



Data Sources:
Imagery: NADP (2015)
Parcels: Open Road (2017)
Wetlands: Cardno (2017)
Ohio DNR Wetlands Inventory
(1981), USFWS (1979)
County, City, Township
Boundaries, Railroad
Right-of-Way (2014)
Roads: U.S. Census Bureau
Tiger Files (2016)

This map and all data contained within are supplied as is, with no warranty, expressed or implied, by Cardno. Cardno shall not be responsible for damages or liability from any claims that may arise out of the use or misuse of this map. It is the sole responsibility of the user to determine if the data on this map meets the user's needs. This map was not created as survey data, nor should it be used as such. It is the user's responsibility to obtain proper survey data, prepared by a licensed surveyor, where required by law.



Locator Map

Wetland and Waterbody Maps (Sheet 11 of 13)

Angelina Solar Project
Preston County, OH

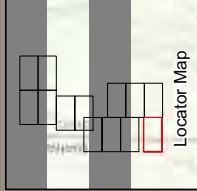


121 Continental Drive, Suite 308
Newark, DE 19713 USA
Phone (+1) 302-395-1919 Fax (+1) 302-395-1920
www.cardno.com

This map and all data contained within are supplied as is, with no warranty, expressed or implied, by Cardno. Cardno shall not be liable for damages or liability from any claims that may arise out of the use or misuse of this map. It is the sole responsibility of the user to determine if the data on this map meets the user's needs. This map was not created as survey data, nor should it be used as such. It is the user's responsibility to obtain proper survey data, prepared by a licensed surveyor, where required by law.

Data Sources:
Imagery: NADP (2015)
Parcels: Open Road (2017)
Wetlands: Cardno (2017)
Ohio DNR Wetlands Inventory (1981), USFWS (1979)
County, City, Township
Boundaries, Railroad
Records: U.S. Census Bureau
Tiger Files (2016)

Project: C:\GIS\Open Road Renewables\Angeline Solar Farm\MOU\Wetland Reports\Spring 2018\Wetland and Waterbody Maps.mxd
Date: 4/17/2018 Date Revised: 11/15/2018 File Path: S:\GIS\Open Road Renewables\Angeline Solar Farm\MOU\Wetland Reports\Spring 2018\Wetland and Waterbody Maps.mxd
GIS Analyst: mngm@cardno.com



Wetland and Waterbody Maps (Sheet 12 of 13)

Angeline Solar Project
Preston County, OH



**Cardno**
Shaping the Future

121 Continental Drive, Suite 308
Newark, DE 19713 USA
Phone (+1) 302-395-1919 Fax (+1) 302-395-1920
www.cardno.com



Angelina Solar Farm

APPENDIX

C

WETLAND DELINEATION AND
ASSESSMENT FORMS

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Angelina Solar Farm City/County: Preble Sampling Date: 11/1/2017
 Applicant/Owner: Open Road Renewables State: OH Sampling Point: WL-001-UPL
 Investigator(s): BS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Forest river bank Local relief (concave, convex, none): None
 Slope (%): 0% Lat: 39.660494 Long: -84.802944 Datum: WGS84
 Soil Map Unit Name: Eea NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			
Remarks: Dominant veg only due to FAC species.					

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u> radius)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>60%</u> (A/B)														
1. <u>Asimina triloba</u>	<u>40%</u>	<u>Yes</u>	<u>FAC</u>															
2. <u>Carya ovata</u>	<u>30%</u>	<u>Yes</u>	<u>FACU</u>															
3. <u>Acer saccharum</u>	<u>10%</u>	<u>No</u>	<u>FACU</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
<u>80%</u> = Total Cover																		
Sapling/Shrub Stratum (Plot size: <u>15'</u> radius)																		
1. <u>Asimina triloba</u>	<u>50%</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species <u>120%</u></td> <td>x3 = <u>3.6</u></td> </tr> <tr> <td>FACU species <u>50%</u></td> <td>x4 = <u>2</u></td> </tr> <tr> <td>UPL species <u>40%</u></td> <td>x5 = <u>2</u></td> </tr> <tr> <td>Column Totals: <u>2.10</u> (A)</td> <td><u>7.6</u> (B)</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species <u>120%</u>	x3 = <u>3.6</u>	FACU species <u>50%</u>	x4 = <u>2</u>	UPL species <u>40%</u>	x5 = <u>2</u>	Column Totals: <u>2.10</u> (A)	<u>7.6</u> (B)
Total % Cover of:	Multiply by:																	
OBL species _____	x1 = _____																	
FACW species _____	x2 = _____																	
FAC species <u>120%</u>	x3 = <u>3.6</u>																	
FACU species <u>50%</u>	x4 = <u>2</u>																	
UPL species <u>40%</u>	x5 = <u>2</u>																	
Column Totals: <u>2.10</u> (A)	<u>7.6</u> (B)																	
2. <u>Acer saccharum</u>	<u>10%</u>	<u>No</u>	<u>FACU</u>															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
<u>60%</u> = Total Cover																		
Herb Stratum (Plot size: <u>5'</u> radius)																		
1. <u>Fragaria vesca</u>	<u>40%</u>	<u>Yes</u>	<u>UPL</u>	Hydrophytic Vegetation Indicators: _____ 1-Rapid Test for Hydrophytic Vegetation <u>X</u> 2-Dominance Test is >50% _____ 3-Prevalence Index is ≤3.0 ¹ _____ 4-Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Andropogon gerardii</u>	<u>20%</u>	<u>Yes</u>	<u>FAC</u>															
3. <u>Alliaria petiolata</u>	<u>10%</u>	<u>No</u>	<u>FAC</u>															
4. _____	_____	_____	_____															
5. _____	_____	_____	_____															
6. _____	_____	_____	_____															
7. _____	_____	_____	_____															
8. _____	_____	_____	_____															
9. _____	_____	_____	_____															
10. _____	_____	_____	_____															
11. _____	_____	_____	_____															
12. _____	_____	_____	_____															
13. _____	_____	_____	_____															
14. _____	_____	_____	_____															
15. _____	_____	_____	_____															
16. _____	_____	_____	_____															
17. _____	_____	_____	_____															
18. _____	_____	_____	_____															
19. _____	_____	_____	_____															
20. _____	_____	_____	_____															
<u>70%</u> = Total Cover																		
Woody/Vine Stratum (Plot size: <u>30'</u> radius)																		
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____														
2. _____	_____	_____	_____															
_____ = Total Cover																		
Remarks: (Include photo numbers here or on a separate sheet.)																		

SOIL

Sampling Point: WL-001-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	2.5Y 4/4	100					Loam clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes _____	No <u> X </u>
Depth (inches): _____			

Remarks:
Assumed due to standing hydrology

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required: check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

Field Observations:		Wetland Hydrology Present?	
Surface Water Present? Yes _____ No <u> X </u>	Depth (inches): <u> N/A </u>	Yes _____	No <u> X </u>
Water Table Present? Yes _____ No <u> X </u>	Depth (inches): <u> N/A </u>		
Saturation Present? Yes _____ No <u> X </u>	Depth (inches): <u> N/A </u>		
(includes capillary fringe)			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Angelina Solar Farm City/County: Preble Sampling Date: 11/1/2017
 Applicant/Owner: Open Road Renewables State: OH Sampling Point: WL-001-WET
 Investigator(s): BS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Relic oxbow Local relief (concave, convex, none): Concave
 Slope (%): 1% Lat: 39.660476 Long: -84.80306 Datum: WGS84
 Soil Map Unit Name: Eea NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks: Concave depression with standing water.					

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u> radius)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																
1. <u>Asimina triloba</u>	<u>30%</u>	<u>Yes</u>	<u>FAC</u>																	
2. <u>Acer rubrum</u>	<u>15%</u>	<u>Yes</u>	<u>FAC</u>																	
3. <u>Acer saccharum</u>	<u>10%</u>	<u>No</u>	<u>FACU</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
	<u>55%</u> = Total Cover																			
Sapling/Shrub Stratum (Plot size: <u>15'</u> radius)																				
1. <u>Asimina triloba</u>	<u>35%</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species <u>40%</u></td> <td>x2 = <u>0.8</u></td> </tr> <tr> <td>FAC species <u>80%</u></td> <td>x3 = <u>2.4</u></td> </tr> <tr> <td>FACU species <u>10%</u></td> <td>x4 = <u>0.4</u></td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: <u>1.30</u> (A)</td> <td><u>3.6</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>2.77</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x1 = _____	FACW species <u>40%</u>	x2 = <u>0.8</u>	FAC species <u>80%</u>	x3 = <u>2.4</u>	FACU species <u>10%</u>	x4 = <u>0.4</u>	UPL species _____	x5 = _____	Column Totals: <u>1.30</u> (A)	<u>3.6</u> (B)	Prevalence Index = B/A = <u>2.77</u>	
Total % Cover of:	Multiply by:																			
OBL species _____	x1 = _____																			
FACW species <u>40%</u>	x2 = <u>0.8</u>																			
FAC species <u>80%</u>	x3 = <u>2.4</u>																			
FACU species <u>10%</u>	x4 = <u>0.4</u>																			
UPL species _____	x5 = _____																			
Column Totals: <u>1.30</u> (A)	<u>3.6</u> (B)																			
Prevalence Index = B/A = <u>2.77</u>																				
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
	<u>35%</u> = Total Cover																			
Herb Stratum (Plot size: <u>5'</u> radius)																				
1. <u>Persicaria maculosa</u>	<u>40%</u>	<u>Yes</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: _____ 1-Rapid Test for Hydrophytic Vegetation <u>X</u> 2-Dominance Test is >50% <u>X</u> 3-Prevalence Index is ≤3.0 ¹ _____ 4-Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
13. _____	_____	_____	_____																	
14. _____	_____	_____	_____																	
15. _____	_____	_____	_____																	
16. _____	_____	_____	_____																	
17. _____	_____	_____	_____																	
18. _____	_____	_____	_____																	
19. _____	_____	_____	_____																	
20. _____	_____	_____	_____																	
	<u>40%</u> = Total Cover																			
Woody Vine Stratum (Plot size: <u>30'</u> radius)																				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																
2. _____	_____	_____	_____																	
	_____ = Total Cover																			

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-001-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)		

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):	Hydric Soil Present?	Yes	No
Type: _____		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Depth (inches): _____			

Remarks:
Assumed due to standing hydrology

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required: check all that apply)		Secondary Indicators (minimum of two required)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

Field Observations:			
Surface Water Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	<u>6</u>
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	<u>0</u>
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	<u>0</u>
(includes capillary fringe)			
Wetland Hydrology Present?		Yes	<input checked="" type="checkbox"/> No <input type="checkbox"/>

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Angelina Solar Farm City/County: Preble Sampling Date: 11/1/2017
 Applicant/Owner: Open Road Renewables State: OH Sampling Point: WL-002-UPL
 Investigator(s): BS & MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Forest river bank Local relief (concave, convex, none): None
 Slope (%): 0% Lat: 39.660494 Long: -84.802944 Datum: WGS84
 Soil Map Unit Name: Eea NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks:			

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u> radius)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:																
1. <u>Carya ovata</u>	40%	Yes	FACU		Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B)															
2. <u>Asimina triloba</u>	20%	Yes	FAC																	
3. <u>Acer saccharum</u>	15%	Yes	FACU																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
				Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species <u>45%</u></td> <td>x3 = <u>1.35</u></td> </tr> <tr> <td>FACU species <u>115%</u></td> <td>x4 = <u>4.6</u></td> </tr> <tr> <td>UPL species <u>30%</u></td> <td>x5 = <u>1.5</u></td> </tr> <tr> <td>Column Totals: <u>1.90</u> (A)</td> <td><u>7.45</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>3.92</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species <u>45%</u>	x3 = <u>1.35</u>	FACU species <u>115%</u>	x4 = <u>4.6</u>	UPL species <u>30%</u>	x5 = <u>1.5</u>	Column Totals: <u>1.90</u> (A)	<u>7.45</u> (B)	Prevalence Index = B/A = <u>3.92</u>	
Total % Cover of:	Multiply by:																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species <u>45%</u>	x3 = <u>1.35</u>																			
FACU species <u>115%</u>	x4 = <u>4.6</u>																			
UPL species <u>30%</u>	x5 = <u>1.5</u>																			
Column Totals: <u>1.90</u> (A)	<u>7.45</u> (B)																			
Prevalence Index = B/A = <u>3.92</u>																				
75% = Total Cover																				
Sapling/Shrub Stratum (Plot size: <u>15'</u> radius)																				
1. <u>Carya ovata</u>	60%	Yes	FACU																	
2. <u>Asimina triloba</u>	10%	No	FAC																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
70% = Total Cover																				
Herb Stratum (Plot size: <u>5'</u> radius)																				
1. <u>Fragaria vesca</u>	30%	Yes	UPL	Hydrophytic Vegetation Indicators: _____ 1-Rapid Test for Hydrophytic Vegetation _____ 2-Dominance Test is >50% _____ 3-Prevalence Index is ≤3.0 ¹ _____ 4-Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u>Andropogon gerardii</u>	15%	Yes	FAC																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
13. _____	_____	_____	_____																	
14. _____	_____	_____	_____																	
15. _____	_____	_____	_____																	
16. _____	_____	_____	_____																	
17. _____	_____	_____	_____																	
18. _____	_____	_____	_____																	
19. _____	_____	_____	_____																	
20. _____	_____	_____	_____																	
45% = Total Cover																				
Woody Vine Stratum (Plot size: <u>30'</u> radius)																				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes _____ No <u>X</u>																
2. _____	_____	_____	_____																	
_____ = Total Cover																				
Remarks: (Include photo numbers here or on a separate sheet.)																				

SOIL

Sampling Point: WL-002-UPL**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	2.5Y 3/3	100					Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ 2 cm Muck (A10)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ 5 cm Mucky Peat or Peat (S3)

☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

☐ Coast Prairie Redox (A16)
☐ Iron-Manganese Masses (F12)
☐ Dark Surface (S7)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X _____

Remarks:

Assumed due to standing hydrology

HYDROLOGY**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required: check all that apply)

☐ Surface Water (A1) ☐ Water-Stained Leaves (B9)
☐ High Water Table (A2) ☐ Aquatic Fauna (B13)
☐ Saturation (A3) ☐ True Aquatic Plants (B14)
☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1)
☐ Sediment Deposits (B2) ☐ Oxidized Rhizospheres on Living Roots (C3)
☐ Drift Deposits (B3) ☐ Presence of Reduced Iron (C4)
☐ Algal Mat or Crust (B4) ☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Iron Deposits (B5) ☐ Thin Muck Surface (C7)
☐ Inundation Visible on Aerial Imagery (B7) ☐ Gauge or Well Data (D9)
☐ Sparsely Vegetated Concave Surface (B8) ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

☐ Surface Soil Cracks (B6)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ FAC-Neutral Test (D5)

Field Observations:Surface Water Present? Yes _____ No X _____ Depth (inches): N/AWater Table Present? Yes _____ No X _____ Depth (inches): N/ASaturation Present? Yes _____ No X _____ Depth (inches): N/A

(includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Angelina Solar Farm City/County: Preble Sampling Date: 11/1/2017
 Applicant/Owner: Open Road Renewables State: OH Sampling Point: WL-002-WET
 Investigator(s): BS Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): Concave
 Slope (%): 1% Lat: 39.660025 Long: -84.803555 Datum: WGS84
 Soil Map Unit Name: Eea NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks:					

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u> radius)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)																
1. <u>Asimina triloba</u>	<u>15%</u>	<u>Yes</u>	<u>FAC</u>																	
2. <u>Acer rubrum</u>	<u>10%</u>	<u>Yes</u>	<u>FAC</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	<u>25%</u>	_____	_____																	
<u>25%</u> = Total Cover																				
Sapling/Shrub Stratum (Plot size: <u>15'</u> radius)																				
1. <u>Asimina triloba</u>	<u>5%</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species <u>40%</u></td> <td>x3 = <u>1.2</u></td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: <u>0.40</u> (A)</td> <td><u>1.2</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>3.00</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species <u>40%</u>	x3 = <u>1.2</u>	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: <u>0.40</u> (A)	<u>1.2</u> (B)	Prevalence Index = B/A = <u>3.00</u>	
Total % Cover of:	Multiply by:																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species <u>40%</u>	x3 = <u>1.2</u>																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: <u>0.40</u> (A)	<u>1.2</u> (B)																			
Prevalence Index = B/A = <u>3.00</u>																				
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	<u>5%</u>	_____	_____																	
<u>5%</u> = Total Cover																				
Herb Stratum (Plot size: <u>5'</u> radius)																				
1. <u>Carex blanda</u>	<u>10%</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: _____ 1-Rapid Test for Hydrophytic Vegetation <u>X</u> 2-Dominance Test is >50% <u>X</u> 3-Prevalence Index is ≤3.0 ¹ _____ 4-Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
13. _____	_____	_____	_____																	
14. _____	_____	_____	_____																	
15. _____	_____	_____	_____																	
16. _____	_____	_____	_____																	
17. _____	_____	_____	_____																	
18. _____	_____	_____	_____																	
19. _____	_____	_____	_____																	
20. _____	<u>10%</u>	_____	_____																	
<u>10%</u> = Total Cover																				
Woody Vine Stratum (Plot size: <u>30'</u> radius)																				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																
2. _____	_____	_____	_____																	
_____ = Total Cover																				
Remarks: (Include photo numbers here or on a separate sheet.)																				

SOIL

Sampling Point: WL-002-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	2.5Y 5/2	95	2.5Y 6/8	5	C	M	Clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes	<input checked="" type="checkbox"/> No _____
Depth (inches): _____			

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required: check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Yes	<input checked="" type="checkbox"/> No _____
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
(includes capillary fringe)			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Angelina Solar Farm City/County: Preble Sampling Date: 11/1/2017
 Applicant/Owner: Open Road Renewables State: OH Sampling Point: WL-003-UPL
 Investigator(s): BS & MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): pasture Local relief (concave, convex, none): None
 Slope (%): 0% Lat: 39.639379 Long: -84.805104 Datum: WGS84
 Soil Map Unit Name: FcA NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No <u>X</u>	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>		
Wetland Hydrology Present?	Yes _____	No <u>X</u>		

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u> radius)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B)																																
1. <u>Carya ovata</u>	<u>15%</u>	<u>Yes</u>	<u>FACU</u>																																	
2. <u>Acer saccharum</u>	<u>5%</u>	<u>Yes</u>	<u>FACU</u>																																	
3. _____	_____	_____	_____																																	
4. _____	_____	_____	_____																																	
5. _____	<u>20%</u>	<u>= Total Cover</u>																																		
Sapling/Shrub Stratum (Plot size: <u>15'</u> radius)				Prevalence Index worksheet: <table border="0"> <tr> <td colspan="2">Total % Cover of:</td> <td colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td>_____</td> <td>x1 =</td> <td>_____</td> </tr> <tr> <td>FACW species</td> <td><u>10%</u></td> <td>x2 =</td> <td><u>0.2</u></td> </tr> <tr> <td>FAC species</td> <td><u>70%</u></td> <td>x3 =</td> <td><u>2.1</u></td> </tr> <tr> <td>FACU species</td> <td><u>35%</u></td> <td>x4 =</td> <td><u>1.4</u></td> </tr> <tr> <td>UPL species</td> <td>_____</td> <td>x5 =</td> <td>_____</td> </tr> <tr> <td>Column Totals:</td> <td><u>1.15</u> (A)</td> <td></td> <td><u>3.7</u> (B)</td> </tr> <tr> <td colspan="4">Prevalence Index = B/A = <u>3.22</u></td> </tr> </table>	Total % Cover of:		Multiply by:		OBL species	_____	x1 =	_____	FACW species	<u>10%</u>	x2 =	<u>0.2</u>	FAC species	<u>70%</u>	x3 =	<u>2.1</u>	FACU species	<u>35%</u>	x4 =	<u>1.4</u>	UPL species	_____	x5 =	_____	Column Totals:	<u>1.15</u> (A)		<u>3.7</u> (B)	Prevalence Index = B/A = <u>3.22</u>			
Total % Cover of:		Multiply by:																																		
OBL species	_____	x1 =	_____																																	
FACW species	<u>10%</u>	x2 =	<u>0.2</u>																																	
FAC species	<u>70%</u>	x3 =	<u>2.1</u>																																	
FACU species	<u>35%</u>	x4 =	<u>1.4</u>																																	
UPL species	_____	x5 =	_____																																	
Column Totals:	<u>1.15</u> (A)		<u>3.7</u> (B)																																	
Prevalence Index = B/A = <u>3.22</u>																																				
1. _____	_____	_____	_____																																	
2. _____	_____	_____	_____																																	
3. _____	_____	_____	_____																																	
4. _____	_____	_____	_____																																	
5. _____	_____	<u>= Total Cover</u>																																		
Herb Stratum (Plot size: <u>5'</u> radius)				Hydrophytic Vegetation Indicators: _____ 1-Rapid Test for Hydrophytic Vegetation _____ 2-Dominance Test is >50% _____ 3-Prevalence Index is ≤3.0 ¹ _____ 4-Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																																
1. <u>Poa pratensis</u>	<u>70%</u>	<u>Yes</u>	<u>FAC</u>																																	
2. <u>Trifolium pratense</u>	<u>15%</u>	<u>No</u>	<u>FACU</u>																																	
3. <u>Spartina pectinata</u>	<u>10%</u>	<u>No</u>	<u>FACW</u>																																	
4. _____	_____	_____	_____																																	
5. _____	_____	_____	_____																																	
6. _____	_____	_____	_____																																	
7. _____	_____	_____	_____																																	
8. _____	_____	_____	_____																																	
9. _____	_____	_____	_____																																	
10. _____	_____	_____	_____																																	
11. _____	_____	_____	_____																																	
12. _____	_____	_____	_____																																	
13. _____	_____	_____	_____																																	
14. _____	_____	_____	_____																																	
15. _____	_____	_____	_____																																	
16. _____	_____	_____	_____																																	
17. _____	_____	_____	_____																																	
18. _____	_____	_____	_____																																	
19. _____	_____	_____	_____																																	
20. _____	<u>95%</u>	<u>= Total Cover</u>																																		
Woody Vine Stratum (Plot size: <u>30'</u> radius)				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>																																
1. _____	_____	_____	_____																																	
2. _____	_____	_____	_____																																	
_____ = Total Cover																																				

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-003-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-3	2.5Y 5/3	100					Loam	
3-12	2.5Y 5/3	65	7.5YR 6/8	5	C	M	Loam clay	
	2.5Y 6/8	30						

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):	
Type: _____	
Depth (inches): _____	

Hydric Soil Present? Yes _____ No X

Remarks:
Assumed due to standing hydrology

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required: check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

Field Observations:			
Surface Water Present?	Yes _____ No <u> X </u>	Depth (inches):	<u> N/A </u>
Water Table Present?	Yes _____ No <u> X </u>	Depth (inches):	<u> N/A </u>
Saturation Present?	Yes _____ No <u> X </u>	Depth (inches):	<u> N/A </u>
(includes capillary fringe)			

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site:	Angelina Solar Farm	City/County:	Preble	Sampling Date:	11/1/2017
Applicant/Owner:	Open Road Renewables	State:	OH	Sampling Point:	WL-003-WET
Investigator(s):	BS & MM	Section, Township, Range:			
Landform (hillslope, terrace, etc.):		Local relief (concave, convex, none):	Concave		
Slope (%):	1%	Lat:	39.639442	Long:	-84.805192
				Datum:	WGS84
Soil Map Unit Name:	FcA	NWI classification:	PUBGx		

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> X </u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> X </u>	No <u> </u>
Hydric Soil Present?	Yes <u> X </u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u> X </u>	No <u> </u>			

Remarks:
Depression in cow pasture

VEGETATION -- Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: 30' radius)					Dominance Test worksheet:	
1.					Number of Dominant Species	
2.					That Are OBL, FACW, or FAC: 1 (A)	
3.					Total Number of Dominant	
4.					Species Across All Strata: 1 (B)	
5.					Percent of Dominant Species	
					That Are OBL, FACW, or FAC: 100% (A/B)	
Sapling/Shrub Stratum (Plot size: 15' radius)					Prevalence Index worksheet:	
1.					Total % Cover of: Multiply by:	
2.					OBL species x1 =	
3.					FACW species 60% x2 = 1.2	
4.					FAC species x3 =	
5.					FACU species x4 =	
					UPL species x5 =	
					Column Totals: 0.60 (A) 1.2 (B)	
Herb Stratum (Plot size: 5' radius)					Prevalence Index = B/A = 2.00	
1.	<i>Persicaria maculosa</i>	60%	Yes	FACW	Hydrophytic Vegetation Indicators:	
2.					<input checked="" type="checkbox"/> 1-Rapid Test for Hydrophytic Vegetation	
3.					<input checked="" type="checkbox"/> 2-Dominance Test is >50%	
4.					<input checked="" type="checkbox"/> 3-Prevalence Index is ≤3.0 ¹	
5.					4-Morphological Adaptations ¹ (Provide supporting	
6.					data in Remarks or on a separate sheet)	
7.					Problematic Hydrophytic Vegetation ¹ (Explain)	
8.					¹ Indicators of hydric soil and wetland hydrology must	
9.					be present, unless disturbed or problematic.	
10.					Hydrophytic	
11.					Vegetation	
12.					Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						
		60%				
Woody Vine Stratum (Plot size: 30' radius)						
1.						
2.						
Remarks: (Include photo numbers here or on a separate sheet.)						

SOIL

Sampling Point: WL-003-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	2.5Y 4/2	100					Clay	
2-12	5Y 5/2	60	5YR 5/8	5	C	M	Clay	
	5Y 5/2	35						

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> Coast Prairie Redox (A16) <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
---	--

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____			Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
---	--	--	--

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required: check all that apply)				Secondary Indicators (minimum of two required)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Drainage Patterns (B10)			
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> True Aquatic Plants (B14)		<input type="checkbox"/> Dry-Season Water Table (C2)			
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)		<input type="checkbox"/> Crayfish Burrows (C8)			
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)		<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)			
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Gauge or Well Data (D9)		<input checked="" type="checkbox"/> Stunted or Stressed Plants (D1)			
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Other (Explain in Remarks)			<input checked="" type="checkbox"/> Geomorphic Position (D2)			
<input type="checkbox"/> Algal Mat or Crust (B4)				<input checked="" type="checkbox"/> FAC-Neutral Test (D5)			
<input type="checkbox"/> Iron Deposits (B5)							
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)							
<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)							

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): <u>N/A</u> Water Table Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>6</u> Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
---	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Angelina Solar Farm City/County: Preble Sampling Date: 11/1/2017
 Applicant/Owner: Open Road Renewables State: OH Sampling Point: WL-004-UPL
 Investigator(s): BS & MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): None
 Slope (%): 1% Lat: 39.636587 Long: -84.800927 Datum: WGS84
 Soil Map Unit Name: MeC2 NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			
Remarks:					

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>30' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15' radius</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
_____ = Total Cover			
Herb Stratum (Plot size: <u>5' radius</u>)			
1. <i>Spartina pectinata</i>	55%	Yes	FACW
2. <i>Bromus inermis</i>	20%	Yes	FACU
3. <i>Andropogon gerardii</i>	15%	No	FAC
4. <i>Trifolium pratense</i>	5%	No	FACU
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
14. _____	_____	_____	_____
15. _____	_____	_____	_____
16. _____	_____	_____	_____
17. _____	_____	_____	_____
18. _____	_____	_____	_____
19. _____	_____	_____	_____
20. _____	_____	_____	_____
95% = Total Cover			
Woody/Vine Stratum (Plot size: <u>30' radius</u>)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
_____ = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x1 = _____
FACW species <u>55%</u>	x2 = <u>1.1</u>
FAC species <u>15%</u>	x3 = <u>0.45</u>
FACU species <u>25%</u>	x4 = <u>1</u>
UPL species _____	x5 = _____
Column Totals: <u>0.95</u> (A)	<u>2.55</u> (B)

Prevalence Index = B/A = 2.68

Hydrophytic Vegetation Indicators:

____ 1-Rapid Test for Hydrophytic Vegetation

____ 2-Dominance Test is >50%

X 3-Prevalence Index is ≤3.0¹

____ 4-Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-004-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	2.5Y 4/4	100					Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes _____	No <u> X </u>
Depth (inches): _____			

Remarks:
Assumed due to standing hydrology

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required: check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes _____ No <u> X </u>	Yes _____	No <u> X </u>
Water Table Present?	Yes _____ No <u> X </u>		
Saturation Present?	Yes _____ No <u> X </u>		
(includes capillary fringe)			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Angelina Solar Farm City/County: Preble Sampling Date: 11/1/2017
 Applicant/Owner: Open Road Renewables State: OH Sampling Point: WL-004-WET
 Investigator(s): BS & MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): Concave
 Slope (%): 1% Lat: 39.636576 Long: -84.801059 Datum: WGS84
 Soil Map Unit Name: MeC2 NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks: Depression along swale between fields					

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>30' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15' radius</u>)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
_____ = Total Cover			
Herb Stratum (Plot size: <u>5' radius</u>)			
1. <u>Typha angustifolia</u>	<u>70%</u>	<u>Yes</u>	<u>OBL</u>
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
13. _____			
14. _____			
15. _____			
16. _____			
17. _____			
18. _____			
19. _____			
20. _____			
_____ = Total Cover			
_____ = Total Cover			
Woody Vine Stratum (Plot size: <u>30' radius</u>)			
1. _____			
2. _____			
_____ = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>70%</u>	x1 = <u>0.7</u>
FACW species _____	x2 = _____
FAC species _____	x3 = _____
FACU species _____	x4 = _____
UPL species _____	x5 = _____
Column Totals: <u>0.70</u> (A)	<u>0.7</u> (B)
Prevalence Index = B/A = <u>1.00</u>	

Hydrophytic Vegetation Indicators:

X 1-Rapid Test for Hydrophytic Vegetation

X 2-Dominance Test is >50%

X 3-Prevalence Index is ≤3.0¹

____ 4-Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-004-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	2.5Y 5/2	100					Loamy cla	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes	<input checked="" type="checkbox"/> No _____
Depth (inches): _____			

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required: check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes <input checked="" type="checkbox"/> No _____	Yes	<input checked="" type="checkbox"/> No _____
Water Table Present?	Yes <input checked="" type="checkbox"/> No _____		
Saturation Present?	Yes <input checked="" type="checkbox"/> No _____		
(includes capillary fringe)			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Angelina Solar Farm City/County: Preble Sampling Date: 11/1/2017
 Applicant/Owner: Open Road Renewables State: OH Sampling Point: WL-005-UPL
 Investigator(s): BS & MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): None
 Slope (%): 2% Lat: 39.631534 Long: -84.798152 Datum: WGS84
 Soil Map Unit Name: MeD2 NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes _____	No <u>X</u>
Hydric Soil Present?	Yes _____	No <u>X</u>			
Wetland Hydrology Present?	Yes _____	No <u>X</u>			

Remarks:

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>30' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
_____ = Total Cover			

Sapling/Shrub Stratum (Plot size: <u>15' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
_____ = Total Cover			

Herb Stratum (Plot size: <u>5' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina pectinata</u>	<u>50%</u>	<u>Yes</u>	<u>FACW</u>
2. <u>Bromus inermis</u>	<u>15%</u>	<u>No</u>	<u>FACU</u>
3. <u>Solidago canadensis</u>	<u>10%</u>	<u>No</u>	<u>FACU</u>
4. <u>Trifolium pratense</u>	<u>5%</u>	<u>No</u>	<u>FACU</u>
5. <u>Daucus carota</u>	<u>5%</u>	<u>No</u>	<u>UPL</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
14. _____	_____	_____	_____
15. _____	_____	_____	_____
16. _____	_____	_____	_____
17. _____	_____	_____	_____
18. _____	_____	_____	_____
19. _____	_____	_____	_____
20. _____	_____	_____	_____
_____ = Total Cover			

Woody/Vine Stratum (Plot size: <u>30' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
_____ = Total Cover			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____ x1 = _____	
FACW species <u>50%</u> x2 = <u>1</u>	
FAC species _____ x3 = _____	
FACU species <u>30%</u> x4 = <u>1.2</u>	
UPL species <u>5%</u> x5 = <u>0.25</u>	
Column Totals: <u>0.85</u> (A)	<u>2.45</u> (B)

Prevalence Index = B/A = 2.88

Hydrophytic Vegetation Indicators:

X 1-Rapid Test for Hydrophytic Vegetation

X 2-Dominance Test is >50%

X 3-Prevalence Index is ≤3.0¹

____ 4-Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-005-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	2.5Y 5/4	100					Loam clay	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes _____	No <u> X </u>
Depth (inches): _____			

Remarks:
Assumed due to standing hydrology

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required: check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes _____ No <u> X </u>	Yes _____	No <u> X </u>
Water Table Present?	Yes _____ No <u> X </u>		
Saturation Present?	Yes _____ No <u> X </u>		
(includes capillary fringe)			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Angelina Solar Farm City/County: Preble Sampling Date: 11/1/2017
 Applicant/Owner: Open Road Renewables State: OH Sampling Point: WL-005-WET
 Investigator(s): BS & MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): Concave
 Slope (%): 1% Lat: 39.631466 Long: -84.798624 Datum: WGS84
 Soil Map Unit Name: MeD2 NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks:					

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u> radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
_____ = Total Cover			

Sapling/Shrub Stratum (Plot size: <u>15'</u> radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
_____ = Total Cover			

Herb Stratum (Plot size: <u>5'</u> radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Typha angustifolia</u>	<u>65%</u>	<u>Yes</u>	<u>OBL</u>
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
13. _____			
14. _____			
15. _____			
16. _____			
17. _____			
18. _____			
19. _____			
20. _____			
_____ = Total Cover			

Woody Vine Stratum (Plot size: <u>30'</u> radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
_____ = Total Cover			

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:

Number of Dominant Species
That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant
Species Across All Strata: 1 (B)

Percent of Dominant Species
That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>65%</u>	x1 = <u>0.65</u>
FACW species _____	x2 = _____
FAC species _____	x3 = _____
FACU species _____	x4 = _____
UPL species _____	x5 = _____
Column Totals: <u>0.65</u> (A)	<u>0.65</u> (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- X 1-Rapid Test for Hydrophytic Vegetation
- X 2-Dominance Test is >50%
- X 3-Prevalence Index is ≤3.0¹
- ____ 4-Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic
Vegetation
Present?

Yes X No _____

SOIL

Sampling Point: WL-005-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	2.5Y 4/1	100					Loamy cla	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes	<input checked="" type="checkbox"/>
Depth (inches): _____		No	<input type="checkbox"/>

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required: check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes	<input checked="" type="checkbox"/>
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	No	<input type="checkbox"/>
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
(includes capillary fringe)			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Angelina Solar Farm City/County: Preble Sampling Date: 11/2/2017
 Applicant/Owner: Open Road Renewables State: OH Sampling Point: WL-006-UPL
 Investigator(s): BS & MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): None
 Slope (%): 0% Lat: 39.630402 Long: -84.79984 Datum: WGS84
 Soil Map Unit Name: MeD2 NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks:			

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>30' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25%</u> (A/B)																																
1. <u>Platanus occidentalis</u>	<u>30%</u>	<u>Yes</u>	<u>FACW</u>																																	
2. <u>Maclura pomifera</u>	<u>15%</u>	<u>Yes</u>	<u>FACU</u>																																	
3. _____	_____	_____	_____																																	
4. _____	_____	_____	_____																																	
5. _____	<u>45%</u>	<u>= Total Cover</u>																																		
Sapling/Shrub Stratum (Plot size: <u>15' radius</u>)																																				
1. _____	_____	_____	_____	Prevalence Index worksheet: <table border="0"> <tr> <td colspan="2">Total % Cover of:</td> <td colspan="2">Multiply by:</td> </tr> <tr> <td>OBL species</td> <td>_____</td> <td>x1 =</td> <td>_____</td> </tr> <tr> <td>FACW species</td> <td><u>30%</u></td> <td>x2 =</td> <td><u>0.6</u></td> </tr> <tr> <td>FAC species</td> <td>_____</td> <td>x3 =</td> <td>_____</td> </tr> <tr> <td>FACU species</td> <td><u>110%</u></td> <td>x4 =</td> <td><u>4.4</u></td> </tr> <tr> <td>UPL species</td> <td>_____</td> <td>x5 =</td> <td>_____</td> </tr> <tr> <td>Column Totals:</td> <td><u>1.40</u> (A)</td> <td></td> <td><u>5</u> (B)</td> </tr> <tr> <td colspan="4">Prevalence Index = B/A = <u>3.57</u></td> </tr> </table>	Total % Cover of:		Multiply by:		OBL species	_____	x1 =	_____	FACW species	<u>30%</u>	x2 =	<u>0.6</u>	FAC species	_____	x3 =	_____	FACU species	<u>110%</u>	x4 =	<u>4.4</u>	UPL species	_____	x5 =	_____	Column Totals:	<u>1.40</u> (A)		<u>5</u> (B)	Prevalence Index = B/A = <u>3.57</u>			
Total % Cover of:		Multiply by:																																		
OBL species	_____	x1 =	_____																																	
FACW species	<u>30%</u>	x2 =	<u>0.6</u>																																	
FAC species	_____	x3 =	_____																																	
FACU species	<u>110%</u>	x4 =	<u>4.4</u>																																	
UPL species	_____	x5 =	_____																																	
Column Totals:	<u>1.40</u> (A)		<u>5</u> (B)																																	
Prevalence Index = B/A = <u>3.57</u>																																				
2. _____	_____	_____	_____																																	
3. _____	_____	_____	_____																																	
4. _____	_____	_____	_____																																	
5. _____	_____	_____	_____																																	
Herb Stratum (Plot size: <u>5' radius</u>)																																				
1. <u>Solidago canadensis</u>	<u>40%</u>	<u>Yes</u>	<u>FACU</u>	Hydrophytic Vegetation Indicators: _____ 1-Rapid Test for Hydrophytic Vegetation _____ 2-Dominance Test is >50% _____ 3-Prevalence Index is ≤3.0 ¹ _____ 4-Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																																
2. <u>Rosa multiflora</u>	<u>35%</u>	<u>Yes</u>	<u>FACU</u>																																	
3. <u>Cirsium arvense</u>	<u>15%</u>	<u>No</u>	<u>FACU</u>																																	
4. <u>Symphyotrichum ericoides</u>	<u>5%</u>	<u>No</u>	<u>FACU</u>																																	
5. _____	_____	_____	_____																																	
6. _____	_____	_____	_____																																	
7. _____	_____	_____	_____																																	
8. _____	_____	_____	_____																																	
9. _____	_____	_____	_____																																	
10. _____	_____	_____	_____																																	
11. _____	_____	_____	_____																																	
12. _____	_____	_____	_____																																	
13. _____	_____	_____	_____																																	
14. _____	_____	_____	_____																																	
15. _____	_____	_____	_____																																	
16. _____	_____	_____	_____																																	
17. _____	_____	_____	_____																																	
18. _____	_____	_____	_____																																	
19. _____	_____	_____	_____																																	
20. _____	<u>95%</u>	<u>= Total Cover</u>																																		
Woody/Vine Stratum (Plot size: <u>30' radius</u>)																																				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes _____ No <u>X</u>																																
2. _____	_____	_____	_____																																	
_____ = Total Cover																																				
Remarks: (Include photo numbers here or on a separate sheet.)																																				

SOIL

Sampling Point: WL-006-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 3/4	100					Clay loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes _____	No <u> X </u>
Depth (inches): _____			

Remarks:
Assumed due to standing hydrology

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required: check all that apply)			
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes _____ No <u> X </u>	Yes _____	No <u> X </u>
Water Table Present?	Yes _____ No <u> X </u>		
Saturation Present?	Yes _____ No <u> X </u>		
(includes capillary fringe)			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Angelina Solar Farm City/County: Preble Sampling Date: 11/2/2017
 Applicant/Owner: Open Road Renewables State: OH Sampling Point: WL-006-WET
 Investigator(s): BS & MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): Concave
 Slope (%): 1% Lat: 39.630526 Long: -84.800096 Datum: WGS84
 Soil Map Unit Name: MeD2 NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No _____	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No _____
Hydric Soil Present?	Yes <u>X</u>	No _____			
Wetland Hydrology Present?	Yes <u>X</u>	No _____			
Remarks:					

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>30' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
_____ = Total Cover			

Sapling/Shrub Stratum (Plot size: <u>15' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
_____ = Total Cover			

Herb Stratum (Plot size: <u>5' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Typha angustifolia</u>	<u>85%</u>	<u>Yes</u>	<u>OBL</u>
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			
13. _____			
14. _____			
15. _____			
16. _____			
17. _____			
18. _____			
19. _____			
20. _____			
_____ = Total Cover			

Woody Vine Stratum (Plot size: <u>30' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
_____ = Total Cover			

Remarks: (Include photo numbers here or on a separate sheet.)

Dominance Test worksheet:

Number of Dominant Species
That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant
Species Across All Strata: 1 (B)

Percent of Dominant Species
That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>85%</u>	x1 = <u>0.85</u>
FACW species _____	x2 = _____
FAC species _____	x3 = _____
FACU species _____	x4 = _____
UPL species _____	x5 = _____
Column Totals: <u>0.85</u> (A)	<u>0.85</u> (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- X 1-Rapid Test for Hydrophytic Vegetation
- X 2-Dominance Test is >50%
- X 3-Prevalence Index is ≤3.0¹
- ____ 4-Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic

Vegetation

Present? Yes X No _____

SOIL

Sampling Point: WL-006-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	2.5Y 6/1	100					Silt loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes	<input checked="" type="checkbox"/> No _____
Depth (inches): _____			

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required: check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes <input checked="" type="checkbox"/> No _____	Yes	<input checked="" type="checkbox"/> No _____
Water Table Present?	Yes <input checked="" type="checkbox"/> No _____		
Saturation Present?	Yes <input checked="" type="checkbox"/> No _____		
(includes capillary fringe)			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site: Angelina Solar Farm City/County: Preble Sampling Date: 11/2/2017
 Applicant/Owner: Open Road Renewables State: OH Sampling Point: WL-007-UPL
 Investigator(s): BS & MM Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): pasture Local relief (concave, convex, none): None
 Slope (%): 0% Lat: 39.629191 Long: -84.806907 Datum: WGS84
 Soil Map Unit Name: MeC2 NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
 Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
 Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland?	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes _____ No <u>X</u>		
Remarks:			

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: <u>30' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Maclura pomifera</u>	<u>30%</u>	<u>Yes</u>	<u>FACU</u>
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	<u>30%</u> = Total Cover		

Sapling/Shrub Stratum (Plot size: <u>15' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	_____ = Total Cover		

Herb Stratum (Plot size: <u>5' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Spartina pectinata</u>	<u>40%</u>	<u>Yes</u>	<u>FACW</u>
2. <u>Trifolium pratense</u>	<u>35%</u>	<u>Yes</u>	<u>FACU</u>
3. <u>Poa pratensis</u>	<u>10%</u>	<u>No</u>	<u>FAC</u>
4. <u>Symphyotrichum ericoides</u>	<u>5%</u>	<u>No</u>	<u>FACU</u>
5. <u>Cirsium arvense</u>	<u>5%</u>	<u>No</u>	<u>FACU</u>
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
12. _____	_____	_____	_____
13. _____	_____	_____	_____
14. _____	_____	_____	_____
15. _____	_____	_____	_____
16. _____	_____	_____	_____
17. _____	_____	_____	_____
18. _____	_____	_____	_____
19. _____	_____	_____	_____
20. _____	_____	_____	_____
	<u>95%</u> = Total Cover		

Woody/Vine Stratum (Plot size: <u>30' radius</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x1 = _____
FACW species <u>40%</u>	x2 = <u>0.8</u>
FAC species <u>10%</u>	x3 = <u>0.3</u>
FACU species <u>75%</u>	x4 = <u>3</u>
UPL species _____	x5 = _____
Column Totals: <u>1.25</u> (A)	<u>4.1</u> (B)

Prevalence Index = B/A = 3.28

Hydrophytic Vegetation Indicators:

____ 1-Rapid Test for Hydrophytic Vegetation

____ 2-Dominance Test is >50%

____ 3-Prevalence Index is ≤3.0¹

____ 4-Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present?

Yes _____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL-007-UPL**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	2.5Y 5/2	100					Clay loam	
4-12	2.5Y 4/4	100					Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators:**

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ 2 cm Muck (A10)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ 5 cm Mucky Peat or Peat (S3)

☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

☐ Coast Prairie Redox (A16)
☐ Iron-Manganese Masses (F12)
☐ Dark Surface (S7)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Assumed due to standing hydrology

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required: check all that apply)

☐ Surface Water (A1) ☐ Water-Stained Leaves (B9)
☐ High Water Table (A2) ☐ Aquatic Fauna (B13)
☐ Saturation (A3) ☐ True Aquatic Plants (B14)
☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1)
☐ Sediment Deposits (B2) ☐ Oxidized Rhizospheres on Living Roots (C3)
☐ Drift Deposits (B3) ☐ Presence of Reduced Iron (C4)
☐ Algal Mat or Crust (B4) ☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Iron Deposits (B5) ☐ Thin Muck Surface (C7)
☐ Inundation Visible on Aerial Imagery (B7) ☐ Gauge or Well Data (D9)
☐ Sparsely Vegetated Concave Surface (B8) ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

☐ Surface Soil Cracks (B6)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Stunted or Stressed Plants (D1)
☐ Geomorphic Position (D2)
☐ FAC-Neutral Test (D5)

Field Observations:Surface Water Present? Yes _____ No X Depth (inches): N/AWater Table Present? Yes _____ No X Depth (inches): N/ASaturation Present? Yes _____ No X Depth (inches): N/A

(includes capillary fringe)

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM -- Midwest Region

Project/Site:	Angelina Solar Farm	City/County:	Preble	Sampling Date:	11/2/2017
Applicant/Owner:	Open Road Renewables	State:	OH	Sampling Point:	WL-007-WET
Investigator(s):	BS & MM	Section, Township, Range:			
Landform (hillslope, terrace, etc.):	floodplain	Local relief (concave, convex, none):	Concave		
Slope (%):	1%	Lat:	39.628949	Long:	-84.805847
				Datum:	WGS84
Soil Map Unit Name:	MeD2	NWI classification:	none		

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation No, Soil No, or Hydrology No significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation No, Soil No, or Hydrology No naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS -- Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u> X </u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u> X </u>	No <u> </u>
Hydric Soil Present?	Yes <u> X </u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u> X </u>	No <u> </u>			

Remarks:

VEGETATION -- Use scientific names of plants.

		Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' radius)				
1.				
2.				
3.				
4.				
5.				
		= Total Cover		
Sapling/Shrub Stratum (Plot size: 15' radius)				
1.				
2.				
3.				
4.				
5.				
		= Total Cover		
Herb Stratum (Plot size: 5' radius)				
1.	<i>Spartina pectinata</i>	80%	Yes	FACW
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
		80% = Total Cover		
Woody Vine Stratum (Plot size: 30' radius)				
1.				
2.				
		= Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)				

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x1 =
FACW species 80%	x2 = 1.6
FAC species	x3 =
FACU species	x4 =
UPL species	x5 =
Column Totals: 0.80 (A)	1.6 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

☒ 1-Rapid Test for Hydrophytic Vegetation

☒ 2-Dominance Test is >50%

☒ 3-Prevalence Index is ≤3.0¹

☐ 4-Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present?

Yes ☒ No ☐

SOIL

Sampling Point: WL-007-WET

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-12	2.5Y 5/2	100					Silt loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2 cm Muck (A10)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____		Yes	<input checked="" type="checkbox"/> No _____
Depth (inches): _____			

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)	
Primary Indicators (minimum of one is required: check all that apply)			
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		

Field Observations:		Wetland Hydrology Present?	
Surface Water Present?	Yes <input checked="" type="checkbox"/> No _____	Yes	<input checked="" type="checkbox"/> No _____
Water Table Present?	Yes _____ No <input checked="" type="checkbox"/> _____		
Saturation Present?	Yes <input checked="" type="checkbox"/> No _____		
(includes capillary fringe)			

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Site: WL-001	Rater(s): BS	Date: 11/1/17
---------------------	---------------------	----------------------

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☒ <0.1 acres (0.04ha) (0 pts)

14	14
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☒ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

- ☒ 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)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

19	33
max 30 pts.	subtotal

Metric 3. Hydrology.

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

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

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

- ☒ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

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)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3)
- ☐ Seasonally inundated (2)
- ☐ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input	<input type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other _____

14	47
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☒ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☒ None or none apparent (9)
- ☐ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed	
<input type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants	<input type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

47
subtotal this page

Site: WL-001	Rater(s): BS	Date: 11/1/17
---------------------	---------------------	----------------------

47

subtotal first page

0	0
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check **all** that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

2	49
max 20 pts.	subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score **all** present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 1 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other _____

6b. horizontal (plan view) Interspersion.

Select **only one**.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☒ None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score **all** present using 0 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 1 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common 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

49

End of Quantitative Rating. Complete Categorization Worksheets.

Site: WL-002	Rater(s): BS	Date: 11/1/17
---------------------	---------------------	----------------------

1	1
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☒ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☐ <0.1 acres (0.04ha) (0 pts)

14	15
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☒ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☐ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

- ☒ 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)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

18	33
max 30 pts.	subtotal

Metric 3. Hydrology.

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

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

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

- ☒ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

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)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☒ Seasonally inundated (2)
- ☐ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input	<input type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other _____

11	44
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☒ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☒ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed	
<input type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input checked="" type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants	<input type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

44
subtotal this page

Site: WL-002	Rater(s): BS	Date: 11/1/17
---------------------	---------------------	----------------------

44

subtotal first page

0	0
max 10 pts.	subtotal

Metric 5. Special Wetlands.Check **all** that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

1	45
max 20 pts.	subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score **all** present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 1 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other _____

6b. horizontal (plan view) Interspersion.

Select **only one**.

- ☐ High (5)
- ☐ Moderately high (4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☒ Low (1)
- ☐ None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☒ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score **all** present using 0 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common 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

45

End of Quantitative Rating. Complete Categorization Worksheets.

Site: WL-003	Rater(s): BS	Date: 11/1/17
---------------------	---------------------	----------------------

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☒ <0.1 acres (0.04ha) (0 pts)

3	3
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

- ☐ 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)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

15	18
max 30 pts.	subtotal

Metric 3. Hydrology.

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

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

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

- ☒ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

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)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☐ Seasonally inundated (2)
- ☒ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input	<input type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other _____

3	21
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☒ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☐ Recovering (3)
- ☒ Recent or no recovery (1)

Check all disturbances observed	
<input type="checkbox"/> mowing <input checked="" type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input checked="" type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants	<input type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

21
subtotal this page

Site: WL-003	Rater(s): BS	Date: 11/1/17
---------------------	---------------------	----------------------

21

subtotal first page

-10	11
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check **all** that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☒ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

0	11
max 20 pts.	subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score **all** present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 0 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other _____

6b. horizontal (plan view) Interspersions.

Select **only one**.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☒ None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☒ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score **all** present using 0 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common 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

11

End of Quantitative Rating. Complete Categorization Worksheets.

Site: WL-004

Rater(s): BS

Date: 11/1/17

0

0

max 6 pts.

subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
☒ <0.1 acres (0.04ha) (0 pts)

1

1

max 14 pts.

subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

- ☐ 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)
☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

15

16

max 30 pts.

subtotal

Metric 3. Hydrology.

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

- ☐ High pH groundwater (5)
☐ Other groundwater (3)
☒ Precipitation (1)
☒ Seasonal/Intermittent surface water (3)
☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 (27.6in) (3)
☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
☒ <0.4m (<15.7in) (1)

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

- ☐ None or none apparent (12)
☒ Recovered (7)
☐ Recovering (3)
☐ Recent or no recovery (1)

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)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
☒ Regularly inundated/saturated (3)
☐ Seasonally inundated (2)
☐ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- ☐ ditch
☒ tile
☒ dike
☐ weir
☐ stormwater input

- ☐ point source (nonstormwater)
☐ filling/grading
☐ road bed/RR track
☐ dredging
☐ other _____

12

28

max 20 pts.

subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
☒ Recovered (3)
☐ Recovering (2)
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
☐ Very good (6)
☐ Good (5)
☐ Moderately good (4)
☒ Fair (3)
☐ Poor to fair (2)
☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
☒ Recovered (6)
☐ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed

- ☒ mowing
☐ grazing
☐ clearcutting
☐ selective cutting
☐ woody debris removal
☐ toxic pollutants

- ☐ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☐ sedimentation
☐ dredging
☐ farming
☐ nutrient enrichment

28

subtotal this page

Site: WL-004	Rater(s): BS	Date: 11/1/17
---------------------	---------------------	----------------------

28

subtotal first page

-10	18
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check **all** that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☒ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

-3	15
max 20 pts.	subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score **all** present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 1 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other _____

6b. horizontal (plan view) Interspersion.

Select **only one**.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☐ Low (1)
- ☒ None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- ☒ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score **all** present using 0 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 1 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common 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

15

End of Quantitative Rating. Complete Categorization Worksheets.

Site: WL-005

Rater(s): BS

Date: 11/1/17

2

2

Metric 1. Wetland Area (size).

max 6 pts.

subtotal

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
☒ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
☐ <0.1 acres (0.04ha) (0 pts)

3

5

Metric 2. Upland buffers and surrounding land use.

max 14 pts.

subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

- ☐ 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)
☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

12

17

Metric 3. Hydrology.

max 30 pts.

subtotal

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

- ☐ High pH groundwater (5)
☐ Other groundwater (3)
☒ Precipitation (1)
☐ Seasonal/Intermittent surface water (3)
☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 (27.6in) (3)
☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
☒ <0.4m (<15.7in) (1)

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

- ☐ None or none apparent (12)
☒ Recovered (7)
☐ Recovering (3)
☐ Recent or no recovery (1)

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)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
☒ Regularly inundated/saturated (3)
☐ Seasonally inundated (2)
☐ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- ☐ ditch
☒ tile
☐ dike
☐ weir
☐ stormwater input

- ☐ point source (nonstormwater)
☐ filling/grading
☐ road bed/RR track
☐ dredging
☐ other _____

11

28

Metric 4. Habitat Alteration and Development.

max 20 pts.

subtotal

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
☒ Recovered (3)
☐ Recovering (2)
☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
☐ Very good (6)
☐ Good (5)
☐ Moderately good (4)
☐ Fair (3)
☒ Poor to fair (2)
☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
☒ Recovered (6)
☐ Recovering (3)
☐ Recent or no recovery (1)

Check all disturbances observed

- ☒ mowing
☐ grazing
☐ clearcutting
☐ selective cutting
☐ woody debris removal
☐ toxic pollutants

- ☐ shrub/sapling removal
☐ herbaceous/aquatic bed removal
☐ sedimentation
☐ dredging
☐ farming
☐ nutrient enrichment

28

subtotal this page

Site: WL-005	Rater(s): BS	Date: 11/1/17
---------------------	---------------------	----------------------

28

subtotal first page

0	28
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check **all** that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

-2	26
max 20 pts.	subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score **all** present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 1 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other _____

6b. horizontal (plan view) Interspersion.

Select **only one**.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☒ Low (1)
- ☐ None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- ☒ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score **all** present using 0 to 3 scale.

- ☐ 0 Vegetated hummocks/tussucks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 1 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common 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

26

End of Quantitative Rating. Complete Categorization Worksheets.

Site: WL-006	Rater(s): BS	Date: 11/2/17
---------------------	---------------------	----------------------

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☒ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☐ <0.1 acres (0.04ha) (0 pts)

4	6
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

- ☒ 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)
- ☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

19	25
max 30 pts.	subtotal

Metric 3. Hydrology.

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

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

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

- ☒ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

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)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☒ Regularly inundated/saturated (3)
- ☐ Seasonally inundated (2)
- ☐ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input	<input type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other _____

12	37
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☒ Recovered (3)
- ☐ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☒ Fair (3)
- ☐ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☒ Recovered (6)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed	
<input checked="" type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input checked="" type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants	<input checked="" type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

37
subtotal this page

Site: WL-006	Rater(s): BS	Date: 11/2/17
---------------------	---------------------	----------------------

37

subtotal first page

0	37
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check **all** that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

-1	36
max 20 pts.	subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score **all** present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 2 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other _____

6b. horizontal (plan view) Interspersion.

Select **only one**.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☒ Moderately low (2)
- ☐ Low (1)
- ☐ None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- ☒ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score **all** present using 0 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 0 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common 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

36

End of Quantitative Rating. Complete Categorization Worksheets.

Site: WL-007	Rater(s): BS	Date: 11/2/17
---------------------	---------------------	----------------------

0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☐ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☒ <0.1 acres (0.04ha) (0 pts)

3	3
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

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

- ☐ 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)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

20	23
max 30 pts.	subtotal

Metric 3. Hydrology.

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

- ☐ High pH groundwater (5)
- ☒ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

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

- ☒ None or none apparent (12)
- ☐ Recovered (7)
- ☐ Recovering (3)
- ☐ Recent or no recovery (1)

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)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☒ Seasonally inundated (2)
- ☐ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
<input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input	<input type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other _____

3	26
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☐ Recovering (2)
- ☒ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☐ Poor to fair (2)
- ☒ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☐ Recovering (3)
- ☒ Recent or no recovery (1)

Check all disturbances observed	
<input checked="" type="checkbox"/> mowing <input checked="" type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input checked="" type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants	<input type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

26
subtotal this page

Site: WL-007	Rater(s): BS	Date: 11/2/17
---------------------	---------------------	----------------------

26

subtotal first page

0	26
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check **all** that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

2	28
max 20 pts.	subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score **all** present using 0 to 3 scale.

- ☐ 0 Aquatic bed
- ☐ 1 Emergent
- ☐ 0 Shrub
- ☐ 0 Forest
- ☐ 0 Mudflats
- ☐ 0 Open water
- ☐ 0 Other _____

6b. horizontal (plan view) Interspersions.

Select **only one**.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- ☒ Low (1)
- ☐ None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☒ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- ☐ Absent (1)

6d. Microtopography.

Score **all** present using 0 to 3 scale.

- ☐ 0 Vegetated hummocks/tussocks
- ☐ 0 Coarse woody debris >15cm (6in)
- ☐ 1 Standing dead >25cm (10in) dbh
- ☐ 0 Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common 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

28

End of Quantitative Rating. Complete Categorization Worksheets.

Angelina Solar Farm

APPENDIX

D

STREAM ASSESSMENT FORMS



Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

78

SITE NAME/LOCATION **Angelina Solar Farm**

SITE NUMBER **WB-001** RIVER BASIN **Little Four Mile Cr.** DRAINAGE AREA (mi²) **5.74**

LENGTH OF STREAM REACH (ft) **5,847** LAT. **39.65972** LONG. **-84.80446** RIVER CODE RIVER MILE

DATE **11/01/17** SCORER **BJS** COMMENTS

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS:

☐ NONE / NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

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
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="text" value="65%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="25%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="10%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **25.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **15**

TOTAL NUMBER OF SUBSTRATE TYPES: **3**

HHEI Metric Points

Substrate Max = 40

18

A + B

Pool Depth Max = 30

30

Bankfull Width Max=30

30

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input checked="" type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS MAXIMUM POOL DEPTH (centimeters): **30**

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input checked="" type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS AVERAGE BANKFULL WIDTH (meters): **6.10**

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)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input checked="" type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ 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 Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

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: Township / City:

MISCELLANEOUS

Base Flow Conditions? (Y/N): Date of last precipitation: Quantity:
Photograph Information:
Elevated Turbidity? (Y/N): Canopy (% open):
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:

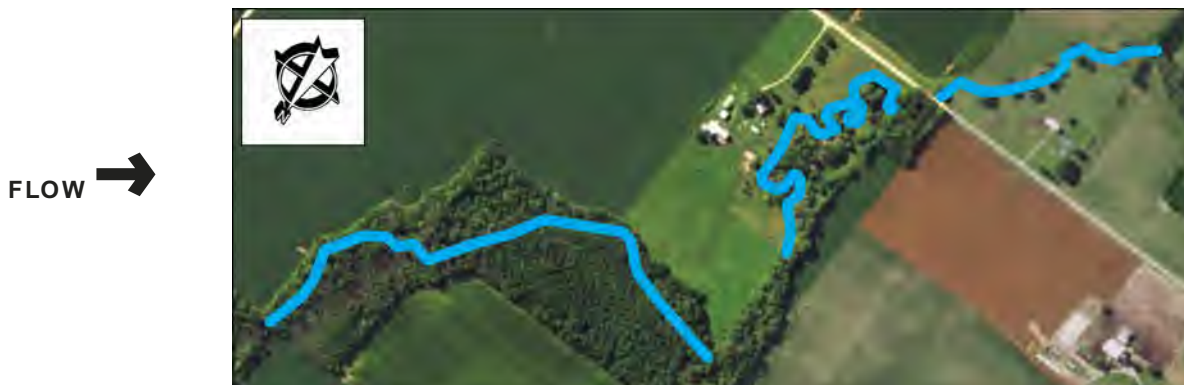
Stream crosses County Highway 45, and also flows through active cow pasture.

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) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N)
Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology:

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

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





Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

52

SITE NAME/LOCATION **Angelina Solar Farm**

SITE NUMBER **WB-002** RIVER BASIN **HFour Mile Creek** DRAINAGE AREA (mi²) **0.17**

LENGTH OF STREAM REACH (ft) **1,658** LAT. **39.65972** LONG. **-84.80446** RIVER CODE RIVER MILE

DATE **11/01/17** SCORER **BJS** COMMENTS **Starts at culverted/reinforced discharge point**

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY

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
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="text" value="75%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="5%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="20%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **5.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **9**

TOTAL NUMBER OF SUBSTRATE TYPES: **3**

HHEI Metric Points

Substrate Max = 40

12

A + B

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

Pool Depth Max = 30

25

COMMENTS MAXIMUM POOL DEPTH (centimeters): **15**

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

Bankfull Width Max=30

15

COMMENTS AVERAGE BANKFULL WIDTH (meters): **1.30**

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)
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS **In north. borders fields. but then enters narrow woodlot**

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input checked="" type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ 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 Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order
County: **Preble** Township / City: **MISCELLANEOUS**Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: **11/01/17** Quantity: **0.69**Photograph Information: **Representative photos taken**Elevated Turbidity? (Y/N): ☒ Y Canopy (% open): **40%**Were samples collected for water chemistry? (Y/N): ☒ 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) ☒ Y 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) ☒ N Salamanders Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N
Frogs or Tadpoles Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N Aquatic Macroinvertebrates Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ NComments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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





Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

52

SITE NAME/LOCATION **Angelina Solar Farm**

SITE NUMBER **WB-003** RIVER BASIN **Four Mile Creek** DRAINAGE AREA (mi²) **0.04**

LENGTH OF STREAM REACH (ft) **559** LAT. **39.63012** LONG. **-84.79875** RIVER CODE RIVER MILE

DATE **11/02/17** SCORER **BJS** COMMENTS

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☒ RECENT OR NO RECOVERY

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
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="text" value="40%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="60%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **60.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **15**

TOTAL NUMBER OF SUBSTRATE TYPES: **2**

HHEI Metric Points

Substrate Max = 40

17

A + B

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input checked="" type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters): **10**

Pool Depth Max = 30

15

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS

AVERAGE BANKFULL WIDTH (meters): **1.80**

Bankfull Width Max=30

20

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)
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS **Drains an upslope wetland.**

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input checked="" type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ 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 Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Township / City: **MISCELLANEOUS**Base Flow Conditions? (Y/N): Date of last precipitation: Quantity:
Photograph Information:
Elevated Turbidity? (Y/N): Canopy (% open):
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**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) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N)
Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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

FLOW →





Primary Headwater Habitat Evaluation Form

69**HHEI Score (sum of metrics 1, 2, 3) :**

SITE NAME/LOCATION **Angelina Solar Farm**

SITE NUMBER **WB-004** RIVER BASIN **Four Mile Creek** DRAINAGE AREA (mi²) **0.04**

LENGTH OF STREAM REACH (ft) **4,076** LAT. **39.63013** LONG. **-84.79964** RIVER CODE RIVER MILE

DATE **11/02/17** SCORER **BJS** COMMENTS

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

- 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
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="text" value="5%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="50%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="30%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="15%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **50.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

15

TOTAL NUMBER OF SUBSTRATE TYPES:

4**HHEI Metric Points**

Substrate Max = 40

19

A + B

- 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):**

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input checked="" type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

25

Pool Depth Max = 30

30

- 3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):**

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS

AVERAGE BANKFULL WIDTH (meters):

1.80

Bankfull Width Max=30

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	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m	<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field	<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m	<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	None	<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

COMMENTS

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input checked="" type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

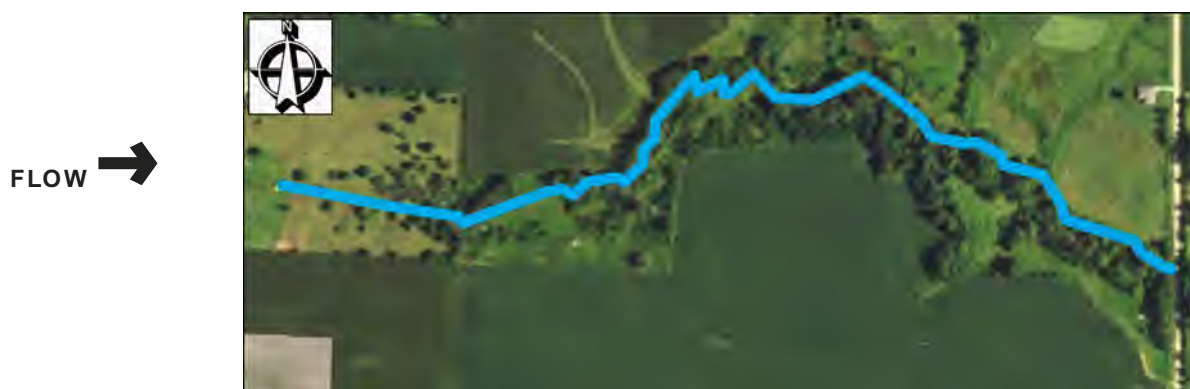
☒ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

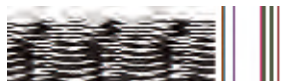
ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Township / City: **MISCELLANEOUS**Base Flow Conditions? (Y/N): Date of last precipitation: Quantity: Photograph Information: Elevated Turbidity? (Y/N): Canopy (% open): 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**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) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N)
Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Comments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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





Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

28

SITE NAME/LOCATION **Angelina Solar Farm**

SITE NUMBER **WB-005** RIVER BASIN **Four Mile Creek** DRAINAGE AREA (mi²) **0.00**

LENGTH OF STREAM REACH (ft) **259** LAT. **39.62973** LONG. **-84.79755** RIVER CODE RIVER MILE

DATE **11/02/17** SCORER **BJS** COMMENTS **Deeply cut feature in slope area.**

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☒ RECENT OR NO RECOVERY

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
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> SILT [3 pt]	<input checked="" type="checkbox"/> 35%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> BEDROCK [16 pt]	<input type="checkbox"/> 0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="checkbox"/> 0%
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input checked="" type="checkbox"/> 30%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/> 0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input checked="" type="checkbox"/> 35%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="checkbox"/> 0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **30.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **15**

TOTAL NUMBER OF SUBSTRATE TYPES: **3**

HHEI Metric Points

Substrate Max = 40

18

A + B

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input checked="" type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS MAXIMUM POOL DEPTH (centimeters): **5**

Pool Depth Max = 30

5

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS AVERAGE BANKFULL WIDTH (meters): **0.30**

Bankfull Width Max=30

5

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)
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	None

COMMENTS

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input checked="" type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ 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 Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Township / City: **MISCELLANEOUS**Base Flow Conditions? (Y/N): Date of last precipitation: Quantity: Photograph Information: Elevated Turbidity? (Y/N): Canopy (% open): 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**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) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N)
Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N) Comments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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





Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) :

39

SITE NAME/LOCATION **Angelina Solar Farm**

SITE NUMBER **WB-006** RIVER BASIN **Four Mile Creek** DRAINAGE AREA (mi²) **0.00**

LENGTH OF STREAM REACH (ft) **272** LAT. **39.62925** LONG. **-84.79905** RIVER CODE RIVER MILE

DATE **11/02/17** SCORER **BJS** COMMENTS **Deeply cut feature in slope area.**

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: ☐ NONE / NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

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
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> SILT [3 pt]	<input type="text" value="5%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="5%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="60%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="30%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **5.00%**

(A)

Substrate Percentage Check **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **15**

TOTAL NUMBER OF SUBSTRATE TYPES: **4**

HHEI Metric Points

Substrate Max = 40

19

A + B

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input checked="" type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS

MAXIMUM POOL DEPTH (centimeters): **8**

Pool Depth Max = 30

15

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS

AVERAGE BANKFULL WIDTH (meters): **0.30**

Bankfull Width Max=30

5

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)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input checked="" type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

☒ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ 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 Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Township / City: **MISCELLANEOUS**Base Flow Conditions? (Y/N): Date of last precipitation: Quantity:
Photograph Information:
Elevated Turbidity? (Y/N): Canopy (% open):
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**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) Voucher? (Y/N) Salamanders Observed? (Y/N) Voucher? (Y/N)
Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinvertebrates Observed? (Y/N) Voucher? (Y/N)
Comments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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



Angelina Solar Project

APPENDIX

E

WETLAND AND WATERBODY
IMPACT TABLES

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

Wetland ID	County	Latitude of Center Point	Longitude of Center Point	Acres within Project Area	Wetland Type	ORAM Score	Wetland Category	Anticipated Jurisdictional	Drainage Basin	Crossed (Yes/No)	ACCESS ROADS			COLLECTION LINES		
											TEMPORARY IMPACTS		PERMANENT IMPACTS	TEMPORARY IMPACTS		PERMANENT IMPACTS
											Access Road Impact (s.f.)	Access Road Impact (acre)		Collection Line Impact (l.f.)	Collection Line Impact (acre)	Collection Line Impact (l.f.)
WL-003	Preble	39.63945	-84.805228	0.10	PEM	11	1	No	Headwaters Four Mile Creek	No	n/a	n/a	n/a	n/a	n/a	n/a
WL-004	Preble	39.636564	-84.801053	0.05	PEM	15	1	Yes	Headwaters Four Mile Creek	No	n/a	n/a	n/a	n/a	n/a	n/a
WL-005	Preble	39.631459	-84.798497	0.35	PEM	26	1	No	Headwaters Four Mile Creek	No	n/a	n/a	n/a	n/a	n/a	n/a
WL-006	Preble	39.630612	-84.800049	0.38	PEM	36	Modified 2	Yes	Headwaters Four Mile Creek	No	n/a	n/a	n/a	n/a	n/a	n/a
WL-007	Preble	39.628963	-84.805803	0.08	PEM	28	1	Yes	Headwaters Four Mile Creek	No	n/a	n/a	n/a	n/a	n/a	n/a
Wetland Totals				0.89026						0	0.00	0	0.00	0	0.00	0.00

Table E-2 - Anticipated Waterbody Crossing Methods & Impacts for the Angelina Solar Project

Feature ID	31.972318	Linear Feet In Project Area	Flow Regime	Type	Drainage Basin	Anticipated Jurisdictional (Yes/No)	Crossed (Yes/No)	ACCESS ROADS				COLLECTION LINES			
								CROSSINGS		PERMANENT IMPACTS		CROSSINGS		TEMPORARY IMPACTS	
								Number of Crossings	Crossing Method	Access Road Impact (L.I.)	Access Road Impact (acre)	Number of Crossings	Crossing Method	Collection Line Impact (L.I.)	Collection Line Impact (acre)
WB-001	Preble	2,063	Perennial	Stream	Little Four Mile Creek	Yes	No	0	n/a	n/a	n/a	0	n/a	n/a	n/a
WB-002	Preble	1,654	Perennial	Stream	Headwaters Four Mile Creek	Yes	No	0	n/a	n/a	n/a	0	n/a	n/a	n/a
WB-003	Preble	558	Intermittent	Ditch	Headwaters Four Mile Creek	Yes	No	0	n/a	n/a	n/a	0	n/a	n/a	n/a
WB-004	Preble	4,073	Perennial	Stream	Headwaters Four Mile Creek	Yes	Yes	0	n/a	n/a	n/a	1	HDD	0.00	0
WB-005	Preble	259	Ephemeral	Ditch	Headwaters Four Mile Creek	Yes	No	0	n/a	n/a	n/a	0	n/a	n/a	n/a
WB-006	Preble	271	Intermittent	Stream	Headwaters Four Mile Creek	Yes	No	0	n/a	n/a	n/a	0	n/a	n/a	n/a
Ditch Subtotals		817				2	0	0	--	--	--	0	--	--	--
Pond Subtotals		n/a				0	0	0	--	--	--	0	--	--	--
Stream Subtotals		8,061				4	1	0	--	--	--	1	(1) HDD	0	0.00
Project Totals		8,878				6	1	0	--	--	0.000	1	(1) HDD	0	0.00

APPENDIX

F

INADVERTENT RELEASE OF DRILLING
FLUID CONTINGENCY PLAN

INADVERTENT RELEASE OF DRILLING FLUID CONTINGENCY PLAN

For Horizontal Directional Drilling
Angelina Solar Project
Preble County, Ohio

I. Introduction

Construction of the Angelina Solar Project in Preble County, Ohio, 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 Angelina 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. Description of Work

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. Site Supervisor Responsibilities

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. Training

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. Procedures

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 frac-out.

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. Notification

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.

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

12/3/2018 3:16:06 PM

in

Case No(s). 18-1579-EL-BGN

Summary: Application Exhibit G, Part 2b of 2 electronically filed by Mr. Michael J. Settineri on behalf of Angelina Solar I, LLC