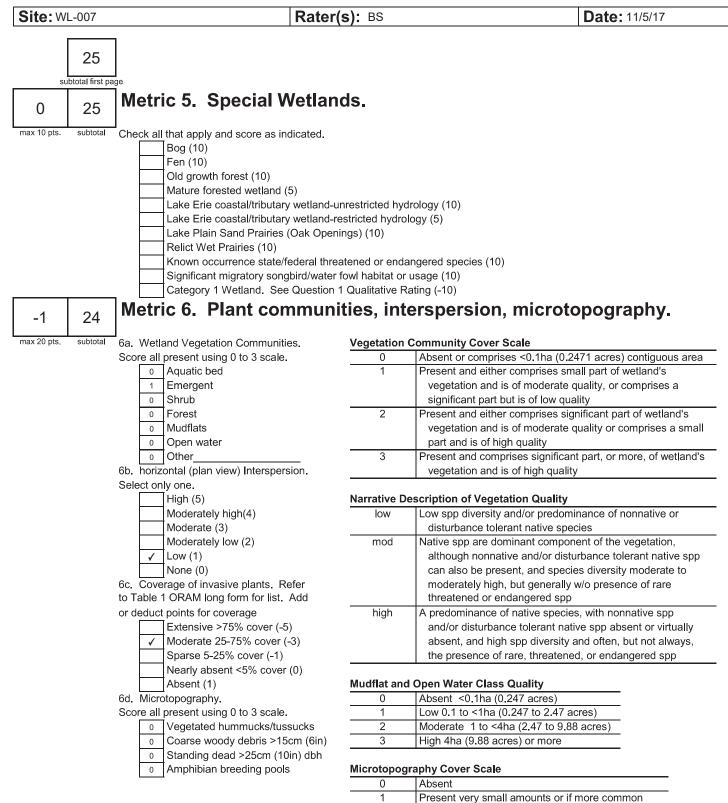


last revised 1 February 2001 jjm

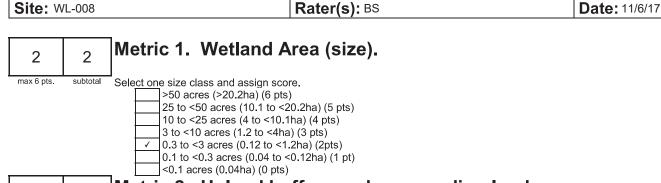


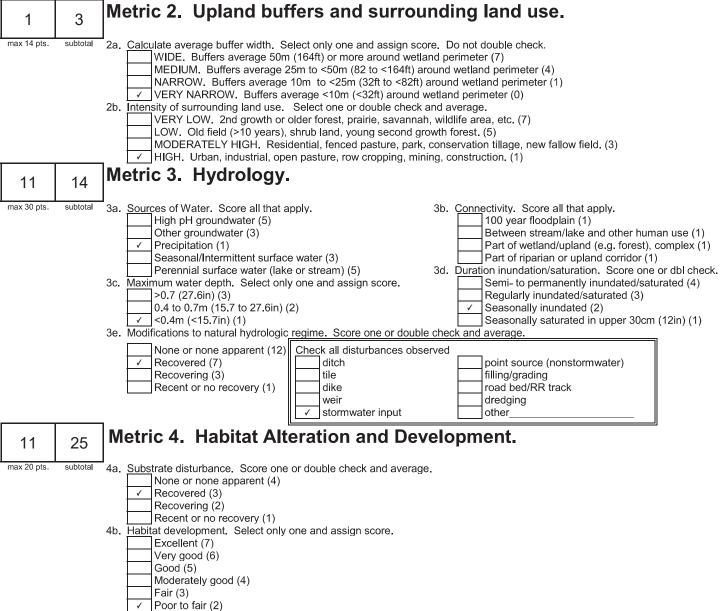
 of marginal quality

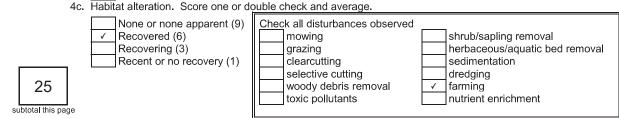
 2
 Present in moderate amounts, but not of highest quality or in small amounts of highest quality

 3
 Present in moderate or greater amounts and of highest quality

24

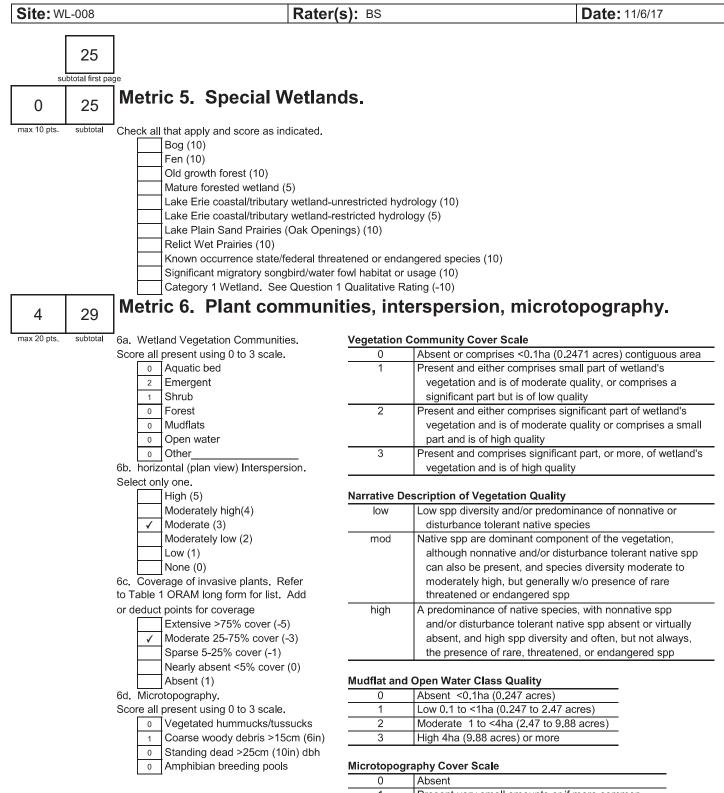




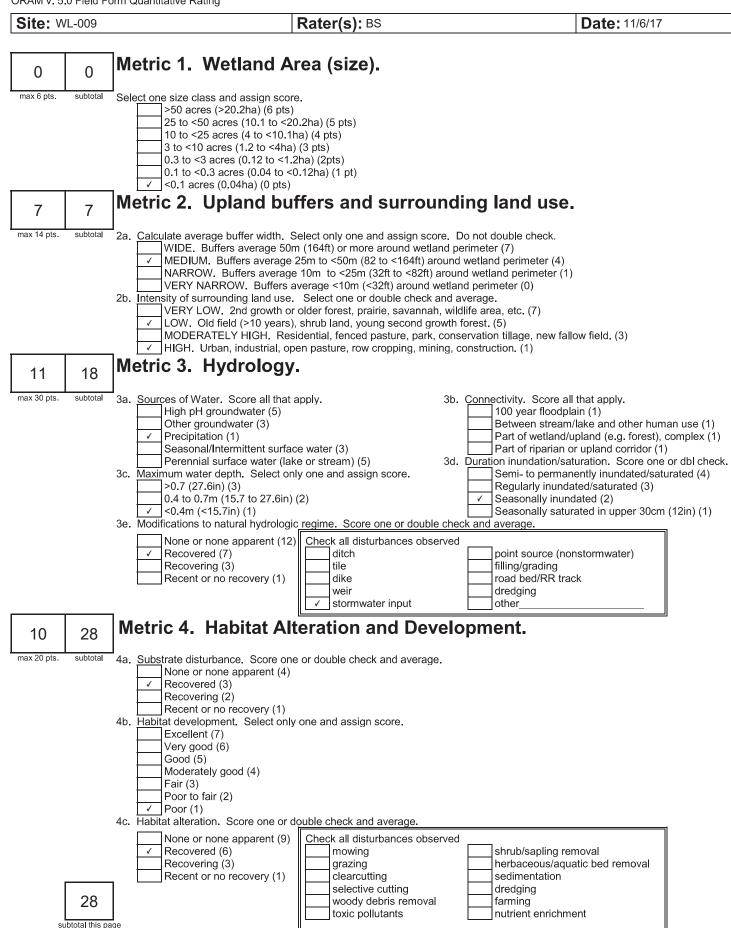




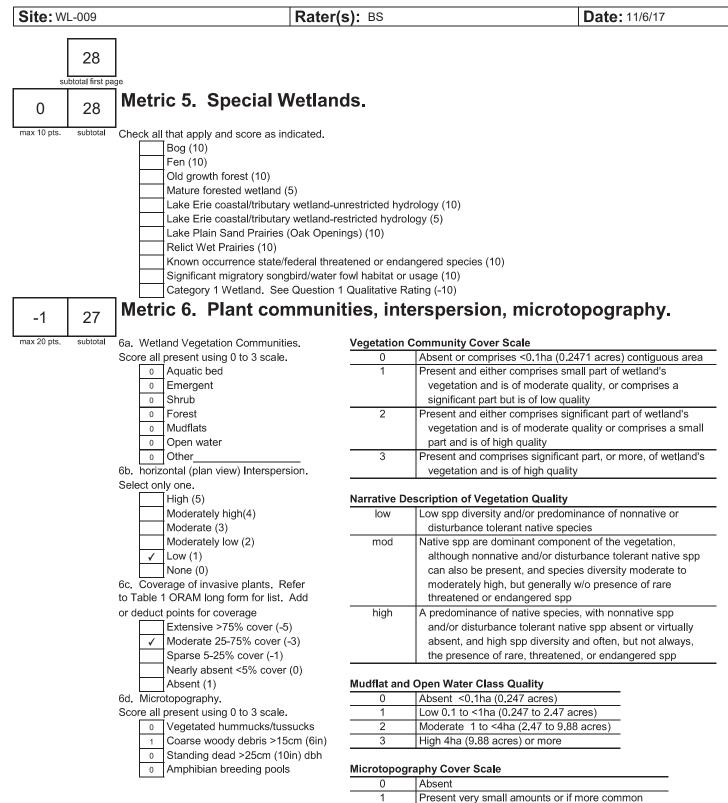
Poor(1)



29



last revised 1 February 2001 jjm



End of Quantitative Rating. Complete Categorization Worksheets.

2

3

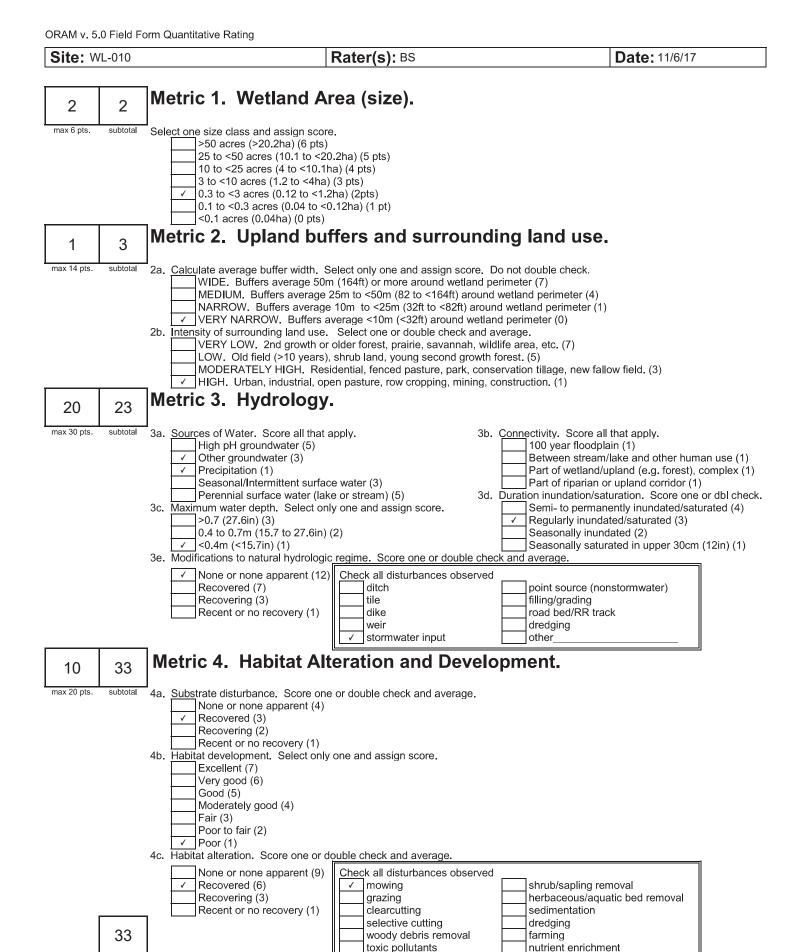
of marginal quality

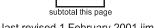
and of highest quality

Present in moderate amounts, but not of highest quality or in small amounts of highest quality

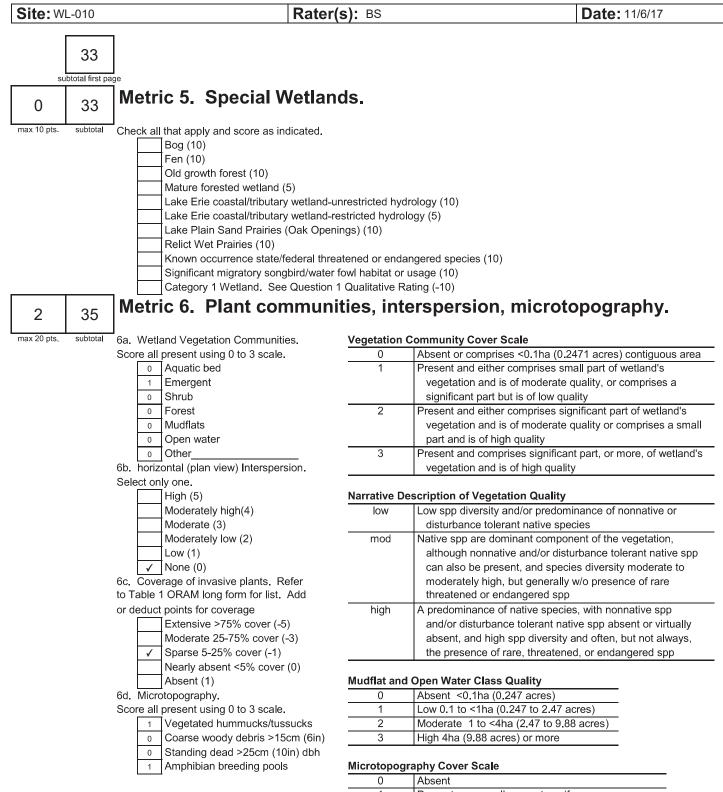
Present in moderate or greater amounts

27

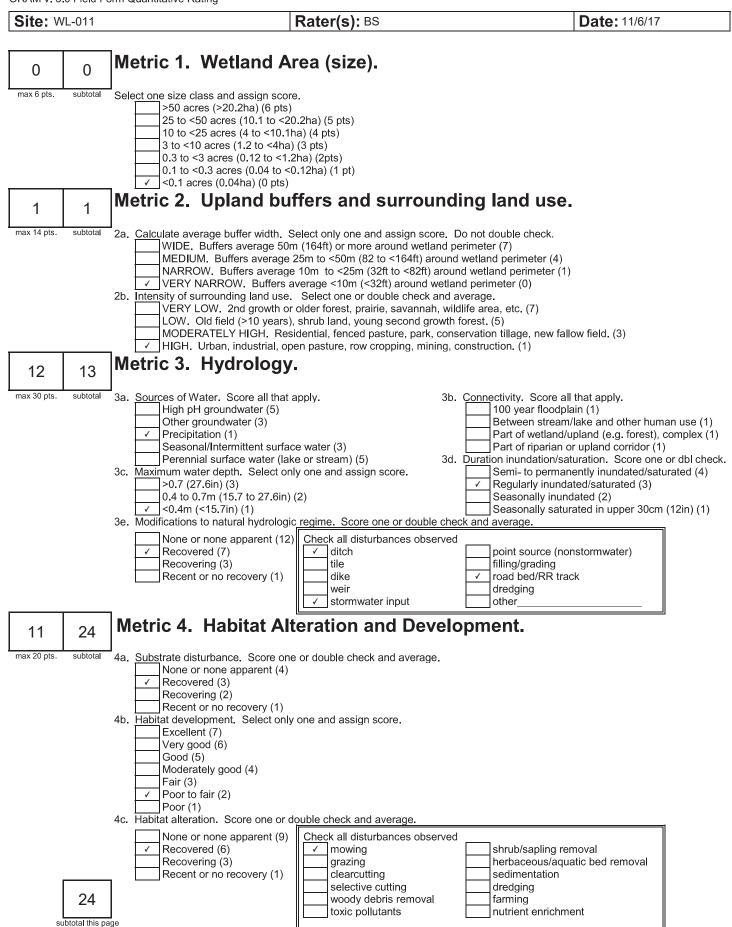




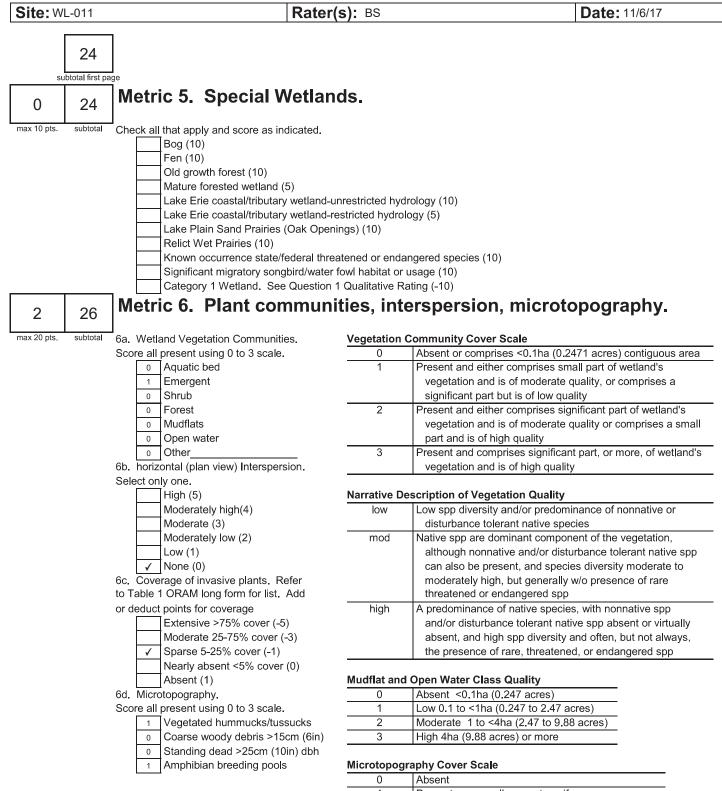
last revised 1 February 2001 jjm



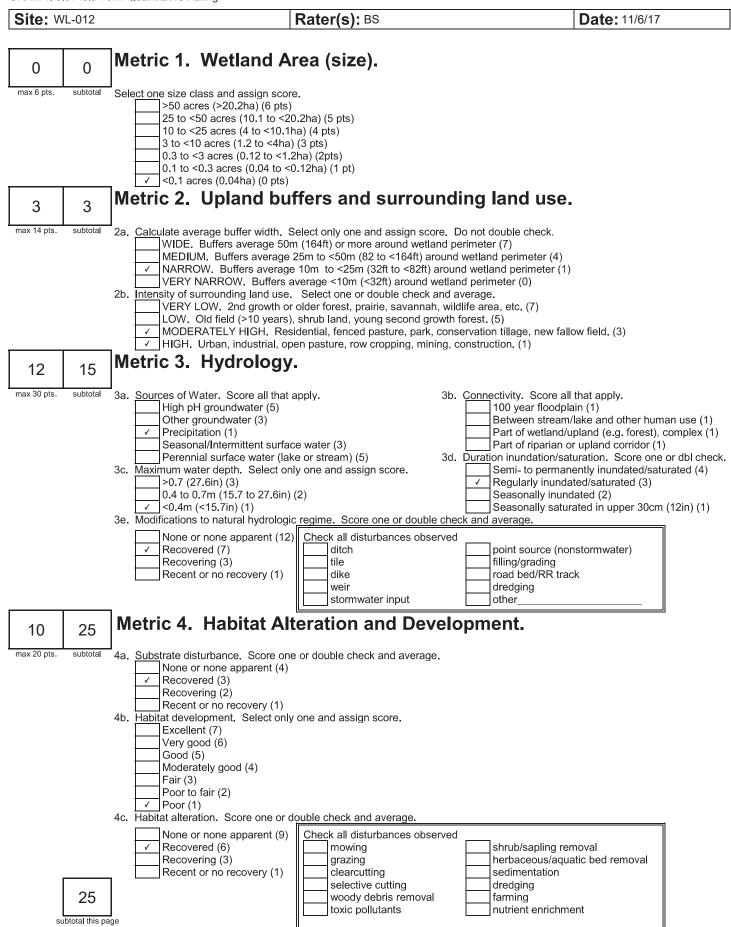
35



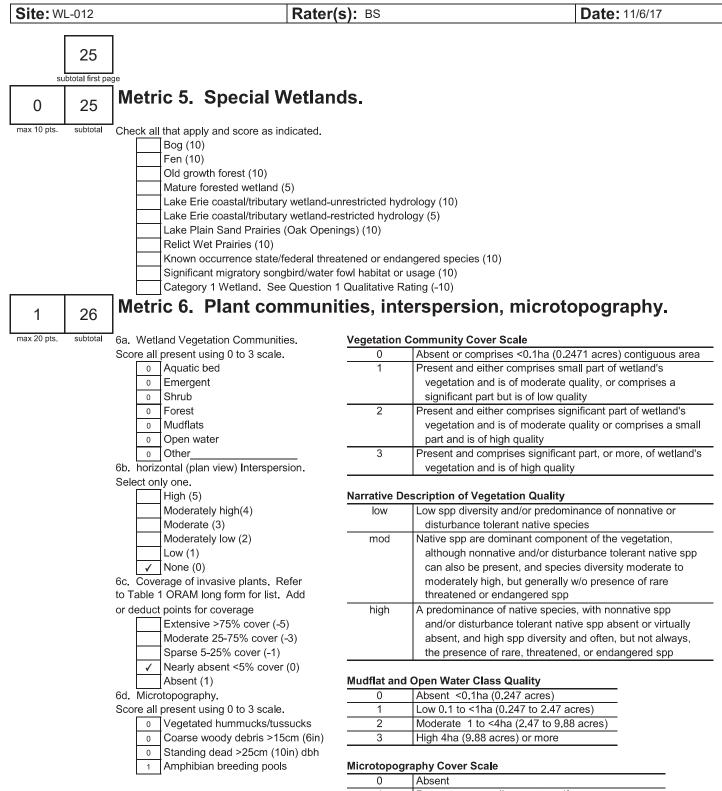
last revised 1 February 2001 jjm



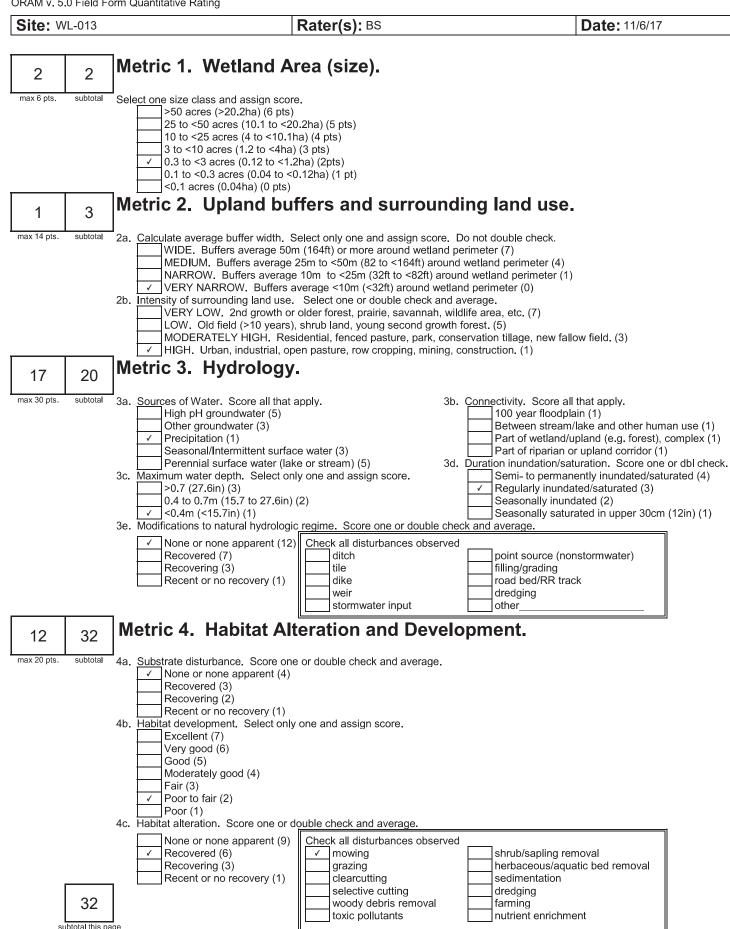
26



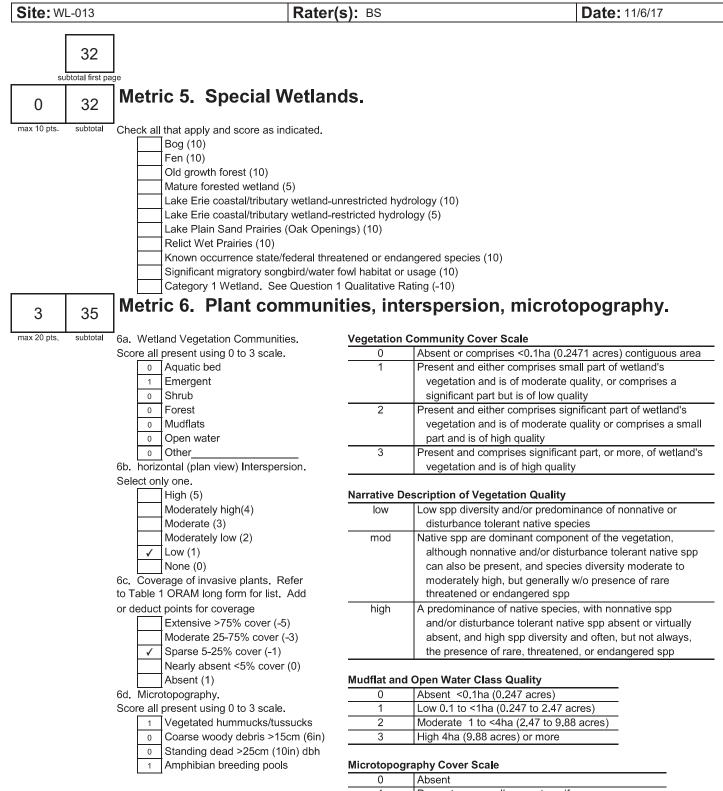
last revised 1 February 2001 jjm



26



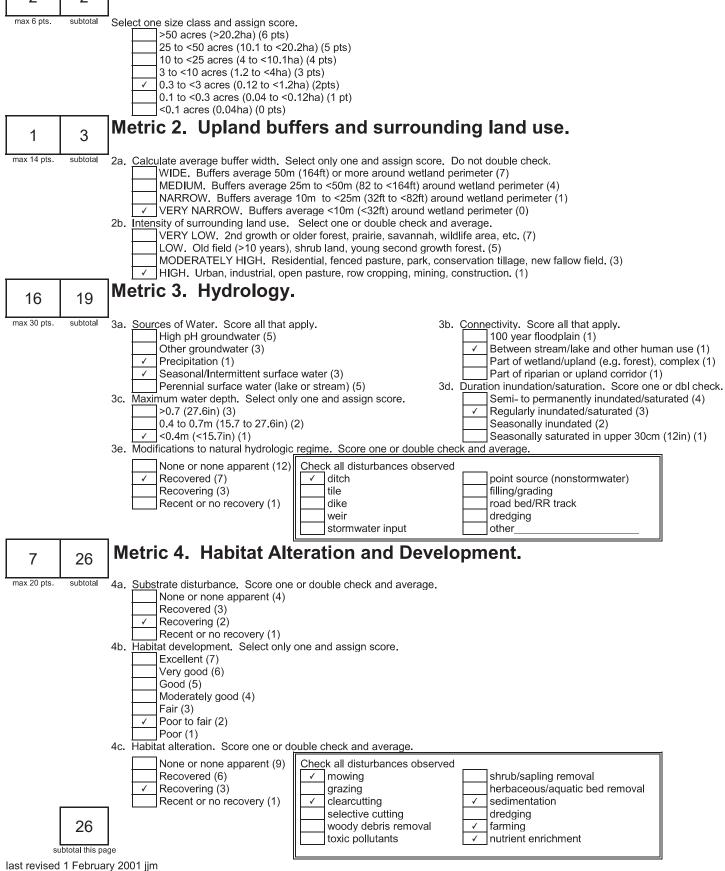
last revised 1 February 2001 jjm

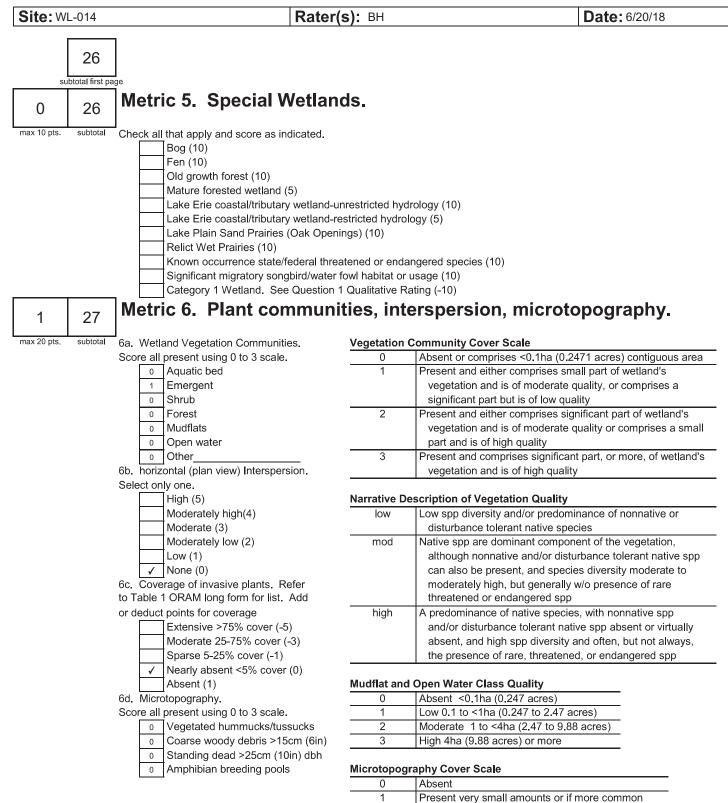


35

 Site: WL-014
 Rater(s): BH
 Date: 6/20/18

 2
 2
 Metric 1. Wetland Area (size).





End of Quantitative Rating. Complete Categorization Worksheets.

2

3

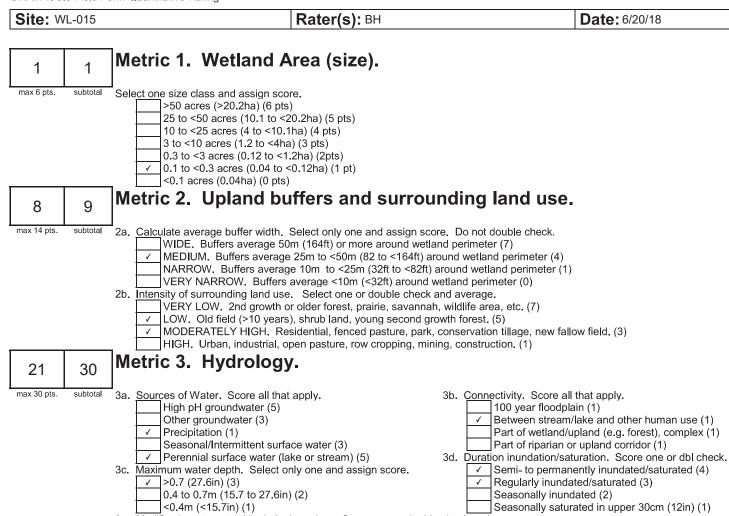
of marginal quality

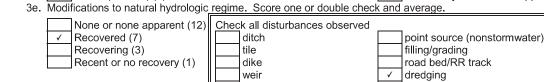
and of highest quality

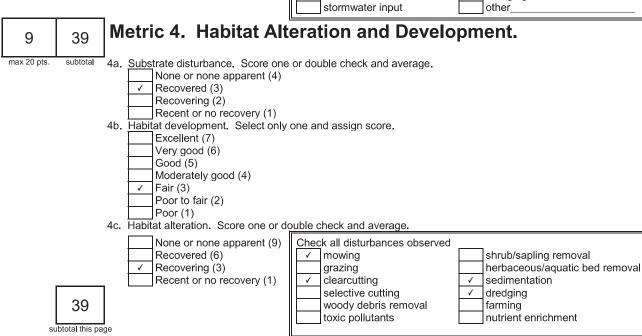
Present in moderate amounts, but not of highest quality or in small amounts of highest quality

Present in moderate or greater amounts

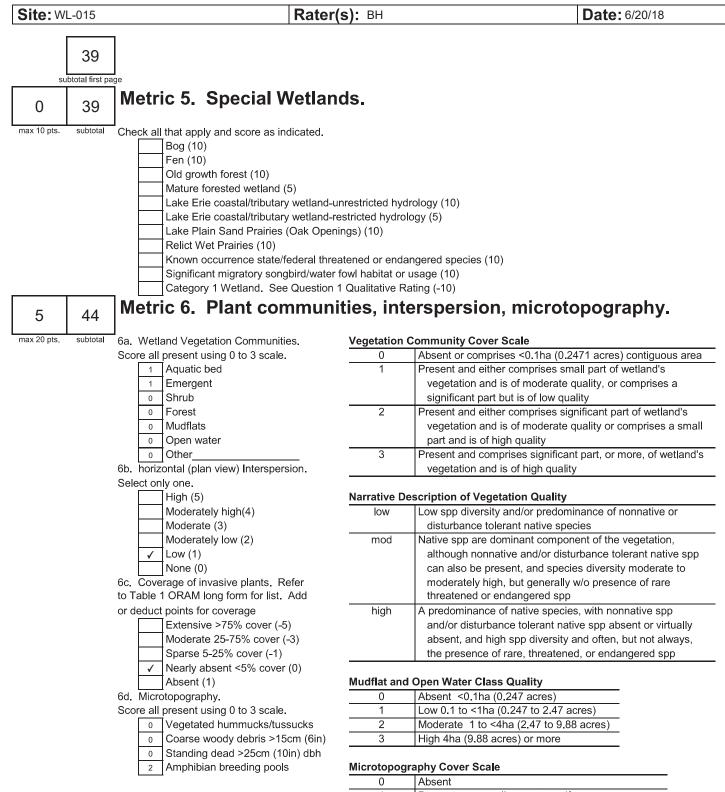
27







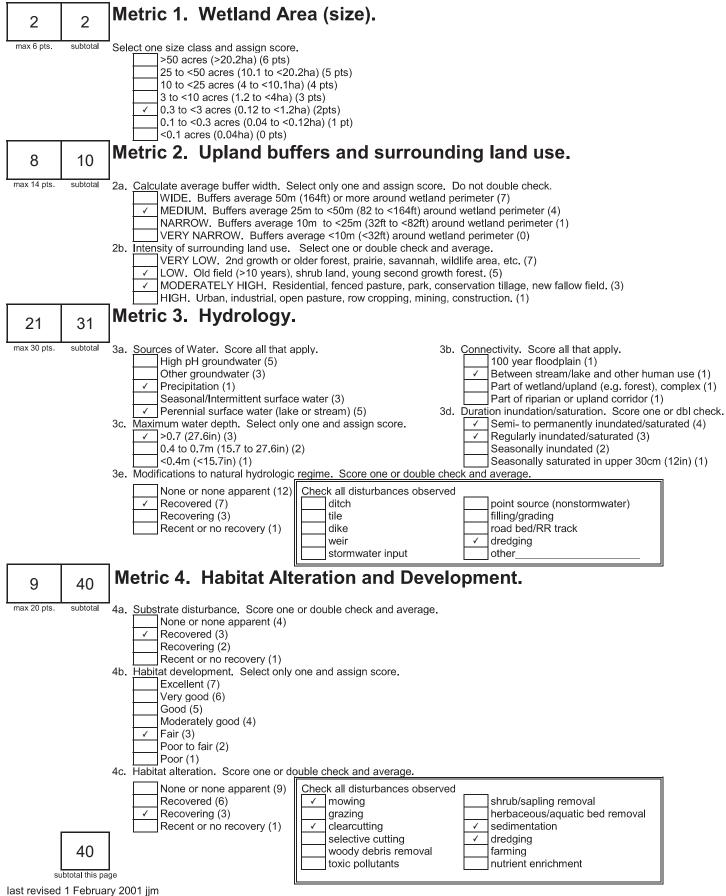
last revised 1 February 2001 jjm

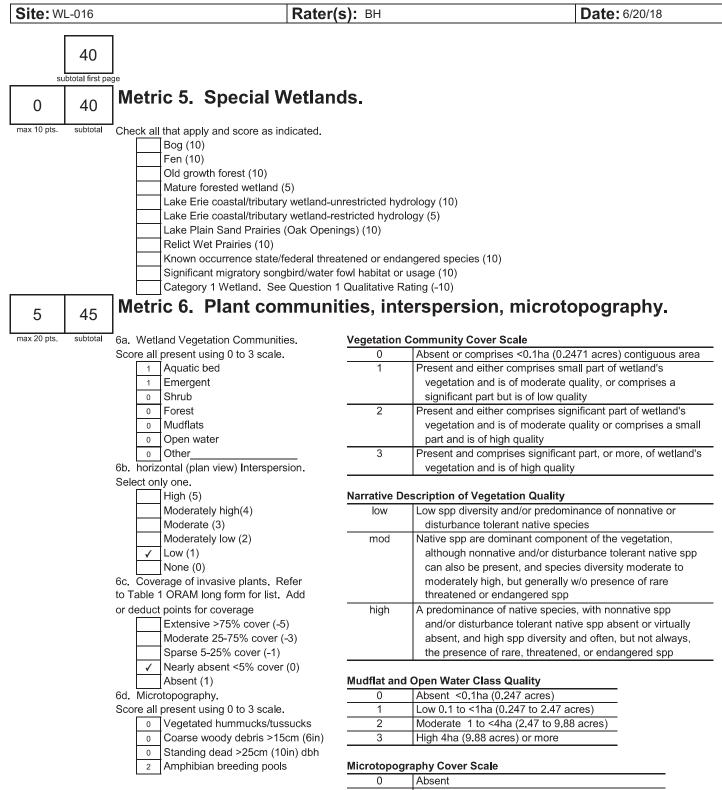


44

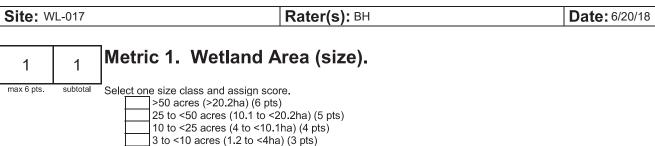


Date: 6/20/18

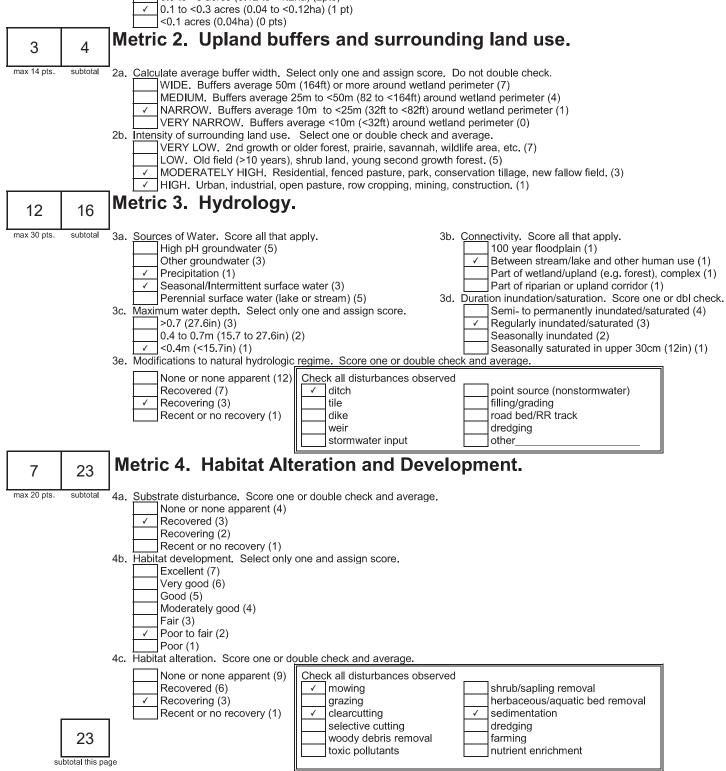


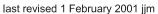


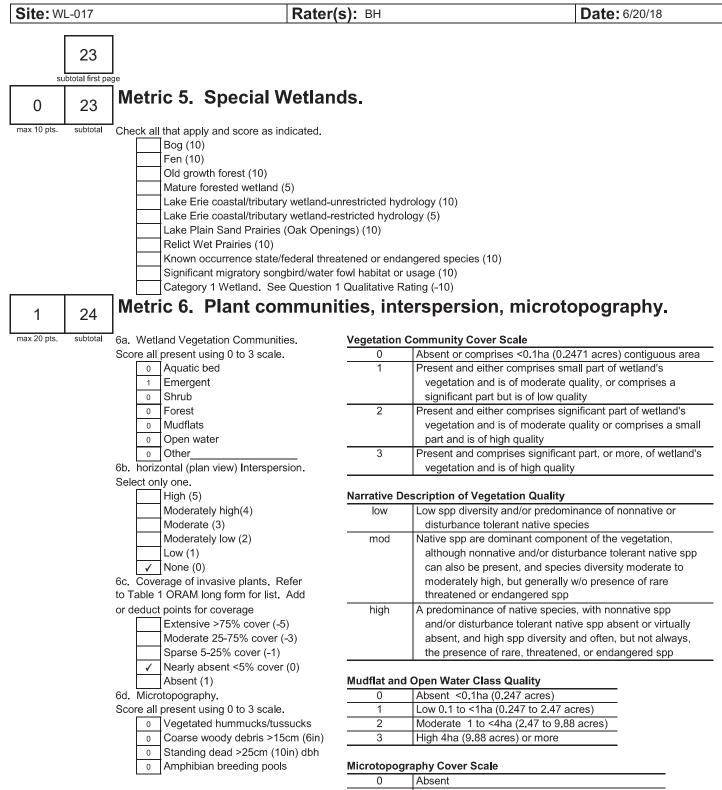
45



0.3 to <3 acres (0.12 to <1.2ha) (2pts)

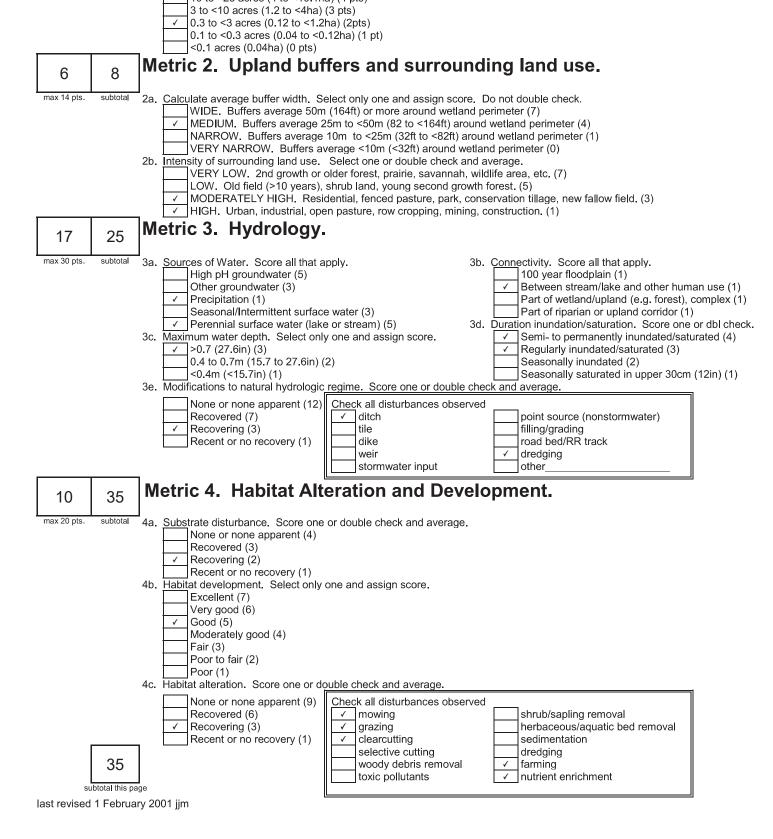


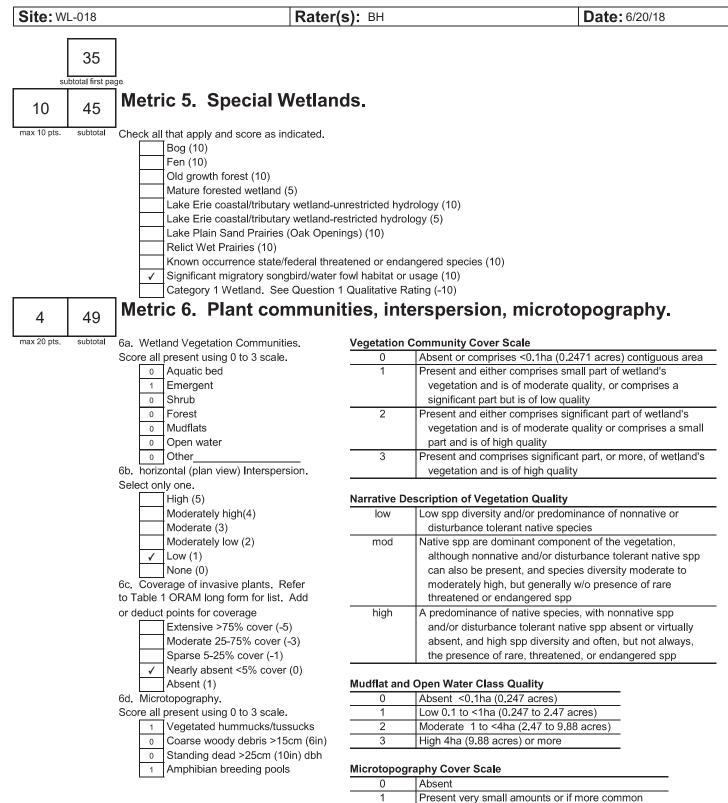




24







End of Quantitative Rating. Complete Categorization Worksheets.

2

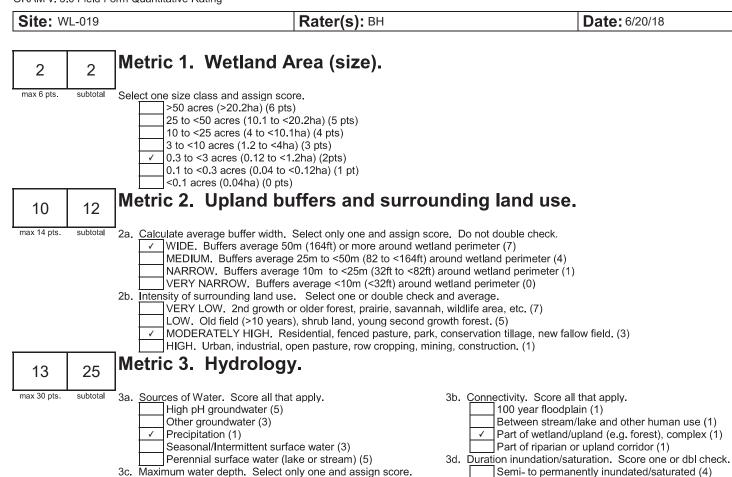
3

of marginal quality

and of highest quality

Present in moderate amounts, but not of highest quality or in small amounts of highest quality

Present in moderate or greater amounts

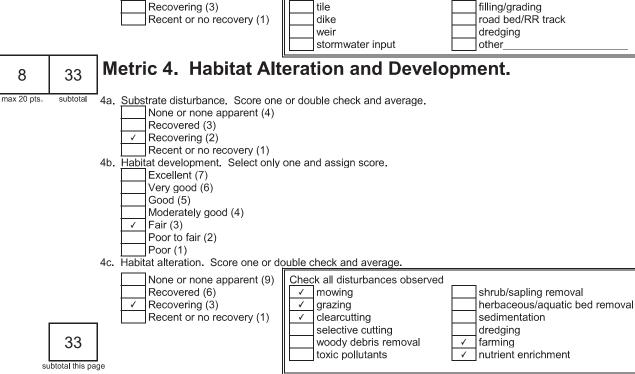


Regularly inundated/saturated (3)

Seasonally saturated in upper 30cm (12in) (1)

Seasonally inundated (2)

point source (nonstormwater)



3e. Modifications to natural hydrologic regime. Score one or double check and average.

ditch

Check all disturbances observed

>0.7 (27.6in) (3)

Recovered (7)

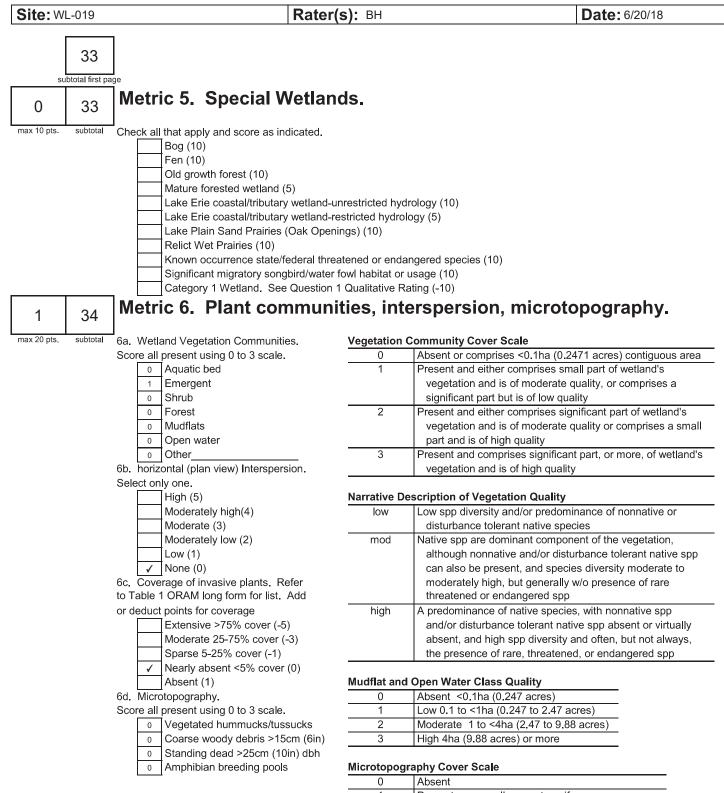
1

<0.4m (<15.7in) (1)

0.4 to 0.7m (15.7 to 27.6in) (2)

None or none apparent (12)

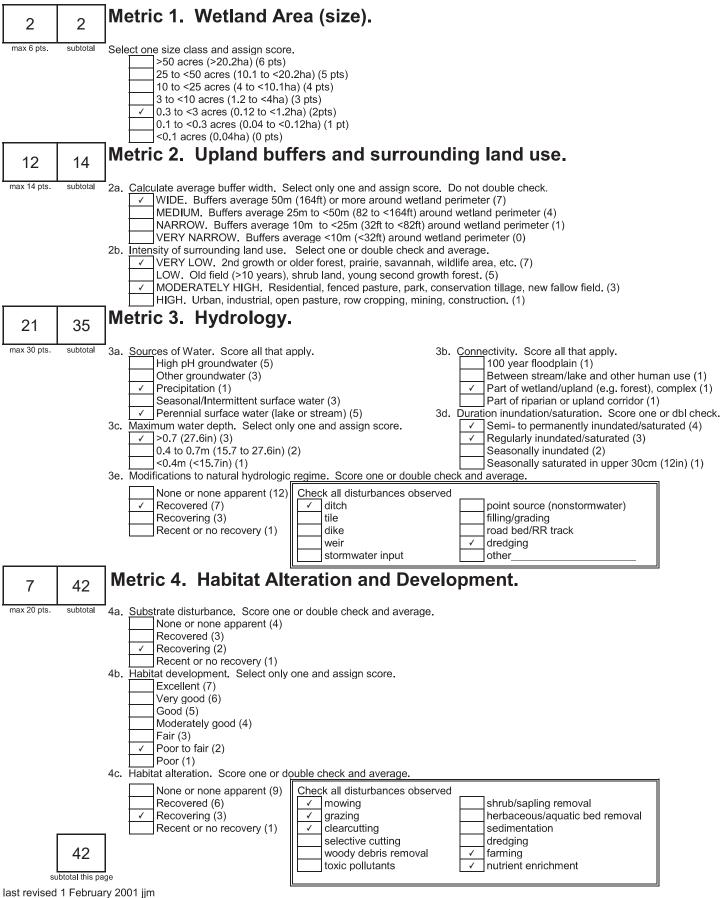
last revised 1 February 2001 jjm

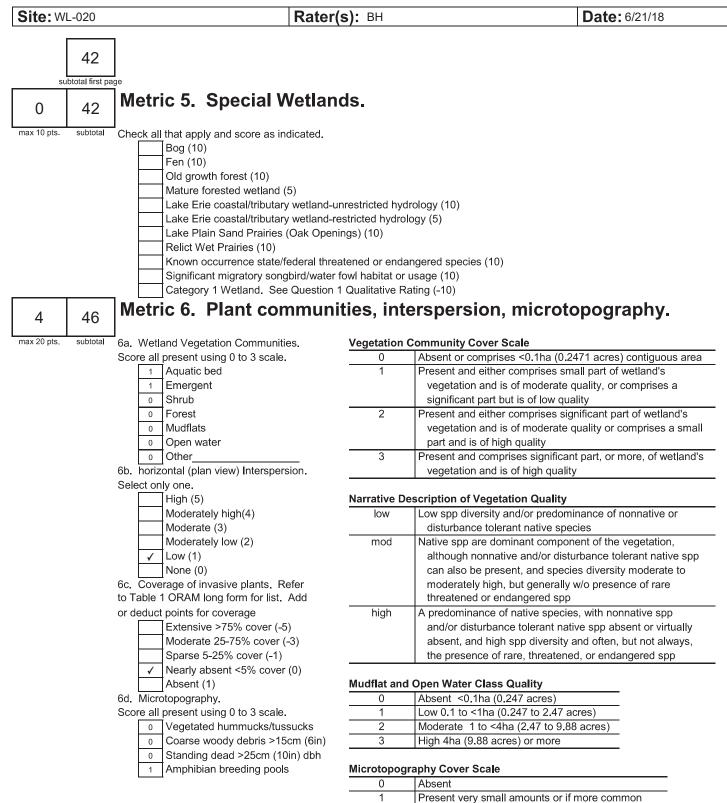


34

Site: WL-020 Rater(s): BH

Date: 6/21/18





End of Quantitative Rating. Complete Categorization Worksheets.

2

3

of marginal quality

and of highest quality

Present in moderate amounts, but not of highest quality or in small amounts of highest quality

Present in moderate or greater amounts

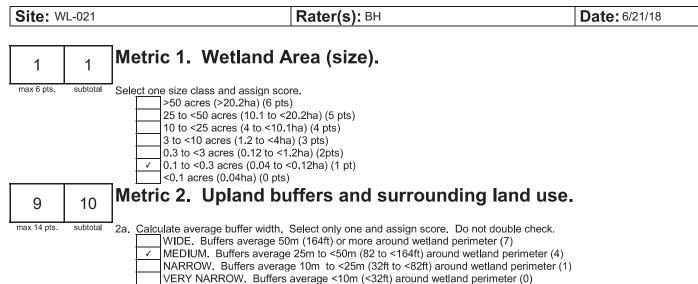
46

21

max 30 pts.

31

subtotal



VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7) LOW. Old field (>10 years), shrub land, young second growth forest. (5)

HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)

3b. Connectivity. Score all that apply. 100 year floodplain (1)

Between stream/lake and other human use (1)

Part of wetland/upland (e.g. forest), complex (1)

Part of riparian or upland corridor (1)

2b. Intensity of surrounding land use. Select one or double check and average.

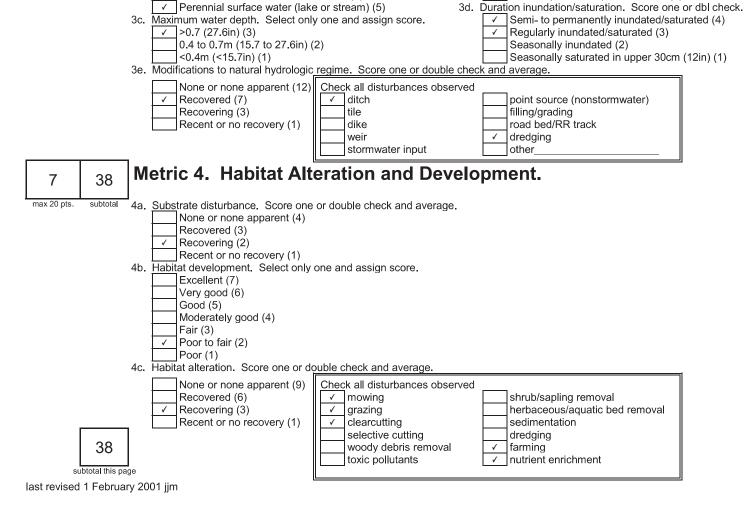
Metric 3. Hydrology.

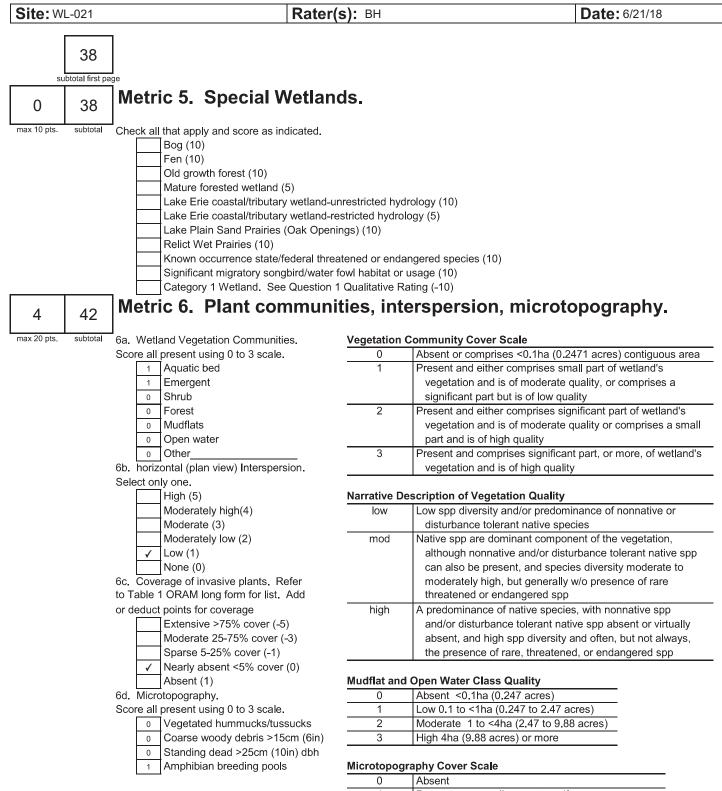
Precipitation (1)

3a. Sources of Water. Score all that apply.

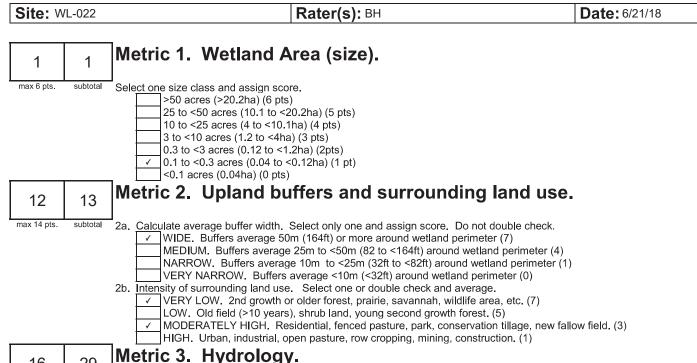
High pH groundwater (5) Other groundwater (3)

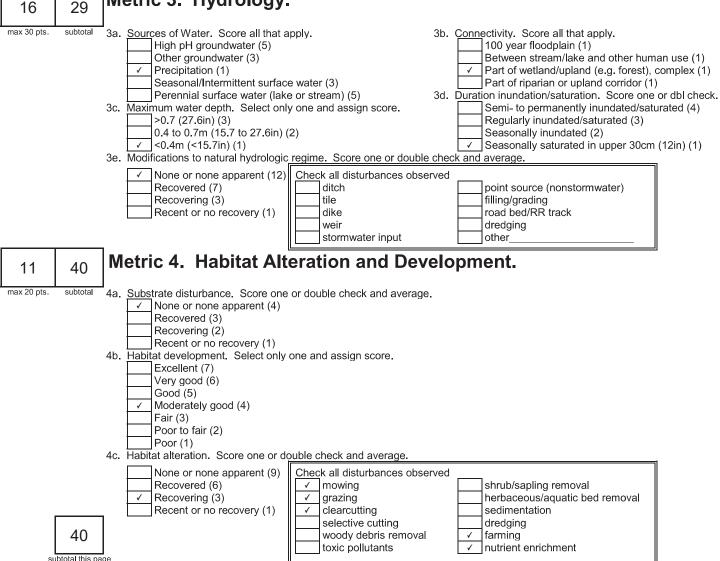
Seasonal/Intermittent surface water (3)



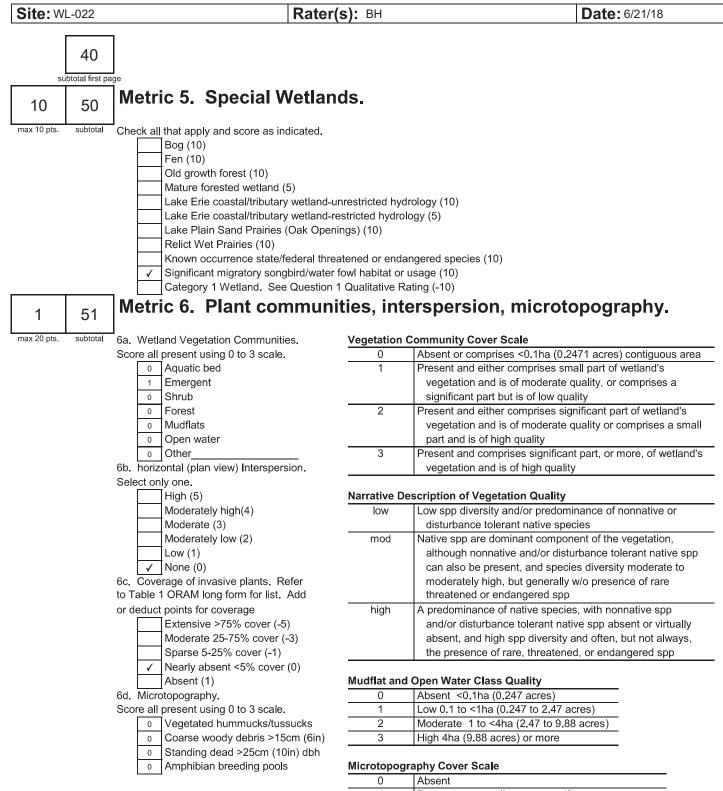


42

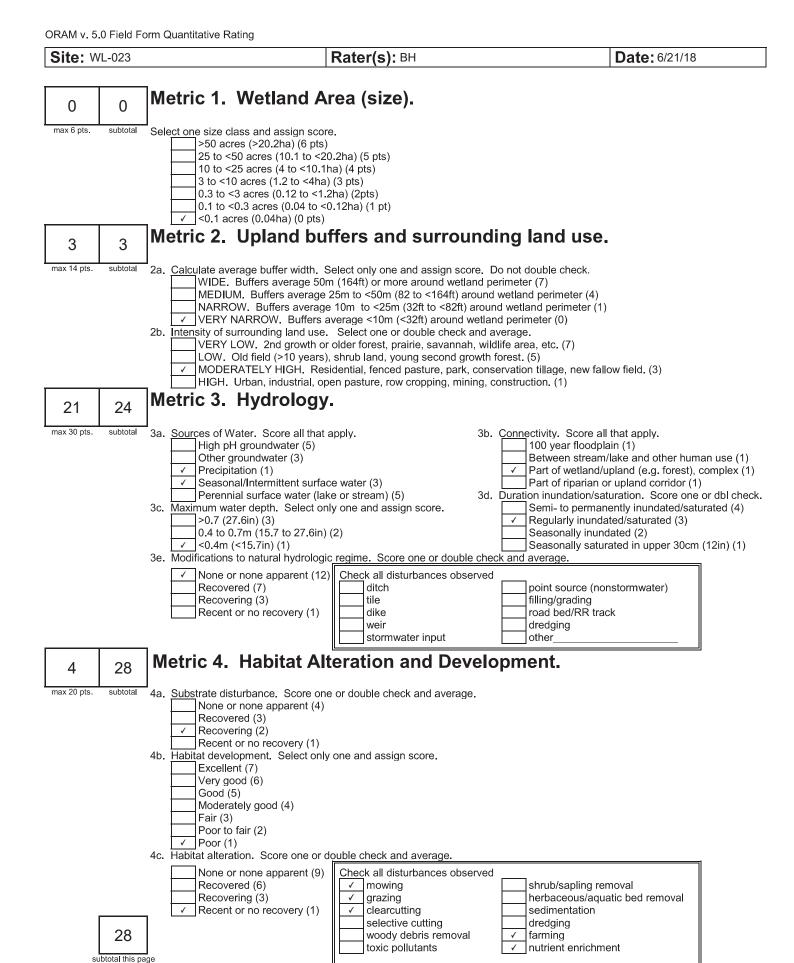




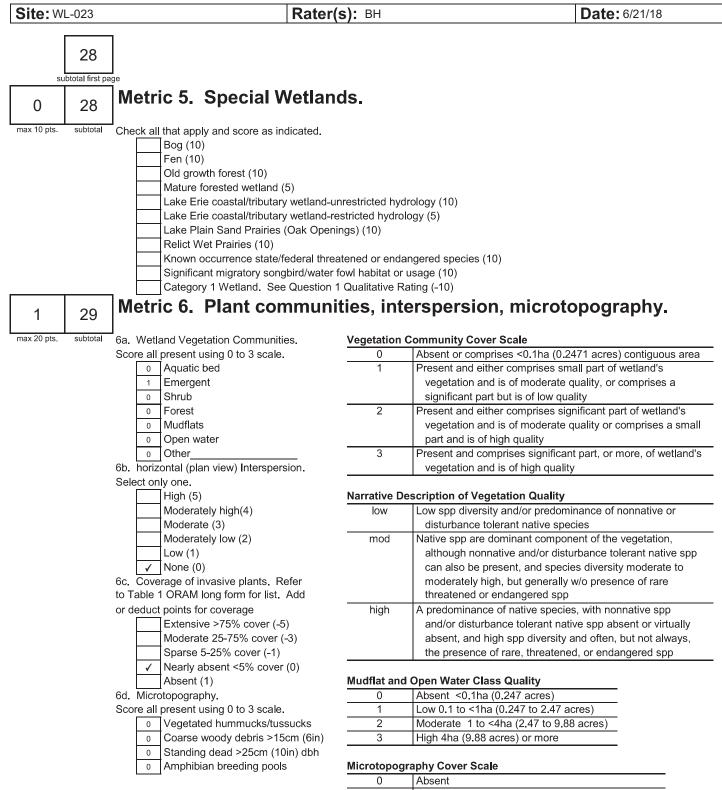
last revised 1 February 2001 jjm



51



last revised 1 February 2001 jjm



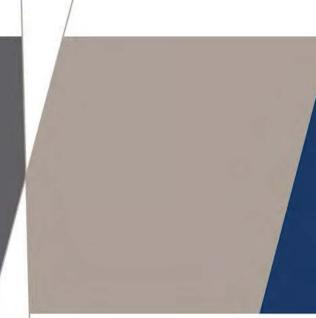
29

Willowbrook Solar Project

APPENDIX



STREAM ASSESSMENT FORMS



ChioEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) : 32

SITE NAME/LOCATION Willowbrook Solar	r Farm	
		DRAINAGE AREA (mi²) 0.29
	AT. 39.02756 LONG83.69870 RIVER CO	
DATE 11/04/17 SCORER BJS	COMMENTS Slabcamp Run-East Fork	
	- Refer to "Field Evaluation Manual for Ohio's	• • • • • • • • • • • • • • • • • • • •
·		
STREAM CHANNEL INONE / NATU MODIFICATIONS:		NG 🔽 RECENT OR NO RECOVERY
	y type of substrate present. Check ONLY two predom	
	nt substrate types found (Max of 8). Final metric score is RCENT TYPE	PERCENT Metr
BLDR SLABS [16 pts]	0% SILT [3 pt]	85% Poin
	0% Leaf Pack/Woody debri 0% Image: Fine detritus [3 pts]	S [3 pts] 0% Substra
	0% CLAY or HARDPAN [0 pt]	0%
	5% MUCK [0 pts]	0% 12
SAND (<2 mm) [6 pts]	10% ARTIFICIAL [3 pts]	
Total of Percentages of 0. Bldr Slabs, Boulder, Cobble, Bedrock	00% (A) Substrate Percentage 100%	(B) A + B
SCORE OF TWO MOST PREDOMINATE SUBST		JBSTRATE TYPES: 3
	ximum pool depth within the 61 meter (200 ft) evalua	
evaluation. Avoid plunge pools from road > 30 centimeters [20 pts]	culverts or storm water pipes) (Check ONLY one box): Max =
> 22.5 - 30 cm [30 pts]	< 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts]	NO WATER OR MOIST CH	ANNEL [0 pts] 15
COMMENTS	MAXIMUM POOL DE	PTH (centimeters): 10
3. BANK FULL WIDTH (Measured as the a	verage of 3-4 measurements) (Check ONLY	one box): Bankfu
> 4.0 meters (> 13') [30 pts]	> 1.0 m - 1.5 m (> 3' 3" - 4' 8	
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	✓ ≤ 1.0 m (<=3' 3") [5 pts]	Max=3
COMMENTS	AVERAGE BANKFU	L WIDTH (meters): 0.50 5
	This information must also be completed	
RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH	AIN QUALITY ☆NOTE: River Left (L) and Right (F FLOODPLAIN QUALITY	र) as looking downstream द्र
L R (Per Bank)	LR (Most Predominant per Bank) L	R
Wide >10m	Mature Forest, Wetland	Conservation Tillage
Moderate 5-10m	Field	Urban or Industrial
Narrow <5m	Residential, Park, New Field	Open Pasture, Row Crop
V None	Fenced Pasture	Mining or Construction
COMMENTS <u>Starts in fenced I</u>	pasture, before flowing along wide grass swale	e between ag fields.
FLOW REGIME (At Time of Evalu		
Stream Flowing Subsurface flow with isolated pools		ted pools, no flow (Intermittent) er (Ephemeral)
COMMENTS		
SINUOSITY (Number of ben <u>ds pe</u>	r 61 m (200 ft) of channel) <u>(C</u> heck <i>ONLY</i> one box):	_
✓ 0.5	1.0 2.0 1.5 2.5	3.0 >3
STREAM GRADIENT ESTIMATE		

ADDITIONAL STREAM INFORMATION (This Information M	ust Also be Completed):
QHEI PERFORMED? - Yes 🖌 No QHEI Sco	ore (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream _
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	3 THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Y Date of last precipitat	ion: 11/04/17 Quantity: 0.07
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open): _	100%
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (m	g/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
Flows through active cow pasture.	
ID number. Include appropriate	. Voucher collections optional. NOTE: all voucher samples must be labeled with the sit field data sheets from the Primary Headwater Habitat Assessment Manual) anders Observed? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N) N

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





SITE NAME/LOCATION Willowbrook Solar Farm	1.23
LENGTH OF STREAM REACH (ft) 8,458 LAT. 39.03473 LONG83.69593 RIVER CODE RIVER MILE	
DATE 11/04/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Inst	ructions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING	COVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHEI
TYPE PERCENT TYPE PERCENT BLDR SLABS [16 pts] 0% Image: SILT [3 pt] 85%	Metric Points
BOULDER (>256 mm) [16 pts] 0% LEAF PACK/WOODY DEBRIS [3 pts] 0% BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0% COBBLE (65-256 mm) [12 pts] 5% CLAY or HARDPAN [0 pt] 0%	Substrate Max = 40
COBBLE (65-256 mm) [12 pts] 5% CLAY or HARDPAN [0 pt] 0% GRAVEL (2-64 mm) [9 pts] 0% MUCK [0 pts] 0% SAND (<2 mm) [6 pts]	12
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 5.00% (A) Substrate Percentage 100% (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 3	
2. Maximum Pool Depth (<i>Measure the maximum pool depth within the 61 meter (200 ft</i>) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check <i>ONLY</i> one box):	Pool Dept Max = 30
> 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts] > 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	25
COMMENTS MAXIMUM POOL DEPTH (centimeters): 15	25
	1
3 BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box)	Bankfull
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] \checkmark 1.1 m (<=3' 3") [5 pts]	Bankfull Width Max=30
$ \begin{array}{ c c c c c } &> 4.0 \text{ meters} (> 13') [30 \text{ pts}] \\ &> 3.0 \text{ m} - 4.0 \text{ m} (> 9' 7" - 13') [25 \text{ pts}] \\ &> 1.5 \text{ m} - 3.0 \text{ m} (> 9' 7" - 4' 8") [20 \text{ pts}] \end{array} $	Width Max=30
$ = > 4.0 \text{ meters } (> 13') [30 \text{ pts}] > 3.0 \text{ m} - 4.0 \text{ m} (> 9' 7" - 13') [25 \text{ pts}] = 1.0 \text{ m} - 1.5 \text{ m} (> 3' 3" - 4' 8") [15 \text{ pts}] \le 1.0 \text{ m} (<=3' 3") [5 \text{ pts}] $	Width
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.50	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters):	Width Max=30
$ \begin{array}{c} \begin{array}{c} > 4.0 \text{ meters} (> 13') [30 \text{ pts}] \\ > 3.0 \text{ m} - 4.0 \text{ m} (> 9' 7'' - 13') [25 \text{ pts}] \\ > 1.5 \text{ m} - 3.0 \text{ m} (> 9' 7'' - 4' 8'') [20 \text{ pts}] \end{array} \end{array} $	Width Max=30
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Width Max=30
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (<=3' 3") [5 pts]	Width Max=30
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.50 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆ RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L Moderate 5-10m Immature Forest, Wetland Moderate 5-10m Immature Forest, Shrub or Old Vide >10m Residential, Park, New Field ✓ Narrow <5m	Width Max=30

ADDITIONAL STREAM INFORMATION (This Information Must	t Also be Completed):
QHEI PERFORMED? - Yes Vo QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING T	HE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitation	11/04/17 Quantity: 0.07
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): N Canopy (% open):	70%
Were samples collected for water chemistry? (Y/N): N (No	ote lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l)	pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations. Vo	oucher collections optional. NOTE: all voucher samples must be labeled with the site
ID number. Include appropriate fiel	ld data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamand	lers Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N	Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location







Reset Form

SITE NAME/LOCATION Willowbrook Se	olar Farm	
SITE NUMBER_)
LENGTH OF STREAM REACH (ft) 399		
DATE 11/04/17 SCORER BJS		
NOTE: Complete All Items On This Fo	orm - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruct	tions
STREAM CHANNEL INONE / NONE /	NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVE	ERY
1. SUBSTRATE (Estimate percent of e	every type of substrate present. Check ONLY two predominant substrate TYPE boxes	
(Max of 32). Add total number of sign		HHE
		Metri Point
BLDR SLABS [16 pts]	0% ✓ SILT [3 pt] 80% ✓ 0% □ LEAF PACK/WOODY DEBRIS [3 pts] 0%	•
BEDROCK [16 pt]	0% FINE DETRITUS [3 pts] 0% St	Substra
COBBLE (65-256 mm) [12 pts]	0% CLAY or HARDPAN [0 pt]	Max = 4
GRAVEL (2-64 mm) [9 pts]	0% MUCK [0 pts] 0%	11
SAND (<2 mm) [6 pts]	20% ARTIFICIAL [3 pts] 0%	
Total of Percentages of	0.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock	k Check 100%	ATD
SCORE OF TWO MOST PREDOMINATE SU	JBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 2	
2. Maximum Pool Depth (Measure the	e maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	ool Dep
	road culverts or storm water pipes) (Check ONLY one box):	Max = 3
> 30 centimeters [20 pts]	> 5 cm - 10 cm [15 pts]	
> 22.5 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts]	<pre>< 5 cm [5 pts] NO WATER OR MOIST CHANNEL [0 pts]</pre>	5
		5
COMMENTS	MAXIMUM POOL DEPTH (centimeters): 5	
3. BANK FULL WIDTH (Measured as t	the average of 3-4 measurements) (Check ONLY one box):	Bankfu
> 4.0 meters (> 13') [30 pts]	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		Max=30
COMMENTS	AVERAGE BANKFULL WIDTH (meters): 0.70	5
	This information must also be completed	
RIPARIAN ZONE AND FLOO	DDPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream	
RIPARIAN WIDTH	FLOODPLAIN QUALITY	
L R (Per Bank)	L R (Most Predominant per Bank) L R Mature Forest, Wetland Conservation Tillage	
Moderate 5-10m	Immature Forest, Shrub or Old Urban or Industrial	
Moderate 5-10m	Field	
Narrow <5m	Residential, Park, New Field Open Pasture, Row Crop	
None None	Fenced Pasture Mining or Construction	
COMMENTS		
FLOW REGIME (At Time of F	Evaluation) (Check ONLY one box):	
Stream Flowing	Moist Channel, isolated pools, no flow (Intermittent)	
Subsurface flow with isolated p	pools (Interstitial) Dry channel, no water (Ephemeral)	
COMMENTS		
SINUOSITY (Number of ben <u>d</u>	ds per 61 m (200 ft) of channel) <u>(C</u> heck <i>ONLY</i> one box):	
None	1.0 2.0 3.0	
0.5	1.5 2.5 >3	
STREAM GRADIENT ESTIMATE		
Flat (0.5 ft/100 ft)	e Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)	.)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Co	mpleted):
QHEI PERFORMED? - Yes V No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	_ Distance from Evaluated Stream
CWH Name: _	_ Distance from Evaluated Stream _
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE W	ATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: NRCS	Soil Map Page: NRCS Soil Map Stream Order
County: Highland Township / Ci	ty:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/04	4/17 Quantity: 0.07
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open):5%	
Were samples collected for water chemistry? (Y/N): (Note lab sample	e no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) p	DH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) If not, please	explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	ons optional. NOTE: all voucher samples must be labeled with the site
	from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Salamanders Observed	I? (Y/N) N Voucher? (Y/N) N N
Frogs or Ladpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Mach	oinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location







SITE NAME/LOCATION Willowbrook Solar Farm	
SITE NUMBER WB-008 RIVER BASIN DRAINAGE AREA (mi²) 0.04	1
LENGTH OF STREAM REACH (ft) 414 LAT. 39.03462 LONG83.69963 RIVER CODE RIVER MILE	
DATE 11/04/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruc	tions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING	/ERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	
	HHEI Metric
BLDR SLABS [16 pts] 0% SILT [3 pt] 90%	Points
BOULDER (>256 mm) [16 pts] 0% LEAF PACK/WOODY DEBRIS [3 pts] 0% BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0% 0% State	Substrate
COBBLE (65-256 mm) [12 pts] 0% CLAY or HARDPAN [0 pt] 0%	Max = 40
GRAVEL (2-64 mm) [9 pts] 10% MUCK [0 pts] 0%	14
SAND (<2 mm) [6 pts]	
Total of Percentages of 0.00% (A) Substrate Percentage 100% (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 2	
	ool Dept
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): I > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30
✓ > 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	20
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	30
COMMENTS MAXIMUM POOL DEPTH (centimeters): 30	
······································	Bankfull
$ = > 4.0 \text{ meters} (> 13') [30 \text{ pts}] $ $ > 3.0 \text{ m} - 4.0 \text{ m} (> 9' 7" - 13') [25 \text{ pts}] $ $ > 1.0 \text{ m} - 1.5 \text{ m} (> 3' 3" - 4' 8") [15 \text{ pts}] $ $ \le 1.0 \text{ m} (<=3' 3") [5 \text{ pts}] $	Width Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	
COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.90	5
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY \$\sigma NOTE: River Left (L) and Right (R) as looking downstream \$\sigma RIPARIAN WIDTH FLOODPLAIN QUALITY	
L R (Per Bank) L R (Most Predominant per Bank) L R	
Wide >10m Mature Forest, Wetland Conservation Tillage	
Moderate 5-10m	
Narrow <5m Residential, Park, New Field Open Pasture, Row Crop	
None Fenced Pasture Mining or Construction	
•	
COMMENTS	
•	
COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) Moist Channel, isolated pools, no flow (Intermittent) Dry channel, no water (Ephemeral)	
COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS	
COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
COMMENTS FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS	

ADDITIONAL STREAM INFORMATION (This Information M	lust Also be Completed):
QHEI PERFORMED? - Yes 🖌 No QHEI Sco	ore (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	G THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Y Date of last precipitat	ion: 11/04/17 Quantity: 0.07
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (% open):	30%
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (m	g/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): N (If Yes, Record all observations.	. Voucher collections optional. NOTE: all voucher samples must be labeled with the site
ID number. Include appropriate	field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) Salama Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) N	anders Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location







SITE NAME/LOCATION Willowbrook Solar Farm SITE NUMBER WB-009 RIVER BASIN DRAINAGE AREA (mi²) 0.12 LENGTH OF STREAM REACH (ft) 1,425 LAT. 39.03545 LONG. -83.69439 RIVER CODE RIVER MILE	
	2
	-
DATE 11/04/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruct	otiono
NOTE. Complete An items on this rorm - Relef to Fleid Evaluation Manual for Onio's Priver Streams for instruct	Stions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING	VERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	нне
	Metr
BLDR SLABS [16 pts] 0% SILT [3 pt] 80%	Poin
BOULDER (>256 mm) [16 pts] 0% LEAF PACK/WOODY DEBRIS [3 pts] 0% BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0%	Substra
	Max =
GRAVEL (2-64 mm) [9 pts] 5% MUCK [0 pts] 0%	40
SAND (<2 mm) [6 pts]	12
Total of Percentages of 0.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock Bedrock 9 TOTAL NUMBER OF SUBSTRATE TYPES: 3	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of P	Pool De
	Max =
 > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] > 5 cm - 10 cm [15 pts] < 5 cm [5 pts] 	
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	25
COMMENTS MAXIMUM POOL DEPTH (centimeters): 20	
	Bankf
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width
	Max=3
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	
	F
COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.90	5
This information <u>must</u> also be completed	5
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY · ☆NOTE: River Left (L) and Right (R) as looking downstream☆	5
This information <u>must</u> also be completed	5
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY NOTE: River Left (L) and Right (R) as looking downstream <u>RIPARIAN WIDTH</u> L R (Per Bank) L R ✓ Wide >10m ✓ Mature Forest, Wetland Conservation Tillage	5
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆ <u>RIPARIAN WIDTH</u> FLOODPLAIN QUALITY L R (Most Predominant per Bank) L R	5
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY INNOTE: River Left (L) and Right (R) as looking downstream in RIPARIAN WIDTH RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L Immature Forest, Wetland Conservation Tillage Moderate 5-10m Immature Forest, Shrub or Old Vibal Open Pasture Row Crop	
This information must also be completed RIPARIAN ZONE AND FLOODP LAIN QUALITY IN NOTE: River Left (L) and Right (R) as looking downstream In Riparity RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R Image: Imag	
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY INNOTE: River Left (L) and Right (R) as looking downstream Innotes and the second downstream Innotes and the sec	
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY INNOTE: River Left (L) and Right (R) as looking downstream IN RIPARIAN WIDTH FLOODPLAIN QUALITY Innote Innote International Person Internation Person International Person Interna	
This information must also be completed RIPARIAN ZONE AND FLOODP LAIN QUALITY ARIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L Mide >10m Mature Forest, Wetland Moderate 5-10m Immature Forest, Shrub or Old Moderate 5-10m Residential, Park, New Field Narrow <5m	
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream A RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R Image: Provide a structure of the structure	
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream & RIPARIAN WIDTH FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream & L R (Per Bank) L R Vide >10m I R (Most Predominant per Bank) L R Vide >10m I R (Most Predominant per Bank) L R Moderate 5-10m Immature Forest, Wetland Open Pasture, Row Crop Narrow <5m Residential, Park, New Field Open Pasture, Row Crop None Fenced Pasture Mining or Construction COMMENTS Moist Channel, isolated pools, no flow (Intermittent) Dry channel, no water (Ephemeral) COMMENTS	
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream and the read a	
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream & RIPARIAN WIDTH FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream & Image: RIPARIAN WIDTH FLOODPLAIN QUALITY Image: Riparity of Research (R) as looking downstream & Image: Riparity of Research (R) Image: Riparity of Research (R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: R) Image: Riparity of R) Image: Riparity of R) Image: Riparity of R) Image: R) Image: R) Image: Riparity of R) Image: Riparity of R) Image: R) Image: R) Image: R) Image: R) Image: Riparity of R) Image: Riparity of R) Im	

ADDITIONAL STREAM INFORMATION (This Information N	lust Also be Completed):
QHEI PERFORMED? - Yes 🗸 No QHEI Sco	ore (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDIN	G THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N):Y Date of last precipitat	tion: 11/04/17 Quantity: 0.07
Photograph Information:	
Elevated Turbidity? (Y/N): N Canopy (% open):	0%
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (m	ng/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations	. Voucher collections optional. NOTE: all voucher samples must be labeled with the site
ID number. Include appropriate	e field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) Salam. Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) N	anders Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	N
1	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





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SITE NAME/LOCATION Willowbrook Solar Farm	0 11
	0.11
LENGTH OF STREAM REACH (ft) 791 LAT. 39.03688 LONG83.69527 RIVER CODE RIVER MILE DATE 11/04/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Ins	tructions
STREAM CHANNEL Image: None / Natural Channel Image: Recovered Image: Recovering Image: Recent or No Recovering MODIFICATIONS: Image: Recent or No Recovering Image: Recent or No Recovering Image: Recent or No Recovering	COVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHEI
TYPE PERCENT TYPE PERCENT	Metric
□ □ BLDR SLABS [16 pts] 0% ✓ □ SILT [3 pt] 40%	Points
BOULDER (>256 mm) [16 pts] 0% LEAF PACK/WOODY DEBRIS [3 pts] 0% BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0%	Substrate
COBBLE (65-256 mm) [12 pts] 0% CLAY or HARDPAN [0 pt] 0%	Max = 40
GRAVEL (2-64 mm) [9 pts] 10% MUCK [0 pts] 0%	12
SAND (<2 mm) [6 pts] 50% ARTIFICIAL [3 pts] 0%	
Total of Percentages of 0.00% (A) Substrate Percentage 100% (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 3	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dept
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30
> 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts] / NO WATER OR MOIST CHANNEL [0 pts]	0
COMMENTS MAXIMUM POOL DEPTH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width
 > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] 	Max=30
COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.50	5
COMMENTSAVERAGE BANKFOLL WIDTH (INELETS).	
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY	
RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank) L R	
Wide >10m Mature Forest, Wetland Conservation Tillage	
Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial	
Narrow <5m Residential, Park, New Field Open Pasture, Row C	Crop
None Fenced Pasture Mining or Constructio	n
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):	
Stream Flowing Moist Channel, isolated pools, no flow (Intermitter Subsurface flow with isolated pools (Interstitial)	nt)
Subsurface flow with isolated pools (Interstitial) COMMENTS_	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
None 1.0 2.0 3.0	
✓ 0.5 1.5 2.5 >3	

ADDITIONAL STREAM INFORMATION (This Information M	ust Also be Completed):
QHEI PERFORMED? - Yes 🖌 No QHEI Sco	ore (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	G THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitat	ion: 11/04/17 Quantity: 0.07
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open): _	0%
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (me	g/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations.	Voucher collections optional. NOTE: all voucher samples must be labeled with the site
ID number. Include appropriate	field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) Salama Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) N	anders Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





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Reset Form

Willowbrook Solar Form		
SITE NAME/LOCATION Willowbrook Solar Farm SITE NUMBER WB-011		
	RIVER BASIN DRAII .03688 LONG83.69527 RIVER CODE	NAGE AREA (mi ²) 0.11
	OMMENTS Slabcamp Run-East Fork Whited	
NOTE: Complete All Items On This Form - Refer	to "Field Evaluation Manual for Ohio's PHWH	Streams" for Instructions
STREAM CHANNEL INONE / NATURAL CH.	ANNEL RECOVERED RECOVERING R	ECENT OR NO RECOVERY
	substrate present. Check ONLY two predominant subs	
(Max of 32). Add total number of significant substra	ate types found (Max of 8). Final metric score is sum of b TYPE	PERCENT HHE
BLDR SLABS [16 pts]	SILT [3 pt]	90% Point
BOULDER (>256 mm) [16 pts]	LEAF PACK/WOODY DEBRIS [3 pts]	0% Substra
BEDROCK [16 pt] 0% COBBLE (65-256 mm) [12 pts] 0%	FINE DETRITUS [3 pts] CLAY or HARDPAN [0 pt]	Max = 4
GRAVEL (2-64 mm) [9 pts]	MUCK [0 pts]	0%
SAND (<2 mm) [6 pts]	ARTIFICIAL [3 pts]	0%
Total of Percentages of 0.00%	(A) Substrate Percentage 100%	(B) A + B
Bldr Slabs, Boulder, Cobble, Bedrock	Check	
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TY	PES: 9 TOTAL NUMBER OF SUBSTRAT	
	ool depth within the 61 meter (200 ft) evaluation reac	
evaluation. Avoid plunge pools from road culverts c > 30 centimeters [20 pts]	or storm water pipes) (Check ONLY one box): > 5 cm - 10 cm [15 pts]	Max = 3
> 22.5 - 30 cm [30 pts]	5 cm [5 pts]	
> 10 - 22.5 cm [25 pts]	NO WATER OR MOIST CHANNEL [0	pts] 15
COMMENTS	MAXIMUM POOL DEPTH (cen	timeters): 8
3. BANK FULL WIDTH (Measured as the average of	of 3-4 measurements) (Check ONLY one box)	Bankfu
> 4.0 meters (> 13') [30 pts]	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	≤ 1.0 m (<=3' 3") [5 pts]	Max=30
COMMENTS	AVERAGE BANKFULL WIDTH	(meters): 1.20 15
T RIPARIAN ZONE AND FLOODPLAIN QUA	his information <u>must</u> also be completed ALITY ☆NOTE: River Left (L) and Right (R) as look	ng downstream 3
	PLAIN QUALITY	
L R (Per Bank) L R	(Most Predominant per Bank) L R	
✓ ✓ Wide >10m ✓ ✓	Immature Forest Shrub or Old	onservation Tillage
Moderate 5-10m	Field	ban or Industrial
Narrow <5m	Residential, Park, New Field	en Pasture, Row Crop
	Fenced Pasture	
None		ning or Construction
COMMENTS		ning or Construction
		ning or Construction
COMMENTS FLOW REGIME (At Time of Evaluation) (C Stream Flowing	Check ONLY one box):	no flow (Intermittent)
COMMENTS	Check ONLY one box):	no flow (Intermittent)
COMMENTS FLOW REGIME (At Time of Evaluation) (C Stream Flowing Subsurface flow with isolated pools (Interstit COMMENTS	Check ONLY one box): ial) Dry channel, isolated pools, Dry channel, no water (Epher	no flow (Intermittent)
COMMENTS FLOW REGIME (At Time of Evaluation) (C Stream Flowing Subsurface flow with isolated pools (Interstit	Check ONLY one box): ial) Moist Channel, isolated pools, Dry channel, no water (Epher	no flow (Intermittent)
COMMENTS FLOW REGIME (At Time of Evaluation) (C Stream Flowing Subsurface flow with isolated pools (Interstit COMMENTS SINUOSITY (Number of bends per 61 m (2)	Check ONLY one box): ial) Moist Channel, isolated pools, Dry channel, no water (Epher 00 ft) of channel) (Check ONLY one box): 2.0	no flow (Intermittent) neral)
COMMENTS FLOW REGIME (At Time of Evaluation) (C Stream Flowing Subsurface flow with isolated pools (Interstit COMMENTS SINUOSITY (Number of bends per 61 m (2) None 0.5 1.5 STREAM GRADIENT ESTIMATE	Check ONLY one box): ial) Moist Channel, isolated pools, Dry channel, no water (Epher 00 ft) of channel) (Check ONLY one box): 2.0	no flow (Intermittent) neral) 3.0

ADDITIONAL STREAM INFORMATION (This Information M	ust Also be Completed):
QHEI PERFORMED? - Yes 🖌 No QHEI Sco	ore (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	G THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitat	ion: 11/04/17 Quantity: 0.07
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open): _	0%
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (me	g/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations.	Voucher collections optional. NOTE: all voucher samples must be labeled with the site
ID number. Include appropriate	field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) Salama Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) N	anders Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Save as pdf Reset Form

SITE NAME (CONTION Willowhronk Solar		
SITE NAME/LOCATION Willowbrook Solar	r Farm	
SITE NUMBER W	B-014 RIVER BASIN DRAINAGE AREA (mi²)	.10
	LAT. 39.04178 LONG83.69741 RIVER CODE RIVER MILE	
DATE 11/05/17 SCORER BJS	COMMENTS Slabcamp Run-East Fork Whiteoak Creek	
	n - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instr	uctions
NOTE. Complete All items on This Form		uctions
STREAM CHANNEL NONE / NATURATIONS:	URAL CHANNEL 🗹 RECOVERED 🔲 RECOVERING 🔲 RECENT OR NO REC	OVERY
	ry type of substrate present. Check ONLY two predominant substrate TYPE boxes	
	ant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHEI Metric
	ERCENT TYPE PERCENT 0% I SILT [3 pt] 85%	Points
	0% LEAF PACK/WOODY DEBRIS [3 pts] 0%	
BEDROCK [16 pt]	0% FINE DETRITUS [3 pts]	Substrate Max = 40
	0% CLAY or HARDPAN [0 pt] 0%	
	0% MUCK [0 pts] 0%	11
SAND (<2 mm) [6 pts]	15% ARTIFICIAL [3 pts] 0%	
Total of Percentages of 0. Bldr Slabs, Boulder, Cobble, Bedrock	.00% (A) Substrate Percentage 100% (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBST		
2. Maximum Pool Depth (Measure the ma	aximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dept
	I culverts or storm water pipes) (Check ONLY one box):	Max = 30
> 30 centimeters [20 pts]	> 5 cm - 10 cm [15 pts]	
> 22.5 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts]	< 5 cm [5 pts] NO WATER OR MOIST CHANNEL [0 pts]	15
		15
COMMENTS	MAXIMUM POOL DEPTH (centimeters): 8	
3 BANK FULL WIDTH (Measured as the a	average of 3-4 measurements) (Check ON/ Yone box):	Bankfull
3. BANK FULL WIDTH (Measured as the a > 4.0 meters (> 13') [30 pts]	average of 3-4 measurements) (Check ONLY one box): > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Bankfull Width
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]		
> 4.0 meters (> 13') [30 pts]	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width
 > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] 	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ✓ ≤ 1.0 m (<=3' 3") [5 pts]	Max=30
 > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] 	 > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts] AVERAGE BANKFULL WIDTH (meters): 0.90 	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL		Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPLE RIPARIAN WIDTH	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPLE RIPARIAN WIDTH L R (Per Bank)	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] \leq 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH L R (Per Bank) Wide >10m	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPLE RIPARIAN WIDTH L R (Per Bank)	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH L R (Per Bank) Wide >10m	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH L R (Per Bank) Wide >10m Image: Moderate 5-10m Marrow <5m	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m ✓ Narrow <5m	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m Moderate 5-10m ✓ Narrow <5m	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
 > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m ✓ Narrow <5m ✓ Narrow <5m ✓ None COMMENTS FLOW REGIME (At Time of Evalue Stream Flowing	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m ✓ Narrow <5m	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
 > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL <u>RIPARIAN WIDTH</u> L R (Per Bank) Wide >10m Moderate 5-10m ✓ Narrow <5m ✓ Narrow <5m ✓ None COMMENTS FLOW REGIME (At Time of Evalue Stream Flowing	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m ✓ Narrow <5m None COMMENTS FLOW REGIME (At Time of Evalue Stream Flowing ✓ Subsurface flow with isolated pools COMMENTS	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m ✓ Narrow <5m	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m ✓ Narrow <5m None COMMENTS FLOW REGIME (At Time of Evalue Stream Flowing ✓ Subsurface flow with isolated pools COMMENTS	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH L R (Per Bank) Wide >10m Moderate 5-10m ✓ Narrow <5m	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30

ADDITIONAL STREAM INFORMATION (This Information M	ust Also be Completed):
QHEI PERFORMED? - Yes 🖌 No QHEI Sco	ore (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Date of last precipitat	ion: 11/04/17 Quantity: 0.07
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open): _	10%
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (m	g/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N)	_ If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): N (If Yes, Record all observations.	Voucher collections optional. NOTE: all voucher samples must be labeled with the site
ID number. Include appropriate	field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) Salama Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) N	anders Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
· · · · · · · · · · · · · · · · · · ·	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





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SITE NAME/LOCATION Willowbrook Sola	ar Earm	Υ		
		CIN	DRAINAGE AREA (mi²)	1 26
LENGTH OF STREAM REACH (ft) 4,415	LAT 39.04137			
DATE 11/05/17 SCORER BJS		abcamp Run-East Fo		
		· · · · · · · · · · · · · · · · · · ·		otructiono
NOTE: Complete All Items On This Form	n - Refer to "Field Eva	luation Manual for Oni	o's PHWH Streams" for in	structions
STREAM CHANNEL INONE / NA MODIFICATIONS:	FURAL CHANNEL 🔲 RI	ECOVERED 🔽 RECOVE	ERING 🔲 RECENT OR NO R	ECOVERY
1. SUBSTRATE (Estimate percent of eve				
(Max of 32). Add total number of signific TYPE P	ercent TYPE	Max of 8). Final metric sco	re is sum of boxes A & B. PERCENT	Metri
BLDR SLABS [16 pts]		SILT [3 pt]	80%	Point
BOULDER (>256 mm) [16 pts]		LEAF PACK/WOODY DE	BRIS [3 pts] 0%	Substra
BEDROCK [16 pt] COBBLE (65-256 mm) [12 pts]	<u> </u>	FINE DETRITUS [3 pts] CLAY or HARDPAN [0 pt		Max = 4
GRAVEL (2-64 mm) [9 pts]	5%	MUCK [0 pts]	0%	40
SAND (<2 mm) [6 pts]	15%	ARTIFICIAL [3 pts]	0%	12
Total of Percentages of	.00% ^(A)	Substrate Percentage 100%	(B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock SCORE OF TWO MOST PREDOMINATE SUBS	TRATE TYPES: 9	Check	SUBSTRATE TYPES: 3	
2. Maximum Pool Depth (Measure the m				Pool Dep
evaluation. Avoid plunge pools from road > 30 centimeters [20 pts]	d culverts or storm water p	ipes) (Check ONLY one > 5 cm - 10 cm [15 pts]	box):	Max = 3
> 22.5 - 30 cm [30 pts]		< 5 cm [5 pts]		
> 10 - 22.5 cm [25 pts]		NO WATER OR MOIST	CHANNEL [0 pts]	_ 20
COMMENTS			DEPTH (centimeters): 38	
3. BANK FULL WIDTH (Measured as the	average of 3-4 measure	nents) (Check O	/LY one box):	Bankful
> 4.0 meters (> 13') [30 pts]		> 1.0 m - 1.5 m (> 3' 3" -		Width
 > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] 		1.0 m (<=3' 3") [5 pts]		Max=30
COMMENTS		AVERAGE BANK	FULL WIDTH (meters): 3.10	25
		n <u>must</u> also be completed		
RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH	FLOODPLAIN QUALITY ☆NC	()	nt (R) as looking downstream☆	
L R (Per Bank)	LR (Most Predo	ninant per Bank)	LR	
Wide >10m	Mature Fores	st, Wetland rest, Shrub or Old	Conservation Tillage	•
Moderate 5-10m	Field		Urban or Industrial	
Narrow <5m	Residential,	Park, New Field	Open Pasture, Row	Crop
None	Fenced Past	ure	Mining or Constructi	on
FLOW REGIME (At Time of Eva	luation) (Check ONLY on			
Stream Flowing Subsurface flow with isolated poor COMMENTS	ls (Interstitial)		solated pools, no flow (Intermitte water (Ephemeral)	ent)
SINUOSITY (Number of bends p None	per 61 m (200 ft) of channe 1.0	I) (Check ONLY one box) 2.0	3.0	
	1.5	2.5	>3	
			□.	
Flat (0.5 ft/100 ft)	Moderate (2 ft/100 ft)	Moderate to Se	vere 🗌 Severe (10	ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Co	mpleted):
QHEI PERFORMED? - Yes V No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	_ Distance from Evaluated Stream
CWH Name: _	_ Distance from Evaluated Stream _
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE W	ATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: NRCS	Soil Map Page: NRCS Soil Map Stream Order
County: Highland Township / Ci	ty:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/04	4/17 Quantity: 0.07
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open):5%	
Were samples collected for water chemistry? (Y/N): (Note lab sample	e no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) p	DH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) If not, please	explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	ons optional. NOTE: all voucher samples must be labeled with the site
	from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Salamanders Observed	I? (Y/N) N Voucher? (Y/N) N N
Frogs or Ladpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Mach	oinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location







SITE NUMBER WB-016 RVER BASIN DRANAGE AREA (mf) 0.00 ENGTH OF STREAM REACH (mf) 429 LAT. 39.04319 LONG. 63.70017 RIVER CODE RIVER MULE Are: 11/05/17 SCORE R BJS COMMENTS ESS Loch MURE SISTEMENT COMMENTS ESS Loch MURE SISTEMENT RECENT OR NO RECOVERY MODIFICATIONS: INONE / NATURAL CHANNEL RECOVERING RECENT OR NO RECOVERY RECENT OR NO RECOVERY SUBSTRATE (Estimate percent of every type of substrate present. Check O/LY Yag predominant substrate TYPE boxes Max of 32). Add total number of significant substrate present. Check O/LY Yag predominant substrate TYPE boxes Minit Stream of the Stream of t		
ENOTH OF STREAM REACH (f) 429 LAT. 39.04319 LONC 83.70017 River coole inver MILE ATE 11/05/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohlo's PHWH Streams" for Instructions Stream Field Evaluation Manual for Ohlo's PHWH Streams" for Instructions STREAM CHANNEL INONE / NATURAL CHANNEL RECOVERING RECOVERING RECOVERING RECENT OR NO RECOVERY WUBSTRATE (Estimate percent of every type of substrate present. Check OVLY two predominant substrate TVPE boxes Substrate present Orkack OVLY two predominant substrate TVPE boxes File Contractions Percent BOULDER (>263 mm) (16 pis) 0%	SITE NAME/LOCATION Willowbrook Solar Fai	rm
ATE 11/05/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions Instructions STREAM CHANNEL INONE / NATURAL CHANNEL RECOVERING RECENT OR NO RECOVERY SUBSTRATE (Estimate percent of every type of substrate present. Check. ONLY two predominant substrate TYPE boxes HHE Wax of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes AB. 8. Percent TPE BLOR SLABS (16 pht) 0% ELAF PACKWOODY DEBRIS (3 pht) Percent BEDROCK (16 pht) 0% 0% CLAY or HARDPAN (0 pt) 0% 0% BEDROCK (16 pht) 0% 0% RATIFICIAL (3 pht) 0% 0% BeDROCK (16 pht) 0% 0% (A) REFERENCE (264 mm) (19 pht) 0% 0% Bidr Sbace Solution: Cooke. Bedrock 0.00% (A) RECENT OR NOST CHANNEL (0 pht) 0% 0% Solution: Cooke. Bedrock 0.00% (A) Recent Of (16 pht) 0% 0% Solution: Cooke. Bedrock 0.00% (A) Recent Of (16 pht) 0% 0%	SITE NUMBER WB-01	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Strams" for Instructions STREAM CHANNEL INONE / NATURAL CHANNEL RECOVERING RECOVERING RECENT ON ON RECOVERY SUBSTRATE (Estimate percent of every type of substrate present. Check OVL Y two predominant substrate TYPE boxes (Max of 32), Add total number of significant substrate types found (Max of 8), Final metric score is substrate TYPE boxes (Max of 32), Add total number of significant substrate types found (Max of 8), Final metric score is substrate TYPE boxes (Max of 32), Add total number of significant substrate types found (Max of 8), Final metric score is substrate TYPE boxes (Max of 32), Add total number of significant substrate types found (Max of 8), Final metric score is substrate types found (Max of 8), Final Metric score is substrate types found (Max of 8), Final Metric score is substrate TYPE is 10, 12, 13, 14, 12, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14		
TREAM CHANNEL INONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY Wax of 32). Add total number of significant substrate types for substrate types	DATE 11/05/17 SCORER BJS	COMMENTS Slabcamp Run-East Fork Whiteoak Creek
TREAM CHANNEL INONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY Wax of 32). Add total number of significant substrate types for substrate types	NOTE: Complete All Items On This Form - Re	efer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruction
MODIFICATIONS: SUBSTRATE (Estimate percent of every type of substrate present. Check: O/M_Y two predominant substrate TYPE horas (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes 8. & B. Image: Status (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes 8. & B. Image: Status (B pt) Image: Status (B pt) <	·	
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. Here TPF BLDR SLABS (16 pts) 0% 12 12 75% BOULDER CABS (266 mm) (16 pts) 0%	MODIFICATIONS:	L CHANNEL I RECOVERED I RECOVERING I RECENT OR NO RECOVER
TYPE PERCENT TYPE PERCENT PFR BLDR SLABS (16 pts) 0% Image: Commentation of the state of the stat		
BLDR SLABS (16 pts) DOWN		
BOULDER (226 mm) [16 pts] 0% BEDROCK [16 pt] 0% COBBLE (65-26 mm) [12 pts] 0% GRAVEL (2-44 mm) [9 pts] 0% Bit Slabs, Boulder, Cobble, Bedrock 0.00% 0% Bit Slabs, Boulder, Cobble, Bedrock 0.00% 0% CORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 Total of Parcentages of evolution of the substrate the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from read culvets or show meter pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts] > 0 cm [5 pts] > 202.5. 30 cm [30 pts] > 5 cm - 10 cm [15 pts] 0 > 30 centimeters [10 pts] < 5 cm - 10 cm [15 pts]		
BEDROLE (65-26 mm) [12 pts] 0% 0% 0% 0% GRAVEL (2-44 mm) [6 pts] 0% 0% 0% 0% 0% Bdr Slabs, Boulder, Cobble, Bedrock 0.00% (A) 0% 0% 0% Total of Percentages of evaluation reachings of a maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from read culvets or storm water pipes) 0 * * * * * * * * * * * * * * * * * * *		LEAF PACK/WOODY DEBRIS [3 pts]
COBBLE (65:266 mm) [12 pts] 0% CAV or HARDPAN [0 pt] 0% SAND (<2 mm) [6 pts]		FINE DETRITUS [3 pts]
Image: Substance of the su		CLAY or HARDPAN [0 pt]
SAND (Common (pp is) Use Use <td></td> <td></td>		
Bidr Stabs, Boulder, Cobble, Bedrock 000% 100% CORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 3 Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culvers or storm water pipes) > 5 cm - 10 cm (15 pis) > 2 o cm (15 pis) > 2 o cm (15 pis) > 2 o cm (15 pis) > 0 > 20 centimeters [20 pts] > 2 o cm (15 pis) > 5 cm - 10 cm (15 pis) > 0 > 0 0 > 20 centimeters [20 pts] > 2 o cm (25 pts) 0 NO WATER OR MOIST CHANNEL [0 pts) 0 > 10 - 22.5 cm [25 pts] 0 > 10 m - 1.5 m (> 3'.3' - 4' 8') (15 pts) > 0 0 > 4.0 meters (> 37) (20 pts) > 1.0 m - 1.5 m (> 3'.3' - 4' 8') (15 pts) > 0 5 > 3.0 m / 0 m (> 9' 7' - 4' 8') (20 pts) > 1.0 m (<=3'.3'') (5 pts)	SAND (<2 mm) [6 pts]	ARTIFICIAL [3 pts]
CORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 3 Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > > > 30 centimeters [20 pt] > > > > O > 22.5 - 30 cm [30 pts] > > > > O > 20.5 - 30 cm [30 pts] > > > > O BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > > 0 > 3.0 meters (> 137 [30 pts] > > > > > 0 > 3.0 m (> 9' 7' - 4' 8') [20 pts] > > > 0 0 > 3.0 meters (> 137 [30 pts] > > > 0 0 0 > 3.0 meters (> 137 [30 pts] > > > > 0 0 0 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY > > None Conservation Tillage 0 0 <		
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters (20 pts) -> 5 cm - 10 cm (15 pts) > 22.5 - 30 cm (30 pts) -> 5 cm - 10 cm (15 pts) > 10 - 22.5 cm (25 pts) OWATER OR MOIST CHANNEL [0 pts] COMMENTS MAXIMUM POOL DEPTH (centimeters): 0 BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > > 4.0 meters (-13) (30 pts) > 1.0 m - 1.5 m (> 3' 3' - 4' 8'') (15 pts) > > 3.0 m - 4.0 m (> 9' 7'' - 13') (25 pts) Z < 1.0 m (<=3' 3'') (5 pts)		E TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 3
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters (20 pts) -> 5 cm - 10 cm (15 pts) > 22.5 - 30 cm (30 pts) -> 5 cm - 10 cm (15 pts) > 10 - 22.5 cm (25 pts) OWATER OR MOIST CHANNEL [0 pts] COMMENTS MAXIMUM POOL DEPTH (centimeters): 0 BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > > 4.0 meters (-13) (30 pts) > 1.0 m - 1.5 m (> 3' 3' - 4' 8'') (15 pts) > > 3.0 m - 4.0 m (> 9' 7'' - 13') (25 pts) Z < 1.0 m (<=3' 3'') (5 pts)	2. Maximum Pool Depth (Measure the maximu	Im pool depth within the 61 meter (200 ft) evaluation reach at the time of Pool
22.5 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts] O BANK FULL WIDTH (Measured as the average of 3-4 measurements) A cometers (> 13) [30 pts] > 4.0 meters (> 13) [30 pts] > 3.0 m - 4.0 m (> 9' 7' - 4'') [20 pts] COMMENTS CO	evaluation. Avoid plunge pools from road culve	erts or storm water pipes) (Check ONLY one box): Ma
> 10 - 22.5 cm [25 pts] ✓ NO WATER OR MOIST CHANNEL [0 pts] 0 COMMENTS MAXIMUM POOL DEPTH (centimeters): 0 BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): 0 > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3'' - 4' 3') [15 pts] 0 > 3.0 m - 4.0 m (> 9' 7'' - 13') [25 pts] ✓ 1.0 m (-5' 3'') [5 pts] 0.70 > 1.5 m - 3.0 m (> 9' 7'' - 4' 3'') [20 pts] ✓ 1.0 m (-6'3' 3'') [5 pts] 5 COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.70 5 This information must also be completed RIPARIAN WIDTH FLOODPLAIN QUALITY *NOTE: River Left (L) and Right (R) as looking downstream * RIPARIAN WIDTH FLOODPLAIN QUALITY *NOTE: River Left (L) and Right (R) as looking downstream * RIPARIAN WIDTH L R (Most Predominant per Bank) L R Conservation Tillage Immature Forest, Shrub or Old Urban or Industrial Open Pasture, Row Crop Mointg or Construction Moderate 5-10m Residential, Park, New Field Open Pasture, Row Crop None Fenced Pasture Mining or Construction COMMENTS You and, no water (Ephemeral) S0 <td< td=""><td></td><td></td></td<>		
COMMENTS MAXIMUM POOL DEPTH (centimeters): 0 BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > > > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > > > > 1.5 m - 3.0 m (> 9' 7" - 13') [25 pts] > > 1.0 m (<=3' 3") [5 pts]		
BANK FULL WIDTH (Measured as the average of 3-4 measurements) C(heck ONL Y one box): > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (>3'3' - 4'8'') [15 pts] > 3.0 m - 4.0 m (>9'7' - 13') [25 pts] 2 1.0 m (<=3'3'') [5 pts]		
> 4.0 meters (> 13) [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4" 8") [15 pts] > 1.0 m - 1.5 m (> 3' 3" - 4" 8") [15 pts] > 3.0 m - 4.0 m (> 9" 7" - 4" 8") [20 pts] > 1.0 m (<=3' 3") [5 pts]	COMMENTS	MAXIMUM POOL DEPTH (centimeters): 0
> 3.0 m + 4.0 m (> 9' 7' - 13') [25 pts] ✓ 1.0 m (<=3' 3') [5 pts]	3. BANK FULL WIDTH (Measured as the avera	age of 3-4 measurements) (Check ONLY one box): Ba
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 µs] AVERAGE BANKFULL WIDTH (meters): 0.70 5 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ** NOTE: River Left (L) and Right (R) as looking downstream** RIPARIAN WIDTH FLOODPLAIN QUALITY ** NOTE: River Left (L) and Right (R) as looking downstream** Wide >10m L R (Most Predominant per Bank) L R Conservation Tillage Immature Forest, Shrub or Old Urban or Industrial Open Pasture, Row Crop Immature Forest, Shrub or Old Urban or Industrial Narrow <5m		
COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.70 5 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY \$\cdot NOTE: River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN WIDTH FLOODPLAIN QUALITY \$\cdot NOTE: River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN WIDTH FLOODPLAIN QUALITY \$\cdot RipARIAN XONE AND FLOODPLAIN QUALITY \$\cdot RipARIAN XONE AND FLOODPLAIN QUALITY \$\cdot RipARIAN XONE AND FLOODPLAIN QUALITY \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Left (L) and Right (R) as looking downstream \$\cdot RipARIAN XONE River Riv		$\leq 1.0 \text{ m} (<=3' 3'') [5 \text{ pts}]$
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream of Ried and Ried Aried and Ried and		
RIPARIAN ZONE AND FLOODPLAIN QUALITY RIPARIAN WIDTH FLOODPLAIN QUALITY L R Wide >10m L Moderate 5-10m Immature Forest, Wetland Moderate 5-10m Immature Forest, Shrub or Old Narrow <5m		AVERAGE BANKFULL WIDTH (meters): 0.70
RIPARIAN ZONE AND FLOODPLAIN QUALITY RIPARIAN WIDTH FLOODPLAIN QUALITY L R Wide >10m L Moderate 5-10m Immature Forest, Wetland Moderate 5-10m Immature Forest, Shrub or Old Narrow <5m		This information must also be completed
L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m Immature Forest, Wetland Immature Forest, Shrub or Old Urban or Industrial Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial Narrow <5m		QUALITY ANOTE: River Left (L) and Right (R) as looking downstream
Wide >10m Mature Forest, Wetland Conservation Tillage Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial Narrow <5m		
Image: Stream Gradient estimate Image: Stream Gradient estimate Stream Gradient estimate 1.0 Stream Gradient estimate		
Moderate 5-10m Image: Field Open Pasture, Row Crop Narrow <5m		Immature Forest Shrub or Old
Narrow <5m	Moderate 5-10m	Field Urban or Industrial
COMMENTS	Narrow <5m	Residential, Park, New Field Open Pasture, Row Crop
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 0.5 1.5 2.0 3.0 >3	None	Fenced Pasture Mining or Construction
Stream Flowing Moist Channel, isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (Interstitial) Image: Commentation of the second secon	COMMENTS	
Stream Flowing Moist Channel, isolated pools, no flow (Intermittent) Subsurface flow with isolated pools (Interstitial) Image: Commentation of the second secon		n) (Check ONLY one box):
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 0.5 1.5 STREAM GRADIENT ESTIMATE	FLOW REGIME (At Time of Evaluation	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 0.5 None 1.0 2.0 2.5 3.0 >3 STREAM GRADIENT ESTIMATE	Stream Flowing	
None 1.0 2.0 3.0 0.5 1.5 2.5 3.0 STREAM GRADIENT ESTIMATE	Stream Flowing Subsurface flow with isolated pools (Inte	
✓ 0.5 1.5 2.5 >3	Stream Flowing Subsurface flow with isolated pools (Inte	
STREAM GRADIENT ESTIMATE	Stream Flowing Subsurface flow with isolated pools (Inter COMMENTS	m (200 ft) of channel) (Check <i>ONLY</i> one box):
	Stream Flowing Subsurface flow with isolated pools (Inter COMMENTS SINUOSITY (Number of bends per 61 r None 1.0	m (200 ft) of channel) (Check <i>ONLY</i> one box):
✓ Flat (0.5 ft/100 ft)	Stream Flowing Subsurface flow with isolated pools (Inte COMMENTS	m (200 ft) of channel) (Check <i>ONLY</i> one box):

ADDITIONAL STREAM INFORMATION (This Information Must Also be Complete	<u>əd):</u>
QHEI PERFORMED? - Yes ✓ No QHEI Score (If Yes	s, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATER	SHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: NRCS Soil N	Map Page: NRCS Soil Map Stream Order
County: Highland Township / City:	
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/04/17	Quantity: 0.07
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): N Canopy (% open): 20%	
Were samples collected for water chemistry? (Y/N): (Note lab sample no. o	or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.	U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) If not, please explain	n:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations. Voucher collections of	otional. NOTE: all voucher samples must be labeled with the site
ID number. Include appropriate field data sheets from t	he Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinver	N) N Voucher? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





PHWH Form Page - 2

Save as pdf Reset Form

SITE NAME/LOCATION Willowbrook Solar Farm)0
LENGTH OF STREAM REACH (ft) 103 LAT. 39.04310 LONG83.69846 RIVER CODE RIVER MILE	
DATE 11/05/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru-	ctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING	VERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT BLDR SLABS [16 pts] 0% SILT [3 pt] 85%	HHEI Metric Points
BOULDER (>256 mm) [16 pts] 0% BEDROCK [16 pt] 0% COBBLE (65-256 mm) [12 pts] 5% CLAY or HARDPAN [0 pt] 0% MUCK [0 pts] 0%	Substrate Max = 40
GRAVEL (2-64 mm) [9 pts] 0% MUCK [0 pts] 0% SAND (<2 mm) [6 pts]	12
Total of Percentages of 5.00% (A) Substrate Percentage 100% (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 3	
 Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] 	Pool Dept Max = 30
> 10 - 22.5 cm [25 pts]	0
COMMENTS MAXIMUM POOL DEPTH (centimeters):	
BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONL Y one box): > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Bankfull
= 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] $ > 3.0 m (<=3' 3") [5 pts] $ $ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]$	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] \checkmark \leq 1.0 m (<=3' 3") [5 pts]	
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.30	Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.30 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆ NOTE: River Left (L) and Right (R) as looking downstream ☆	Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.30 Image: Commentation in the second	Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS	Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.30 RIPARIAN ZONE AND FLOODPLAIN QUALITY \$NOTE: River Left (L) and Right (R) as looking downstream \$ RIPARIAN WIDTH FLOODPLAIN QUALITY \$NOTE: River Left (L) and Right (R) as looking downstream \$ RIPARIAN WIDTH FLOODPLAIN QUALITY \$NOTE: River Left (L) and Right (R) as looking downstream \$ RIPARIAN WIDTH FLOODPLAIN QUALITY \$NOTE: River Left (L) and Right (R) as looking downstream \$ RIPARIAN WIDTH FLOODPLAIN QUALITY \$Node = 10m Mature Forest, Wetland Moderate 5-10m Immature Forest, Shrub or Old Moderate 5-10m Immature Forest, Shrub or Old \$None Residential, Park, New Field Open Pasture, Row Crop None Fenced Pasture Mining or Construction	Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.30 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ↓ R (Per Bank) ↓ R ↓ L R (Per Bank) ↓ R ↓ Wide >10m ↓ Mature Forest, Wetland ↓ Conservation Tillage ↓ Moderate 5-10m ↓ Imature Forest, Shrub or Old ↓ Urban or Industrial ↓ None ↓ Residential, Park, New Field ↓ Open Pasture, Row Crop ↓ None ↓ Fenced Pasture ↓ Mining or Construction COMMENTS ↓ ↓ Dry channel, isolated pools, no flow (Intermittent) ↓ Stream Flowing Subsurface flow with isolated pools (Interstitial) ↓ Moist Channel, isolated pools, no flow (Intermittent)	Max=30

ADDITIONAL STREAM INFORMATION (This Information M	ust Also be Completed):
QHEI PERFORMED? - Yes 🖌 No QHEI Sco	re (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N):_Y Date of last precipitat	ion: 11/04/17 Quantity: 0.07
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open): _	80%
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (m	g/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	Voucher collections optional. NOTE: all voucher samples must be labeled with the site
	field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) Salama Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) N	Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



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Reset Form

SITE NAME/LOCATION Willowbrook Solar Farm	
SITE NUMBER WB-018 RIVER BASIN DRAINAGE AREA (mi²)	.00
LENGTH OF STREAM REACH (ft) 1,217 LAT. 39.04320 LONG83.69463 RIVER CODE RIVER MILE	
DATE 11/05/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instr	uctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT	HHEI Metric
BLDR SLABS [16 pts] 0% SILT [3 pt] 85%	Points
BOULDER (>256 mm) [16 pts] 0% LEAF PACK/WOODY DEBRIS [3 pts] 0% BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0%	Substrate
Ok Ok<	Max = 40
GRAVEL (2-64 mm) [9 pts] 15% MUCK [0 pts] 0%	14
SAND (<2 mm) [6 pts]	
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock (A) (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 2	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dept
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):	Max = 30
> 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts] > 22.5 - 30 cm [30 pts] < 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	25
COMMENTS MAXIMUM POOL DEPTH (centimeters): 15	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	
	Bankfull
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Bankfull Width
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] \checkmark \leq 1.0 m (<=3' 3") [5 pts]	
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] \checkmark \leq 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] \checkmark \leq 1.0 m (<=3' 3") [5 pts]	
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.90	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ✓ ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
$ \begin{array}{ c c c c c c c } \hline & > 3.0 \text{ m} + 4.0 \text{ m} (> 9' 7'' - 13') [25 \text{ pts}] \\ \hline & > 1.5 \text{ m} - 3.0 \text{ m} (> 9' 7'' - 4' 8'') [20 \text{ pts}] \\ \hline & & & & & & & & & & & & & & & & & &$	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ✓ ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.90 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆ RIPARIAN WIDTH FLOODPLAIN QUALITY ↓ R (Per Bank) ↓ R ↓ R (Most Predominant per Bank) ↓ R ↓ Wide >10m ↓ Mature Forest, Wetland ↓ Conservation Tillage ↓ Moderate 5-10m ↓ Residential, Park, New Field ✓ ✓ ↓ Narrow <5m	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY Short E RIPARIAN WIDTH FLOODPLAIN QUALITY Short E RIPARIAN WIDTH FLOODPLAIN QUALITY Short E Riparian Moderate 5-10m Short E Residential, Park, New Field Open Pasture, Row Cross Yon None Fenced Pasture Mining or Construction	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆ RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L Moderate 5-10m Mature Forest, Wetland Moderate 5-10m Immature Forest, Shrub or Old Wide >10m Residential, Park, New Field None Fenced Pasture Moint Colment Mining or Construction COMMENTS Moist Channel, isolated pools, no flow (Intermittent	Width Max=30
> 3.0 m - 4.0 m (< 9' 7" - 13') [25 pts]	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] This information must also be completed RIPARIAN ZONE AND FLOODP LAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆ RIPARIAN ZONE AND FLOODP LAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆ RIPARIAN WIDTH FLOODPLAIN QUALITY Wide >10m Mature Forest, Wetland Wide >10m Mature Forest, Shrub or Old Wide >10m Immature Forest, Shrub or Old Wide >10m Residential, Park, New Field Narrow <5m	Width Max=30
> 3.0 m - 4.0 m (< 9' 7" - 13') [25 pts]	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): O model in the image in th	Width Max=30

ADDITIONAL STREAM INFORMATION (This Information M	ust Also be Completed):
QHEI PERFORMED? - Yes 🗸 No QHEI Sco	re (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Y Date of last precipitati	on: 11/04/17 Quantity: 0.07
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open): _	100%
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mo	η/I) pH (S.U.) Conductivity (μmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): N (If Yes, Record all observations.	Voucher collections optional. NOTE: all voucher samples must be labeled with the site
	field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salama Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) N	nders Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





PHWH Form Page - 2



SITE NAME/LOCATION Willowbrook Solar Farm	0.42
LENGTH OF STREAM REACH (ft) 5,902 LAT. 39.04965 LONG83.69699 RIVER CODE RIVER MILE	
DATE 11/05/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Inst	ructions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING	COVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	I HHEI
TYPE PERCENT TYPE PERCENT	Metric
BLDR SLABS [16 pts] 0% ✓ SILT [3 pt] 60% BOULDER (>256 mm) [16 pts] 0% EAF PACK/WOODY DEBRIS [3 pts] 0%	Foints
BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0%	Substrate Max = 40
COBBLE (65-256 mm) [12 pts] 5% CLAY or HARDPAN [0 pt] 0% GRAVEL (2-64 mm) [9 pts] 35% MUCK [0 pts] 0%	
SAND (<2 mm) [6 pts]	15
Total of Percentages of 5.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock	
2. Maximum Pool Depth (<i>Measure the maximum pool depth within the 61 meter (200 ft)</i> evaluation reach at the time of	Pool Dept
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):	Max = 30
> 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts] ✓ > 22.5 - 30 cm [30 pts]	
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	30
COMMENTS MAXIMUM POOL DEPTH (centimeters): 30	
	1
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	
> 4.0 meters (> 13') [30 pts]	Bankfull Width Max=30
	Width
> 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] imes 1.0 m (> 3' 3" - 4' 8") [15 pts] imes 1.0 m (<=3' 3") [5 pts]	Width
$ \begin{array}{ c c c c c c c c } &> 4.0 \text{ meters} (> 13') [30 \text{ pts}] \\ &> 3.0 \text{ m} - 4.0 \text{ m} (> 9' 7" - 13') [25 \text{ pts}] \\ &> 1.5 \text{ m} - 3.0 \text{ m} (> 9' 7" - 4' 8") [20 \text{ pts}] \\ \hline \end{array} \\ \hline \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Width Max=30
$ \begin{array}{ c c c c c } &> 4.0 \text{ meters} (> 13') [30 \text{ pts}] \\ &> 3.0 \text{ m} - 4.0 \text{ m} (> 9' 7" - 13') [25 \text{ pts}] \\ &> 1.5 \text{ m} - 3.0 \text{ m} (> 9' 7" - 4' 8") [20 \text{ pts}] \end{array} $	Width Max=30
$ \begin{array}{ c c c c c } \hline & > 4.0 \text{ meters} (> 13') [30 \text{ pts}] \\ \hline > 3.0 \text{ m} - 4.0 \text{ m} (> 9' 7'' - 13') [25 \text{ pts}] \\ \hline > 1.5 \text{ m} - 3.0 \text{ m} (> 9' 7'' - 4' 8'') [20 \text{ pts}] \\ \hline & \\ \hline \hline & \\ \hline & \\ \hline & \\ \hline \hline \hline & \\ \hline \hline & \\ \hline \hline \hline & \\ \hline \hline \hline \hline$	Width Max=30
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Width Max=30
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Width Max=30
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] 1.0 m (<=3' 3") [5 pts]	Width Max=30
A.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 1.30 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY AVERAGE BANKFULL WIDTH (meters): 1.30 L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m Mature Forest, Wetland Conservation Tillage Immature Forest, Shrub or Old Urban or Industrial Moderate 5-10m Residential, Park, New Field I I/I Open Pasture, Row C None Fenced Pasture Mining or Construction COMMENTS Fenced Pasture Mining or Construction	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] 1.0 m (<=3' 3") [5 pts]	Width Max=30

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):	
QHEI PERFORMED? - Yes Ves No QHEI Score (If Yes, At	tach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	_ Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHE	DAREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: NRCS Soil Map	Page: NRCS Soil Map Stream Order
County: Highland Township / City:	
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Y Date of last precipitation: 11/04/17	Quantity: 0.07
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): N Canopy (% open): 20%	
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id.	. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) PH (S.U.)	Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) If not, please explain:	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	al. NOTE: all voucher samples must be labeled with the site
ID number. Include appropriate field data sheets from the P	
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebr	Voucher? (Y/N) Nates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





PHWH Form Page - 2



Save as pdf

Willowbrook Solar I	orm			
SITE NAME/LOCATION Willowbrook Solar I				0.12
LENGTH OF STREAM REACH (ft) 1,220 LA			DRAINAGE AREA (mi²)	0.13
DATE 11/05/17 SCORER BJS		camp Run-East For		
		· · · · · · · · · · · · · · · · · · ·		
NOTE: Complete All Items On This Form -	Refer to "Field Evalua	tion Manual for Ohio's	s PHWH Streams" for Ins	tructions
STREAM CHANNEL INONE / NATUR MODIFICATIONS:		OVERED 🔽 RECOVER	ING 🔲 RECENT OR NO RE	COVERY
1. SUBSTRATE (Estimate percent of every t				I HHEI
(Max of 32). Add total number of significant TYPE PER(substrate types found (Ma	x of 8). Final metric score	IS SUM OF DOXES A & B. PERCENT	Metri
BLDR SLABS [16 pts]	%	LT [3 pt]	75%	Point
BOULDER (>256 mm) [16 pts]		AF PACK/WOODY DEBF	RIS [3 pts] 0%	Substrat
BEDROCK [16 pt] 09 COBBLE (65-256 mm) [12 pts] 59		NE DETRITUS [3 pts] AY or HARDPAN [0 pt]	0%	Max = 4
GRAVEL (2-64 mm) [9 pts] 20		JCK [0 pts]	0%	1
SAND (<2 mm) [6 pts]	6 AF	RTIFICIAL [3 pts]	0%	15
Total of Percentages of 5.00		ostrate Percentage 100%	(B)	A+B
Bldr Slabs, Boulder, Cobble, Bedrock		eck	UBSTRATE TYPES: 3	
2. Maximum Pool Depth (Measure the maxi	mum pool depth within t	he 61 meter (200 ft) evalu	ation reach at the time of	Pool Dep
evaluation. Avoid plunge pools from road cu			x):	Max = 30
 > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] 		5 cm - 10 cm [15 pts] 5 cm [5 pts]		
> 10 - 22.5 cm [25 pts]		O WATER OR MOIST CH	HANNEL [0 pts]	5
COMMENTS		MAXIMUM POOL DI	EPTH (centimeters): 5	
			· · · ·	
3. BANK FULL WIDTH (Measured as the average of the second		(Check ONL) 1.0 m - 1.5 m (> 3' 3" - 4')		Bankfull Width
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]		a 1.0 m (<=3' 3") [5 pts]		Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]				
COMMENTS		AVERAGE BANKFU	LL WIDTH (meters): 1.30	15
		ust also be completed		
RIPARIAN ZONE AND FLOODPLA RIPARIAN WIDTH		River Left (L) and Right (R) as looking downstream 🛠	
	L R (Most Predomina		R	
Wide >10m	Mature Forest, V		Conservation Tillage	
Moderate 5-10m	Field		Urban or Industrial	
Narrow <5m	Residential, Par	k, New Field	Open Pasture, Row C	rop
✓ ✓ None	Fenced Pasture		Mining or Constructio	n
COMMENTS				
FLOW REGIME (At Time of Evaluat	<i>tion)</i> (Check ONLY one b			
Stream Flowing Subsurface flow with isolated pools (Interstitial)	Moist Channel, isola	ated pools, no flow (Intermitter	nt)
COMMENTS_		, e	···· (prioritorior)	
SINUOSITY (Number of bends per 6	61 m (200 ft) of channel)	(Check ONLY one box)		
None 🗹	1.0	2.0	3.0	
0.5	1.5	2.5	>3	
STREAM GRADIENT ESTIMATE	Moderate (2 ft/100 ft)	Moderate to Seve	re 🔲 Severe (10 fi	/100 ft)

ADDITIONAL STREAM INFORMATION (This Information	Must Also be Completed):
QHEI PERFORMED? - Yes 🗸 No QHEI So	core (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	_ Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDIN	NG THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Y Date of last precipita	ation: 11/04/17 Quantity: 0.07
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open):	100%
Were samples collected for water chemistry? (Y/N):	_ (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (r	mg/l) pH (S.U.) Conductivity (μmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	s. Voucher collections optional. NOTE: all voucher samples must be labeled with the site
	te field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salan Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Salan	nanders Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location







SITE NAME/LOCATION Willowbrook Solar Farm	
SITE NUMBER WB-021 RIVER BASIN DRAINAGE AREA (mi²) 0.	00
LENGTH OF STREAM REACH (ft) 243 LAT. 39.05006 LONG83.69669 RIVER CODE RIVER MILE	
DATE 11/06/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru	ictions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	HHEI
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT	Metric
BLDR SLABS [16 pts] 0% Image: SILT [3 pt] 80% BOULDER (>256 mm) [16 pts] 0% LEAF PACK/WOODY DEBRIS [3 pts] 0%	Points
$\square \square BEDROCK [16 pt] \square \square FINE DETRITUS [3 pts] \square \square $	Substrate
COBBLE (65-256 mm) [12 pts] 5% CLAY or HARDPAN [0 pt] 0%	Max = 40
GRAVEL (2-64 mm) [9 pts] 15% MUCK [0 pts] 0% SAND (<2 mm) [6 pts]	15
Total of Percentages of 5.00% (A) Substrate Percentage 100% (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 3	
	Pool Dept
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30
✓ > 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	25
COMMENTS MAXIMUM POOL DEPTH (centimeters): 15	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfull
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ✓	Width Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	
COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.50	5
RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆ RIPARIAN WIDTH FLOODPLAIN QUALITY	
L R (Per Bank) L R (Most Predominant per Bank) L R	
Wide >10m Mature Forest, Wetland Conservation Tillage	
Moderate 5-10m Field Ones, Shirds of Old Urban or Industrial	-
Image: Narrow <5m	5
None Fenced Pasture COMMENTS	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):	
Stream Flowing Moist Channel, isolated pools, no flow (Intermittent)	
Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)	
Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)	
Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral) COMMENTS SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
Subsurface flow with isolated pools (Interstitial) Dry channel, no water (Ephemeral)	

ADDITIONAL STREAM INFORMATION (This Information	Must Also be Completed):
QHEI PERFORMED? - Yes 🗸 No QHEI S	core (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	_ Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream _
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDI	NG THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): N Date of last precipit	ation: 11/06/17 Quantity: 0.53
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open)	100%
Were samples collected for water chemistry? (Y/N):	_ (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (μmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	ns. Voucher collections optional. NOTE: all voucher samples must be labeled with the site
	te field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) Salar Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N)	nanders Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
<u>-</u>	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





PHWH Form Page - 2



Willowbrook Solar Form	2, 0/1
SITE NAME/LOCATION Willowbrook Solar Farm	AREA (mi ²) 0.00
DATE 11/06/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak (
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Strea	· · · · · · · · · · · · · · · · · · ·
STREAM CHANNEL □ NONE / NATURAL CHANNEL □ RECOVERED □ RECOVERING ☑ RECEN MODIFICATIONS: □ <t< td=""><td>JT OR NO RECOVERY</td></t<>	JT OR NO RECOVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate	
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes TYPE PERCENT TYPE PE	RCENT Metr
BLDR SLABS [16 pts]	50% Point
BOULDER (>256 mm) [16 pts] 0% LEAF PACK/WOODY DEBRIS [3 pts] BEDROCK [16 pt] 0% FINE DETRITUS [3 pts]	0% Substra
□ COBBLE (65-256 mm) [12 pts] 0% □ CLAY or HARDPAN [0 pt]	0% Max =
GRAVEL (2-64 mm) [9 pts]	<u>0%</u> 12
SAND (<2 mm) [6 pts]	0%
Total of Percentages of 0.00% (A) Substrate Percentage 100%	(B) A + B
Bldr Slabs, Boulder, Cobble, Bedrock Check TOU 70 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES:	PES: 3
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the	
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max =
✓ > 22.5 - 30 cm [30 pts] ✓ < 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts]	30
COMMENTS MAXIMUM POOL DEPTH (centimet	ters): 30
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	Bankfu
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	Width Max=3
$ = 3.0 \text{ m} - 4.0 \text{ m} (> 9' 7" - 13') [25 \text{ pts}] \\ > 1.5 \text{ m} - 3.0 \text{ m} (> 9' 7" - 4' 8") [20 \text{ pts}] \\ \le 1.0 \text{ m} (<=3' 3") [5 \text{ pts}] $	Iviax-5
COMMENTS AVERAGE BANKFULL WIDTH (met	ters): 0.20 5
This information must also be completed	
RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking do RIPARIAN WIDTH FLOODPLAIN QUALITY	Wilst earl A
L R (Per Bank) L R (Most Predominant per Bank) L R	
	vation Tillage
	or Industrial
	asture, Row Crop
	or Construction
COMMENTS	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):	ow (Intermittent)
Stream Flowing Subsurface flow with isolated pools (Interstitial) Subsurface flow with isolated pools (Interstitial) Subsurface flow with isolated pools (Interstitial)	. ,
COMMENTS	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
None 1.0 2.0 3.0 ✓ 0.5 1.5 2.5 >3	
STREAM GRADIENT ESTIMATE	
✓ Flat (0.5 ft/100 ft) Flat to Moderate Moderate Moderate (2 ft/100 ft) Moderate to Severe	Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Al	iso be Completed):
QHEI PERFORMED? - Yes 🗸 No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland Tow	vnship / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N):_N Date of last precipitation:	11/06/17 Quantity: 0.53
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): N Canopy (% open): 10	00%
Were samples collected for water chemistry? (Y/N): (Note	lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l)	pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) If n	ot, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	ther collections optional. NOTE: all voucher samples must be labeled with the site
	lata sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) Salamanders Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aqu	Observed? (Y/N) N Voucher? (Y/N) Voucher? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N) N
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location







SITE NAME/LOCATION Willowbrook Solar Farm	0.11
LENGTH OF STREAM REACH (ft) 1,244 LAT. 39.04934 LONG83.67840 RIVER CODE RIVER MILE	
DATE 11/06/17 SCORER BJS COMMENTS Little West Fork Ohio Brush Creek	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Inst	tructions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING	COVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE BLDR SLABS [16 pts] 0% SILT [3 pt] PERCENT BOULDER (>256 mm) [16 pts] 0% SILT [3 pt] 45% 0% 0% SILT [3 pt] 0% FINE DETRITUS [3 pts] 0% 0%	HHEI Metric Points Substrate
COBBLE (65-256 mm) [12 pts] 5% CLAY or HARDPAN [0 pt] 0% GRAVEL (2-64 mm) [9 pts] 20% MUCK [0 pts] 0%	Max = 40
SAND (<2 mm) [6 pts] 30% ARTIFICIAL [3 pts] 0%	
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 5.00% (A) Substrate Percentage 100% (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 4	
 2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] > 5 cm [5 pts] 	Pool Dept Max = 30
> 22.5 - 30 cm [30 pts] < 3 cm [5 pts]	30
COMMENTS MAXIMUM POOL DEPTH (centimeters): 30	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (<=3' 3") [5 pts]	Bankfull Width Max=30
$ > 4.0 \text{ meters } (> 13') [30 \text{ pts}] \\ > 3.0 \text{ m} - 4.0 \text{ m} (> 9' 7'' - 13') [25 \text{ pts}] \\ \le 1.0 \text{ m} (<=3' 3'') [5 \text{ pts}] $	Width
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (<=3' 3") [5 pts]	Width Max=30
$ \begin{array}{c} $	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] 1.0 m (<=3' 3") [5 pts]	Width Max=30

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):	
QHEI PERFORMED? - Yes Ves No QHEI Score (If Yes, At	tach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	_ Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHE	DAREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: NRCS Soil Map	Page: NRCS Soil Map Stream Order
County: Highland Township / City:	
MISCELLANEOUS	
Base Flow Conditions? (Y/N):_N Date of last precipitation:_ 11/06/17	Quantity: 0.53
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): N Canopy (% open): 5%	
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id.	and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.)	Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) If not, please explain:	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	al. NOTE: all voucher samples must be labeled with the site
ID number. Include appropriate field data sheets from the P	
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebra	Voucher? (Y/N) N ates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
· · · · · · · · · · · · · · · · · · ·	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





PHWH Form Page - 2



Save as pdf

SITE NAME/LOCATION Willowbrook Solar Farm	.12
LENGTH OF STREAM REACH (ft) 17 LAT. 39.05207 LONG83.68687 RIVER CODE RIVER MILE	
DATE 11/06/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instr	ructions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING RECENT OR NO RECOVERING RECENT OR NO RECOVERING RECENT OF NO RECOVERING RECOVERING RECENT OF NO RECENT OF	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes	HHEI
(Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT	Metric
BLDR SLABS [16 pts] 0% SILT [3 pt] 75%	Points
BOULDER (>256 mm) [16 pts] 0% LEAF PACK/WOODY DEBRIS [3 pts] 0% BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0%	Substrate
COBBLE (65-256 mm) [12 pts]	Max = 40
GRAVEL (2-64 mm) [9 pts] 5% MUCK [0 pts] 0% SAND (<2 mm) [6 pts]	12
Total of Percentages of 0.00% (A) Substrate Percentage 100% (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9 TOTAL NUMBER OF SUBSTRATE TYPES: 3	
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of	Pool Dept
evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	Max = 30
> 22.5 - 30 cm [30 pts]	
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	20
COMMENTS MAXIMUM POOL DEPTH (centimeters): 35	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):	
	Bankfull
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Bankfull Width Max=30
	Width
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width
 > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] 	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.60 This information must also be completed	Width Max=30
$ \begin{array}{ c c c c c } &> 3.0 \text{ m} - 4.0 \text{ m} (> 9' 7" - 13') [25 \text{ pts}] \\ \hline &> 1.5 \text{ m} - 3.0 \text{ m} (> 9' 7" - 4' 8") [20 \text{ pts}] \\ \hline & \\ \hline \hline & \\ \hline & \\ \hline \hline & \\ \hline \hline & \\ \hline & \\ \hline & \\ \hline & \\ \hline \hline & \\ \hline & \\ \hline \hline \\ \hline \hline & \\ \hline \hline \hline \\ \hline \hline \\ \hline \hline \hline \\ \hline \hline \hline \hline$	Width Max=30
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] AVERAGE BANKFULL WIDTH (meters): 0.60 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆ RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L Moderate 5-10m Mature Forest, Wetland Moderate 5-10m Immature Forest, Shrub or Old Winbarrow <5m	Width Max=30
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] ≤ 1.0 m (<=3' 3") [5 pts]	Width Max=30
→ 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] → 1.0 m (<=3' 3") [5 pts]	Width Max=30
→ 3.0 m - 4.0 m (< 9' 7" - 13') [25 pts]	Width Max=30
→ 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] → 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.60 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ↓ R (Per Bank) ↓ R ↓ R (Per Bank) ↓ R ↓ Wide >10m ↓ Mature Forest, Wetland ↓ Conservation Tillage ↓ Moderate 5-10m ↓ Immature Forest, Shrub or Old ↓ Urban or Industrial ↓ None ↓ Residential, Park, New Field ↓ Open Pasture, Row Cr ↓ None ↓ Fenced Pasture Mining or Construction COMMENTS ↓ Stream Flowing ↓ Moist Channel, isolated pools, no flow (Intermittent Dry channel, no water (Ephemeral) COMMENTS ↓ Sinuosity (Number of bends per 61 m (200 ft) of channel) ↓ Check ONLY one box):	Width Max=30

ADDITIONAL STREAM INFORMATION (This Information Must A	Also be Completed):
QHEI PERFORMED? - Yes 🗸 No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	_ Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream _
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE	ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland To	wnship / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): N Date of last precipitation:	11/06/17 Quantity: 0.53
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open):1	00%
Were samples collected for water chemistry? (Y/N): (Note	a lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l)	pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) If r	not, please explain:
Additional comments/description of pollution impacts:	
Occupies roadside.	
ID number. Include appropriate field Fish Observed? (Y/N) N Voucher? (Y/N)	cher collections optional. NOTE: all voucher samples must be labeled with the sit data sheets from the Primary Headwater Habitat Assessment Manual) is Observed? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N) N
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location







SITE NAME/LOCATION Willowbrook Solar Farm	
SITE NUMBER WB-025 RIVER BASIN DRAINAGE AREA (mi ²) 0.3	39
LENGTH OF STREAM REACH (ft) 3,380 LAT. 39.05207 LONG83.68687 RIVER CODE RIVER MILE	
DATE 11/06/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instruct	ctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING	
BLDR SLABS [16 pts] 0% SILT [3 pt] 0% BOULDER (>256 mm) [16 pts] 0% LEAF PACK/WOODY DEBRIS [3 pts] 0%	HHEI Metric Points
Image: BedRock [16 pt] 0% Image: Fine Detritus [3 pts] 0% Image: Cobect (65-256 mm) [12 pts] 20% Image: Clay or HARDPAN [0 pt] 0%	Max = 40
GRAVEL (2-64 mm) [9 pts] 75% MUCK [0 pts] 0% SAND (<2 mm) [6 pts]	24
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 20.00% (A) Substrate Percentage 100% (B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 21 TOTAL NUMBER OF SUBSTRATE TYPES: 3	
 2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] 	Pool Dept Max = 30
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	20
COMMENTS MAXIMUM POOL DEPTH (centimeters): 35	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (<=3' 3") [5 pts] < 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] > 1.0 m (<=3' 3") [5 pts]	Bankfull Width Max=30
COMMENTS AVERAGE BANKFULL WIDTH (meters): 2.40	20
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY 차NOTE: River Left (L) and Right (R) as looking downstream☆	
RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m Mature Forest, Wetland Conservation Tillage Moderate 5-10m Immature Forest, Shrub or Old Urban or Industrial	
Image: Narrow <5m	1
None Fenced Pasture Mining or Construction COMMENTS	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS_	
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box): None 1.0 2.0 3.0 0.5 1.5 2.5 3.0	

ADDITIONAL STREAM INFORMATION (This Information Must Also	be Completed):
QHEI PERFORMED? - Yes V No QHEI Score	(If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream _
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE	NTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland Towns	ship / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N):N Date of last precipitation:	11/06/17 Quantity: 0.53
Photograph Information:	
Elevated Turbidity? (Y/N): N Canopy (% open): 209	//
Were samples collected for water chemistry? (Y/N): (Note lat	b sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l)	pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) Y If not,	, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	er collections optional. NOTE: all voucher samples must be labeled with the site a sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders C	N Voucher? (Y/N) N Voucher? (Y/N) N Voucher? (Y/N) Voucher? (Y/N) N Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location







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ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Willowbrook Solar Farm	
SITE NUMBER WB-026 RIVER BASIN DRAINAGE AREA (mi ²) 0.	39
LENGTH OF STREAM REACH (ft) 156 LAT. 39.05207 LONG83.68687 RIVER CODE RIVER MILE	
DATE 11/06/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru	uctions
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING	OVERY
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE BLDR SLABS [16 pts] 0% SILT [3 pt] BOULDER (>256 mm) [16 pts] 0% O%	HHEI Metric Points
BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0% COBBLE (65-256 mm) [12 pts] 20% CLAY or HARDPAN [0 pt] 0%	Max = 40
Image: Construction of the construc	24
Total of Percentages of 20.00% (A) Substrate Percentage 100% (B)	A + B
Bldr Slabs, Boulder, Cobble, Bedrock TOTAL NUMBER OF SUBSTRATE TYPES: 21 TOTAL NUMBER OF SUBSTRATE TYPES: 3	A · D
 Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] > 5 cm - 10 cm [15 pts] < 5 cm [5 pts] 	Pool Dept Max = 30
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]	20
COMMENTS MAXIMUM POOL DEPTH (centimeters): 35	
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box): > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] > 1.0 m (<=3' 3") [5 pts] ✓ > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Bankfull Width Max=30
COMMENTS AVERAGE BANKFULL WIDTH (meters): 2.40	20
This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream RIPARIAN WIDTH FLOODPLAIN QUALITY	
L R (Per Bank) L R (Most Predominant per Bank) L R Wide >10m Mature Forest, Wetland Conservation Tillage Moderate 5-10m Immature Forest, Shrub or Old Immature Forest, Shrub or Old	
Field Open Pasture, Row Cro Image: A strain of the strai	р
None Fenced Pasture Mining or Construction COMMENTS	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box): Stream Flowing Subsurface flow with isolated pools (Interstitial) COMMENTS_	
SINUOSITY (Number of bends per 61 m (200 ft) of channel)(Check ONLY one box):None1.02.03.00.51.52.5>3	

ADDITIONAL STREAM INFORMATION (This Information N	lust Also be Completed):			
QHEI PERFORMED? - Yes 🗸 No QHEI Sco	ore (If Yes, Attach Completed QHEI Form)			
DOWNSTREAM DESIGNATED USE(S)				
WWH Name:	Distance from Evaluated Stream			
CWH Name:	Distance from Evaluated Stream			
EWH Name:	Distance from Evaluated Stream			
MAPPING: ATTACH COPIES OF MAPS, INCLUDIN	G THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION			
USGS Quadrangle Name:	GS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order			
County: Highland	Township / City:			
MISCELLANEOUS				
Base Flow Conditions? (Y/N):N Date of last precipita	tion: 11/06/17 Quantity: 0.53			
Photograph Information:Representative photos taken				
Elevated Turbidity? (Y/N): _ N Canopy (% open):	20%			
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:			
	ng/l) pH (S.U.) Conductivity (μmhos/cm)			
Is the sampling reach representative of the stream (Y/N)	If not, please explain:			
Additional comments/description of pollution impacts:				
BIOTIC EVALUATION				
Performed? (Y/N): (If Yes, Record all observations	. Voucher collections optional. NOTE: all voucher samples must be labeled with the sit			
	e field data sheets from the Primary Headwater Habitat Assessment Manual)			
	anders Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N) N			
Comments Regarding Biology:				

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Save as pdf Reset Form

ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Willowbrook Sola	r Farm			
	B-028 RIVER BAS		_ DRAINAGE AREA (mi²)	0.00
		-83.70622 RIVER COD		
DATE 11/06/17 SCORER BJS		bcamp Run-East Fork		
NOTE: Complete All Items On This Form		·····		tructions
STREAM CHANNEL	URAL CHANNEL LRE		G 🗹 RECENT OR NO RE	COVERY
 SUBSTRATE (Estimate percent of ever (Max of 32). Add total number of significa 				I HHE
	RCENT TYPE	iax of o). Final metric score is	PERCENT	Metr
BLDR SLABS [16 pts]	0%	SILT [3 pt]	90%	Poin
BOULDER (>256 mm) [16 pts]		_EAF PACK/WOODY DEBRIS FINE DETRITUS [3 pts]	5 [3 pts] 0%	Substra
COBBLE (65-256 mm) [12 pts]		CLAY or HARDPAN [0 pt]	0%	Max =
GRAVEL (2-64 mm) [9 pts]		MUCK [0 pts]	0%	12
SAND (<2 mm) [6 pts]	5%	ARTIFICIAL [3 pts]	0%	
Total of Percentages of 0 . Bldr Slabs, Boulder, Cobble, Bedrock		Substrate Percentage	(B)	A + B
SCORE OF TWO MOST PREDOMINATE SUBST	RATE TYPES: 9	TOTAL NUMBER OF SU	BSTRATE TYPES: 3	
2. Maximum Pool Depth (Measure the ma				Pool De
evaluation. Avoid plunge pools from road > 30 centimeters [20 pts]	culverts or storm water pip	es) (Check ONLY one box) > 5 cm - 10 cm [15 pts]		Max =
> 22.5 - 30 cm [30 pts]		< 5 cm [5 pts]		
> 10 - 22.5 cm [25 pts]	1	NO WATER OR MOIST CHA	NNEL [0 pts]	0
COMMENTS		MAXIMUM POOL DEP	TH (centimeters): 0	
3. BANK FULL WIDTH (Measured as the	average of 3-4 measurem	ents) (Check ONLY of	one box):	Bankfu
 > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] 		> 1.0 m - 1.5 m (> 3' 3" - 4' 8")	[15 pts]	Width Max=3
> 1.5 m - 3.0 m (> 9' 7' - 1'') [25 pts]		≤ 1.0 m (<=3' 3") [5 pts]		
COMMENTS		AVERAGE BANKFUL	WIDTH (meters): 0.20	5
RIPARIAN ZONE AND FLOODP		must also be completed E: River Left (L) and Right (R)	as looking downstroom	
RIPARIAN WIDTH	FLOODPLAIN QUALITY	() 0 ()		
L R (Per Bank) Wide >10m	L R (Most Predom	inant per Bank) L F	Conservation Tillage	
Moderate 5-10m		est, Shrub or Old	Urban or Industrial	
	Field			ron
Narrow <5m	Residential, P	ark, New Field	Open Pasture, Row C	лор
COMMENTS	Fenced Pastur	e LL	Mining or Constructio	n
FLOW REGIME (At Time of Eval.	uation) (Check ONLY one		ed pools, no flow (Intermitter	nt)
Subsurface flow with isolated pool	s (Interstitial)	Dry channel, no wate		,
COMMENTS				
SINUOSITY (Number of bends pe				
✓ None □ 0.5 □	1.0 1.5	2.0 2.5	3.0 >3	
STREAM GRADIENT ESTIMATE	_	_	_	
Flat (0.5 ft/100 ft)	Moderate (2 ft/100 ft)	Moderate to Severe	Severe (10 f	:/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Mu	ust Also be Completed):
QHEI PERFORMED? - Yes 🖌 No QHEI Sco	re (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream _
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N):N Date of last precipitation	on: 11/06/17 Quantity: 0.53
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open): _	100%
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg	/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
Along roadside	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations.	Voucher collections optional. NOTE: all voucher samples must be labeled with the site
ID number. Include appropriate f	field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) Salama Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) N	nders Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Willowbrook Solar Farm			
SITE NUMBER WB-029 RIVER BASIN DRAINAGE AREA (mi²)	0.04		
LENGTH OF STREAM REACH (ft) 900 LAT. 39.04124 LONG83.70811 RIVER CODE RIVER MILE			
DATE 11/06/17 SCORER BJS COMMENTS Slabcamp Run-East Fork Whiteoak Creek			
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Inst	ructions		
STREAM CHANNEL NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERING	COVERY		
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B. TYPE PERCENT TYPE PERCENT BLDR SLABS [16 pts] 0% SILT [3 pt] 10%	HHEI Metric Points		
Image: Bound SLABS (16 pts) 0% Image: Sill [[5 pt] 10% Image: Bound Deck (>256 mm) [16 pts] 0% Image: Leaf Pack/WOODY DEBRIS [3 pts] 0% Image: Bound Deck (16 pt] 0% Image: Sill [[5 pt] 0% 0% 0% Image: Bound Deck (16 pt] 0% Image: Sill [[5 pt] 0% 0% 0% Image: Bound Deck (16 pt] 0% Image: Sill [[5 pt] 0% 0% 0% Image: Bound Deck (16 pt] 0% Image: Sill [[5 pt] 0% 0% 0% Image: Bound Deck (16 pt] 0% Image: Sill [[5 pt] 0% 0% 0% Image: Bound Deck (16 pt] 0% Image: Sill [16 pt] 0% 0% 0% Image: Bound Deck (16 pt] 0% Image: Sill [16 pt] 0% 0% 0% Image: Bound Deck (16 pt] 0% Image: Sill [16 pt] 0% 0% 0% Image: Bound Deck (16 pt] 0% Image: Sill [16 pt] 0% 0% 0%	Substrate Max = 40		
GRAVEL (2-64 mm) [9 pts] 55% MUCK [0 pts] 0% SAND (<2 mm) [6 pts]	19		
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 5.00% (A) Substrate Percentage 100% (B)	A + B		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 15 TOTAL NUMBER OF SUBSTRATE TYPES: 4			
 2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box): > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] > 5 cm [5 pts] 	Pool Dept Max = 30		
> 22.0 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts]	25		
COMMENTS MAXIMUM POOL DEPTH (centimeters): 15			
$ = 3.0 \text{ m} - 4.0 \text{ m} (> 9' 7" - 13') [25 \text{ pts}] \\ > 1.5 \text{ m} - 3.0 \text{ m} (> 9' 7" - 4' 8") [20 \text{ pts}] \\ = 4.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [5 \text{ pts}] \\ = 5.0 \text{ m} (<=3' 3") [$	Width Max=30		
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	Max=30		
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.30 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆ <u>RIPARIAN WIDTH</u> L R (Most Predominant per Bank) L R	Max=30		
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS AVERAGE BANKFULL WIDTH (meters): 0.30 This information must also be completed RIPARIAN ZONE AND FLOODP LAIN QUALITY \$NOTE: River Left (L) and Right (R) as looking downstream \$\$ RIPARIAN WIDTH ELOODPLAIN QUALITY Wide >10m Mature Forest, Wetland Moderate 5-10m	Max=30		
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] AVERAGE BANKFULL WIDTH (meters): 0.30 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆ RIPARIAN WIDTH L R (Per Bank) L Wide >10m Mature Forest, Wetland Moderate 5-10m Immature Forest, Shrub or Old Immature Forest, Shrub or Old Urban or Industrial Open Pasture, Row Cultified Open Pasture, Row Cultified	Max=30		
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] AVERAGE BANKFULL WIDTH (meters): 0.30 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream A RIPARIAN WIDTH L R (Per Bank) L Wide >10m Mature Forest, Wetland Moderate 5-10m Immature Forest, Shrub or Old U Open Pasture Row Colspan="2">Open Pasture Row Colspan="2">Commenter Row Colspan="2" <td>Max=30</td>	Max=30		
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] AVERAGE BANKFULL WIDTH (meters): 0.30 COMMENTS This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY AVERAGE BANKFULL WIDTH (meters): BIPARIAN WIDTH FLOODPLAIN QUALITY Wide >10m Moderate 5-10m Immature Forest, Shrub or Old Field Open Pasture, Row Critical Mone	Max=30		
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] AVERAGE BANKFULL WIDTH (meters): 0.30 This information must also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream ☆ RIPARIAN WIDTH FLOODPLAIN QUALITY L R (Per Bank) L Moderate 5-10m Immature Forest, Wetland Moderate 5-10m Immature Forest, Shrub or Old Wirban or Industrial Field Vone Fenced Pasture None Fenced Pasture Mining or Construction COMMENTS	Max=30		

ADDITIONAL STREAM INFORMATION (This Information M	lust Also be Completed):
QHEI PERFORMED? - Yes 🗸 No QHEI Sco	ore (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	G THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N):N Date of last precipitat	ion: 11/06/17 Quantity: 0.53
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open): _	5%
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg	g/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
	. Voucher collections optional. NOTE: all voucher samples must be labeled with the site
ID number. Include appropriate	field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) Salama Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) N	anders Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
· · · · · · · · · · · · · · · · · · ·	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location







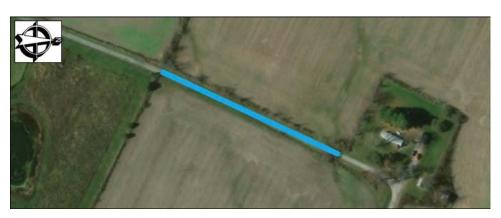
ChioEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) : 27

SITE NAME/LOCATION Willowbrook Sol	ar Farm	
		DRAINAGE AREA (mi²)
LENGTH OF STREAM REACH (ft) 471	LAT. 39.02213 LONG83.68859 RIVER COL	
DATE 04/09/18 SCORER BJS	COMMENTS Little West Fork Ohio Bru	ish Creek
NOTE: Complete All Items On This Form	m - Refer to "Field Evaluation Manual for Ohio's	PHWH Streams" for Instructi
STREAM CHANNEL INONE / NA MODIFICATIONS:		NG 🔽 RECENT OR NO RECOVE
	ery type of substrate present. Check ONLY two predom	
· · · · ·	cant substrate types found (Max of 8). Final metric score is	
TYPE P BLDR SLABS [16 pts]	PERCENT TYPE 0% Image: Comparison of the second s	PERCENT 100%
BOULDER (>256 mm) [16 pts]		
BEDROCK [16 pt]	0% FINE DETRITUS [3 pts]	<u>0%</u> Su M
COBBLE (65-256 mm) [12 pts]	0% CLAY or HARDPAN [0 pt]	0%
GRAVEL (2-64 mm) [9 pts]	0% □ MUCK [0 pts] 0% □ ARTIFICIAL [3 pts]	0%
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock	0.00% (A) Substrate Percentage 100% Check	(B) A
CORE OF TWO MOST PREDOMINATE SUBS	STRATE TYPES: 6 TOTAL NUMBER OF SU	JBSTRATE TYPES: 1
Maximum Pool Depth (Measure the n	naximum pool depth within the 61 meter (200 ft) evalua	ation reach at the time of Po
	ad culverts or storm water pipes) (Check ONLY one box	
> 30 centimeters [20 pts]	✓ > 5 cm - 10 cm [15 pts]	
> 22.5 - 30 cm [30 pts] > 10 - 22.5 cm [25 pts]	S cm [5 pts] NO WATER OR MOIST CH	ANNEL [0 pts]
	MAXIMUM POOL DE	PTH (centimeters): 10
BANK FULL WIDTH (Measured as the		
 > 4.0 meters (> 13') [30 pts] > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] 	> 1.0 m - 1.5 m (> 3' 3" - 4' 8 ≤ 1.0 m (<=3' 3") [5 pts]	") [15 pts]
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		
COMMENTS	AVERAGE BANKFUL	L WIDTH (meters): 0.80
	This information <u>must</u> also be completed	
RIPARIAN ZONE AND FLOODE RIPARIAN WIDTH	PLAIN QUALITY ☆NOTE: River Left (L) and Right (F FLOODPLAIN QUALITY	२) as looking downstream 🏠
L R (Per Bank)		R
Wide >10m	Mature Forest, Wetland	Conservation Tillage
Moderate 5-10m	Immature Forest, Shrub or Old	Urban or Industrial
	Field Field	Open Pasture, Row Crop
│ Narrow <5m ✓ ✓ None		
COMMENTS	Fenced Pasture	Mining or Construction
FLOW REGIME (At Time of Eva Stream Flowing	aluation) (Check ONLY one box):	ted pools, no flow (Intermittent)
Stream Flowing Subsurface flow with isolated poo		
COMMENTS		
SINUOSITY (Number of bends	per 61 m (200 ft) of channel) <u>(C</u> heck <i>ONLY</i> one box):	
None 🗌	1.0 2.0	3.0
0.5	1.5 2.5	>3
STREAM GRADIENT ESTIMATE		_
Flat (0.5 ft/100 ft)	Moderate (2 ft/100 ft) Moderate to Sever	e Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information M	ust Also be Completed):		
QHEI PERFORMED? - Yes 🖌 No QHEI Sco	ore (If Yes, Attach Completed QHEI Form)		
DOWNSTREAM DESIGNATED USE(S)			
WWH Name:	Distance from Evaluated Stream		
CWH Name: Distance from Evaluated Stream			
EWH Name:	Distance from Evaluated Stream		
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	G THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION		
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order		
County: Highland	Township / City:		
MISCELLANEOUS			
Base Flow Conditions? (Y/N): Date of last precipitat	ion: 04/04/18 Quantity: 0.07		
Photograph Information: Representative photos taken			
Elevated Turbidity? (Y/N): Canopy (% open): _	100%		
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:		
Field Measures: Temp (°C) Dissolved Oxygen (m	g/l) pH (S.U.) Conductivity (µmhos/cm)		
Is the sampling reach representative of the stream (Y/N)	If not, please explain:		
Additional comments/description of pollution impacts:			
BIOTIC EVALUATION			
Performed? (Y/N): N (If Yes, Record all observations.	Voucher collections optional. NOTE: all voucher samples must be labeled with the site		
ID number. Include appropriate	field data sheets from the Primary Headwater Habitat Assessment Manual)		
Fish Observed? (Y/N) N Voucher? (Y/N) Salama Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) N	anders Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)		
Comments Regarding Biology:			

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





PHWH Form Page - 2

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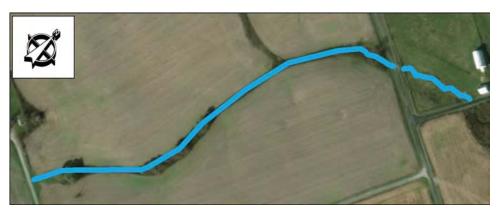
ChioEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Willowbrook Sola		
SITE NUMBER		_ DRAINAGE AREA (mi²)
· · · · · · · · · · · · · · · · · · ·	LAT. 39.02486 LONG83.68623 RIVER CODI	
DATE 04/09/18 SCORER BJS	COMMENTS Little West Fork Ohio Brus	пСтеекк
NOTE: Complete All Items On This Form	- Refer to "Field Evaluation Manual for Ohio's F	HWH Streams" for Instructions
STREAM CHANNEL NONE / NAT MODIFICATIONS:	URAL CHANNEL RECOVERED RECOVERING	G 🔲 RECENT OR NO RECOVERY
	y type of substrate present. Check <i>ONLY</i> two predomin	
	Int substrate types found (Max of 8). Final metric score is a	Motri
BLDR SLABS [16 pts]	RCENT TYPE 0% Image: Comparison of the second sec	85%
BOULDER (>256 mm) [16 pts]		Out stur
BEDROCK [16 pt]	0% Image: Fine detritus [3 pts] 5% Image: Fine detritus [3 pts]	0% Substra Max = 4
COBBLE (65-256 mm) [12 pts]	5% CLAY or HARDPAN [0 pt] 10% MUCK [0 pts]	0%
SAND (<2 mm) [6 pts]	0% ARTIFICIAL [3 pts]	0%
Total of Percentages of	Substrate Percentage	(B) A + B
Bldr Slabs, Boulder, Cobble, Bedrock	Check 100%	
SCORE OF TWO MOST PREDOMINATE SUBST	TRATE TYPES: 12 TOTAL NUMBER OF SUE	STRATE TYPES: 3
	aximum pool depth within the 61 meter (200 ft) evaluati	
evaluation. Avoid plunge pools from road > 30 centimeters [20 pts]	culverts or storm water pipes) (Check ONLY one box): > 5 cm - 10 cm [15 pts]	Max = 3
> 22.5 - 30 cm [30 pts]	5 cm - 10 cm [15 pts] < 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts]	NO WATER OR MOIST CHA	NNEL [0 pts] 25
COMMENTS Majority of pools less	than 10 cm deep MAXIMUM POOL DEP	TH (centimeters): 15
		· · · <u> </u>
3. BANK FULL WIDTH (Measured as the a > 4.0 meters (> 13') [30 pts]	average of 3-4 measurements) (Check ONLY o > 1.0 m - 1.5 m (> 3' 3" - 4' 8")	
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	≤ 1.0 m (<=3' 3") [5 pts]	Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		
COMMENTS	AVERAGE BANKFULL	WIDTH (meters): 0.50 5
	This information must also be completed	
RIPARIAN ZONE AND FLOODP RIPARIAN WIDTH	LAIN QUALITY ☆NOTE: River Left (L) and Right (R) FLOODPLAIN QUALITY	as looking downstream 🛠
L R (Per Bank)	L R (Most Predominant per Bank) L R	
Wide >10m	Mature Forest, Wetland	Conservation Tillage
Moderate 5-10m	Immature Forest, Shrub or Old	Urban or Industrial
Narrow <5m	Residential, Park, New Field	Open Pasture, Row Crop
	Fenced Pasture	Mining or Construction
ELOW DECIME (At Time of Evel	uction) (Check ON// Vana hay);	
FLOW REGIME (At Time of Eval Stream Flowing		d pools, no flow (Intermittent)
Subsurface flow with isolated pool	s (Interstitial) Dry channel, no water	(Ephemeral)
	er 61 m (200 ft) of channel) (Check ONLY one box):	
✓ 0.5	1.0 2.0 1.5 2.5	3.0
STREAM GRADIENT ESTIMATE	Moderate (2 ft/100 ft) Moderate to Severe	Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information M	lust Also be Completed):			
QHEI PERFORMED? - Yes 🖌 No QHEI Sco	ore (If Yes, Attach Completed QHEI Form)			
DOWNSTREAM DESIGNATED USE(S)				
WWH Name:	Distance from Evaluated Stream			
CWH Name:	_ Distance from Evaluated Stream			
EWH Name:	Distance from Evaluated Stream			
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	G THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION			
USGS Quadrangle Name:	GS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order			
County: Highland	Township / City:			
MISCELLANEOUS				
Base Flow Conditions? (Y/N): Y Date of last precipitat	ion: 04/04/18 Quantity: 0.07			
Photograph Information: Representative photos taken				
Elevated Turbidity? (Y/N): Canopy (% open): _	75%			
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:			
Field Measures: Temp (°C) Dissolved Oxygen (m	g/l) pH (S.U.) Conductivity (µmhos/cm)			
Is the sampling reach representative of the stream (Y/N)	If not, please explain:			
Additional comments/description of pollution impacts:				
BIOTIC EVALUATION				
	. Voucher collections optional. NOTE: all voucher samples must be labeled with the sit			
	field data sheets from the Primary Headwater Habitat Assessment Manual)			
Fish Observed? (Y/N) Voucher? (Y/N) Salama	anders Observed? (Y/N) N Voucher? (Y/N) N			
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N	Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)			
Comments Regarding Biology:				

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





PHWH Form Page - 2

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ChioEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3) : 23

Willowhrook Color		
SITE NAME/LOCATION WILlowbrook Sola		0.00
SITE NUMBER WI		DRAINAGE AREA (mi²)
	AT. 39.02307 LONG83.69232 RIVER COD	
DATE 06/20/18 SCORER BH	COMMENTS Slabcamp Run - East Fork	
NOTE: Complete All Items On This Form	- Refer to "Field Evaluation Manual for Ohio's I	PHWH Streams" for Instructions
STREAM CHANNEL NONE / NATU MODIFICATIONS:	JRAL CHANNEL RECOVERED RECOVERIN	G 🔲 RECENT OR NO RECOVERY
	y type of substrate present. Check <i>ONLY</i> <u>two</u> predomir	
	nt substrate types found (Max of 8). Final metric score is RCENT TYPE	sum of boxes A & B. PERCENT
	0% SILT [3 pt]	20% Point
		6 [3 pts] 0% Substra
	0% □ FINE DETRITUS [3 pts] 0% □ ✓ CLAY or HARDPAN [0 pt]	30% Max = 4
	40% MUCK [0 pts]	0%
	10% ARTIFICIAL [3 pts]	0% 13
Total of Percentages of 0. Bldr Slabs, Boulder, Cobble, Bedrock	00% (A) Substrate Percentage 100%	(B) A + B
CORE OF TWO MOST PREDOMINATE SUBST	RATE TYPES: 9 TOTAL NUMBER OF SU	BSTRATE TYPES: 4
• •	ximum pool depth within the 61 meter (200 ft) evaluat	
evaluation. Avoid plunge pools from road > 30 centimeters [20 pts]	culverts or storm water pipes) (Check ONLY one box) > 5 cm - 10 cm [15 pts]	: Max = 3
> 22.5 - 30 cm [30 pts]	S cm [15 pts]	
> 10 - 22.5 cm [25 pts]	NO WATER OR MOIST CHA	NNEL [0 pts] 5
COMMENTS	MAXIMUM POOL DEF	PTH (centimeters): 3
BANK FULL WIDTH (Measured as the a	verage of 3-4 measurements) (Check ONLY of the contract of the	one box): Bankfu
BANK FULL WIDTH (Measured as the a > 4.0 meters (> 13') [30 pts]	> 1.0 m - 1.5 m (> 3' 3" - 4' 8")	
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	✓ ≤ 1.0 m (<=3' 3") [5 pts]	Max=30
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] COMMENTS		L WIDTH (meters): 0.50 5
	AVERAGE BANKFUL	L WIDTH (meters): 0.30 5
	This information must also be completed	
RIPARIAN ZONE AND FLOODPL	·) as looking downstream☆
RIPARIAN WIDTH	FLOODPLAIN QUALITY	_
L R (Per Bank)	L R (Most Predominant per Bank) L F Mature Forest, Wetland	Conservation Tillage
Moderate 5-10m	Immature Forest, Shrub or Old	Urban or Industrial
	Field Field	Open Pasture, Row Crop
Narrow <5m	Residential, Park, New Field	
COMMENTS	Fenced Pasture	Mining or Construction
FLOW REGIME (At Time of Evalu		ed pools, no flow (Intermittent)
Stream Flowing Subsurface flow with isolated pools		
COMMENTS_		
SINUOSITY (Number of ben <u>ds pe</u>	r 61 m (200 ft) of channel)_(Check <i>ONLY</i> one box):	_
● None ● ● 0.5 ●	1.0 2.0 1.5 2.5	3.0 >3
U.5 V.	1.5 [] 2.0	
STREAM GRADIENT ESTIMATE	Moderate (2 ft/100 ft) Moderate to Severe	Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):	
QHEI PERFORMED? - Yes ✓ No QHEI Score (If Yes, Attach Cor	npleted QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name: Dist	ance from Evaluated Stream
CWH Name: Dista	ance from Evaluated Stream
EWH Name: Dista	ance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA	. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: NRCS Soil Map Page:	NRCS Soil Map Stream Order
County: Highland Township / City:	
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Y Date of last precipitation: 06/19/18	uantity: 0.31
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open):15%	
Were samples collected for water chemistry? (Y/N): _N (Note lab sample no. or id. and att	ach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.)	Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) If not, please explain:	
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations. Voucher collections optional. NOT ID number. Include appropriate field data sheets from the Primary H	
N N N	bucher? (Y/N)
Comments Regarding Biology:	
<u>.</u>	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



PHWH Form Page - 2

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ChieEPA Primary Headwater Habitat Evaluation Form HHEI Score (sum of metrics 1, 2, 3):

Willowhere de Oele	- -	•
SITE NAME/LOCATION WILlowbrook Sola		0.00
		DRAINAGE AREA (mi²)
	AT. 39.02749 LONG83.68403 RIVER COL	
DATE 06/20/18 SCORER BH	COMMENTS Little West Fork Ohio Bru	······································
NOTE: Complete All Items On This Form	- Refer to "Field Evaluation Manual for Ohio's	PHWH Streams" for Instruction
STREAM CHANNEL IN NONE / NATU MODIFICATIONS:		G 🔲 RECENT OR NO RECOVERY
	y type of substrate present. Check ONLY two predomin	
	nt substrate types found (Max of 8). Final metric score is RCENT TYPE	PERCENT Met
BLDR SLABS [16 pts]	0% SILT [3 pt]	85% POI
		S [3 pts] 0% Subst
	0% □ FINE DETRITUS [3 pts] 0% □ ✓ CLAY or HARDPAN [0 pt]	10% Max =
	0% MUCK [0 pts]	0%
	5% ARTIFICIAL [3 pts]	0%
Total of Percentages of 0 .	00% (A) Substrate Percentage 100%	(B) A + I
Bldr Slabs, Boulder, Cobble, Bedrock		BSTRATE TYPES: 3
. Maximum Pool Depth (Measure the ma	ximum pool depth within the 61 meter (200 ft) evalua	tion reach at the time of Pool D
	culverts or storm water pipes) (Check ONLY one box)	Max •
 > 30 centimeters [20 pts] > 22.5 - 30 cm [30 pts] 	> 5 cm - 10 cm [15 pts] < 5 cm [5 pts]	
> 10 - 22.5 cm [25 pts]	NO WATER OR MOIST CHA	ANNEL [0 pts] 25
COMMENTS	MAXIMUM POOL DEF	PTH (centimeters): 10
B. BANK FULL WIDTH (Measured as the a > 4.0 meters (> 13') [30 pts]	verage of 3-4 measurements) (Check ONLY > 1.0 m - 1.5 m (> 3' 3" - 4' 8"	
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	\leq 1.0 m (<=3' 3") [5 pts]	Max=
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		
COMMENTS	AVERAGE BANKFUL	L WIDTH (meters): 0.60 5
	This information must also be completed	
RIPARIAN ZONE AND FLOODPL RIPARIAN WIDTH	AIN QUALITY ☆NOTE: River Left (L) and Right (R FLOODPLAIN QUALITY) as looking downstreamऽर
<u>L</u> R (Per Bank)	<u>L R</u> (Most Predominant per Bank) <u>L I</u>	<u>₹</u>
Wide >10m	Mature Forest, Wetland	Conservation Tillage
Moderate 5-10m	Immature Forest, Shrub or Old	Urban or Industrial
Narrow <5m	Residential, Park, New Field	Open Pasture, Row Crop
None	Fenced Pasture	
COMMENTS		Mining or Construction
FLOW REGIME (At Time of Evalue) Stream Flowing		ed pools, no flow (Intermittent)
Subsurface flow with isolated pools		
COMMENTS		
	r 61 m (200 ft) of channel) (Check ONLY one box):	
✓ 0.5	1.0 2.0 1.5 2.5	3.0
	2.0	
STREAM GRADIENT ESTIMATE		—

ADDITIONAL STREAM INFORMATION (This Information M	ust Also be Completed):
QHEI PERFORMED? - Yes 🗸 No QHEI Sco	ore (If Yes, Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)	
WWH Name:	Distance from Evaluated Stream
CWH Name:	_ Distance from Evaluated Stream _
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING	G THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name:	NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Highland	Township / City:
MISCELLANEOUS	
Base Flow Conditions? (Y/N): Y Date of last precipitati	ion: 06/19/18 Quantity: 0.31
Photograph Information: Representative photos taken	
Elevated Turbidity? (Y/N): Canopy (% open): _	100%
Were samples collected for water chemistry? (Y/N):	(Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mo	g/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N)	If not, please explain:
Additional comments/description of pollution impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): N (If Yes, Record all observations.	Voucher collections optional. NOTE: all voucher samples must be labeled with the sit
	field data sheets from the Primary Headwater Habitat Assessment Manual)
N	N
Fish Observed? (Y/N) N Voucher? (Y/N) Salama Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) N	Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:	
<u> </u>	

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



FLOW

PHWH Form Page - 2

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ACCESS ROADS TEMPORARY PERMANENT IMPACTS **IMPACTS** Access Acres Access Latitude of Longitude Access Wetland ORAM Wetland Anticipated Crossed Road Access Road Road within Netland ID County Center Drainage Basin of Center ad Impa Impact Category Jurisdictional Impac Project Score (Yes/No) Impact (s.f.) Туре Point Point (s.f.) (acre) (acre) Area Slabcamp Run-East Fork WL-001 Highland 39.023978 -83.697156 0.16 PEM 40 2 No No N/A N/A N/A N/A Whiteoak Creek Slabcamp Run-East Fork Highland 39.024536 0.04 PEM No N/A N/A N/A N/A WL-002 -83.697538 -1.5 1 No Whiteoak Creek Slabcamp Run-East Fork WL-003 Highland 39.025155 -83.69362 0.12 PEM 32.5 Modified 2 Yes No N/A N/A N/A N/A Whiteoak Creek Little West Fork Ohio Brush WL-004 Highland 39.024257 -83.69022 0.05 PEM 10 1 No No N/A N/A N/A N/A Creek Slabcamp Run-East Fork WL-005 Highland 39.031504 -83.699757 1.23 PEM 43 2 No Yes N/A N/A N/A N/A Whiteoak Creek Slabcamp Run-East Fork PEM/PSS Highland 39.035661 -83.699322 0.43 38 2 No No N/A N/A N/A N/A WL-006 Whiteoak Creek Slabcamp Run-East Fork Highland 39.036466 PEM No N/A N/A N/A N/A WL-007 -83.692395 0.36 24 1 Yes Whiteoak Creek Slabcamp Run-East Fork WL-008 Highland 39.050695 -83.696612 0.44 PEM 29 1 Yes No N/A N/A N/A N/A Whiteoak Creek Little West Fork Ohio Brush WL-009 Highland 39.048806 -83.676978 0.05 PEM 27 1 No No N/A N/A N/A N/A Creek Slabcamp Run-East Fork WL-010 Highland 39.057519 -83.692099 1.09 PEM 35 Modified 2 Yes No N/A N/A N/A N/A Whiteoak Creek Slabcamp Run-East Fork PEM N/A WL-011 Highland 39.04918 -83.704197 0.07 26 Yes No N/A N/A N/A 1 Whiteoak Creek Slabcamp Run-East Fork WL-012 Highland 39.048017 -83.708162 0.03 PEM 26 1 No No N/A N/A N/A N/A Whiteoak Creek Slabcamp Run-East Fork WL-013 Highland 39.042196 -83.706654 0.91 PEM 35 Modified 2 Yes No N/A N/A N/A N/A Whiteoak Creek Highland/B Slabcamp Run-East Fork WL-014 39.021987 -83.700571 0.31 PEM 27 Yes N/A N/A N/A N/A 1 Yes Whiteoak Creek rown Slabcamp Run-East Fork Highland 39.022536 -83.69488 0.27 PEM 44 2 N/A N/A N/A N/A WL-015 Yes No Whiteoak Creek Slabcamp Run-East Fork WL-016 Highland 39.02246 -83.695676 0.45 PEM 45 2 No No N/A N/A N/A N/A Whiteoak Creek Slabcamp Run-East Fork Highland 39.022225 -83.694977 WL-017 0.10 PEM 24 1 Yes No N/A N/A N/A N/A Whiteoak Creek Slabcamp Run-East Fork Highland/B 39.019463 -83.698318 WL-018 2.18 PEM 49 2 No No N/A N/A N/A N/A Whiteoak Creek rown Slabcamp Run-East Fork WL-019 39.018511 -83.695303 0.37 PEM 34 Modified 2 No No N/A N/A N/A N/A Brown Whiteoak Creek Little West Fork Ohio Brush 0.57 PEM 46 2 No No N/A N/A N/A N/A WL-020 Brown 39.016323 -83.691367 Creek Little West Fork Ohio Brush WL-021 Brown 39.07323 -83.692065 0.28 PEM 42 2 No No N/A N/A N/A N/A Creek Slabcamp Run-East Fork 0.23 PEM N/A WL-022 Brown 39.01975 -83.696865 51 2 No No N/A N/A N/A Whiteoak Creek Little West Fork Ohio Brush WL-023 Highland 39.027698 -83.684372 0.07 PEM 29 No No N/A N/A N/A N/A 1

2.03442

Wetland Totals

Table E-1 - Anticipated Wetland Impacts for the Hillcrest Solar Project

Creek

2

0.00

0

0.00

	COLLECTION LINES											
s	TEMPORARY	IMPACTS		ANENT ACTS								
	Collection Line Impact (I.f.)	Collection Line Impact (acre)	Collection Line Impact (I.f.)	Collection Line Impact (acre)								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	0	0	0	0								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	0	0	0	0								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	N/A	N/A	N/A	N/A								
	0	0.00	0	0.00								

							Table	e E-2 - Antici	pated Waterboo	ly Crossing M	ethods & Impacts		;									
										ACCESS ROADS CROSSINGS TEMPORARY IMPACTS PERMANE					ERMANENT IMPACTS CROSSINGS			COLLECTIO		PERMANENT IMPACTS		
		Linear Feet in			PHWH Class		Anticipated	Crossed	Crossing Width	Number of	Crossing	Access Road	Access Road	Access Road	Access Road	Number of	RUSSINGS	Collection Line	Collection Line		Collection Line	
Feature ID	County	Project Area	Flow Regime	Туре	Designation	Drainage Basin	Jurisidictional (Yes/No)	(Yes/No)	(feet)	Crossings	Method	Impact (I.f.)	Impact (acre)	Impact\ (I.f.)	Impact (acre)	Crossings	Crossing Method	Impact (I.f.)	Impact (acre)	Impact (I.f.)	Impact (acre)	
WB-001	Highland	N/A	Perennial	Pond	N/A	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-002	Highland	N/A	Perennial	Pond	N/A	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-003	Highland	4,138	Intermittent	Stream	Class II	Slabcamp Run-East Fork Whiteoak Creek	Yes	Yes	30.53	0	N/A	N/A	N/A	N/A	N/A	1	Open Cut	30.53	0.010489	0	0	
WB-004	Highland	5,677	Intermittent	Stream	Class II	Slabcamp Run-East Fork Whiteoak Creek	Yes	Yes	62.51	0	N/A	N/A	N/A	N/A	N/A	5	Open Cut	62.51	0.007176	0	0	
WB-005	Highland	N/A	Perennial	Pond	N/A	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-006	Highland	399	Intermittent	Stream	Class I	Slabcamp Run-East Fork Whiteoak Creek	Yes	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-007	Highland	N/A	Perennial	Pond	N/A	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-008	Highland	414	Intermittent	Stream	Class II	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-009	Highland	1,425	Intermittent	Stream	Class II	Slabcamp Run-East Fork Whiteoak Creek	Yes	Yes	N/A	0	N/A	N/A	N/A	N/A	N/A	4	HDD	0.00	0	0	0	
WB-010	Highland	791	Ephemeral	Stream	Class I	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-011	Highland	2,913	Intermittent	Stream	Class II	Slabcamp Run-East Fork Whiteoak Creek	Yes	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-014	Highland	2,167	Intermittent	Stream	Class II	Slabcamp Run-East Fork Whiteoak Creek	Yes	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-015	Highland	4,415	Intermittent	Stream	Class II	Slabcamp Run-East Fork Whiteoak Creek	Yes	Yes	N/A	0	N/A	N/A	N/A	N/A	N/A	3	HDD	0.00	0	0	0	
WB-017	Highland	103	Ephemeral	Stream	Class I	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-018	Highland	1,217	Intermittent	Ditch	Class II	Slabcamp Run-East Fork Whiteoak Creek	Yes	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-019	Highland	5,902	Perennial	Stream	Class II	Slabcamp Run-East Fork Whiteoak Creek	Yes	Yes	25.10	1	Culvert	9.04	0.003113	16.06	0.005531	4	Open Cut (1), HDD (3)	17.28	0.005994	0	0	
WB-020	Highland	1,220	Ephemeral	Stream	Class II	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-021	Highland	243	Ephemeral	Stream	Class II	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-022	Highland	353	Ephemeral	Ditch	Class II	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-023	Highland	1,244	Intermittent	Stream	Class II	Little West Fork Ohio Brush Creek	Yes	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-024	Highland	17	Intermittent	Ditch	Class II	Slabcamp Run-East Fork Whiteoak Creek	Yes	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-025	Highland	3,380	Perennial	Stream	Class III	Slabcamp Run-East Fork Whiteoak Creek	Yes	Yes	N/A	0	N/A	N/A	N/A	N/A	N/A	2	HDD	0	0	0	0	
WB-026	Highland	156	Ephemeral	Ditch	Class II	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-027	Highland	N/A	Perennial	Pond	N/A	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-028	Highland	679	Ephemeral	Ditch	Class I	Slabcamp Run-East Fork Whiteoak Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-029	Highland	900	Intermittent	Stream	Class II	Slabcamp Run-East Fork Whiteoak Creek	Yes	Yes	28.57	1	Culvert	10.71	0.001014	17.86	0.001641	1	HDD	0.00	0	0	0	
WB-030	Highland	471	Ephemeral	Ditch	Class I	Little West Fork Ohio Brush Creek	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-031	Highland	1,827	Ephemeral	Ditch	Class II	Little West Fork Ohio Brush	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-032	Brown	287	Ephemeral	Stream	Class I	Creek Slabcamp Run-East Fork	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-033	Brown	228	Ephemeral	Stream	Class II	Whiteoak Creek Little West Fork Ohio Brush	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
WB-034	Brown	N/A	Perennial	Pond	N/A	Creek Little West Fork Ohio Brush	No	No	N/A	0	N/A	N/A	N/A	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	
Ditch Sub		4,720		<u>.</u>		Creek	2	0	146.71	0		0	0.00	0	0.00	0		0	0.00	0	0.00	
Pond Sub	ototals	N/A					0	0		0		0	0.00	0	0.00	0		0	0.00	0	0.00	
Stream Su	btotals	35,846					11	7		2	(2) Culvert	20	0.004	34	0.01	20	(7) Open Cut (13) HDD	110	0.02	о	0.00	
Project T	Fotals	40,566	1				13	7	146.71	2	(2) Culvert	20	0.004	34	0.01	20	(7) Open Cut	110	0.02	0	0.00	
0,000 1		.0,000								-	(_) cantert		0.004	54	0.01		(13) HDD	-10	0.02			

INADVERTENT RELEASE OF DRILLING FLUID CONTINGENCY PLAN

For Horizontal Directional Drilling Willowbrook Solar Project Highland and Brown Counties, Ohio

I. Introduction

Construction of the Willowbrook Solar Project in Highland and Brown Counties, Oho, will include the use of trenchless excavation methods known as horizontal directional drilling ("HDD"). This widely used technique accomplishes the installation of buried utilities with minimal impact, by routing the utility under a sensitive feature (such as a stream, river or wetland). The HDD procedure uses a bentonite slurry, a fine clay material as a drilling lubricant ("drilling mud"). Although bentonite is non-toxic and non-hazardous, a potential environmental risk associated with conducting HDD under sensitive features occurs when bentonite is released to the surface during construction (sometimes referred to as an inadvertent release or "frac-out").

Seepage of drilling fluid is most likely to occur near the bore entry and exit points where the drill head is shallow. Frac-outs can occur, however, in any location along a directional bore. This plan establishes operational procedures and responsibilities for the prevention, containment, and remediation of any of frac-outs that may occur in connection with the proposed HDD as part of the construction of the Willowbrook Solar Project.

The objectives of this Plan are to:

- 1. Minimize the potential for an inadvertent release associated with HDD activities;
- 2. Provide for the timely detection of an inadvertent release;
- 3. Protect sensitive water courses and associated riparian vegetation;
- 4. Ensure an organized, timely, and minimum-impact response in the event an inadvertent release occurs; and
- 5. Ensure that all appropriate notifications are made immediately to management and environmental personnel.

Measures to be deployed as part of the contingency plan include site inspection, proper training of the contractor and construction personnel, development of response procedures, provision of containment materials, and implementation of appropriate clean up procedures. These measures are described in detail below:

II. <u>Description of Work</u>

Drilling operations will be carefully monitored to determine if and when a frac-out may be occurring. Operations will be halted immediately upon detection of a significant decline in drilling pressure or other evidence that a frac-out may be occurring. The clean-up of all spills shall begin immediately. Management and environmental personnel shall be notified immediately of any spills and shall be consulted regarding remediation procedures. Spill response kits shall be maintained on-site and used if a frac-out occurs. A vacuum truck and containment materials, such as straw bales, shall also be readily available. In the event of a frac-out, the on-site supervisor of construction activities ("Site Supervisor") will conduct an evaluation of the situation and direct recommended mitigation actions, based on the following guidelines:

- 1. If the frac-out is minor, easily contained, has not reached the surface, and is not threatening sensitive resources, then drilling operations may resume after use of a leak-stopping compound or redirection of the bore; and
- 2. If the frac-out has reached the surface, any hazardous materials within the bentonite shall be removed, contained and properly disposed of, as required by law. The drilling contractor shall be responsible for ensuring that the bentonite either is properly disposed of at an approved disposal facility or properly recycled in an approved manner. The Site Supervisor shall notify and take any necessary follow-up response actions in coordination with the relevant regulatory agency representatives. The Site Supervisor shall coordinate the mobilization of equipment stored at off-site locations (e.g., vacuum trucks) on an as needed basis.

III. <u>Site Supervisor Responsibilities</u>

The Site Supervisor has ultimate responsibility for implementing this plan. The Site Supervisor shall ensure that all relevant employees are trained prior to drilling. The Site Supervisor shall be notified immediately when a frac-out is detected. The Site Supervisor shall be responsible for ensuring that environmental personnel are aware of the frac-out, and coordinate personnel, response, remediation, and regulatory agency notification. The Site Supervisor shall ensure all waste materials are properly containerized, labeled, and removed from the site to an approved disposal facility by personnel experienced in the removal, transport and disposal of drilling mud.

The Site Supervisor shall be familiar with all aspects of the drilling activity, the contents of this plan and the conditions of approval under which the HDD is authorized to take place. The Site Supervisor shall have the authority to stop work and commit the resources (personnel and equipment) necessary to implement this plan. The Site Supervisor shall ensure that a copy of this plan is available (at the project work site) and accessible to all construction personnel. The Site Supervisor shall ensure that all workers are properly trained and familiar with the necessary procedures for response to a frac-out, prior to commencement of drilling operations.

IV. Equipment

The Site Supervisor shall ensure that:

- 1. Spill responses kit and spill containment materials are available on-site at all times, and that the equipment is in good working order;
- 2. Equipment required to contain and remediate a frac-out release either will either be available at the work site or readily available at an offsite location within 15- minutes of the bore site; and

If equipment is required to be operated adjacent to a water course, absorbent pads and plastic sheeting for placement beneath motorized equipment shall be used to protect sensitive areas from engine fluids.

V. <u>Training</u>

Prior to the start of construction, the Site Supervisor shall ensure that relevant workers receive training in the following areas:

- 1. The provisions of this plan, equipment maintenance and site-specific permit and monitoring requirements;
- 2. Inspection procedures for release prevention and containment equipment and materials;
- 3. Contractor/employee obligations to immediately stop the drilling operation upon first evidence of the occurrence of a frac-out and to immediately report any frac-out releases;
- 4. Contractor/employee responsibilities in the event of a release;
- 5. Operation of release prevention and control equipment and the location of release control materials, as necessary and appropriate; and
- 6. Protocols for communication with relevant regulatory agency representatives who might be on-site during the remediation effort.

VI. <u>Procedures</u>

The following procedures shall be followed each day, prior to the start of work. This plan shall be available on-site during all construction. The Site Supervisor shall be on-site at any time that HDD is occurring or is planned to occur. The Site Supervisor shall ensure that a briefing is held at the start of each day of HDD to review the appropriate procedures to be followed in case of a frac-out. Questions shall be answered and clarification given on any point over which the HDD operating crew or other employees or contractors have concerns.

A. Drilling

Drilling pressures shall be closely monitored so they do not exceed those needed to penetrate the target formation. Pressure levels shall be monitored randomly by the operator. Pressure levels shall be set at a minimum level to prevent frac-outs. During the pilot bore, the drilled annulus shall be maintained. Cutters and reamers shall be pulled back into previously-drilled sections after each new joint of pipe is added.

Exit and entry pits shall be enclosed by silt fences and straw or similar material. A spill kit shall be on-site and used if a frac-out occurs. A vacuum truck shall be readily available prior to and during all HDD operations. Containment materials (straw, silt fencing, sand bags, frac-out spill kits, etc.) shall be staged on-site at locations where they are readily available and easily mobilized for immediate use in the event of a frac-out. If necessary, barriers (straw bales or sedimentation fences) between the bore site and the edge of the water source, shall be constructed, prior to drilling, to prevent released bentonite material from reaching the water.

Once the drill rig is in place, and drilling begins, the drill operator shall stop work whenever the pressure in the drill rig significantly drops or there is a lack of returns in the entrance pit. If either of these occur, the Site Supervisor shall be informed that a possible frac-out has occurred. The

Site Supervisor and the drill rig operator(s) shall work to coordinate the likely location of the fracout.

The location of the frac-out shall be recorded and notes made on the location and measures taken to address the concern. The following subsections shall be adhered to when addressing a frac-out situation.

Water containing mud, silt, bentonite, or other pollutants from equipment washing or other activities, shall not be allowed to enter any water course. The bentonite used in the drilling process shall be either disposed of at an approved disposal facility or recycled in an approved manner. Other construction materials and wastes shall be recycled, or disposed of, as appropriate.

B. Vacuum Truck

A vacuum truck shall be staged at a location from which it can be mobilized and relocated so that any place along the drill shot, can be reached by the apparatus, within thirty (30) minutes of information indicating a possible frac-out.

C. Field Response

The response of the field crew to a frac-out release shall be immediate and in accordance with procedures set forth in this plan. All appropriate emergency actions that do not pose additional threats to sensitive resources will be taken, as follows:

- 1. Boring shall stop immediately;
- 2. The bore stem shall be pulled back to relieve pressure on the frac-out;
- 3. The Site Supervisor shall be notified to ensure that management and environmental personnel are notified, adequate response actions are taken and required notifications are made;
- 4. The Site Supervisor shall evaluate the situation and recommend the type and level of response warranted, including the level of notification required;
- 5. If the frac-out is minor, easily contained, has not reached the surface and is not threatening any sensitive resources, then a leak-stopping compound shall be employed to block the frac-out. If the use of leak-stopping compound is not fully successful, then the bore stem shall be redirected to a new location along the desired drill path (i.e., where a frac-out has not occurred);
- 6. If the frac-out has reached the surface, any hazardous materials within the bentonite shall be removed to a depth of 48 inches, contained and properly disposed of, as required by law. A dike or berm may be constructed around the frac-out to entrap released drilling fluid, if necessary. Clean sand shall be deployed and the area returned to pre-project contours; and
- 7. If a frac-out occurs, reaches the surface and becomes widespread, the Site Supervisor shall authorize a vacuum truck and bulldozer stored off-site to be mobilized. The vacuum

truck may be either positioned at either end of the line of the drill so that the frac-out can be reached by crews on foot, or may be pulled by a bulldozer, so that contaminated soils can be vacuumed up.

D. Response Close-out Procedures

- 1. When the release has been contained and remediated, response close-out activities shall be conducted at the direction of the Site Supervisor. These activities shall include those below.
- 2. The recovered drilling fluid shall either be recycled or transported to an approved facility for disposal. No recovered drilling fluids may be discharged into streams, storm drains or any other water source;
- 3. All frac-out excavation and remediation sites shall be returned to pre-project contours using clean fill, as necessary; and
- 4. All containment measures (fiber rolls, straw bale, etc.) shall be removed, unless otherwise specified by the Site Supervisor.

E. Resumption of HDD

For minor releases not necessitating external notification, HDD may continue, if full containment is achieved through the use of a leak-stopping compound or redirection of the bore and the cleanup crew remains at the frac-out location throughout the HDD activity. For releases necessitating external notification, HDD activities shall not restart without prior approval from the Site Supervisor.

F. Bore Abandonment

Abandonment of the bore will only be required when all efforts to control the frac-out within the existing directional bore have failed.

VII. <u>Notification</u>

In the event of a frac-out that reaches a water source, the Site Supervisor shall notify safety personnel so they can notify the appropriate regulatory agencies. All agency notifications will occur within 24 hours and proper documentation will be created in a timely and complete manner.

The following information will be provided:

- 1. Name and telephone number of person reporting;
- 2. Location of the release;
- 3. Date and time of release;
- 4. Type and quantity, estimated size of release;

- 5. How the release occurred;
- 6. The type of activity that was occurring around the area of the frac-out;
- 7. Description of any sensitive areas, and their location in relation to the frac-out; and
- 8. Description of the methods used to remediate the site.

A. Communicating with Regulatory Agency Personnel

All employees and subcontractors shall adhere to the following protocols when regulatory agency personnel arrive on site. Regulatory agency personnel shall be required to comply with appropriate safety rules. Only the Site Supervisor, safety personnel and environmental should coordinate communication with regulatory agency personnel.

B. Documentation

The Site Supervisor shall record the frac-out event in his or her daily log. The log will include the following:

- 1. Details on the release event, including an estimate of the amount of bentonite released;
- 2. The location and time of release;
- 3. The size of the area impacted, and the success of the remediation action;
- 4. Name and telephone number of person reporting;
- 5. Date;
- 6. How the release occurred;
- 7. The type of activity that was occurring around the area of the frac-out:
- 8. Description of any sensitive areas, and their location in relation to the frac-out;
- 9. Description of the methods used to remediate the site; and
- 10. Listing of the water-related permits for the project.

VIII. Project Completion and Clean-up

- 1. All materials and any rubbish-construction debris shall be removed from the construction zone at the end of each work day;
- 2. Sump pits at bore entry and exits will be filled and returned to natural grade; and
- 3. All protective measures (fiber rolls, straw bale, silt fence, etc.) will be removed unless otherwise specified by the Site Supervisor.

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