

AECOM

Stream Morphology (continued)

Substrate (<=>)

- Description**
- Bo - Boulder
 - Co - Cobble
 - Gr - Gravel
 - Sa - Sand
 - Si - Silt
 - Cl - Clay
 - MK - Muck
 - DT - Detritus
 - Other

Cl > Si > Sa

Notes:

Morphological Structure (%)			
Pool	Riffle	Run	Flat
		20	80

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
				10		Overhanging veg = 5%

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

cattail

Canopy Cover (% closed cover):

- 100-90% 30-1%
 90-80% 0%
 80-30%

Types of Cover (% cover)

- Trees 5 Shrubs 5 Man-made structures _____
 Grasses 80 Herbaceous _____ Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions Man-Made
 Natural

Description:

vegetation cattails and shallow narrow flow areas

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

Flat

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

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Page 3 of 4

Other General Comments Regarding the Study Area:

west side channel becomes more narrow + shallow with increased vegetation (cattails) in stream

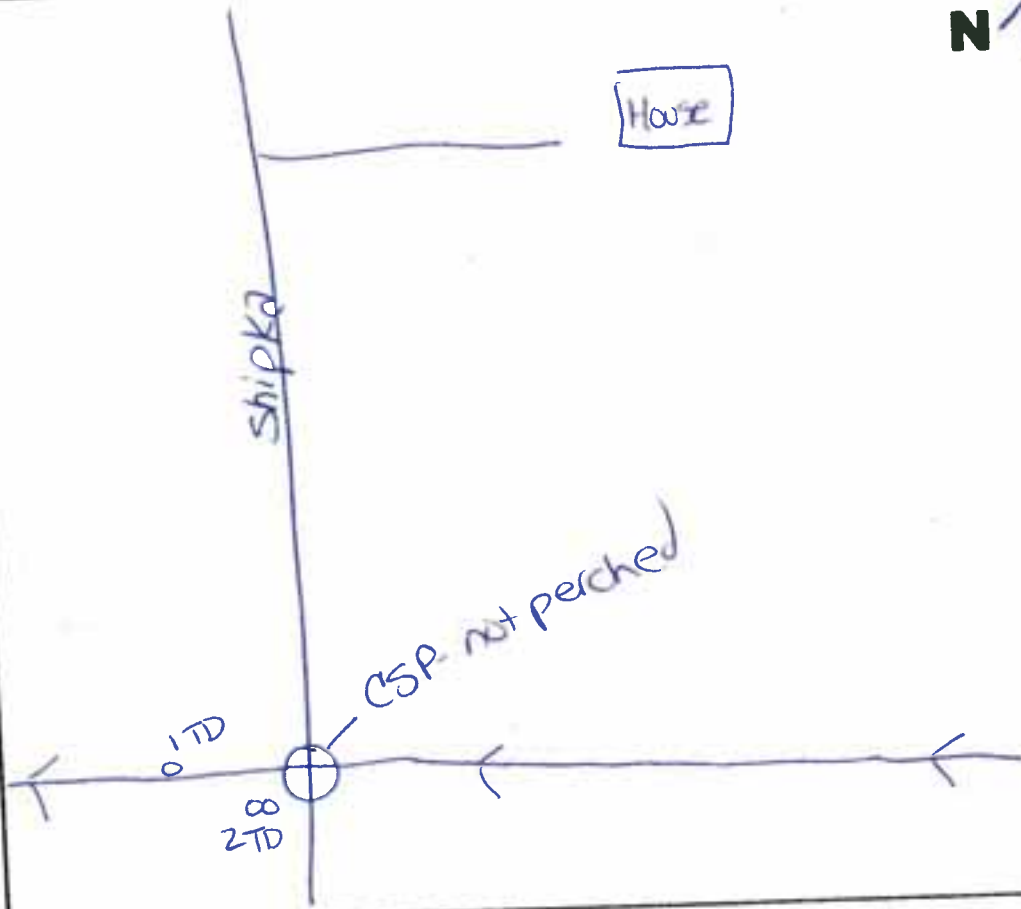
Photo log

Picture #	Description	Picture #	Description
157-159	From road - east		
160-161	From road - west		

AECOM

Watercourse Sketch

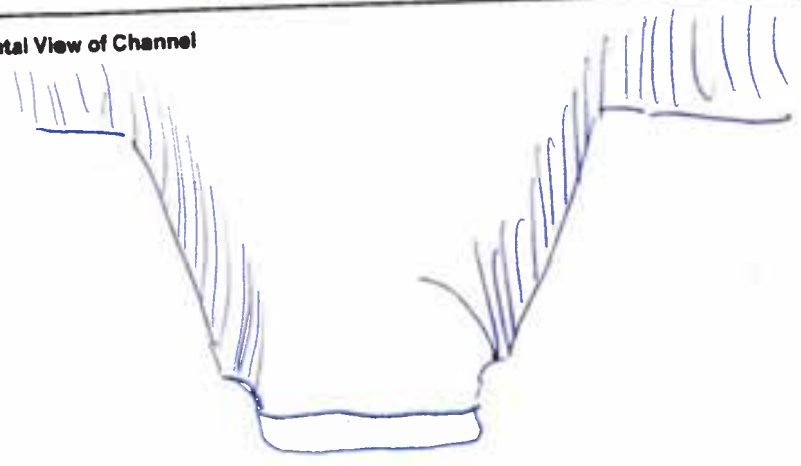
Study Area: Jericho Goshen Bluewater Land Parcel# G541079 Turbine # C63



LEGEND	
10d depth (cm)	0-9 width
→	Riffle
—	Run/Glide
○	Pool
■	Island/Bar
○	Fine Substrate
■	Gravel Substrate
○	Cobble/Boulder
•••	Debris
CT	Cattail
S/V/F/V	Submerg/Float Veg
EV	Emergent
W	Watercress
Fe	Iron Staining
	Eroded Bank
	Riprap / Other Stabilization
—	Instream Log/Tree
▲▲▲	Dam/Wall
●	Riparian Tree
↳	Seep/Spring
—	Undercut Bank
—	Barrier to Fish Movement
⊖	Seasonal Barrier
-x-x-	Fence line
⌊	Culvert

TD = tie drain

Horizontal View of Channel



Downstream more veg in water

AECOM		Page 1 of 4	
		Field Crew: <i>CB, JP</i>	
General Information			
Study Area: Jericho <u>Goshen</u> Bluewater	Land Parcel# <u>101641532</u>	Turbine # <u>605-C64</u>	
Date: <u>Sept 7/11</u>	Start time: <u>10:59</u>	End Time: <u>2:00</u>	
Weather Conditions: <u>Cloudy, 10°C</u>		Field Notes By: <u>CB</u>	
Site Location			
<u>Collection line in G652</u>			
UTM Co-ordinates			
Easting: <u>442026</u>	Northing: <u>4790405</u>	Description: <u>west side of road</u>	
Easting: _____	Northing: _____	Description: _____	
Easting: _____	Northing: _____	Description: _____	
Easting: _____	Northing: _____	Description: _____	
Surrounding Landuse/Pollution Sources		Type of Watercourse	
Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Channelized <input type="checkbox"/>
Agriculture <input checked="" type="checkbox"/>	Wetland <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Natural Channel <input checked="" type="checkbox"/>
Forest <input checked="" type="checkbox"/>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	
Other: _____			
Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow) <u>~25m buffer on south side + ~25m buffer on north side</u>			
In-Situ Water Quality		Ground Water Indicators	
WT (°C): _____	AT(°C): <u>15°C</u>	Watercress <input type="checkbox"/>	Bank Seepage <input type="checkbox"/>
pH: _____	Cond (s/cm): _____	Iron Staining <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Water Clarity: Clear <input checked="" type="checkbox"/> Turbid <input type="checkbox"/>		Bubbling <input type="checkbox"/>	Other <input type="checkbox"/>
Notes: <u>w/g meter not available</u>			
Stream Morphology			
Site Length (m): <u>200m</u>		Bank Stability:	
Channel Dimensions		Stable	Slightly unstable
Mean Wetted Width (m): <u>1.5</u>	Mean Bankfull Width (m): <u>2.5</u>	Moderately unstable	Unstable
Mean Wetted Depth (m): <u>0.25</u>	Mean Bankfull Depth (m): <u>0.5</u>	Left Bank <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
		Right Bank <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Flow Description: <u>moderate flow</u>			
Notes: _____			

Stream Morphology (continued)

Substrate (< = >)

- Description**
 Bo - Boulder
 Co - Cobble
 Gr - Gravel
 Sa - Sand
 Si - Silt
 Cl - Clay
 MK - Muck
 DT - Detritus
 Other

si = cl > ~~sa~~ >> gr, Co

Morphological Structure (%)

Pool	Riffle	Run	Fiat
20	5	25	50

Notes:

some areas of riffle included woody debris and sand substrate

Habitat

Instream Cover (%)

50

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	50		20	30		

***Aquatic Vegetation Types Present (algae, submergent, emergent etc.)**

algae - filamentous, some grasses

Canopy Cover (% closed cover):

- 100-90% 30-1%
 90-60% 0%
 60-30%

Types of Cover (% cover)

- Trees 60 Shurbs 10 Man-made structures _____
 Grasses 10 Herbaceous 20 Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions Man-Made
 Natural

Description:

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

- adjacent lands

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No - JCP completed EIS at the same time

AECOM

Gas - C64

Sep 7/11

Page 3 of 4

Other General Comments Regarding the Study Area:

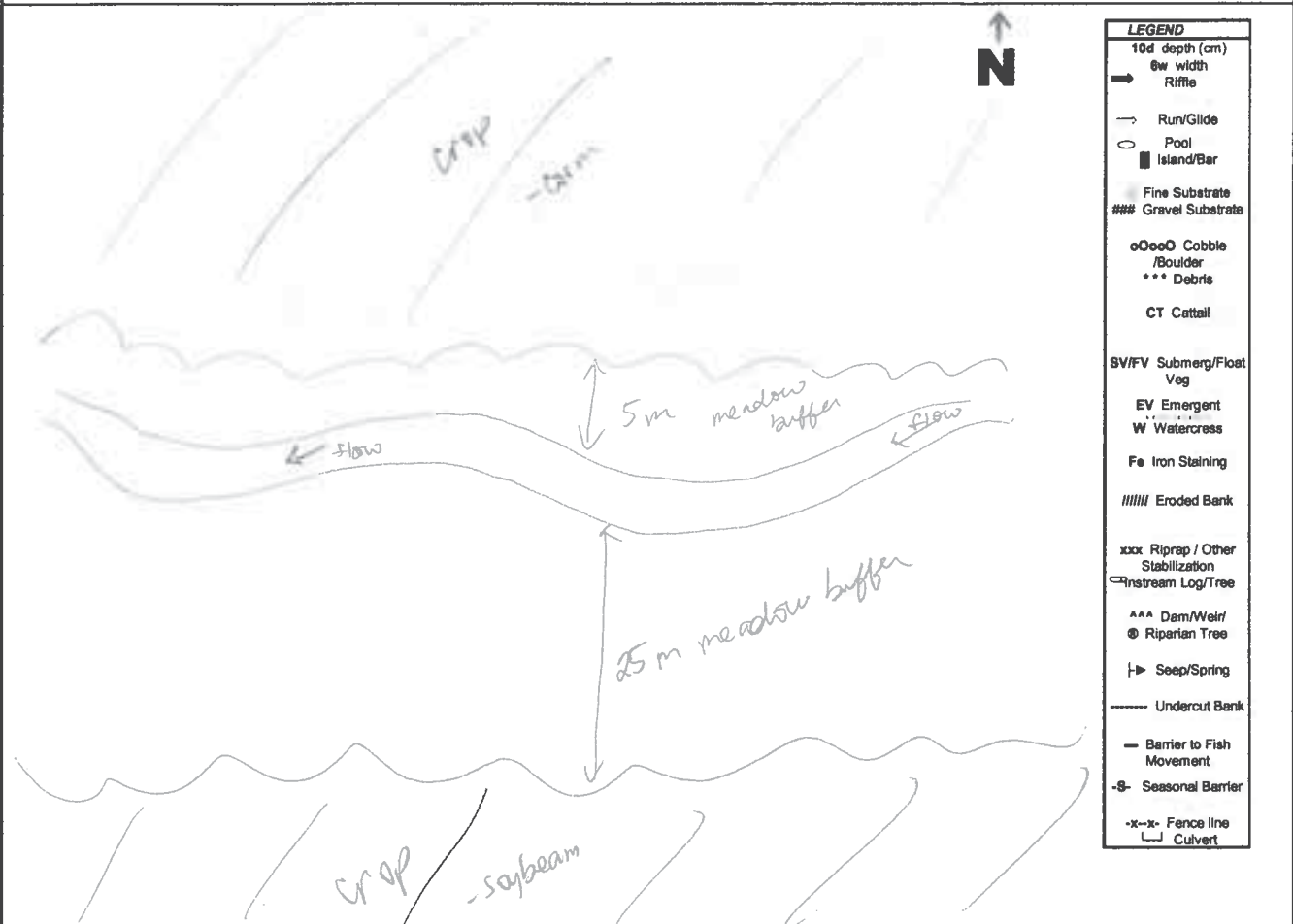
- many fish observed in big pool
- frogs observed.

Photolog

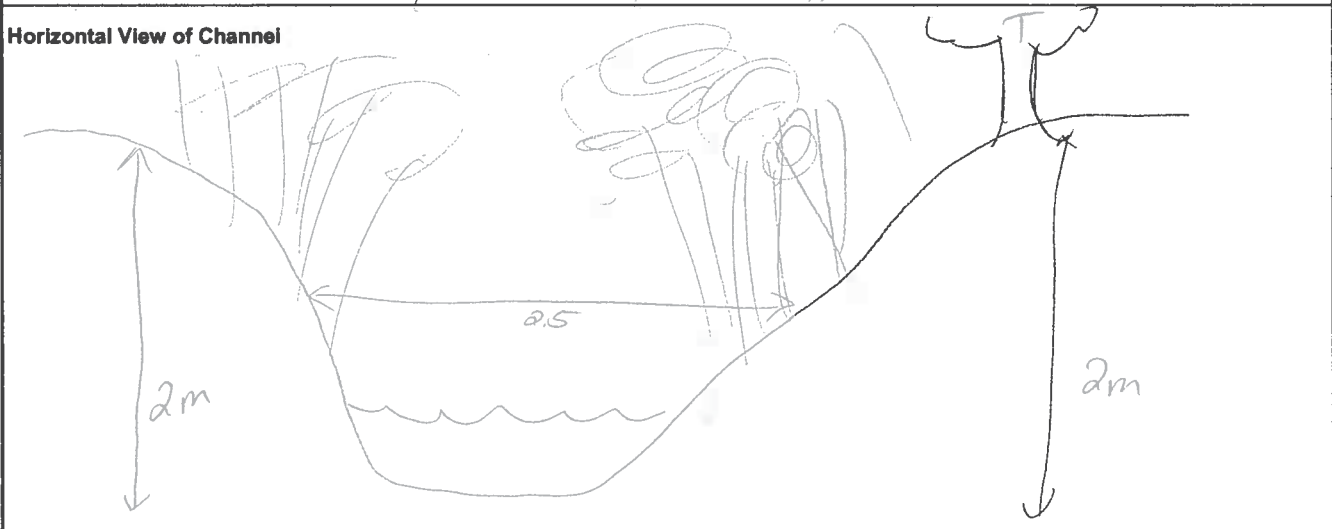
Picture #	Description	Picture #	Description
1	-looking downstream @ west end.		
2	looking up/s @ west end.		
3	substrate		
4	mid-way through site		
5	"		
6	"		
7	large pool where fish were observed.		
8	mid-way through site		
9	looking up/s @ east end.		
10	looking down/s @ east end.		

Watercourse Sketch

Study Area: Jericho Goshen Bluewater Land Parcel# 1016+1532 Turbine # G05-264



Horizontal View of Channel



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Field Crew: SA, TS

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# 2176+1022 Turbine # C666

Date: Nov 17/2011 Start time: 14:09 End Time: 14:45

Weather Conditions: overcast, windy Field Notes By: SA

Site Location

Mollard Line

UTM Co-ordinates

Easting:	Northing:	Description: <u>C666B (End)</u>
Easting:	Northing:	Description:
Easting:	Northing:	Description:
Easting:	Northing:	Description:

Surrounding Landuse/Pollution Sources

Residential Meadow
 Agriculture Wetland
 Forest Livestock

Type of Watercourse

Intermittent Channelized
 Permanent Natural Channel
 Ephemeral

Other:

Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)

In-Situ Water Quality

WT (°C): 4.5°c AT (°C): 1.5°c
 pH: 8.31 Cond (µs/cm): 702
 Water Clarity: Clear Turbid

Ground Water Indicators

Watercress Bank Seepage
 Iron Staining None
 Bubbling Other

Notes:

Stream Morphology

Site Length (m): 400 m

Bank Stability:

Channel Dimensions

Mean Wetted Width (m):	<u>2.10</u>	Mean Bankfull Width (m):	<u>3.10</u>
Mean Wetted Depth (m):	<u>0.33</u>	Mean Bankfull Depth (m):	<u>1.50</u>

	Stable	Slightly unstable	Moderately unstable	Unstable
Left Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Right Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Flow Description: good flow - moderate

Notes:

exposed soils, some slumping, exposed roots
TOBW - 5.0m
TOBH - 3.0m

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Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Cl > Sa = Si & Gr

Morphological Structure (%)

Pool	Riffle	Run	Flat
30	30	30	

Notes:

riffle / pool / run

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	40	/	/	/	10	

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

Canopy Cover (% closed cover):

- 100-90%
- 90-80%
- 60-30%

- 30-1%
- 0%

Types of Cover (% cover)

Trees 40 Shrubs 15
 Grasses 20 Herbaceous 20

Man-made structures _____
 Other _____

Notes:

Obstructions to Fish Passage

No Obstructions
 Natural

Man-Made

Description:

debris dams

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

flat

Terrestrial features Present

Yes

No

Terrestrial Recon Form Filled out

Yes

No

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Other General Comments Regarding the Study Area:

Photo log 76-82			
Picture #	Description	Picture #	Description
76	DIS		

C 66

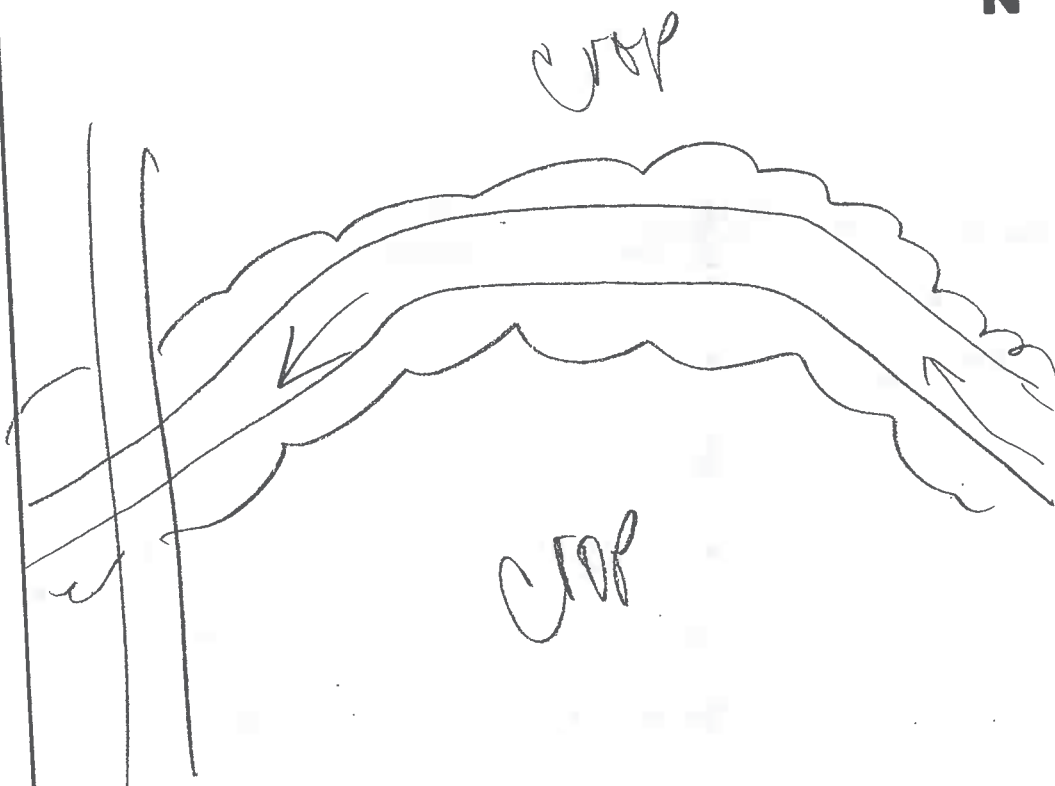
AECOM

Watercourse Sketch

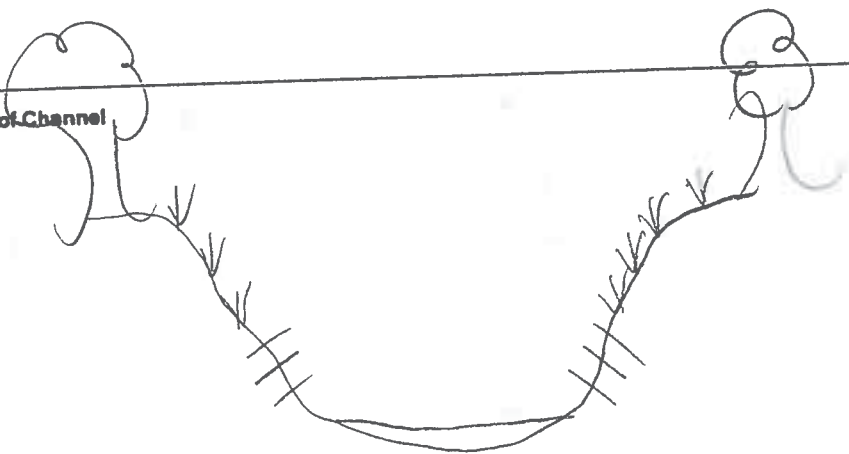
Study Area: Jericho Goshen Bluewater Land Parcel# 2176 + 1022 Turbine # CL66



LEGEND	
100 depth (cm)	
Bar width	
Rifle	
Run/Glide	
Pool	
Island/Bar	
Fine Substrate	
Gravel Substrate	
Cobble/Boulder	
Debris	
Catfall	
Submerg/Float Veg	
Emergent	
Watercress	
Iron Stairing	
Eroded Bank	
Riprap / Other Stabilization	
Instream Log/Tree	
Dam/Weir	
Riparian Tree	
Seep/Spring	
Undercut Bank	
Barrier to Fish Movement	
Seasonal Barrier	
Fence line	
Culvert	



Horizontal View of Channel



AECOM

Field Crew: SA, TS

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# 1020+2176 Turbine # C67
 Date: Nov 17/11 Start time: 13:30 End Time: 13:50

Weather Conditions: overcast, snow Field Notes By: SA

Site Location

West of Mollard line

UTM Co-ordinates

Easting: 438011	Northing: 4790349	Description: C67
Easting: 438160	Northing: 4790329	Description: C67B (crossing)
Easting:	Northing:	Description:
Easting:	Northing:	Description:

Surrounding Landuse/Pollution Sources

Residential Meadow
 Agriculture Wetland
 Forest Livestock

Intermittent Channelized
 Permanent Natural Channel
 Ephemeral

Other:

Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)

tile drains observed

In-Situ Water Quality

WT (°C): 4.6 AT (°C):
 pH: 8.15 Cond (µs/cm): 703
 Water Clarity: Clear Turbid

Ground Water Indicators

Watercress Bank Seepage
 Iron Staining None
 Bubbling Other

Notes: yellow/brown colour. slight sedimentation

Stream Morphology

Site Length (m): 250 m

Bank Stability:

Channel Dimensions

Mean Wetted Width (m):	3.03	Mean Bankfull Width (m):	5.90
Mean Wetted Depth (m):	0.30	Mean Bankfull Depth (m):	0.65

	Stable	Slightly unstable	Moderately unstable	Unstable
Left Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/> ←	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Right Bank	<input type="checkbox"/>	<input checked="" type="checkbox"/> ←	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Flow Description: Evidence of high flows

Notes:

bank scouring observed, exposed tree roots
 TOBH - 2.5 m
 TOBN - 7.0 m

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Stream Morphology (continued)

Substrate (< = >)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Sa > Gr > Cl.

Notes:

Morphological Structure (%)

Pool	Riffle	Run	Flat
15	50	50	

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	30%	0	0	0	5%	

***Aquatic Vegetation Types Present (algae, submergent, emergent etc.)**

large + small woody debris
both downed trees & exposed roots

Canopy Cover (% closed cover):

- 100-90%
- 90-80%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

Trees 70 Shrubs 20 Man-made structures _____
Grasses 10 Herbaceous 10 Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

none observed.

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

relatively flat.

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

C67

AECOM

Page 3 of 4

Other General Comments Regarding the Study Area:

- relatively straight, minor meanders
- channelized, uniform
- poor quality fish habitat
- riparian at TOB ~ 2.0m then agri field

Photo log (61-75)

Picture #	Description	Picture #	Description
61			

C67

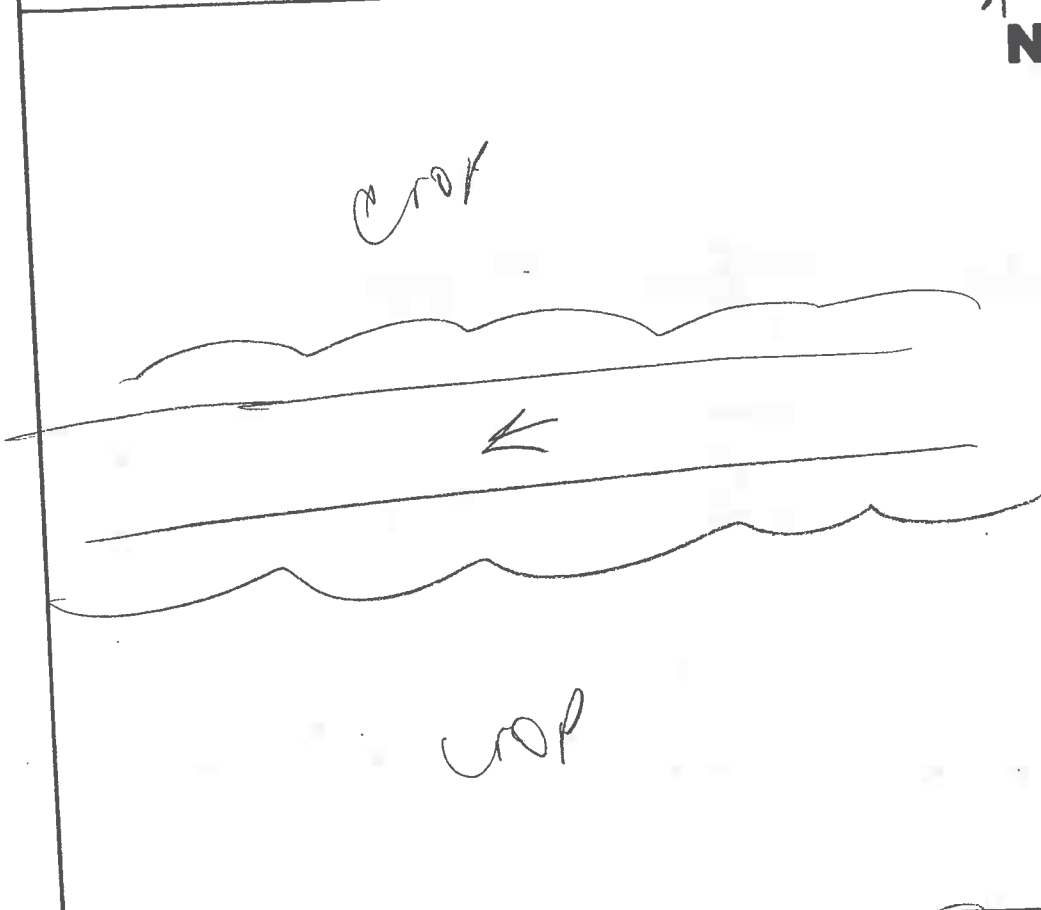
AECOM

Watercourse Sketch

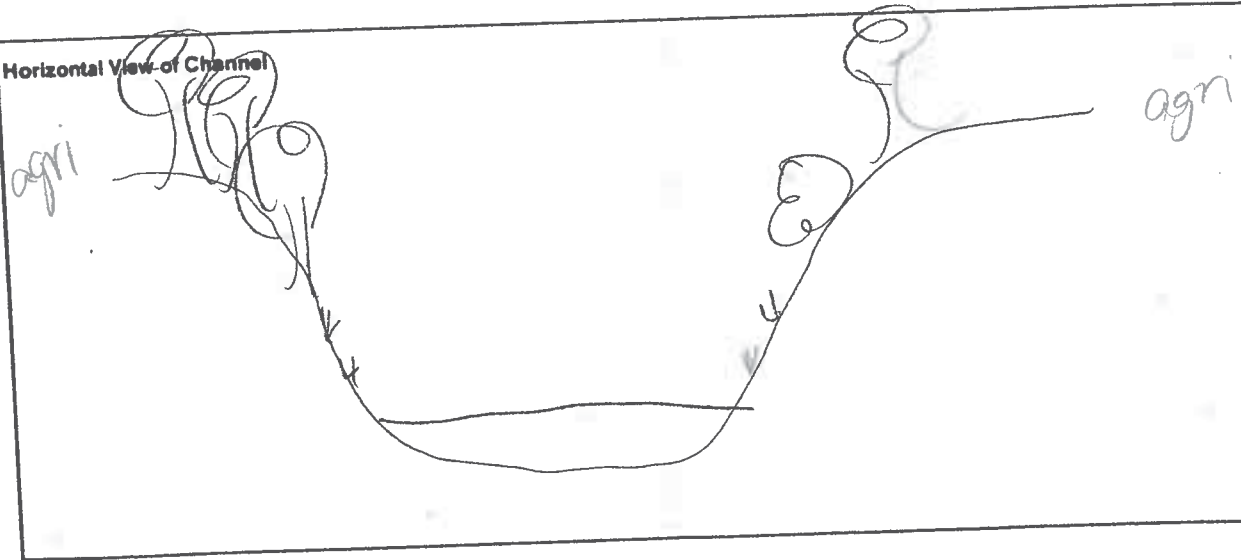
Study Area: Jericho Goshen Bluewater Land Parcel# 1020 + 2176 Turbine # C107



LEGEND	
10d depth (cm)	
8d width	
→	Rife
—	Run/Glide
○	Pool
■	Island/Bar
—	Fine Substrate
—	Gravel Substrate
oOooO	Cobble/Boulder
***	Debris
CT	Cattail
SV/FV	Submerg/Float Veg
EV	Emergent
W	Watercress
Fe	Iron Staining
	Eroded Bank
xxx	Riprap / Other Stabilization
—	Instream Log/Tree
^^^	Dam/Wall
●	Riparian Tree
↳	Seep/Spring
—	Undercut Bank
—	Barrier to Fish Movement
-S-	Seasonal Barrier
-x-x-	Fence line
—	Culvert



Horizontal View of Channel



AECOM

Field Crew: SA, BG

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# 1020 Turbine # 68 C68
 Date: July 14/11 Start time: 2:45 End Time: 10:45

Weather Conditions: Sunny Field Notes By: SA

Site Location

accessed off of Mollard line through wheat field

UTM Co-ordinates

Easting: 438032 Northing: 4789930 Description: Bridge 66
 Easting: Northing: Description:
 Easting: Northing: Description:
 Easting: Northing: Description:

Surrounding Landuse/Pollution Sources

Residential Meadow
 Agriculture Wetland
 Forest Livestock

Type of Watercourse

Intermittent Channelized
 Permanent Natural Channel
 Ephemeral

Other:

Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)

no water at time of assessment
Naturalized channel

In-Situ Water Quality

WT (°C): AT (°C):
 pH: Cond (s/cm):
 Water Clarity: Clear Turbid

Ground Water Indicators

Watercress Bank Seepage
 Iron Staining None
 Bubbling Other

Notes:

no GW indicators observed
no flow/no WT

Stream Morphology

Site Length (m):

Bank Stability:

Channel Dimensions

Mean Wetted Width (m): Mean Bankfull Width (m):
 Mean Wetted Depth (m): 0.5 Mean Bankfull Depth (m): 1.0

Stable Slightly unstable Moderately unstable Unstable
 Left Bank
 Right Bank

Flow Description: no flow

Notes:

Banks steep and well vegetated
channel width ~1.5m wide

Stream Morphology (continued)

Substrate (<=>)

- Description**
- Bo - Boulder
 - Co - Cobble
 - Gr - Gravel
 - Sa - Sand
 - Si - Silt
 - Cl - Clay
 - MK - Muck
 - DT - Detritus
 - Other

Morphological Structure (%)			
Pool	Riffle	Run	Flat
✓			

Notes:

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	50			50		

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

- Trees 25
- Grasses 25
- Shurbs 30
- Herbaceous 25
- Man-made structures _____
- Other _____

Notes:

~~100%~~ 50% open
50% covered

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

low flow barrier

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

flat

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

Other General Comments Regarding the Study Area:

dry agri channel
overgrown

Photolog

Picture #	Description	Picture #	Description
18	facing N/S Cattail Channel		
19	facing N/S Cattail Channel		
20	overview facing W		
21	overview facing E		
22	facing N/S		
23	view of Channel		
24	dry Channel		
25	dry Channel		

July 14/11

AECOM

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Watercourse Sketch

Study Area:

Jericho

Goshen

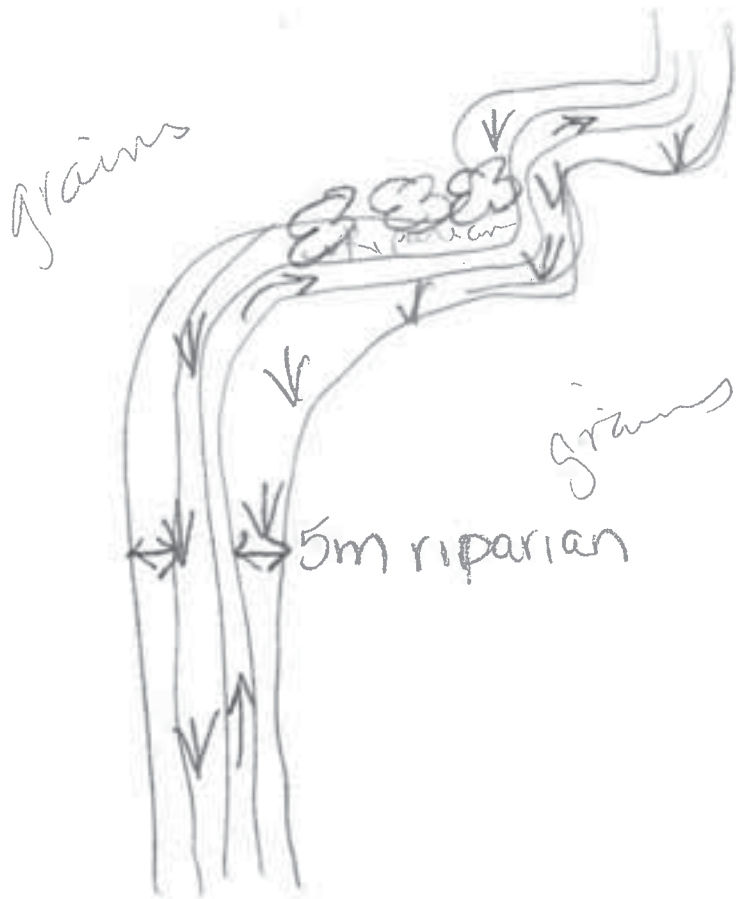
Bluewater Land Parcel#

1020

Turbine #

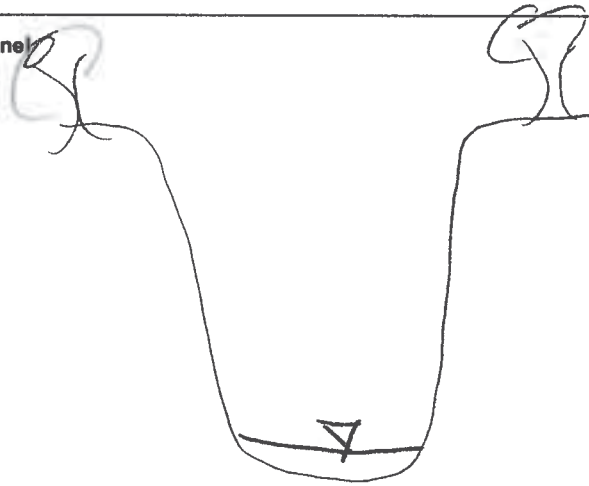
~~1020~~

C68



LEGEND	
10d depth (cm)	→
8w width	→
Riffle	→
Run/Glide	→
Pool	○
Island/Bar	■
Fine Substrate	..
Gravel Substrate	##
Cobble/Boulder	oOoO
Debris	***
Cattail	CT
Submerg/Float Veg	SV/FV
Emergent	EV
Watercress	W
Iron Staining	Fe
Eroded Bank	
Riprap / Other Stabilization	xxx
Instream Log/Tree	☐
Dam/Weir	AAA
Riparian Tree	⊗
Seep/Spring	↳
Undercut Bank	---
Barrier to Fish Movement	-
Seasonal Barrier	-S-
Fence line	-x-x-
Culvert	┌

Horizontal View of Channel



Water Bodies Assessment Field Collection Form

C68
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AECOM

General Information

Study Area: Jericho Goshen Bluewater Land Parcel: SH 1020 Site ID: 210
 Date: Apr 26/2012 Start time: 4:43 PM End Time: 4:50 PM
 Weather Conditions: sunny, windy 10°C Field Crew: S. LOHNES & AITKEN
 Field Notes By: S. LOHNES

Site Location

South road & Mollard line

UTM Co-ordinates (continue on page 3 if necessary) none taken

Eastings:	Northing:	Description:
Eastings:	Northing:	Description:
Eastings:	Northing:	Description:
Eastings:	Northing:	Description:

Surrounding Landuse

Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>
Agriculture <input checked="" type="checkbox"/>	Wetland <input type="checkbox"/>
Forest <input type="checkbox"/>	Livestock <input type="checkbox"/>
Other <input type="checkbox"/>	

Description: row crops

Type of Watercourse

Intermittent <input checked="" type="checkbox"/>	Channelized <input checked="" type="checkbox"/>
Permanent <input type="checkbox"/>	Natural Channel <input type="checkbox"/>
Ephemeral <input type="checkbox"/>	

Description: no flow under road
Cattail choked.

Notes: (Include any inputs into the system i.e. tile drainage, seepages, overland flow)

road drainage, outputs from drain

Is any portion of the water body underground or not as mapped? Y / (N)
 If Yes describe:

GPS Coordinate: Easting - Northing - Description -

Description of Land Topography Surrounding Water Body (rolling hills, sloping towards water body)

flat

In-Situ Water Quality

WT (°C):	AT (°C):
pH:	Cond (s/cm):
D.O. (mg/L)	
Water Clarity: Clear <input checked="" type="checkbox"/> Turbid <input type="checkbox"/>	

Water Colour: colourless - stagnant
in areas

Notes: - NO WQ Taken -
shallow stagnant water

Ground Water and Seepage Indicators

Watercress <input checked="" type="checkbox"/>	Bank Seepage <input type="checkbox"/>
Iron Staining <input type="checkbox"/>	None <input type="checkbox"/>
Bubbling <input type="checkbox"/>	
Other <input type="checkbox"/>	

Details:

Water Bodies Assessment Field Collection Form

Stream Morphology																		
Site Length (m): 500m		Bank Stability:																
Channel Dimensions		<table style="width:100%; text-align: center;"> <tr> <td></td> <td>Stable</td> <td>Slightly unstable</td> <td>Moderately unstable</td> <td>Unstable</td> </tr> <tr> <td>Left Bank</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Right Bank</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>			Stable	Slightly unstable	Moderately unstable	Unstable	Left Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Right Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Stable	Slightly unstable	Moderately unstable	Unstable														
Left Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>														
Right Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>														
Mean Wetted Width (m): 0.8	Mean Wetted Depth (m): 0.1	Description: red-osier dogwood, grasses																
Mean Bankfull Width (m): 1.0	Mean Bankfull Depth (m): 0.2																	
Mean Top of Bank Width (m): 2.5	Mean Top of Bank Depth (m): 1.5																	
Flow Description: (high or low flow conditions, stagnant, etc) very low gradient (flat) - no flow																		
Substrate (<=>)		Habitat																
Bo - Boulder Co - Cobble Gr - Gravel Sa - Sand Si - Silt Cl - Clay MK - Muck DT - Detritus	Description Sa = Si	<table border="1" style="width:100%; text-align: center;"> <tr><th colspan="4">Morphological Structure (%)</th></tr> <tr><th>Pool</th><th>Riffle</th><th>Run</th><th>Flat</th></tr> <tr><td></td><td></td><td></td><td>100</td></tr> </table>		Morphological Structure (%)				Pool	Riffle	Run	Flat				100			
Morphological Structure (%)																		
Pool	Riffle	Run	Flat															
			100															
		Notes: no flow past Mollard isolated pools w/ fish obs.																
Instream Cover (%)																		
Other	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	None	Undercut Banks												
				CT DS		Average Depth: (% Cover)												
Note: Low = 0 - 30%; Moderate = 30 - 75%; High = 75 - 100%																		
*Aquatic Vegetation Species Present (algae, submergent, emergent etc.) cattails, emergent veg																		
Canopy Cover (% closed cover):				Types of Cover (% cover)														
100-90%	<input type="checkbox"/>	30-1%	<input checked="" type="checkbox"/>	Trees	Shrubs 50	Man-made structures												
90-60%	<input type="checkbox"/>	0%	<input type="checkbox"/>	Grasses	Herbaceous 50	Other												
60-30%	<input type="checkbox"/>																	
Note: Low = 0 - 30%; Moderate = 30 - 60%; High = 60 - 100%																		
Notes: (vegetation species, types of structures) cattails, some dogwood + willow																		
Riparian Vegetation																		
Width of riparian vegetation: ~5m.																		
Description of vegetation community surrounding 30 m from watercourse: agricultural cropland.																		
Obstructions to Fish Passage																		
No Obstructions	<input type="checkbox"/>	Man-Made	<input type="checkbox"/>	Natural	<input type="checkbox"/>	Low Flow Barrier <input checked="" type="checkbox"/>												
Description of Barrier: v. low flow - none through culverts.																		
Height of Barrier (m)			GPS Coordinates:															

C68

AECOM

Date: Apr 26, 2012

Land Parcel/Site ID: 1000 ~~1000~~ Page 3 of 4

Other General Comments Regarding the Study Area:

- fish observed - cyprinids
- intermittent channel - choked w/ cattail in reaches closest to the road.
- mats of emergent vegetation
- appears to be tile drain fed, no connectivity to other channels

Additional UTM Coordinates:

Photo log

Picture #	Description	Picture #	Description
1	Sheet		
2	Mollard roadside ditch		
3	looking d/s		
4	cattail choked channel		
5	looking u/s.		
6	looking d/s.		
7	emergent veg.		
8	open channel hab		
9	grasses, riparian shrub		
10	looking u/s dogwood/willow		

Water Bodies Assessment Field Collection Form

AECOM

Page 4 of 4

Watercourse Sketch

Study Area:

Jericho

Goshen

Bluewater

Land Parcel#

1020

Site ID

D10 - C68

N

LEGEND

- 10d depth (cm)
- Øw width
- Rifle
- Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- ## Gravel Substrate
- oOoo Cobble/Boulder
- *** Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- ///// Eroded Bank
- xxx Riprap / Other Stabilization
- Instream Log/Tree
- AAA Dam/Weir Obstruction
- ⊙ Riparian Tree
- ↳ Seep/Spring
- Undercut Bank
- Barrier to Fish Movement
- B- Seasonal Barrier
- x-x- Fence line
- Culvert

GSH 2175

GSH 1020

Corn

Corn

farm access road (South Rd)

fish observed (isolated pools)

roadside ditch (dry)

Mollard

Horizontal View of Channel



Initial QA/QC By: L Bentley

Date: May 4, 2012

Technical QA/QC By: J. J. J.

Date: Aug 2nd 2012

C73

AECOM		Page 1 of 4	
		Field Crew: SA, RG	
General Information			
Study Area:	Jericho <u>Goshén</u> Bluewater	Land Parcel#	2174
Date:	July 13/2011	Start time:	13:15
		End Time:	13:50
Weather Conditions:	Sunny, Breezy	Field Notes By:	SA
Site Location			
West of Mollard Road			
UTM Co-ordinates			
Easting:	_____	Northing:	_____
Description:	GPS not working		
Easting:	_____	Northing:	_____
Description:	_____		
Easting:	_____	Northing:	_____
Description:	_____		
Easting:	_____	Northing:	_____
Description:	_____		
Surrounding Landuse/Pollution Sources		Type of Watercourse	
Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	Channelized <input checked="" type="checkbox"/>
Agriculture <input checked="" type="checkbox"/>	Wetland <input type="checkbox"/>	Permanent <input type="checkbox"/>	Natural Channel <input checked="" type="checkbox"/>
Forest <input type="checkbox"/>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	
Other: _____			
Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)			
appears to be an agricultural drain that receives runoff from adjacent fields - dry at time of investigation. Lower half had cattails			
In-Situ Water Quality		Ground Water Indicators	
WT (°C): _____	AT (°C): _____	Watercress <input type="checkbox"/>	Bank Seepage <input type="checkbox"/>
pH: _____	Cond (s/cm): _____	Iron Staining <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Water Clarity: Clear <input type="checkbox"/>	Turbid <input type="checkbox"/>	Bubbling <input type="checkbox"/>	Other <input type="checkbox"/>
Notes:			
Stream Morphology			
Site Length (m): _____		Bank Stability:	
		Stable	Slightly unstable
		Moderately unstable	Unstable
Channel Dimenions			
Mean Wetted Width (m): _____	Mean Bankfull Width (m): 1.50	Left Bank <input checked="" type="checkbox"/>	<input type="checkbox"/>
Mean Wetted Depth (m): _____	Mean Bankfull Depth (m): 0.50	Right Bank <input checked="" type="checkbox"/>	<input type="checkbox"/>
Flow Description: no flow			
Notes:			
~ channel width 1.0 meter steep well vegetated banks			

Stream Morphology (continued)

Substrate (< = >)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Sa = Si

Notes:

none.

Morphological Structure (%)

Pool	Riffle	Run	Flat

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
				100		

***Aquatic Vegetation Types Present (algae, submergent, emergent etc.)**

Cattails

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

Trees 5 Shrubs 15 Man-made structures _____
 Grasses 30 Herbaceous 15 Other _____

Notes: consists of poplars, dogwoods, teasels, goldenrods

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

none observed
no flow

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

fields is very flat

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

C73

AECOM

July 13 / 2011

~~SPW14~~ GL 67 Page 3 of 4

Other General Comments Regarding the Study Area:

- very straight naturalize channelized feature
- choked to upland veg at beginning transitioning to cattails

Photolog		Photolog	
Picture #	Description	Picture #	Description
1292	overview		
1293	view channel		
1294	dry channel		
1295	cattails		
1296	cattails no water		
1297	tree cover - no water potholes		

Watercourse Sketch

Study Area:

Jericho

Goshen

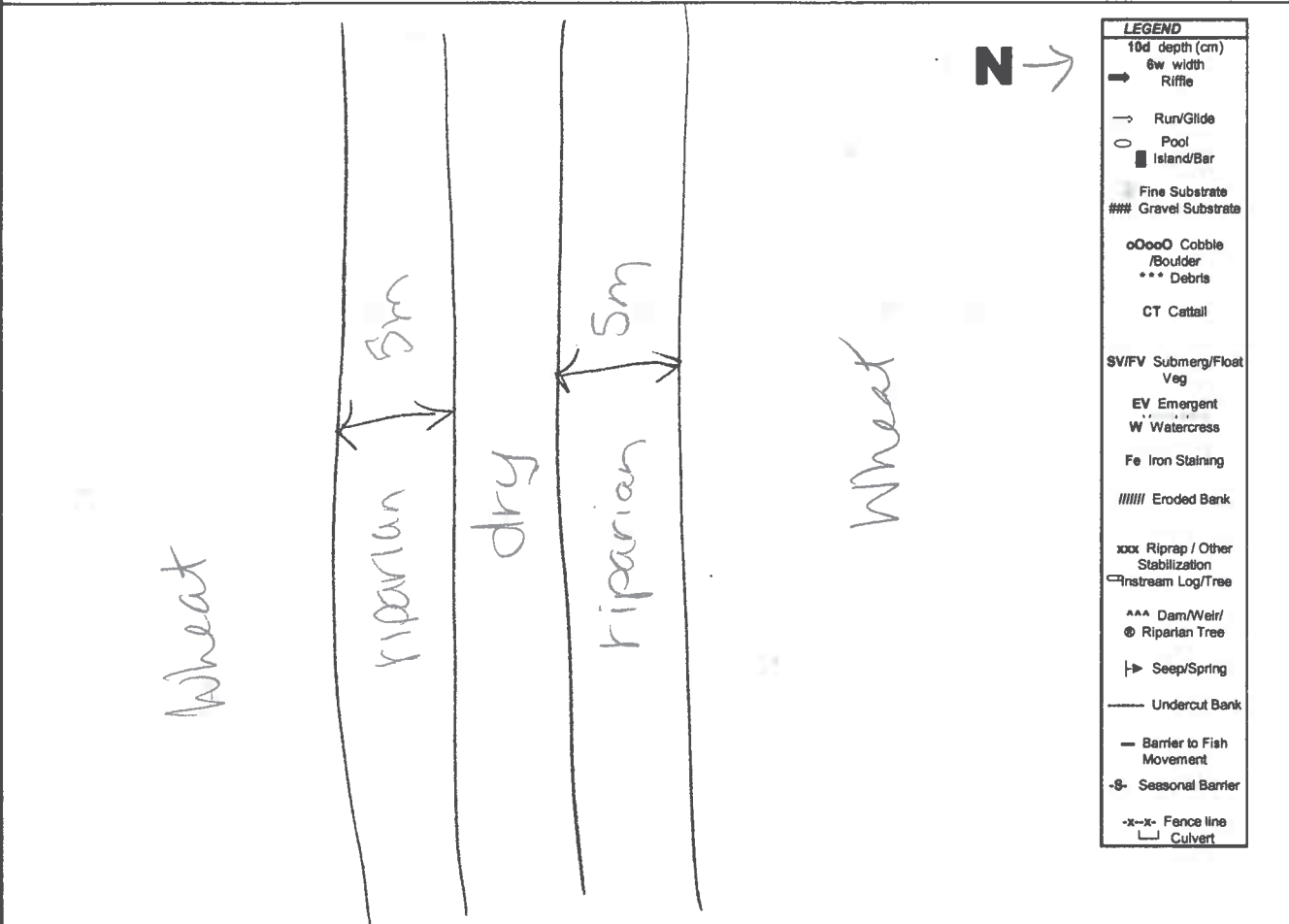
Bluewater Land Parcel#

2174

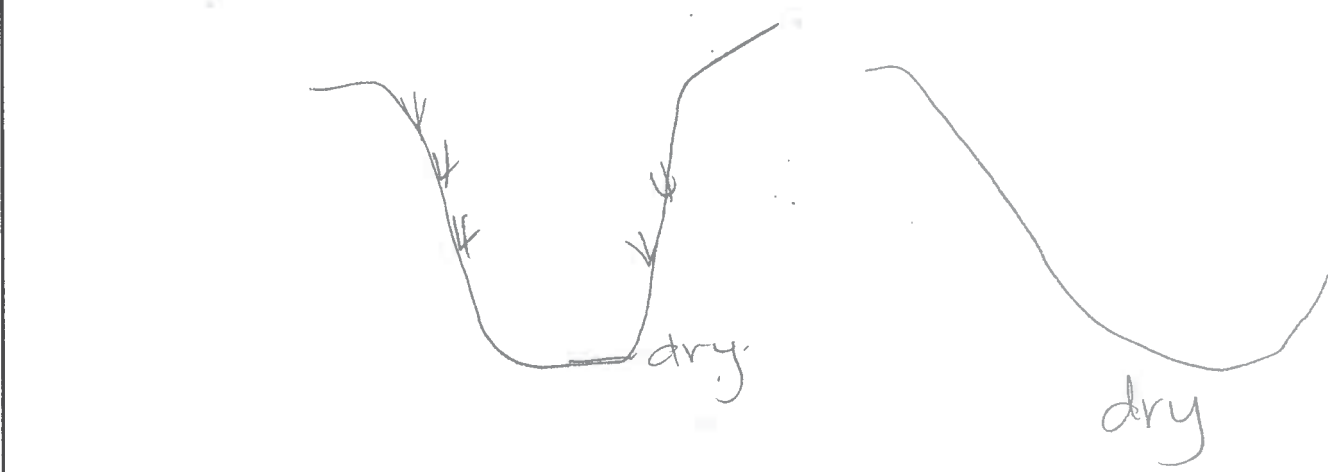
Turbine #

~~SMN 444 + 6162~~

C78



Horizontal View of Channel



AECOM

Field Crew: SA, Blon

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# 1068 Turbine # GE69-SMN 45
 Date: July 31 2011 Start time: 14:00 End Time: 14:25

C74

Weather Conditions: Sunny, very windy Field Notes By: SA

Site Location

West of Mollard Rd.

UTM Co-ordinates

Easting: 437085 Northing: 4788793 Description:
 Easting: Northing: Description:
 Easting: Northing: Description:
 Easting: Northing: Description:

Surrounding Landuse/Pollution Sources

Residential Meadow
 Agriculture Wetland
 Forest Livestock

Type of Watercourse

Intermittent Channelized
 Permanent Natural Channel
 Ephemeral

Other:

Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)

dry channel

In-Situ Water Quality

WT (°C): AT (°C):
 pH: Cond (s/cm):
 Water Clarity: Clear Turbid

Ground Water Indicators

Watercress Bank Seepage
 Iron Staining None
 Bubbling Other

Notes:

no water
no WQ

Stream Morphology

Site Length (m): Bank Stability:

Channel Dimensions				Stable	Slightly unstable	Moderately unstable	Unstable
Mean Wetted Width (m):	<u>/</u>	Mean Bankfull Width (m):	<u>1.50</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mean Wetted Depth (m):	<u>/</u>	Mean Bankfull Depth (m):	<u>0.60</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Left Bank Right Bank

Flow Description:

no flow

Notes:

Stream Morphology (continued)

Substrate (< = >)

- Description**
 Bo - Boulder
 Co - Cobble
 Gr - Gravel
 Sa - Sand
 Si - Silt
 Cl - Clay
 MK - Muck
 DT - Detritus
 Other

Si = Sa

Notes:

Morphological Structure (%)

Pool	Riffle	Run	Flat

none

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	40			30%		

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

Canopy Cover (% closed cover):

- 100-90% 30-1%
 90-60% 0%
 60-30%

Types of Cover (% cover)

Trees 5 Shurbs 5 Man-made structures _____
 Grasses 30 Herbaceous 30 Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions Man-Made
 Natural

Description:

low flow

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

flat

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

Other General Comments Regarding the Study Area:

Willow trees
 100% cover
 substrate Sand + silt was wet- when stepped in

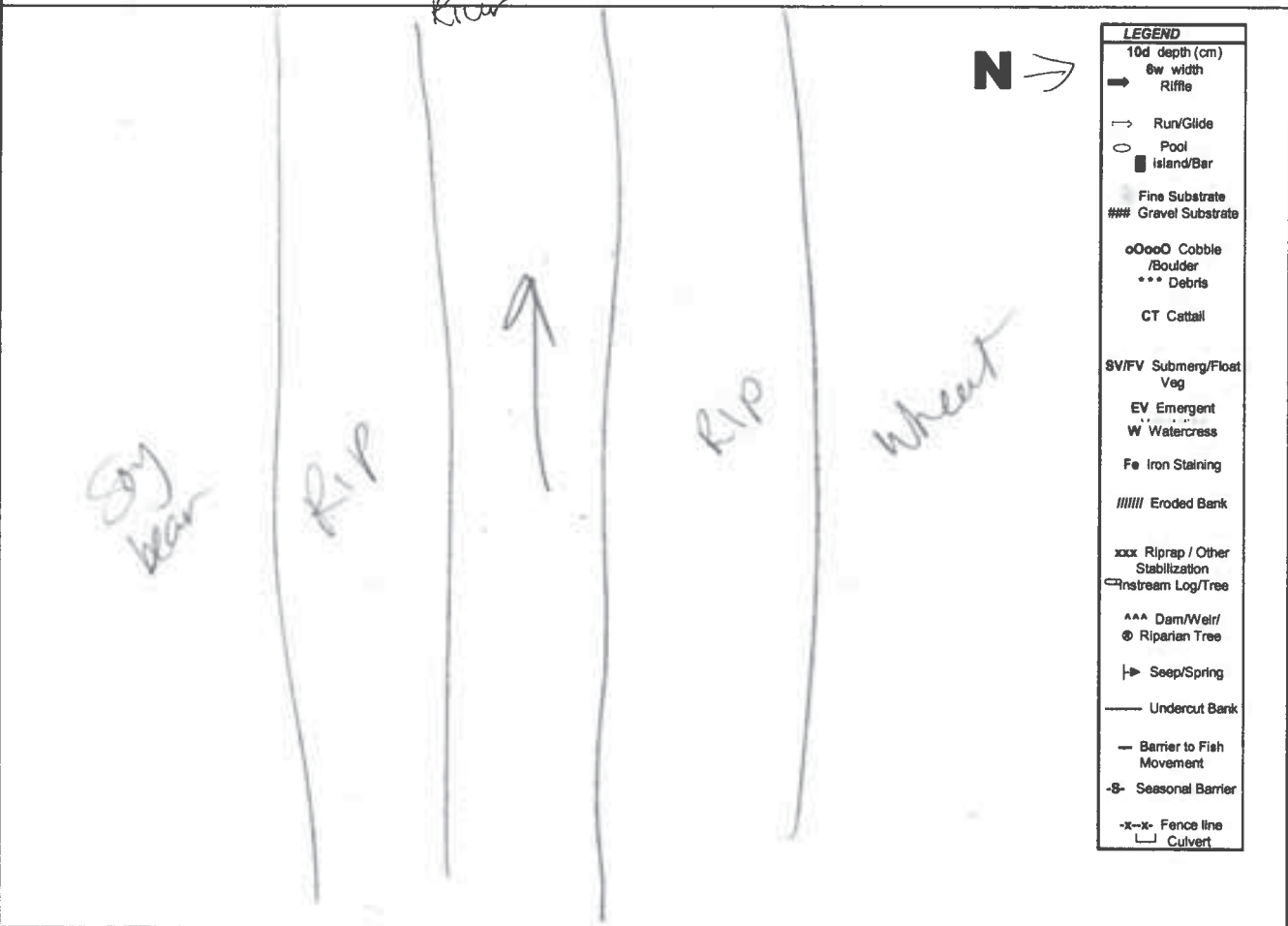
Photolog

Picture #	Description	Picture #	Description
302	overview pic		
303	overview		
304	facing o/s		
305	facing u/s		

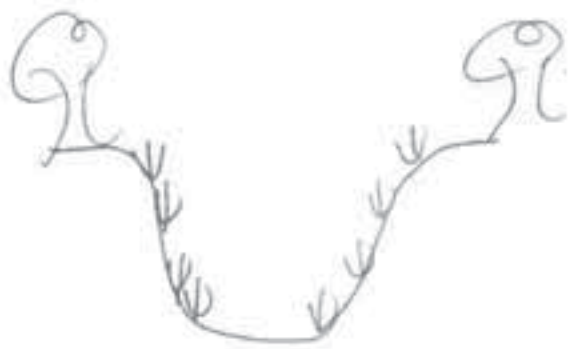
Watercourse Sketch

Study Area: Jericho Goshen Bluewater Land Parcel# 1068 Turbine # ~~1068-1069~~

C74



Horizontal View of Channel



AECOM

Field Crew: SA, BG

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# 1068 Turbine # ~~1068~~ C75

UTM Co-ordinates: Easting: _____ Northing: _____

Date: July 13/2011 Start time: 14:00 End Time: 14:25

Weather Conditions: sunny
very windy Field Notes By: SA

Site Location

west from Mollard Rd

Surrounding Landuse/Pollution Sources

Residential
Agriculture
Forest Meadow
Wetland

Type of Watercourse

Intermittent
Permanent
Ephemeral Channelized
Natural Channel

Notes: (Include any inputs into the system i.e. tile drainage, seepages, overland flow)

agri ditch

In-Situ Water Quality

yellow-brown colour
WT (°C) 20.9°C AT (°C) _____
pH 8.35 Cond (us/cm) 0.66
Water Clarity: Clear
Turbid

Ground Water Indicators

Watercress Bubbling None
Iron Staining Bank Seepage Other

Notes: WC was present further downstream

Stream Morphology

Site Length (m): _____

Bank Stability:

Channel Dimensions

Mean Wetted Width (m):	<u>1.5</u>	Mean Bankfull Width (m):	<u>2</u>
Mean Wetted Depth (m):	<u>0.20</u>	Mean Bankfull Depth (m):	<u>0.7</u>

	Stable	Slightly unstable	Moderately unstable	Unstable
Left Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Notes: well vegetated steep banks
deciduous trees

Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- Other

Description

Detritus
silt

Morphological Structure (%)

Pool	Riffle	Run	Flat
			<u>red</u>

Notes:

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	30			15		

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

Canopy Cover (% closed cover):

100-90%	<input type="checkbox"/>	30-1%	<input type="checkbox"/>
90-60%	<input checked="" type="checkbox"/>	0%	<input type="checkbox"/>
60-30%	<input checked="" type="checkbox"/>		

Types of Cover (% cover)

Trees	20	Shurbs	20	Man-made structures	
Grasses	30	Herbaceous	30	Other	

Notes:

Obstructions to Fish Passage

No Obstructions	<input type="checkbox"/>	Man-Made	<input type="checkbox"/>
Natural	<input type="checkbox"/>		

Description: none observed
low flow barrier

Drainage Features within Study Area

Observations of Land Topography:

flat.

Terrestrial features present:

Yes

No

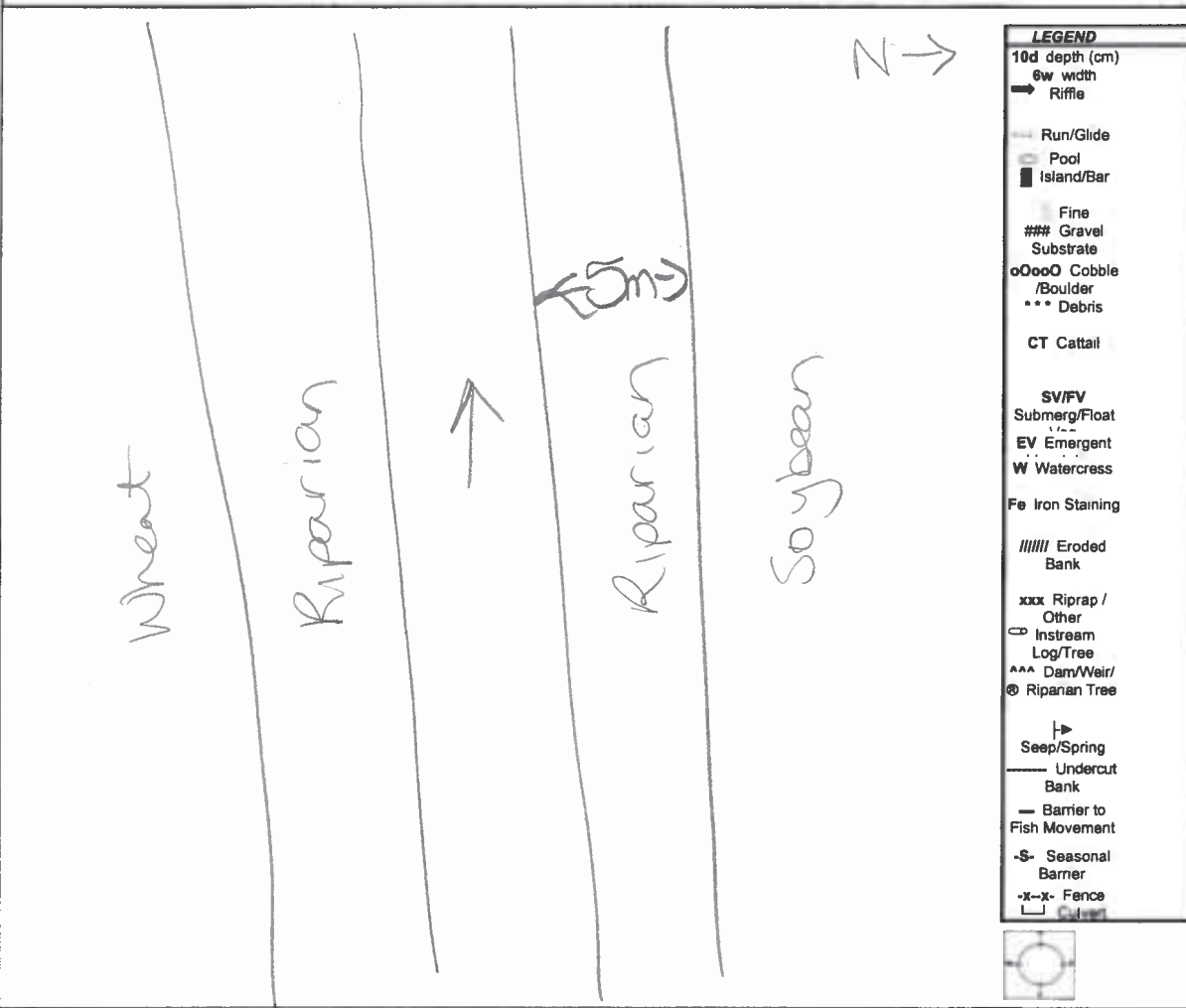
Other Comments:

Photolog

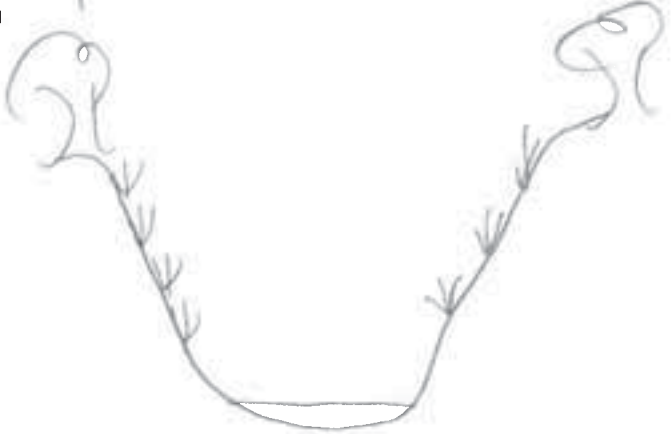
Picture #	Description	Picture #	Description

Watercourse Sketch

Study Area: Jericho Coshen Bluewater Land Parcel# 1068 Turbine # ~~1068~~ C74 C75



Horizontal View of Channel



075

AECOM		Page 1 of 4																
		Field Crew: SA, BG																
General Information																		
Study Area: Jericho <u>Goshen</u> Bluewater	Land Parcel#: 1068	Turbine # 5-10-SMITH																
Date: July 13/2011	Start time: 14:35	End Time: 14:45																
Weather Conditions: Sunny Very windy		Field Notes By: SA																
Site Location																		
West from Mollard Rd																		
UTM Co-ordinates																		
Easting: 0437034	Northing: 4788596	Description: 600270																
Easting:	Northing:	Description:																
Easting:	Northing:	Description:																
Easting:	Northing:	Description:																
Surrounding Landuse/Pollution Sources		Type of Watercourse																
Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Channelized <input checked="" type="checkbox"/>															
Agriculture <input checked="" type="checkbox"/>	Wetland <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Natural Channel <input checked="" type="checkbox"/>															
Forest <input type="checkbox"/>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>																
Other:																		
Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow) water in channel																		
In-Situ Water Quality		Ground Water Indicators																
WT (°C):	AT (°C):	Watercress <input type="checkbox"/>	Bank Seepage <input type="checkbox"/>															
pH:	Cond (s/cm):	Iron Staining <input type="checkbox"/>	None <input type="checkbox"/>															
Water Clarity: Clear <input type="checkbox"/>	Turbid <input type="checkbox"/>	Bubbling <input type="checkbox"/>	Other <input type="checkbox"/>															
Notes: maybe watercress in channel																		
Stream Morphology																		
Site Length (m):		Bank Stability:																
Channel Dimensions		<table style="width:100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">Stable</td> <td style="text-align: center;">Slightly unstable</td> <td style="text-align: center;">Moderately unstable</td> <td style="text-align: center;">Unstable</td> </tr> <tr> <td>Left Bank</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Right Bank</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>			Stable	Slightly unstable	Moderately unstable	Unstable	Left Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Right Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Stable	Slightly unstable	Moderately unstable	Unstable														
Left Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>														
Right Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>														
Mean Wetted Width (m): 1.00	Mean Bankfull Width (m):																	
Mean Wetted Depth (m): 0.40	Mean Bankfull Depth (m):																	
Flow Description: water in channel very low flow																		
Notes: banks are high & steep well vegetated large trees, shrubs, herbaceous & grasses																		

Stream Morphology (continued)

Substrate (< = >)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Sa & Si

Notes:

Morphological Structure (%)

Pool	Riffle	Run	Flat
			100

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	50			20		

*Aquatic Vegetation Types Present (aigea, submergent, emergent etc.)

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

Trees 5 Shrubs 15 Man-made structures _____
 Grasses 20 Herbaceous 50 Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

none observed

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

flat.
not sloping towards water course

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

C75

AECOM

Page 3 of 4

Other General Comments Regarding the Study Area:

Photolog

Picture #	Description	Picture #	Description
	d/s		
	u/s		
	potential WC		
	view of channel facing d/s		

Watercourse Sketch

Study Area:

Jericho

Goshen

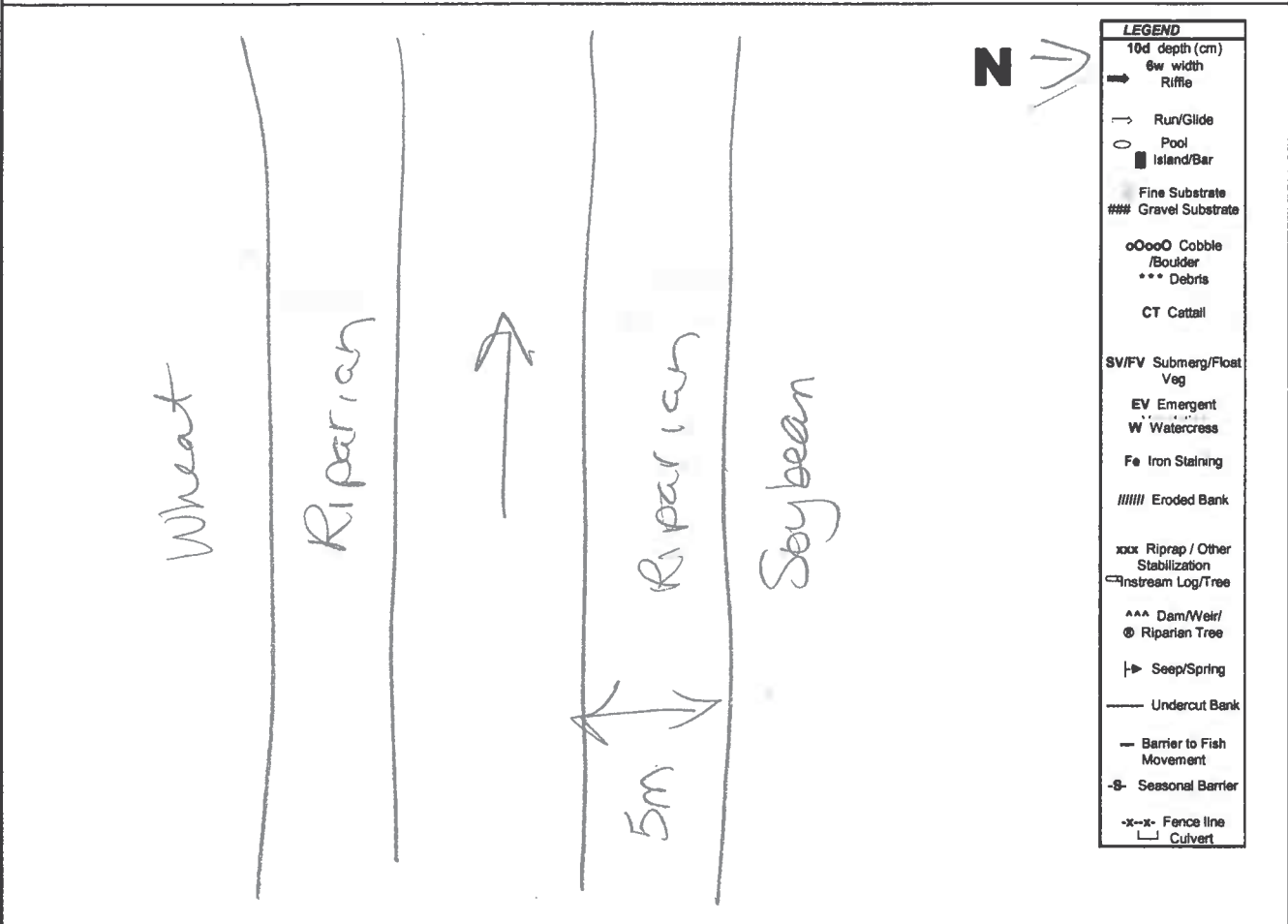
Bluewater Land Parcel#

1068

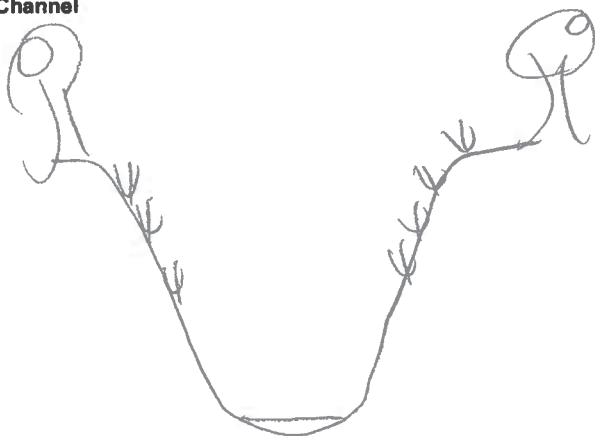
Turbine #

~~570~~

75



Horizontal View of Channel



C76

AECOM		Page 1 of 4	
		Field Crew: SA, BG	
General Information			
Study Area: Jericho <u>Gosher</u> Bluewater	Land Parcel# <u>1068</u>	Turbine # <u>444</u>	<u>46</u>
Date: <u>July 13/2011</u>	Start time: <u>15:00</u>	End Time: <u>15:20</u>	
Weather Conditions: <u>Sunny, Windy</u>		Field Notes By: <u>SA</u>	
Site Location			
<u>West of Mollard Rd, North of Greenway A</u>			
UTM Co-ordinates:			
Easting: <u>437914</u>	Northing: <u>478 7869</u>	Description:	
Easting:	Northing:	Description:	
Easting:	Northing:	Description:	
Easting:	Northing:	Description:	
Surrounding Landuse/Pollution Sources		Type of Watercourse	
Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Channelized <input checked="" type="checkbox"/>
Agriculture <input checked="" type="checkbox"/>	Wetland <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Natural Channel <input type="checkbox"/>
Forest <input checked="" type="checkbox"/>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	
Other:			
Notes: (Include any inputs into the system i.e. tile drainage, seepages, overland flow) <u>there was water in channel</u>			
In-Situ Water Quality		Ground Water Indicators	
WT (°C):	AT (°C):	Watercress <input type="checkbox"/>	Bank Seepage <input type="checkbox"/>
pH:	Cond (s/cm):	Iron Staining <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Bubbling <input type="checkbox"/>	Other <input type="checkbox"/>		
Water Clarity: Clear <input type="checkbox"/>	Turbid <input type="checkbox"/>		
Notes:			
Stream Morphology			
Site Length (m):		Bank Stability:	
Channel Dimensions		Stable	Slightly unstable
Mean Wetted Width (m): <u>0.30</u>	Mean Bankfull Width (m): <u>1.50</u>	Moderately unstable	Unstable
Mean Wetted Depth (m): <u>0.05</u>	Mean Bankfull Depth (m): <u>0.80</u>	Left Bank <input checked="" type="checkbox"/>	<input type="checkbox"/>
		Right Bank <input checked="" type="checkbox"/>	<input type="checkbox"/>
Flow Description: <u>standing water, no flow</u>			
Notes: <u>very stable, well vegetated banks</u>			

Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Sa = Si

Morphological Structure (%)			
Pool	Riffle	Run	Flat

Notes:

none

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	20			30		

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

Trees 10 Shrubs 15 Man-made structures _____
 Grasses 20 Herbaceous 20 Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

Low flow

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

C76

AECOM

Page 3 of 4

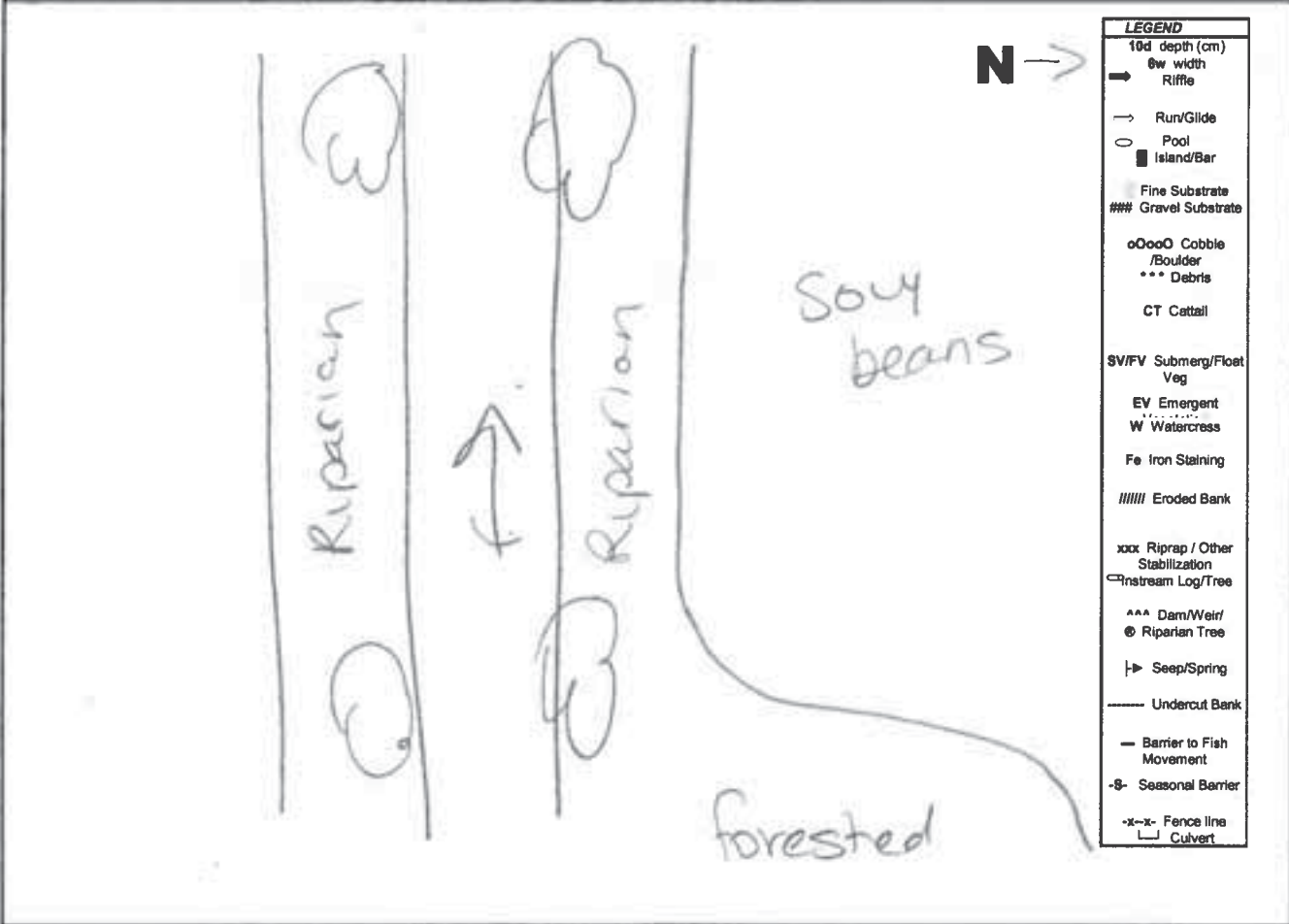
Other General Comments Regarding the Study Area:

Photolog			
Picture #	Description	Picture #	Description

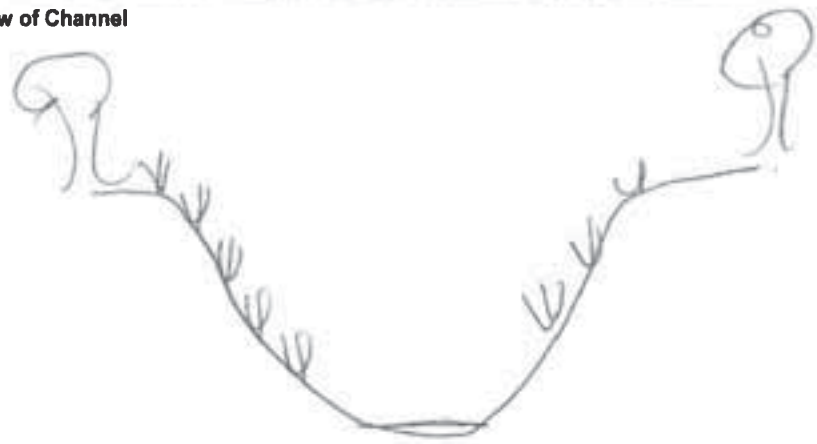
Watercourse Sketch

Study Area: Jericho Boshan Bluewater Land Parcel# 1068 Turbine # ~~5127~~ ~~522146~~

C76



Horizontal View of Channel



Water Bodies Assessment Field Collection Form

C78

AECOM

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# 49 Gosh 10.68 Site ID: 002
 Date: April 18/12 Start time: 7:50 End Time: 8:35
 Weather Conditions: Sunny, 5°C Field Crew: C. Boros, S. Lohnes
 Field Notes By: C. Boros

Site Location

Greenway drive, +1/2 mi Haginier Rd.

UTM Co-ordinates (continue on page 2 if necessary)

Easting: <u>0437851</u>	Northing: <u>4787448</u>	Description: <u>North end Start</u>
Easting: <u>0438106</u>	Northing: <u>4787487</u>	Description: <u>South end</u>
Easting: _____	Northing: _____	Description: _____
Easting: _____	Northing: _____	Description: _____

Surrounding Landuse

Typical Watercourse

Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Channelized <input checked="" type="checkbox"/>
Agriculture <input checked="" type="checkbox"/>	Wetland <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Natural Channel <input type="checkbox"/>
Forest <input type="checkbox"/>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	
Other <input type="checkbox"/>			

Description: also roadside

Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)

- only at ~~the~~ portion, after the fork in watercourse east

Is any portion of the water body underground or not as mapped? Y (N)
 If Yes describe:

GPS Coordinate: Easting - _____ Northing - _____ Description - _____

Description of Land Topography Surrounding Water Body (rolling hills, sloping towards water body)

crop field flat, adjacent road

In Situ Water Quality

Ground Water and Seepage Indicators

WT (°C): <u>5.31</u>	AT (°C): <u>5°C</u>	Watercress <input type="checkbox"/>	Bank Seepage <input type="checkbox"/>
pH: <u>7.83</u>	Cond (µs/cm): <u>533</u>	Iron Staining <input type="checkbox"/>	None <input checked="" type="checkbox"/>
D.O. (mg/L) <u>8.9</u>		Bubbling <input type="checkbox"/>	
Water Clarity: Clear <input checked="" type="checkbox"/> Turbid <input type="checkbox"/>		Other <input type="checkbox"/>	

Details:

Water Colour: clear

Notes:

Water Bodies Assessment Field Collection Form

Stream Morphology																				
Site Length (m): 300m			Bank Stability:																	
Channel Dimensions			<table border="1" style="width: 100%; text-align: center;"> <tr> <td></td> <td>Stable</td> <td>Slightly unstable</td> <td>Moderately unstable</td> <td>Unstable</td> </tr> <tr> <td>Left Bank</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Right Bank</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>				Stable	Slightly unstable	Moderately unstable	Unstable	Left Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Right Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Stable	Slightly unstable	Moderately unstable	Unstable																
Left Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
Right Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
Mean Wetted Width (m): 1	Mean Wetted Depth (m): 0.10	Description: well veg banks																		
Mean Bankfull Width (m): 1.4	Mean Bankfull Depth (m): 0.5																			
Mean Top of Bank Width (m): 3	Mean Top of Bank Depth (m): 2																			
Flow Description: (high or low flow conditions, stagnant, etc) <i>visible flow only observed in one location in west end, all other areas stagnant → visible flow observed in west East end as there is tile drain input</i>																				
Substrate (<=>)			Morphological Structure (%)																	
Bo - Boulder Co - Cobble Gr - Gravel Sa - Sand Si - Silt Cl - Clay MK - Muck DT - Detritus	Description si, cl, mk	<table border="1" style="width: 100%; text-align: center;"> <tr> <th>Pool</th> <th>Riffle</th> <th>Run</th> <th>Flat</th> </tr> <tr> <td></td> <td></td> <td></td> <td>100</td> </tr> </table>				Pool	Riffle	Run	Flat				100							
Pool	Riffle	Run	Flat																	
			100																	
			Notes: straight channel																	
Instream Cover (%)																				
Other	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	None	Undercut Banks														
				90%		Average Depth: (% Cover)														
Note: Low = 0 - 30%; Moderate = 30 - 75%; High = 75 - 100%																				
*Aquatic Vegetation Species Present (algae, submergent, emergent etc.) 70% cattail 5% algae 15% grasses, shrubs																				
Canopy Cover (% closed cover):			Types of Cover (% cover)																	
100-90%	<input type="checkbox"/>	30-1%	<input type="checkbox"/>	Trees	Shrubs 50	Man-made structures														
90-60%	<input type="checkbox"/>	0%	<input type="checkbox"/>	Grasses 50	Herbaceous	Other														
60-30%	<input checked="" type="checkbox"/> potential																			
Note: Low = 0 - 30%; Moderate = 30 - 60%; High = 60 - 100%																				
Notes: (vegetation species, types of structures) trees present but no leaves - leaves, cattail, shrub																				
Riparian Vegetation																				
Width of riparian vegetation: South - 1m grasses North - grasses, 1m, roadside																				
Description of vegetation community surrounding 30 m from watercourse: grasses, some trees.																				
Obstructions to Fish Passage																				
No Obstructions <input checked="" type="checkbox"/> Man-Made <input type="checkbox"/> Natural <input type="checkbox"/> Low Flow Barrier <input type="checkbox"/>																				
Description of Barrier: → potential low flow barrier																				
Height of Barrier (m)			GPS Coordinates:																	

AECOM

Date: April 18, 2012

Land Parcel/Site ID:

G5H1068
D02

Page 3 of 4

Other General Comments Regarding the Study Area:

- No pools observed.
- Standing water in culvert under Hagenmuir Road.
- golden saxifrage observed at bend

Additional UTM Coordinates:

Watercourse straight channelized feature with high instream cover (catfish), soft substrate.

Picture #	Description	Picture #	Description
1	at west end looking west East		
2-3	Culvert at Hagenmuir Rd		
4-7	Overviews		
8-9	Fork of watercourse		
10	15 m past west ^{East} of fork		

Water Bodies Assessment Field Collection Form

C78

AECOM

Page 4 of 4

Study Area:

Jericho

Goshen

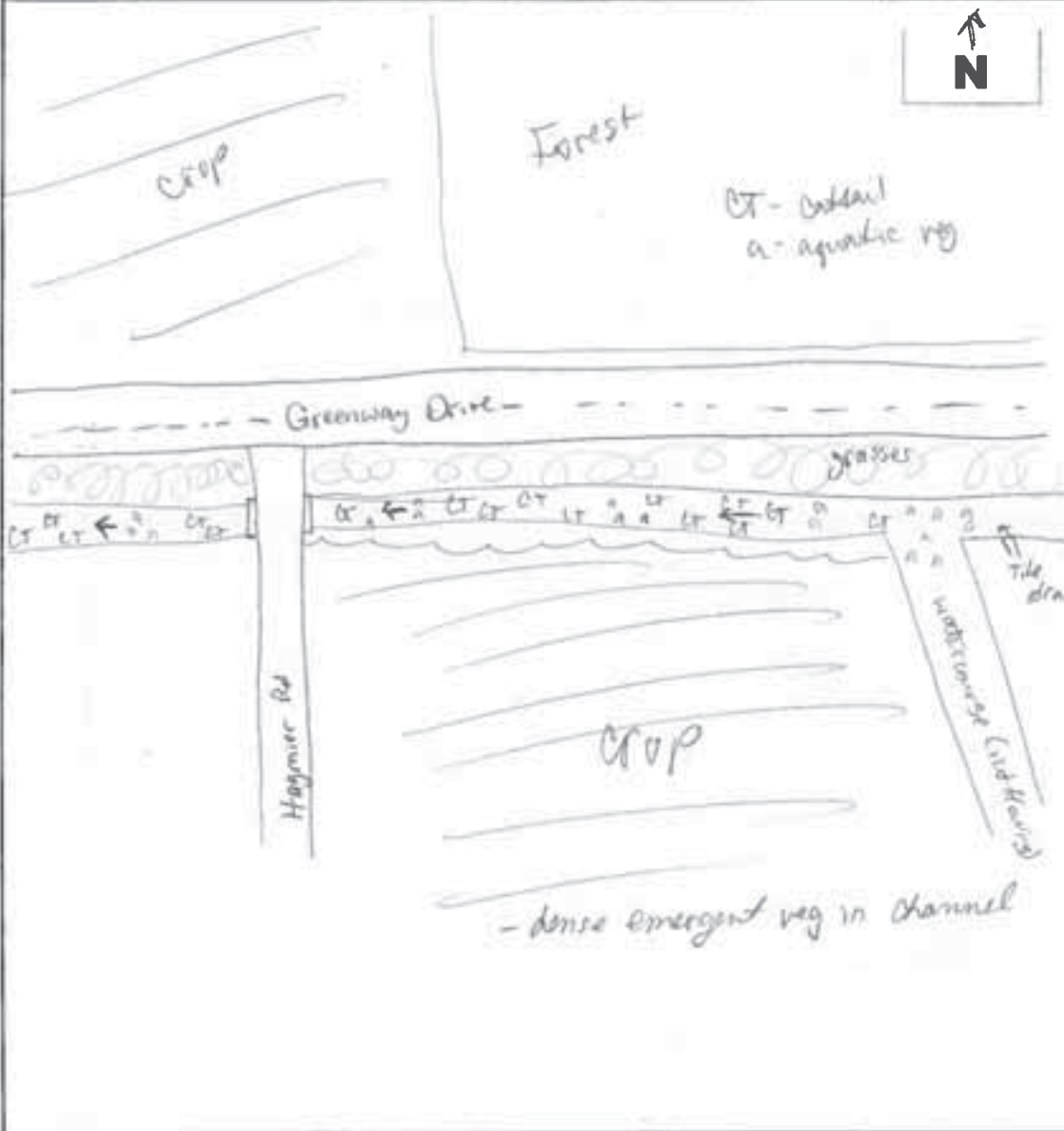
Bluewater

Land Parcel#

1068

Site ID

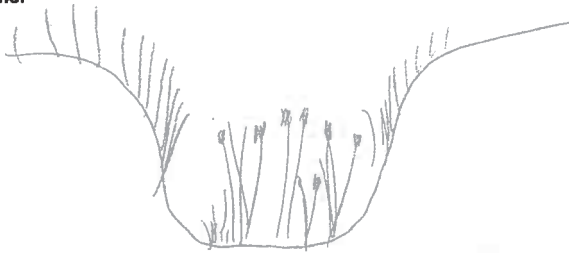
D02



LEGEND

- 10d depth (cm)
- 6w width
- Riffle
- Run/Glide
- Pool
- Island/Bar
- Fine Substrate
- Gravel Substrate
- Cobble/Boulder
- Debris
- Cattail
- Submerg/Float Veg
- Emergent Vegetation
- Watercress
- Iron Staining
- Eroded Bank
- Riprap / Other Stabilization
- Instream Log/Tree
- Dam/Weir/ Obstruction
- Riparian Tree
- Seep/Spring
- Undercut Bank
- Barrier to Fish Movement
- Seasonal Barrier
- Fence line
- Culvert

Horizontal View of Channel



Initial QA/QC By: AMS

Date: Apr. 19/12

Technical QA/QC By: Sautken Date: May 3/12

AECOM

Field Crew: SA, BG

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# 1019 Turbine # ~~673~~ (078)
 Date: July 13-2011 Start time: 5:18 PM End Time: 5:25
 Weather Conditions: Sunny, ~30°C Field Notes By: SA

Site Location

Greenway Dr, East of Mollard Rd.

UTM Co-ordinates

Easting: 438826 Northing: 4787374 Description: Groggs
 Easting: _____ Northing: _____ Description: _____
 Easting: _____ Northing: _____ Description: _____
 Easting: _____ Northing: _____ Description: _____

Surrounding Landuse/Pollution Sources

Residential Meadow
 Agriculture Wetland
 Forest Livestock

Type of Watercourse

Intermittent Channelized
 Permanent Natural Channel
 Ephemeral

Other: _____

Notes: (Include any inputs into the system i.e. tile drainage, seepages, overland flow)

Chocked cattail channel
 moist substrates

In-Situ Water Quality

WT (°C): _____ AT (°C): _____
 pH: _____ Cond (s/cm): _____
 Water Clarity: Clear Turbid

Ground Water Indicators

Watercress Bank Seepage
 Iron Staining None
 Bubbling Other

Notes:

dry channel, some areas of standing water

Stream Morphology

Site Length (m): _____

Bank Stability:

Channel Dimensions

Mean Wetted Width (m): — Mean Bankfull Width (m): 2.00
 Mean Wetted Depth (m): — Mean Bankfull Depth (m): 0.50

	Stable	Slightly unstable	Moderately unstable	Unstable
Left Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Flow Description: no flow

Notes:

Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Si

Morphological Structure (%)

Pool	Riffle	Run	Flat

Notes:

None

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	/	/	/	75	/	

***Aquatic Vegetation Types Present (algae, submergent, emergent etc.)**

Choked w cattails

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

- Trees 5
- Grasses 20
- Shurbs _____
- Herbaceous 20
- Man-made structures _____
- Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

low flow barrier

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

flat

Terrestrial features Present

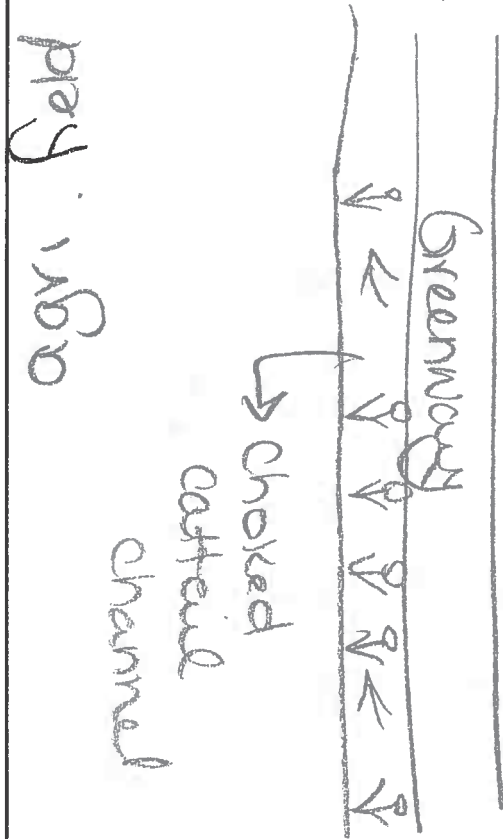
Yes No

Terrestrial Recon Form Filled out

Yes No

Watercourse Sketch

Study Area: Jericho Goshen Bluewater Land Parcel# 1019 Turbine # C78



LEGEND	
10d depth (cm)	→
Øw width	→
Riffle	→
Run/Glide	→
Pool	○
Island/Bar	■
Fine Substrate	□
Gravel Substrate	###
Cobble/Boulder	oOooO
Debris	***
Cattail	CT
Submerg/Float Veg	SV/FV
Emergent	EV
Watercress	W
Iron Staining	Fe
Eroded Bank	
Riprap / Other Stabilization	xxx
Instream Log/Tree	□
Dam/Weir	^^^
Riparian Tree	⊗
Seep/Spring	↳
Undercut Bank	—
Barrier to Fish Movement	—
Seasonal Barrier	-S-
Fence line	-x-x-
Culvert	┌

Horizontal View of Channel

C80

AECOM		Page 1 of 4	
		Field Crew: SA, Blg	
General Information			
Study Area: Jericho <u>Goshen</u> Bluewater	Land Parcel# <u>1091</u>	Turbine # <u>6E6G / SMN42</u>	
Date: <u>July 14/2011</u>	Start time: <u>8:15</u>	End Time: <u>9:30</u>	
Weather Conditions: <u>Sunny, 11°C</u>		Field Notes By: <u>SA</u>	
Site Location			
<u>entered from Eaglecrest Rd through corn field</u>			
UTM Co-ordinates			
Easting: <u>0437925</u>	Northing: <u>4787473</u>	Description: <u>Goshen</u>	
Easting:	Northing:	Description:	
Easting:	Northing:	Description:	
Easting:	Northing:	Description:	
Surrounding Landuse/Pollution Sources		Type of Watercourse	
Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input checked="" type="checkbox"/>	Channelized <input type="checkbox"/>
Agriculture <input checked="" type="checkbox"/> <u>W</u>	Wetland <input type="checkbox"/>	Permanent <input type="checkbox"/>	Natural Channel <input type="checkbox"/>
Forest <input checked="" type="checkbox"/> <u>E</u>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	
Other:			
Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)			
In-Situ Water Quality		Ground Water Indicators	
WT (°C):	AT (°C):	Watercress <input type="checkbox"/>	Bank Seepage <input type="checkbox"/>
pH:	Cond (s/cm):	Iron Staining <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Water Clarity: Clear <input type="checkbox"/> Turbid <input type="checkbox"/>		Bubbling <input type="checkbox"/>	Other <input type="checkbox"/>
Notes: <u>no WQ, no water flow</u>			
Stream Morphology			
Site Length (m):		Bank Stability:	
Channel Dimensions		Stable	Slightly unstable
Mean Wetted Width (m): <u>0.30</u>	Mean Bankfull Width (m): <u>2.00</u>	Moderately unstable	Unstable
Mean Wetted Depth (m): <u>0.05</u>	Mean Bankfull Depth (m): <u>0.70</u>	Left Bank <input checked="" type="checkbox"/>	<input type="checkbox"/>
		Right Bank <input checked="" type="checkbox"/>	<input type="checkbox"/>
Flow Description: <u>no flow, standing water ~ 0.05m deep</u>			
Notes: <u>stable vegetated banks</u>			

Stream Morphology (continued)

Substrate (< = >)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Sa > gr > Co

Morphological Structure (%)			
Pool	Riffle	Run	Flat

Notes:

none
low flow discerned

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	20		5			

***Aquatic Vegetation Types Present (algae, submergent, emergent etc.)**

attached & floating algae

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

Trees 80 Shrubs 15 Man-made structures _____
 Grasses _____ Herbaceous 5 Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions Man-Made
- Natural

Description:

low flow

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

relatively flat

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

Other General Comments Regarding the Study Area:

UIS of farm culvert channel is dry
 Areas of pooled water
 low flow disconnect

Photolog

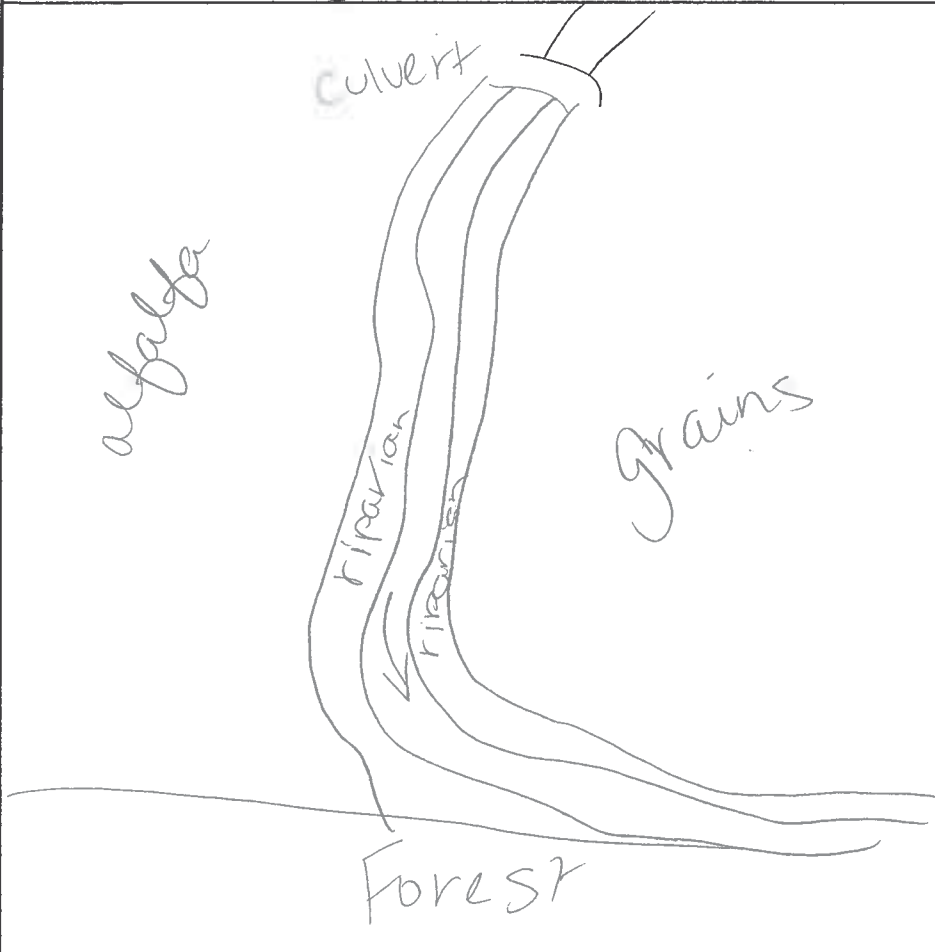
Picture #	Description	Picture #	Description
1	UIS	12	facing UIS
2	d/s	13	facing d/s
3	overview to W	14	UIS-dry channel
4	overview to south	15	d/s-dry channel
5	algae in standing water		
6	facing d/s woody debris		
7	facing UIS		
8	facing d/s		
9	view of channel		
10	facing d/s w		
11	facing d/s		

Watercourse Sketch

C80

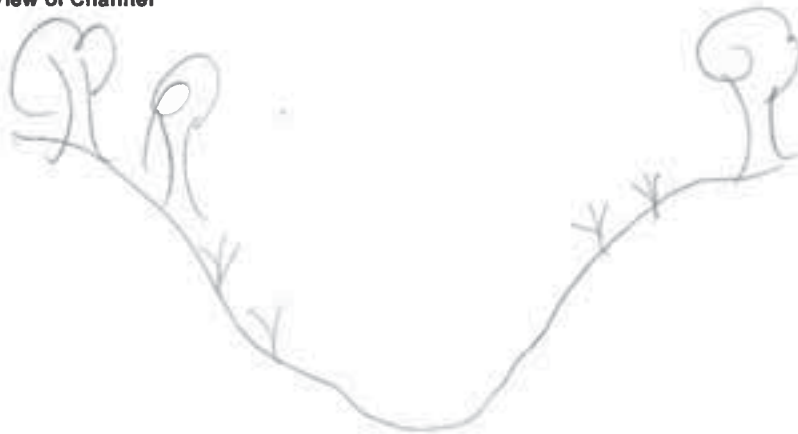
Study Area: Jericho Goshen Bluewater Land Parcel# 1091

Turbine # 6565/SMN42



LEGEND	
10d depth (cm)	
6w width	
Riffle	→
Run/Glide	↔
Pool	○
Island/Bar	■
Fine Substrate	●
Gravel Substrate	###
Cobble/Boulder	oOoO
Debris	***
Cattail	CT
Submerg/Float Veg	SV/FV
Emergent	EV
Watercress	W
Iron Staining	Fe
Eroded Bank	
Riprap / Other Stabilization	xxx
Instream Log/Tree	☐
Dam/Weir	^^^
Riparian Tree	⊙
Seep/Spring	┆▶
Undercut Bank	—
Barrier to Fish Movement	—
Seasonal Barrier	-S-
Fence line	-x-x-
Culvert	┌

Horizontal View of Channel



AECOM		Page 1 of 4	
Field Crew: SA, TS			
General Information			
Study Area: Jericho	Goshen	Bluewater	Land Parcel# 1091
Date: Dec 22/11	Start time: 11:50	Turbine #	C80
Weather Conditions: Sunny		Field Notes By: SA	
Site Location			
located east of Mollard Line.			
UTM Co-ordinates			
Easting:	Northing:	Description: C80-A (Start)	
Easting:	Northing:	Description: C80TD (Tile Drain)	
Easting:	Northing:	Description: C80B (End)	
Easting:	Northing:	Description:	
Surrounding Landuse/Pollution Sources		Type of Watercourse	
Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Channelized <input checked="" type="checkbox"/>
Agriculture <input checked="" type="checkbox"/>	Wetland <input type="checkbox"/>	Permanent <input type="checkbox"/>	Natural Channel <input type="checkbox"/>
Forest <input type="checkbox"/>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	
Other:			
Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)			
- tile drain - lots of water			
In-Situ Water Quality		Ground Water Indicators	
WT (°C):	AT (°C):	Watercress <input type="checkbox"/>	Bank Seepage <input type="checkbox"/>
pH:	Cond (µs/cm):	Iron Staining <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Water Clarity: Clear <input type="checkbox"/>	Turbid <input checked="" type="checkbox"/>	Bubbling <input type="checkbox"/>	Other <input type="checkbox"/>
Notes:			
Stream Morphology			
Site Length (m):		Bank Stability:	
Channel Dimensions		Stable	Slightly unstable
Mean Wetted Width (m):	1.35	Mean Bankfull Width (m):	2.5
Mean Wetted Depth (m):	0.22	Mean Bankfull Depth (m):	0.60
		Left Bank	Stable <input checked="" type="checkbox"/> Slightly unstable <input type="checkbox"/> Moderately unstable <input type="checkbox"/> Unstable <input type="checkbox"/>
		Right Bank	Stable <input checked="" type="checkbox"/> Slightly unstable <input type="checkbox"/> Moderately unstable <input type="checkbox"/> Unstable <input type="checkbox"/>
Flow Description: high flow well vegetated banks			
Notes: TOB W - 3m TOB H - 2.5m			

AECOM

Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Sa = Si > Gr

Notes:

Morphological Structure (%)

Pool	Riffle	Run	Flat
10	20	20	10

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
/	30	/	/	10	/	

***Aquatic Vegetation Types Present (algae, submergent, emergent etc.)**

- large + small woody debris
- overhanging + fallen shrubs

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

- Trees 5
- Grasses 30
- Shrubs 10
- Herbaceous 30
- Man-made structures _____
- Other _____

Notes:

ash, apple; dogwood, grasses, asters, goldenrods

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

none observed

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

relatively flat

Terrestrial features Present

Yes

No

Terrestrial Recon Form Filled out

Yes

No

C80

AECOM

Page 3 of 4

Other General Comments Regarding the Study Area:

- natural - channelized water course
- good in-stream cover.
- up stream of tile drain - channel choked @ phragmites
↳ slower moving water
- channel then becomes open and similar to
d/s of tile drain

Picture #		Photo log	
Picture #	Description	Picture #	Description
23-32			

C80

AECOM

Watercourse Sketch

Study Area:

Jericho

Goshen

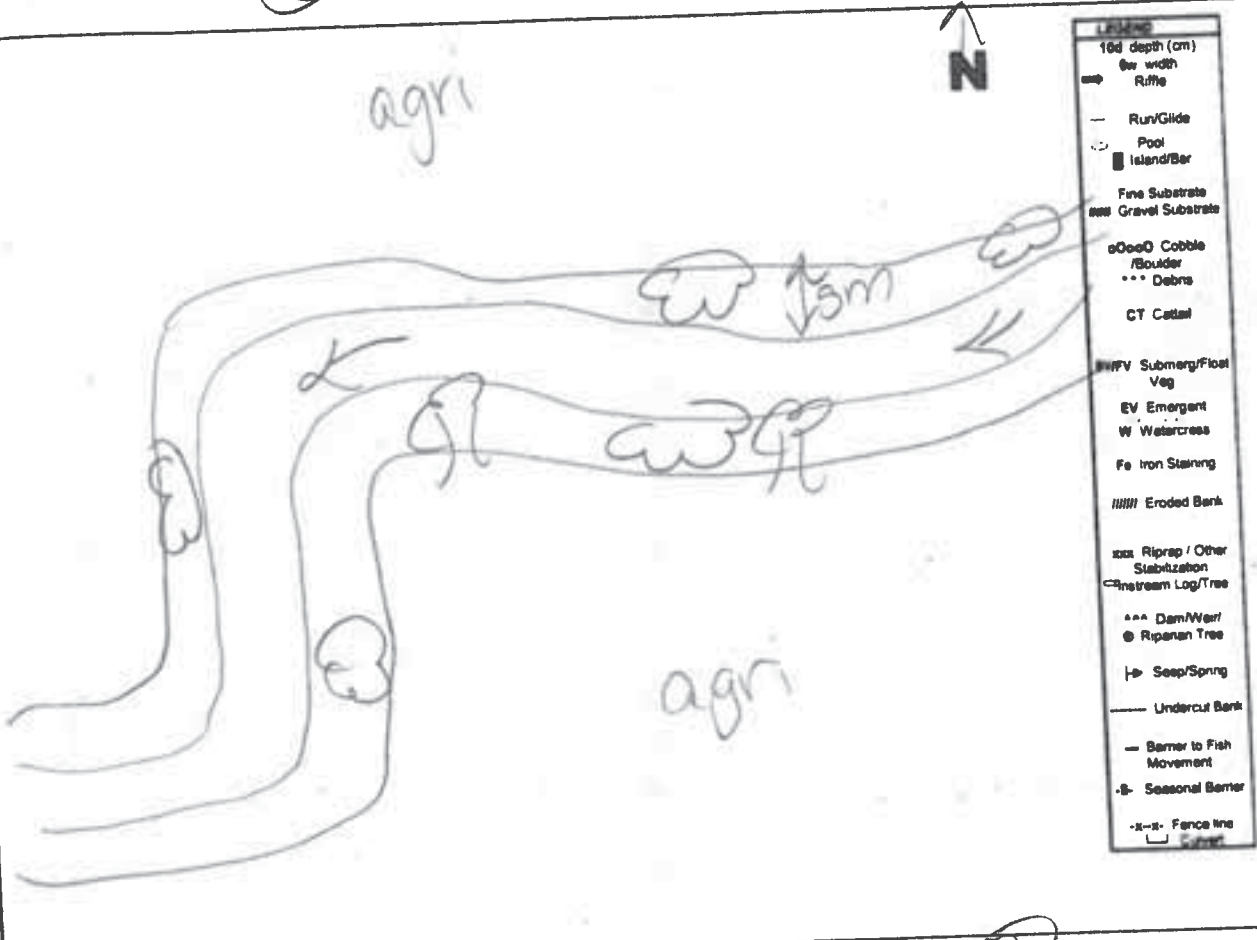
Bluewater

Land Parcel#

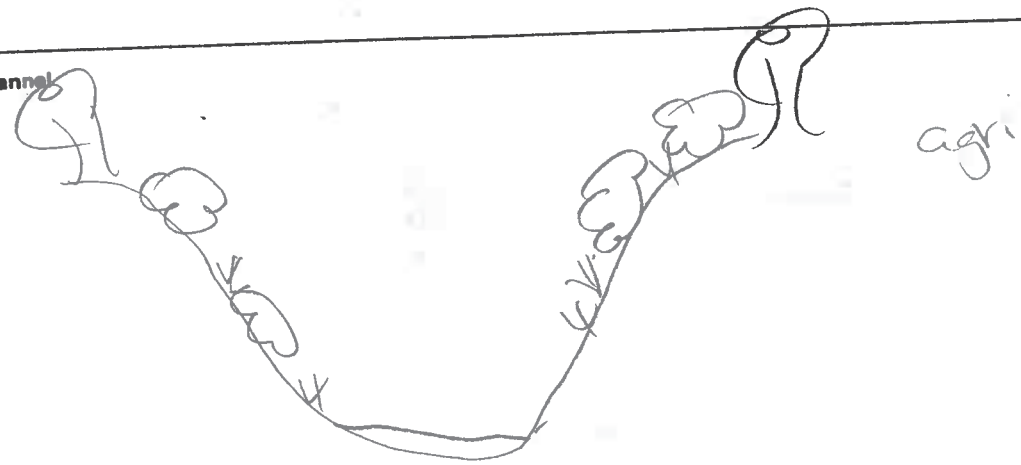
1091

Turbine #

C80



Horizontal View of Channel



AECOM

Field Crew: SA, TS

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# 1090 Turbine # C81
 Date: Nov 17/11 Start time: 14:20 End Time: 14:40

Weather Conditions: overcast, windy Field Notes By: SA

Site Location

North of South Rd, East of Mollard

UTM Co-ordinates

Easting:	Northing:	Description: <u>C81.A (end)</u>
Easting:	Northing:	Description: <u>C81.B (data)</u>
Easting:	Northing:	Description:
Easting:	Northing:	Description:

Surrounding Landuse/Pollution Sources

Residential Meadow
 Agriculture Wetland
 Forest Livestock

Type of Watercourse

Intermittent Channelized
 Permanent Natural Channel
 Ephemeral

Other:

Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)
in forest & agriculture fields on either side

In-Situ Water Quality

Ground Water Indicators

WT (°C): 4.8°C AT (°C):
 pH: 8.32 Cond (µs/cm): 690
 Water Clarity: Clear Turbid

Watercress Bank Seepage
 Iron Staining None
 Bubbling Other

Notes: none observed

Stream Morphology

Site Length (m): 200 Bank Stability:

	Stable	Slightly unstable	Moderately unstable	Unstable
Left Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Right Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Channel Dimensions

Mean Wetted Width (m):	<u>2.4</u>	Mean Bankfull Width (m):	<u>7.00</u>
Mean Wetted Depth (m):	<u>0.18</u>	Mean Bankfull Depth (m):	<u>1.3</u>

Flow Description: Low flow
-evidence of high flow channel

Notes: Signs of erosion along RB + LB - exposed soils + tree roots
TOBH - 1.8 m TOBW - 8.0 m

AECOM

Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Sa > Gr. > Si

Notes:

Morphological Structure (%)			
Pool	Riffle	Run	Flat
10	30	50	

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	15%	5%	15%	/	/	

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

wide flat system w small-large woody debris

Canopy Cover (% closed cover):

- 100-90%
- 90-80%
- 80-30%
- 30-1%
- 0%

Types of Cover (% cover)

Trees 60 Shrubs _____
 Grasses 15 Herbaceous 15 Man-made structures _____
 Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

none observed

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

C81

AECOM

Page 3 of 4

Other General Comments Regarding the Study Area:

Photo log 23-92

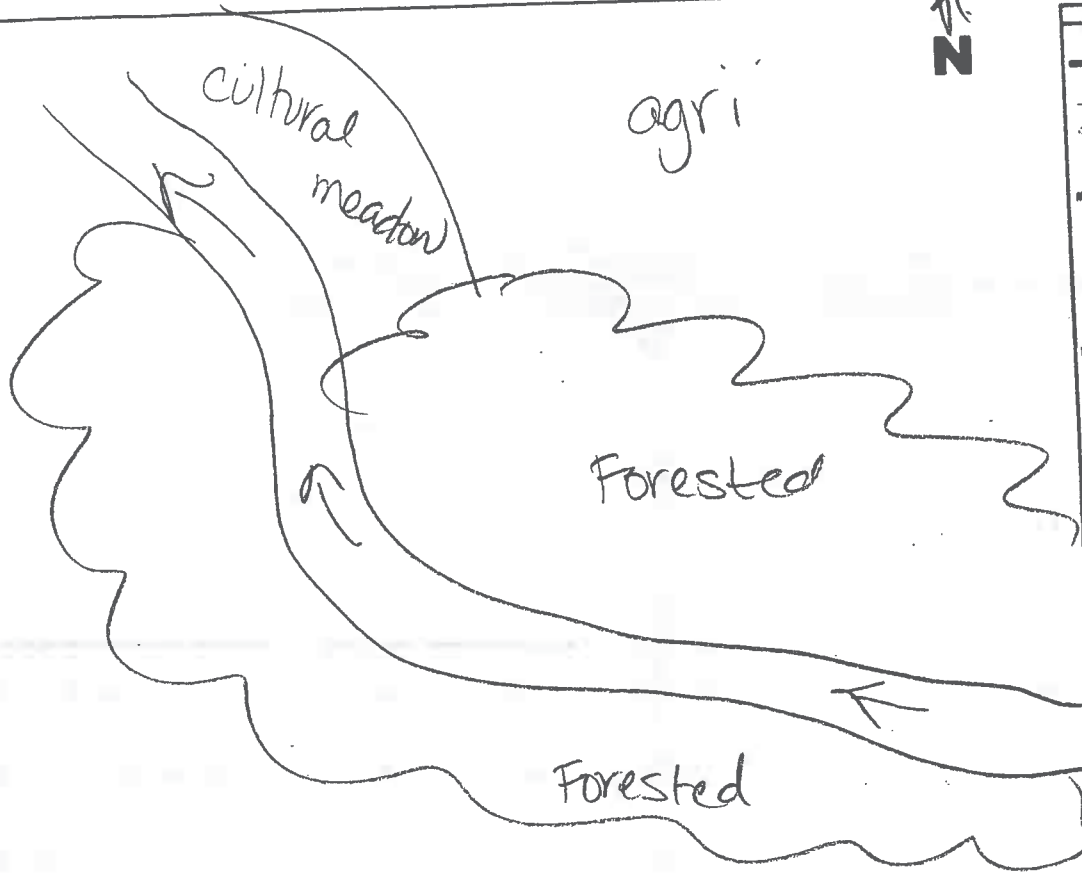
Picture #	Description	Picture #	Description
8392			

081

AECOM

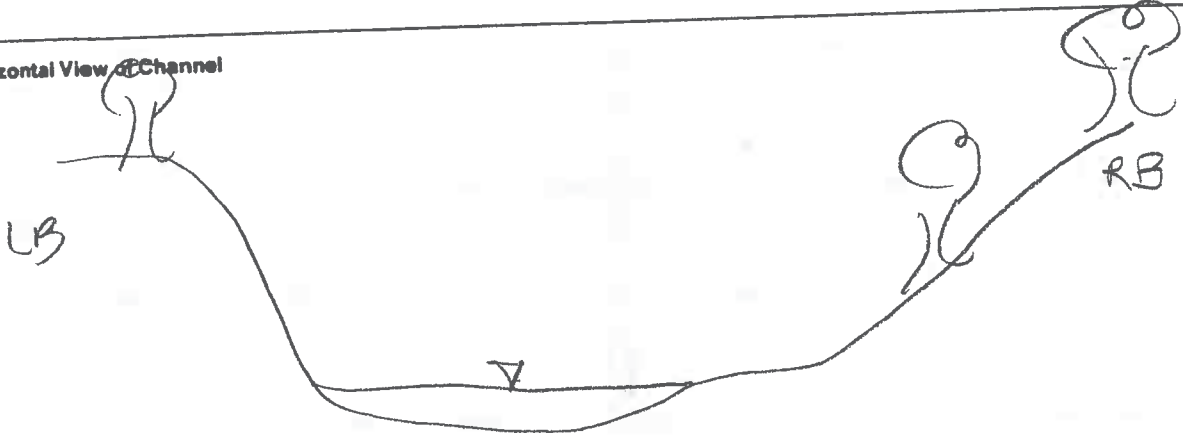
Watercourse Sketch

Study Area: Jericho Goshen Bluewater Land Parcel# 1090 Turbine # C81



LEGEND	
10d depth (cm)	Bar width
→	Rifle
—	Run/Glide
○	Pool
■	Island/Bar
—	Fine Substrate
—	Gravel Substrate
○●○○○	Cobble / Boulder
●●●	Debris
CT	Cattail
SV/FV	Submerg/Float Veg
EV	Emergent
W	Watercress
Fe	Iron Staining
	Eroded Bank
xxx	Riprap / Other Stabilization
□	Instream Log/Tree
***	Dam/Weir
●	Riparian Tree
↳	Seep/Spring
—	Undercut Bank
—	Barrier to Fish Movement
—	Seasonal Barrier
—	Fence line
□	Culvert

Horizontal View of Channel



AECOM

Field Crew: SA, TS

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# 1075 Turbine # C82
 Date: Nov 17/11 Start time: 15:00 End Time: 15:24

Weather Conditions: overcast, windy Field Notes By: SA

Site Location

South Rd., East of Grand Bend Line

UTM Co-ordinates

Easting:	Northing:	Description: GPS not working
Easting:	Northing:	Description:
Easting:	Northing:	Description:
Easting:	Northing:	Description:

Surrounding Landuse/Pollution Sources

Residential Meadow
 Agriculture Wetland
 Forest Livestock

Intermittent Channelized
 Permanent Natural Channel
 Ephemeral

Other:

Notes: (Include any inputs into the system i.e. tile drainage, seepages, overland flow)

In-Situ Water Quality

Same as C81

WT (°C): 4.8 AT (°C):
 pH: 8.32 Cond (µs/cm): 690
 Water Clarity: Clear Turbid

Ground Water Indicators

Watercress Bank Seepage
 Iron Staining None
 Bubbling Other

Notes:

Stream Morphology

Site Length (m): Same as C81

Channel Dimensions				Bank Stability:			
Mean Wetted Width (m):	2.4	Mean Bankfull Width (m):	7.0	Stable	Slightly unstable	Moderately unstable	Unstable
Mean Wetted Depth (m):	0.2	Mean Bankfull Depth (m):	1.3	Left Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> → <input checked="" type="checkbox"/>
				Right Bank	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>

Flow Description:

Notes: large meander where bank is eroding away

AECOM

Stream Morphology (continued)

Substrate (< = >)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

sa > gr > s

Notes:

Morphological Structure (%)			
Pool	Riffle	Run	Flat
15	15	30	

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	20	15	15	/		

***Aquatic Vegetation Types Present (algae, submergent, emergent etc.)**

Small + large woody debris
instream boulders + cobble

Canopy Cover (% closed cover):

- 100-90%
- 90-80%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

- Trees 80
- Grasses _____
- Shrubs 20
- Herbaceous _____
- Man-made structures _____
- Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

082

Other General Comments Regarding the Study Area:

- area near culvert where bank have been reinforced w/ cobble
- severe erosion located near culvert
- failed reinforcements
- up side is green colour & very slow moving due to stream modifications made d/s

Photo log 93-107

Picture #	Description	Picture #	Description
93-107			

AECOM

Watercourse Sketch

Study Area:

Jericho

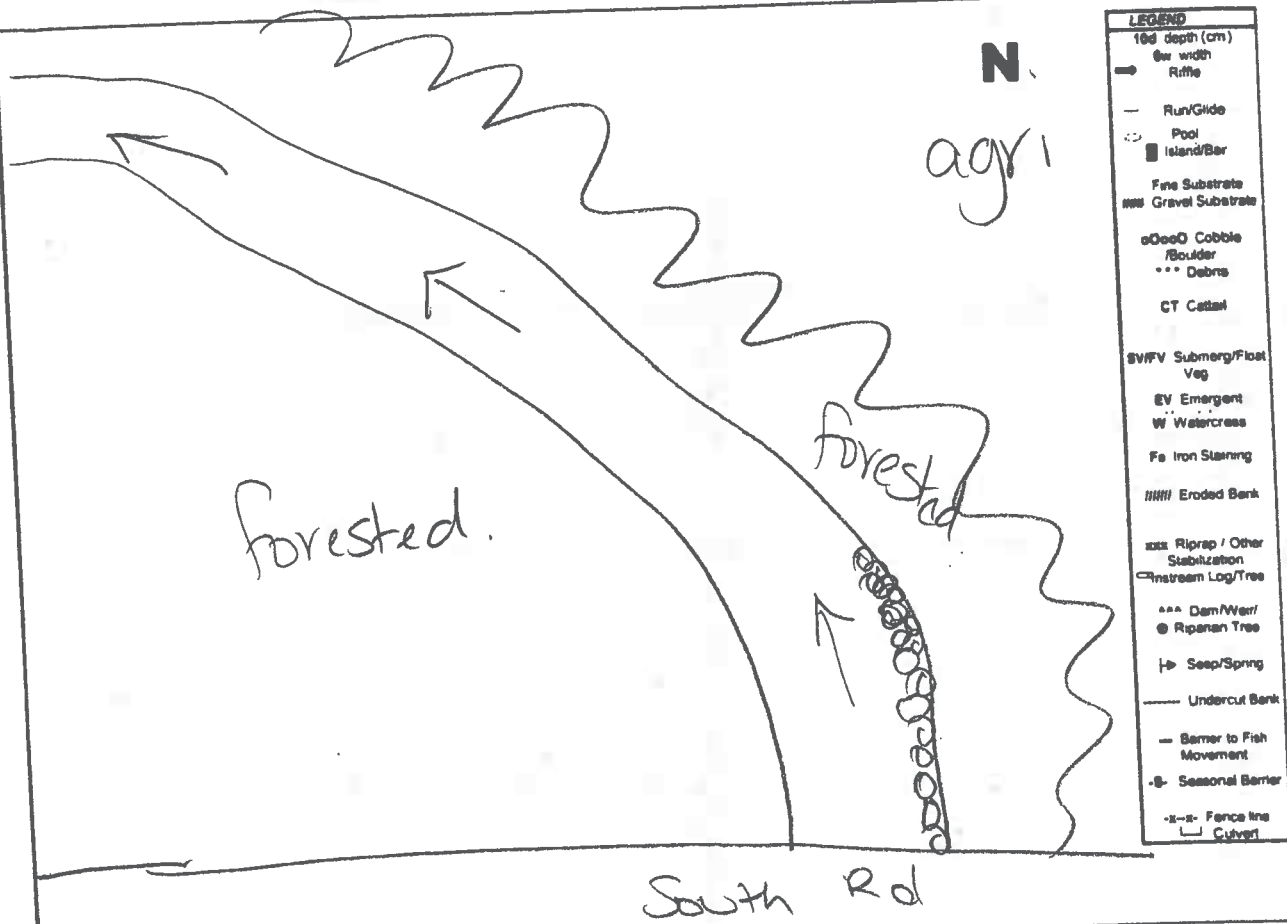
Goshen

Bluewater Land Parcel#

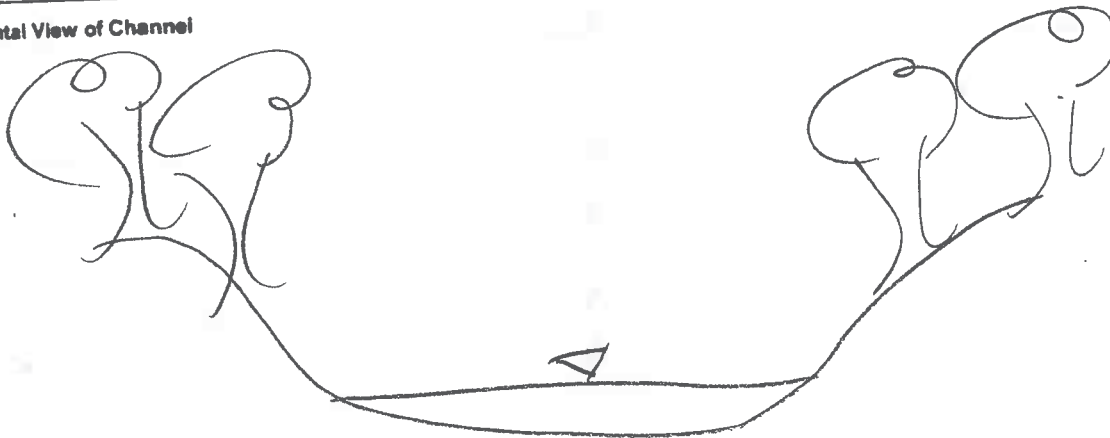
1075

Turbine #

C82



Horizontal View of Channel



AECOM

Field Crew:

General Information

Study Area: Jericho ~~Goshen~~ Bluewater Land Parcel# 10211557, 25101 Turbine # 283
 Date: Nov 17/11 Start time: 15:36 End Time: 14:20

Weather Conditions: overcast, windy Field Notes By: SA

Site Location: crossing at South Rd & Grand Bend Line

UTM Co-ordinates

Easting: _____ Northing: _____ Description: GPS not working
 Easting: _____ Northing: _____ Description: _____
 Easting: _____ Northing: _____ Description: _____
 Easting: _____ Northing: _____ Description: _____

Surrounding Landuse/Pollution Sources

Type of Watercourse

Residential Meadow
 Agriculture Wetland
 Forest Livestock

Intermittent Channelized
 Permanent Natural Channel
 Ephemeral

Other:

Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)

~~lots of water~~

In-Situ Water Quality

Ground Water Indicators

WT (°C): 4.2 AT (°C): _____
 pH: 8.07 Cond (µcm): 714
 Water Clarity: Clear Turbid

Watercress Bank Seepage
 Iron Staining None
 Bubbling Other

Notes: lots of ~~water~~ cross located on east & west side of Grand Bend Line

Stream Morphology

Site Length (m): 250 Bank Stability:

Channel Dimensions				Stable	Slightly unstable	Moderately unstable	Unstable
Mean Wetted Width (m):	0.50	Mean Bankfull Width (m):	1.5	Left Bank <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mean Wetted Depth (m):	0.10	Mean Bankfull Depth (m):	2.0	Right Bank <input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Flow Description:

Notes:

AECOM

Stream Morphology (continued)

Substrate (< = >)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Si = Sa

Notes:

Morphological Structure (%)			
Pool	Riffle	Run	Flat
	30	50	

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
				40		

***Aquatic Vegetation Types Present (algae, submergent, emergent etc.)**

Watercress + grasses

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%

- 30-1%
- 0%

Types of Cover (% cover)

Trees _____ Shrubs _____
 Grasses 30 Herbaceous 30

Man-made structures _____
 Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

none observed.

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

Terrestrial features Present

Yes

No

Terrestrial Recon Form Filled out

Yes

No

083

AECOM

Page 3 of 4

Other General Comments Regarding the Study Area:

- straightened ditch, cattail choked
- some filamentous alga
- runoff from ditch

Photo log 120-124

Picture #	Description	Picture #	Description
116-118	South of South Rd.		
119	North of South rd East of Grand Bend Line		

C83

AECOM

Watercourse Sketch

Study Area:

Jericho

Goshen

Bluewater

Land Parcel# 1021, 1587, 2264

Turbine #

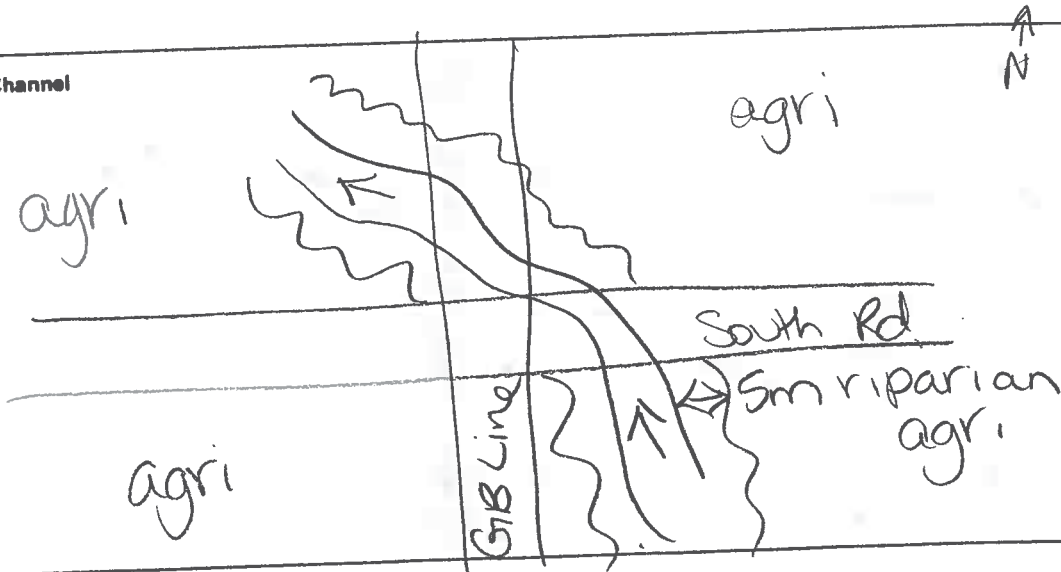
C 83

N

LEGEND	
10d depth (cm)	0m width
→	Riffle
—	Run/Glide
○	Pool
■	Island/Bar
—	Fine Substrate
—	Gravel Substrate
○	Cobble/Boulder
•••	Debris
CT	Cattail
SV/FV	Submerg/Float Veg
EV	Emergent
W	Watercress
Fe	Iron Staining
	Eroded Bank
	Riprap / Other Stabilization
—	Instream Log/Tree
▲▲▲	Dam/Wall
●	Riparian Tree
↳	Seep/Spring
—	Undercut Bank
—	Barrier to Fish Movement
-S-	Seasonal Barrier
-x-x-	Fence line
┌	Culvert



Horizontal View of Channel



(C86)

AECOM		Page 1 of 4	
		Field Crew: <i>M JAG</i>	
General Information			
Study Area: Jericho <u>Goshen</u> Bluewater	Land Parcel# <u>1781</u>	Turbine # 1781 <u>C86</u>	
Date: <u>13/07/11</u>	Start time: <u>8:20</u>	End Time: <u>15:50</u>	
Weather Conditions: <u>Sunny, light wind</u>		Field Notes By: <u>NZ</u>	
Site Location			
<u>thru agricultural field. car @ South line opposite 68 46</u>			
UTM Co-ordinates			
Easting: <u>0448827</u>	Northing: <u>4791717</u>	Description:	
Easting:	Northing:	Description:	
Easting:	Northing:	Description:	
Easting:	Northing:	Description:	
Surrounding Landuse/Pollution Sources		Type of Watercourse	
Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Channelized <input checked="" type="checkbox"/>
Agriculture <input checked="" type="checkbox"/>	Wetland <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Natural Channel <input type="checkbox"/>
Forest <input type="checkbox"/>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	<u>naturalized</u>
Other:			
Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)			
In-Situ Water Quality		Ground Water Indicators	
WT (°C):	AT (°C):	Watercress <input type="checkbox"/>	Bank Seepage <input type="checkbox"/>
pH:	Cond (s/cm):	Iron Staining <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Water Clarity: Clear <input checked="" type="checkbox"/> Turbid <input type="checkbox"/>		Bubbling <input type="checkbox"/>	Other <input type="checkbox"/>
Notes: <u>No groundwater indicators observed</u>			
Stream Morphology			
Site Length (m):		Bank Stability:	
Channel Dimensions <u>EST.</u>		Stable	Slightly unstable
Mean Wetted Width (m): <u>0.70</u>	Mean Bankfull Width (m): <u>1.5</u>	Moderately unstable	Unstable
Mean Wetted Depth (m): <u>10cm</u>	Mean Bankfull Depth (m): <u>30cm</u>	Left Bank <input checked="" type="checkbox"/>	<input type="checkbox"/>
		Right Bank <input checked="" type="checkbox"/>	<input type="checkbox"/>
Flow Description: <u>slow moving, stagnant in parts.</u>			
Notes: <u>Choked with veg. and grasses + shrubs @ some points</u>			

Stream Morphology (continued)

Substrate (< = >)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Co = MK

Notes:

Morphological Structure (%)

Pool	Riffle	Run	Flat
			100

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
			20		10	

***Aquatic Vegetation Types Present (algae, submergent, emergent etc.)**

filamentous brown-green algae
grasses - some islands in streams

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

Trees 5 Shurbs 15 Man-made structures _____
Grasses 70 Herbaceous 10 Other _____

Notes:

vegetation choked - overgrown with shrubs + grasses

Obstructions to Fish Passage

- No Obstructions Man-Made
- Natural

Description:

Maybe some low flow obstructions - veg. + debris

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

flat. No obvious drainage features

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

(C86)

AECOM

July 13/11

~~6/15/10~~

Page 3 of 4

Other General Comments Regarding the Study Area:

Photolog			
Picture #	Description	Picture #	Description
225	General Location		
226	Upstream		
227	Downstream		

Watercourse Sketch

Study Area:

Jericho

Goshen

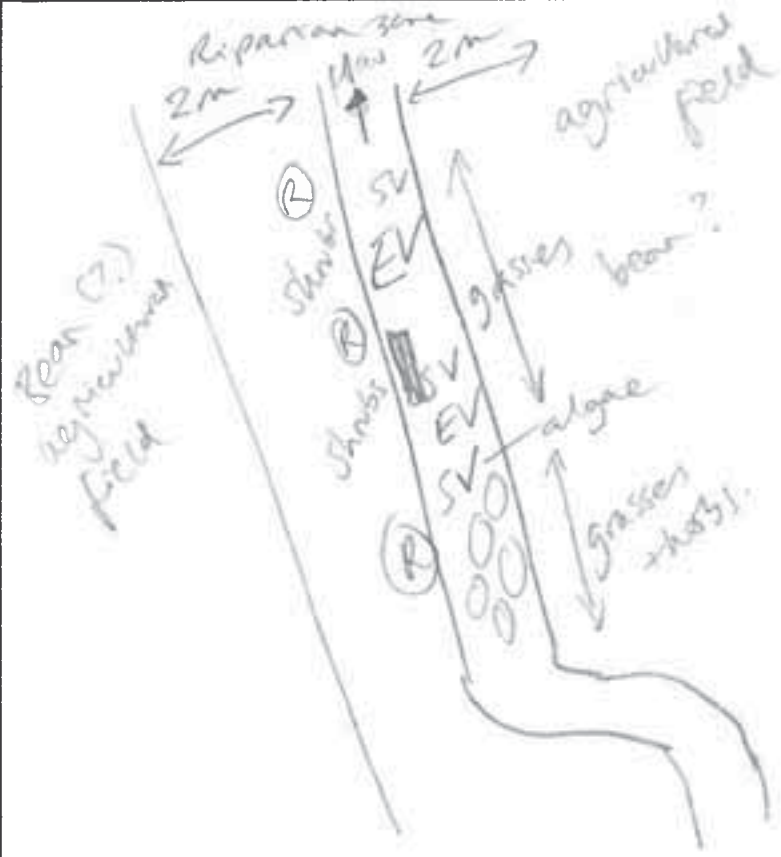
Bluewater Land Parcel#

1781

Turbine #

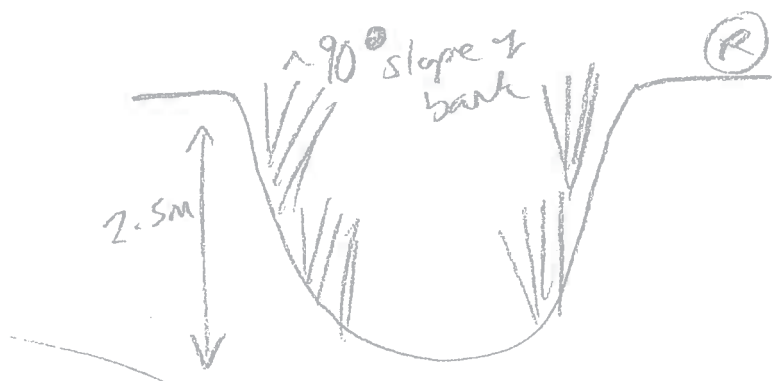
~~67546~~

C86



LEGEND	
10d depth (cm)	8w width
→	Riffle
→	Run/Glide
○	Pool
■	Island/Bar
	Fine Substrate
###	Gravel Substrate
o o o o	Cobble/Boulder
***	Debris
CT	Cattail
SV/FV	Submerg/Float Veg
EV	Emergent
W	Watercress
Fe	Iron Staining
	Eroded Bank
xxx	Riprap / Other Stabilization
—	Instream Log/Tree
^^^	Dam/Weir
⊙	Riparian Tree
↳	Seep/Spring
—	Undercut Bank
—	Barrier to Fish Movement
-S-	Seasonal Barrier
-x-x-	Fence line
┌	Culvert

Horizontal View of Channel



C89

AECOM		Page 1 of 4	
		Field Crew: <u>NL, JAG</u>	
General Information			
Study Area: Jericho <u>Goshen</u> Bluewater Land Parcel# <u>1062</u>		Turbine # <u>9547</u>	
Date: <u>13th July 2011</u>		Start time: <u>14:50</u> End Time: <u>15:05</u>	
Weather Conditions: <u>Sunny, light wind</u>		Field Notes By: <u>NL</u>	
Site Location			
<u>3000' field from south line</u>			
UTM Co-ordinates			
Easting: <u>0448876</u>		Northing: <u>4790731</u>	
Description: <u>line correct site</u>			
Easting: <u>0448867</u>		Northing: <u>4790850</u>	
Description: <u>line this is correct site</u>			
Easting:		Northing:	
Description:			
Easting:		Northing:	
Description:			
Surrounding Landuse/Pollution Sources		Type of Watercourse	
Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Channelized <input type="checkbox"/>
Agriculture <input checked="" type="checkbox"/>	Wetland <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Natural Channel <input checked="" type="checkbox"/>
Forest <input checked="" type="checkbox"/>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	
Other:			
Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow) <u>None observed</u>			
In-Situ Water Quality		Ground Water Indicators	
WT (°C): <u>25.2</u>	AT (°C):	Watercress <input type="checkbox"/>	Bank Seepage <input type="checkbox"/>
pH: <u>9.13</u>	Cond (µs/cm): <u>614</u>	Iron Staining <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Water Clarity: Clear <input checked="" type="checkbox"/> Turbid <input type="checkbox"/>		Bubbling <input type="checkbox"/>	Other <input type="checkbox"/>
Notes:			
Stream Morphology			
Site Length (m):		Bank Stability:	
Channel Dimensions			
Mean Wetted Width (m): <u>1</u>	Mean Bankfull Width (m): <u>2.4</u>	Stable	Slightly unstable
Mean Wetted Depth (m): <u>130</u>	Mean Bankfull Depth (m): <u>70cm</u>	Moderately unstable	Unstable
		Left Bank <input checked="" type="checkbox"/>	<input type="checkbox"/>
		Right Bank <input checked="" type="checkbox"/>	<input type="checkbox"/>
Flow Description: <u>Slow - Moderate</u>			
Notes:			

Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

SI > MK = DT > Gr

Notes:

Morphological Structure (%)

Pool	Riffle	Run	Flat
			100

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	10	0	0	30	10	

***Aquatic Vegetation Types Present (algae, submergent, emergent etc.)**

lots of algae - blankets of green filamentous algae

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

- Trees _____
- Grasses _____
- Shurbs _____
- Herbaceous _____
- Man-made structures _____
- Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions Natural
- Man-Made

Description:

some piles of LWD but flow depth = sufficient for fish passage

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

None noted - flat topography

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

C89

C89

AECOM

July 18 / 11



~~2012~~

Page 3 of 4

Other General Comments Regarding the Study Area:

land-use doesn't fit with Orms on one side of W/C -
 forested areas closer to W/C than appears on photo-map.
 Confirmation visit required
 Fish observed. - stickleback?

Photolog

Picture #	Description	Picture #	Description
220	Ben location		
221	Upstream 		
222	downstream 		
223*	Upstream - correct location		
224	downstream		

C89

Watercourse Sketch

Study Area:

Jericho

Goshen

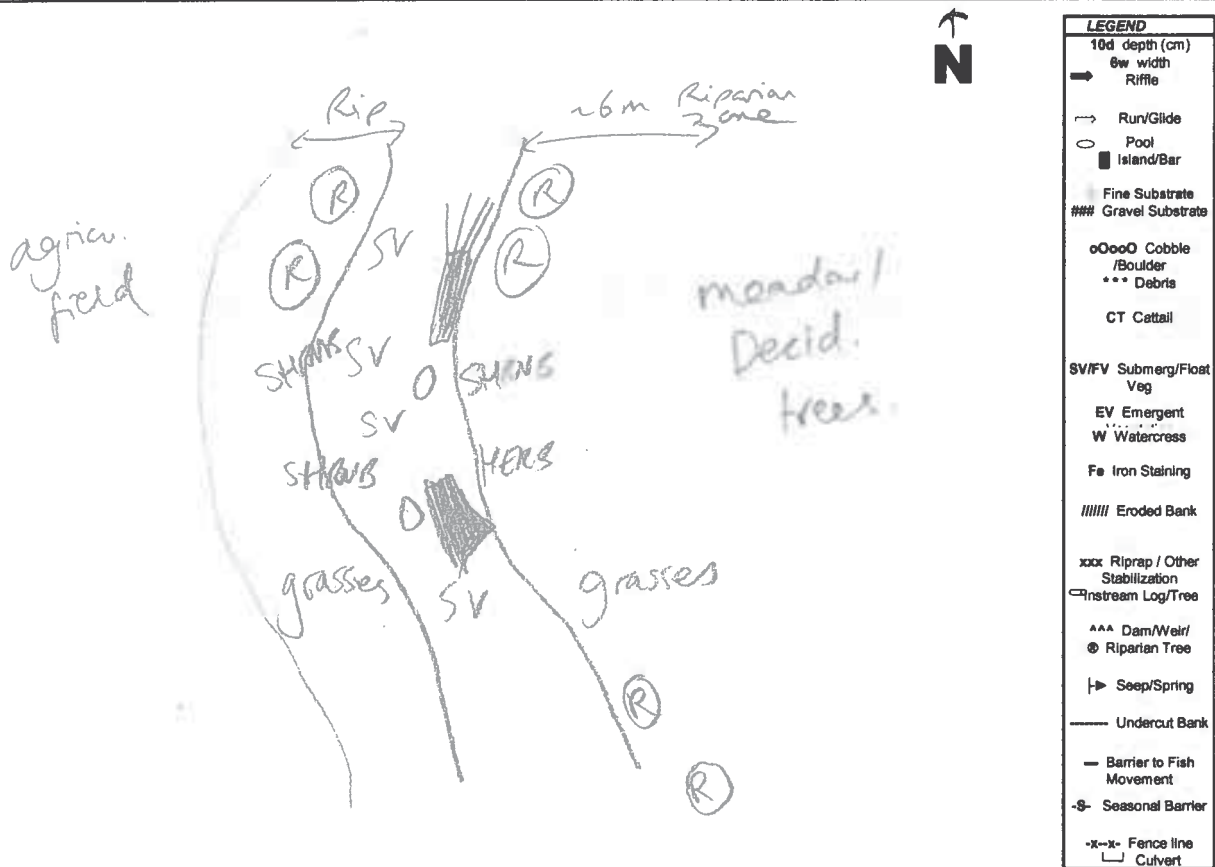
Bluewater Land Parcel#

1062

Turbine #

~~1062~~

C89



Horizontal View of Channel



AECOM		Page 1 of 4	
		Field Crew: <u>CB, JP</u>	
General Information			
Study Area: Jericho <u>Goshen</u> Bluewater	Land Parcel# <u>1062</u>	Turbine # <u>GOS-C89</u>	
Date: <u>Sept 8/11</u>	Start time: <u>8:15</u>	End Time: <u>9:00</u>	
Weather Conditions: <u>Cloudy, 120c</u>		Field Notes By: <u>CB</u>	
Site Location			
<u>South Rd - west of Brown</u>			
UTM Co-ordinates			
Easting: <u>0448863</u>	Northing: <u>4790854</u>	Description: <u>in stream - N end</u>	
Easting: <u>0448950</u>	Northing: <u>4790664</u> <u>±8m</u>	Description: <u>close to S end - in field</u>	
Easting: _____	Northing: _____	Description: _____	
Easting: _____	Northing: _____	Description: _____	
Surrounding Landuse/Pollution Sources		Type of Watercourse	
Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Channelized <input type="checkbox"/>
Agriculture <input checked="" type="checkbox"/>	Wetland <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Natural Channel <input checked="" type="checkbox"/>
Forest <input checked="" type="checkbox"/>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	
Other: _____			
Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow) <u>-no inputs noted</u>			
In-Situ Water Quality		Ground Water Indicators	
WT (°C): _____	AT (°C): _____	Watercress <input type="checkbox"/>	Bank Seepage <input type="checkbox"/>
pH: _____	Cond (s/cm): _____	Iron Staining <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Water Clarity: <u>Clear</u> <input checked="" type="checkbox"/>	<u>Turbid</u> <input checked="" type="checkbox"/>	Bubbling <input type="checkbox"/>	Other <input type="checkbox"/>
Notes: <u>sl. turbid water</u> <u>w/g meter not available</u>			
Stream Morphology			
Site Length (m): <u>~200m</u>		Bank Stability:	
Channel Dimensions		Stable	Slightly unstable
Moderately unstable	Unstable		
Mean Wetted Width (m): <u>1.25</u>	Mean Bankfull Width (m): <u>2</u>	Left Bank <input type="checkbox"/>	<input checked="" type="checkbox"/>
Mean Wetted Depth (m): <u>0.10</u>	Mean Bankfull Depth (m): <u>0.35</u>	Right Bank <input type="checkbox"/>	<input checked="" type="checkbox"/>
Flow Description: <u>low flow -> in some areas no visible flow</u>			
Notes: <u>banks undercut in some areas causing slumping</u>			

Stream Morphology (continued)

Substrate (< = >)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Sa, Si > gr > Co > mk > bo

Notes:

Morphological Structure (%)

Pool	Riffle	Run	Flat
10	/	45	45

Habitat

Instream Cover (%) *40*

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	10	10	50	30		

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

emergents, grasses, algae

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

Trees 30 Shrubs 30 Man-made structures _____
 Grasses 30 Herbaceous 10 Other _____

Notes:

veg v. dense in some locations, sparser in others

Obstructions to Fish Passage

- No Obstructions Man-Made
- Natural

Description:

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

flat.

Terrestrial features Present

Yes

No

-ELC completed by JP

Terrestrial Recon Form Filled out

Yes

No

AECOM Sep 8/11

G105 - C89

Other General Comments Regarding the Study Area:

- Blue Heron observed
- no fish observed.

Photo log

Picture #	Description	Picture #	Description
1	North end stream	12	overview of end
2	site overview		
3	substrate		
4	1/3 of site		
5	site overview ^{reef}		
6	substrate		
7	overview of middle section		
8	overview "		
9	stream 1/2 site length		
10	pool		
11	end section of site		

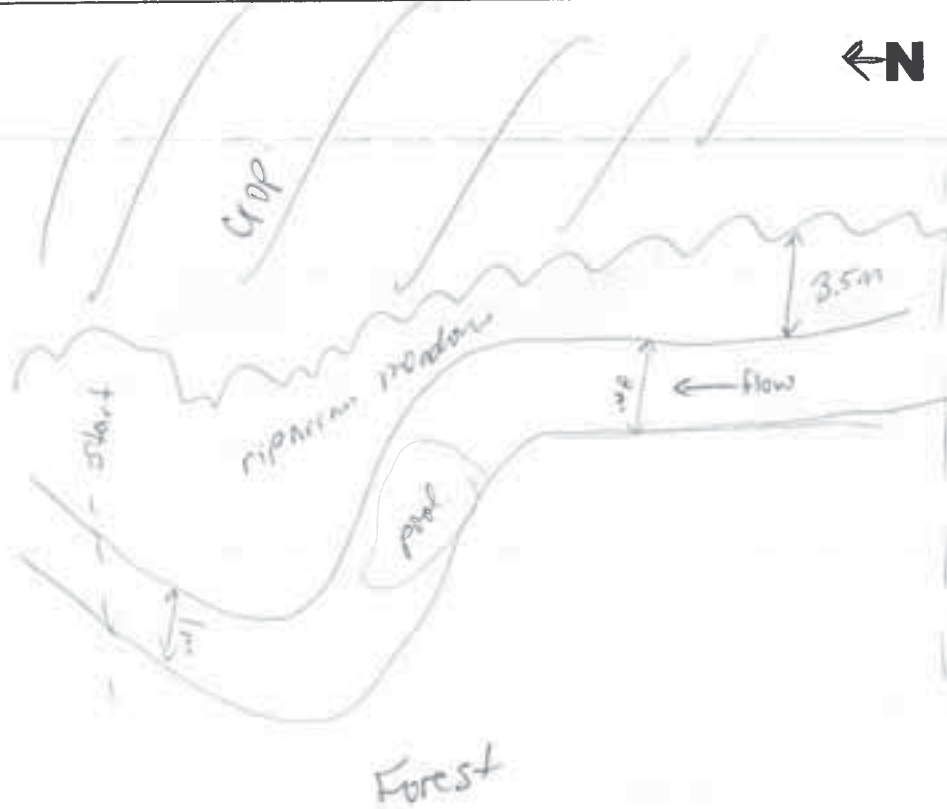
AECOM

GOS-089

Page 4 of 4

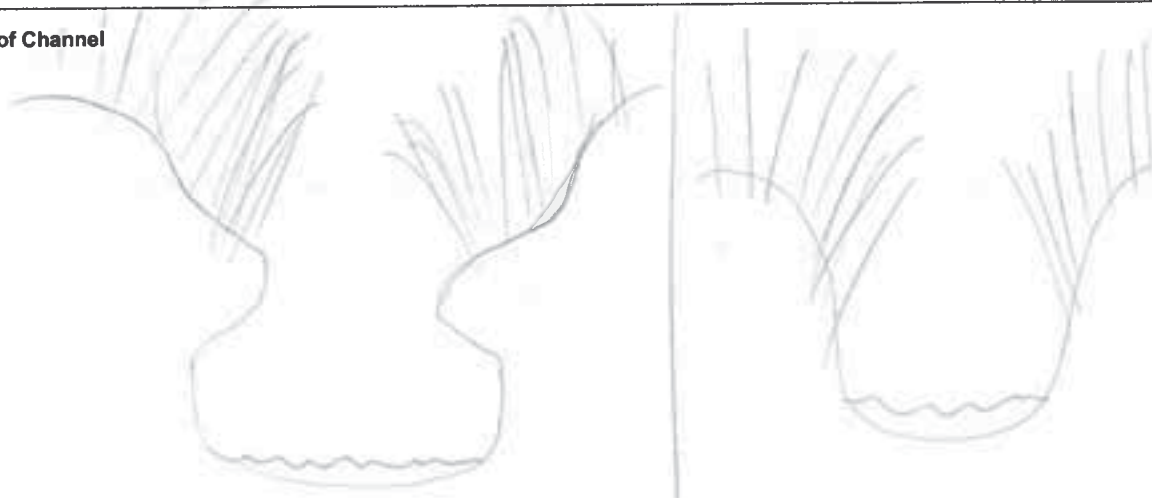
Watercourse Sketch

Study Area: Jericho Goshen Bluewater Land Parcel# 1062 Turbine # 089



LEGEND	
10d depth (cm)	6w width
→	Riffle
↔	Run/Glide
○	Pool
■	Island/Bar
○	Fine Substrate
###	Gravel Substrate
o o o o	Cobble/Boulder
• • •	Debris
CT	Cattail
SV/FV	Submerg/Float Veg
EV	Emergent
W	Watercress
Fe	Iron Staining
	Eroded Bank
xxx	Riprap / Other Stabilization
☐	Instream Log/Tree
^^^	Dam/Weir
⊙	Riparian Tree
↳	Seep/Spring
—	Undercut Bank
—	Barrier to Fish Movement
-S-	Seasonal Barrier
-x-x-	Fence line
┌	Culvert

Horizontal View of Channel



AECOM

Field Crew: CB, MO

General Information

Study Area: Jericho Goshier Bluewater Land Parcel# 1360, 1117 Turbine# C96
 Date: Dec 9/11 Start time: 9:45 End Time: 10:25

Weather Conditions: Light Snow Field Notes By: C. Boros

Site Location

Grasken Line, north of Pepper Rd. + roadside survey on west

UTM Co-ordinates

Easting: 0449987 Northing: 4803856 3m Description: wharf on East side
 Easting: Northing: Description:
 Easting: Northing: Description:
 Easting: Northing: Description:

Surrounding Landuse/Pollution Sources

Residential Meadow
 Agriculture Wetland
 Forest Livestock

Type of Watercourse

Intermittent Channelized
 Permanent Natural Channel
 Ephemeral

Other:

Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)

drainage from roadside ditch entering

In-Situ Water Quality

WT (°C): / AT (°C): /
 pH: / Cond (s/cm): /
 Water Clarity: Clear Turbid

Ground Water Indicators

Watercress Bank Seepage
 Iron Staining None
 Bubbling Other

Notes: no access to site so wq not completed

Stream Morphology

Site Length (m): 10m total, 3m west Bank Stability:

		Stable	Slightly unstable	Moderately unstable	Unstable
Channel Dimensions					
Mean Wetted Width (m):	<u>1.3</u>	Mean Bankfull Width (m):	<u>1.5</u>	Left Bank	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Mean Wetted Depth (m):	<u>0.3</u>	Mean Bankfull Depth (m):	<u>0.45</u>	Right Bank	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Flow Description: at outfall end of culvert flow into ocean causing erosion

Notes: good flow observed

Stream Morphology (continued)

Substrate (< = >)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Co = Sa = gr = fines

Notes:

Morphological Structure (%)			
Pool	Riffle	Run	Flat
	<i>10</i>	<i>90</i>	

Habitat

Instream Cover (%) *70*

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
		<i>25</i>	<i>25</i>	<i>40</i>	<i>10</i>	

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

grasses

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

- Trees *10*
- Grasses *80*
- Shrubs _____
- Herbaceous *10*
- Man-made structures _____
- Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions Natural
- Man-Made

Description:

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

barley flat

Terrestrial features Present Yes No

Terrestrial Recon Form Filled out Yes No

Other General Comments Regarding the Study Area:

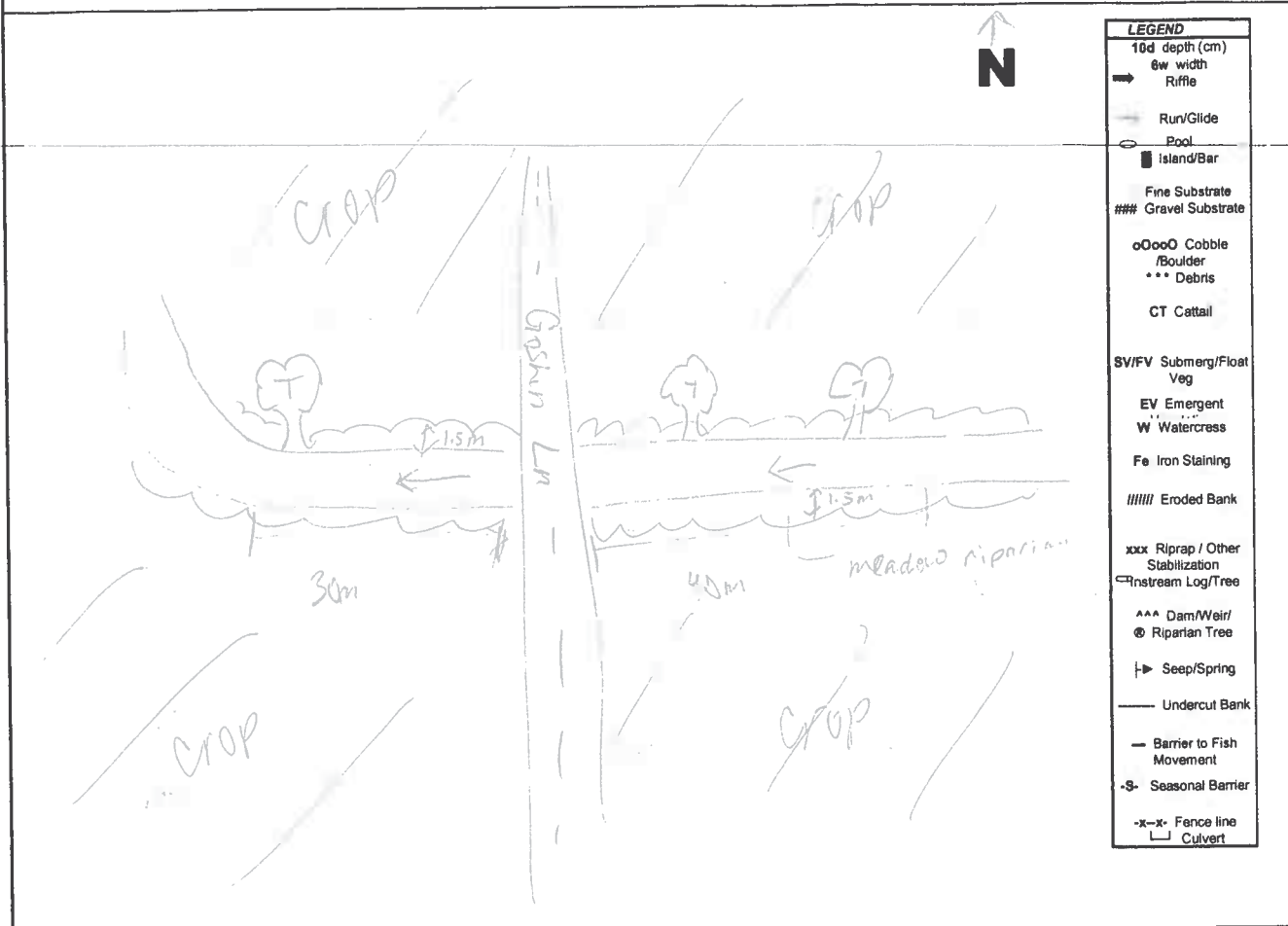
- Channelized features

Photo log

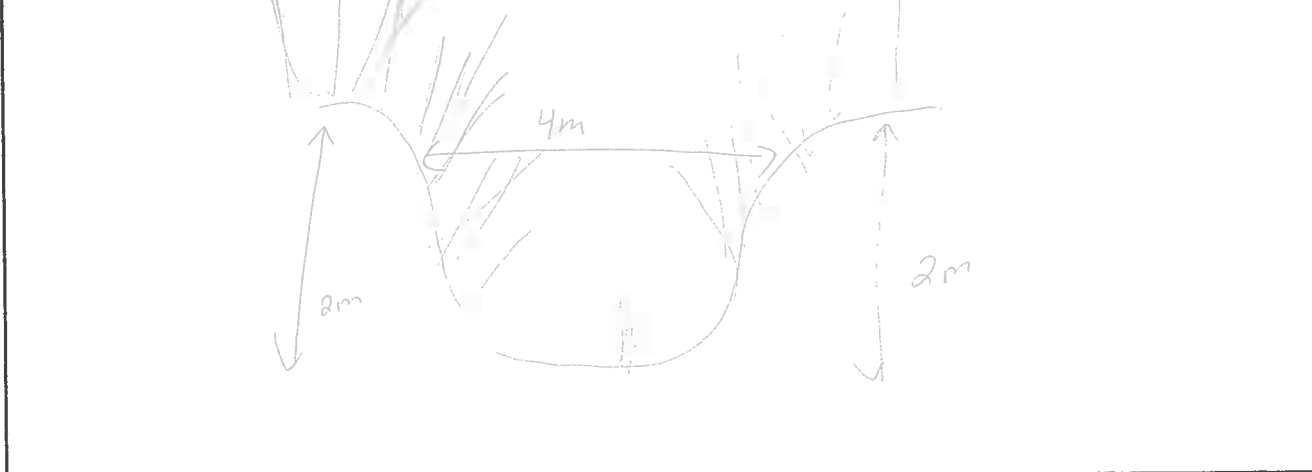
Picture #	Description	Picture #	Description
25	Looking East		
26	standing at culvert looking down East side		
27	Looking East		
28	Looking West		
29	Looking down at culvert		
30	Looking west		

Watercourse Sketch

Study Area: Jericho Goshen Bluewater Land Parcel# 1360, 1117 Turbine # C 96



Horizontal View of Channel



Property ID: C106 Roadside Date: Nov 18-2011

Property Access: Goshen Line Start Time: 1:30
End Time: 1:39

Field Investigators: Dalt + Ferris Weather: overcast, 0C

Terrestrial Feature Present: No Yes

Provide brief description of observations (i.e. hedgerow, treerow, woodlot, valleylands, deciduous vs coniferous, crop)

No feature

Photograph Numbers: _____

Aquatic Feature Present: No Yes

Provide brief description (i.e. drainage ditch, watercourse, intermittent, permanent)

No feature - just low lying
area

Photograph Numbers: 217

AECOM

Field Crew: CB, TS

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# 2098 Turbine # C119
 Date: Dec 15/11 Start time: 15:00 End Time: 15:40

Weather Conditions: Cloudy, 10°C Field Notes By: CB

Site Location

Pass Line, north of Huron

UTM Co-ordinates

Easting: 0453963 Northing: 4798803 Description: at stream
 Easting: Northing: Description:
 Easting: Northing: Description:
 Easting: Northing: Description:

Surrounding Landuse/Pollution Sources

Residential Meadow
 Agriculture Wetland
 Forest Livestock

Type of Watercourse

Intermittent Channelized - newly dug
 Permanent Natural Channel
 Ephemeral

Other:

Notes: (Include any inputs into the system i.e. tile drainage, seepages, overland flow)

- tile drain inputs noted

In-Situ Water Quality

WT (°C): 6.9 AT (°C): 10
 pH: 7.46 Cond $\mu\text{m/cm}$: 521
 Water Clarity: Clear Turbid

Ground Water Indicators

Watercress Bank Seepage
 Iron Staining None
 Bubbling Other

Notes: brown

Stream Morphology

Site Length (m): 50 m

Bank Stability:

Channel Dimensions

Mean Wetted Width (m):	<u>1.5</u>	Mean Bankfull Width (m):	<u>2.3</u>
Mean Wetted Depth (m):	<u>0.15</u>	Mean Bankfull Depth (m):	<u>0.45</u>

	Stable	Slightly unstable	Moderately unstable	Unstable
Left Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Flow Description: mod flow

Notes:

AECOM

Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Cl > Si >> Gr > Co

[Handwritten scribbles]

Morphological Structure (%)

Pool	Riffle	Run	Flat
		<i>100</i>	

Notes:

Instream Cover (%)

2

Habitat

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
			<i>PO</i>			

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

Canopy Cover (% closed cover):

- 100-90%
- 90-80%
- 80-30%
- 30-1%
- 0%

Types of Cover (% cover)

- Trees _____
- Grasses _____
- Shrubs _____
- Herbaceous _____
- Man-made structures _____
- Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

retched culvert at edge of property

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

flat

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

C110

AECOM

Other General Comments Regarding the Study Area:

- freshly dug out channel

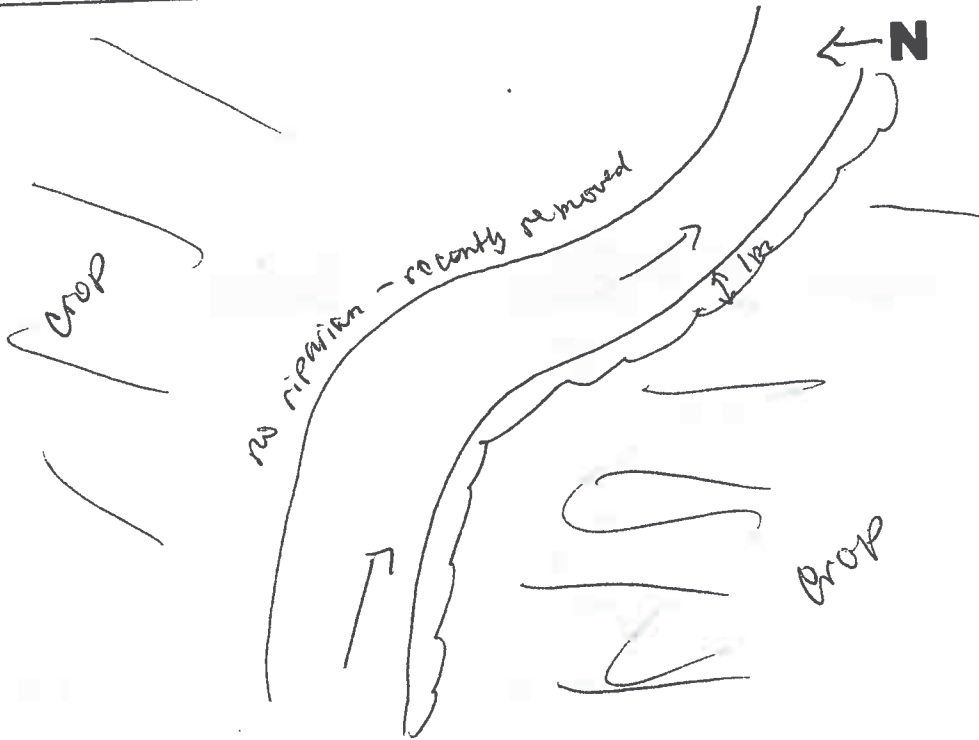
Photo log

Picture #	Description	Picture #	Description
70-75			

AECOM

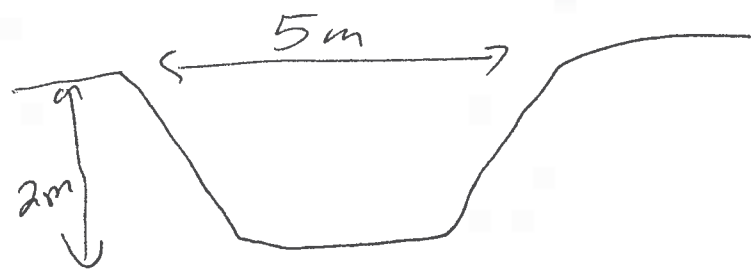
Watercourse Sketch

Study Area: Jericho Goshen Bluewater Land Parcel# 2098 Turbine # C110



LEGEND	
10d depth (cm)	
6w width	
Rifle	→
Run/Glide	—
Pool	○
Island/Bar	■
Fine Substrate	○
Gravel Substrate	■
Cobble/Boulder	oOoO
Debris	***
CT Canal	
BV/FV Submerg/Float Veg	
EV Emergent	
W Watercross	
Fe Iron Staining	
Eroded Bank	
Riprap / Other Stabilization	
Instream Log/Tree	—
Dam/Weir	***
Riparian Tree	●
Seep/Spring	↳
Undercut Bank	—
Barrier to Fish Movement	—
Seasonal Barrier	-B-
Fence line	-x-x-
Culvert	—

Horizontal View of Channel



C124

AECOM

Field Crew: SA, BG

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# 1758 Turbine # GE24

UTM Co-ordinates: Easting: 447599 Northing: 4795595

Date: July 14/2011 Start time: 12:20 End Time: 13:10

Weather Conditions: Sunny ~28°C Field Notes By: SA

Site Location

Surrounding Landuse/Pollution Sources

Residential Meadow
Agriculture Wetland
Forest

Type of Watercourse

Intermittent Channelized
Permanent Natural Channel
Ephemeral

Notes: (Include any Inputs into the system i.e. tile drainage, seepages, overland flow)

In-Situ Water Quality

WT (°C) _____ AT (°C) _____
pH _____ Cond (us/cm) _____
Water Clarity: Clear
Turbid

Ground Water Indicators

Watercress Bubbling None
Iron Staining Bank Seepage Other

Notes: NO WQ.
standing water, no flow

Stream Morphology

Site Length (m): _____

Bank Stability:

Channel Dimensions

Mean Wetted Width (m):	<u>0.30</u>	Mean Bankfull Width (m):	<u>1.25</u>
Mean Wetted Depth (m):	<u>0.05</u>	Mean Bankfull Depth (m):	<u>0.50</u>

Stable Slightly unstable Moderately unstable Unstable

Left Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Bank	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Notes: well vegetated banks

Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- Other

Description

Sa = Si

Morphological Structure (%)

Pool	Riffle	Run	Flat

Notes:

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
				100		

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

Canopy Cover (% closed cover):

100-90%	<input type="checkbox"/>	30-1%	<input type="checkbox"/>
90-60%	<input checked="" type="checkbox"/>	0%	<input type="checkbox"/>
60-30%	<input type="checkbox"/>		

Types of Cover (% cover)

Trees	Shurbs	30	Man-made structures
Grasses	Herbaceous	30	Other

Notes:

Jewelweed, WC, grasses
Sycamore, Virginia creeper, golden rods

Obstructions to Fish Passage

No Obstructions	<input type="checkbox"/>	Man-Made	<input type="checkbox"/>
Natural	<input type="checkbox"/>		

Description:

low flow

Drainage Features within Study Area

Observations of Land Topography:

flat

Terrestrial features present:

Yes

No

Other Comments:

Photolog

Picture #	Description	Picture #	Description

Watercourse Sketch

Study Area: Jericho Goshen Bluewater Land Parcel# 1758 Turbine # 0239

C124
0239

Corn.


Forest



Cattail channel

LEGEND

- 10d depth (cm)
- Sw width
- Riffle
- Run/Glide
- Pool
- ◻ Island/Bar
- Fine
- ### Gravel
- Substrate
- oOooO Cobble
- / Boulder
- *** Debris
- CT Cattail
- SV/FV Submerg/Float
- EV Emergent
- W Watercress
- Fe Iron Staining
- ||||| Eroded Bank
- xxx Riprap / Other
- Instream Log/Tree
- AAA Dam/Weir/
- ⊗ Riparian Tree
- ↳ Seep/Spring
- Undercut Bank
- Barrier to Fish Movement
- S- Seasonal Barrier
- x-x- Fence
- Culvert



Horizontal View of Channel



- 33 overview
- 34 Over view
- 35 faeing vls
- 36 faeing dls
- 37 Water cress
- 38 cattails

C124

AECOM		Page 1 of 4	
Field Crew: <i>CB, TS</i>			
General Information			
Study Area: Jericho <i>Goshen</i> Bluewater	Land Parcel#: <i>1758</i>	Turbine #: <i>045-044</i>	
Date: <i>Sept 27/11</i>	Start time: <i>16:00</i>	End Time: <i>16:45</i>	
Weather Conditions: <i>Sunny, 17°C (last 24hrs 10mm rain)</i>		Field Notes By: <i>CB</i>	
Site Location			
<i>East of Blackwash Ln, North of Kirkton</i>			
UTM Co-ordinates			
Easting: <i>0447510</i>	Northing: <i>4795818</i>	Description: <i>West end of site</i>	
Easting: <i>0447975</i>	Northing: <i>4796057</i>	Description: <i>east end of site</i>	
Easting:	Northing:	Description:	
Easting:	Northing:	Description:	
Surrounding Landuse/Pollution Sources		Type of Watercourse	
Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Channelized <input checked="" type="checkbox"/>
Agriculture <input checked="" type="checkbox"/> <i>west end</i>	Wetland <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Natural Channel <input type="checkbox"/>
Forest <input checked="" type="checkbox"/> <i>one side agri on other</i>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	
Other:			
Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow) <i>- no tile inputs observed however still possible</i> <i>→ although channel flows through a forest it appears to be channelized</i> <i>↳ evidence of dredging seen could be interpreted through new ground forest adjacent to channel</i>			
In-Situ Water Quality		Ground Water Indicators	
WT (°C): <i>11°C</i>	AT (°C): <i>17°C</i>	Watercress <input checked="" type="checkbox"/> <i>a</i>	Bank Seepage <input type="checkbox"/>
pH: <i>/</i>	Cond (s/cm): <i>/</i>	Iron Staining <input type="checkbox"/>	None <input type="checkbox"/>
Water Clarity: Clear <input checked="" type="checkbox"/>	Turbid <input type="checkbox"/>	Bubbling <input type="checkbox"/>	Other <input type="checkbox"/>
Notes: <i>agri - water clean, watercress noted</i> <i>forest - water clean</i>			
Stream Morphology			
Site Length (m): <i>~75m agri ~300+m forest</i>		Bank Stability:	
Channel Dimensions		Stable	Slightly unstable
Mean Wetted Width (m):	<i>a f</i> <i>1.5 1.5</i>	Mean Bankfull Width (m):	<i>a f</i> <i>2.5 2.5</i>
Mean Wetted Depth (m):	<i>0.2 0.15</i>	Mean Bankful Depth (m):	<i>0.6 0.55</i>
		Left Bank	Right Bank
		<i>f</i> <input checked="" type="checkbox"/> <i>a</i>	<i>f</i> <input checked="" type="checkbox"/> <i>a</i>
		<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>
Flow Description: <i>→ in some areas of the forest the banks were not vegetated so minor erosion occurring</i>			
Notes: <i>→ visible flow</i>			

AECOM

Stream Morphology (continued)

Substrate (< = >)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

both
Si, Cl, dt; sa > gr > co, bo
sna

forest
~~both~~

Morphological Structure (%)			
Pool	Riffle	Run	Flat
	10	70	20

Notes:

- riffle areas appeared to be due to built up of stone + debris → no run or pool necessarily followed

agri
80-run
20-flat

Habitat

Instream Cover (%) agr - 40% forest - 50%

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other: <u>detritus</u>
	a=5 f=10	f=5	f=5	a=95 f=70		f=10

***Aquatic Vegetation Types Present (algae, submergent, emergent etc.)**

emergent, submergent, grasses, shrubs in stream

Canopy Cover (% closed cover):

- 100-90% 30-1%
 90-80% f 0%
 60-30% a

Types of Cover (% cover)

- Trees f=50 Shrubs f=30
 Grasses a=30 Herbaceous f=10
 Man-made structures _____
 Other _____

Notes:

as the stream ran through the forest it had open canopy + meadow surrounding it with mature forest further out.

Obstructions to Fish Passage

- No Obstructions Man-Made
 Natural

Description: Culverts not perched

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

- flat

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

→ sent for adjacent property

C124

AECOM Sep 27/11

~~AMS 611~~

Page 3 of 4

Other General Comments Regarding the Study Area:

Forested section of stream seemed to be trenched

Photo log

Picture #	Description	Picture #	Description
96	Field Portion of Stream	107	"
97	Thick veg. in stream channel	108	"
98	Watercres in stream channel	109	"
99	open canopy along stream channel	110	"
100	Thick veg. along stream channel	111	"
101	Culvert at stream crossing		
102	Culvert at stream crossing		
103	Closed canopy / stream channel		
104	open canopy stream channel		
105	Stream channel		
106	thick veg. along stream channel		

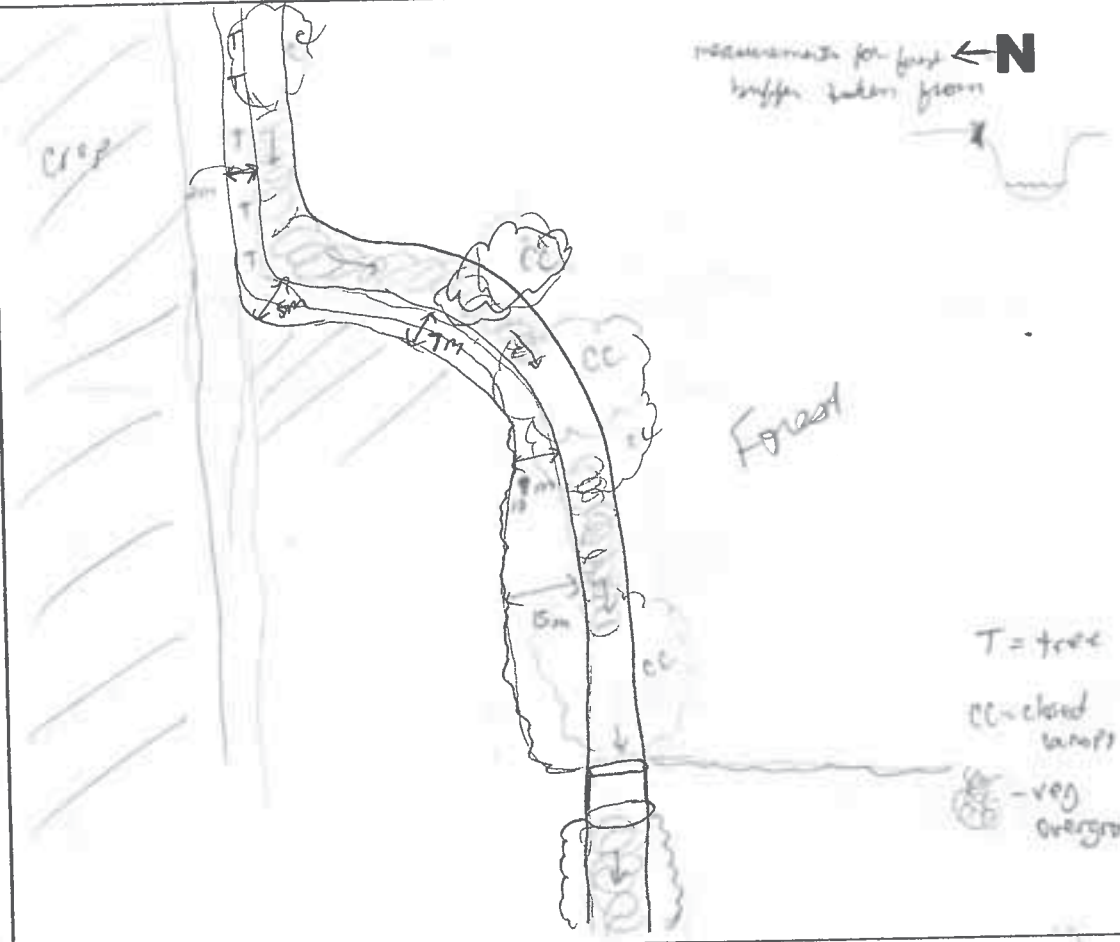
0124

AECOM

Watercourse Sketch

Study Area: Jericho Goshen Bluewater Land Parcel# 1758 Turbine # ~~6115 044~~

LEGEND	
100	depth (cm)
8w	width
→	Rifle
—	Run/Glide
○	Pool
■	Island/Bar
	Fine Substrate
###	Gravel Substrate
o	Cobble
o	Boulder
•••	Debris
CT	Cattail
SV/FV	Submerg/Float Veg
EV	Emergent
W	Watercress
Fe	Iron Staining
	Eroded Bank
xxx	Riprap / Other Stabilization
—	Instream Log/Tree
AAA	Dam/Weir
⊙	Riparian Tree
↳	Seep/Spring
—	Undercut Bank
—	Barrier to Fish Movement
-S-	Seasonal Barrier
-x-x-	Fence line
┌	Culvert



Horizontal View of Channel



AECOM

Field Crew: Ferris + Dart

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# 6SH1758 Turbine # C124
 Date: Nov 18 2011 Start time: 12:50 End Time: 13:20

Weather Conditions: C124 Field Notes By: Dart

Site Location: Blackbush

UTM Co-ordinates

Easting: 446990 Northing: 4795732 Description: C124
 Easting: Northing: Description:
 Easting: Northing: Description:
 Easting: Northing: Description:

Surrounding Landuse/Pollution Sources

Residential Meadow
 Agriculture Wetland
 Forest Livestock

intermittent Channelized
 Permanent Natural Channel
 Ephemeral

Other:

Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)

Agriculture on both sides.

In-Situ Water Quality

WT (°C): 5.2 AT(°C): 0°C
 pH: 7.02 Cond (µs/cm): 635
 Water Clarity: Clear Turbid

Ground Water Indicators

Watercress Bank Seepage
 Iron Staining None
 Bubbling Other

Notes: water chem taken east of road D/S of tile drain.
WC @ tile drains ups + d/s + throughout reach

Stream Morphology

Site Length (m):
Bank Height: 1.6m Bank width 4.0m
 Channel Dimensions
 Mean Wetted Width (m): 1.3 Mean Bankfull Width (m): 2.5
 Mean Wetted Depth (m): 0.06 Mean Bankfull Depth (m): 0.80

		Stable	Slightly unstable	Moderately unstable	Unstable
Left Bank		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Right Bank		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Flow Description:

Flowing west ~ 65/m

4 tile drains east of road - only 2 flowing (perched)

CSP not perched under road

vegetated banks grass + cattails Buffer on top of bank

~ 3m south side, 1.5m north side.

AECOM

Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

Si > Cl > Sa

Notes:

Morphological Structure (%)

Pool	Riffle	Run	Flat
10		70	20

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
				90%		

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

watercress + cattail

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

- Trees 10
- Grasses 80
- Shrubs _____
- Herbaceous _____
- Man-made structures _____
- Other _____

Notes:

very few trees - small diameter - seasonal overhanging grass

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

some woody debris, but still passage

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

Flat

Terrestrial features Present

Yes

No

Terrestrial Recon Form Filled out

Yes

No

AECOM

Page 3 of 4

Other General Comments Regarding the Study Area:

Photo log			
Picture #	Description	Picture #	Description
197- 203	C124 v/s + d/s of road		
204	WC		
211	C124 v/s		

C124

AECOM

Watercourse Sketch

Study Area:

Jericho

Goshen

Bluewater Land Parcel#

GSH1758

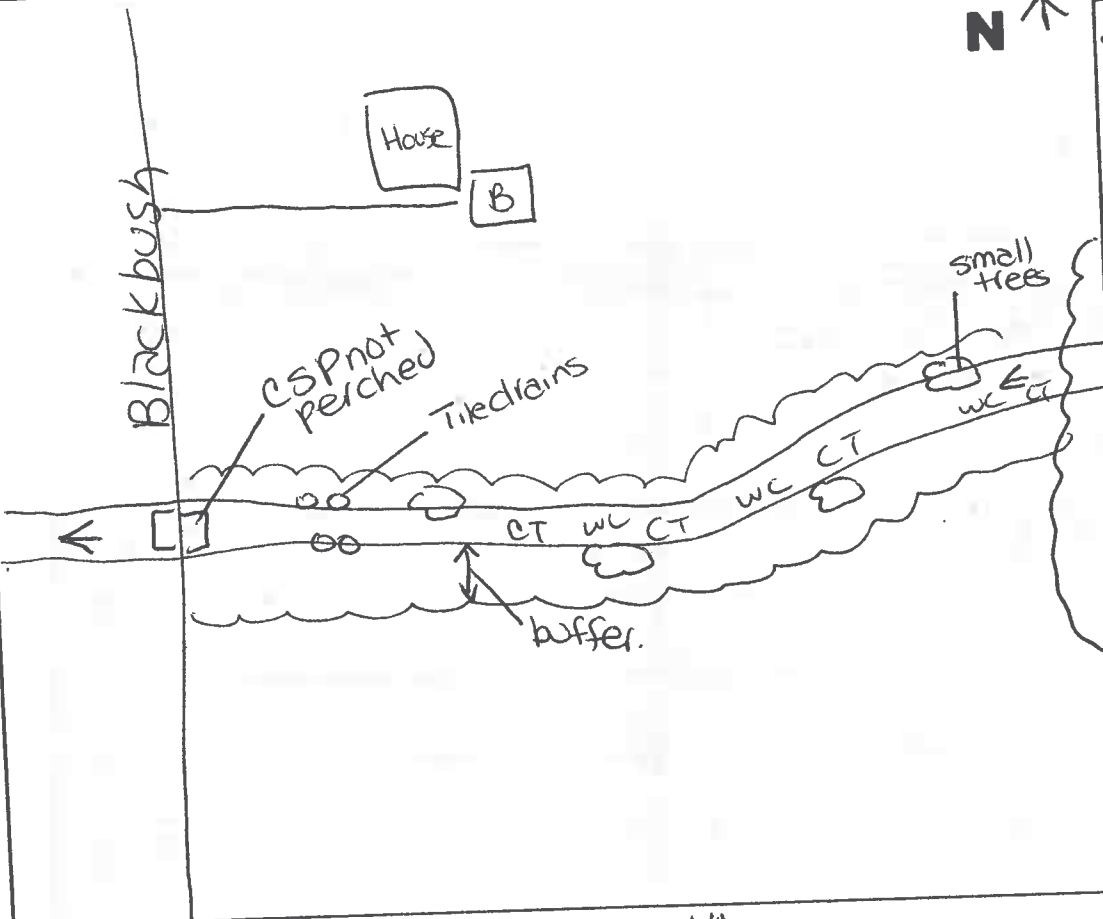
Turbine #

C124

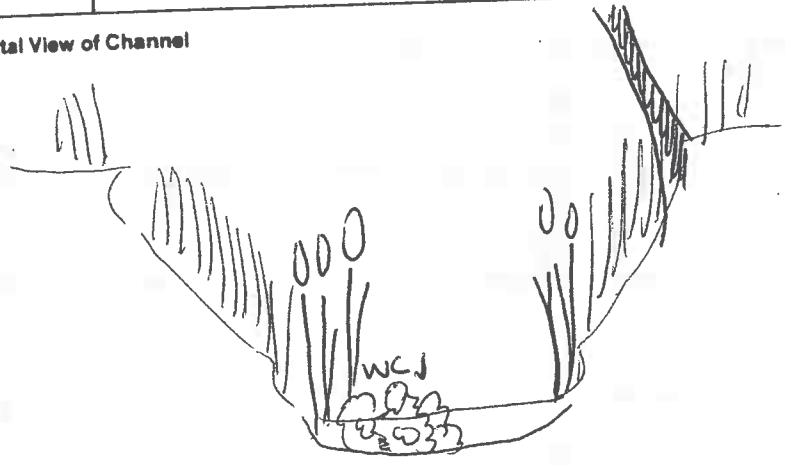


LEGEND	
10d depth (cm)	→
6w width	→
Rifle	→
Run/Glide	—
Pool	○
Island/Bar	■
Fine Substrate	○
Gravel Substrate	■
Cobble/Boulder	○
Debris	***
Cattail	CT
Submerg/Float Veg	SV/FV
Emergent	EV
Watercress	W
Iron Staining	Fe
Eroded Bank	
Riprap / Other Stabilization	xxx
Instream Log/Tree	—
Dam/Weir	***
Riparian Tree	●
Seep/Spring	↳
Undercut Bank	—
Barrier to Fish Movement	—
Seasonal Barrier	-B-
Fence line	-x-x-
Culvert	—

CT = cattail
WC = watercress



Horizontal View of Channel



Gaston

Property ID: 2133, 2141 (C127) Date: Dec 9/11

Property Access: ROE Start Time: 14:30

End Time: 15:10

Field Investigators: CB, MO Weather: Light Snow

Terrestrial Feature Present: No Yes

Provide brief description of observations (i.e. hedgerow, treerow, woodlot, valleylands, deciduous vs coniferous, crop)

Photograph Numbers: _____

Aquatic Feature Present: No Yes

GPS 0451942, 4795260 ^{±3m}
↳ start of watercourse

Provide brief description (i.e. drainage ditch, watercourse, intermittent, permanent)

- agri field tile drained, outfall of tile
drainage is ~ 125m from tree line
↳ watercourse then channelized, ~2m MWW, MWD = 0.25
MBD = 0.75 MSW = 3m
high aquatic veg, tile drains fish
passage obstructed

Photograph Numbers: _____
Canit on back →

-walked Alt 3 line - no features observed

Pics

70 - from Kirkton towards 2133 (watercourse area)

71 - from tree line towards 2141

72 - "

73 - start of watercourse

74 - watercourse

75 - " - not watercourse

76 - like drain inputs

77 - Alt 3 area towards Kirkton

- Spoke w man who had a "Honey do Maintenance" truck
↳ asked what we were doing but did not seem interested
only interested

AECOM

Field Crew: DART + Ferris

General Information

Study Area: Jericho Goshen Bluewater Land Parcel# GSH1509 Turbine # C137
 Date: 18 NOV 2011 Start time: 10:00 End Time: 11:00

Weather Conditions: Sunny, 0C Field Notes By: DART

Site Location: C137

UTM Co-ordinates

Easting: <u>446121</u>	Northing: <u>4791967</u>	Description: <u>C137a. Start</u> (wetland west wood)
Easting: <u>446379</u>	Northing: <u>4791907</u>	Description: <u>C137b. Start</u> (west wood)
Easting: <u>446495</u>	Northing: <u>4791827</u>	Description: <u>C137c. end of wood section</u> (end of wood section)
Easting: _____	Northing: _____	Description: _____

Surrounding Landuse/Pollution Sources

Residential Meadow
 Agriculture Wetland
 Forest Livestock

Type of Watercourse

Intermittent Channelized
 Permanent Natural Channel
 Ephemeral

Other: _____

Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)

In-Situ Water Quality

WT (°C): 2.9 AT (°C): 0C
 pH: 7.01 Cond (µs/cm): 675
 Water Clarity: Clear Turbid

Ground Water Indicators

Watercress Bank Seepage
 Iron Staining None
 Bubbling Other

Notes: water chem. taken @ C137a

Stream Morphology

Site Length (m): FIELD Bank Stability: Field
 Bank Height: 2.7 Bank Width: 50
 Channel Dimensions:

Mean Wetted Width (m): <u>2.30</u>	Mean Bankfull Width (m): <u>2.9</u>	Left Bank	Stable <input type="checkbox"/>	Slightly unstable <input checked="" type="checkbox"/>	Moderately unstable <input checked="" type="checkbox"/>	Unstable <input type="checkbox"/>
Mean Wetted Depth (m): <u>0.30</u>	Mean Bankfull Depth (m): <u>1.3</u>	Right Bank	Stable <input type="checkbox"/>	Slightly unstable <input checked="" type="checkbox"/>	Moderately unstable <input checked="" type="checkbox"/>	Unstable <input type="checkbox"/>

Flow Description:

Field = Flowing south/west ~ 65/m. Hard pan clay streambed
 Woods = Flowing south/west ~ 85/m.

Notes:

vegetated banks through field section - grasses w some trees
exposed clay banks - eroding - near stream level

Woods: banks having some exposed soil - Mostly tree.

AECOM

Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

In field G | S | S
 In woods S | G | S

Morphological Structure (%)			
Pool	Riffle	Run	Flat

Notes:

In Field = 30% Riffle 60% Run 10% Flat
 In woods = 30% Riffle 50% Run 20% Flat

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:

***Aquatic Vegetation Types Present (algae, submergent, emergent etc.)**

WOODS = woody debris = 3%
 Field = woody debris = 7%, undercut bank = 50% of banks were undercut

Canopy Cover (% closed cover):

- 100-90%
- 90-80%
- 80-30%
- 30-1%
- 0%

Types of Cover (% cover)

- Trees _____
- Grasses _____
- Shrubs _____
- Herbaceous _____
- Man-made structures _____
- Other _____

Notes:

WOODS - 100-90% = Seasonal trees (100%)
 Field - 80-30% = 50% shrub, 50% grass

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

woody debris, but not a complete barrier

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

Flat - slight slope from east

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

within WOODLOT, none seen in field

C137

Other General Comments Regarding the Study Area:

Didn't continue further than C137c (east edge woodlot) as it was uniform throughout reach.

Photo log

Picture #	Description	Picture #	Description
164- 166	C137a		
167- 171-	stretch b/w C137a + Tile Drain		
171- 173	tile drain corner b/w C137a + b		
174- 175	east end of C137a		
176 177	in woodlot		
178- 180	in woodlot		

C137

AECOM

Watercourse Sketch

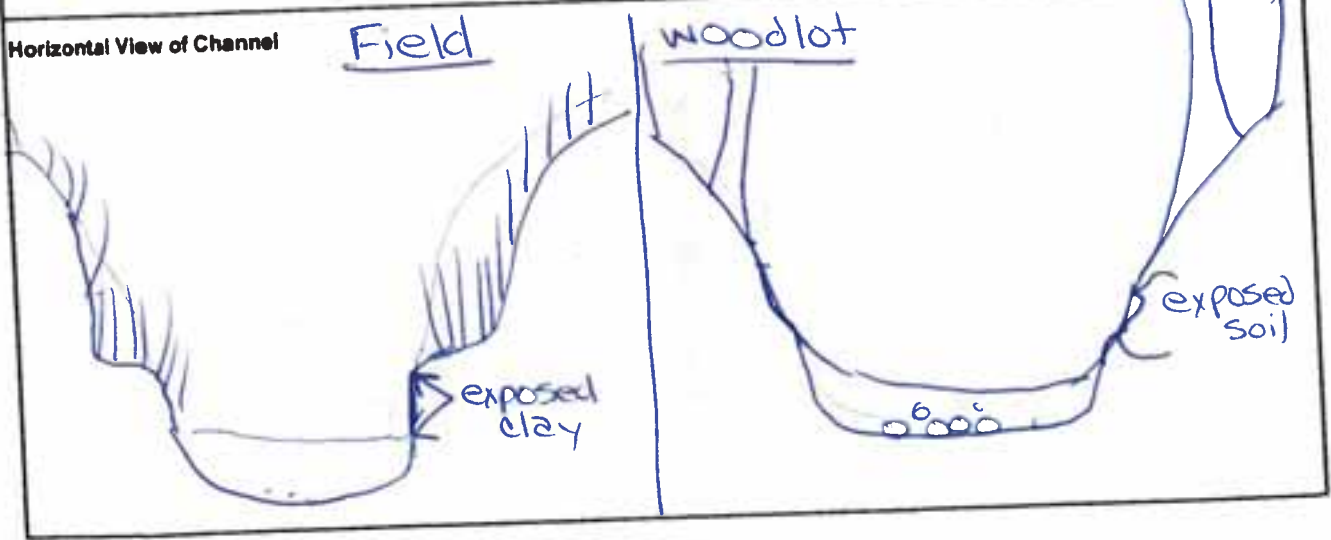
Study Area: Jericho Goshen Bluewater Land Parcel# GSH1509 turbine # C137



LEGEND	
10d depth (cm)	6w width
→	Riffle
—	Run/Glide
○	Pool
■	Island/Bar
—	Fine Substrate
≡≡≡	Gravel Substrate
○	Cobble
○	Boulder
•••	Debris
CT	Cattail
SV/FV	Submerg/Float Veg
EV	Emergent
W	Weir/cross
Fe	Iron Staining
	Eroded Bank
xxx	Riprap / Other Stabilization
—	Instream Log/Tree
▲▲▲	Dam/Weir
●	Riparian Tree
↳	Seep/Spring
—	Undercut Bank
—	Barrier to Fish Movement
-B-	Seasonal Barrier
-x-x-	Fence line
—	Stream



Horizontal View of Channel



C139

AECOM Page 1 of 4
 Field Crew: A Dart, G. Ferris

General Information
 Study Area: Jericho Goshen Bluewater Land Parcel# 65H2163 Turbine # [C139A]
 Date: 18-NOV-2011 Start time: 8:20 End Time: 8:50

Weather Conditions: Sunny 1°C Field Notes By: DART.

Site Location: C139

UTM Co-ordinates

Easting: <u>452411</u>	Northing: <u>4792445</u>	Description: <u>C139A</u>
Easting: <u>451982</u>	Northing: <u>4792648</u>	Description: <u>C139B</u>
Easting: _____	Northing: _____	Description: _____
Easting: _____	Northing: _____	Description: _____

Surrounding Landuse/Pollution Sources

Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Channelized <input checked="" type="checkbox"/>
Agriculture <input checked="" type="checkbox"/>	Wetland <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Natural Channel <input type="checkbox"/>
Forest <input type="checkbox"/>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	

Other: _____

Notes: (include any inputs into the system i.e. tile drainage, seepages, overland flow)
Agri. field both sides of creek

In-Situ Water Quality		Ground Water Indicators	
WT (°C): <u>2.4</u>	AT (°C): <u>1.0</u>	Watercress <input type="checkbox"/>	Bank Seepage <input type="checkbox"/>
pH: <u>7.01</u>	Cond (µ/cm): <u>725</u>	Iron Staining <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Water Clarity: Clear <input type="checkbox"/>	Turbid <input checked="" type="checkbox"/>	Bubbling <input type="checkbox"/>	Other <input type="checkbox"/>

Notes: Both tile drain flowing

Stream Morphology

Site Length (m): _____
 Bank Height: 5m, Bank width: ~20m

Channel Dimensions		Bank Stability:			
		Stable	Slightly unstable	Moderately unstable	Unstable
Mean Wetted Width (m): <u>3.5</u>	Mean Bankfull Width (m): <u>6.5</u>	Left Bank <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mean Wetted Depth (m): <u>0.75</u>	Mean Bankfull Depth (m): <u>1.5</u>	Right Bank <input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Flow Description:
Flowing south. 11sec/1m
 Tile drain discharges into channel @ C139A - flowing
 Notes: and @ C139B - north bank on both
vegetated banks w grasses + shrubs - the odd tree
~ 1.5m wide buffer on top of bank

AECOM

Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

S1 > C1

Morphological Structure (%)			
Pool	Riffle	Run	Flat
			100

Notes:

Habitat

Instream Cover (%)

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
					2%	15% overhanging shrubs + grasses

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

- Trees 100% of cover is tree
- Grasses _____
- Shrubs _____
- Herbaceous _____
- Man-made structures _____
- Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions
- Natural
- Man-Made

Description:

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

Family flat, but slope from S/W!

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

C57

AECOM

C139

Page 3 of 4

Other General Comments Regarding the Study Area:

Photo log			
Picture #	Description	Picture #	Description
146-150	C139A (TD)		
151-154	C139B (TD)		

C57

AECOM

Watercourse Sketch

C139
C587

Study Area:

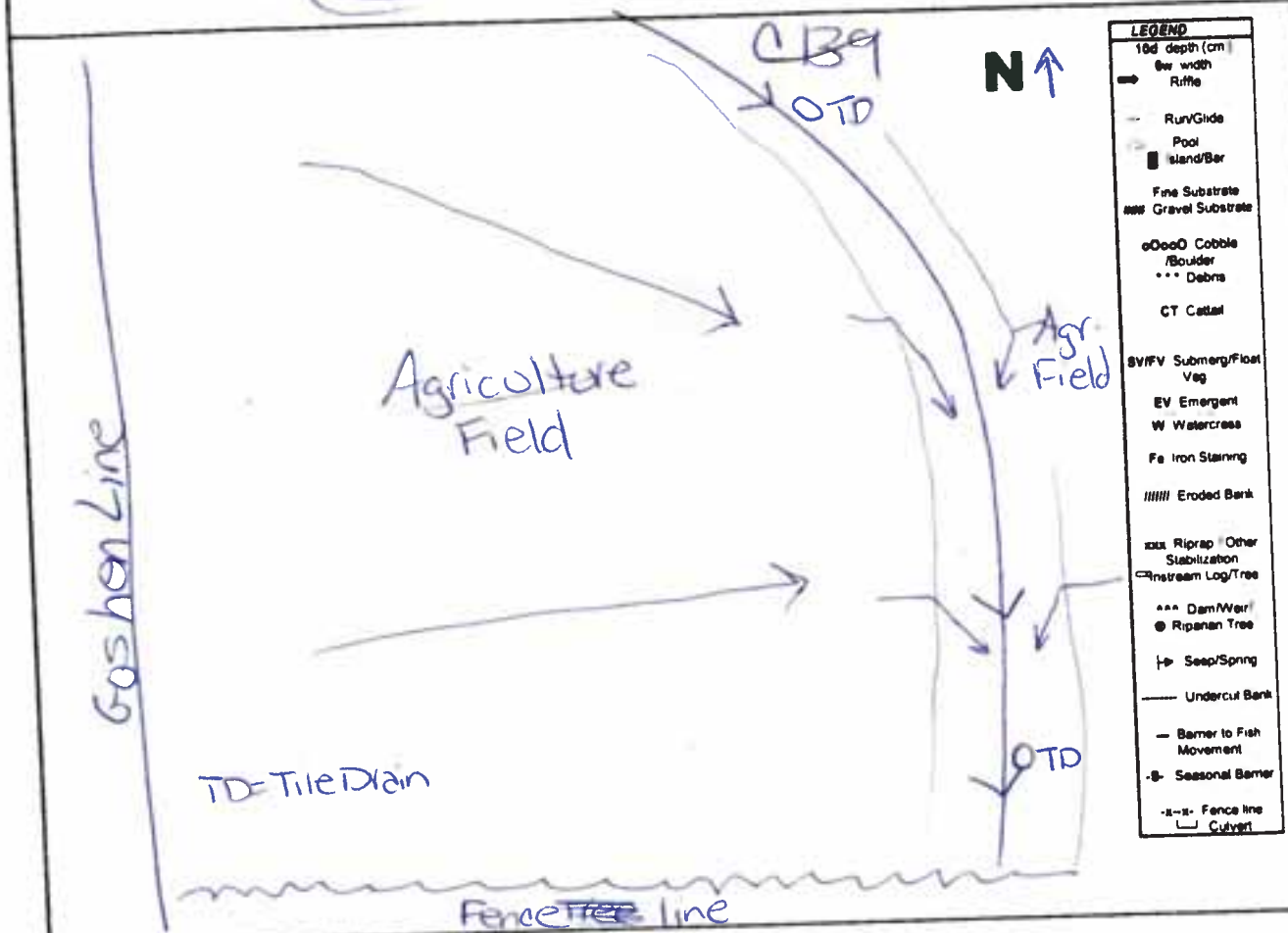
Jencho

Goshen

Bluewater Land Parcel#

GSH2163

Turbine #



Horizontal View of Channel



C139

AECOM		Page 1 of 4	
		Field Crew: <u>CB, AS</u>	
General Information			
Study Area: Jericho <u>Goshen</u> Bluewater	Land Parcel# <u>2162</u>	Turbine # <u>620 157</u>	
Date: <u>Oct 6/11</u>	Start time: <u>8:19</u>	End Time: <u>9:00</u>	
Weather Conditions:		Field Notes By: <u>CB</u>	
Site Location			
east of Goshen, South of Crediton			
UTM Co-ordinates			
Easting: <u>0451786</u>	Northing: <u>4793121</u>	Description: <u>North end</u>	start end
Easting: <u>0451857</u>	Northing: <u>4792794</u>	Description: <u>South of bridge</u>	
Easting: _____	Northing: _____	Description: _____	
Surrounding Landuse/Pollution Sources		Type of Watercourse	
Residential <input type="checkbox"/>	Meadow <input type="checkbox"/>	Intermittent <input type="checkbox"/>	Channelized <input checked="" type="checkbox"/>
Agriculture <input checked="" type="checkbox"/>	Wetland <input type="checkbox"/>	Permanent <input checked="" type="checkbox"/>	Natural Channel <input type="checkbox"/>
Forest <input type="checkbox"/>	Livestock <input type="checkbox"/>	Ephemeral <input type="checkbox"/>	
Other: _____			
Notes: (Include any inputs into the system i.e. tile drainage, seepages, overland flow)			
<u>- tile drains noted</u>			
In-Situ Water Quality		Ground Water Indicators	
WT (°C): _____	AT (°C): _____	Watercress <input type="checkbox"/>	Bank Seepage <input type="checkbox"/>
pH: <u>/</u>	Cond (s/cm): <u>/</u>	Iron Staining <input type="checkbox"/>	None <input checked="" type="checkbox"/>
Water Clarity: Clear <input type="checkbox"/>	Turbid <input checked="" type="checkbox"/>	Bubbling <input type="checkbox"/>	Other <input type="checkbox"/>
Notes: <u>water turbid but could see the bottom in some locations</u>			
Stream Morphology			
Site Length (m): <u>~ 200 250m</u>		Bank Stability:	
Channel Dimensions		Stable	Slightly unstable
Mean Wetted Width (m): <u>2.5</u>	Mean Bankfull Width (m): <u>3</u>	Moderately unstable	Unstable
Mean Wetted Depth (m): <u>0.3</u>	Mean Bankfull Depth (m): <u>0.9</u>	Left Bank <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
		Right Bank <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Flow Description: <u>→ moderate flow</u>			
Notes: <u>→ some bank slumping + erosion</u>			

AECOM

Stream Morphology (continued)

Substrate (<=>)

- Bo - Boulder
- Co - Cobble
- Gr - Gravel
- Sa - Sand
- Si - Silt
- Cl - Clay
- MK - Muck
- DT - Detritus
- Other

Description

si, cl >> mk, dt

Morphological Structure (%)			
Pool	Riffle	Run	Flat
/	/	100	/

Notes:

Habitat

Instream Cover (%)

40

None	Woody Debris	Boulders	Cobble	Aquatic Vegetation*	Undercut Bank	Other:
	10			85		detritus / log bank
						5

*Aquatic Vegetation Types Present (algae, submergent, emergent etc.)

emergents, grasses

Canopy Cover (% closed cover):

- 100-90%
- 90-60%
- 60-30%
- 30-1%
- 0%

Types of Cover (% cover)

- Trees 20
- Grasses 30
- Shrubs 50
- Herbaceous _____
- Man-made structures _____
- Other _____

Notes:

Obstructions to Fish Passage

- No Obstructions Natural
- Man-Made

Description:

Drainage Features within Study Area

Observations of Land Topography within 120 m buffer area:

- flat

Terrestrial features Present

Yes No

Terrestrial Recon Form Filled out

Yes No

CS7

AECOM

C139

Page 3 of 4

Other General Comments Regarding the Study Area:

- bridge where proposed road is

Photo log			
Picture #	Description	Picture #	Description
269	overview	281	taken south of bridge.
270	stream +		
271	channel		
272	"		
273	aquatic veg		
274	landuse		
275	stream		
276	" w/ + veg		
277	"		
278	Bridge - channel N		
280	" " S		

C57

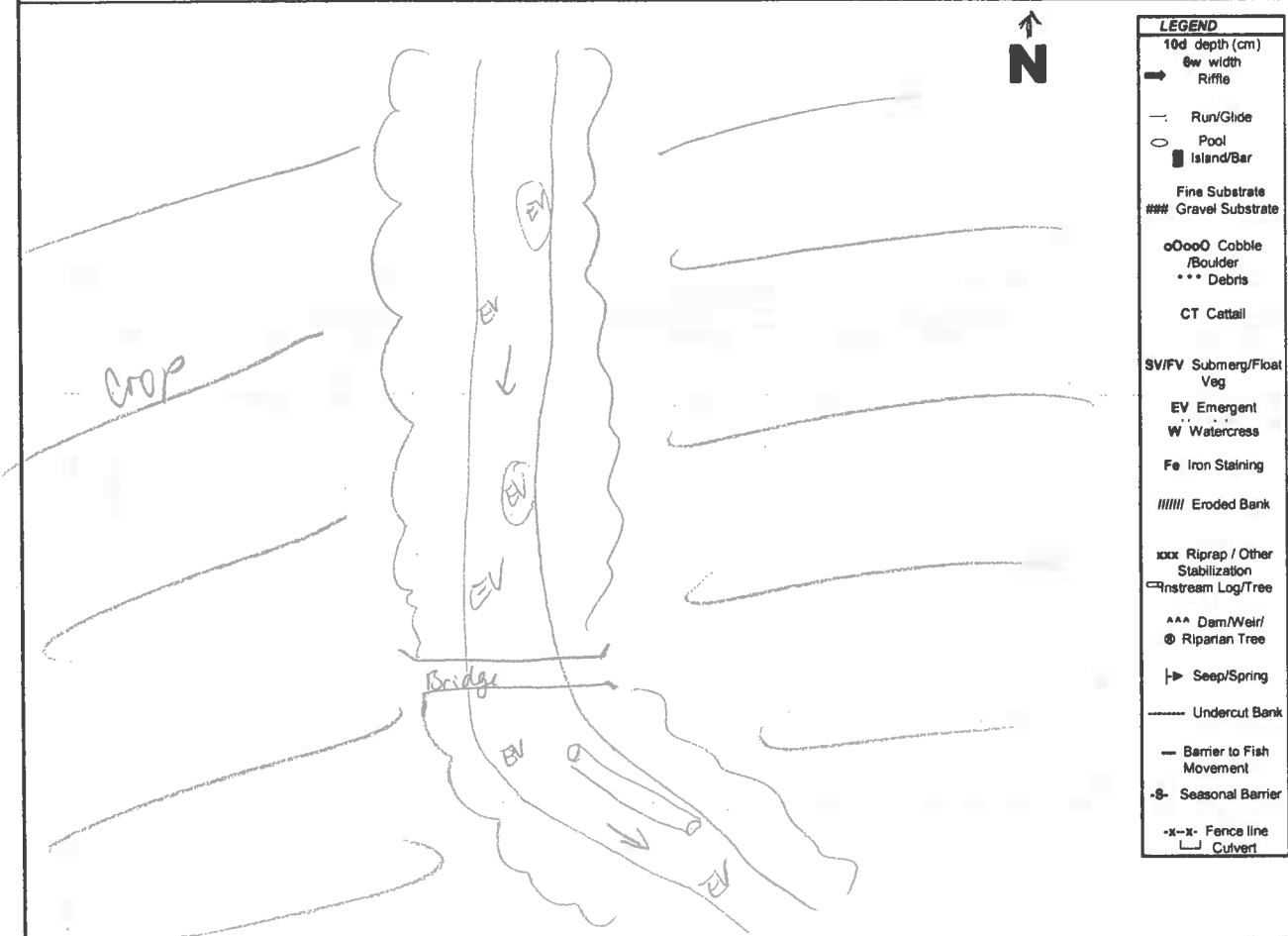
C139

AECOM

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Watercourse Sketch

Study Area: Jericho Goshen Bluewater Land Parcel# 2162 Turbine # GWS 257



Horizontal View of Channel

