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 & veg

Substrate (% cover)

Bedrock _____ Cobble 40 Sand 20 Silt _____ Muck _____
Boulder _____ Gravel 40 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)
40% Ash, Apple, Shrubs, Forbi grasses

Adjacent Land Use

Ag

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 KE Field Notes QA/QCed by _____

No access, only visual survey from ROW.

OFF ROW. Need permission



WIND FARM WATERBODY RAPID ASSESSMENT FORM

McCallum Brain 52-1
WB

Stantec

Station # 52-1 Project Name C.P.
 Watercourse Name Unknown Project # 160960709
 Photos 639=id 640=south 641=north Field Staff NB, MF
 Date 2012 06 06 Time 16:27
 Weather conditions in previous 24 hrs No precip.
 GPS Coordinates (Zone) 17T E 421040 N 4771552 Datum NAD83
 Descriptive Location On Elerton Rd on east side. Runs parallel ~ 200m south of Townsend Line.

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 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 None. well veget'd

DRY

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)
5% shrubs (small) grasses.

Adjacent Land Use

agriculture, Elerton Rd.

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
low levels, dry?

Note any fish observations none

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

None

Field Notes Authored by MF

Field Notes QA/QCed by JK



WIND FARM WATERBODY RAPID ASSESSMENT FORM

McCallum Drain 51-3
WB

Stantec

Station # 51-3 Project Name C.P.
 Watercourse Name known McCallum Drain Project # 168960709
 Photos 636=id 637=ols 638=d/s Field Staff NB, MF
 Date 2012 06 06 Time 16:00
 Weather conditions in previous 24 hrs No precip.
 GPS Coordinates (Zone) 17T N4772124 N421056 Datum NAD83
 Descriptive Location At corner of Elarton Rd & Townsend Line in SE corner.

Water Quality

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

Watercourse Dimensions & Morphology

Mean Watercourse Width dry (m) Maximum Pool Depth dry (cm)
 Mean Bankfull Width 4.6 (m) Mean Water Depth dry (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability grassed banks.

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 20 Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay 80 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)
overhanging grasses

Adjacent Land Use

Ag

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 MF Field Notes QA/QCed by Johanna



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Haney brain 15-1
WB

Stantec

Project C.P.
Station # 15-1
Photos Taken 430-434
GPS Coordinates 17 475111 416482
Descriptive Location Cedar Point Line, 300 m east of Dolmage

Project # 160960709
Field Staff KE + ME
Date Nov. 25 2011
Time 11:10

Water Quality

Dissolved Oxygen (mg/L) 12.42 pH 8.15 Conductivity (µS/cm) 805
Water Temperature (°C) 6.43 Air Temperature (°C) 6°
Weather conditions in previous 24 hrs cold, sunny & overcast

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 20 (cm)
Mean Bankfull Width 4 (m) Mean Water Depth 15 (cm)
0 % Riffle 0 % Pool 100 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability steep, slight erosion due to high flows

south

Substrate - Upstream (% cover)

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

north

Substrate - Downstream (% cover)

0 Bedrock 0 Silt 70 Boulder 0 Clay 0 Cobble
10 Muck 10 Gravel 0 Marl 20 Sand 0 Detritus

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants minimal near culvert
Other 0

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 0
Downstream 20% scatter riparian trees

Adjacent Land Use

Upstream Ag fields
Downstream Ag fields

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?
Downstream 0

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- slow run through incised channel, little bit of substrate diversity at up culvert, but most of reach clay.



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Brush Drain

12-2

WB

Stantec

Project C.P
 Station # 12-2
 Photos Taken 442-448
 GPS Coordinates 17 4774565 417783
 Descriptive Location Fuller Rd, 500 m south of cedar point cur

Project # 160960709
 Field Staff KE + MF
 Date Nov. 28 2011
 Time 11:32

Water Quality

Dissolved Oxygen (mg/L) 12.65 pH 8.17 Conductivity (µS/cm) 799
 Water Temperature (°C) 6.69 Air Temperature (°C) 6°
 Weather conditions in previous 24 hrs cold, sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 10.5 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 4 (m) Mean Water Depth 10 (cm)
 % Riffle % Pool 100 % Run % Flat

Evidence of eroding banks, Comments on bank stability appear stable + veg

east

Substrate - Upstream (% cover) thick w/ veg; assumed
 Bedrock _____ Silt _____ Boulder 30 Clay _____ Cobble _____
 Muck _____ Gravel _____ Marl _____ Sand 70 Detritus _____

west

Substrate - Downstream (% cover) thick w/ veg; assumed
 Bedrock _____ Silt _____ Boulder 20 Clay _____ Cobble _____
 Muck _____ Gravel _____ Marl _____ Sand 80 Detritus _____

In-water Cover

Cover Types Present (circle):
 Overhanging Vegetation Undercut Banks Deep Pool Vascular Plants watercress, RCG, cattails, nightshade
 Woody Debris Boulder Other _____
minimal

Riparian Zone

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

Upstream 5% riparian trees
 Downstream 15% riparian trees

Adjacent Land Use

Upstream _____
 Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
 Downstream possible ground water input @ watercress

Migratory Obstructions (seasonal, permanent)

Upstream _____
 Downstream any in summer

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- watercress 2 m d/s
 - slow flow through thick veg lined, incised channel



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Brush Drain

12-1
WB

Stantec

Project CIP Project # 160960709
 Station # 12-1 Field Staff KE + MF
 Photos Taken 435-441 Date Nov. 25 2011
 GPS Coordinates 17 4775090 417262 Time 11:23
 Descriptive Location Cedar Point Lane, 500 m west of Fuller Rd.

Water Quality

Dissolved Oxygen (mg/L) 12.48 pH 8.04 Conductivity (µS/cm) 724
 Water Temperature (°C) 6.95 Air Temperature (°C) 6°
 Weather conditions in previous 24 hrs cold, sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 20 (cm)
 % Riffle 60 % Pool 40 % Run % Flat

Evidence of eroding banks, Comments on bank stability stable + veg

south

Substrate - Upstream (% cover) thick w/ RCG + watercress b/c culvert & Ag culvert
 Bedrock Silt Boulder Clay 60 Cobble 10
 Muck Gravel Marl Sand 30 Detritus

north

Substrate - Downstream (% cover) thick asters immediately d/s then open
 Bedrock Silt 20 Boulder Clay 70 Cobble
 Muck Gravel Marl Sand 10 Detritus

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Vascular Plants watercress + RCG
 Other

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
 Upstream 30% riparian trees
 Downstream 50% riparian trees

Adjacent Land Use

Upstream
 Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Upstream possible groundwater upwelling
 Downstream none

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?
 Downstream

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- u/s thick with RCG + watercress
- d/s thick bunch of asters in channel, but open 8 m d/s
- slow flow through in used channel



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Brush Drain

14-3

WB

Station # 14-3
Watercourse Name Woods Creek
Photos
Date July 4 2012
Weather conditions in previous 24 hrs T-storm
GPS Coordinates (Zone) 17 E 416799 N 4775730 Datum NAD83
Descriptive Location 800 m west of Miller Rd

Project Name C.P.
Project # 1609160709
Field Staff KE + JK
Time 8:40

Water Quality

Dissolved Oxygen (mg/L) 1.62 pH 8.03 Conductivity (µS/cm) 1837
Water Temperature (°C) 20.62 Air Temperature (°C) 837
Time in situ measurements taken

dry reach except refuse pool

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth 20 (cm)
Mean Bankfull Width 4 (m) Mean Water Depth 20 (cm)
% Riffle 100 % Pool % Run % Flat

Evidence of eroding banks, Comments on bank stability

stable + veg

Substrate (% cover)

Bedrock Cobble 40 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

RCG, water plants

Riparian Zone

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

RCG

Adjacent Land Use

Ag

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

refuse pool @ culvert rest of watercourse dry

Migratory Obstructions (seasonal, permanent)

dry

Note any fish observations

fathead, brook stickleback, creek chub

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

Field Notes Authored by KE

Field Notes QA/QCed by JK

Brush Drain 14-3

Fishing Record and Catch Results (passive collection methods) Page 1 of 1



Project Number 160960709
 Project Name: C.P
 Waterbody Name: _____
 Field Staff: KE + JKC

Station Number 14-3
 Lift / Haul / Pass No. 1
 Date (yyyymmdd): July 4 2012

Fishing Method (check one) and Gear Specs: _____ Gillnet No. of Panels: _____ Mesh Sizes: _____
 _____ Trap Net _____
 _____ Hoop Net _____
 _____ Minnow Trap _____
 Other (specify) dip net

Descriptive Location of Station 800 m west of Fuller Rd

UTM Coordinates: Zone V7 Easting 416799 Northing 4775730

~~SET: Date: _____ LIFT: Date: _____ Total Netting Hours (approx.) _____
 Time: _____ Time: _____~~
 Season Depth (m): Max: 20cm Min: 20cm
 3 dip net haul already e-fished @ 12-1

Supporting Measurements (recorded at time of net set)

Depth (m)	Temp. (°C)	D.O. (mg/L)	pH	Cond. (µS/cm)
	20.62	1.62	8.03	837

Time 9:14

Additional Catch Data on Separate Sheet? Y/N
 Detailed Fish Measurements on Separate Sheet? Y/N

Catch Data

Mesh Size	Species	Number	Comments (i.e. age, disease, etc.)
	Fathead minnow	35	Juv.
	Brook stickleback	100s possibly 1000s.	Juv & YOY
	creel chub	35	A



WIND FARM WATERBODY RAPID ASSESSMENT FORM

WB
12-3

Stantec

Brush drain

Station # 12-3
Watercourse Name Brush Drain
Photos 1/21 + 1/22
Date Dec 3/12

Project Name Cedar Point
Project # 160960109
Field Staff NB, KE
Time 13:11

Weather conditions in previous 24 hrs rain - last eve.
GPS Coordinates (Zone) 10416975 E 4775312 → N 171 Datum
Descriptive Location cedar point line, just west of Fuller

Water Quality
Dissolved Oxygen (mg/L) 9.68 pH 7.83 Conductivity (µS/cm) 525
Water Temperature (°C) 8.04 Air Temperature (°C) 11°C
Time in situ measurements taken 13:17

Watercourse Dimensions & Morphology
Mean Watercourse Width 2.0 (m) Maximum Pool Depth 40 (cm)
Mean Bankfull Width 8.0 (m) Mean Water Depth 20 (cm)
% Riffle _____ % Pool slow-100 % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability steep, mostly stable.

Substrate (% cover)
Bedrock _____ Cobble _____ Sand 20 Silt _____ Muck _____
Boulder _____ Gravel 60 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)
10% black ash, Hawthorne.
Adjacent Land Use Agriculture.

Fish Habitat Potential
Critical Habitat (spawning or nursery areas, groundwater upwellings)
none
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 N. Burnett Field Notes QA/QCed by _____



WIND FARM WATERBODY RAPID ASSESSMENT FORM

South Boundary Drain 512
WB

Stantec

Station # 51-2 Project Name C.P.
 Watercourse Name Watercourse South Boundary Drain Project # 160960709
 Photos 633=id 634=uls 635=d/s Field Staff NB, MF
 Date 2012 06 06 Time 16:00
 Weather conditions in previous 24 hrs no precip
 GPS Coordinates (Zone) 17T E 421644 N 4771975 Datum NAD83
 Descriptive Location Townsend Line ~ 150 west of Kincaid Rd on
South Side along rd. Connects with 51-1

Water Quality

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

Watercourse Dimensions & Morphology

Mean Watercourse Width Dry (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 gravel banks

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 20 Silt _____ Muck _____
 Boulder _____ Gravel _____ Clay 80 Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

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

Adjacent Land Use

Ag

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 MF

Field Notes QA/QCed by [Signature]



WIND FARM WATERBODY RAPID ASSESSMENT FORM

South Boundary Drain
Woods Creek 51-4
WB

Stantec

Station # 51-4 Project Name C.P.
 Watercourse Name McCallum + S. Boundary Project # 160960709
 Photos _____ Field Staff KE + JK
 Date July 4 2012 Time 1:30pm
 Weather conditions in previous 24 hrs T-storm, hot & sunny
 GPS Coordinates (Zone) 17 E 481009 N 4772398 Datum NAD83
 Descriptive Location 900m west of Kinnaird Rd, 250m N of Townsend Ln

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 (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 _____ 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)
20% man maples, sunny shrubs etc
 Adjacent Land Use Agriculture

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.

- confluence of South Boundary Drain + McCallum Drain
- both WB.

Field Notes Authored by KE Field Notes QA/QCed by JK



WIND FARM WATERBODY RAPID ASSESSMENT FORM

51-1 South Boundary Drain - 1 WB

Stantec

Station # 51-1 Project Name Cedar Point
 Watercourse Name South Boundary Drain-1 Project # 160960709
 Photos 631-632 Field Staff Marc Fasella, Nathan Burnett
 Date 2012/06/06 Time 15:45
 Weather conditions in previous 24 hrs 0 ppt
 GPS Coordinates (Zone) 17T E 421700 N 4771963 Datum NAD83
 Descriptive Location Tornal Line, 100m west of Emerald Rd on South side of Rd

Water Quality

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

Watercourse Dimensions & Morphology

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

Substrate (% cover)

Bedrock	Cobble	Sand	20	Silt		Muck
Boulder	Gravel	Clay	80	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% partly open - scattered trees.

Adjacent Land Use

Ag

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 mf

Field Notes QA/QCed by OK



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

James Creek Drain

13-1

WB

Stantec

Project C.P
 Station # 13-1
 Photos Taken 460-468
 GPS Coordinates N 477015 415351
 Descriptive Location Lakeshore Rd, 400 m west of Vance Dr

Project # 160960709
 Field Staff KE+MI
 Date Nov. 25 2011
 Time 1:20pm

Water Quality

Dissolved Oxygen (mg/L) 12.72 pH 8.14 Conductivity (µS/cm) 706
 Water Temperature (°C) 7.25 Air Temperature (°C) 6°
 Weather conditions in previous 24 hrs cold + sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 15 (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 10 (cm)
 % Riffle 0 % Pool 60 % Run 40 % Flat 0

Evidence of eroding banks, Comments on bank stability stable + veg

Substrate - Upstream (% cover) thick cattails

Bedrock _____ Silt _____ Boulder 20 Clay _____ Cobble _____
 Muck _____ Gravel _____ Marl _____ Sand 80 Detritus _____

Substrate - Downstream (% cover) thick cattails

Bedrock _____ Silt _____ Boulder 20 Clay _____ Cobble _____
 Muck _____ Gravel _____ Marl _____ Sand 80 Detritus _____

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks _____ Deep Pool _____ Vascular Plants cattails watercress
 Woody Debris _____ Boulder _____ Other _____

Riparian Zone

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

Adjacent Land Use

Upstream Ag fields
 Downstream _____

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Upstream possible groundwater inputs
 Downstream possible ground water inputs
 Migratory Obstructions (seasonal, permanent)
 Upstream dry in summer?
 Downstream _____
 Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- tile drain inputs
- watercress 10 m up lakeshore (south side), 1 m at lakeshore (S side)
- incised, cattail channel w/ pooled water & reaches of slow run



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

James Creek Drain

14-1
WRB

Stantec

Project C.P
Station # 14-1
Photos Taken 449-453
GPS Coordinates 17 4776511 417835
Descriptive Location Fuller Rd 250 m south of Proof Line

Project # 1609160709
Field Staff KE + MF
Date Nov. 25 2011
Time 12:45 pm

Water Quality

Dissolved Oxygen (mg/L) 12.3 pH 7.93 Conductivity (µS/cm) 722
Water Temperature (°C) 8.75 Air Temperature (°C) 6
Weather conditions in previous 24 hrs cold + sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 1.5 (cm)
Mean Bankfull Width 4 (m) Mean Water Depth 10 (cm)
0 % Riffle 50 % Pool 50 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability stable + vegetated

east

Substrate - Upstream (% cover) thick w/ RCG
Bedrock 0 Silt 0 Boulder 20 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 80 Detritus 0

west

Substrate - Downstream (% cover) thick w/ RCG
Bedrock 0 Silt 0 Boulder 20 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 80 Detritus 0

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants RCG
Other RCG

Riparian Zone

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

Upstream 10% riparian trees
Downstream 20% riparian trees

Adjacent Land Use

Upstream Ag fields
Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream none

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?
Downstream dry in summer?

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

-incised channel lined w/ RCG, slow flow through veg



Stantec Consulting Ltd - Electrofishing Record and Catch Results

Project Name C.P. Station Number 14-1

Project Number 160960709 Pass No. (if applicable) 1

Photos 509=id 510=uls 511=d/s Date (yyyymmdd): 2012 06 05

Descriptive Location On Fuller Rd. ~250 m south of Proof Line

UTM coordinates 4776511 ~~easting~~ 417835 ~~northing~~ 17T zone

Fishing Method (circle one): Backpack Boat Unit Model/Make ER12

Sampling Method (circle one): even habitat transect spot

Effort (Electrofishing Seconds): 111 Number of Netters: 1 Number of Anodes: 1

Settings
Frequency (Hz) 60 Voltage (volts) 700 Current (Amps) — Power (Watts) —

Station Information
Length of Stream Surveyed (m) ~ 60

Station Characteristics:
Width (m): Range 0.40 - 0.50 Average: 0.45
Depth (m): Range 0.03 - 0.05 Average: 0.04

Water Clarity/Colour: tea colour Water Velocity if Measured (m/s): N/A Time 09:20
Temperature (°C) 13.22 Conductivity (uS/cm) 785
pH 8.04 Dissolved Oxygen (mg/L) 10.06

Species	Number of Fish	Comments (i.e. age, disease, etc):
<u>Many yoy BRST observed @ culvert openings.</u>		
<u>Very hard to fish / see. Thick w aquatic veg (eg. watercress)</u>		
<u>Very shallow water levels. Very minor flows</u>		

Fish Measurements on Separate Sheet?
Field Staff: NB, MF Notes By: MF
(Station Diagram on Back)



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Frayne Drain

4-3
WB

Stantec

Project C.P Project # 1609160709
 Station # 4-3 Field Staff KE + MF
 Photos Taken 551-556 Date Nov. 28 2011
 GPS Coordinates 17 4778314 420290 Time 2:30 pm
 Descriptive Location Thompson line, 300m east of Rowlings

Water Quality

Dissolved Oxygen (mg/L) 11.14 pH 7.98 Conductivity (µS/cm) 478
 Water Temperature (°C) 8.2 Air Temperature (°C) 16°
 Weather conditions in previous 24 hrs cold + rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 40 (cm)
 Mean Bankfull Width 3 (m) Mean Water Depth 30 (cm)
 % Riffle 20 % Pool 70 % Run 10 % Flat

Evidence of eroding banks, Comments on bank stability

stable + veg

South

Substrate - Upstream (% cover) turbid

Bedrock _____ Silt _____ Boulder 20 Clay _____ Cobble _____
 Muck _____ Gravel _____ Marl _____ Sand 80 Detritus _____

West

Substrate - Downstream (% cover) turbid

Bedrock _____ Silt _____ Boulder 20 Clay _____ Cobble _____
 Muck _____ Gravel _____ Marl _____ Sand 80 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Vascular Plants RCS
 Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

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

Upstream _____
 Downstream 30% riparian trees (ash, sumac, spruce)

Adjacent Land Use

Upstream _____
 Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream None
 Downstream _____

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?
 Downstream _____

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

-inused, turbid, slow flow, RCS filled channel

*bird nest 15 m ups in shrubs next to WB. (near sumac)



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

6-1
WB

Stantec

Project C.P
Station # 6-1
Photos Taken 489-489
GPS Coordinates 17 4776341 914813
Descriptive Location Rawlings Rd, 800 m south of poof line

Project # 1609160709
Field Staff KE+ME
Date Nov 25 2011
Time 2:30 pm

Water Quality

Dissolved Oxygen (mg/L) 12.02 pH 8.0 Conductivity (µS/cm) 809
Water Temperature (°C) 9.03 Air Temperature (°C) 10°
Weather conditions in previous 24 hrs cold + sunny

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 80 % Pool 80 % Run — % Flat

Evidence of eroding banks, Comments on bank stability

stable + recy

Substrate - Upstream (% cover)

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

tiled to culvert

Substrate - Downstream (% cover)

— Bedrock — Silt — Boulder 20 Clay — Cobble
— Muck — Gravel — Marl — Sand 80 Detritus

thick cattails + watercress

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks — Deep Pool — Vascular Plants cattails watercress
Woody Debris — Boulder — Other —

Riparian Zone

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

Upstream na tiled

Downstream 0% open

Adjacent Land Use

Upstream Ag fields
Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream na tiled

Downstream ground water upwelling possible

Migratory Obstructions (seasonal, permanent)

Upstream tiled

Downstream dry in summer?

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- watercress in dls + large patch 15m dls
- trickle flow through cattail lined, incised channel



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Wadsworth Drain 6-2 WB

Stantec

Project C.P. Station # 6-2 Photos Taken 420-495 GPS Coordinates 174776341 414813 Descriptive Location Proof Line, 600 m west of Rowings Project # 160960709 Field Staff KE + MF Date Nov. 25 2011 Time 2:45 pm

Water Quality

Dissolved Oxygen (mg/L) 10.9 pH 7.94 Conductivity (µS/cm) 907 Water Temperature (°C) 7.87 Air Temperature (°C) 6° Weather conditions in previous 24 hrs cold & sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 15 (cm) Mean Bankfull Width 4 (m) Mean Water Depth 10 (cm) % Riffle 40 % Pool 40 % Run % Flat Evidence of eroding banks, Comments on bank stability stable + veg

Substrate - Upstream (% cover)

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

thick cattails

Substrate - Downstream (% cover)

Bedrock Silt Boulder 20 Clay Cobble Muck Gravel Marl Sand 80 Detritus

thick cattails

In-water Cover

Cover Types Present (circle): Overhanging vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants cattails Other

Riparian Zone

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

Adjacent Land Use

Upstream Ag fields Downstream

Fish Habitat Potential

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

-incised channel thickly lined w/ cattails, negligible flows



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

Too shallow to fish **Wadsworth Drain** 2-5-5
WB

Station # S-5 *Wadsworth Drain* Project Name C.P.
 Watercourse Name unknown *Wadsworth Drain* Project # 160960709
 Photos 668=id 669=east 670=west Field Staff NB, MF
 Date 2012 06 07 Time 13:54

Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 0419179 N 4778357 Datum NAD83
 Descriptive Location On Thompson Line ~ 700 m west of Rawlings.
Runs parallel to road on south side.

Water Quality
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____ *Too shallow*
 Water Temperature (°C) _____ Air Temperature (°C) 21°C
 Time *in situ* measurements taken _____

Watercourse Dimensions & Morphology
 Mean Watercourse Width 0.6 (m) Maximum Pool Depth 0.04 (cm)
 Mean Bankfull Width 2.0 (m) Mean Water Depth 0.02 (cm)
 _____ % Riffle 100 % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____
None

Substrate (% cover)
 Bedrock _____ Cobble _____ Sand 40 Silt 20 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)
3% small shrubs, terr veg.
 Adjacent Land Use ag, Thompson Line

Fish Habitat Potential
 Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawn?
 Migratory Obstructions (seasonal, permanent)
Very shallow or 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.
Could not fish. Too shallow

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



WIND FARM WATERBODY RAPID ASSESSMENT FORM

WB

Wads worth drain 5-7

Stantec

Station # 5-7 Project Name CIP
 Watercourse Name Wads worth Project # 100910709
 Photos 1118-1120 Field Staff KR + MB
 Date Dec 3 2012 Time 12:55pm
 Weather conditions in previous 24 hrs cool
 GPS Coordinates (Zone) 17T E 0419298 N 4777567 Datum
 Descriptive Location Raukays, south of Thompson

Water Quality

Dissolved Oxygen (mg/L) 9.48 pH 7.80 Conductivity (μ S/cm) 725
 Water Temperature ($^{\circ}$ C) 6.61 Air Temperature ($^{\circ}$ C) 5
 Time *in situ* measurements taken 12:55pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 6 (m) Maximum Pool Depth 20 (cm)
 Mean Bankfull Width 1.5 (m) Mean Water Depth 15 (cm)
 % Riffle _____ % Pool 100 % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability steep, stable emb

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 RCS
 Overhanging Vegetation _____ Woody Debris _____ Boulder _____ Other _____ Aquatic Veg

Riparian Zone

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

Adjacent Land Use

Ag

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
none

Note any fish observations
none

Waterbody Notes

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

Other Habitat Notes, Incidental Wildlife Observations, etc. _____

Field Notes Authored by KL

Field Notes QA/QCed by _____



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Beith Creek Drain

5-2
WB

Stantec

Project C.P Project # 160960709
 Station # 5-2 Field Staff KE + MF
 Photos Taken 496-499 Date Nov. 24 2011
 GPS Coordinates 174776341 414813 Time 2:57 pm
 Descriptive Location _____

Water Quality

not enough to sample
 Dissolved Oxygen (mg/L) _____ pH _____ Conductivity (µS/cm) _____
 Water Temperature (°C) _____ Air Temperature (°C) _____
 Weather conditions in previous 24 hrs _____

Watercourse Dimensions & Morphology

tiny pool @ tile drainage
 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 + veg

Substrate - Upstream (% cover) *tiled*

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

Substrate - Downstream (% cover) *lots of veg*

_____ Bedrock _____ Silt _____ Boulder 20 Clay _____ Cobble
 _____ Muck _____ Gravel _____ Marl _____ Sand 80 Detritus

In-water Cover

Cover Types Present (circle):
 Overhanging Vegetation Undercut Banks Deep Pool Vascular Plants *cattails + terrestrial veg*
 Woody Debris Boulder Other _____

Riparian Zone

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

Adjacent Land Use

Upstream _____
 Downstream Ag fields

Fish Habitat Potential

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

Other Habitat Notes, Incidental Wildlife Observations, etc.

- tile drainage into incised channel w/ mixed cattails +
 terrestrial veg (mainly terrestrial)
 - east clearly just road ditch, not as incised
 - west incised & connects to WB @ 5-1, areas of standing water
 - borderline WB, but culvert @ 5-1 connected



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Beth Creek Drain

5-1
WB.

Stantec

Project C.P Project # 160960709
 Station # 5-1 Field Staff KE + MF
 Photos Taken 501-507 Date Nov 25 2011
 GPS Coordinates 17 4776341 414813 Time 3:05 pm
 Descriptive Location PROOF LINE 1.2 km west of Rawlins

Water Quality

Dissolved Oxygen (mg/L) 11.95 pH 7.96 Conductivity (µS/cm) 732
 Water Temperature (°C) 9.37 Air Temperature (°C) 6°
 Weather conditions in previous 24 hrs cold + sunny

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 6 (m) Mean Water Depth 5 (cm)
 % Riffle 80 % Pool 20 % Run 0 % Flat 0

Evidence of eroding banks, Comments on bank stability stable + veg

Substrate - Upstream (% cover) tiled to culvert
 Bedrock 0 Silt 0 Boulder 50 Clay 10 Cobble 0
 Muck 0 Gravel 0 Marl 0 Sand 40 Detritus 0

Substrate - Downstream (% cover) RCG + cattails
 Bedrock 0 Silt 0 Boulder 20 Clay 0 Cobble 0
 Muck 0 Gravel 0 Marl 0 Sand 80 Detritus 0

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks 0 Deep Pool 0 Vascular Plants cattails
 Woody Debris 0 Boulder 0 Other RCG

Riparian Zone

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

Adjacent Land Use

Upstream Ag fields
 Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
 Upstream possible ground water input @ u/s culvert
 Downstream none

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?
 Downstream dry in summer?

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- u/s watercross @ culvert + tile drainage
 - d/s 1st 15m thick w/ RCG, then cattails
 - mainly standing water in incised channel, negligible flow from tile drain



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Beith Creek Drain
5-6
WB

Stantec

Station # 5-6 Project Name CIP
 Watercourse Name unnamed Project # 160960709
 Photos _____ Field Staff KE + JK
 Date July 3 2012 Time 6:50 pm
 Weather conditions in previous 24 hrs T-storm
 GPS Coordinates (Zone) 17 E 418395 N 4778376 Datum
 Descriptive Location Thompson line, east of Fuller

Water Quality

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

Watercourse Dimensions & Morphology

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

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)
0%

Adjacent Land Use

As

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 KE

Field Notes QA/QCed by JK



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Beith Creek Drain 5-3
WB

Stantec

Station # 5-3

Project Name C.P.

Watercourse Name unknown

Project # 100960709

Photos 662=id 663=0/s 664=d/s

Field Staff NB, MF

Date 2012 06 07

Time 13:06

Weather conditions in previous 24 hrs No precipitation

GPS Coordinates (Zone) 17T E 0418325 N 4778378 Datum NAD83

Descriptive Location On Thompson Line ~400m East of Fuller Rd, watercourse cons under road.

Water Quality

Dissolved Oxygen (mg/L) 6.21 pH 7.87 Conductivity (μ S/cm) 846

Water Temperature ($^{\circ}$ C) 19.08 Air Temperature ($^{\circ}$ C) 19 $^{\circ}$ C

Time *in situ* measurements taken 13:06

Watercourse Dimensions & Morphology

Mean Watercourse Width 23.630 (m) Maximum Pool Depth 0.60 (cm)

Mean Bankfull Width 4.0 (m) Mean Water Depth 0.20 (cm)

% Riffle 50 % Pool 50 % Run 50 % Flat

Evidence of eroding banks, Comments on bank stability None - well veg'd

Substrate (% cover)

Bedrock 0 Cobble 0 Sand 50 Silt 20 Muck

Boulder 0 Gravel 30 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

Riparian Zone

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

10% small shrubs, grass

Adjacent Land Use

ag, Thompson line

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawn, nursery, foraging

Migratory Obstructions (seasonal, permanent)

low levels

Note any fish observations many. Fished. see sheet

Waterbody Notes

Natural Watercourse Trapezoidal 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 NB

Field Notes QA/QCed by OK



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Saskiwanda Creek

9-2
WB

Stantec

Project C.P

Project # 160960709

Station # 9-2

Field Staff KE + MF

Photos Taken _____

Date Nov. 29, 2011

GPS Coordinates 174774992 422812

Time 9:25

Descriptive Location Cedar point fire, 1 km east of
Kubruia, 100 m into woodlot (north)

Water Quality

Dissolved Oxygen (mg/L) 11.58 pH 7.89 Conductivity (µS/cm) 433

Water Temperature (°C) 16.91 Air Temperature (°C) 4

Weather conditions in previous 24 hrs cold + lots of rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 40.8 (m) Maximum Pool Depth 71.5 (cm)

Mean Bankfull Width 8 (m) Mean Water Depth 71.5 (cm)

0 % Riffle 0 % Pool 100 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability stable + veg

east

Substrate - Upstream (% cover)

turbid & deep, assumed

Bedrock _____ Silt _____ Boulder 20 Clay _____ Cobble _____
Muck _____ Gravel _____ Marl _____ Sand 80 Detritus _____

west

Substrate - Downstream (% cover)

turbid & deep, assumed

Bedrock _____ Silt _____ Boulder 20 Clay _____ Cobble _____
Muck _____ Gravel _____ Marl _____ Sand 80 Detritus _____

In-water Cover

Cover Types Present (circle):
Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants
Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 90% dec. woodlot
Downstream 30%

Adjacent Land Use

Upstream woodlot
Downstream woodlot & Ag

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
Upstream dry in summer?
Downstream _____

Note any fish observations None

Other Habitat Notes, Incidental Wildlife Observations, etc.

- turbid, fast flowing at bank full
- leaf litter lines banks, assume some grasses based on banks
- extremely flash, most likely mixed channel



WIND FARM WATERBODY RAPID ASSESSMENT FORM

9-5

Saskawanda creek

Stantec

Station # 9-5 Project Name CIP
 Watercourse Name Saskawanda creek Project # 100960909
 Photos 9696 → 9701 Field Staff KE & SK
 Date July 25 2012 Time 2:20 pm
 Weather conditions in previous 24 hrs: hot & dry
 GPS Coordinates (Zone) 17 T E 422411 N 4775339 Datum NAD83
 Descriptive Location North of Cedar Pt Line, (300m N) & 1.2 km west of Army Corp 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 1.5 (m) Maximum Pool Depth dry (cm)
 Mean Bankfull Width 7 (m) Mean Water Depth _____ (cm)
 _____ % Riffle _____ % Pool _____ % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability _____

Substrate (% cover)

Bedrock < 1% 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 RCG Woody Debris Boulder Other _____

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
10%

Adjacent Land Use

AG

Fish Habitat Potential

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

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.

- bone dry, seasonal or result of drought (unsure)
- incised, approx 2+m.

Field Notes Authored by KE

Field Notes QA/QCed by Joe



Stantec

RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

shashawanda creek WB 3-1

Project C.P.
Station # 3-1
Photos Taken 624-628
GPS Coordinates 17477754 422024
Descriptive Location Kinnaird, 500 m south of Thompson

Project # 160960709
Field Staff KE + MF
Date Mar. 29 2011
Time 9:00

Water Quality

Dissolved Oxygen (mg/L) 11.4 pH 7.91 Conductivity (uS/cm) 500
Water Temperature (C) 16.93 Air Temperature (C) 40
Weather conditions in previous 24 hrs cold + lots of rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 8 (m) Maximum Pool Depth 2100+(cm)
Mean Bankfull Width 8 (m) Mean Water Depth 2100+(cm)
% Riffle % Pool 100 % Run % Flat

Evidence of eroding banks, Comments on bank stability

veg + stable

South

Substrate - Upstream (% cover)

Bedrock Silt Boulder 20 Clay Cobble
Muck Gravel Marl Sand 80 Detritus

turbid, assured + deep

North

Substrate - Downstream (% cover)

Bedrock Silt Boulder 20 Clay Cobble
Muck Gravel Marl Sand 80 Detritus

turbid, assured + deep

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants RCO7 Other

Riparian Zone

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

Upstream
Downstream 60% riparian trees (Ash trees)

Adjacent Land Use

Upstream
Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream Pike spawning areas nearby.
Downstream

Migratory Obstructions (seasonal, permanent)

Upstream permanent
Downstream

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- Fast flow, turbid, reanders, currently close to bank fail



Stantec

Stantec Consulting Ltd - Electrofishing Record and Catch Results

*Sushwanda
creek*

3-1

Project Name C.P. Station Number 3-1

Project Number 160960709 Pass No. (if applicable) 1

Photos 545=1d 546=1s 547=1s Date (yyyymmdd): 2012 06 05

Descriptive Location On Kinard Rd ~ 500m South of Thompson Rd.

UTM coordinates 4777754 easting 422024 northing 171 zone 17T

Fishing Method (circle one): Backpack Boat ER 12 Unit Model/Make ER 12

Sampling Method (circle one): even habitat transect spot

Effort (Electrofishing Seconds): 330 Number of Netters: 1 Number of Anodes: 1

Settings
Frequency (Hz) 60 Voltage (volts) 800 Current (Amps) ✓ Power (Watts) ✓

Station Information
Length of Stream Surveyed (m) ~ 100

Station Characteristics:
Width (m): Range 2.0 - 2.75 Average: 2.5
Depth (m): Range 0.25 - 0.60 Average: 0.40

Water Clarity/Colour: lea Water Velocity if Measured (m/s): N/A Time 14:15
Temperature (°C) 16.05 Conductivity (uS/cm) 707
pH 8.34 Dissolved Oxygen (mg/L) 10.74

Catch Data

Species	Number of Fish	Comments (i.e. age, disease, etc):
Crk chub	### ## (23)	
Cmn Sh	### ## (32)	
Bluntnose Min	### ## (33)	
Pumpkin Seed	### (3)	
BK Side Dt.	### ## (13)	Minor black spot
W45C	### (7)	
Nth. Pike	1 (100%) (1)	
John. Dt.	### (4)	
Fish photos: 549-557		

Fish Measurements on Separate Sheet? (Y/N)
Field Staff: N.B., MF Notes By: MF



WIND FARM WATERBODY RAPID ASSESSMENT FORM

WB

shashwanda 3-2

Stantec

Station # 3-2 Project Name CIP
 Watercourse Name shashwanda Project # 1100960709
 Photos 1615-1117 Field Staff KE + WB
 Date Dec 5 2012 Time 12:01
 Weather conditions in previous 24 hrs _____
 GPS Coordinates (Zone) 17T E 0422097 N 4777439 Datum _____
 Descriptive Location _____

Water Quality

Dissolved Oxygen (mg/L) 10.91 pH 7.97 Conductivity (μ S/cm) 453
 Water Temperature ($^{\circ}$ C) 6.21 Air Temperature ($^{\circ}$ C) 5
 Time *in situ* measurements taken 12:03 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth _____ (cm)
 Mean Bankfull Width 15 (m) Mean Water Depth 15 (cm)
 _____ % Riffle _____ % Pool 100 % Run _____ % Flat
 Evidence of eroding banks, Comments on bank stability stable + veg

Substrate (% cover)

Bedrock _____ Cobble 30 Sand 20 Silt _____ Muck _____
 Boulder 50 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)
RON, RCG, Hawthorne, Dale Ash 40%

Adjacent Land Use

Ag - winter wheat + corn

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
potential upwelling for brook trout
 Migratory Obstructions (seasonal, permanent)
none
 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. _____

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



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Russel Brain 9-1 WB

Stantec

Project CIP Station # 9-1 Photos Taken 629-634 GPS Coordinates 17 4774930 422814 Descriptive Location cedar point we, 1 km east of Kinnaird

Project # 1609160709 Field Staff KC + MF Date Nov 29 2011 Time 9:15

Water Quality Dissolved Oxygen (mg/L) 11.5 pH 8.11 Conductivity (µS/cm) 270 Water Temperature (°C) 6.14 Air Temperature (°C) 4° Weather conditions in previous 24 hrs cold + lots of rain

Watercourse Dimensions & Morphology Mean Watercourse Width 4.5 (m) Maximum Pool Depth > 1 m (cm) Mean Bankfull Width 4.5 (m) Mean Water Depth > 1 m (cm) % Riffle % Pool 100% Run % Flat

Evidence of eroding banks, Comments on bank stability Stable + veg

South Substrate - Upstream (% cover) turbid + deep, assumed Bedrock Silt Boulder 30 Clay Cobble Muck Gravel Marl Sand 70 Detritus

North Substrate - Downstream (% cover) turbid + deep, assumed Bedrock Silt Boulder 30 Clay Cobble Muck Gravel Marl Sand 70 Detritus

In-water Cover Cover Types Present (circle): Overhanging vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants RCG Other

Riparian Zone Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional) Upstream 70% dec. woodlot Downstream 30% dec. woodlot

Adjacent Land Use Upstream woodlot Downstream Ag + woodlot

Fish Habitat Potential Critical Habitat (spawning or nursery areas, groundwater upwellings) Upstream None Downstream Migratory Obstructions (seasonal, permanent) Upstream dry in summer? Downstream Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc. - fast flows, turbid, bank full - up flows through woodlot - d/s flows through edge of woodlot + open out into Ag field

- mixed & debris & very flashy system - woody debris jam @ up culvert causing flow to boil up ext effe



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Ross Drain

7-2
WB.

Stantec

Station # 7-2 Project Name C.P
 Watercourse Name Sashunda Creek 3 Ross Drain Project # 1609160709
 Photos 1193 Field Staff KE + JK
 Date July 3 2012 Time 7:10 pm
 Weather conditions in previous 24 hrs T-storm
 GPS Coordinates (Zone) 17 + E 42+317 N 4776634 Datum NAD83
 Descriptive Location Proof Rd, west of Kinnard

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 _____ (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 40 Sand _____ Silt _____ Muck _____
 Boulder _____ Gravel 60 Clay _____ Marl _____ Detritus _____

In-water Cover

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

Riparian Zone

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

0%
Adjacent Land Use Ag

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 KE

Field Notes QA/QCed by JK



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Ross Drain

4-1
WRB

Stantec

Project CIP

Project # 160960709

Station # 4-1

Field Staff KE + MF

Photos Taken 535-543

Date Nov. 28 2011

GPS Coordinates 17 47 18.90 42 26 8

Time 2:10 pm

Descriptive Location Thompson line, 800 m west of

Kinnaird Rd

Water Quality

Dissolved Oxygen (mg/L) 8.57 pH 7.8 Conductivity (µS/cm) 531

Water Temperature (°C) 7.98 Air Temperature (°C) 6°

Weather conditions in previous 24 hrs cold + rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 40 (cm)

Mean Bankfull Width 6 (m) Mean Water Depth 30 (cm)

1 % Riffle 70 % Pool 30 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability

stable & veg

Substrate - Upstream (% cover)

turbid, assumed

Bedrock 20 Silt 80 Boulder 80 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 0 Detritus 0

Substrate - Downstream (% cover)

turbid, assumed

Bedrock 20 Silt 80 Boulder 80 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 0 Detritus 0

In-water Cover

Cover Types Present (circle):
Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants RCG
Other gubage

Riparian Zone

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

Upstream 40% ash trees line south side

Downstream 40% ash & other dec. trees line east side

Adjacent Land Use

Upstream Ag fields

Downstream _____

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none

Downstream _____

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?

Downstream _____

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- wide, incised channel, slow flow, turbid, straight
- ups through field, more red-oxis along banks



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Ross Drain 4-4
WB

Stantec

Station # 4-4
Watercourse Name Ross Drain
Photos 851-853
Date 2012/10/04

Project Name Cedar Point
Project # 160960709
Field Staff JK KE
Time 9:17am

GPS
with
Footprint

Weather conditions in previous 24 hrs overcast - w/ ppt.
GPS Coordinates (Zone) 17T E N Datum NAD83
Descriptive Location On Ross Drain, west of Kinross Rd. south of Thompson Line.

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 _____ (m) Maximum Pool Depth _____ (cm)
Mean Bankfull Width 7.0 (m) Mean Water Depth _____ (cm)
% Riffle _____ % Pool _____ % Run _____ % Flat _____
Evidence of eroding banks, Comments on bank stability Clay sides - grassed - no undercutting

Substrate (% cover)

Bedrock _____ Cobble 10 Sand 10 Silt _____ Muck _____
Boulder _____ Gravel 80 Clay _____ Marl RCG 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% Ash Elm trees, - Oak Saplings

Adjacent Land Use

Ag - Hayfield NE - Corn West

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 JK

Field Notes QA/QCed by _____



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Stewardson drain 7-1
WB

Stantec

Project C.P Project # 160960709
Station # 7-1 Field Staff KE + MF
Photos Taken 560-565 Date Nov. 28 2011
GPS Coordinates 17 4776649 920743 Time 3:00 pm
Descriptive Location Proof Line, 1 km east of Rawlings

Water Quality

Dissolved Oxygen (mg/L) 11.73 pH 7.79 Conductivity (µS/cm) 6666
Water Temperature (°C) 8.67 Air Temperature (°C) 10
Weather conditions in previous 24 hrs cold + rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 1 (m) Maximum Pool Depth 20 (cm)
Mean Bankfull Width 4 (m) Mean Water Depth 20 (cm)
0 % Riffle 40 % Pool 60 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability stable + veg

south

Substrate - Upstream (% cover)

Bedrock 0 Silt 0 Boulder 20 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 80 Detritus 0

tiled into small catchment area @ culvert

north

Substrate - Downstream (% cover)

Bedrock 0 Silt 0 Boulder 0 Clay 20 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 80 Detritus 0

choked w/ RCG

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks 0 Deep Pool 0 Vascular Plants RCG
Woody Debris 0 Boulder 0 Other 0

Riparian Zone

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

Upstream 0%
Downstream 20% scattered riparian trees

Adjacent Land Use

Upstream 0
Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream 0

Migratory Obstructions (seasonal, permanent)

Upstream tiled drainage inputs to catchment area @ culvert
Downstream dry in summer

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- ups catchment area for tile drainage WB ~ 10 m
- d/s incised channel choked w/ RCG, flows through the RCG



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Stewardson Drain

4-2
WRB

Stantec

Project C.P Project # 160960709
Station # 4-2 Field Staff MF + KE
Photos Taken 544-550 Date Nov 25 2011
GPS Coordinates 174778304 420757 Time 2:23 pm
Descriptive Location Thompson Cree, 1 km east of Rautings

Water Quality

Dissolved Oxygen (mg/L) 11.19 pH 7.91 Conductivity (µS/cm) 558
Water Temperature (°C) 8.25 Air Temperature (°C) 16°
Weather conditions in previous 24 hrs cold & rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 40 (cm)
Mean Bankfull Width 6 (m) Mean Water Depth 30 (cm)
— % Riffle 100 % Pool 40 % Run — % Flat

Evidence of eroding banks, Comments on bank stability

Stable & veg

Substrate - Upstream (% cover) turbid, assumed

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

Substrate - Downstream (% cover)

Bedrock — Silt — Boulder — Clay 20 Cobble —
Muck — Gravel — Marl — Sand 80 Detritus —

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool — Vascular Plants RCG
Boulder — Other —

Riparian Zone

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

Upstream 100% woodlot - deadwood

Downstream 40% dec trees in east bank

Adjacent Land Use

Upstream As & woodlot

Downstream As field

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream None

Downstream —

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?

Downstream —

Note any fish observations None

Other Habitat Notes, Incidental Wildlife Observations, etc.

- tile & ditch drainage inputs
- a/s no in-water veg, just leaf litter & some woody debris
- d/s channel b/c choked with RCG



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stewardson Drain

WB
4-5

Stantec

Station # 4-5 Project Name C.P.
 Watercourse Name Stewardson Drain Project # 160960710
 Photos 1101-1103 Field Staff KE BM.
 Date Nov. 29 2012. Time 2:30 pm
 Weather conditions in previous 24 hrs cold
 GPS Coordinates (Zone) 17T E 420767 N 470305 Datum
 Descriptive Location Landings Road, South of Thompson

Water Quality

Dissolved Oxygen (mg/L) 11.38 pH 7.81 Conductivity (µS/cm) 431
 Water Temperature (°C) 4.18 Air Temperature (°C) 0
 Time in situ measurements taken 2:30 pm

Watercourse Dimensions & Morphology

Mean Watercourse Width 0.75 (m) Maximum Pool Depth 10 (cm)
 Mean Bankfull Width 8 (m) Mean Water Depth 7 (cm)
 % Riffle 100 % Pool standing water % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability
steep but stable

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)
40 - Ash

Adjacent Land Use

Ag.

Fish Habitat Potential

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

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.

recently cleared channel

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



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Lusby Drain

2-5

WB

Stantec

Project C.P

Project # 160960709

Station # 2-2

Field Staff K.E. + M.F.

Photos Taken 1019-623

Date Nov. 29 2011

GPS Coordinates 17 478226 422896

Time 8:47

Descriptive Location Thompson Line, 1.5 km west of Army Camp Rd.

Water Quality

Dissolved Oxygen (mg/L) 11.82 pH 8.02 Conductivity (µS/cm) 271

Water Temperature (°C) 6.79 Air Temperature (°C) 4°

Weather conditions in previous 24 hrs cold + lots of rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.5 (m) Maximum Pool Depth 30 (cm)

Mean Bankfull Width 3.8 (m) Mean Water Depth 30 (cm)

— % Riffle 50 % Pool 50 % Run — % Flat

Evidence of eroding banks, Comments on bank stability stable + veg

Substrate - Upstream (% cover) turbid, assumed

Bedrock — Silt — Boulder 20 Clay — Cobble —
Muck — Gravel — Marl — Sand 80 Detritus —

Substrate - Downstream (% cover) turbid, assumed

Bedrock — Silt — Boulder — Clay 20 Cobble —
Muck — Gravel — Marl — Sand 80 Detritus —

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants attails Other RCG

Riparian Zone

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

Upstream 50% riparian trees

Downstream 5%

Adjacent Land Use

Upstream Ag fields

Downstream —

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream None

Downstream None

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?

Downstream —

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

rain - has flooded culvert

- incised channel, RCG + attail lined

- straight, min flow.



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Lusby Drain 2-3
WB

Stantec

Project C.P Project # 160960709
Station # 2-3 Field Staff KE + MF
Photos Taken 575-581 Date Nov 28 2011
GPS Coordinates N 4779062 427581 Time 4:00 pm
Descriptive Location Kinnard, 1.6 km south of Ravenswood
+ 750 m east into field

Water Quality

Dissolved Oxygen (mg/L) 12.16 pH 8.0 Conductivity (µS/cm) 1061
Water Temperature (°C) 7.87 Air Temperature (°C) 5
Weather conditions in previous 24 hrs cold & rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 30 (cm)
Mean Bankfull Width 4 (m) Mean Water Depth 30 (cm)
— % Riffle — % Pool 100 % Run — % Flat

Evidence of eroding banks, Comments on bank stability
stable & veg

South proposed crossings north

Substrate - Upstream (% cover) turbid
Bedrock — Silt — Boulder — Clay 40 Cobble —
Muck — Gravel — Marl — Sand 60 Detritus —

Substrate - Downstream (% cover) turbid
Bedrock — Silt — Boulder — Clay 40 Cobble —
Muck — Gravel — Marl — Sand 60 Detritus —

In-water Cover

Cover Types Present (circle): Undercut Banks — Deep Pool — Vascular Plants RCG
Overhanging Vegetation — Woody Debris — Boulder — Other —

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream 30% riparian trees & shrubs
Downstream 20%

Adjacent Land Use

Upstream Ag fields
Downstream —

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
Upstream dry in summer?
Downstream —

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- raised channel, lined with moderate RCG
- riparian trees line embankment
- med. deep, slow flow.



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Lusby Drain

2-2
WB

Stantec

Project C.P
Station # 2-2
Photos Taken 566-570
GPS Coordinates 174779290 422553
Descriptive Location _____

Project # 160960709
Field Staff KE + MF
Date Nov. 28 2011
Time 3:40 pm

Kinnard, 1.5 km south of Ravenswood, 250m east into field

Water Quality

Dissolved Oxygen (mg/L) 11.45 pH 7.95 Conductivity (µS/cm) 555
Water Temperature (°C) 8.42 Air Temperature (°C) 6°
Weather conditions in previous 24 hrs cold + rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 3 (m) Maximum Pool Depth 50 (cm)
Mean Bankfull Width 6 (m) Mean Water Depth 60 (cm)
— % Riffle 30 % Pool 70 % Run — % Flat

Evidence of eroding banks, Comments on bank stability _____

stable + veg

South
farm
crossing
north

Substrate - Upstream (% cover) turbid

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

Substrate - Downstream (% cover) turbid

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

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Vascular Plants RCS
Overhanging Vegetation Woody Debris Boulder Other _____

Riparian Zone

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

Upstream _____
Downstream 100% dec riparian trees line both banks

Adjacent Land Use

Upstream _____
Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream _____

Migratory Obstructions (seasonal, permanent)

Upstream _____
Downstream dry in summer?

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc. possible mudcrat

- incised channel, slow flow, ok amount woody debris
- more RCS obs, less up



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Driftus Drain

1-1
WB

Stantec

Project C.P Project # 160960709
Station # 1-1 Field Staff KE & MF
Photos Taken 582-587 Date Nov. 28 2011
GPS Coordinates 17 4779944 422086 Time 4:15 pm
Descriptive Location Kinnaird, 400 m south of Ravenswood

Water Quality

Dissolved Oxygen (mg/L) 10.55 pH 7.9 Conductivity (µS/cm) 563
Water Temperature (°C) 8.12 Air Temperature (°C) 16°
Weather conditions in previous 24 hrs cold & rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 5 (m) Maximum Pool Depth 60 (cm)
Mean Bankfull Width 10 (m) Mean Water Depth 50 (cm)
— % Riffle 40 % Pool 60 % Run — % Flat

Evidence of eroding banks, Comments on bank stability

Stable & veg

Substrate - Upstream (% cover) turbid

Bedrock — Silt — Boulder 20 Clay — Cobble —
Muck — Gravel — Marl — Sand 80 Detritus —

Substrate - Downstream (% cover) turbid

Bedrock — Silt — Boulder 20 Clay — Cobble —
Muck — Gravel — Marl — Sand 80 Detritus —

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks — Deep Pool — Vascular Plants —
Woody Debris — Boulder — Other —

watercress
RCS & cattails

Riparian Zone

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

Upstream 5% riparian trees
Downstream 0%

Adjacent Land Use

Upstream —
Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream watercress, possible ground water input near culvert

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer ?
Downstream —

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

u/s less incised, more of a shallow valley, some reaches
at braided flow through RCS
d/s watercress near culverts (large patch), some reaches braided
flow through RCS + cattails

mod. flow, slight meander
wider & less entrenched, more of a natural valley.



Stantec Consulting Ltd - Electrofishing Record and Catch Results

Project Name C.P. Station Number 1-1
 Project Number 160960709 Pass No. (if applicable) 1
 Photos 590=id 591=u/s 592=d/s Date (yyyymmdd): 2012 06 06
 Descriptive Location On Kinnaird rd ~ 400 m south of Ravenwood.
 UTM coordinates 477.9944 ~~easting~~ 422086 ~~northing~~ 17T

Fishing Method (circle one): Backpack Boat Unit Model/Make Model ER 12
 Sampling Method (circle one): even habitat transect spot
 Effort (Electrofishing Seconds): 60 Number of Netters: 1 Number of Anodes: 1
 Settings
 Frequency (Hz) 60 Voltage (volts) 700 Current (Amps) ✓ Power (Watts) ✓

Station Information
 Length of Stream Surveyed (m) Row (2.0m u/s + d/s) + in culvert (~9m) Total: 12m.
 Station Characteristics:
 Width (m): Range 0.5 - 0.7 Average: 0.6
 Depth (m): Range 0.1 - 0.15 Average: 0.12
 Water Clarity/Colour: tea Water Velocity if Measured (m/s): _____ Time 10:30
 Temperature (°C) 15.00 Conductivity (uS/cm) 783
 pH 8.34 Dissolved Oxygen (mg/L) 10.41

Species	Number of Fish	Comments (i.e. age, disease, etc):
BRST	/// (3)	
Fathead Mn	// (2)	
Crk chub	/// (3)	
100's of yoy BRST observed. Very close to non participants. Stayed in Row.		

Fish Measurements on Separate Sheet? Y/N
 Field Staff: NB, MF Notes By: MF
 (Station Diagram on Back)



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Buffus Drain

24
WB

Stantec

Project CIP

Project # 160960709

Station # 2-1

Field Staff KE + MF

Photos Taken 618 - 618

Date Nov. 29 2011

GPS Coordinates 17 4778225 423460

Time 8:36

Descriptive Location Champion Ave, 500 m west of

Army Camp

Water Quality

Dissolved Oxygen (mg/L) 11.67 pH 7.97 Conductivity (μ S/cm) 218

Water Temperature ($^{\circ}$ C) 6.57 Air Temperature ($^{\circ}$ C) 4

Weather conditions in previous 24 hrs cold + lots of rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 2.5 (m) Maximum Pool Depth 40 (cm)

Mean Bankfull Width 4 (m) Mean Water Depth 50 (cm)

0 % Riffle 0 % Pool 100 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability

stable + veg

Substrate - Upstream (% cover)

Bedrock 0 Silt 0 Boulder 20 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 80 Detritus 0

turbid assumed

Substrate - Downstream (% cover)

Bedrock 0 Silt 0 Boulder 20 Clay 0 Cobble 0
Muck 0 Gravel 0 Marl 0 Sand 80 Detritus 0

turbid assumed

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks 0 Deep Pool 0 Vascular Plants grass
Woody Debris 0 Boulder 0 Other 0

Riparian Zone

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

Upstream 5%

Downstream 30% riparian trees

Adjacent Land Use

Upstream Ag fields

Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream None

Downstream None

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?

Downstream dry in summer?

Note any fish observations None

Other Habitat Notes, Incidental Wildlife Observations, etc.

- incised, grass lined channel (some RCGs)
- turbid + lots of flow due to significant rain
- straight, fast flows



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Duffus Drain

2-1
WB

Stantec

Project C.P.
Station # 2-1
Photos Taken 571-574
GPS Coordinates 174779278 482570
Descriptive Location

Project # 110960709
Field Staff KE + MF
Date Nov. 28 2011
Time 3:35 pm

Kinnaird Rd, 1.5 km south of Ravenswood
750 m east into field

Water Quality

Dissolved Oxygen (mg/L) 11.24 pH 7.82 Conductivity (µS/cm) 522
Water Temperature (°C) 8.47 Air Temperature (°C) 6°
Weather conditions in previous 24 hrs cold + rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 60 (cm)
Mean Bankfull Width 4 (m) Mean Water Depth 50 (cm)
0 % Riffle 40 % Pool 60 % Run 0 % Flat

Evidence of eroding banks, Comments on bank stability stable + veg

east
from
farm crossing
west

Substrate - Upstream (% cover) turbid

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

Substrate - Downstream (% cover) turbid

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

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Vascular Plants litter RCG
Boulder Other _____

Riparian Zone

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

Upstream 30% riparian trees

Downstream 5% riparian trees

Adjacent Land Use

Upstream _____
Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none
Downstream _____

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?
Downstream _____

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

-incised, straight, turbid channel w/ dec. trees lining the
North bank
-slow flow or pooled water

-channel filled w/ moderate amount of RCG



Stantec Consulting Ltd - Electrofishing Record and Catch Results

Project Name CP Station Number 2-1
 Project Number 160960709 Pass No. (if applicable) 1
 Photos 574=id 575=vs 576=d/s Date (yyyymmdd): 20120606
 Descriptive Location off Kinnaird Rd - 1.5 km South of Ravenswood - 750 m east into field
 UTM coordinates 477.9278 easting 422570 northing 575 zone 17T

Fishing Method (circle one): Backpack Boat Unit Model/Make roper ER 12
 Sampling Method (circle one): even habitat transect spot
 Effort (Electrofishing Seconds): 200 Number of Netters: 1 Number of Anodes: 1
 Settings
 Frequency (Hz) 60 Voltage (volts) 700 Current (Amps) — Power (Watts) —

Station Information
 Length of Stream Surveyed (m) ~90
 Station Characteristics: Width (m): Range 1.75 Average: 1.75
 Depth (m): Range 0.10-0.20 Average: 0.15
 Water Clarity/Colour: tes Water Velocity if Measured (m/s): N/A Time 09:30
 Temperature (°C) 13.82 Conductivity (uS/cm) 906
 pH 8.15 Dissolved Oxygen (mg/L) 10.82

Species	Number of Fish	Comments (i.e. age, disease, etc):
Fathead Mn	1	(1)
Cent Mud Mn	111	(3)
Nth Redbelly dace	1	(1)
Cik chub	####	(24)
BRST	###	(8)
Pumpkinseed	1	(1)
100's of very cyprinidae + BRST observed throughout		
fish photos: 577-582		

Fish Measurements on Separate Sheet? YN
 Field Staff: NB, MF Notes By: MF
 (Station Diagram on Back)



Stantec

WIND FARM WATERBODY RAPID ASSESSMENT FORM

wfB
Duffus Drain 2-7

Station # 2-7
 Watercourse Name Duffus Drain
 Photos 1113-1114
 Date Dec. 3 2012
 Weather conditions in previous 24 hrs rain
 GPS Coordinates (Zone) E N Datum
 Descriptive Location _____

Project Name CIP
 Project # 160960709
 Field Staff KE + NR
 Time 11:35

Water Quality

Dissolved Oxygen (mg/L) 12.69 pH 7.44 Conductivity (µS/cm) 449
 Water Temperature (°C) 7.23 Air Temperature (°C) 5°
 Time *in situ* measurements taken 11:37

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 30 (cm)
 Mean Bankfull Width 5 (m) Mean Water Depth 25 (cm)
 % Riffle _____ % Pool 100 % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability
stable & veg.

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 30 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)
50% Dec. trees line

Adjacent Land Use

Ag.

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
no

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. _____

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



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

Walden Drain 1-3 WB

Stantec

Project C.P Station # 1-3 Photos Taken 1:00-6:05 GPS Coordinates 17 4780879 423504 Descriptive Location Ravens wood, 800 m west of Army Camp Project # 160960709 Field Staff KE + MF Date Nov. 28 2011 Time 4:45 pm

Water Quality

Dissolved Oxygen (mg/L) 11.85 pH 7.88 Conductivity (µS/cm) 811 Water Temperature (°C) 7.91 Air Temperature (°C) 5° Weather conditions in previous 24 hrs cold & rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 2 (m) Maximum Pool Depth 10 (cm) Mean Bankfull Width 4 (m) Mean Water Depth 10 (cm) % Riffle 100% Pool % Run % Flat

Evidence of eroding banks, Comments on bank stability stable & veg

South

Substrate - Upstream (% cover)

Bedrock Silt Boulder Clay Cobble Muck Gravel Marl Sand 100 Detritus

thick w/ cattails

West

Substrate - Downstream (% cover)

Bedrock Silt Boulder Clay Cobble Muck Gravel Marl Sand 100 Detritus

thick w/ cattails

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants cattails Other

Riparian Zone

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

Adjacent Land Use

Upstream Downstream Ag fields

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)

Upstream Downstream dry in summer

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

-incised channel thick w/ cattails -very min. flow, but pooled water



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Mud Creek WB 53-1

Stantec

Station # 53-1

Project Name C.P.

Watercourse Name Mud Crk

Project # 160960709

Photos 619-2a 620-01b 621-d1e

Field Staff NB, MF

Date 2012 06 06

Time 14:27

Weather conditions in previous 24 hrs No precip

GPS Coordinates (Zone) 17T E 0425289 N 4778173 Datum NAD83

Descriptive Location On Thompson Line ~1.2km east of Army Camp Rd.

Water Quality

Dissolved Oxygen (mg/L) 12.14 pH 8.51 Conductivity (µS/cm) 565

Water Temperature (°C) 24.35 Air Temperature (°C) 22°C

Time *in situ* measurements taken 19:30

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 0.30 m (cm)

Mean Bankfull Width 5.0 (m) Mean Water Depth 0.15 m (cm)

10 % Riffle 30 % Pool 40 % Run 20 % Flat

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

Substrate (% cover)

Bedrock 5 Cobble 20 Sand 25 Silt 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)

10% sparse trees

Adjacent Land Use

rd, ag field

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

spawning, foraging, nursery

Migratory Obstructions (seasonal, permanent)

none

Note any fish observations see fish notes

Waterbody Notes

Natural Watercourse Trapezoidal 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 JK



Stantec

Stantec Consulting Ltd - Electrofishing Record and Catch Results

Mud Creek 53-1

Page 1 of 1

Project Name C.P. Station Number 53-1
 Project Number 160960709 Pass No. (if applicable) 1
 Photos 679=1/d/678-sub 679=2/s 680=1/s Date (yyyymmdd): 2010 06 07
 Descriptive Location On Thompson Line - 1.2km east of Army Camp
 UTM coordinates 0425289 easting 4778173 northing zone 17T

Fishing Method (circle one): Backpack Boat _____ Unit Model/Make Model LR 12
 Sampling Method (circle one): even habitat _____ transect _____ spot _____
 Effort (Electrofishing Seconds): 140 Number of Netters: 1 Number of Anodes: 1
 Settings
 Frequency (Hz) 60 Voltage (volts) 900 Current (Amps) _____ Power (Watts) _____

Station Information

Length of Stream Surveyed (m) Row (2.0 m o/s rd/s + under bridge = Total 14m)
 Station Characteristics:
 Width (m): Range 1.0 - 2.0 Average: 1.5
 Depth (m): Range 0.10 - 0.30 Average: 0.15

Water Clarity/Colour: tea Water Velocity if Measured (m/s): N/A Time 15:25
 Temperature (°C) 24.35 Conductivity (uS/cm) 565
 pH 8.51 Dissolved Oxygen (mg/L) 12.14

Catch Data

Species	Number of Fish	Comments (i.e. age, disease, etc):
John Dt	##	
Com Shn	##	
BWHSK	1	
Crk chub	##	
Iowa Dt.	##	
Nth Redbelly Dca	1	
Salmonid sp Rainbow Trout	1	(see pictures)
Fish Photos 681-697		

Fish Measurements on Separate Sheet? Y/N
 Field Staff: NB, MF Notes By: MF
 (Station Diagram on Back)



WIND FARM WATERBODY RAPID ASSESSMENT FORM

WB
53-4
Mud Creek

Stantec

Station # 53-4 Project Name C.P
 Watercourse Name Mud Creek Project # 1009100710
 Photos 1078 u/s 1079 d/s 1090 sub. Field Staff KE & BM
 Date Nov. 29 2012 Time 11:45 AM
 Weather conditions in previous 24 hrs cold
 GPS Coordinates (Zone) 17T E 425048 N 479011 Datum
 Descriptive Location Army Camp Rd, north of Thompson

Water Quality

Dissolved Oxygen (mg/L) 13.47 pH 7.72 Conductivity (µS/cm) 451
 Water Temperature (°C) 2.06 Air Temperature (°C) 0°
 Time in situ measurements taken 12:00 pm

Watercourse Dimensions & Morphology

Flood plain 22m
 Mean Watercourse Width 3 (m) Maximum Pool Depth 7 (cm)
 Mean Bankfull Width 5 (m) Mean Water Depth 5 (cm)
20 % Riffle _____ % Pool _____ % Run 80 % Flat

Evidence of eroding banks, Comments on bank stability
reach of steep, eroding banks & some stumps

Substrate (% cover)

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

In-water Cover

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

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
60% hawthorn, cottonwood, Ash

Adjacent Land Use

Ag & wooded area

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Migratory Obstructions (seasonal, permanent)

permanent

Note any fish observations

yes small bodied 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.

steep bank on east side, 20m flood plain on west side
d/s of station is a gravel cobble silt & approx 7m long
mostly flat over grass, silt detritus

Field Notes Authored by KE

Field Notes QA/QCed by _____



WIND FARM WATERBODY RAPID ASSESSMENT FORM

10th Conc. drain 53-2

WB

Stantec

Station # 53-2 Project Name C?
 Watercourse Name unknown Project # 160960709
 Photos 624-1d 675-0/s 676-d/s Field Staff N.B. MF
 Date 2012 06 07 Time 14:55
 Weather conditions in previous 24 hrs No precip
 GPS Coordinates (Zone) 17T E 0424099 N 4778199 Datum NAD83
 Descriptive Location NE corner of Thompson line + Army Camp Rd

Water Quality

Dissolved Oxygen (mg/L) 8.28 pH 7.90 Conductivity (μ S/cm) 757
 Water Temperature ($^{\circ}$ C) 25.78 Air Temperature ($^{\circ}$ C) 21.0
 Time *in situ* measurements taken 14:55

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 0.10 m (cm)
 Mean Bankfull Width 2.5 (m) Mean Water Depth 0.05 m (cm)
 % Riffle 100 % Pool _____ % Run _____ % Flat _____
 Evidence of eroding banks, Comments on bank stability None.

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)
2% sparse trees, shrubs, grasses
 Adjacent Land Use ag, roads

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
spawning nursery
 Migratory Obstructions (seasonal, permanent)
man dry up, very shallow
 Note any fish observations See fish sheet

Waterbody Notes

Natural Watercourse Trapezoidal 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 JK

No fishing. off rocks

10th cone

53-3
WB



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Stantec

Station # 53-3

Project Name C.P.

Watercourse Name unknown

Project # 160960709

Photos 622=id 623=ul 624=dl

Field Staff NB, MF

Date 2012 06 06

Time 14:38

Weather conditions in previous 24 hrs _____

GPS Coordinates (Zone) 17T E 424090 N 4778636 Datum NAD83

Descriptive Location On Army Camp Rd ~ 600m north of Thompson Line
on east side of rd. (runs parallel)

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 0.10 (m) Maximum Pool Depth 0.03 (cm)
Mean Bankfull Width 2.5 (m) Mean Water Depth 0.03 (cm)
_____ % Riffle 100 % Pool _____ % Run _____ % Flat

Evidence of eroding banks, Comments on bank stability recently dredged

Substrate (% cover)

Bedrock _____ Cobble _____ Sand 35 Silt 5 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)
2% some shrubs

Adjacent Land Use

adj. roads

Fish Habitat Potential

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

Migratory Obstructions (seasonal, permanent)
dry / very shallow, 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. _____

Field Notes Authored by MF

Field Notes QA/QCed by JK



RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

10th Conc. Drain

1-4
WB

Stantec

Project CIP

Project # 160260709

Station # 1-4

Field Staff KE & MF

Photos Taken 607-612

Date Nov. 27 2011

GPS Coordinates 17 4779431 424102

Time 8:20

Descriptive Location Army Camp Rd, 800 m south of Ravenswood line

Water Quality

Dissolved Oxygen (mg/L) 11.58 pH 8.19 Conductivity (µS/cm) 526

Water Temperature (°C) 7.04 Air Temperature (°C) 4°

Weather conditions in previous 24 hrs cold + lots of rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 3.5 (m) Maximum Pool Depth 75 (cm)

Mean Bankfull Width 5 (m) Mean Water Depth 60 (cm)

— % Riffle — % Pool 100 % Run — % Flat

Evidence of eroding banks, Comments on bank stability Shrub vegetation

south

Substrate - Upstream (% cover) turbid assumed

Bedrock — Silt — Boulder 20 Clay — Cobble —
Muck — Gravel — Marl — Sand 80 Detritus —

north

Substrate - Downstream (% cover) turbid assumed

Bedrock — Silt — Boulder 20 Clay — Cobble —
Muck — Gravel — Marl — Sand 80 Detritus —

In-water Cover

Cover Types Present (circle): Overhanging Vegetation Undercut Banks Woody Debris Deep Pool Boulder Vascular Plants Cattails Other —

Riparian Zone

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

Upstream 20% riparian trees

Downstream —

Adjacent Land Use

Upstream Ag fields

Downstream —

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)

Upstream none

Downstream —

Migratory Obstructions (seasonal, permanent)

Upstream dry in summer?

Downstream —

Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

-trenched channel w/ cracks filled w/ cattails
-lots of water due to rain
-turbid + fast flowing



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Mud Creek-1 NWB

53-5

Stantec

Station # 53-5 Project Name C.P
 Watercourse Name _____ Project # 160960709
 Photos 1086, 1087, 1095-1098 Field Staff KE & BM
 Date Nov 29 2012 Time 12:15 pm
 Weather conditions in previous 24 hrs cold
 GPS Coordinates (Zone) 17T E 424961 N 4779005 Datum _____
 Descriptive Location Army Camp Rd, north of Thompson

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 _____ (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)

grassed
 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.

grassy, shale dominated by terrestrial veg
piped / tiled drainage under surface outlets into
 flood plain of Mud Creek

Field Notes Authored by KE

Field Notes QA/QCed by _____



Stantec

Elliott-McBryan Drain

RAPID ASSESSMENT FORM FOR AQUATIC HABITAT

43-1
WB

Project CIP
Station # 43-1
Photos Taken 666-673
GPS Coordinates 17 4776320 92.6101
Descriptive Location Thompson line, 500m east of Jencho

Project # 160960709
Field Staff KE & ME
Date Nov 29 2011
Time 10:45

Water Quality

Dissolved Oxygen (mg/L) 11.85 pH 8.11 Conductivity (µS/cm) 166
Water Temperature (°C) 5.62 Air Temperature (°C) 4°
Weather conditions in previous 24 hrs cold & lots of rain

Watercourse Dimensions & Morphology

Mean Watercourse Width 1.5 (m) Maximum Pool Depth 30 (cm)
Mean Bankfull Width 2 (m) Mean Water Depth 30 (cm)
% Riffle _____ % Pool _____ 100 % Run _____ % Flat _____

Evidence of eroding banks, Comments on bank stability
stable & veg

South

Substrate - Upstream (% cover) turbid, assumed based on banks
Bedrock _____ Silt _____ Boulder 20 Clay _____ Cobble _____
Muck _____ Gravel _____ Marl _____ Sand 80 Detritus _____

North

Substrate - Downstream (% cover) turbid, assumed
Bedrock _____ Silt _____ Boulder 20 Clay _____ Cobble _____
Muck _____ Gravel _____ Marl _____ Sand 80 Detritus _____

In-water Cover

Cover Types Present (circle): Undercut Banks Deep Pool Vascular Plants grasses, cattails
Overhanging Vegetation Woody Debris Boulder Other _____
Red osier + leaves

Riparian Zone

Riparian Cover (% of watercourse shaded, dominant vegetation, mature or early successional)
Upstream _____
Downstream 5% riparian tree

Adjacent Land Use

Upstream _____
Downstream Ag fields

Fish Habitat Potential

Critical Habitat (spawning or nursery areas, groundwater upwellings)
Upstream none
Downstream _____
Migratory Obstructions (seasonal, permanent)
Upstream _____
Downstream dry in summer?
Note any fish observations none

Other Habitat Notes, Incidental Wildlife Observations, etc.

- ups lined w/ terrestrial grasses, some cattails, red osier
but incised channel
- d/s similar to ups

- slow Rost & turbid, close to bankfull



WIND FARM WATERBODY RAPID ASSESSMENT FORM

Elliot McBryan Dain NWRB
84-1

Stantec

Station # 54-1
Watercourse Name _____
Photos 1104-1105
Date Nov 29 2012

Project Name C.P.
Project # 110960709
Field Staff KE + BAN
Time 3 pm

Weather conditions in previous 24 hrs cold
GPS Coordinates (Zone) 17T E 725550 N 4778968 Datum _____
Descriptive Location Jericho Rd, just north of Thompson 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. _____

Field Notes Authored by MG

Field Notes QA/QCed by _____