# Hardin Solar Energy II LLC Case No. 18-1360-EL-BGN

# **Application Part 4 of 6**

# **Part 4 includes:**

- Exhibit H TRC Wetlands and other Waters of the U.S. Delineation Report October 2018
- Exhibit I PJM Feasibility Study AD1-130 May 2018
- Exhibit J Economic Impact Report September 2018
- Exhibit K Complaint Resolution Plan
- Exhibit L Certificate of Liability Insurance (filed under seal, in part)
- Exhibit M Determination of Average Ambient Noise Levels

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Date Filed: October 12, 2018

# **Exhibit H**

# TRC Wetlands and other Waters of the U.S. Delineation Report October 2018

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# WETLANDS AND OTHER WATERS OF THE U.S. DELINEATION REPORT

Hardin Solar II Energy Center
Hardin County, Ohio
October 2018

TRC Project No. 302899.0002.0000



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CONFIDENTIAL BUSINESS INFORMATION

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# **ACRONYMS**

DOW Division of Wildlife

FAC Facultative

FACU Facultative upland

FACW Facultative wetland

FEMA Federal Emergency Management Agency

GPS Global Positioning System

HSE Hardin Solar Energy II, LLC

HHEI Headwater Habitat Evaluation Index

HUC Hydrologic Unit Code

MWH Modified Warmwater Habitat

NHD National Hydrography Dataset

NRCS Natural Resources Conservation Service

NWI National Wetlands Inventory

OAC Ohio Administrative Code

OBL Obligate wetland

ODNR Ohio Department of Natural Resources

Ohio EPA Ohio Environmental Protection Agency

ORAM Ohio Rapid Assessment Method

PEM Palustrine emergent

PFO Palustrine forested

PHWH Primary Headwater Habitat

POW Palustrine open-water



#### Hardin Solar II Energy Center Wetlands and Other Waters of the U.S. Delineation Report October 2018

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Project Hardin Solar II Energy Center Project

PSS Palustrine scrub-shrub

QHEI Qualitative Habitat Evaluation Index

Report Wetlands and Other Waters of the U.S. Delineation Report

TNM The National Map

TRC Environmental Corporation

UPL Upland

U.S. United States

USACE United States Army Corps of Engineers

USDA United States Department of Agriculture

USEPA United States Environmental Protection Agency

USFWS United States Fish and Wildlife Service

USGS United States Geological Survey

WWH Warmwater Habitat

WQC Water Quality Certification



# 1.0 Introduction

On behalf of Hardin Solar Energy II LLC (HSE), TRC Environmental Corporation (TRC) has prepared this Wetlands and Other Waters of the United States (U.S.) Delineation Report (Report) as part of the environmental studies conducted for the Hardin Solar II Energy Center (Project), located in Hardin County, Ohio. This Report contains the methodology and results of the wetland identification and delineation investigations performed on May 16<sup>th</sup>, 18<sup>th</sup>, 22<sup>nd</sup>, 23<sup>th</sup>, 29<sup>th</sup>, June 12<sup>th</sup>, 13<sup>th</sup>, 14<sup>th</sup>, and September 14<sup>th</sup> and 17<sup>th</sup>, 2018 by TRC. Ms. Maggie Molnar, PWS, Mr. Jeffrey Vandeveer, Ms. Sarah Bender, Mr. Dan Kelly, Mr. Justin Pitts, and Ms. Lindsey Moss, of TRC are environmental scientists who have over 30 years of combined experience and performed field surveys for this Project.

The primary objective of the survey was to identify and evaluate wetlands and other waters of the U.S. within the Study Area, such that the resources could be considered in the planning, design, permitting, and installation of the proposed Project in accordance with Ohio Administrative Code (OAC) Chapter 4906-4-08 (B)(1)(a)(iv-v)-(b).

In total, the Project Area is approximately 3,388 acres (1,371 hectares), including 396 acres (160 hectares) of underground collection corridors. As proposed, the two (2) underground collection corridors will have no above ground construction impact. The Study Area, totaling approximately 3,696 acres, includes the potential construction Project Area and a 100 foot (30 meter) buffer in accordance with OAC 4906-4-08(B)(1)(b). In addition, 35 acres (14 hectacres) of this Study Area was previously surveyed as part of TRC's Addendum (*Hardin Wind Energy Project Wetlands and Other Waters of the U.S. Delineation Survey Report, October 2016*) for Point on Interconnection Facility dated September 12, 2017 (Appendix A, Figure 1)(TRC 2017). The area investigated was dominated by rotational upland cropland with pockets of emergent herbaceous and scrub/shrub wetland, and wetland and upland deciduous forest. The Study Area is bisected by Township Road 120 (east/west) and is bounded by Township Road 100 on the north, County Road 65 on the east, and private land holdings to the south and west. Currently, the undeveloped land is privately owned (Appendix A, Figure 1).

The Study Area lies within the Eastern Corn Belt Plains, which typically have loamy and well-drained soils, and are most commonly characterized by rolling plains and local end moraines (Wilken, Jiménez Nava and Griffith 2011). The vegetation of the ecoregion was originally dominated by American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), and American basswood (*Tilia americana*) forests. Overall, the landscape has been significantly altered to accommodate agricultural activities which have negatively altered stream chemistry and turbidity (US EPA 2010) (US EPA 2013) (Wilken, Jiménez Nava and Griffith



2011). Topography in the region consists of flat farmland, with elevations ranging from 961 feet (290 meters) to 1011 feet (308 meters) above mean sea level. The proposed Project is located within the Ohio River drainage basin. The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) maintains a classification system for identifying watersheds by hydrologic unit code (HUC). The Project is located within the Upper Scioto River watershed (8-Digit HUC: 05060001) (USDA/NRCS, Watershed Boundary Dataset 2013). The streams and tributaries found within the Study Area include Scioto River, Elder Creek, Cottonwood Ditch, and Twin Branches as well as multiple unnamed tributaries to these waterbodies. The Study Area is located within Marion, McDonald, and Roundhead townships in Hardin County, Ohio (Appendix A, Figure 1).

### 2.0 METHODOLOGY

Pursuant to the United States Army Corps of Engineers (USACE) wetlands and other waters of the U.S. delineation methodology, potential wetland and other waters of the U.S. located within the Study Area were identified, delineated, and mapped through the combined use of existing available public source information and field investigation. In addition, in accordance with the State of Ohio's Water Quality Standards (OAC Rule 3745-1-54), wetlands within the Study Area were evaluated and provisionally categorized utilizing Ohio EPA's Ohio Rapid Assessment Method (ORAM).

# 2.1 Desktop Review Methodology

The sources utilized for the desktop review included: the United States Geological Survey (USGS) Alger and Roundhead, Ohio (1988) 7.5 minute series topographical quadrangles (USGS 1994) (Appendix A, Figure 1), soil datasets acquired from the NRCS Web Soil Survey (USDA 2018) for Hardin County, Ohio (Appendix A, Figure 2), the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) for Ohio (USFWS 2018) (Appendix A, Figure 3), the United States Geological Survey (USGS) National Hydrography Dataset (NHD) (USGS no date (n.d.)) (Appendix A, Figure 3), the Ohio Environmental Protection Agency (Ohio EPA) 401 Water Quality Certification (WQC) for the Nationwide Permits Stream Eligibility Map (Ohio EPA 2017) (Appendix A, Figure 4), the Federal Emergency Management Agency (FEMA) flood hazard risk map (FEMA 2018) (Appendix A, Figure 5), the Ohio EPA OAC Chapter 3745-1 Water Quality Standards (Ohio EPA 2017a), and the Ohio Department of Natural Resources (ODNR), Division of Wildlife (DOW) (ODNR 2018). Sources were reviewed to identify wetland and other waters of the U.S. conditions that may be present within the Study Area. The results of the desktop review were used to aid in the field investigation.



# 2.2 Field Methodology-Wetlands

Wetland resources within the Study Area were identified and their boundaries determined in accordance with the USACE Wetlands Delineation Manual (1987 Manual) (USACE 1987), utilizing the Regional Supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual: Midwest (Version 2.0) (Regional Supplement) (USACE 2012). Consistent with the 1987 Manual, wetland determinations were based on dominant plant species, soil characteristics, and hydrologic characteristics. In addition, wetlands and other waters of the U.S. were evaluated in accordance with the State of Ohio's Water Quality Standards (OAC Chapter 3745-1) as managed by the Ohio Environmental Protection Agency (Ohio EPA). Areas that exhibit hydric soils, wetland hydrology, and a dominance of hydrophytic vegetation were considered potentially jurisdictional wetlands. Wetlands or other waters of the U.S. are considered potentially jurisdictional until verified by the USACE (USACE/USEPA 2008). A photographic log of field observations is presented in Appendix B. Completed USACE Wetland Determination Data Forms-Midwest Region are presented in Appendix C.

Soils were examined by excavating a soil pit twenty (20) inches (50 centimeters) below the ground surface using a tile spade. The exposed soil profile was examined for characteristics using hydric soil criteria described in the National Technical Committee for Hydric Soils *Field Indicators of Hydric Soils in the United States* (USDA 2017). Hue, value, and chroma of the matrix (e.g., 10YR 6/1) and mottles (e.g., 10YR 5/6) of moist soils were examined, and were determined by comparing soils to the *Munsell Soil Color Chart* (Munsell Color 2009).

The hydrology criterion in the *Regional Supplement* requires that an area exhibit at least one primary or at least two secondary indicators of wetland hydrology. Examples of primary wetland hydrology indicators include standing water or saturated soils, water marks on trees, drift lines, water-stained leaves, and oxidized root zones surrounding living roots. Examples of secondary wetland hydrology indicators include drainage patterns, microtopographic relief, presence of crayfish burrows, and sparsely vegetated concave surfaces. Additional secondary signs of hydrology include visible saturation on aerial photographs and a positive facultative (FAC)-neutral test as described below (USACE 2010).

Plants were identified to the lowest taxonomic level possible, using professional references to differentiate cryptic taxa (Braun 1967) (Braun 1969) (Gleason and Cronquist 1991) (Holmgren 1998) (Mohlenbrock 2001a) (Mohlenbrock 2001) (Mohlenbrock 2002) (Mohlenbrock 2006) (Mohlenbrock 2011) (Newcomb 1977) (Rhoads and Block 2007) (Rothrock 2009) (Stein, Binion and Acciavatti 2003) (Voss and Reznicek 2012) (Weakley, Ludwig and Townsend 2013). Dominant vegetation for each community was determined by estimating dominant species in the tree, sapling/shrub, herbaceous, and woody vine strata. Dominant



species were determined by using the 50/20 dominance rule for each stratum, which was accomplished by estimating the percent areal cover for each species. The relative percent areal cover was calculated for each species by dividing each species percent cover by the total percent cover for all species and multiplying by 100. The species were then arranged in descending order of relative percent cover. A running total was kept by adding the relative cover of each species starting with the species with the highest relative cover until the total cover equals 50 percent. All species included in this calculation are regarded as dominant. Species of equal cover value that contributed to meeting the sum of 50 percent are also considered dominant. Additionally, other species that solely accounted for 20 percent or more of the relative percent cover were also considered dominant species.

The indicator status of each dominant species was determined. An indicator status of obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU) and/or upland (UPL) has been assigned to each plant species in the *U.S. Army Corps of Engineers National Wetlands Plant List* (Lichvar, et al. 2016). In accordance with the aforementioned guidance, an area was classified with hydrophytic vegetation when, under normal circumstances, more than 50 percent of the composition of the dominant species from all strata is comprised of OBL, FACW, and/or FAC species.

The FAC-neutral test, as a secondary indicator of hydrology, was calculated for each data set. This test considers all FAC species as neutral for wetland determination and compares the number of dominant species wetter than FAC (i.e., OBL, FACW) against the number of dominant species drier than FAC (i.e., FACU, UPL). A positive FAC-neutral test results when dominant species wetter than FAC are more prevalent than dominant species drier than FAC. A positive FAC-neutral test is a secondary indicator of wetland hydrology.

Plots, and consequently communities, that meet the three criteria of hydric soils, wetland hydrology, and hydrophytic vegetation are considered wetlands. Wetland boundaries were mapped where one or more of these criteria gave way to upland characteristics (i.e. no longer met the soils, hydrology, and hydrophytic vegetation requirements as previously described). Samples were also taken in nearby apparent upland areas to confirm that one or more of the criteria were not met in these locations.

Wetlands within the Study Area were classified according to the USFWS *Classification of Wetlands and Deepwater Habitats for the United States* (Cowardin, et al. 1979). Wetland classifications were based upon hydrophytic vegetation type and dominance found within the delineated wetland, and included the following classification types: palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO), palustrine open-water (POW), or a combination of these classifications (Cowardin, et al. 1979).



The wetland boundaries were flagged, and surveyed through the use of a Global Positioning System (GPS) receiver capable of sub-meter accuracy (Model R1, handheld, Trimble, Sunnyvale, California). The delineated wetlands were labeled (e.g., *Wetland HS-MA*, *Wetland HS-MB*, etc.), and correspond to the wetlands illustrated on the Delineated Resources map provided in Appendix A, as Figure 6A. The wetland boundaries were mapped as polygons and the wetland areal extents were calculated using the shapefile properties utility in ArcMap.

Wetland boundaries that extend beyond the Study Area were collected to the edge of the Study Area and categorized as "Open Ended" within the GPS data to indicate that the wetland continued.

# 2.3 Ohio Rapid Assessment Method

The regulation of wetlands under Section 401 and 404 of the Clean Water Act, requires the assessment of the function and quality of wetlands in order to determine the appropriate level of mitigation that should be required for the destruction, alteration, or degradation of a wetland. In accordance with Ohio EPA requirements (OAC Rule 3745-1-54), delineated wetlands within the Study Area were evaluated using the Ohio Rapid Assessment Method in an attempt to determine the ecological quality and the level of function of these wetlands (ORAM Version 5.0) (Mack 2001). The wetland value information, as determined by the ORAM, is provided to the Ohio EPA for the purposes of placing wetlands in the appropriate wetland Antidegradation Category as defined in Ohio's Wetland Antidegradation Rule (OAC Rule 3745-1-54). These ORAM scoring sheets (data forms) are populated based on a review of resource material (e.g. FEMA 100 year floodplain, known occurrence of state/federal threatened or endangered species, etc.), data obtained in the field, and the acreage as determined by delineation and mapping. Utilizing the ORAM wetland categories as defined by Ohio EPA, wetlands were provisionally categorized as low quality (Category 1) to high quality (Category 3). The score from the Quantitative Rating ranges from 0 to 100 and the scoring breakdown for wetland regulatory categories is as follows:

Category 1: 0 - 29.9 (Low Quality)

Category 1 or 2 Gray Zone: 30 - 34.9

Modified Category 2: 35 - 44.9

Category 2: 45-59.9 (Moderate Quality)

Category 2 or 3: 60 - 64.9

Category 3: 65 - 100 (High Quality)



The ORAMs were performed using detailed field evaluations and, for wetland features extending beyond the Study Area, were supplemented by aerial photographic interpretation to aid in approximate boundary determination and total area estimates. While the score and conclusions of the ORAM are designed such that they correlate well with more detailed measures of the biology of the wetlands, they are not considered absolutely definite. ORAM scores are considered preliminary until verified by the Ohio EPA. Refer to Appendix D for completed ORAM data forms.

The scoring sheets (ORAM Version 5.0 Field Form Quantitative Rating) for individual wetlands were completed and were the basis for the provisional wetland categorizations. The delineated wetlands and preliminary ORAM scores are illustrated in Appendix A, Figure 6B.

# 2.4 Field Methodology - Other Waters of the U.S.

The Study Area was screened for the presence of areas that meet the criteria for "other waters of the U.S." specified in the USACE's 1987 Manual. Other waters of the U.S. consist of ephemeral, intermittent, and perennial streams, as well as open water features, such as ponds. Drainage channels that exhibited defined "bed and bank" and an ordinary high water mark in the channel were identified and delineated as jurisdictional streams. Drainage channels that did not exhibit an ordinary high water mark and/or defined bed and bank were regarded as non-jurisdictional drainages. Delineated resources are illustrated in Appendix A, Figure 6A. Final jurisdictional determinations are made by the USACE; therefore, all determinations are preliminary until verified by the USACE (USACE/USEPA 2008).

Identified streams were evaluated utilizing Ohio EPA approved methods for stream habitat assessment which include the Qualitative Habitat Evaluation Index (QHEI) and/or the Headwater Habitat Evaluation Index (HHEI) assessment method (Ohio EPA 2006) (Ohio EPA 2012). These approved assessment methods provide an empirical, quantified evaluation of streams as required by the State of Ohio for permitting and mitigation purposes. These methods assess stream habitat to provide a qualitative index (score) to determine the level of compensatory mitigation that may be needed for impacts to waters of the U.S.

Use of the QHEI or HHEI assessment method is determined based on the size of the stream's drainage area and/or the stream's pool depths. Where coverage was available, the drainage area was calculated using automated basin characteristics from USGS StreamStats v 4.0: Ohio (USGS 2017).

Following Ohio EPA guidance, streams with a drainage area of greater than 1.0 square mile (2.6 square kilometers), or which have pools with maximum depths over 15.8 inches (40.0 centimeters), as determined by measuring pool depth within the stream, were evaluated using the QHEI. Data on these streams were



collected on the QHEI form provided by the Ohio EPA. The QHEI is composed of six principal metrics: substrate, instream cover, channel morphology, riparian zone and bank erosion, pool/glide and riffle-run quality, and map gradient. Each metric is scored separately and summed to obtain the total QHEI score. Using the scoring methods associated with these forms, the stream is placed into the following general narrative ranges, dependent on stream size; for smaller streams ( $\leq$ 20 sq mi): Excellent >70, Good 55-69, Fair 43-54, Poor 30-42, and Very Poor <30; for larger streams (>20 sq mi): Excellent >75, Good 60-74, Fair 45-59, Poor 30-44, and Very Poor <30.

The HHEI was utilized to score streams with a drainage area of less than 1.0 square mile (2.6 square kilometers). Data on these streams were collected on the HHEI forms, provided by the Ohio EPA. Observational data regarding the physical nature of the stream corridor including stream flow, riparian zone land use and buffer width, and channel modification were recorded. Measurements included bankfull width, maximum pool depth and substrate composition.

Using the scoring method associated with these forms, a Class I, II, or III was assigned to each stream (with Class I being the least protected and Class III being the most protected). Streams that exhibited a major change in morphology were scored at multiple representative locations. QHEI and HHEI scores are considered preliminary until verified by the Ohio EPA. Appendix E provides completed Ohio EPA Stream Data Sheets (QHEI and HHEI Data Forms). The delineated streams and QHEI and HHEI scores are illustrated in Appendix A, Figure 6B.

The Study Area was investigated for other waters of the U.S. that are considered "open water" by the USACE. By definition, open water was "an area that, during a year with normal patterns of precipitation, has standing or flowing water for sufficient duration to establish an ordinary high water mark, where aquatic vegetation is either non-emergent, sparse, or absent" (USACE n.d.). When identified, the derived open water (pond) boundaries were surveyed through the use of a GPS receiver capable of sub-meter accuracy (model GeoHX handheld, Trimble, Sunnyvale, California). Delineated open waters are labeled (e.g., WB-M1, WB-M2 etc.) and areas were mapped as polygons in GIS.

# 3.0 RESULTS

During the investigations identified within this Report, fourteen (14) wetlands, ten (10) streams, one (1) ditch, and six (6) open water resources (ponds) were identified and delineated within the Study Area (Tables 3.1, 3.2.1, and 3.2.2).



Table 3.1 Potential Wetlands and Other Waters of the U.S. Investigated and Jurisdictional Determinations within the Study Area

Resource ID	Field Survey Date	Location (Latitude, Longitude)	Provisional Determination	Acreage (Hectares) of Jurisdictional Waters in Study Area and Cowardin Classification <sup>1</sup>
HS-MA	05/22/18	40.62896, -83.78380	Waters of the U.S., Wetland	0.05 (0.02)/PEM
HS-MB	05/22/18	40.63755, -83.78418	Waters of the U.S., Wetland	1.13 (0.46)/PFO
HS-MC	05/22/18	40.63659, -83.78176	Waters of the U.S., Wetland	1.91 (0.77)/PSS, PFO
HS-MD	05/22/18	40.63673, -83.78030	Waters of the U.S., Wetland	0.14 (0.06)/PEM, PFO
HS-MQ	05/23/18	40.63099, -83.79334	Waters of the U.S., Wetland	0.43 (0.17)/PEM
HS-VA	05/23/18	40.62780, -83.81884	Waters of the U.S., Wetland	3.67 (1.49)/PEM
HS-VB	05/23/18	40.62732, -83.82878	Waters of the U.S., Wetland	0.41 (0.17)/PEM
HS-VC	05/23/18	40.63208, -83.83163	Waters of the U.S., Wetland	4.09 (1.66)/PFO
HS-VD	05/23/18	40.63222, -83.82940	Waters of the U.S., Wetland	0.03 (0.01)/PFO
HW-MH	09/14/18	40.65146, -83.79942	Waters of the U.S., Wetland	0.06 (0.02)/PEM
HW-ML	05/23/18	40.63765, -83.79774	Waters of the U.S., Wetland	0.44 (0.18)/PEM
HS-JA	09/14/18	40.62596, -83.80588	Waters of the U.S., Wetland	1.98 (0.80)/PEM
HS-JB	09/14/18	40.62716, -83.80368	Waters of the U.S., Wetland	1.81 (0.73)/PEM
HS-JC	09/14/18	40.62780, -83.806073	Waters of the U.S., Wetland	0.36 (0.15)/PEM
HS-M1 (Scioto River)	05/18/18	40.64344, -83.80440	Waters of the U.S., Stream	6.56 (2.65)/R5
HS-M2	05/18/18	40.66162, -83.79594	Waters of the U.S., Stream	<0.01(<0.01)/R4
HS-M3	05/18/18	40.66104, -83.79662	Waters of the U.S., Stream	<0.01 (<0.01)/R4



Table 3.1 Potential Wetlands and Other Waters of the U.S. Investigated and Jurisdictional Determinations within the Study Area

Resource ID	Field Survey Date	Location (Latitude, Longitude)	Provisional Determination	Acreage (Hectares) of Jurisdictional Waters in Study Area and Cowardin Classification <sup>1</sup>
HS-M4	05/18/18	40.65976, -83.79786	Waters of the U.S., Stream	<0.01 (<0.01)/R5
HS-M6 (Elder Creek)	05/18/18	40.64109, -83.83490	Waters of the U.S., Stream	0.18 (0.07)/R5
HS-M9 (Cottonwood Ditch)	06/12/18	40.68936, -83.79707	Waters of the U.S., Stream	0.45 (0.18)/R5
HS-M10	06/14/18	40.66668, -83.84106	Waters of the U.S., Stream	0.10 (0.04)/R5
HS-M11	06/14/18	40.65213, -83.84656	Waters of the U.S., Stream	<0.01 (<0.01)/R5
HW-M9 (Twin Branches)	06/14/18	40.67457, -83.80498	Waters of the U.S., Stream	0.86 (0.35)/R5
HW-M10	05/16/18	40.65453, -83.82305	Waters of the U.S., Stream	0.33 (0.13)/R5
Ditch M1	5/16/18	40.65988,- 83.82309	Waters of the U.S., Ditch	0.15 (0.06)/N/A
HS-WB-M1	5/22/18	40.63792, -83.78553	Waters of the U.S., Waterbody	1.91 (0.77)/POW
HS-WB-M2	5/22/18	40.63832, -83.78503	Waters of the U.S., Waterbody	0.53 (0.21)/POW
HS-WB-M3	5/22/18	40.63851, -83.78486	Waters of the U.S., Waterbody	0.35 (0.14)/POW
HS-WB-M4	5/22/18	40.63875, -83.78467	Waters of the U.S., Waterbody	0.52 (0.21)/POW
HS-WB-M5	5/16/18	40.66009, -83.81637	Waters of the U.S., Waterbody	0.02 (0.01)/POW
HS-WB-M6	6/14/18	40.63485, -83.78782	Waters of the U.S., Waterbody	0.25 (0.10)/POW
<sup>1</sup> Cowardin Classific PEM = Palustrine I PSS = Palustrine S PFO = Palustrine F	Emergent crub/Shrub		POW = Palustrine Open Work   R4 = Intermittent Stream   R5 = Perennial Stream   R6 = Ephemeral Stream	ater



# 3.1 Background Resources

#### 3.1.1 USGS Topographic Map

Based on desktop review, the Study Area contains no wetland features according to the Alger and Roundhead, Ohio (1988) USGS 7.5 minute series topographic quadrangles (USGS 1994) (Appendix A, Figure 1). The majority of the terrain is almost completely level, with the exception of stream channels. Elevation ranges from approximately 961 feet (290 meters) to 1011 feet (308 meters) above mean sea level.

#### **3.1.2** Soils

According to the soil dataset acquired from the NRCS Web Soil Survey for Hardin County, Ohio, the Study Area was underlain by twenty (20) different soil types; ten (10) soil types are mapped as non-hydric and ten (10) soil types are mapped as hydric (USDA 2018) (Table 3.1.2 and Appendix A, Figure 2).

Table 3.1.2 Soils Mapped within the Study Area

Soil Code	Soil Name	Percent (%) in Study Area	Hydric Status
Ro	Roundhead muck	25.77%	Yes
Mc	McGuffey muck	19.42%	Yes
Ln	Linwood muck	15.50%	Yes
PkA	Pewamo silty clay loam, 0 to 1 percent slopes	14.04%	Yes
Po	Pewamo variant muck	2.47%	Yes
Co	Colwood loam	2.17%	Yes
Ot	Olentangy silt loam	1.21%	Yes
Mf	Milford silty clay loam, 0 to 2 percent slopes	0.24%	Yes
Ca	Carlisle muck, Central Ohio clayey till plain, drained, 0 to 2 percent slopes	0.10%	Yes
So	Sloan silt loam, frequently flooded	0.04%	Yes
Blg1B1	Blount silt loam, ground moraine, 2 to 4 percent slopes	10.02%	No
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	4.61%	No
Ble1B1	Blount silt loam, end moraine, 2 to 4 percent slopes	1.37%	No
Gwd5C2	Glynwood clay loam, 6 to 12 percent slopes, eroded	1.22%	No
Gwg1B1	Glynwood silt loam, ground moraine, 2 to 6 percent slopes	0.65%	No
Gwg5C2	Glynwood clay loam, ground moraine, 6 to 12 percent slopes, eroded	0.43%	No
Gwe1B1	Glynwood silt loam, end moraine, 2 to 6 percent slopes	0.36%	No



Table 3.1.2 Soils Mapped within the Study Area

Soil Code	Soil Name	Percent (%) in Study Area	Hydric Status
Gwg5B2	Glynwood clay loam, ground moraine, 2 to 6 percent slopes, eroded	0.25%	No
Ble1A1	Blount silt loam, end moraine, 0 to 2 percent slopes	0.13%	No
MrD2	Morley clay loam, 12 to 18 percent slopes, eroded	0.00%	No

#### 3.1.3 National Wetlands Inventory

According to the USFWS NWI (USFWS 2018) three (3) freshwater emergent wetlands, three (3) freshwater forested wetlands, and three (3) freshwater ponds are located within Study Area. Two (2) emergent wetlands identified on the NWI maps were not found in the field during the reconnaissance (Appendix A, Figure 3).

#### 3.1.4 National Hydrography Database

The USGS Natural Hydrography Dataset (NHD) (USGS 2018) Downloadable Data Collection from The National Map (TNM) is a comprehensive set of digital spatial data that encodes information about naturally occurring and constructed bodies of surface water (lakes, ponds, and reservoirs), paths through which water flows (canals, ditches, streams, and rivers), and related entities such as point features (springs, wells, stream gages, and dams). Eight (8) streams were identified in the NHD, within the Study Area (Appendix A, Figure 3).

#### 3.1.5 Ohio EPA Stream Eligibility for Nationwide Permit Program

Ohio EPA, as part of Ohio's 401-WQC process, has determined which HUC12 watersheds within the state have streams eligible for coverage under Nationwide Permits. There are three categories identified within Ohio: eligible, ineligible, and possibly eligible, with additional field screening required. All streams identified as part of this Project are located within "Eligible" areas according to Ohio EPA's Stream Eligibility for Nationwide Permit Program (Ohio EPA 2017) and are therefore eligible for coverage under the 401-WQC for Nationwide Permits (Appendix A, Figure 4).

#### 3.1.6 FEMA Flood Hazard

According to the FEMA Flood Hazard mapping, a small portion of the northern Project boundary and a small portion of one (1) of the most eastern parcels is located within a FEMA Flood Zone A (FEMA 2018) (Appendix A, Figure 5).



#### 3.1.7 Water Quality Standards

Four (4) streams within the Study Area have a Designated Use from Ohio EPA according to OAC Chapter 3745-1 Water Quality Standards (Ohio EPA 2017a). Cottonwood Ditch is listed as Modified Warmwater Habitat (MWH), whereas Elder Creek, Twin Branches, and Scioto River are listed as Warmwater Habitat (WWH). All four (4) designations are based on the results of a biological field assessment performed by the Ohio EPA. MWH habitat streams, according to OAC Chapter 3745-1 Water Quality Standards, are incapable of supporting and maintaining a balanced community of warmwater aquatic organisms because of extensive and irretrievable modifications to the physical habitat of the streams. WWH habitat streams have been determined, by OAC Chapter 3745-1 Water Quality Standards, to be capable of supporting and maintaining a balanced community of warmwater aquatic organisms. WWH is the most common designation assigned to streams within Ohio.

# 3.2 Field Delineations

TRC performed wetland and other waters of the U.S. identification and delineation on May 16<sup>th</sup>, 18<sup>th</sup>, 22<sup>nd</sup>, 23<sup>th</sup>, 29<sup>th</sup>, June 12<sup>th</sup>, 13<sup>th</sup>, 14<sup>th</sup>, and September 14<sup>th</sup> and 17<sup>th</sup>, 2018. Weather conditions were seasonably warm, ranging between 55 degrees to 91 degrees Fahrenheit (13 degrees to 33 Celsius) with a mix of rain, and clear, and sunny skies. Native herbaceous vegetation and non-native cultivated crops were observed within the Study Area. The presence of hydrologic and hydric soil indicators, as well as identifiable plant species within the wetland areas, allowed for positive wetland determinations. The USACE maintains the final authority that determines jurisdiction; therefore, statements about jurisdiction within this Report are preliminary and subject to final determination by the USACE and Ohio EPA.

#### 3.2.1 Wetlands

During the course of this investigation fourteen (14) wetlands were identified and delineated within the Study Area. Each wetland is listed in Table 3.2.1, described below and shown in Appendix A on Figures 6A and 6B. The completed USACE Wetland Determination Data Forms-Midwest Region are presented in Appendix C.

Table 3.2.1 Wetlands Delineated within the Study Area

Wetland ID	Vegetation Class <sup>1</sup>	Extends Offsite?	Acres (Hectares) <sup>2</sup>	ORAM Score <sup>3</sup>	ORAM Category <sup>3</sup>	Jurisdictional Status <sup>4</sup>
HS-MA	PEM	No	0.05 (0.02)	9	1	Jurisdictional
HS-MB	PFO	No	1.13 (0.46)	37	Modified 2	Jurisdictional
HS-MC	PSS/PFO	No	1.91 (0.77)	55	2	Jurisdictional



Table 3.2.1 Wetlands Delineated within the Study Area

Wetland ID	Vegetation Class <sup>1</sup>	Extends Offsite?	Acres (Hectares) <sup>2</sup>	ORAM Score <sup>3</sup>	ORAM Category <sup>3</sup>	Jurisdictional Status <sup>4</sup>
HS-MD	PEM/PFO	No	0.14 (0.06)	31	1 or 2 Gray Zone	Jurisdictional
HS-MQ	PEM	No	0.43 (0.17)	13	1	Jurisdictional
HS-VA	PEM	Yes	3.67 (1.49)	24.5	1	Jurisdictional
HS-VB	PEM	No	0.41 (0.17)	37	Modified 2	Jurisdictional
HS-VC	PFO	No	4.09 (1.66)	40.5	Modified 2	Jurisdictional
HS-VD	PFO	No	0.03 (0.01)	28.5	1	Jurisdictional
HW-MH	PEM	Yes	0.06 (0.02)	20	1	Jurisdictional
HW-ML	PEM	Yes	0.44 (0.18)	22	1	Jurisdictional
HS-JA	PEM	No	1.98 (0.80)	14	1	Jurisdictional
HS-JB	PEM	No	1.81 (0.73)	16	1	Jurisdictional
HS-JC	PEM	No	0.36 (0.15)	11	1	Jurisdictional

<sup>1</sup> PEM = palustrine emergent

Much of the Study Area is maintained active, rotational agriculture (primarily corn and soy beans). However, a total of fourteen (14) wetlands were identified throughout the Study Area. These wetlands mostly occurred within in the tree-lines, grassed swales, and forested portions of the Study Area. Many of these wetlands occur within wetland forest complexes and mosaics. Historic and recent tiling is prevalent within the Study Area for the purpose of creating useable farmland. All wetlands within the Study Area are potentially jurisdictional as they display a physical connection or adjacency to a jurisdictional stream.

#### Wetland HS-MA

Wetland HS-MA is a 0.05 acre (0.02 hectare) PEM wetland dominated by blue joint grass (*Calamagrostis canadensis*). The wetland is preliminarily assigned an ORAM score of 9, corresponding to a Category 1 wetland. The determination of Category 1 was based on the wetland's limited size, very narrow buffer, high intensity of surrounding land use, and disturbances to the hydrology, substrate, and habitat of the Wetland HS-MA (i.e. tile, sedimentation, farming, and nutrient enrichment).

#### Wetland HS-MB

Wetland HS-MB is a 1.13 acre (0.46 hectares) PFO wetland dominated by eastern cottonwood (*Populus deltoides*), shagbark hickory (*Carya ovata*), and northern spicebush (*Lindera benzoin*) in tree stratum. The sapling/shrub stratum is dominated by northern spicebush, and the herb stratum is dominated by hybrid



 $PSS = palustrine \ scrub/shrub$ 

PFO = palustrine forested

<sup>2</sup> Represents delineated acreage within Study Area

<sup>3</sup> Preliminarily assigned. Not considered final until verified by Ohio EPA

<sup>4</sup> Preliminarily assigned. Not considered final until verified by the USACE

cattail (*Typha x glauca*) and common duckweed (*Lemna minor*). The wetland is preliminarily assigned an ORAM score of 37, corresponding to a Modified Category 2 wetland. The determination of a Modified Category 2 wetland was based on average buffer width, duration of inundation/saturation and habitat development. The score was limited by disturbances to the hydrology, substrate, and habitat (i.e. roadbed/railroad track, dredging, and filling/grading, sedimentation, clearcutting, selective cutting, nutrient enrichment).

#### Wetland HS-MC

Wetland HS-MC is a 1.91 acre (0.77 hectare) PSS/PFO wetland dominated by silver maple (*Acer saccharinum*) in the tree stratum, green ash (*Fraxinus pennsylvanica*) in the sampling/shrub stratum, and fringed sedge (*Carex crinita*) in the herb stratum. The wetland is preliminarily assigned an ORAM score of 55, corresponding to a Category 2 wetland. The determination of a Category 2 wetland was based on good habitat, medium average buffer width, mature forested wetland component, and moderately high horizontal interspersion. The score was limited by the upland buffers, surrounding land use and size of HS-MC (i.e. narrow buffers and row cropping).

#### Wetland HS-MD

Wetland HS-MD is a 0.14 acre (0.06 hectares) PEM/PFO wetland, the PEM portion is dominated by fringed sedge and reed canary grass (*Phalaris arundinacea*), and the PFO portion is dominated by northern spicebush, green ash, Eastern hop-hornbeam (*Ostrya virginiana*), fringed sedge, and Gray's sedge (*Carex grayi*). The wetland is preliminarily assigned an ORAM score of 31, corresponding to a Category 1 or 2 Gray Zone wetland. The determination of a Category 1 or 2 Gray Zone wetland was based on moderately good habitat development, moderate horizontal interspersion, and microtopography (i.e. coarse woody debris, and amphibian breeding pools). The score was limited by the size and disturbances to the hydrology and substrate of Wetland HS-MD (i.e. ditch, filling/grading, road bed/RR track, sedimentation, mowing, clearcutting).

#### Wetland HS-MQ

Wetland HS-MQ is a 0.43 acre (0.17 hectare) PEM wetland with a small amount of great ragweed (*Ambrosia trifida*). The hydrophytic vegetation criterion is assumed met as Wetland HS-MQ has a sparsely vegetated concave surface. The wetland is preliminarily assigned an ORAM score of 13, corresponding to a Category 1 wetland. The determination of a Category 1 wetland was based on habitat and hydrology (i.e. groundwater, precipitation, seasonal/intermittent surface water, and perennial surface water). The score was limited by the very narrow buffer widths, high intensity of surround land use, poor habitat development,



lack of horizontal interspersion, and disturbances to the hydrology, substrate, and habitat of HS-MQ (i.e. tile, stormwater input, filling/grading, clearcutting, sedimentation, and farming).

#### Wetland HS-VA

Wetland HS-VA is a PEM wetland with 3.67 acres (1.48 hectares) delineated within the Study Area. Wetland HS-VA is dominated by reed canary grass and lesser poverty rush (*Juncus tenuis*). The wetland is preliminarily assigned an ORAM score of 24.5, corresponding to a Category 1 wetland. The determination of a Category 1 wetland was based on narrow buffer width, high intensity of surrounding land use, poor habitat development, moderately low horizontal interspersion, and moderate coverage of invasive plants.

#### Wetland HS-VB

Wetland HS-VB is a 0.41 acre (0.17 hectare) PEM wetland dominated by lesser poverty rush. The wetland is preliminarily assigned an ORAM score of 37, corresponding to a Modified Category 2 wetland. The determination of a Modified Category 2 wetland was based on size, sources of water (precipitation and seasonal/intermittent surface water), and duration of inundation/saturation. The score was limited by the narrow buffer width, high intensity of surrounding landuse, poor to fair habitat development, and disturbance to hydrology, substrate, and habitat (i.e. tile, farming, nutrient enrichment, sedimentation).

#### Wetland HS-VC

Wetland HS-VC is a 4.09 acre (1.66 hectares) PFO wetland dominated by black walnut (*Juglans nigra*) and red maple (*Acer rubrum*) in the tree stratum, red maple and northern spicebush in the sapling/shrub stratum, stinging nettle (*Urtica dioica*) and fowl manna grass (*Glyceria striata*) in the herb stratum, and Virginia-creeper (*Parthenocissus quinquefolia*) in the woody vine stratum. The wetland is preliminarily assigned an ORAM score of 40.5, corresponding to a Modified Category 2 wetland. The determination of a Modified Category 2 wetland was based on medium buffer width, low intensity of surrounding land use, moderately good habitat development, sparse coverage of invasive plants, and microtopography (coarse woody debris, amphibian breeding pools). The score was limited by the shallow maximum water depth, and disturbances to hydrology, substrate, and habitat (i.e. tile, farming, selective cutting, and nutrient enrichment).

#### Wetland HS-VD

Wetland HS-VD is a 0.03 acre (0.01 hectare) PFO wetland dominated by black tupelo (*Nyssa sylvatica*), red maple, and black walnut in the tree stratum, northern spicebush and silky dogwood (*Cornus amomum*) in the sapling/shrub stratum, and garlic-mustard (*Alliaria petiolata*), curly blue grass (*Poa pratensis*), and beaked grooveburr (*Agrimonia rostellata*). The wetland is preliminarily assigned an ORAM score of 28.5, corresponding to a Category 1 wetland. The determination of a Category 1 wetland was based on narrow



buffer width, size, source of water, low horizontal interspersion, poor to fair habitat development, and disturbance to hydrology, substrate, and habitat (i.e. tile, selective cutting, farming, and nutrient enrichment).

#### Wetland HW-MH

Wetland HW-MH is a PEM wetland with a 0.06 acre (0.02 hectare) portion delineated within the Study Area. Wetland HW-MH is dominated by reed canary grass and hybrid cattail. This area is located within a drainage ditch that receives hydrology from adjacent field tiles. The water was stagnant at the time of the investigation, allowing for wetland vegetation to revert and dominate. The wetland is preliminarily assigned an ORAM score of 20, corresponding to a Category 1 wetland. The score was limited by intensity of surrounding land use, very narrow buffer width, poor habitat development, moderate coverage of invasive plants, and disturbances to hydrology, substrate, and habitat (i.e. nutrient enrichment, sedimentation, farming, dredging, tiling, and filling/grading, etc.).

#### Wetland HW-ML

Wetland HW-ML is a PEM wetland with a 0.44 acre (0.18 hectare) portion delineated within the Study Area. Wetland HW-ML is dominated by American burr-reed (*Sparganium americanum*). The wetland is preliminarily assigned an ORAM score of 22, corresponding to a Category 1 wetland. The determination of a Category 1 wetland was based on the very narrow buffer width, high intensity of surrounding land use, moderate coverage of invasive plants, and disturbances to hydrology, substrate, and habitat (i.e. ditch, filling/grading, dredging, clearcutting, sedimentation, and nutrient enrichment).

#### Wetland HS-JA

Wetland HS-JA is a 1.98 acre (0.80 hectare) PEM wetland delineated within the Study Area. Wetland HS-JA is dominated by fall panicgrass (*Panicum dichotomiflorum*) and false pimpernel (*Lindernia dubia*). The wetland is preliminarily assigned an ORAM score of 14, corresponding to a Category 1 wetland. The determination of a Category 1 wetland was based on the very narrow buffer width, high intensity of surrounding land use, and disturbances to hydrology, substrate, and habitat (i.e. filling/grading, farming, nutrient enrichment).

#### Wetland HS-JB

Wetland HS-MB is a 1.81 acre (0.73 hectare) PEM wetland delineated within the Study Area. Wetland HS-MB is dominated by yellow nutsedge (*Cyperus esculentus*). The wetland is preliminarily assigned an ORAM score of 16, corresponding to a Category 1 wetland. The determination of a Category 1 wetland



was based on the very narrow buffer width, high intensity of surrounding land use, and disturbances to hydrology, substrate, and habitat (i.e. tile, farming, and nutrient enrichment).

#### Wetland HS-JC

Wetland HS-JC is a 0.36 acre (0.15 hectare) PEM wetland delineated within the Study Area. Wetland HS-JC is located within a cropped field and therefore lacks a natural plant community and because of this is dominated by soybean (*Glycine max*). The wetland is preliminarily assigned an ORAM score of 11, corresponding to a Category 1 wetland. The determination of a Category 1 wetland was based on the very narrow buffer width, high intensity of surrounding land use, and disturbances to hydrology, substrate, and habitat (i.e. tile, farming, and nutrient enrichment).

#### 3.2.2 Other Waters of the U.S.

#### A. Streams

Ten (10) streams with defined bed and bank and ordinary high water mark were identified within the Study Area. Delineated streams within the Study Area are within the Upper Scioto River watershed (8-Digit HUC: 05060001) (USGS/NRCS, Watershed Boundary Dataset 2013). The streams are listed in Table 3.2.2, described below and shown in Appendix A on Figures 6A and 6B. The streams were channelized agricultural drainages and received direct drainage from field drain tile sources which has influenced channel morphology, increased embeddedness, reduced sinuosity and flow regime, and affected water quality of the streams. Therefore, the streams are recorded as "Modified" channels. Table 3.2.2. below, provides flow regime, drainage area, preliminary HHEI and QHEI scores, and HHEI class and QHEI ratings for streams identified in the Study Area. All HHEI and QHEI scores are considered preliminary until verified by OEPA. Completed Ohio EPA stream assessment forms are provided in Appendix E. In addition, one (1) ditch, Ditch M1 was identified within the Study Area. All jurisdiction determinations are preliminary until the USACE makes the final determination.

Table 3.2.2 Other Waters of the U.S. Delineated within the Study Area

Stream ID	Flow Regime	Length <sup>1</sup> (ft; m)	Drainage Area (sq mi; sq km) <sup>2</sup>	HHEI (H) /QHEI (Q) Score <sup>3,4</sup>	HHEI Class/ QHEI Rating
HS-M1 (Scioto River)	Perennial	14292.75 (5784.07)	55.00 (142.00)	23 (Q)	Very Poor
HS-M2	Intermittent	25.27 (7.70)	< 0.01 (0.03)	20 (H)	Modified Class I
HS-M3	Intermittent	17.03 (5.19)	<0.01 (0.03)	17 (H)	Modified Class I



Table 3.2.2 Other Waters of the U.S. Delineated within the Study Area

Stream ID	Flow Regime	Length <sup>1</sup> (ft; m)	Drainage Area (sq mi; sq km) <sup>2</sup>	HHEI (H) /QHEI (Q) Score <sup>3, 4</sup>	HHEI Class/ QHEI Rating
HS-M4	Perennial	53.30 (16.25)	3.41 (8.83)	25 (Q)	Very Poor
HS-M6 (Elder Creek)	Perennial	660.41 (267.26)	6.39 (16.55)	53.5 (Q)	Fair
HS-M9 (Cottonwood Ditch)	Perennial	2432.07 (984.22)	2.20 (6.70)	25 (Q)	Very Poor
HS-M10	Perennial	750.80 (228.84)	0.50 (1.29)	58 (H)	Modified Class II
HS-M11	Perennial	1.95 (0.79)	1.10 (2.85)	47 (Q)	Fair
HW-M9 (Twin Branches)	Perennial	7456.56 (3017.56)	1.97 (5.10)	23 (Q)	Very Poor
HW-M10	Perennial	2906.35 (1176.16)	1.67 (4.32)	19 (Q)	Very Poor
Ditch M1	N/A	1307.61 (529.17)	N/A	N/A	N/A

<sup>1</sup> Represents delineated length, in feet, and meters within Study Area

#### Stream HS-M1

Stream HS-M1 (Scioto River) is a perennial stream with a drainage area of approximately 55.00 square miles (142.00 square kilometers). The stream flows west to east through the Study Area for approximately 14292.75 feet (5784.07 meters). Stream HS-M1 (Scioto River) is preliminarily determined to be a jurisdictional water of the U.S. The QHEI habitat assessment method was used to evaluate Stream HS-M1. It was determined that dominant substrates for Stream HS-M1 are comprised of silt and muck; instream cover (i.e. shallows and pools >70 centimeters) is nearly absent; channel sinuosity is nonexistent, development is poor; channelization is recent; and stability is low; bank erosion is moderate; riparian width is very narrow; floodplain quality is row crop; maximum pool depth is less than 2.30 feet (0.7 meter); and bankfull width is 20.0 feet (6.1 meters). Scioto River (Stream HS-M1) has an Ohio EPA designated use of WWH. This stream has been preliminarily assigned a QHEI score of 23; therefore, categorized as in the very poor QHEI narrative range.

#### Stream HS-M2



<sup>2</sup> Where within coverage, drainage area was calculated using automated basin characteristics from USGS StreamStats v 4.0: Ohio (USGS 2017).

<sup>3</sup> Primary Headwater Habitat Evaluation Index (HHEI), for streams with drainage areas of less than 1.0 square mile and a maximum pool depth of less than 40 centimeters.

<sup>4</sup> Qualitative Habitat Evaluation Index (QHEI), for larger streams with a drainage area greater than 1.0 square mile.

Stream HS-M2 is a modified intermittent stream with a drainage area of less than 0.01 square mile (<0.03 square kilometer). The stream flows north to south through the Study Area for approximately 25.27 feet (7.70 meters). Stream HS-M2 drains to HS-M1 (Scioto River) and, as such, Stream HS-M2 is preliminarily determined to be jurisdictional. The HHEI habitat assessment method was used to evaluate Stream HS-M2. It was determined that dominant substrates for Stream HS-M2 are comprised of muck and silt, the maximum pool depth is 2.00 inches (5.08 centimeters), and the bankfull width is 2.00 feet (0.61 meter). Consequently, this stream has been preliminarily assigned an HHEI score of 20; therefore, categorized as a Modified Class I Primary Headwater Habitat (PHWH).

#### Stream HS-M3

Stream HS-M3 is a modified intermittent stream within the Study Area with a drainage area of less than 0.01 square mile (<0.03 square kilometer). The stream flows south to north through the Study Area for approximately 17.03 feet (5.19 meters). Stream HS-M3 drains to HS-M1 (Scioto River) and, as such Stream HS-M3 is preliminary determined to be jurisdictional. The HHEI habitat assessment method was used to evaluate Stream HS-M3. It was determined that dominant substrates for Stream HS-M3 are comprised of muck and silt, the maximum pool depth is 2.00 inches (5.08 centimeters), and the bankfull width is 1.50 feet (0.46 meter). This stream has been preliminarily assigned an HHEI score of 17; therefore, categorized as a Modified Class I PHWH.

#### Stream HS-M4

Stream HS-M4 is a perennial stream within the Study Area with a drainage area of 3.41 square miles (8.83 square kilometers). The stream flows west to east through the Study Area for approximately 53.30 feet (16.25 meters). Stream HS-M4 drains to HS-M1 (Scioto River) and, as such Stream HS-M4 is preliminary determined to be jurisdictional. The QHEI habitat assessment method was used to evaluate Stream HS-M4. It was determined that dominant substrates for Stream HS-M4 are comprised of gravel and muck; instream cover (i.e. shallows) is nearly absent; channel sinuosity is nonexistent; development is poor; channelization is recovering; and stability is low; bank erosion is moderate; riparian width is very narrow; floodplain quality is row crop; maximum pool depth is less than 0.66 feet (0.20 meter); and bankfull width is 5.00 feet (1.52 meters). This stream has been preliminarily assigned a QHEI score of 25; therefore, categorized as in the very poor QHEI narrative range.

#### Stream HS-M6 (Elder Creek)

Stream HS-M6 is a perennial stream within the Study Area with a drainage area of 6.39 square miles (16.55 square kilometers). The stream flows north through the Study Area for approximately 660.41 feet (267.26



meters). Stream HS-M6 (Elder Creek) is preliminary determined to be jurisdictional. The QHEI habitat assessment method was used to evaluate Stream HS-M6. It was determined that dominant substrates for Stream HS-M6 are comprised of gravel and sand; instream cover (i.e. undercut banks, shallows, boulders, oxbows, backwaters, aquatic macrophytes) is moderate; channel sinuosity is nonexistent; development is fair; channelization is recovering; and stability is low to moderate; bank erosion is moderate; riparian width is very narrow; floodplain quality row crop; maximum pool depth is less than 2.30 feet (0.70 meter); and bankfull width is 12.00 feet (3.66 meters). Elder Creek (Stream HS-M6) has an Ohio EPA designated use of WWH. This stream has been preliminarily assigned a QHEI score of 53.5; therefore, categorized as in the fair QHEI narrative range.

#### Stream HS-M9 (Cottonwood Ditch)

Stream HS-M9 (Cottonwood Ditch) is a perennial stream within the Study Area with a drainage area of 2.20 square mile (6.70 square kilometer). The stream flows southwest through the Study Area for approximately 2432.07 feet (984.22 meters). Stream HS-M9 (Cottonwood Ditch) is preliminary determined to be jurisdictional. The QHEI habitat assessment method was used to evaluate Stream HS-M9. It was determined that dominant substrates for Stream HS-M9 are comprised of sand and silt; instream cover (i.e. overhanging vegetation, shallows, and pools >70 cm) is nearly absent; channel sinuosity is nonexistent; development is poor; channelization is recent; and stability is low; bank erosion is moderate; riparian width is nonexistent; floodplain quality is row crop; maximum pool depth is less than 27.0 inches (0.70 meter); and bankfull width is 8.00 feet (2.40 meters). Cottonwood Ditch (Stream HS-M9) has an Ohio EPA designated use of MWH. This stream has been preliminarily assigned a QHEI score of 25; therefore, categorized as in the very poor QHEI narrative range.

#### Stream HS-M10

Stream HS-M10 is a modified perennial stream originating within the Study Area with a drainage area of less than 0.50 square mile (1.29 square kilometer). The stream flows east through the Study Area for approximately 750.80 feet (228.84 meters). Stream HS-M10 is preliminary determined to be jurisdictional. The HHEI assessment method was used to evaluate Stream HS-M10. It was determined that dominant substrates for Stream HS-M10 are comprised of sand and silt, the maximum pool depth is 8.00 inches (20.32 centimeters), and the bankfull width is 6.00 feet (1.82 meters). This stream has been preliminarily assigned an HHEI score of 58; therefore, categorized as a Modified Class II PHWH.

#### Stream HS-M11

Stream HS-M11 is a modified perennial stream originating within the Study Area with a drainage area of less than 1.1 square mile (2.85 square kilometers). The stream flows west through the Study Area for



approximately 1.95 feet (0.79 meters). Stream HS-M11 is preliminary determined to be jurisdictional. The QHEI habitat assessment method was used to evaluate Stream HS-M11. It was determined that dominant substrates for Stream HS-M11 are comprised of gravel and silt; instream cover (i.e. undercut banks, overhanging vegetation, shallows, pools, aquatic macrophytes, and logs or woody debris) is moderate; channel sinuosity is low; development is fair; channelization is recovering, and stability is low to moderate; bank erosion is moderate; riparian width is very narrow; floodplain quality is open pasture (row crop); maximum pool depths are 0.66 to 1.31 feet (0.2 to 0.4 meters) and bankfull width is less than 5.00 feet (1.52 meters). This stream has been preliminarily assigned a QHEI score of 47; therefore, categorized as in the fair QHEI narrative range.

#### Stream HW-M9 (Twin Branches)

Stream HW-M9 (Twin Branches) is a perennial stream with a drainage area of 1.97 square miles (5.10 square kilometers). The stream flows west through the Study Area for approximately 7456.56 feet (3017.56 meters). Stream HW-M9 is preliminarily determined to be jurisdictional. The QHEI habitat assessment method was used to evaluate Stream HW-M9. It was determined that dominant substrates for Stream HW-M9 are comprised of silt; instream cover (i.e. overhanging vegetation, shallows, and aquatic macrophytes,) is nearly absent; channel sinuosity is nonexistent, development is poor, channelization is recent, and stability is moderate; bank erosion is little; riparian width is nonexistent; floodplain quality is row crop and urban or industrial; maximum pool depths are less than 0.66 feet (0.20 meter) and bankfull width of 5.00 feet (1.52 meters). Twin Branches (Stream HW-M9) has an Ohio EPA designated use of WWH. Macroinvertebrates were not sampled or observed during the time of delineation. This stream has been preliminarily assigned a QHEI score of 23; therefore, categorized as in the very poor QHEI narrative range.

#### Stream HW-M10

Stream HW-M10 is a perennial stream originating within the Study Area with a drainage area of 1.67 square mile (4.32 square kilometers). The stream flows west through the Study Area for approximately 2906.35 feet (1176.16 meters). Stream HW-M10 is preliminarily determined to be jurisdictional. The QHEI habitat assessment method was used to evaluate Stream HW-M10. It was determined that dominant substrates for Stream HW-M10 are comprised of silt; instream cover (i.e. overhanging vegetation and aquatic macrophytes) is nearly absent; channel sinuosity is none; development is poor; channelization is recent; and stability is low; bank erosion is moderate; riparian width is nonexistent; floodplain quality is row crop; maximum pool depths are less than 0.66 feet (<0.20 meter) and bankfull width is less than 5.0 feet (1.52 meters). Macroinvertebrates were not sampled or observed during the time of delineation. This stream has



been preliminarily assigned a QHEI score of 19; therefore, categorized as in the very poor QHEI narrative range.

#### **B.** Open Waters (Ponds)

The Study Area was investigated for areas that are considered "open water" by the USACE. Field investigations identified six (6) potentially jurisdictional open water resources (ponds) within the Study Area. All six (6) of these pond appear to be man-made. Several were created by drainage tile pump stations, others were created as stormwater retention basins, residential ponds, or fish hatchery ponds.

Table 3.2.3 Waterbodies Delineated within the Study Area

Waterbody ID	Acres (Hectares)
HS-WB-M1	1.91 (0.77)
HS-WB-M2	0.53 (0.21)
HS-WB-M3	0.35 (0.14)
HS-WB-M4	0.52 (0.21)
HS-WB-M5	0.02 (0.01)
HS-WB-M6	0.25 (0.10)



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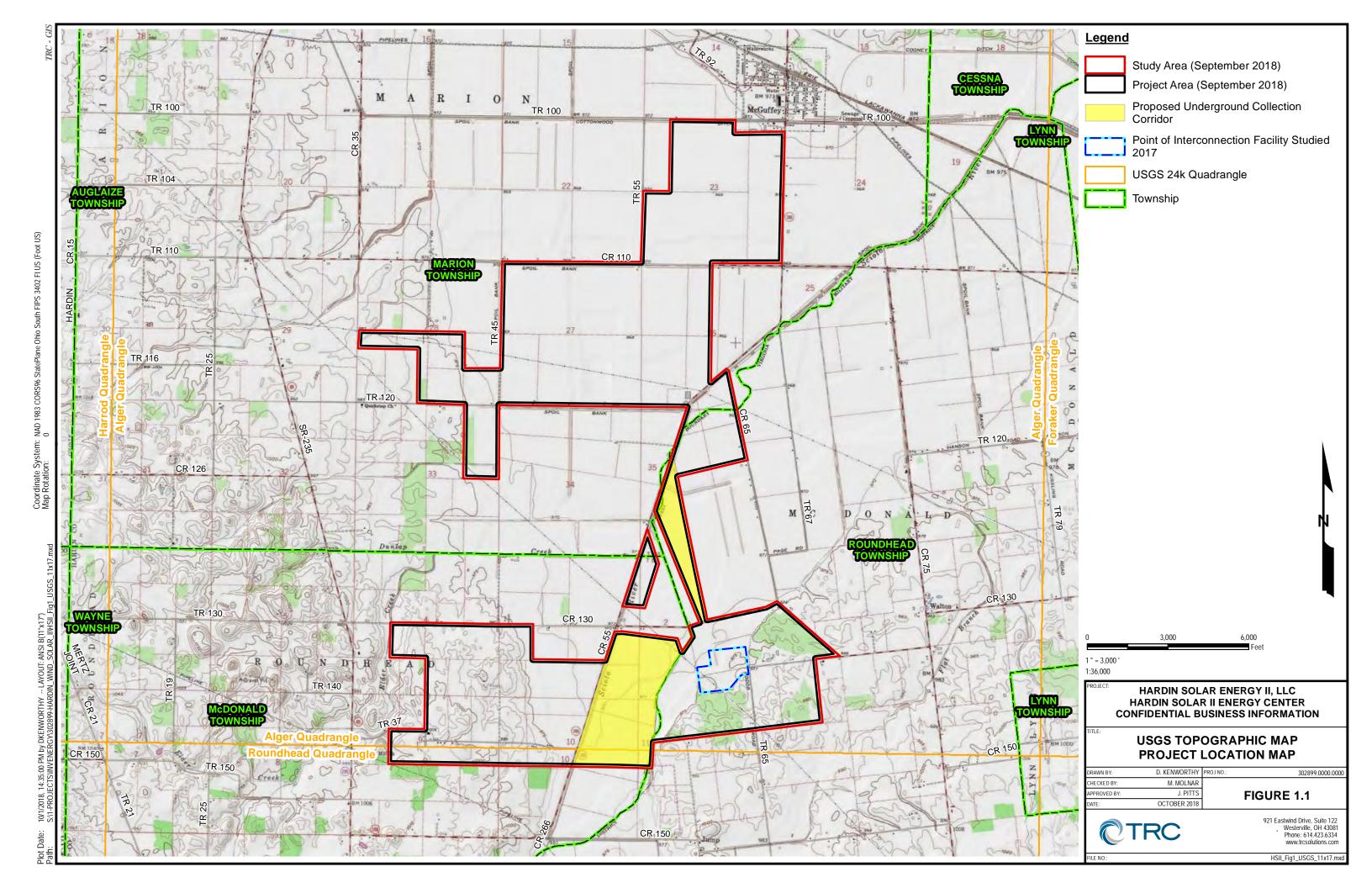
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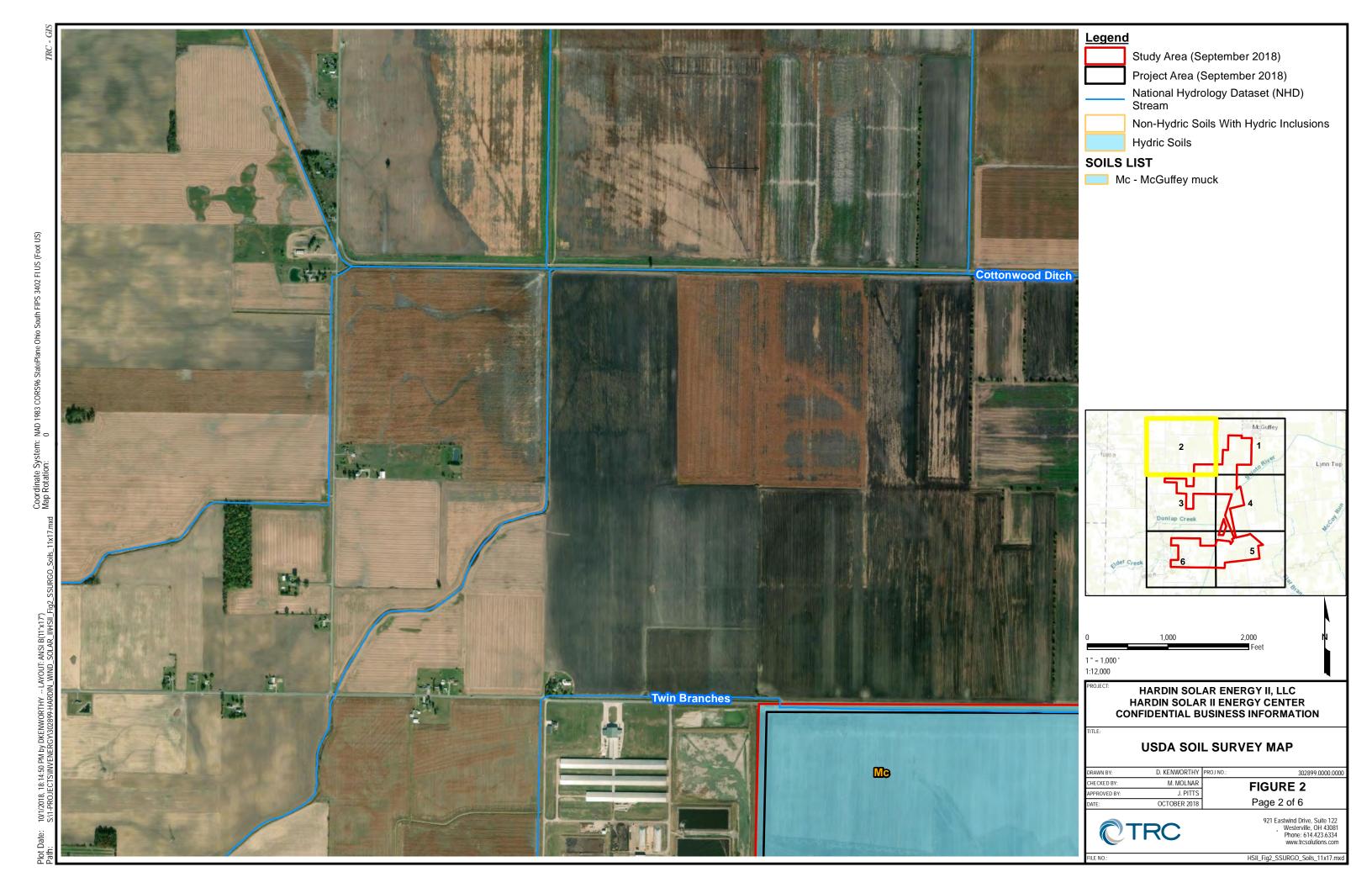


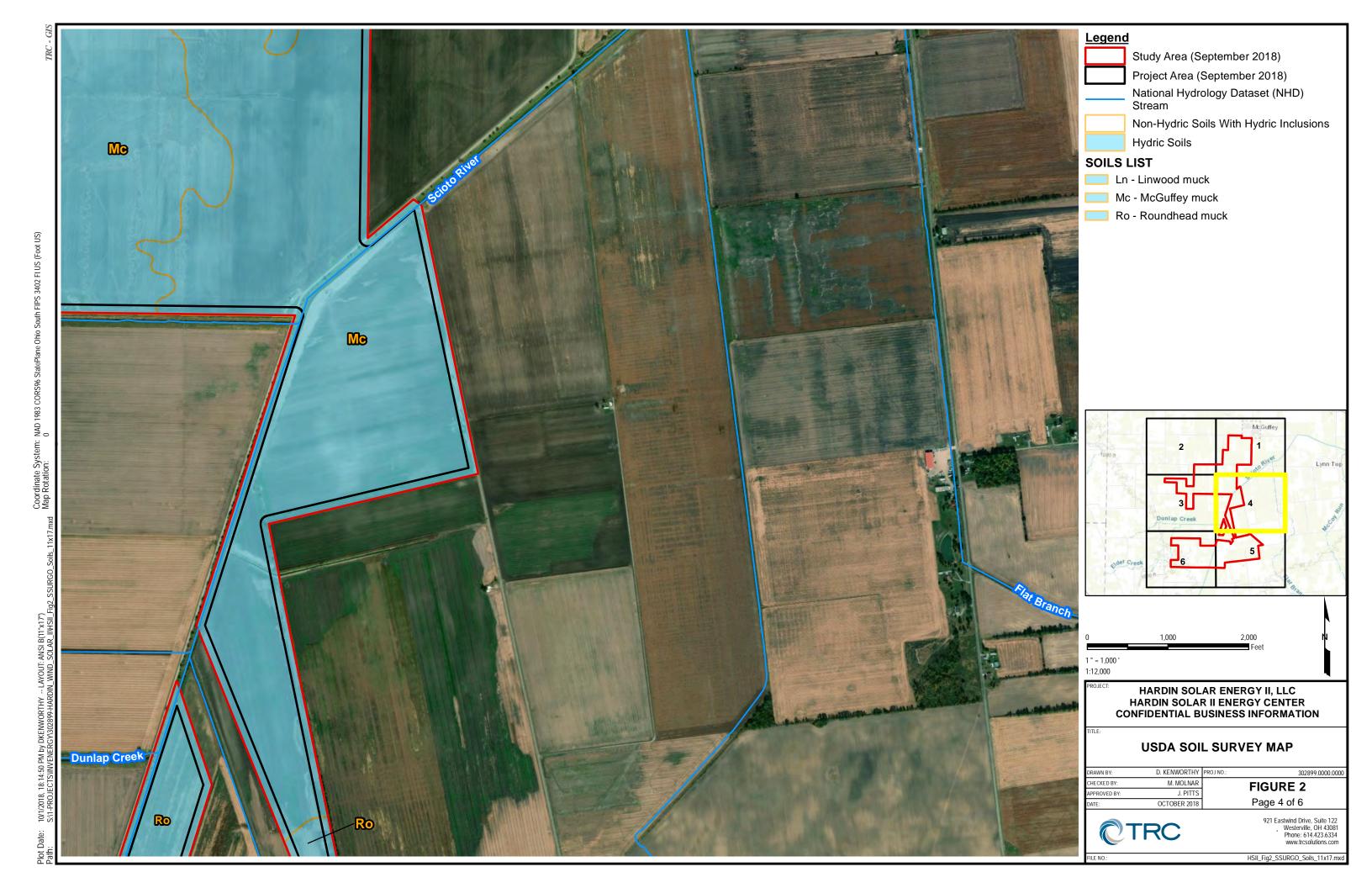
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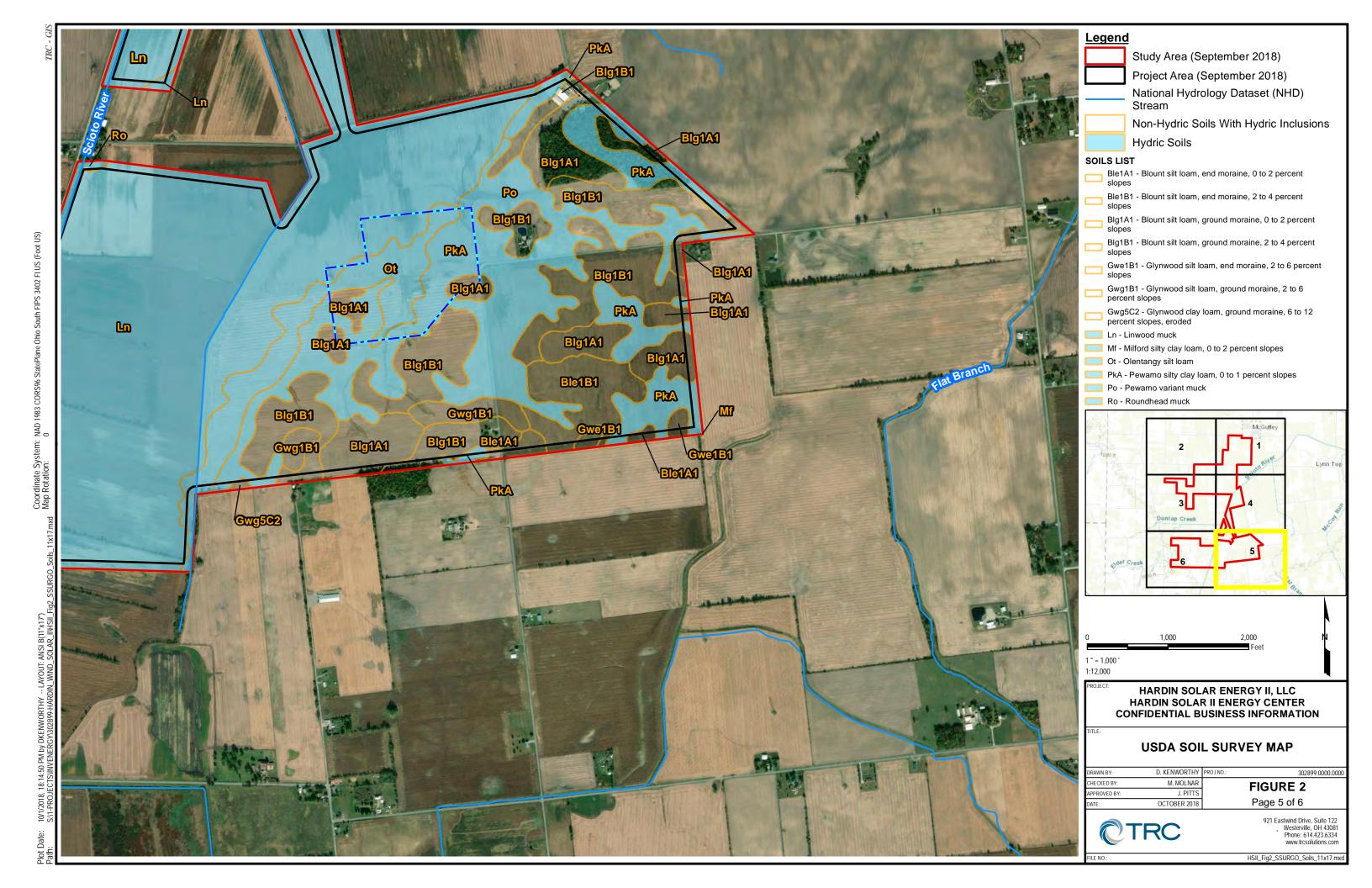


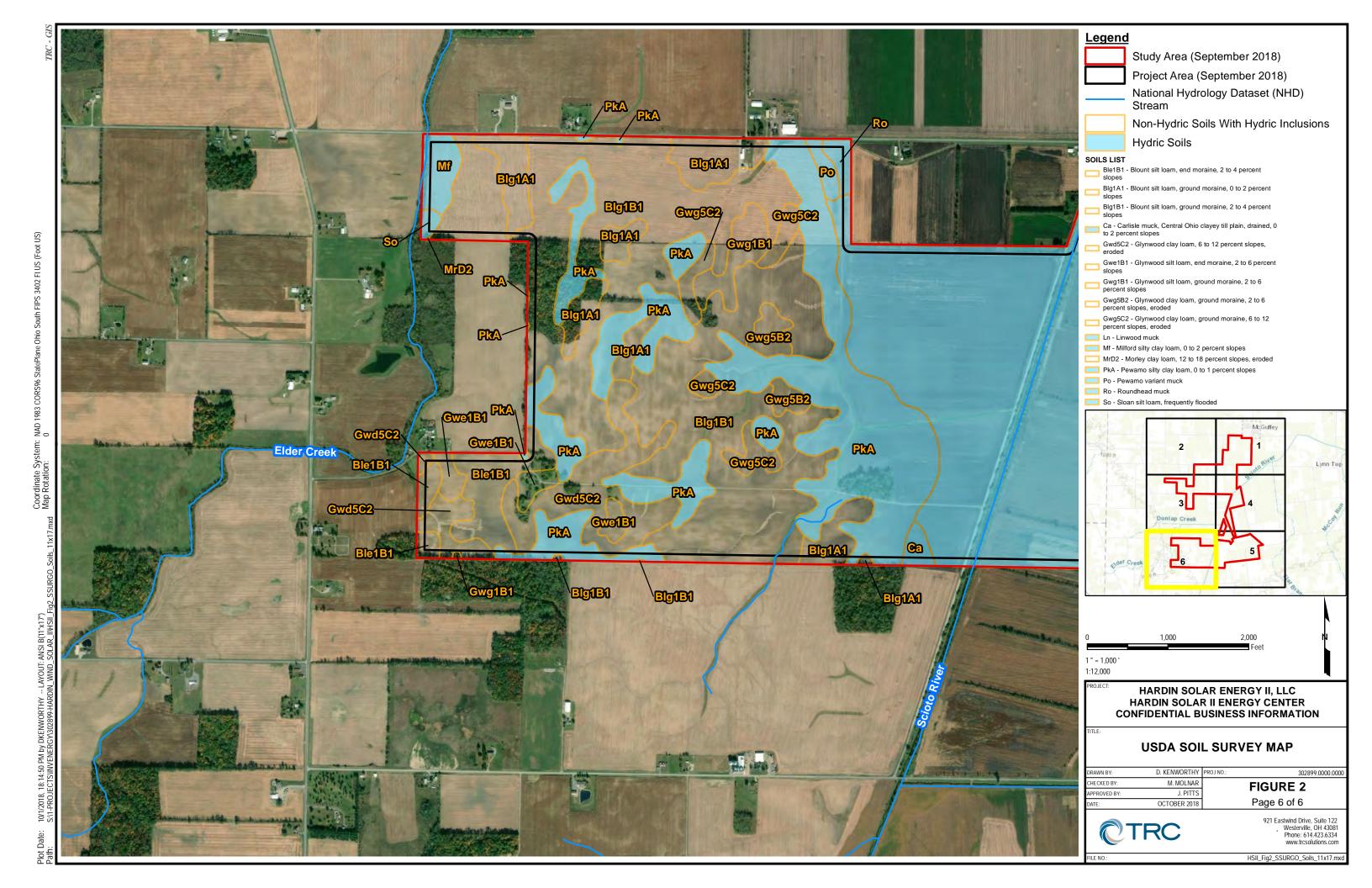
# Appendix A Figures

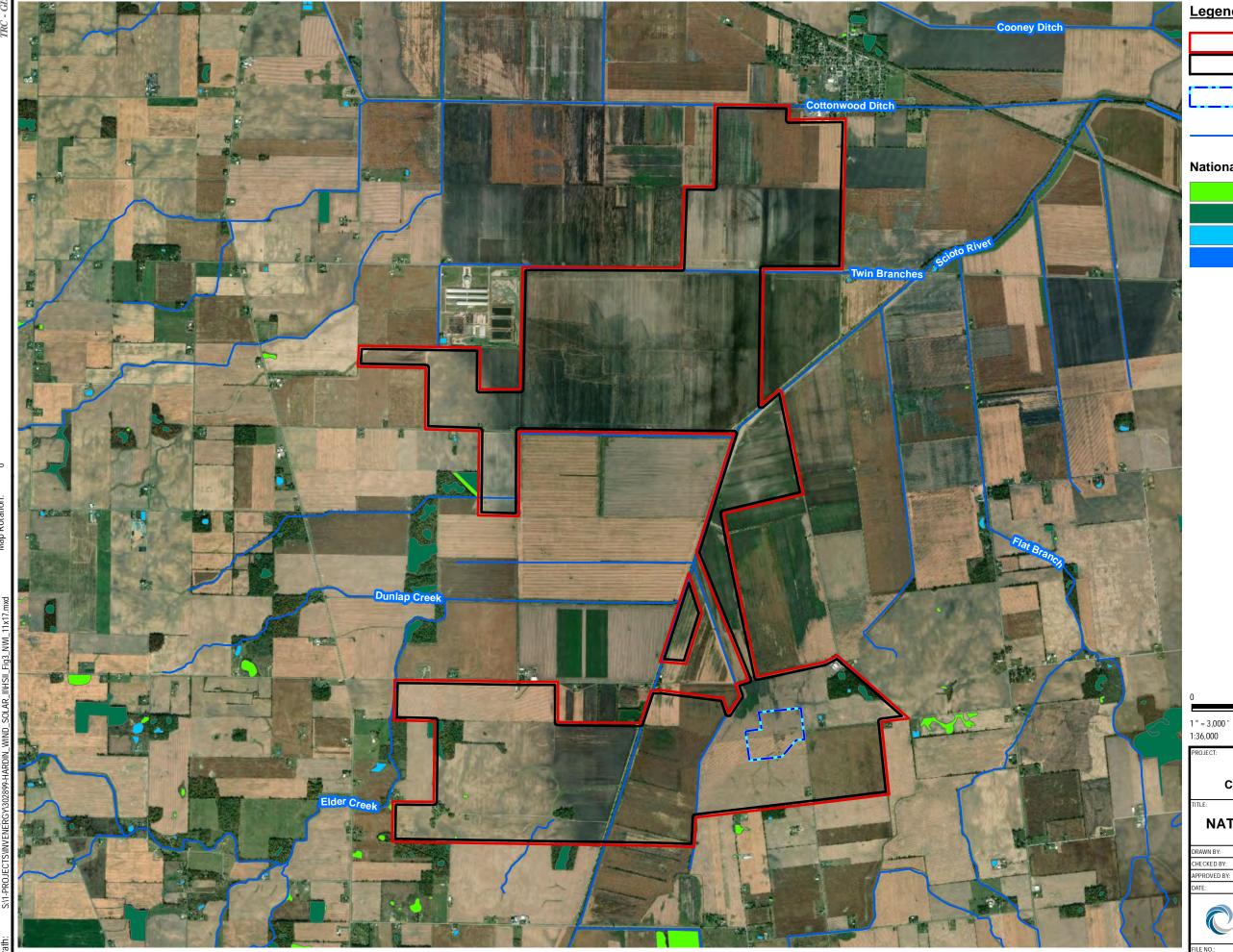












**Legend** Study Area (September 2018) Project Area (September 2018) Point of Interconnection Facility Studied 2017 National Hydrography Dataset (NHD) Stream **National Wetlands Inventory (NWI)** Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

Riverine

Freshwater Pond

HARDIN SOLAR ENERGY II, LLC HARDIN SOLAR II ENERGY CENTER CONFIDENTIAL BUSINESS INFORMATION

### NATIONAL WETLAND INVENTORY MAP

D. KENWORTHY PROJ NO.: M. MOLNAR

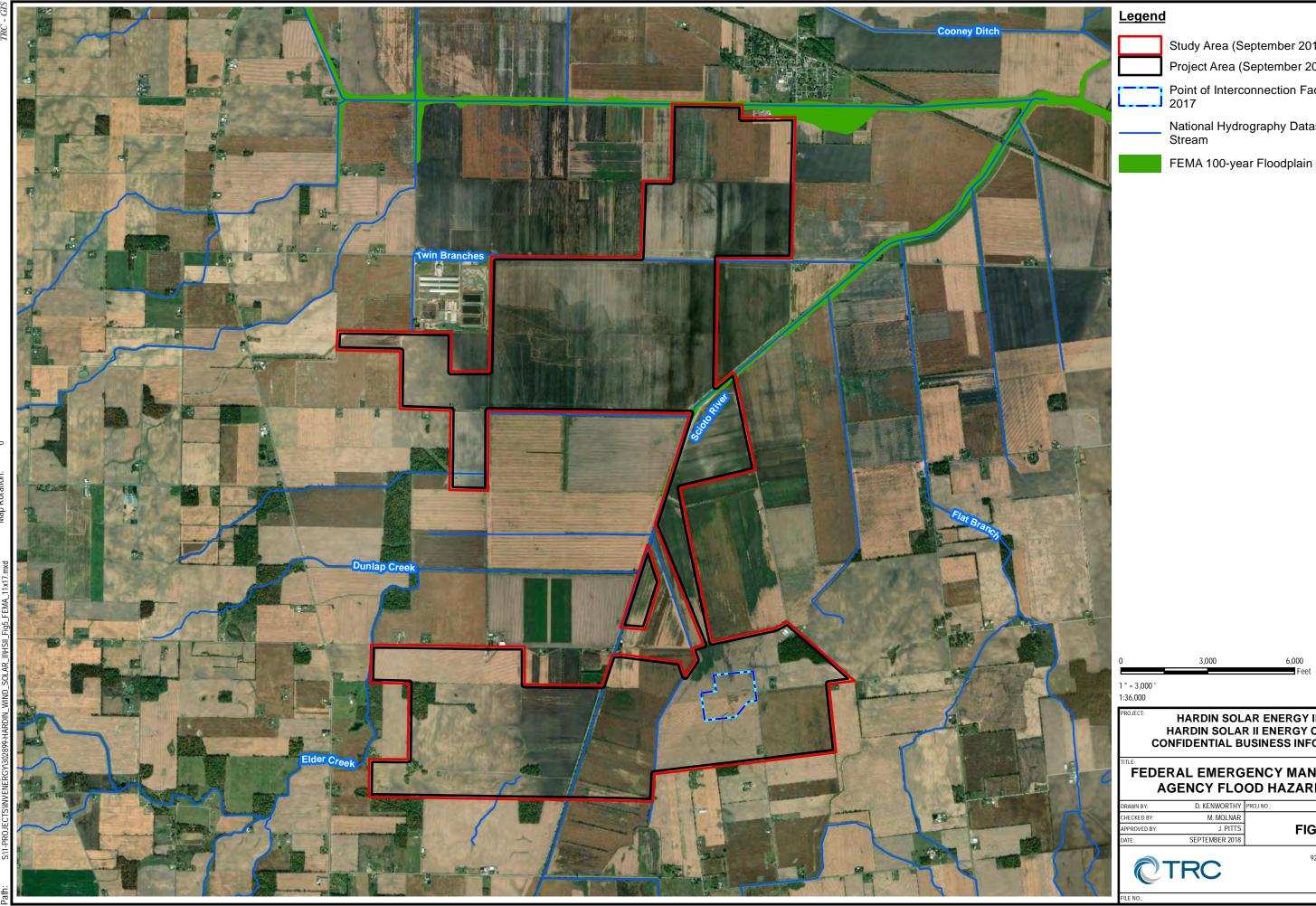
J. PITTS SEPTEMBER 2018

FIGURE 3



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HSII\_Fig3\_NWI\_11x17.mxd



Study Area (September 2018) Project Area (September 2018) Point of Interconnection Facility Studied 2017 National Hydrography Dataset (NHD) Stream

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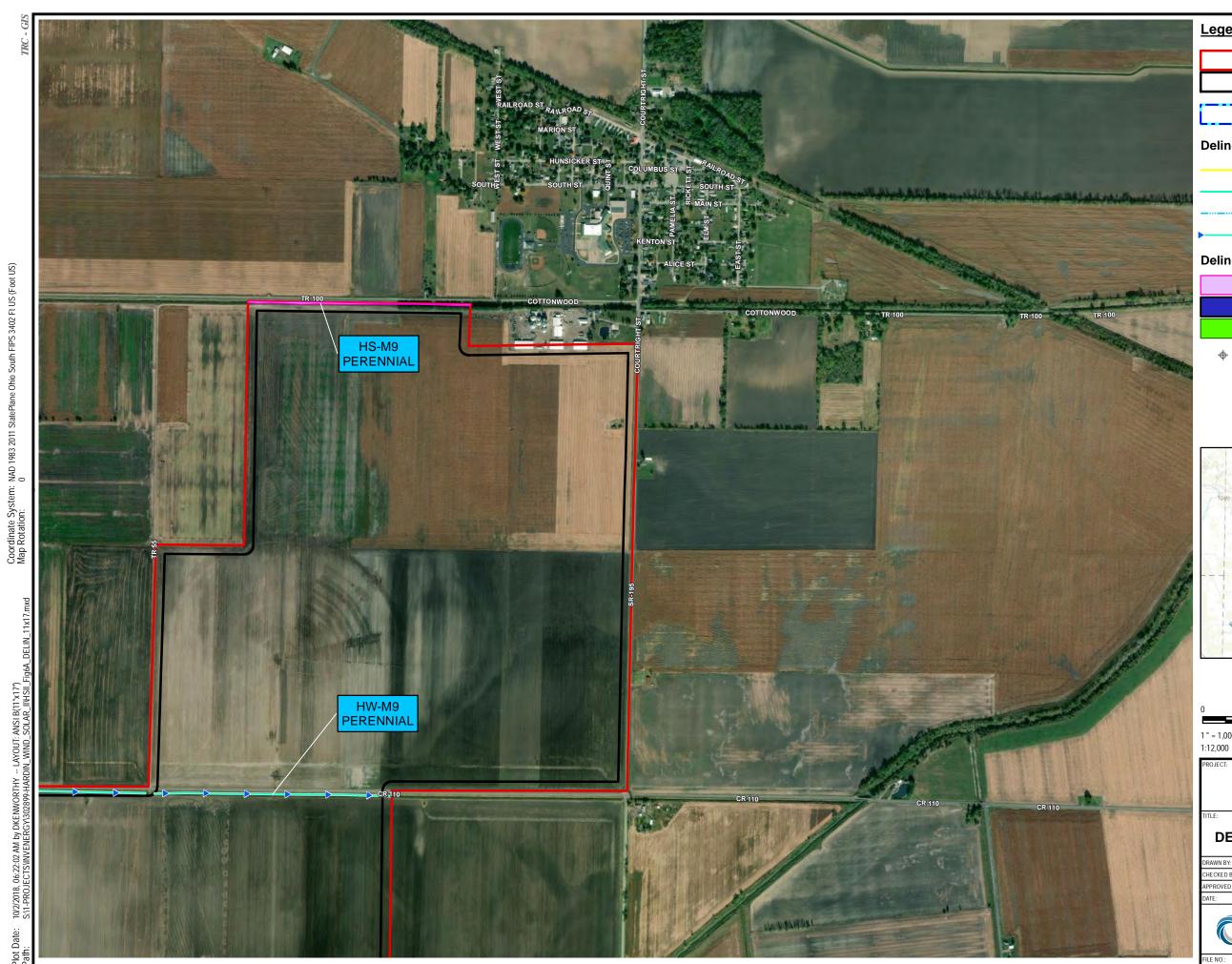
## FEDERAL EMERGENCY MANAGEMENT

A C	SENCY FLO	OD HAZ	ARD MAP
DRAWN BY:	D. KENWORTHY	PROJ NO.:	302899.0000.0000
CHECKED BY:	M. MOLNAR		
APPROVED BY:	J. PITTS		FIGURE 5
DATE:	SEPTEMBER 2018		



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HSII\_Fig5\_FEMA\_11x17.mxd



Study Area (September 2018)

Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

Ephemeral

Intermittent

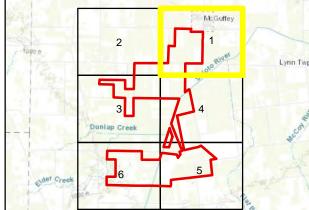
Perennial

#### **Delineated Area**

Stream Polygon

Water/Pond Boundary Wetland Boundary

Sample Point



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#### **DELINEATED RESOURCE BOUNDARIES**

	CHECKED BY:	M. MOLNAR		<b>FIGURE 6A</b>
133	DRAWN BY:	D. KENWORTHY	PROJ NO.:	302899
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Page 1 of 6





Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

Ephemeral

Intermittent

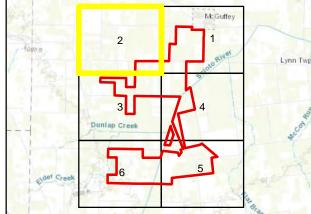
Perennial

#### **Delineated Area**

Stream Polygon

Water/Pond Boundary Wetland Boundary

Sample Point



HARDIN SOLAR ENERGY II, LLC HARDIN SOLAR II ENERGY CENTER CONFIDENTIAL BUSINESS INFORMATION

#### **DELINEATED RESOURCE BOUNDARIES**

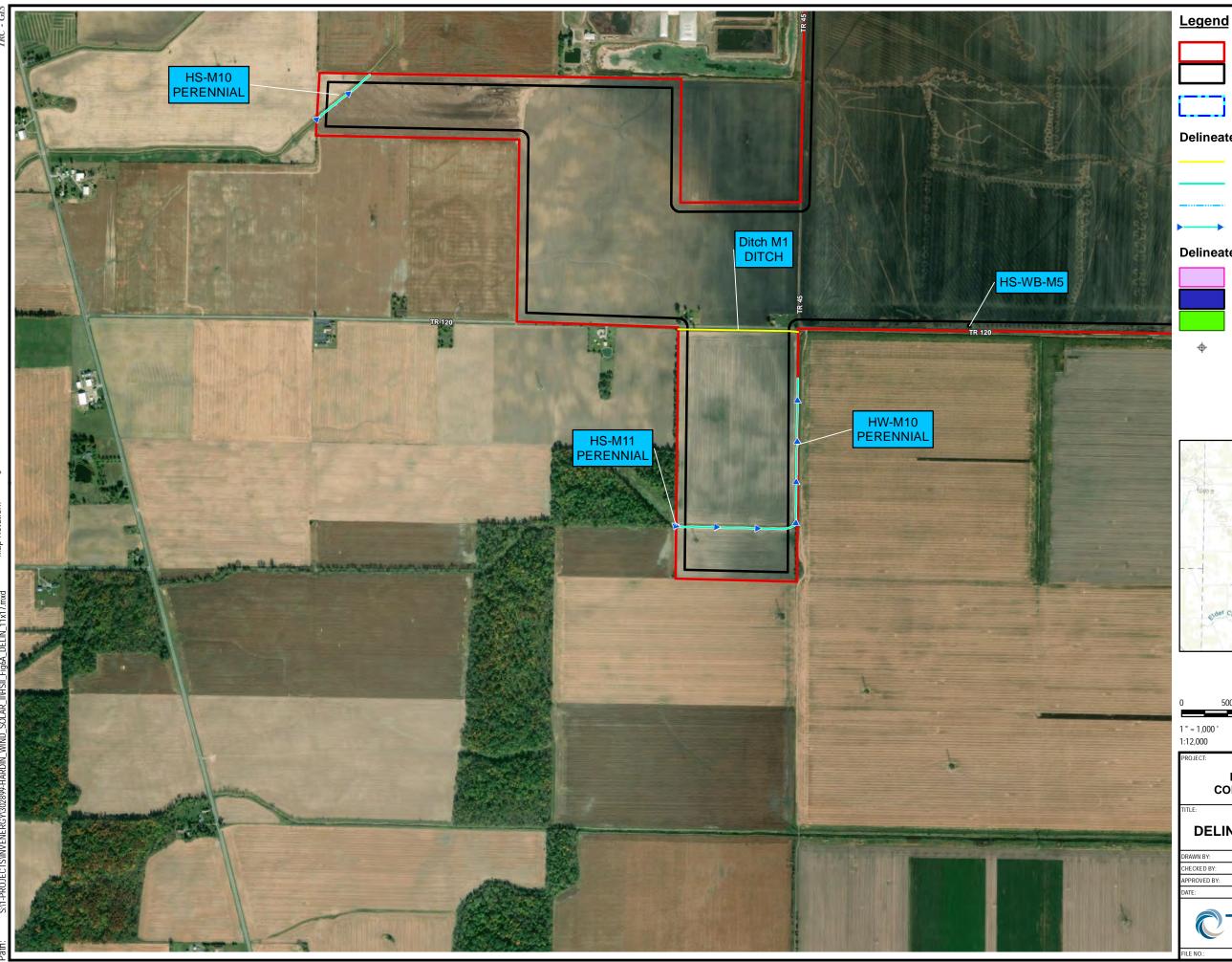
ш	DRAWN BY:	D. KENWORTHY	PROJ NO.:	
	CHECKED BY:	M. MOLNAR		- 6
m	APPROVED BY:	J. PITTS		•

**FIGURE 6A** 

OCTOBER 2018 Page 2 of 6







Project Area (September 2018)

Point of Interconnection Facility Studied 2017

**Delineated Streams** 

Ditch

Ephemeral

Intermittent

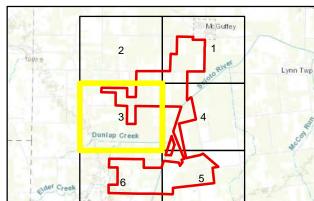
Perennial

#### **Delineated Area**

Stream Polygon

Water/Pond Boundary Wetland Boundary

Sample Point



HARDIN SOLAR ENERGY II, LLC HARDIN SOLAR II ENERGY CENTER CONFIDENTIAL BUSINESS INFORMATION

#### **DELINEATED RESOURCE BOUNDARIES**

Name of				
	DRAWN BY:	D. KENWORTHY	PROJ NO.:	302899
	CHECKED BY:	M. MOLNAR		FIGURE 6A
M	APPROVED BY:	J. PITTS	1	I IGUNE OA

J. PITTS OCTOBER 2018

Page 3 of 6



Study Area (September 2018)

Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

Ephemeral

Intermittent

Perennial

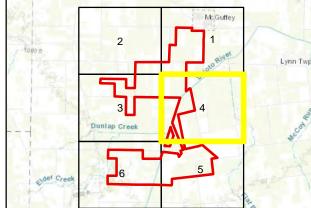
#### **Delineated Area**

Stream Polygon

Water/Pond Boundary

Wetland Boundary

Sample Point



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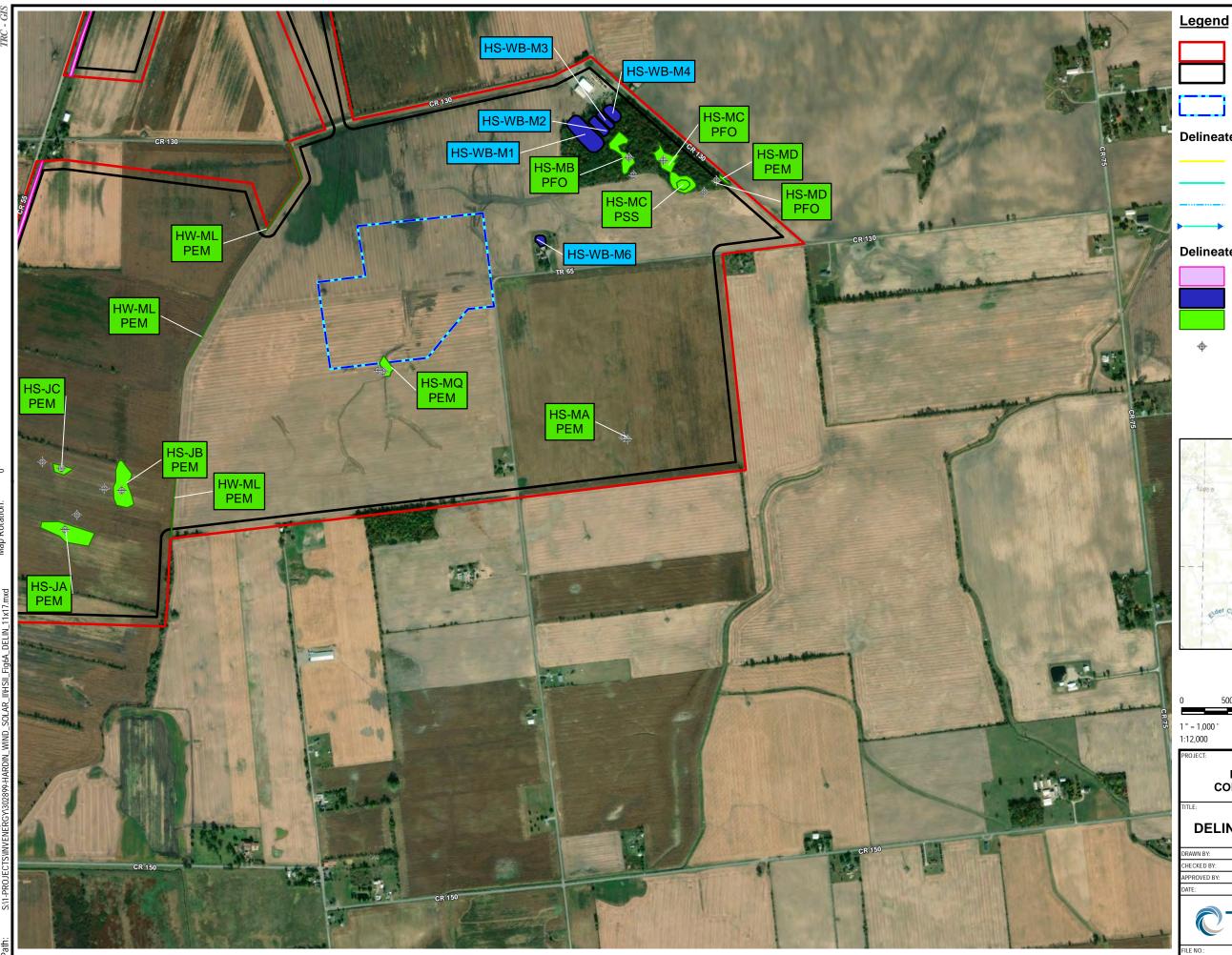
#### **DELINEATED RESOURCE BOUNDARIES**

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OCTOBER 2018



Page 4 of 6 921 Eastwind Drive, Suite 122 Westerville, OH 43081 Phone: 614.423.6334 www.trcsolutions.com



Project Area (September 2018)

Point of Interconnection Facility Studied 2017

**Delineated Streams** 

Ditch

Ephemeral

Intermittent

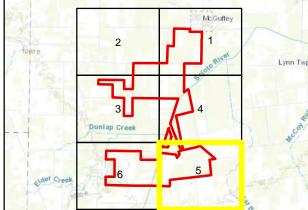
Perennial

#### **Delineated Area**

Stream Polygon

Water/Pond Boundary Wetland Boundary

Sample Point



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#### **DELINEATED RESOURCE BOUNDARIES**

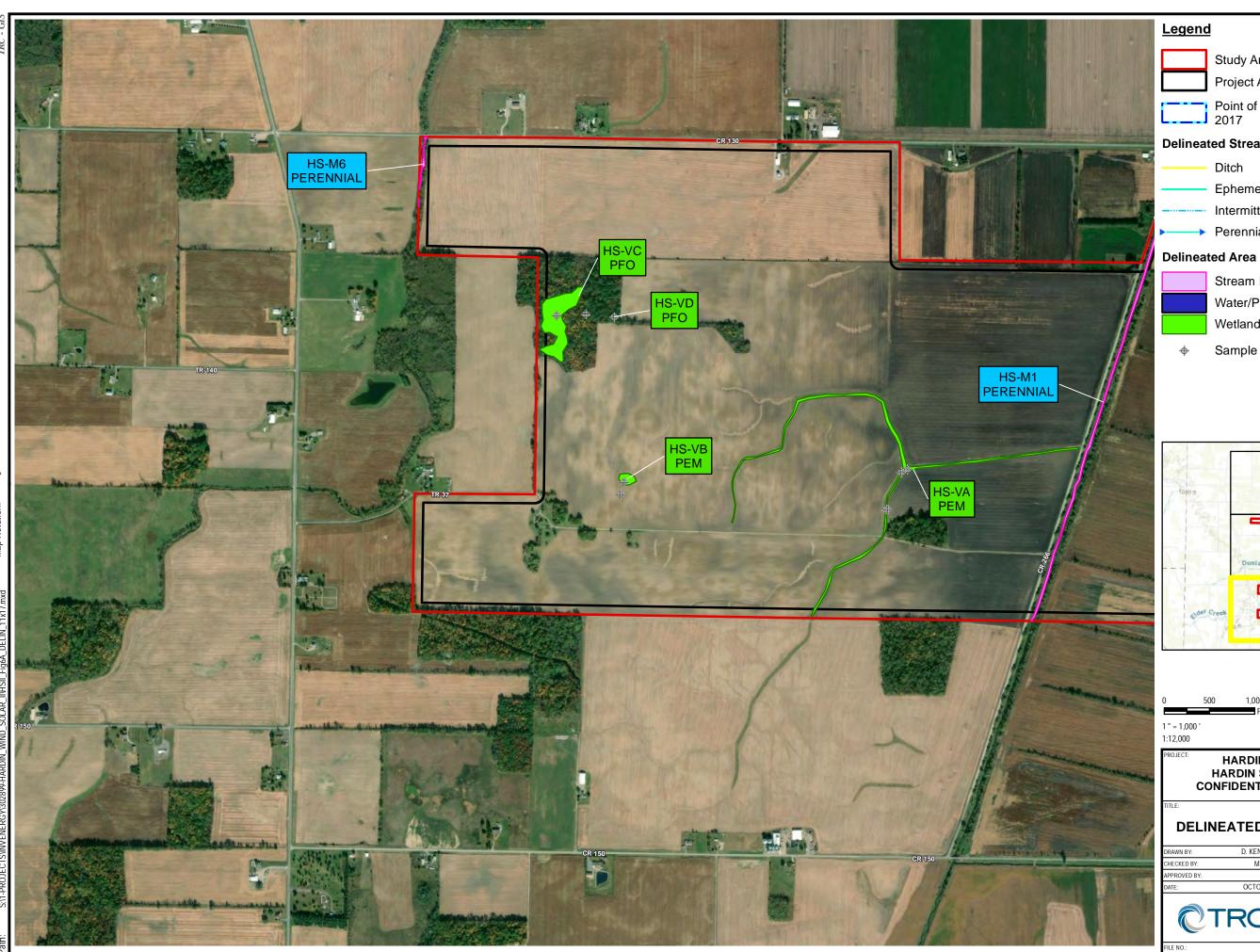
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Page 5 of 6





Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ephemeral

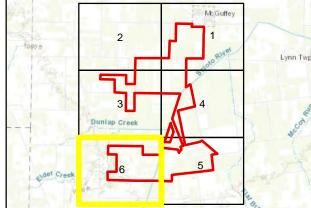
Intermittent

Perennial

Stream Polygon

Water/Pond Boundary Wetland Boundary

Sample Point



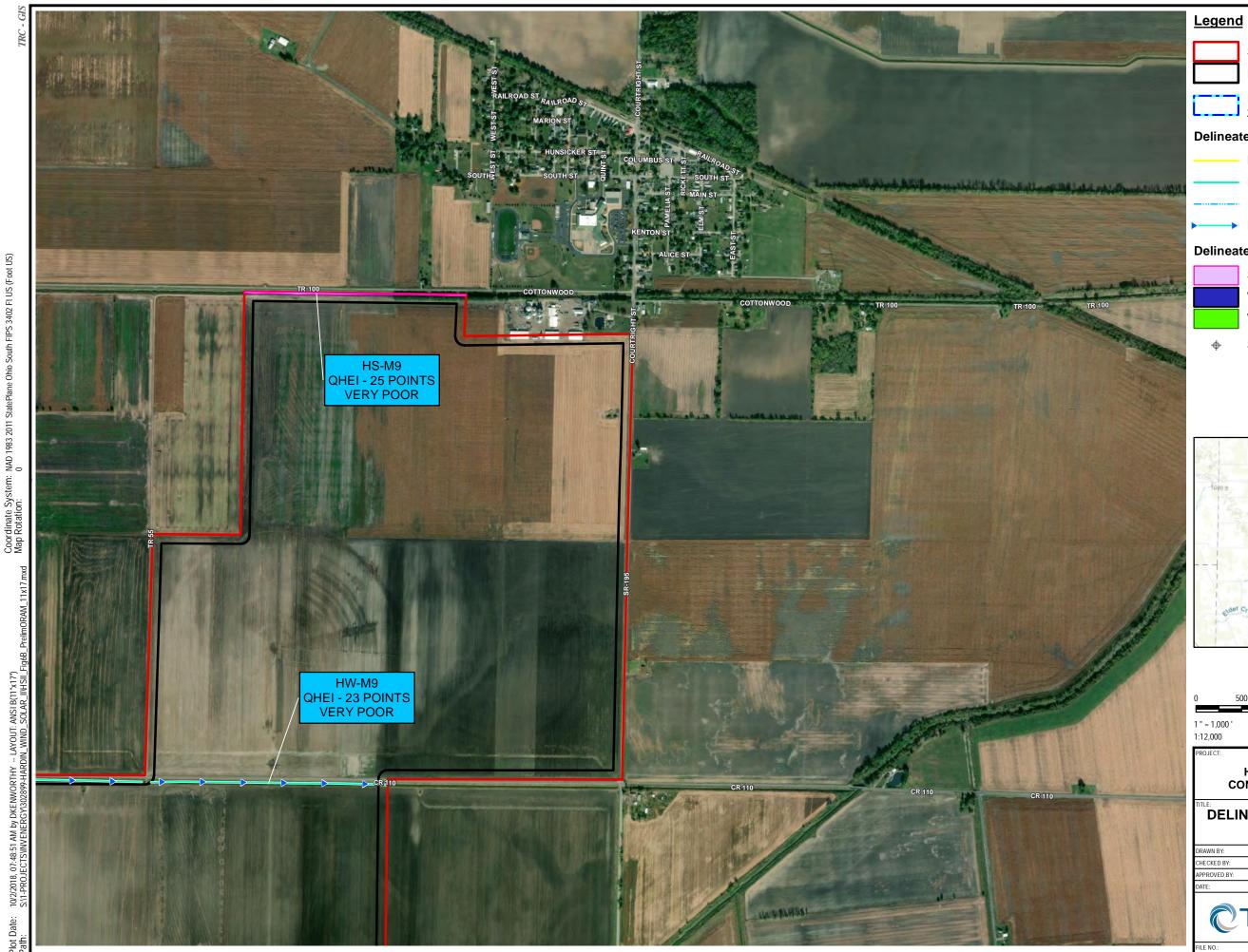
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#### **DELINEATED RESOURCE BOUNDARIES**

96				
724	DRAWN BY:	D. KENWORTHY	PROJ NO.:	302899
	CHECKED BY:	M. MOLNAR		FIGURE 6A
	APPROVED BY:	J. PITTS		I IOOKE OA

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Page 6 of 6



Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

Ephemeral

Intermittent

Perennial

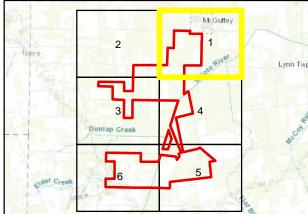
#### **Delineated Area**

Water/Pond Boundary

Stream Polygon

Wetland Boundary

Sample Point



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#### DELINEATED RESOURCE PRELIMINARY **ORAMS QHEI AND HHEIS**

	DRAWN BY:	D. KENWORTHY	PROJ NO.:
	CHECKED BY:	M. MOLNAR	
	APPROVED BY:	J. PITTS	

**FIGURE 6B** Page 1 of 6





Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

Ephemeral

Intermittent

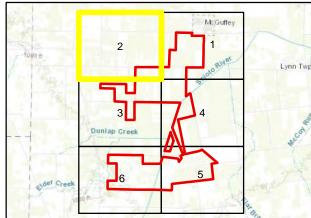
Perennial

#### **Delineated Area**

Stream Polygon

Water/Pond Boundary Wetland Boundary

Sample Point



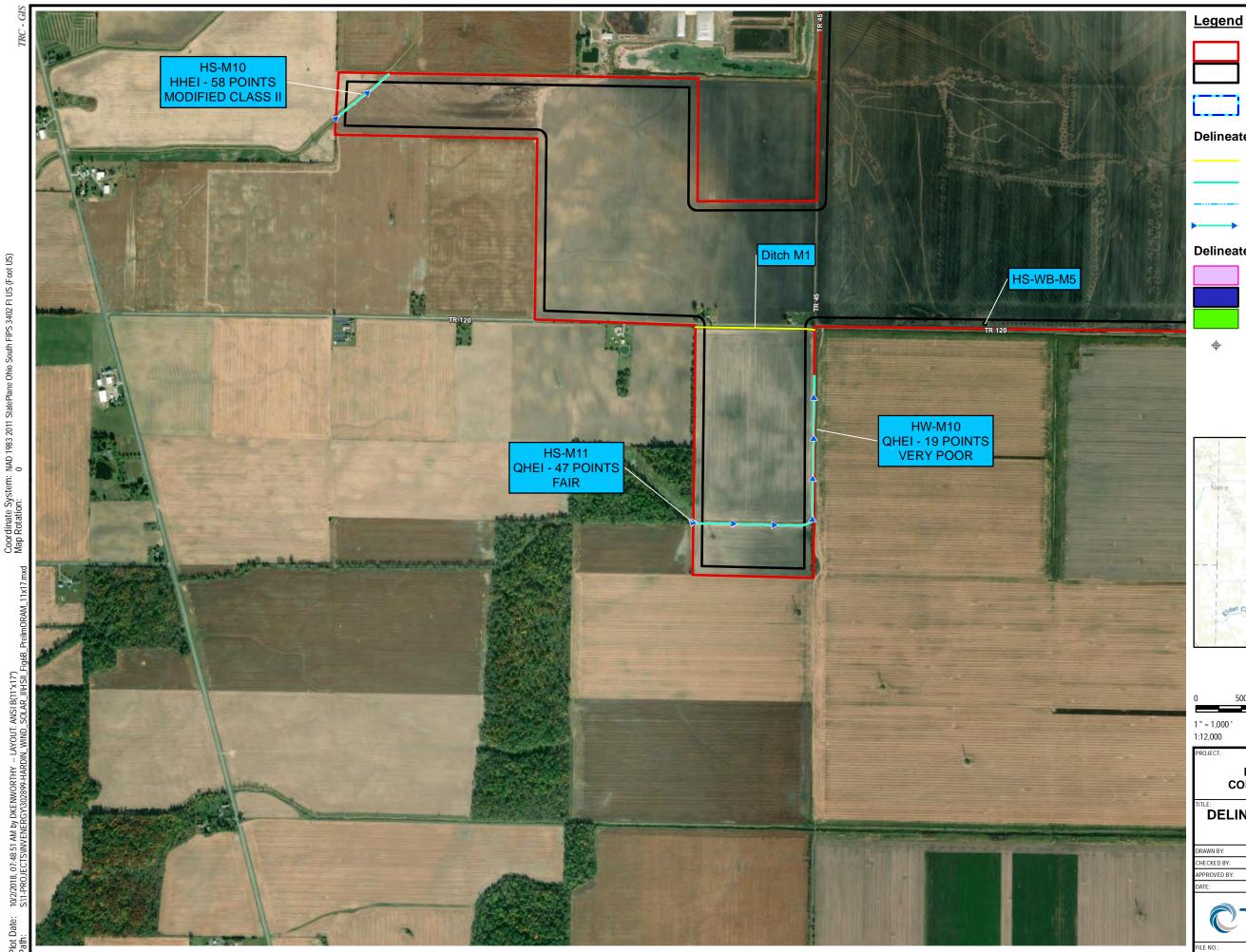
HARDIN SOLAR ENERGY II, LLC HARDIN SOLAR II ENERGY CENTER CONFIDENTIAL BUSINESS INFORMATION

#### DELINEATED RESOURCE PRELIMINARY **ORAMS QHEI AND HHEIS**

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CHECKED BY:	M. MOLNAR	
APPROVED BY:	J. PITTS	
	OCTOBED 2010	

FIGURE 6B Page 2 of 6





Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

Ephemeral

Intermittent

Perennial

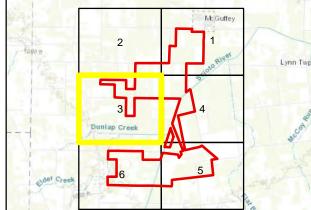
#### **Delineated Area**

Stream Polygon

Water/Pond Boundary

Wetland Boundary

Sample Point



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#### DELINEATED RESOURCE PRELIMINARY **ORAMS QHEI AND HHEIS**

	DRAWN BY: D. KE	NWORTHY PROJ N	D.:
	CHECKED BY:	M. MOLNAR	
П	APPROVED BY:	J. PITTS	

**FIGURE 6B** 

Page 3 of 6 OCTOBER 2018





Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

Ephemeral

Intermittent

Perennial

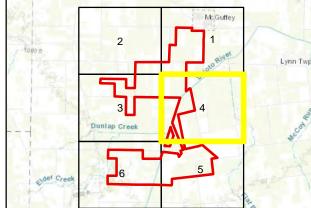
#### **Delineated Area**

Stream Polygon

Water/Pond Boundary

Wetland Boundary

Sample Point



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#### DELINEATED RESOURCE PRELIMINARY **ORAMS QHEI AND HHEIS**

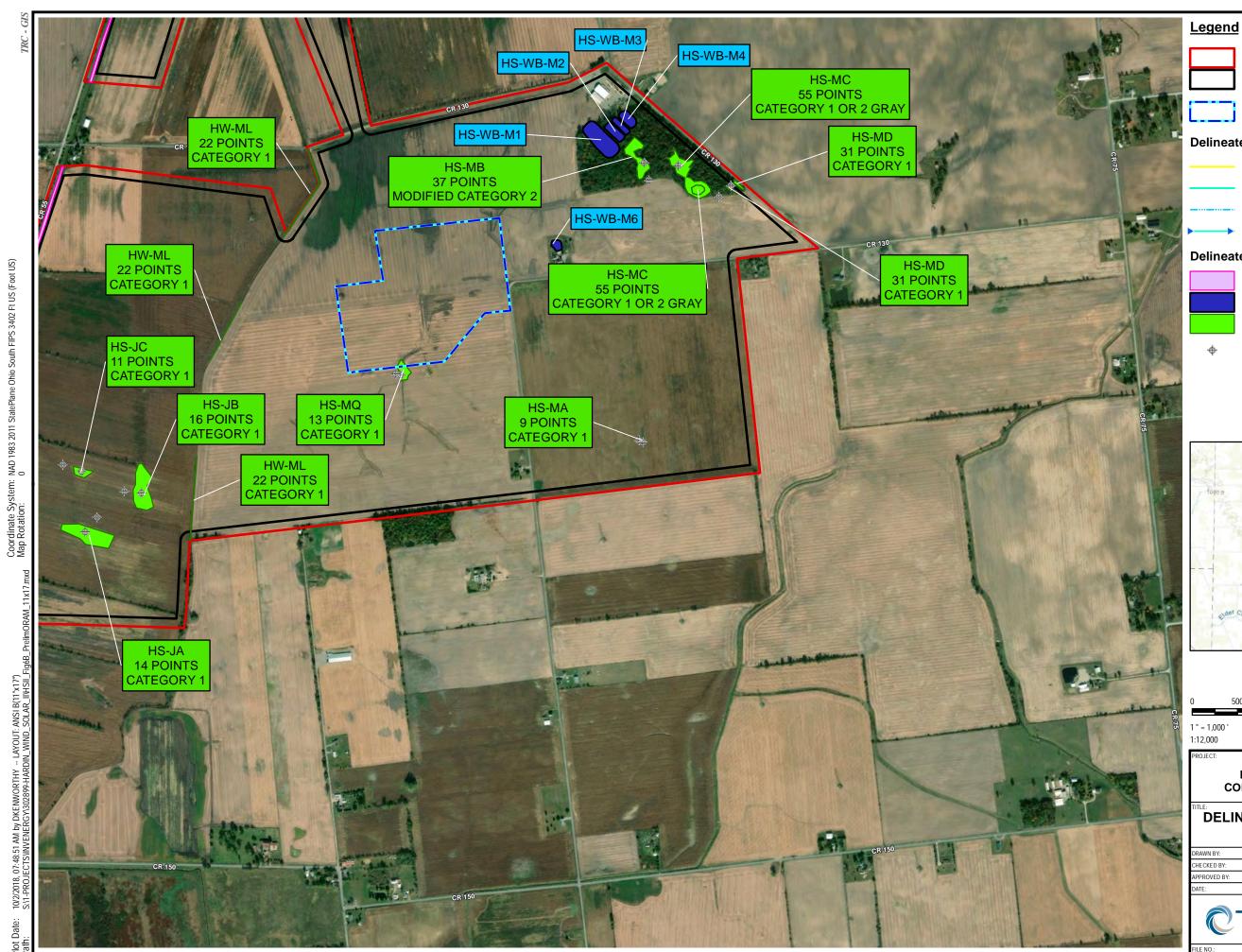
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	DRAWN BY:	D. KENWORTHY	PROJ NO.:	302899
	CHECKED BY:	M. MOLNAR		FIGURE 6B
	APPROVED BY:	I PITTS		I IGUNE OD

OCTOBER 2018



Page 4 of 6

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Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

**Ephemeral** 

Intermittent

Perennial

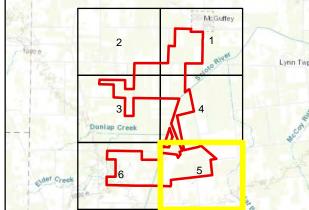
#### **Delineated Area**

Stream Polygon

Water/Pond Boundary

Wetland Boundary

Sample Point



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#### DELINEATED RESOURCE PRELIMINARY **ORAMS QHEI AND HHEIS**

	DATE	OCTOBED 2010	
	APPROVED BY:	J. PITTS	
ì	CHECKED BY:	M. MOLNAR	
ì	DRAWN BY:	D. KENWORTHY	PROJ N

**FIGURE 6B** Page 5 of 6



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Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

Ephemeral

Intermittent

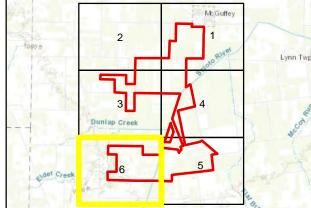
Perennial

Stream Polygon

Water/Pond Boundary

Wetland Boundary

Sample Point



HARDIN SOLAR ENERGY II, LLC HARDIN SOLAR II ENERGY CENTER CONFIDENTIAL BUSINESS INFORMATION

#### DELINEATED RESOURCE PRELIMINARY **ORAMS QHEI AND HHEIS**

	OILAINO Q	TIET AND TITLE
DRAWN BY:	D. KENWORTHY	PROJ NO.: 302899.0000.0000
CHECKED BY:	M. MOLNAR	FIGURE 6B
APPROVED BY:	J. PITTS	I IOOKE OD

J. PITTS OCTOBER 2018

Page 6 of 6

Study Area (September 2018)

Project Area (September 2018)

Point of Interconnection Facility Studied 2017

**Delineated Streams** 

Ditch

Ephemeral

Intermittent

Perennial

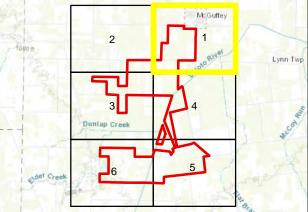
#### **Delineated Area**

Stream Polygon

Water/Pond Boundary Wetland Boundary

Sample Point

NOTE: LABEL LEADERS INDICATE THE LOCATION WHERE THE PHOTO WAS TAKEN.



HARDIN SOLAR ENERGY II, LLC HARDIN SOLAR II ENERGY CENTER CONFIDENTIAL BUSINESS INFORMATION

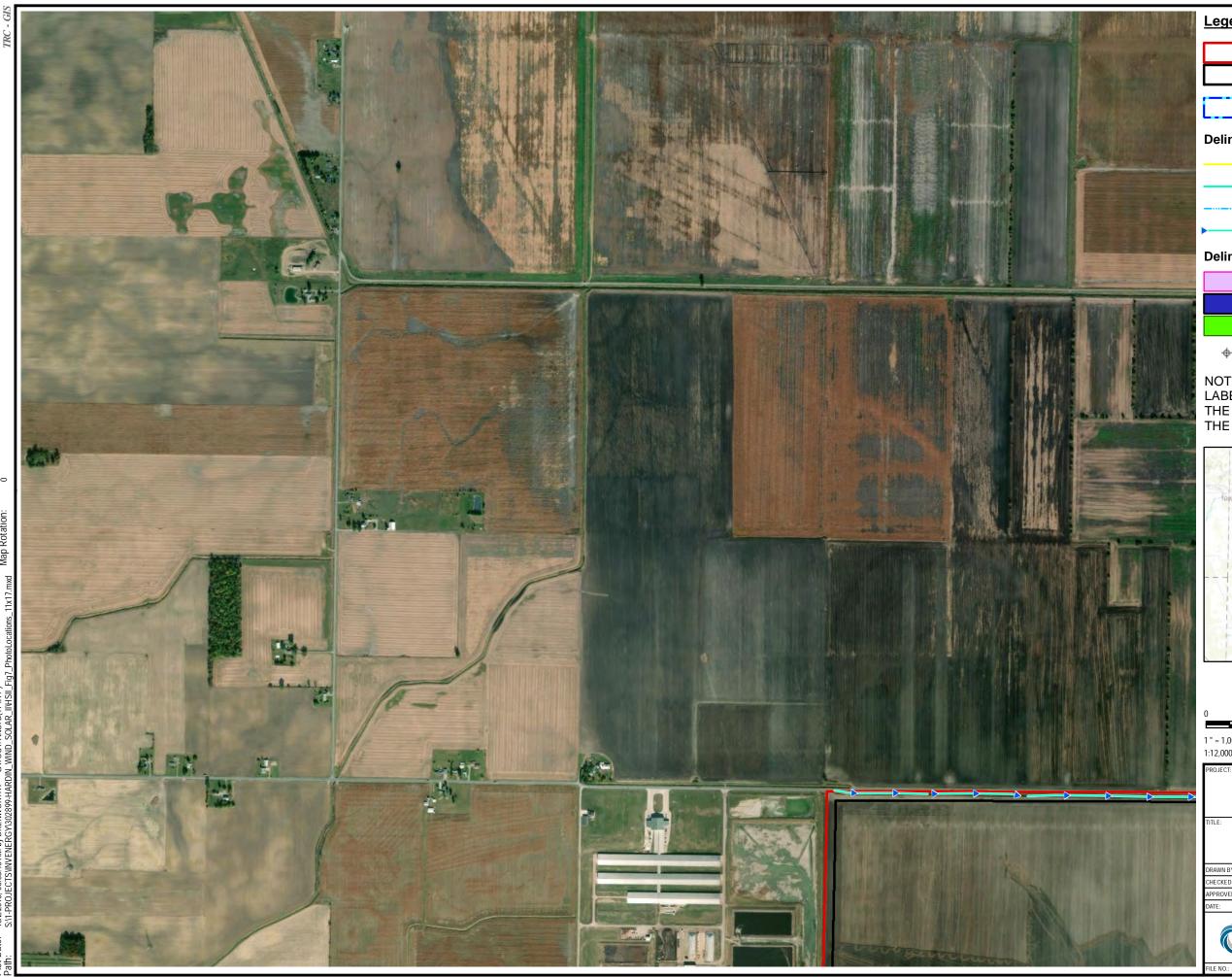
#### PHOTO DOCUMENTATION **AND LOCATIONS**

(B) (B)			
1333	DRAWN BY:	D. KENWORTHY	PROJ NO.:
(30	CHECKED BY:	M. MOLNAR	
	APPROVED BY:	J. PITTS	

FIGURE 7 Page 1 of 6



302899.0000.0000



Study Area (September 2018)

Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

Ephemeral

Intermittent

Perennial

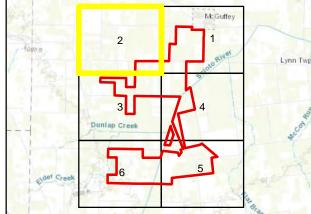
#### **Delineated Area**

Stream Polygon

Water/Pond Boundary Wetland Boundary

Sample Point

NOTE: LABEL LEADERS INDICATE THE LOCATION WHERE THE PHOTO WAS TAKEN.



HARDIN SOLAR ENERGY II, LLC HARDIN SOLAR II ENERGY CENTER CONFIDENTIAL BUSINESS INFORMATION

#### PHOTO DOCUMENTATION **AND LOCATIONS**

	DRAWN BY:	D. KENWORTHY	PROJ NO.:
	CHECKED BY:	M. MOLNAR	
200	APPROVED BY:	J. PITTS	



Page 2 of 6

FIGURE 7

302899.0000.0000

Study Area (September 2018)

Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

**Ephemeral** 

Intermittent

Perennial

#### **Delineated Area**

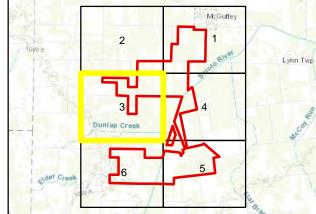
Water/Pond Boundary

Stream Polygon

Wetland Boundary

Sample Point

NOTE: LABEL LEADERS INDICATE THE LOCATION WHERE THE PHOTO WAS TAKEN.



HARDIN SOLAR ENERGY II, LLC HARDIN SOLAR II ENERGY CENTER CONFIDENTIAL BUSINESS INFORMATION

#### PHOTO DOCUMENTATION **AND LOCATIONS**

	DRAWN BY:	D. KENWORTHY	PF
	CHECKED BY:	M. MOLNAR	
	APPROVED BY:	J. PITTS	
111	DATE:	OCTOBER 2018	

302899.0000.0000 FIGURE 7

Page 3 of 6





Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

**Ephemeral** 

Intermittent

Perennial

#### **Delineated Area**

Stream Polygon

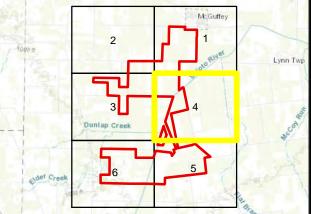


Water/Pond Boundary Wetland Boundary



Sample Point

NOTE: LABEL LEADERS INDICATE THE LOCATION WHERE THE PHOTO WAS TAKEN.



HARDIN SOLAR ENERGY II, LLC HARDIN SOLAR II ENERGY CENTER CONFIDENTIAL BUSINESS INFORMATION

#### PHOTO DOCUMENTATION **AND LOCATIONS**

DRAWN BY:	D. KENWORTHY	PRO
CHECKED BY:	M. MOLNAR	
APPROVED BY:	J. PITTS	
DATE:	OCTOBER 2018	

302899.0000.0000 FIGURE 7

Page 4 of 6



Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

Ephemeral

Intermittent

Perennial

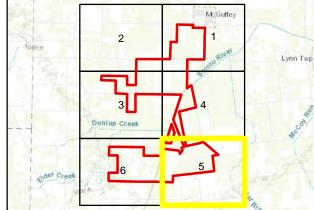
#### **Delineated Area**

Stream Polygon

Water/Pond Boundary Wetland Boundary

Sample Point

NOTE: LABEL LEADERS INDICATE THE LOCATION WHERE THE PHOTO WAS TAKEN.



HARDIN SOLAR ENERGY II, LLC HARDIN SOLAR II ENERGY CENTER CONFIDENTIAL BUSINESS INFORMATION

#### PHOTO DOCUMENTATION **AND LOCATIONS**

	DRAWN BY:	D. KENWORTHY	PRO
h	CHECKED BY:	M. MOLNAR	
	APPROVED BY:	J. PITTS	
	DATE:	OCTOBER 2018	

FIGURE 7 Page 5 of 6

**OTRC** 

302899.0000.0000

Project Area (September 2018)

Point of Interconnection Facility Studied 2017

#### **Delineated Streams**

Ditch

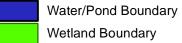
**Ephemeral** 

Intermittent

Perennial

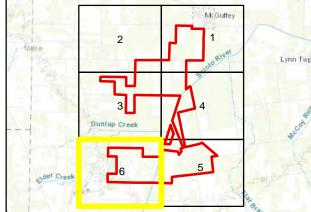
#### **Delineated Area**

Stream Polygon



Sample Point

NOTE: LABEL LEADERS INDICATE THE LOCATION WHERE THE PHOTO WAS TAKEN.





HARDIN SOLAR ENERGY II, LLC HARDIN SOLAR II ENERGY CENTER CONFIDENTIAL BUSINESS INFORMATION

#### PHOTO DOCUMENTATION **AND LOCATIONS**

п				
b	DRAWN BY:	D. KENWORTHY	PROJ NO.:	30289
	CHECKED BY:	M. MOLNAR	FIGURE	7
8	APPROVED BY:	J. PITTS		_
ı	DATE:	OCTOBER 2018	Page 6 of 0	6



302899.0000.0000

# Appendix B Photographic Log

Confidential Business Information

## WETLAND RESOURCE PHOTOGRAPHS



Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #1

Date: 05/22/2018

Feature:

HS-MA

**Comments:** 

Photo of PEM wetland HS-MA, looking north.



Photo ID:

Photo #2

Date: 05/22/2018

**Feature:** HS-MA

Comments:

Photo of PEM wetland HS-MA, looking east.





Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #3

Date: 05/22/2018

**Feature:** HS-MA

Comments:

Photo of PEM wetland HS-MA, looking south.



Photo ID:

Photo #4

Date: 05/22/2018

**Feature:** HS-MA

Comments:

Photo of PEM wetland HS-MA, looking west.





Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #5

Date: 05/22/2018

Feature:

HS-MB

Comments:

Photo of PFO wetland HS-MB, looking east.



Photo ID: Photo #6

Date: 05/22/2018

**Feature:** HS-MB

Comments:

Photo of PEM section of wetland HS-MB, looking north.





Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #7

Date: 05/22/2018

**Feature:** HS-MB

Comments:

Photo of PFO wetland HS-MB, looking southwest.



Photo ID: Photo #8

Date: 05/22/2018

**Feature:** HS-MB

Comments:

Photo of PFO wetland HS-MB, looking south.





Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #9

Date: 05/22/2018

**Feature:** HS-MD

Comments:

Photo of PFO wetland HS-MD, looking north.



Photo ID:

Photo #10

Date: 05/22/2018

**Feature:** HS-MD

**Comments:** 

Photo of PFO wetland HS-MD, looking east.





Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #11

Date: 05/22/2018

**Feature:** HS-MD

Comments:

Photo of PFO wetland HS-MD, looking south.



Photo ID: Photo # 12

Date: 05/22/2018

**Feature:** HS-MD

**Comments:** 

Photo of PFO wetland HS-MD, looking west.





Hardin Solar Energy II, LLC State: Ohio County: Hardin

Project Name: Hardin Solar II Energy Center

Photo ID: Photo #13

Date: 05/23/2018

**Feature:** HS-MD

Comments:

Photo of PEM section of wetland HS-MD.





Hardin Solar II Energy Center Wetlands and Other Waters of the U.S. Delineation Report September 2018

Confidential Business Information

WATERBODY RESOURCE PHOTOGRAPHS



Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #14

Date: 05/18/2018

Feature:

HS-M1

**Comments:** 

Photo of perennial stream HS-M1, looking upstream.



Photo ID:

Photo #15

Date: 05/18/2018

Feature:

HS-M1

**Comments:** 

Photo of perennial stream HS-M1, looking downstream.





Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #16

Date: 05/18/2018

Feature:

HS-M1

Comments:

Photo of perennial stream HS-M1, looking at the substrate.



Photo ID: Photo #17

Date: 05/18/2018

**Feature:** HS-M4

**Comments:** 

Photo of perennial stream HS-M4, looking upstream.





Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #18

Date: 05/18/2018

Feature:

HS-M4

Comments:

Photo of perennial stream HS-M4, looking downstream.



Photo ID: Photo #19

Date: 05/18/2018

**Feature:** HS-M4

Comments:

Photo of perennial stream HS-M4, looking at the substrate.





Project Name: Hardin Solar II Energy Center

Photo ID: Photo #20

Date: 05/23/2018

**Feature:** HS-M6

Comments:

Photo of perennial stream HS-M6, looking upstream.



Photo ID: Photo #21

Date: 05/23/2018

**Feature:** HS-M6

Comments:

Photo of perennial stream HS-M1, looking downstream.





Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #22

Date: 05/23/2018

Feature:

HS-M6

Comments:

Photo of perennial stream HS-M6, looking at the substrate.



Photo ID:

Photo #23

Date: 05/23/2018

**Feature:** HS-M6

Comments:

Photo of perennial stream HS-M6, looking downstream.





Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #24

Date: 05/23/2018

Feature:

HS-M6

Comments:

Photo of perennial stream HS-M6, looking

upstream.



Photo ID: Photo #25

Date: 05/23/2018

**Feature:** HS-M6

**Comments:** 

Photo of perennial stream HS-M6, looking at the substrate.





Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #26

Date: 05/23/2018

Feature:

HS-WB-M1

Comments:

Photo of waterbody HS-WB-M1, looking north.



Photo ID: Photo #27

Date: 05/23/2018

Feature:

HS-WB-M3

Comments:

Photo of waterbody HS-WB-M3, looking north.





Project Name: Hardin Solar II Energy Center

Photo ID:

Photo #28

Date: 05/23/2018

Feature: HS-WB-M4

Comments:

Photo of waterbody HS-WB-M4, looking northeast.





# Appendix C USACE Wetland Determination Data Forms

Project/Site: 302899: Hardin Solar II ci	ity/County: Havru'n County Sampling Date: 5/22/1
Applicant/Owner: TRC/Inveneray, LLC.	State: OH Sampling Point: WET - H
	ection, Township, Range: N/A
Lendform (hillslope, terrace, etc.): ADDYESS 1 8Y	Local relief (concave, convex, none): 10 n Caw
	ong: <u>-83,7838  </u> Datum: <u>W6584</u>
Soil Map Unit Name: (Ble 1 R1) Blownts 11100 MI &	M morganie 2-4/0 & WW classification: None
Are climatic / hydrologic conditions on the site typical for this time of year	? Yes No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly dis	sturbed? 🗸 Are "Normal Circumstances" present? Yes 🛴 No
Are Vegetation, Soil, or Hydrology naturally proble	ematic? (If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map showing s	ampling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No	
Hydric Soll Present? Yes No	is the Sampled Area
Wetland Hydrology Present? Yes No	within a Wetland? Yes No
Remarks: 3 wetland criteria have t	seen met.
VEGETATION – Use scientific names of plants.	· ·
Absolute I	Dominant Indicator   Dominance Test worksheet:
Tree Stratum (Plot size: 5())	Species? Status   Number of Dominant Species   That Are OBL, FACW, or FAC: (A)
2	Total Number of Dominant Species Across All Strata: (B)
4.	
5.	Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)
0=	Total Cover
Sapling/Shrub Stratum (Plot size: \)	Prevalence Index worksheet:  Total % Cover of: Multiply by:
1	OBL species x 1 =
3.	FACW species x 2 =
4	FAC species x 3 =
5	x 4 =
Herb Stratum (Plot size: 5)	Total Cover UPL species x 5 =
1. Galamaarostiz/canadonsis 50	OBI Column Totals:(A)(B)
2. Poa palustris	FACW Prevalence Index = B/A =
3. Glycinė max 16	UP / Hydrophytic Vegetation Indicators:
4	1 - Rapid Test for Hydrophylic Vegetation
5,	✓ 2 - Dominance Test is >50%
6	3 - Prevalence Index is ≤3.0¹
7	4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
8,	Problematic Hydrophytic Vegetation¹ (Explain)
9	
72	Total Cover Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1	Hydrophytic
2	Vegetation
	Total Cover Present? Yes V No
Remarks: (Include photo numbers here or on a separate sheet.)  Hydro Phytic Vege tattom a	ntenon has been met.

٦I

Sampling Point: WET-HS-MA

Depth	Matri	ne in me ne	thru useded to doci	ment the	indicator	or confir	m the absence of indica	tors.)
(inches)	Color (moist)		Color (moist)	x Feature %	Type¹	Loc²	Tardena	Ps
0-150	104R3/1		FYR5/8	- <del>- </del>	<u> 1906</u>		Texture	Remarks
	-		5VR 3/1	_ <u>~</u> _	_ <del></del> _	1	siltyclay	
<del></del>	-		JAU 2/1		<u> </u>	<u>M</u>	Manganese ma	SSES
			***************************************	<u> </u>			<b>V</b>	
ļ				***************************************	****			<u> </u>
			<del></del>					
1								
l lype: C≃Co	ncentration, D=D	epletion, RM	=Reduced Matrix, MS	S=Masked	Sand Gra	ins.	<sup>2</sup> Location: PL=Pore	Lining, M=Matrix.
Hydric Soil Ir							Indicators for Proble	matic Hydric Soils <sup>3</sup> :
Histosol (	•			leyed Ma			Coast Prairie Red	
Plack His	pedon (A2) tic (A3)			ledox (S5)			Dark Surface (S7	
	Sulfide (A4)			Matrix (S	•		✓ Iron-Manganese i	
	Layers (A5)	ř		lucky Mina Bleyed Mar			Very Shallow Dar	
2 cm Muc				Matrix (F			Other (Explain in	Remarks)
Depleted i	Below Dark Surfa	ice (A11)		ark Surfac				•
Thick Dark	k Surface (A12)			Dark Sur			8Indicators of hydropt	viic vegetation and
	cky Mineral (S1)			epression:			wetland hydrology	
5 cm Muc	ky Peat or Peat (	S3) 					unless disturbed o	
	yer (if observed	<b>)</b> :					1	
Туре:			-,					
Depth (inch	es): <b>\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \</b>						Hydric Soil Present?	Yes No
YDROLOG'	Υ					·		
	logy Indicators	<del></del> ·	<del></del>	·				<u></u>
			ed: check all that appl	LA				
∠ Surface Wa		one is require				<del></del>		s (minimum of two required)
	Table (A2)		Water-Staine		(B9)		Surface Soil Cra	
Saturation (			Aquatic Faur				Drainage Patter	
Water Mark			True Aquatio				Dry-Season Wa	
	eposits (B2)		Hydrogen St			- 5 . <i>1</i>	Crayfish Burrow	
Drift Deposi			Oxidized Rhi Presence of			) Roots (		e on Aerial Imagery (C9)
Algai Mat o			Recent Iron I			Polic (CS)	Stunted or Stres	
Iron Deposi			Thin Muck S			00115 \$CO)	) Geomorphic Pos ✓ FAC-Neutral Tes	
	Visible on Aerial i	magery (B7)	Gauge or We				✓ CAC-Medital Let	it (Db)
	egetated Concave			-	•			•
ield Observati			7			1	<del></del>	<u> </u>
Surface Water F	resent? Y	es 🗸 N	Depth (inche	l Mae	¥4			
Water Table Pre	sent? Y	es 🔽 N	Depth (inche		vefo co	,		
Saturation Prese includes capillai	ry fringe)	es N	Depth (inche	es): <b>(Q</b> S)	xface	Wetla	nd Hydrology Present?	Yes No
NP	led Data (stream \	gauge, mon	itoring well, aerial pho	otos, previ	ous inspe	ctions), if	available:	
Remarks:	^	· · · · · · · · · · · · · · · · · · ·						
Willell Rd.	&\ \ .	1 - 1						·····
Weth	and hu	drol	ogy cn	ter	(VO)	Vic	as been	met.

#### WETLAND DETERMINATION DATA FORM - Midwest Region Project/Site: 302899: Hard in Solar II City/County: Hardin County Sampling Date: 5/02/18 State: OH 3 Sampling Point: UPL-H9-MA Applicant/Owner: TRC/ Section, Township, Range: N/A Investigator(s): MMM \_ Local relief (concave, convex, none): <u>NON</u> Landform (hillslope, terrace, etc.): +VOCT Long: -83, 78 39 7 Datum: WG 584 Lat: 40.62899 Blount 5: It loam and moraine 2-40/0 SLARWIS assistication: Are climatic I hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No \_\_\_\_ (If no, explain in Remarks.) significantly disturbed? Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_ \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.) Are Vegetation \_\_\_\_, Soil SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. No V Yes Hydrophytic Vegetation Present? is the Sampled Area Hydric Soil Present? within a Wetland? Wetland Hydrology Present? uniteria have been met. Remarks: of 3 wetland VEGETATION - Use scientific names of plants. Dominance Test worksheet: Absolute Dominant Indicator Tree Stratum (Plot size: \_30 % Cover Species? Status Number of Dominant Species That Are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: Percent of Dominant Species That Are OBL, FACW, or FAC: = Total Cover Prevalence Index worksheet: Sapling/Shrub Stratum (Piot size: Total % Cover of: Multiply by: OBL species x1 = FACW species \_\_\_\_\_ x 2 = \_\_\_\_ x 3 = .... FAC species FACU species x4=\_\_\_ \_ x5=\_\_ = Total Cover Herb Stratum (Plot size: Column Totals: \_ 1. Glurine mas Prevalence Index = B/A = \_\_ Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation **N** 2 - Dominance Test is >50% N 3 - Prevalence Index is ≤3.01 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation<sup>1</sup> (Explain) <sup>1</sup>Indicators of hydric soil and wetland hydrology must = Total Cover be present, unless disturbed or problematic. Woody Vine Stratum (Plot size: 2 Hydrophytic

Remarks: (Include photo numbers here or on a separate sheet)
Hydrophytic vegetation criterion has not been met.

Vegetation Present?

	Matrix Color (moist)		Redo	ment the inex Features					
(inches) D-\(\big(\lambda)		<del>%</del>	Color (moist)	- <del>_%</del>	Type	Loc2	Texture		Remarks
<u> </u>	104R3/2	45	104R4/0	<u> </u>		MIPL	sittu cla	l L	
								0	
	;		· · · · · · · · · · · · · · · · · · ·				<del></del>		·
	······································		····			<del></del>	<del></del>		<u> </u>
<del></del>	- <del></del>		<del></del>	-					
	·								
						<del></del> .			<del></del>
ype: C=Conc	entration. D≕Denk	etion RM=	Reduced Matrix, MS	- Mankad C			9.		<del></del>
ydric Soil Ind	icators:	July 1 din-	Roddcod MidtilX, 1910	-Masked S	ало Gra	ins.	<sup>2</sup> Location: PL	.=Pore Linir	ig, M=Matrix.
_ Histosol (A1	I)	-	Sandy G	eleyed Matrix	- /QA\				c Hydric Soils³:
_ Histic Epipe	don (A2)			Redox (S5)	K (34)		Coast Prair		A16)
_ Black Histic	(A3)			Matrix (S6)			Dark Surface Iron-Manga		(E4D)
_ Hydrogen S			•	lucky Minera					es (F12) face (TF12)
_ Stratified La				Heyed Matrix			Other (Expl		
2 cm Muck (	(A10)		Depleted	Matrix (F3)	• •		Outor (Exp	ani ili 1761ik	ains)
_ Depleted Be	low Dark Surface	(A11)		ark Surface					
	Surface (A12)			Dark Surfac			<sup>a</sup> Indicators of h	ydrophytic v	regetation and
	ly Mineral (S1) Peat or Peat (S3)		Redox D	epressions (	F6)		wetland hyd	rology mus	t be present,
strictive Law	er (if observed):	<del></del>	<u> </u>				unless distu		
Туре: <u>N о</u> ч								,.,	· · · · · · · · · · · · · · · · · · ·
	X / / /					ŀ			. /-
Depth (inches	): <u></u>		<del></del>				Hydric Soil Pres	ent? Yes	5_V No
marks: Hydv	ic soil	crit	erion h	as L	ees		met	1	
Hydr	ic soil	cnit	erion h	as L	Res		met	1	
Hydr		cnit	erion h	os b	Res		met		
PROLOGY tland Hydrolo	gy Indicators;		·		Res		met	4	
DROLOGY tland Hydroic mary Indicators	gy Indicators: s (minimum of one		; check all that appl	y)		<u>.</u>			timum of two require
DROLOGY tland Hydrolo mary Indicators Surface Wate	gy indicators: s (minimum of one er (A1)		·	y)			Secondary Ind		
DROLOGY tland Hydrolo mary Indicators Surface Water High Water To	ogy Indicators: (minimum of one er (A1) able (A2)		i; check all that appl Water-Staine Aquatic Faul	y) ed Leaves (E na (B13)	39)		Secondary Ind	icators (mir	B6)
DROLOGY tland Hydrolo mary Indicators Surface Water High Water To Saturation (A:	egy Indicators: <u>(minimum of one</u> er (A1) able (A2)		i <u>; check all that appl</u> Water-Staine Aquatic Faul True Aquatic	y) ed Leaves (B na (B13) : Plants (B14	39) ()		Secondary Ind	icators (mir oil Cracks (l Patterns (B	B6) 10)
DROLOGY tland Hydrolo mary Indicators Surface Water High Water T: Saturation (A: Water Marks	egy Indicators; s (minimum of one er (A1) able (A2) 3) (B1)		i: check all that appl Water-Staine Aquatic Faur True Aquatic Hydrogen Su	y) ed Leaves (E na (B13) : Plants (B14 :lfide Odor (G	39) () ()		Secondary Ind Surface Some Drainage I Dry-Seasc	icators (mir	B6) 10) ible (C2)
DROLOGY tland Hydrolo mary Indicators Surface Water High Water To Saturation (A: Water Marks Sediment Dep	egy Indicators: s (minimum of one er (A1) able (A2) 3) (B1) posits (B2)		l; check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen St	y) ed Leaves (E na (B13) : Plants (B14 alfide Odor (G zospheres o	39) () C1) on Living		Secondary Ind Surface Some Drainage I Dry-Season Crayfish B	lcators (mir oil Cracks (l Patterns (B on Water Ta urrows (C8	B6) 10) lble (C2)
DROLOGY tland Hydrolo mary Indicators Surface Water High Water To Saturation (A: Water Marks Sediment Dep Drift Deposits	egy Indicators: s (minimum of one er (A1) able (A2) 3) (B1) cosits (B2) (B3)		l; check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Staine Oxidized Rhi	y) ed Leaves (E na (B13) Plants (B14 iffide Odor (C zospheres o Reduced Iro	39) (3) (31) (3) (C4)	Roots (C3	Secondary Ind Surface Some Drainage I Dry-Seaso Crayfish B	lcators (mir oil Cracks (l Patterns (B on Water Ta urrows (C8 Visible on J	B6) 10) Ible (C2) ) Aerial Imagery (C9)
DROLOGY tland Hydrolo mary Indicators Surface Wate High Water T. Saturation (A: Water Marks Sediment Dep Drift Deposits Algal Mat or C	egy Indicators: (minimum of one er (A1) able (A2) 3) (B1) cosits (B2) (B3) crust (B4)		: check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron F	y) ed Leaves (E na (B13) Plants (B14 lifide Odor (C zospheres o Reduced Iro	39) (3) (31) (3) (C4)	Roots (C3	Secondary Ind Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or	icators (mir oil Cracks (i Patterns (B on Water Ta urrows (C8 Visible on J Stressed F	B6) 10) Ible (C2) ) Aerial Imagery (C9) Plants (D1)
DROLOGY tland Hydrolo mary Indicators Surface Wate High Water T. Saturation (A: Water Marks Sediment Dep Drift Deposits Algal Mat or C Iron Deposits	egy Indicators: Eximinimum of one or (A1) able (A2) 3) (B1) cosits (B2) (B3) crust (B4) (B5)	is reguired	i; check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron F	y) ed Leaves (E na (B13) Flants (B14 difide Odor (C zospheres o Reduced Iro. Reduction in urface (C7)	39) (1) (21) (21) (21) (24) (24) (24) (31)	Roots (C3	Secondary Ind Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or	icators (mir oil Cracks (i Patterns (B on Water Ta urrows (C8 Visible on Stressed F ic Position	B6) 10) lble (C2) ) Aerial Imagery (C9) Plants (D1) (D2)
DROLOGY tland Hydrolo mery Indicators Surface Water High Water T. Saturation (A: Water Marks Sediment Deposits Algal Mat or C. Iron Deposits Inundation Visit	egy Indicators:  6 (minimum of one er (A1)  able (A2)  3)  (B1)  cosits (B2)  (B3)  crust (B4)  (B5)  sible on Aerial Imag	is required	i: check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck Su	y) ed Leaves (E na (B13) Plants (B14 dide Odor (C zospheres o Reduced Iro Reduction in urface (C7) ell Data (D9)	39) C1) on Living on (C4) Tilled S	Roots (C3	Secondary Ind Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or	icators (mir oil Cracks (i Patterns (B on Water Ta urrows (C8 Visible on Stressed F ic Position	B6) 10) lble (C2) ) Aerial Imagery (C9) Plants (D1) (D2)
DROLOGY tland Hydrolo mary Indicators Surface Water High Water T. Saturation (A: Water Marks Sediment Deposits Algal Mat or C Iron Deposits Inundation Vis Sparsely Vege	ogy Indicators:  6 (minimum of one er (A1) able (A2) 3) (B1) cosits (B2) (B3) crust (B4) (B5) sible on Aerial Imagerated Concave Su	is required	l; check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Staine Oxidized Rhi Presence of Recent Iron Faur	y) ed Leaves (E na (B13) Plants (B14 dide Odor (C zospheres o Reduced Iro Reduction in urface (C7) ell Data (D9)	39) C1) on Living on (C4) Tilled S	Roots (C3	Secondary Ind Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or	icators (mir oil Cracks (i Patterns (B on Water Ta urrows (C8 Visible on Stressed F ic Position	B6) 10) lble (C2) ) Aerial Imagery (C9) Plants (D1) (D2)
DROLOGY tland Hydrolo mary Indicators Surface Water High Water To Saturation (A: Water Marks Sediment Deposits Algal Mat or Co Iron Deposits Inundation Vis Sparsely Vege d Observation	egy Indicators: s (minimum of one er (A1) able (A2) 3) (B1) cosits (B2) (B3) cosits (B4) (B5) sible on Aerial Imagerated Concave Supers	is required gery (B7) rrface (B8)	i: check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck Su Gauge or We	y) ed Leaves (E na (B13) : Plants (B14 difide Odor (C zospheres o Reduced Iro. Reduction in urface (C7) in in Remark	39) C1) on Living on (C4) Tilled S	Roots (C3	Secondary Ind Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or	icators (mir oil Cracks (i Patterns (B on Water Ta urrows (C8 Visible on Stressed F ic Position	B6) 10) lble (C2) ) Aerial Imagery (C9) Plants (D1) (D2)
DROLOGY tland Hydrolo mary Indicators Surface Water High Water Tr Saturation (A: Water Marks Sediment Dep Drift Deposits Algal Mat or C Iron Deposits Inundation Vis Sparsely Vege d Observatior ace Water Pre	egy Indicators: (minimum of one er (A1) able (A2) 3) (B1) cosits (B2) (B3) crust (B4) (B5) sible on Aerial Imagetaled Concave Survey as: sent? Yes	is required gery (B7) inface (B8)	i: check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Staine Oxidized Rhi Presence of Recent Iron Faur Thin Muck Staine Gauge or We	ed Leaves (Ena (B13): Plants (B14): Ifide Odor (Caspheres of Reduced Ironal (C7): Reduction in unface (C7): In in Remark	39) C1) on Living on (C4) Tilled S	Roots (C3	Secondary Ind Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or	icators (mir oil Cracks (i Patterns (B on Water Ta urrows (C8 Visible on Stressed F ic Position	10) lble (C2) ) Aerial Imagery (C9) Plants (D1) (D2)
DROLOGY tland Hydrolo mary Indicators Surface Water High Water T. Saturation (A: Water Marks Sediment Dep Drift Deposits Algal Mat or C Iron Deposits Inundation Vis Sparsely Vege d Observation ace Water Prae er Table Prese	egy Indicators:  Eliminimum of one or (A1) able (A2) 3) (B1) cosits (B2) (B3) Crust (B4) (B5) sible on Aerial Imagetated Concave Superiors: sent? Yes	is required gery (B7) urface (B8)	l; check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Staine Oxidized Rhi Presence of Recent Iron I Thin Muck Staine Gauge or We Other (Explaine	ed Leaves (Ena (B13) Plants (B14 Iffide Odor (Cazospheres of Reduced Iro. Reduction in unface (C7) Ill Data (D9) In in Remark Res):	39) C1) on Living on (C4) Tilled S	Roots (C3	Secondary Ind Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or	icators (mir oil Cracks (i Patterns (B on Water Ta urrows (C8 Visible on Stressed F ic Position	B6) 10) lble (C2) ) Aerial Imagery (C9) Plants (D1) (D2)
DROLOGY tland Hydrolo mary Indicators Surface Water High Water Tr. Saturation (A: Water Marks Sediment Dep Drift Deposits Algal Mat or C Iron Deposits Inundation Vis Sparsely Vege d Observatior ace Water Pre er Table Present	egy Indicators: (minimum of one er (A1) able (A2) 3) (B1) cosits (B2) (B3) crust (B4) (B5) sible on Aerial Imagetated Concave Suits: sent? Yes	is required gery (B7) inface (B8)	l; check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Staine Oxidized Rhi Presence of Recent Iron I Thin Muck Staine Gauge or We Other (Explaine) Depth (inches	ed Leaves (Ena (B13) Plants (B14 Iffide Odor (Cazospheres of Reduced Iro. Reduction in unface (C7) Ill Data (D9) In in Remark Res):	39) C1) on Living on (C4) Tilled S	Roots (C3	Secondary Ind Surface & Drainage I Dry-Seaso Crayfish B Saturation Stunted or Geomorph FAC-Neutr	lcators (mir oil Cracks (Patterns (B on Water Ta urrows (C8 Visible on a Stressed F ic Position al Test (D5	B6) 10) lble (C2) ) Aerial Imagery (C9) Plants (D1) (D2)
DROLOGY tland Hydrolo mary Indicators Surface Water High Water T. Saturation (A: Water Marks Sediment Deposits Algal Mat or C Iron Deposits Inundation Vis Sparsely Vege d Observation ace Water Prese er Table Present udes capillary	egy Indicators: s (minimum of one er (A1) able (A2) 3) (B1) cosits (B2) (B3) cosits (B4) (B5) sible on Aerial Imagetated Concave Surs: sent? Yes ent? Yes fringe)	js reguired gery (B7) rrface (B8) No	Echeck all that appl Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck Su Gauge or We Other (Explained) Depth (inches)	ed Leaves (Ena (B13): Plants (B14): Plants (B14): Plants (B14): Plants (B14): Plants (B14): Plants (C7): Plants (C7): Plants (D9): Plan	39) C1) on Living n (C4) Tilled S	Roots (C3)	Secondary Ind Surface Some Drainage I Dry-Season Crayfish B Saturation Stunted or Geomorph FAC-Neutr	lcators (mir oil Cracks (Patterns (B on Water Ta urrows (C8 Visible on a Stressed F ic Position al Test (D5	B6) 10) lble (C2) ) Aerial Imagery (C9) Plants (D1) (D2)
DROLOGY tland Hydrolo mary Indicators Surface Water High Water T. Saturation (A: Water Marks Sediment Deposits Algal Mat or C Iron Deposits Inundation Vis Sparsely Vege d Observation ace Water Prese er Table Present udes capillary	egy Indicators: s (minimum of one er (A1) able (A2) 3) (B1) cosits (B2) (B3) cosits (B4) (B5) sible on Aerial Imagetated Concave Surs: sent? Yes ent? Yes fringe)	js reguired gery (B7) rrface (B8) No	l; check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Staine Oxidized Rhi Presence of Recent Iron I Thin Muck Staine Gauge or We Other (Explaine	ed Leaves (Ena (B13): Plants (B14): Plants (B14): Plants (B14): Plants (B14): Plants (B14): Plants (C7): Plants (C7): Plants (D9): Plan	39) C1) on Living n (C4) Tilled S	Roots (C3)	Secondary Ind Surface Some Drainage I Dry-Season Crayfish B Saturation Stunted or Geomorph FAC-Neutr	lcators (mir oil Cracks (Patterns (B on Water Ta urrows (C8 Visible on a Stressed F ic Position al Test (D5	B6) 10) lble (C2) ) Aerial Imagery (C9) Plants (D1) (D2)
DROLOGY tland Hydrolo mary Indicators Surface Water High Water T. Saturation (A: Water Marks Sediment Dep Drift Deposits Algal Mat or C Iron Deposits Inundation Vis Sparsely Vege d Observation ace Water Pre er Table Prese ration Present udes capillary cribe Recorded	egy indicators:  Eliminimum of one or (A1) able (A2) 3) (B1) cosits (B2) (B3) crust (B4) (B5) sible on Aerial Imagetaled Concave Surs: sent? Yes ort? Yes ort? Yes ort? Yes ortinge)	gery (B7) Inface (B8) No. No.	l; check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen St. Oxidized Rhi Presence of Recent Iron I Thin Muck St Gauge or We Other (Explai	ed Leaves (Ena (B13) Plants (B14 Iffide Odor (Cazospheres of Reduced Iro. Reduction in unface (C7) Ill Data (D9) In in Remark In Ses):	39) C1) C1) In Living In (C4) Tilled S	Roots (C3 ofis (C6)  Wetland tions), if av	Secondary Ind Surface Some Secondary Ind Surface Some Secondary Ind Ory-Season Crayfish B Saturation Stunted or Geomorph FAC-Neutr Hydrology Presonaliable:	leators (mir oil Cracks (i Patterns (B on Water Ta urrows (C8 Visible on a Stressed F ic Position ral Test (D5	B6) 10) ble (C2) ) Aerial Imagery (C9) Plants (D1) (D2)  No
DROLOGY tland Hydrolo mary Indicators Surface Water High Water T. Saturation (A: Water Marks Sediment Dep Drift Deposits Algal Mat or C Iron Deposits Inundation Vis Sparsely Vege d Observation ace Water Pre er Table Prese ration Present udes capillary cribe Recorded	egy indicators:  Eliminimum of one or (A1) able (A2) 3) (B1) cosits (B2) (B3) crust (B4) (B5) sible on Aerial Imagetaled Concave Surs: sent? Yes ort? Yes ort? Yes ort? Yes ortinge)	gery (B7) Inface (B8) No. No.	Echeck all that appl Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron F Thin Muck Su Gauge or We Other (Explained) Depth (inches)	ed Leaves (Ena (B13) Plants (B14 Iffide Odor (Cazospheres of Reduced Iro. Reduction in unface (C7) Ill Data (D9) In in Remark In Ses):	39) C1) C1) In Living In (C4) Tilled S	Roots (C3 ofis (C6)  Wetland tions), if av	Secondary Ind Surface Some Secondary Ind Surface Some Secondary Ind Ory-Season Crayfish B Saturation Stunted or Geomorph FAC-Neutr Hydrology Presonaliable:	leators (mir oil Cracks (i Patterns (B on Water Ta urrows (C8 Visible on a Stressed F ic Position ral Test (D5	B6) 10) ble (C2) ) Aerial Imagery (C9) Plants (D1) (D2) )

Project/Site: 302899: Hardin Sa	Dar II cityk	County: Hardin County Sampling Date: 5/22/
Applicant/Owner: TKC/TU/6/18/00"	LLC.	State: OH Sampling Point: WET-H
Investigator(s):	Secti	ion Township Benea: N/A
Landform (hillslope, terrace, etc.):	'0V)	Local relief (concave, convex, none): COVCAMA
Slope (%): 0 / 6 Lat: 10.63738	Long	: 183.78391 Datum WGS84
Soil Map Unit Name: (YKA) Yewamo si Hu	Lau Loan. O-	10 Slapes NW classification PED
Are climatic / hydrologic conditions on the site typical fo	this time of year? Y	(es \ No \ /if no explain in Remarks )
Are Vegetation, Soil, or Hydrology	significantly distur	bed? V Are "Normal Circumstances" present? Yes V No
Are Vegetation, Soil, or Hydrology		
	· ·	opling point locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	No	-panie reactions, transcotts, important reatures, etc.
Hydric Soli Present? Yes	No	is the Sampled Area
Wetland Hydrology Present? Yes	No	within a Wetland? Yes No
Remarks: 3 wetland criterio	have be	an met
The same of the sa		
VEGETATION - Use scientific names of plan	ts.	
Tree Stratum (Plot size: 30)	Absolute Dom	inant Indicator Dominance Test worksheet:
1. Populus de Hoides	% Cover Spec	Number of Dominant Species
2. Framois pennsylvanica	- 109m V	FACW That Are OBL, FACW, or FAC: (A)
3 Carya Ovata	20% 🗸	Total Number of Dominant
4	-	Species Across All Strata: (B)
5		Percent of Dominant Species That Are OBL, FACW, or FAC: 53/6 (A/B)
Sapling/Shrub Stratum (Plot size: 5)	50% = Tota	Cover
	10% V	Prevalence Index worksheet:  FACW
2.	- 10.19 K	
3.		OBI. species x 1 = FACW species x 2 =
4	<del></del>	FAC species x3 =
5		FACU species x4=
Herb Stratum (Plot size:)	10% = Total	Cover UPL species x5=
1. Thomax alawa	150/	Column Totals:(A)(B)
2. Lemna minor	25%	OBL Prevalence Index = B/A =
3. Polygonumsp		NT Hydrophytic Vegetation Indicators:
4		1 - Rapid Test for Hydrophytic Vegetation
5		2 - Dominance Test is >50%
ő		3 - Prevalence Index is ≤3.0¹
7	_ <u></u>	4 - Morphological Adaptations¹ (Provide supporting
8,		data in Remarks or on a separate sheet)
9.	<del></del>	Problematic Hydrophytic Vegetation1 (Explain)
10.	450/ -	Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: 30)	45% = Total	be present, unless disturbed or problematic,
1	- <del></del>	— Hydrophytic
2		1 Monatoria di
Denote the training	= Total	Cover Present? Yes No
Remarks: (Include photo numbers here or on a separate	sheet.)	acon lose for a mot
Hydrophytic vegeta	tion and	eriori ved learning.
<u> </u>		

hydrology criterion has been met.

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

Remarks:

Project/Site: 302899: Hardin Solar	TI :	City/Cor	unty: <u>Har</u>	<u> </u>
Applicant/Owner: TRC/Invenerall	LLC	. 4	•	State: OH Sampling Point: UPL=H5-MB
Investigator(s): MMM, SKB	<u>.                                    </u>	Section	, Township, Ra	nge: N/A
Landform (hillslope, terrace, etc.): <u>+00+</u>				(concave, convex, none): NONL
Slope (%): 00/2 Lat: 40.63686	1	Long: <u> </u>		078 Datum: WG 584
Soil Map Unit Name (Blg 1 A1) Blant silt	loama	ww	maraine	0-2% NWI classification: NONL
Are climatic / hydrologic conditions on the site typical for this	()			
Are Vegetation, Soil, or Hydrology si	ignificantly o	disturbe	ed? 🔥 Are	'Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology no			• •	eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map s	showing	samp	ling point l	ocations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No				,
Hydric Soll Present? Yes No	<u>//</u> _		s the Sampled	Area
Wetland Hydrology Present? Yes No			vithin a Wetlar	<u></u>
	ena	ha	ve bee	nmet. Area is not a
wetland.				
<b>VEGETATION</b> – Use scientific names of plants.				
Tree Stratum (Plot size: 30')	Absolute % Cover		ant Indicator es? Status	Dominance Test worksheet:
1. Aesculus alabra	5%	<u>opecie</u>		Number of Dominant Species That Are OBL, FACW, or FAC: (A)
2. Cama ovata	20%	$\overline{V}$	FACU	
3. Frannûs pennsylvan ica	5%		ACW	Total Number of Dominant Species Across Ali Strata:  (B)
4				Percent of Dominant Species
,	B0%	= Total	Cover	That Are OBL, FACW, or FAC: (A/B)
Sapting/Shrub Stratum (Plot size: \)	_	/ / /		Prevalence Index worksheet:
1. Lindera benzoin	30%	-	FAC	Total % Cover of: Multiply by:
2				OBL species
] 3,		<u> </u>	····	FACW species 5 ×2= 10 FAC species 5 ×3= 150
4			<del></del>	FAC species 50 x3 = 150 FACU species 50 x4 = 200
0,1	30%		Count	UPL species $\frac{1}{8}$ $x_5 = 25$
Herb Stratum (Plot size: 5)			COVE	Column Totals: 110 (A) 38.5 (B)
1. Hudrophyllum Virginianum			<u>FAC</u>	,
2. Podopaulium petatum	25%		_ <u>Eac</u> u	Prevalence Index = B/A = 3.5
3. Polygonatum potitlerum	0/0		_ <u>FACU</u>	Hydrophytic Vegetation Indicators:
4. Jeffersonia diphylla	5%		<u>UPL</u>	1 - Rapid Test for Hydrophytic Vegetation /
5				2 - Dominance Test is >50%/V 3 - Prevalence Index is ≤3.0¹ V
6.	*			4 - Morphological Adaptations¹ (Provide supporting
7.				data in Remarks or on a separate sheet)
8.				Problematic Hydrophytic Vegetation1 (Explain)
10.	· · · · · · · · · · · · · · · · · · ·	<del></del>		
Woody Vine Stratum (Plot size: 30')	50_	= Total	Cover .	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1.	-			Hydrophytic
2.				Vegetation
		= Total	Cover	Present? Yes No V
Remarks: (Include photo numbers here or on a separate s	heet)		10.41	int been met
Hydrophytic vegetation	CVITE	VIC	SN LIOS	YIUI
			·	

Depth Matrix	Redox Features	
(inches) Color (moist) %	Color (moist) % Type¹ Loc²	Texture Remarks
0-18" <u>104R3/1 LO</u> D		- Siltuloam
		<u> </u>
Type: C=Concentration, D=Depletion, RN	#=Reduced Matrix, MS=Masked Sand Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
ydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :
Histosol (A1)	Sandy Gleyed Matrix (S4)	Coast Prairie Redox (A16)
Histic Epipedon (A2)	Sandy Redox (S5)	Dark Surface (\$7)
Black Histic (A3)	Stripped Matrix (S6)	Iron-Manganese Masses (F12)
Hydrogen Sulfide (A4) Stratified Layers (A5)	Loamy Mucky Mineral (F1)	Very Shallow Dark Surface (TF12)
_ 2 cm Muck (A10)	Loamy Gleyed Matrix (F2) Depleted Matrix (F3)	Other (Explain in Remarks)
Depleted Below Dark Surface (A11)	Redox Dark Surface (F6)	
Thick Dark Surface (A12)	Depleted Dark Surface (F7)	<sup>3</sup> Indicators of hydrophytic vegetation and
_ Sandy Mucky Mineral (S1)	Redox Depressions (F8)	wetland hydrology must be present,
_ 5 cm Mucky Peat or Peat (S3)	,	unless disturbed or problematic.
estrictive Layer (if observed):	10.	
Type: Nove		
Depth (inches): NA	<u> </u>	Hydric Soil Present? Yes No
emarks: Hydric soil cri	terion has not be	een met.
Hydric soil cr	terion has not be	en met.
Hydric soil cr	terion has not be	een met.
DROLOGY etland Hydrology Indicators:		
DROLOGY etland Hydrology Indicators:	red: check all that apply)	Secondary indicators (minimum of two required
DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one is requi	red: check all that apply) Water-Stained Leaves (B9)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6)
DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one is requil Surface Water (A1) High Water Table (A2)	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Drainage Patterns (B10)
DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3)	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2)
DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)
DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Staturation Visible on Aerial Imagery (C9)
DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4)	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)
DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) S(C3) Saturation Visible on Aerial Imagery (C9) Sturted or Stressed Plants (D1) Geomorphic Position (D2)
DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C	Secondary Indicators (minimum of two requires 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)
DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one is requiled by Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C4)  Thin Muck Surface (C7)  Gauge or Well Data (D9)	Secondary Indicators (minimum of two require  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)
DROLOGY etland Hydrology Indicators: Imary indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B) Sparsely Vegetated Concave Surface (I	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C4)  Thin Muck Surface (C7)  Gauge or Well Data (D9)	Secondary Indicators (minimum of two require  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)
DROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B) Sparsely Vegetated Concave Surface (Indeed Observations:	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (Cause of C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)	Secondary Indicators (minimum of two require  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)
TDROLOGY etland Hydrology Indicators: Imary Indicators (minimum of one is requil Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B1) Sparsely Vegetated Concave Surface (Intel Mater Conc	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)	Secondary Indicators (minimum of two require  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)
etland Hydrology Indicators: Imary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B) Sparsely Vegetated Concave Surface (Ield Observations: Iface Water Present? Ster Table Present? Ves Intertable Present?	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)  No Depth (inches):	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)
TOROLOGY  etland Hydrology Indicators: Imary Indicators (minimum of one is requised by the surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (Bill Observations: If ace Water Present?  Alter Table Present?  Ves Intertion Present? Yes	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)  No Depth (inches): NA	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)
TOROLOGY  etland Hydrology Indicators: Imary Indicators (minimum of one is requised by the surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (Bill Observations: If ace Water Present?  Alter Table Present?  Ves Intertion Present? Yes	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)  No Depth (inches):	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)
TOROLOGY  etland Hydrology Indicators:  Imary Indicators (minimum of one is requiled by the surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Grust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (Bit of Observations:  Iface Water Present? Yes	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C1)  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)  No Depth (inches): WA  Depth (inches): Water (Depth (inches): Water	Secondary Indicators (minimum of two requires 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)
DROLOGY  atland Hydrology Indicators:  mary Indicators (minimum of one is requised.)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B)  Sparsely Vegetated Concave Surface (Indicate Water Present?  Surface Water Present?  VesI  Surface Corded Data (stream gauge, moscibe Recorded Data (stream gauge)	red: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)  No Depth (inches): NA	Secondary Indicators (minimum of two requires 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)

Project/Site: 302899: Hardin Solar	II City/Co	unty: Have	an countu	Sampling Date: 5/22/18
Applicant/Owner: TRC/Inveneray, LLC	, ,		State: OH	Sampling Point: WET-HS-1
Investigator(s): MMM SKB 33	Section	. Townshio, Ra	nge: NA	
Lendform (hillslope, terrace, etc.): depression		Local relief	(concave, convex, none):	concern
Slope (%): 0% Lat: 40.63731				Datum: WG584
Soil Map Unit Name (PKA) Pewanno 5 Hy clay				
Are climatic / hydrologic conditions on the site typical for this tim	•			
	-			
Are Vegetation, Soil, or Hydrology signif		, -(		
Are Vegetation, Soil, or Hydrology natur		•	eded, explain any answer	·
SUMMARY OF FINDINGS - Attach site map sho	wing sam	oling point l	ocations, transects,	, important features, etc.
Hydrophytic Vegetation Present? Yes No		_		
Hydric Soll Present? Yes No		is the Sampled	. /	/
Wetland Hydrology Present? Yes No		within a Wetlar		No
Remarks 3 wetland criteriano	we bee	m.met.		
1 Action				
and the state of t				
VEGETATION - Use scientific names of plants.				
	solute Domir <u>Cover</u> Speci	nant Indicator es? Status	Dominance Test works	
1. Platanus occidentalis	<u> </u>	FACIL	Number of Dominant Sp That Are OBL, FACW, o	
2. Acur sarchamnum 5		FACW		
3. Fraxinus pennsulvamica	5	FACW	Total Number of Domina Species Across All Strat	
4. Quencus palustris	5	FACW		
5			Percent of Dominant Spi That Are OBL, FACW, o	ecies r FAC:   O ( (A/B)
	30 = Total	Cover		
Sapling/Shrub Stratum (Plot size: 100)	ا. ا	Eka	Prevalence Index work	1'
1. Fraxinus pennsylvanica	$O_{\Lambda}$	<u> FACW</u>	Total % Cover of:	
				x 1 =
				x3=
4		<del></del>		x4=
· \	= Total	Cover		x5=
Herb Stratum (Plot size:)		, Ouver		(A) (B)
1. Carex spinita	<u> 2</u> <u> </u>	OBL		
2. Parthonocissus quinquefolia !	<u> </u>	_ FACU	Prevalence Index	
3. Andsalmathiphyllum	$\Box$	_ FACW	Hydrophytic Vegetation	
4		<del></del> [	1- Rapid Test for H	· · · · · · · · · · · · · · · · · · ·
5,	· ·	-	✓ 2 - Dominance Test	
6			3 - Prevalence Inde:	x is So.V daptations <sup>1</sup> (Provide supporting
		<del></del> -	data in Remarks	or on a separate sheet)
8			Problematic Hydrop	hytic Vegetation¹ (Explain)
9				
10.		Cover	Indicators of hydric soil-	and wetland hydrology must
Woody Vine Stratum (Plot size: 30)	- I U(3)	OOARI	be present, unless distu	rbed or problematic,
1			Hydrophytic	,
2			3 Campanal au	No
	C = Total	Cover	Present? Yes	NO
Remarks: (Include photo numbers here or on a separate sheet	t.)	חירישית [	ms hoon n	no-t-
Hydro Phytic Vegetatic	in 1 Ch 12	OF LOTE !	ا الكيناسي التي اسا ا	V- ( '
				l

Profile Description: (Describe to the dep Depth Matrix		x Features	or comm	in the absence of indi	cators.)
(inches) Color (moist) %	Color (moist)	% Type <sup>1</sup>	Loc <sup>2</sup>	. <u>Texture</u>	Remarks
0-18 10482/1 GE	1048 4/C		M	CIA COLL	Remarks
<u> </u>	10 (11 (7)			SITY CXMY	
				· — — —	
	## 1, %. C	· · · · · · · · · · · · · · · · · · ·	_		
	<del></del>	·			
	<u> </u>				
				· <del></del>	
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=	Reduced Matrix, MS	=Masked Sand Gr	ains.	2Location: PL=Pr	ore Lining, M=Matrix.
Hydric Soil Indicators:				Indicators for Pro	blematic Hydric Soils <sup>3</sup> :
Histosol (A1)	Sandy G	leyed Matrix (S4)		Coast Prairie F	•
Histic Epipedon (A2)		edox (S5)		Dark Surface (	• •
Black Histic (A3)		Matrix (36)			se Masses (F12)
✓ Hydrogen Sulfide (A4)		ucky Mineral (F1)			Park Surface (TF12)
Stratified Layers (A5)		leyed Matrix (F2)		Other (Explain	
2 cm Muck (A10)		Matrix (F3)			Willeman Dy
Depleted Below Dark Surface (A11)		ark Surface (F6)			
Thick Dark Surface (A12)		Dark Surface (F7)		<sup>a</sup> Indicators of hydro	phytic vegetation and
Sandy Mucky Mineral (S1)	Redox De	epressions (FB)			gy must be present,
5 cm Mucky Peat or Peat (S3)		·			d or problematic.
Restrictive Layer (if observed):				1	
Type: Novu					. /
Depth (inches): N/A				Hydric Soil Present	? Yes 🔽 No
				1 -	
Remarks: Hydric Soil ori	terion 1	has be	en n	net.	
Remarks: Hydric Soilon	terion (	∩as bed	W n	net.	
Hydric soil cr	terion (	nas bed	2)/\ Y\	net.	
YDROLOGY Wetland Hydrology Indicators:			2X/ Y)	net.	
YDROLOGY Wetland Hydrology Indicators:			en n		tors (minimum of two required)
YDROLOGY Wetland Hydrology Indicators:	d: check all that appl	у)	en n	Secondary Indica	
Hydric Sork (X)  YDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is require	id: check all that appl ✓ Water-Stains	y) od Leaves (B9)	en n	Sacondary Indica	Cracks (B6)
YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is require Surface Water (A1)	id: check all that appl  Water-Stains  Aquatic Fau	y) od Leaves (B9) na (B13)	W n	Secondary Indica Surface Soil Drainage Pat	Cracks (B6) terns (B10)
IYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is require Surface Water (A1) High Water Table (A2)	id: check all that appl  Water-Stains  Aquatic Faur  True Aquatic	v) od Leaves (B9) na (B13) : Plants (B14)	W n	Secondary indica Surface Soil Drainage Pat Dry-Season \	Cracks (B6) terns (B10) <i>N</i> ater Table (C2)
YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is require Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	ed: check all that appl  Water-Stains  Aquatic Faus  True Aquatic  Hydrogen Su	y) ed Leaves (B9) na (B13) Plants (B14) ulfide Odor (C1)		Secondary Indica Surface Soil Drainage Pat Dry-Season \ Crayfish Burr	Cracks (B6) terns (B10) Water Table (C2) ows (C8)
IYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is require Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	ed: check all that appl  Water-Stains Aquatic Faul True Aquatic Whydregen Su Chidized Rhi	y) of Leaves (B9) na (B13) : Plants (B14) ulfide Odor (C1) zospheres on Livir	ng Roots (	Secondary Indica Surface Soil Drainage Pat Dry-Season \ Crayfish Burr C3) Saturation Vi	Cracks (B6) terns (B10) Water Table (C2) ows (C8) sible on Asrial Imagery (C9)
YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is require Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	ed: check all that appl  Water-Staine Aquatic Faus True Aquatic V Hydregen Su Oxidized Rhi Presence of	y) ad Leaves (B9) na (B13) Plants (B14) Uffide Odor (C1) zospheres on Livir	ng Roots (	Secondary Indica  Surface Soil  Drainage Pat  Dry-Season V  Crayfish Burr  Saturation Vi  Stunted or St	Cracks (B6) terns (B10) Water Table (C2) ows (C8) sible on Asrial Imagery (C9) ressed Plants (D1)
IYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is require Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	d: check all that appl  Water-Staine Aquatic Faur True Aquatic Hydregen Su Oxidized Rhi Presence of Recent Iron I	y) ad Leaves (B9) na (B13) i Plants (B14) ulfide Odor (C1) zospheres on Livir Reduced Iron (C4) Reduction in Tilled	ng Roots (	Secondary Indica Surface Soil Drainage Pat Dry-Season V Crayfish Burr C3) Saturation Vi Stunted or St Geomorphic	Cracks (B6) terns (B10)  Water Table (C2) ows (C8) sible on Asrial Imagery (C9) ressed Plants (D1) Position (D2)
IYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is require  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Grust (B4)  Iron Deposits (B5)	d: check all that appl  Water-Stains Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron I	y) ed Leaves (B9) na (B13) Plants (B14) ulfide Odor (C1) zospheres on Livir Reduced iron (C4) Reduction in Tilled	ng Roots (	Secondary Indica  Surface Soil  Drainage Pat  Dry-Season V  Crayfish Burr  Saturation Vi  Stunted or St	Cracks (B6) terns (B10)  Water Table (C2) ows (C8) sible on Asrial Imagery (C9) ressed Plants (D1) Position (D2)
IYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is require Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aeriel Imagery (B7)	d: check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron I Thin Muck St	y) ad Leaves (B9) ha (B13) Plants (B14) Ulfide Odor (C1) zespheres on Livir Reduced Iron (C4) Reduction in Tilled urface (C7)	ng Roots (	Secondary Indica Surface Soil Drainage Pat Dry-Season V Crayfish Burr C3) Saturation Vi Stunted or St Geomorphic	Cracks (B6) terns (B10)  Water Table (C2) ows (C8) sible on Asrial Imagery (C9) ressed Plants (D1) Position (D2)
IYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is require Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8	d: check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron I Thin Muck St	y) ed Leaves (B9) na (B13) Plants (B14) ulfide Odor (C1) zospheres on Livir Reduced iron (C4) Reduction in Tilled	ng Roots (	Secondary Indica Surface Soil Drainage Pat Dry-Season V Crayfish Burr C3) Saturation Vi Stunted or St Geomorphic	Cracks (B6) terns (B10)  Water Table (C2) ows (C8) sible on Asrial Imagery (C9) ressed Plants (D1) Position (D2)
IYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is require  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aeriel Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Field Observations:	d: check all that appl  Water-Stains Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron I Thin Muck St Gauge or We  Other (Explain	y) ad Leaves (B9) na (B13) Plants (B14) Ulfide Odor (C1) zospheres on Livir Reduced Iron (C4) Reduction In Tilled urface (C7) Ell Data (D9) in in Remarks)	ng Roots (	Secondary Indica Surface Soil Drainage Pat Dry-Season V Crayfish Burr C3) Saturation Vi Stunted or St Geomorphic	terns (B10)  Nater Table (C2)  ows (C8)  sible on Asrial Imagery (C9)  ressed Plants (D1)  Position (D2)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is require  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8  Field Observations:  Burface Water Present?  Yes No	id: check all that appl  Water-Stains Aquatic Faur True Aquatic Hydregen Su Oxidized Rhi Presence of Recent Iron I Thin Muck So Gauge or We Other (Explain	y) ad Leaves (B9) as (B13) Plants (B14) Uffide Odor (C1) zospheres on Livir Reduced Iron (C4) Reduction in Tilled urface (C7) bil Data (D9) in in Remarks)	ng Roots ( Soils (C6	Secondary Indica Surface Soil Drainage Pat Dry-Season V Crayfish Burr C3) Saturation Vi Stunted or St Geomorphic	Cracks (B6) terns (B10)  Water Table (C2) ows (C8) sible on Asrial Imagery (C9) ressed Plants (D1) Position (D2)
IYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is require  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Grust (B4)  Iron Deposits (B5)  Inundation Visible on Aeriel Imagery (B7)  Sparsely Vegetated Concave Surface (B8 Field Observations:  Surface Water Present?  Water Table Present?	d: check all that appl  Water-Staine Aquatic Faur True Aquatic Hydregen Su Oxidized Rhi Presence of Recent Iron I Thin Muck So Gauge or We Other (Explain	y) ad Leaves (B9) na (B13) Plants (B14) Uffide Odor (C1) zospheres on Livir Reduced Iron (C4) Reduction in Tilled urface (C7) In In Remarks) In In Remarks) In In Remarks	ng Roots ( Soils (C6	Secondary Indica Surface Soil Drainage Pat Dry-Season V Crayfish Burr C3) Saturation Vi Stunted or St Geomorphic	Cracks (B6) terns (B10)  Water Table (C2) ows (C8) sible on Asrial Imagery (C9) ressed Plants (D1) Position (D2)
IYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is require  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aeriel Imagery (B7)  Sparsely Vegetated Concave Surface (B8 Field Observations:  Burface Water Present?  Water Table Present?  Yes  No	d: check all that appl  Water-Staine Aquatic Faur True Aquatic Hydregen Su Oxidized Rhi Presence of Recent Iron I Thin Muck So Gauge or We Other (Explain	y) ad Leaves (B9) as (B13) Plants (B14) Uffide Odor (C1) zospheres on Livir Reduced Iron (C4) Reduction in Tilled urface (C7) bil Data (D9) in in Remarks)	ng Roots ( Soils (C6	Secondary Indica Surface Soil Drainage Pat Dry-Season V Crayfish Burr C3) Saturation Vi Stunted or St Geomorphic	Cracks (B6) terns (B10) Water Table (C2) ows (C8) sible on Asrial Imagery (C9) ressed Plants (D1) Position (D2) Test (D5)
IYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is require  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aeriel Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Field Observations:  Surface Water Present?  Water Table Present?  Yes No.	d: check all that appl  Water-Stains Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron I Thin Muck So Gauge or We Other (Explain	y) ad Leaves (B9) ha (B13) Plants (B14) Ulfide Odor (C1) zospheres on Livir Reduced Iron (C4) Reduction In Tilled urface (C7) in In Remarks) his in Remarks) his in Remarks	ng Roots ( Soils (C6	Secondary Indica Surface Soil Drainage Pat Dry-Season \ Crayfish Burr C3) Saturation Vi Stunted or St Geomorphic FAC-Neutral	Cracks (B6) terns (B10) Water Table (C2) ows (C8) sible on Asrial Imagery (C9) ressed Plants (D1) Position (D2) Test (D5)
IYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is require  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aeriel Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Field Observations:  Surface Water Present?  Water Table Present?  Ves Note of the Marks (B1)  Note of the Marks (B1)  Note of the Marks (B2)  Note of the Marks (B2)  Saturation Present?  Yes Note of the Marks (B2)  N	d: check all that appl  Water-Stains Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron I Thin Muck So Gauge or We Other (Explain	y) ad Leaves (B9) ha (B13) Plants (B14) Ulfide Odor (C1) zospheres on Livir Reduced Iron (C4) Reduction In Tilled urface (C7) in In Remarks) his in Remarks) his in Remarks	ng Roots ( Soils (C6	Secondary Indica Surface Soil Drainage Pat Dry-Season \ Crayfish Burr C3) Saturation Vi Stunted or St Geomorphic FAC-Neutral	Cracks (B6) terns (B10) Water Table (C2) ows (C8) sible on Asrial Imagery (C9) ressed Plants (D1) Position (D2) Test (D5)
IYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is require Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aeriel Imagery (B7) Sparsely Vegetated Concave Surface (B8 Field Observations: Surface Water Present? Water Table Present? Water Table Present? Yes No. Saturation Present? Includes capillary fringe) Describe Recorded Data (stream gauge, moni	d: check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Staine Oxidized Rhi Presence of Recent Iron I Thin Muck Staine Gauge or We Other (Explaine Depth (Inches) Depth (Inches) Depth (Inches) Depth (Inches)	y) ad Leaves (B9) ha (B13) Plants (B14) Ulfide Odor (C1) zospheres on Livir Reduced Iron (C4) Reduction In Tilled urface (C7) ID Data (D9) in in Remarks) as):  BSUFFACE ptos, previous insp	Solis (C6) Wetla	Secondary Indica Surface Soil Drainage Pat Dry-Season \ Crayfish Burr C3) Saturation Vi Stunted or St Geomorphic FAC-Neutral	Cracks (B6) terns (B10)  Water Table (C2) rows (C8) sible on Aerial Imagery (C9) ressed Plants (D1) Position (D2) Test (D5)  No
YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is require Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aeriel Imagery (B7) Sparsely Vegetated Concave Surface (B8 Field Observations: Surface Water Present? Water Table Present? Ves No Saturation Present? Yes No Secribe Recorded Data (stream gauge, moni	d: check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Staine Oxidized Rhi Presence of Recent Iron I Thin Muck Staine Gauge or We Other (Explaine Depth (Inches) Depth (Inches) Depth (Inches) Depth (Inches)	y) ad Leaves (B9) ha (B13) Plants (B14) Ulfide Odor (C1) zospheres on Livir Reduced Iron (C4) Reduction In Tilled urface (C7) ID Data (D9) in in Remarks) as):  BSUFFACE ptos, previous insp	Solis (C6) Wetla	Secondary Indica Surface Soil Drainage Pat Dry-Season \ Crayfish Burr C3) Saturation Vi Stunted or St Geomorphic FAC-Neutral	Cracks (B6) terns (B10)  Water Table (C2) rows (C8) sible on Aerial Imagery (C9) ressed Plants (D1) Position (D2) Test (D5)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is require  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Grust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Field Observations:  Surface Water Present?  Ves No.  Saturation Present?  Yes No.	d: check all that appl  Water-Staine Aquatic Faur True Aquatic Hydrogen Staine Oxidized Rhi Presence of Recent Iron I Thin Muck Staine Gauge or We Other (Explaine) Depth (Inchestor) Depth (Inchestor) Depth (Inchestor)	y) ad Leaves (B9) ha (B13) Plants (B14) Ulfide Odor (C1) zospheres on Livir Reduced Iron (C4) Reduction In Tilled urface (C7) ID Data (D9) in in Remarks) as):  BSUFFACE ptos, previous insp	Solis (C6) Wetla	Secondary Indica Surface Soil Drainage Pat Dry-Season \ Crayfish Burr C3) Saturation Vi Stunted or St Geomorphic FAC-Neutral	Cracks (B6) terns (B10)  Water Table (C2) rows (C8) sible on Aerial Imagery (C9) ressed Plants (D1) Position (D2) Test (D5)  No

LAFIN bortion

Project/Site: 302899 Havain Sol	ar II city/	County: Have	lin county sa	impling Date: <u>5/22/18</u>
Applicant/Owner: TRC/Invenergy, L	LU,		State: OF Sa	mpling Point: WEI-HS-YJ
investigator(s): 14114141 3 V	Secti	ion, Township, Ra	nge:	· · · · · · · · · · · · · · · · · · ·
Landform (hillslope, terrace, etc.): (10,07055)011				
Slope (%): 0% Lat: 40.63672				
Soil Map Unit Name: (PKA) PENIAMO SIHUC	lau laam.	0-19/0 5	MWI classificatio	n: None
Are climatic / hydrologic conditions on the site typical for ti	is time of year? \	res No	(if no. explain in Rema	arks.)
Are Vegetation, Soil, or Hydrology		•		· /
Are Vegetation, Soil, or Hydrology				
SUMMARY OF FINDINGS - Attach site map				
Hydric Soil Present? Yes I	No No No	is the Sampled		No
Remarks: All 3 wetland criteria		en met.	<del></del>	Δ
		Arrange and the second and the secon		
VEGETATION – Use scientific names of plants				
Tree Stratum (Plot size: 30')	Absolute Don <u>% Cover</u> Spe	ninant Indicator ecies? Status	Dominance Test workshe	
1.			Number of Dominant Speci That Are OBL, FACW, or F.	
2.				
3,			Total Number of Dominant Species Across All Strata:	(B)
4.				
5	<del>_</del>	:	Percent of Dominant Specie That Are OBL, FACW, or Fa	
151	= Tot	al Cover		. ,
Sapling/Shrub Stratum (Plot size: 15 )			Prevalence Index worksho	
	<del> </del>	<del></del>	Total % Cover of: OBL species	
3	<del> </del>		FACW species	
4			FAC species	
5			FACU species	
		al Cover	UPL species	
Herb Stratum (Plot size:)		( 00:	Column Totals:	
1. Carex crin at a	- 쥬O - ^	/ <u>UBL</u>	<del></del>	
2. Phalan's annihine coa			Prevalence Index = B	
3,	<del> </del>		Hydrophytic Vegetation Ir	· · · · · · · · · · · · · · · · · · ·
4		<u> </u>	1 - Rapid Test for Hydro	
5.	<del>-</del>	<u> </u>	✓ 2 - Dominance Test is >	
6			3 - Prevalence Index is	·
7				tations <sup>1</sup> (Provide supporting on a separate sheet)
8.			Problematic Hydrophyti	
9	<del> </del>			
Woody Vine Stratum_(Plot size: 30)	100 = Tota	al Cover	<sup>1</sup> Indicators of hydric soil and be present, unless disturbed	
1	·		Hydrophytic	
2.			V	
		al Cover	Present? Yes	No
Remarks: (Include photo numbers here or on a separate	sheet.)	Lascono I	MIS book mo	+
Hydro Phytic vegeta	TOVI CVIT	INA FORE	W DECKLING	

LE LOVATION

SOIL Sampling Point: ME Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Matrix Color (moist) finches Color (moist) <sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix. Hydric Soil Indicators: Indicators for Problematic Hydric Soils3: Histosol (A1) Sandy Gleyed Matrix (S4) Coast Prairie Redox (A16) Histic Epipedon (A2) Sandy Redox (S5) Dark Surface (S7) Black Histic (A3) Stripped Matrix (S6) Iron-Manganese Masses (F12) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) \_ Very Shallow Dark Surface (TF12) Loamy Gleyed Matrix (F2) Stratified Layers (A5) Other (Explain in Remarks) 2 cm Muck (A10) Depleted Matrix (F3) Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) <sup>8</sup>Indicators of hydrophytic vegetation and Sandy Mucky Mineral (S1) Redox Depressions (F8) wetland hydrology must be present, 5 cm Mucky Peat or Peat (S3) unless disturbed or problematic. Restrictive Layer (if observed): Hydric Soil Present? Depth (inches): Hydric soil criterion has been met **HYDROLOGY** Wetland Hydrology Indicators: Primary Indicators (minimum of one is required: check all that apply) Secondary Indicators (minimum of two required) Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6) High Water Table (A2) Aquatic Fauna (B13) ✓ Drainage Patterns (B10) Saturation (A3) True Aquatic Plants (B14) Dry-Season Water Table (C2) Water Marks (B1) Hydrogen Sulfide Odor (C1) Crayfish Burrows (C8) Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Saturation Visible on Aerial Imagery (C9) Drift Deposits (B3) Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Geomorphic Position (D2) Iron Deposits (B5) Thin Muck Surface (C7) ✓ FAC-Neutral Test (D5) Inundation Visible on Aerial Imagery (B7) Gauge or Well Data (D9) Sparsely Vegetated Concave Surface (B8) Other (Explain in Remarks) Field Observations: Surface Water Present? Water Table Present? Saturation Present? Depth (Inches): 05 W + CCL Wetland Hydrology Present? Yes (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: wetland hydrology criterion has been met.

PFO portion

Project/Site: 302899: Hardin Sol	Par II City/County: Hav	rain County Sampling Date: 5/22/19
Applicant/Owner: TRC/Invenerau. L	LC.	State: OH Sampling Point: WET-HS-
Investigator(s): MMM, SKB 33	Section, Township,	61 <i>((</i> )
Landform (hillslope, terrace, etc.):	∠ Local reli	ef (concave, convex, none): CONCOW
Slope (%): 00/6 Lat: 40.63673	Long: 183.79	8047 Detum: WG 584
Soil Map Unit Name: (PKA) Pewamo Si Hu	clayloam.0-10%.	DES_NWI classification: NON
Are climatic / hydrologic conditions on the site typical for ti		
Are Vegetation, Soil, or Hydrology		. /
Are Vegetation, Soil, or Hydrology		· · · · · · · · · · · · · · · · · · ·
		locations, transects, important features, etc.
	No	
<del></del> _	No Is the Samp!	/
E. A.	No within a Wet	^ ^ ^ ^ ^
Remarks: 3 wetland criteria	have been met	
VEGETATION - Use scientific names of plants	S.	3.00
20'	Absolute Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: OU)	Species? Status FAC	Number of Dominant Species
2. Ostrua vira pieva	5 FACU	V That Are OBL, FACW, or FAC:(A)
3.		Total Number of Dominant Species Across All Strata:  (B)
4.		
5,		Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
Sapling/Shrub Stratum (Plot size: 15)	= Total Cover	Prevalence index worksheet:
1. Lindera bezoin	40 V FACE	
2. Fraxinus pennslyvanica	5 FACW	- I
з	·	FACW species x 2 =
4		FAC species x 3 =
5	45 = Total Cover	FACU species x 4 =
Herb Stratum (Plot size:)	45 = Total Cover	UPL species x 5 = (B)  Column Totals: (A) (B)
1. Carex grayi	90 V. FACI	Octobril Totals:(A)
2. Carex chinata	30 V OBL	Prevalence Index = B/A =
3. Carex blando	5 FAC	Hydrophytic Vegetation indicators:
4.       5.		✓ 1 - Rapid Test for Hydrophytic Vegetation ✓ 2 - Dominance Test is >50%
6		3 - Prevalence Index is ≤3.0¹
7.		4 - Morphological Adaptations¹ (Provide supporting
8		data in Remarks or on a separate sheet)
9	<del></del>	Problematic Hydrophytic Vegetation¹ (Explain)
10.	7.5	Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: 30)	Total Cover	be present, unless disturbed or problematic.
1		Hydrophytic
2		Vegetation
	= Total Cover	Present? Yes V No
Remarks: (Include photo numbers here or on a separate Hydro Phytic vegeta	sheet.)	was been most
mysiop glic vegeta	LIONI CALLER FORE	

KLO bortion

Sampling Point: SOIL Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Depth Matrix Redox Features Color (moist) Color (moist) Type<sup>1</sup> Loc2 Texture (inches <sup>2</sup>Location: PL=Pore Lin<u>ing, M=Matrix.</u> <sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Hydric Soil Indicators: Indicators for Problematic Hydric Soils3: Histosol (A1) Coast Prairie Redox (A16) Sandy Gleyed Matrix (S4) Histic Epipedon (A2) Sandy Redox (S5) Dark Surface (S7) Black Histic (A3) Stripped Matrix (S6) Iron-Manganese Masses (F12) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) Very Shallow Dark Surface (TF12) Stratified Layers (A5) Loamy Gleyed Matrix (F2) Other (Explain in Remarks) 2 cm Muck (A10) Depleted Matrix (F3) Depleted Below Dark Surface (A11) Redox Dark Surface (F6) Thick Dark Surface (A12) Depleted Dark Surface (F7) <sup>3</sup>Indicators of hydrophytic vegetation and Sandy Mucky Mineral (S1) Redox Depressions (F8) wetland hydrology must be present, 5 cm Mucky Peat or Peat (S3) unless disturbed or problematic. Restrictive Layer (if observed): None Hydric Soil Present? Depth (inches): N/A Hydric soil criterion has been met HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required: check all that apply) Secondary Indicators (minimum of two required) ∠ Surface Water (A1) ✓ Water-Stained Leaves (B9) Surface Soil Cracks (B6) High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10) Saturation (A3) True Aquatic Plants (B14) Dry-Season Water Table (C2) Water Marks (B1) Hydrogen Suifide Odor (C1) Crayfish Burrows (C8) Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Saturation Visible on Aerial Imagery (C9) Drift Deposits (B3) Stunted or Stressed Plants (D1) Presence of Reduced Iron (C4) Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Geomorphic Position (D2) Iron Deposits (B5) Thin Muck Surface (C7) ✓ FAC-Neutral Test (D5) Inundation Visible on Aerial Imagery (B7) Gauge or Well Data (D9) Sparsely Vegetated Concave Surface (B8) Other (Explain in Remarks) Field Observations: Surface Water Present? Water Table Present? Saturation Present? Depth (inches)(O)SW+QU Wetland Hydrology Present? (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: wetland hydrology criterion has been met.

Project/Site: 302899: Hardin Solar	CII C	ity/Coun	o. Har	QIN COUNTY Sampling Date: 5/22/
Applicant/Owner: TRC/Invenerau	_	``\		State: OH Sampling Point: UPL-HS-N
Investigator(s): MMM, SKB	S	ection, T	Fownship, Rar	ige: N/A
Landform (hillslope, terrace, etc.):		_	Local relief (	concave, convex, none): Nove
Sione (%): C% Lat: 40, 63638	Lo	ona: ~ <	23.780	74 Datum: WG 584
Slope (%): 0% Lat: 40,63638 Soil Map Unit Name: Blg181 Blount silt	ROOM, aron	UWD m	oraine	2-U96 NWI classification: NONL
Are climatic i hydrologic conditions on the site typical for thi				
Are Vegetation, Soil, or Hydrologys	<del>-</del>			Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology r			' <del>'</del> .	eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map				
Hydrophytic Vegetation Present? Yes N	lo	1		
Hydric Soil Present? Yes N	lo 🗸	1	the Sampled	
	lo <u> </u>		thin a Wetlan	
Remarks: 0 of 3 wetland cn't	ena 1	nav	e been	met. Area is not a
wetland.				
VEGETATION - Use scientific names of plants.				
7.0	Absolute I		nt Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30)	% Cover	Species'		Number of Dominant Species
1. Tilia amenicana	<u> </u>	<u> </u>	- FACU NI	That Are OBL, FACW, or FAC: (A)
2. Crateagus sp.	. <del>.         -</del> -			Total Number of Dominant Species Across All Strata:  (B)
4	-			
δ				Percent of Dominant Species That Are OBL, FACW, or FAC:
5	70_=	Total Co	over	
Sapling/Shrub Stratum (Plot size: \\)	10	. /	ENCLI	Prevalence Index worksheet:
1. Comus amamum	- 10	_:Y	_ <u>FACW</u>	
2				OBL species x 1 =  FACW species x 2 =
А .				FAC species x 3 =
5				FACU species x 4 =
<u> </u>	10 =	Total Co	over	UPL species x 5 =
Herb Stratum (Plot size:)	<u> </u>	4	٠	Column Totals: (A) (B)
1 Podophyllum petatum	. 끊으 -	<b>√</b> -	- <del>1400</del>	Survey for days a Std or
2. Dicentra cucullana	- 10 -		- 45-	Prevalence Index = B/A =
3. Hydrophyllum pirginiana			- FA.C	1 - Rapid Test for Hydrophytic Vegetation
4				2 - Dominance Test is >50%
5,				3 - Prevalence Index is ≤3.0¹
7			<del> </del>	4 - Morphological Adaptations <sup>1</sup> (Provide supporting
8.				data in Remarks or on a separate sheet)
9.				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
10				11-25-4
Woody Vine Stratum (Plot size: 30)	<del>7</del> 6_=	Total C	over	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
vyoody vine Stratum (Plot size: 2	•		Ì	
1				Hydrophytic Vegetation
	<u> </u>	Total C	over	Present? Yes No
Remarks: (Include photo numbers here or on a separate	-1			in at looping a 0 to
Hydrophytic vegetation	crite	NO	n Mas	NOI LEWINGT.

	Color (moist)	%	Redox Features Color (moist) % Type¹ Loc²	Texture	Remarks
\D	10 6 N. A.	. ⊥00			
·					
<u>, , , , , , , , , , , , , , , , , , , </u>		· —— —			
					Such character and the such as
<del></del>					
			·		
	<del></del>	<del></del>			
		etion, RM=Re	educed Matrix, MS=Masked Sand Grains.		PL=Pore Lining, M=Matrix.
Hydric Soil In					for Problematic Hydric Soils <sup>3</sup> :
Histosol (/	· · · · ·		Sandy Gleyed Matrix (S4)		Prairie Redox (A16)
- ,	pedon (A2)		Sandy Redox (S5)		urface (S7)
Black Hist	*, *		Stripped Matrix (S6)		inganese Masses (F12)
	Sulfide (A4) Layers (A5)		Loamy Mucky Mineral (F1)		nallow Dark Surface (TF12)
Straumed I	,		Loamy Gleyed Matrix (F2)	Uiner (	Explain in Remarks)
	k (A:0) Below Dark Surface	· /A11)	Depleted Matrix (F3) Redox Dark Surface (F6)		
	k Surface (A12)	(ATT)	Redox Dark Surface (F6) Depleted Dark Surface (F7)	3Indicators	of hydrophytic vegetation and
	cky Mineral (S1)		Redox Depressions (F8)		hydrology must be present,
	ky Peat or Peat (S3)	1	reduce populations (- o)		disturbed or problematic.
	yer (if observed):	<u>′</u>		1	and the first of the second
Туре: 🚺 🔿					
	es): N/A	<del></del>		Hydric Soil I	Present? Yes No
	ea), <u>1 - , , , , , , , , , , , , , , , , , , </u>				
Remarks: Hydl	nic soil	! cvite	erion has not b	een m	et.
Hyd		l criti	erion has not b	een m	et. 
Hydi	Y	l criti	erion has not b	een m	et.
Hyd)  IYDROLOG  Wetland Hydro	Y ology indicators:		)		
Hydl IYDROLOG Wetland Hydro Primary Indicat	Y ology indicators; tors (minimum of on		check all that apply)	Secondar	y Indicators (minimum of two required)
Hydl IYDROLOG Wetland Hydro Primary Indicat Surface W	Y ology indicators; tors (minimum of on ater (A1)		check all that apply)  Water-Stained Leaves (B9)	Secondar	v Indicators (minimum of two required) ce Soil Cracks (B6)
Hydli IYDROLOG Wetland Hydro Primary Indicat Surface W High Wate	Y ology indicators: tors (minimum of on fater (A1) r Table (A2)		check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)	Secondar Surfa Drain	v Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10)
Hydli IYDROLOG Wetland Hydro Primary Indicat Surface W High Wate Saturation	Y ology Indicators; tors (minimum of on ater (A1) r Table (A2) (A3)		check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)	Secondar Surfa Drain Dry-8	v Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) leason Water Table (C2)
Hydlogo Wetland Hydrogo Primary Indicate Surface W High Wate Saturation Water Mar	Y ology Indicators; tors (minimum of on ater (A1) r Table (A2) (A3) ks (B1)		check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)	Secondar Surfa Drain Dry-S Crayl	v Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) ieason Water Table (C2) ish Burrows (C8)
Hydlog  Wetland Hydro  Primary Indicat  Surface W  High Wate  Saturation  Water Mar  Sediment I	Y clogy Indicators; tors (minimum of on ater (A1) r Table (A2) (A3) ks (B1) Deposits (B2)		check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots	Secondar Surfa Drain Dry-S Crayl (C3) Satur	v Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) leason Water Table (C2) ish Burrows (C8) ation Visible on Aerial Imagery (C9)
Hydeliand Hydro Primary Indicat Surface W High Wate Saturation Water Mar. Sediment I Drift Depos	Y clogy Indicators; tors (minimum of on fater (A1) r Table (A2) (A3) rks (B1) Deposits (B2)		check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4)	Secondar Surfa Drain Dry-S Crayl (C3) Satur	y Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) teason Water Table (C2) tish Burrows (C8) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1)
Hydel  IYDROLOG  Wetland Hydre  Primary Indicate  Surface W  High Wate  Saturation  Water Man  Sediment I  Drift Depos	Y ology Indicators; tors (minimum of on ater (A1) or Table (A2) (A3) ks (B1) Deposits (B2) sits (B3) or Crust (B4)		check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C	Secondar  Surfa  Drain  Dry-S  Crayl  (C3) Satur  Stunt  G Geon	v Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) ieason Water Table (C2) ish Burrows (C8) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) iorphic Position (D2)
IYDROLOG Wetland Hydro Primary Indicat Surface W High Wate Saturation Water Man Sediment I Drift Depos Algal Mat o	Y clogy indicators: tors (minimum of on ater (A1) r Table (A2) (A3) ks (B1) Deposits (B2) sits (B3) or Crust (B4)	e is required:	check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Solls (C	Secondar  Surfa  Drain  Dry-S  Crayl  (C3) Satur  Stunt  G Geon	y Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) teason Water Table (C2) tish Burrows (C8) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1)
IYDROLOG Wetland Hydro Primary Indicat Surface W High Wate Saturation Water Man Sediment I Drift Depos Algal Mat of Iron Depos	Y  ology indicators: tors (minimum of on fater (A1) or Table (A2) (A3) ks (B1) Deposits (B2) sits (B3) or Crust (B4) oits (B6) Visible on Aerial Im	e is required:	check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) Gauge or Well Data (D9)	Secondar  Surfa  Drain  Dry-S  Crayl  (C3) Satur  Stunt  G Geon	v Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) ieason Water Table (C2) ish Burrows (C8) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) iorphic Position (D2)
Hydro  IYDROLOG  Wetland Hydro  Primary Indicat  Surface W  High Wate  Saturation  Water Mar.  Sediment I  Drift Depos  Algal Mat of Iron Depos  Inundation  Sparsely V	Y clogy indicators; tors (minimum of on fater (A1) or Table (A2) (A3) ks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B6) Visible on Aerial Im	e is required:	check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Solls (C	Secondar  Surfa  Drain  Dry-S  Crayl  (C3) Satur  Stunt  G Geon	v Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) ieason Water Table (C2) ish Burrows (C8) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) iorphic Position (D2)
Hydrolog Wetland Hydro Primary Indicat Surface W High Wate Saturation Water Mar Sediment I Drift Depos Algal Mat of Iron Depos Inundation Sparsely V Field Observar	Y closy Indicators; tors (minimum of on ater (A1) r Table (A2) (A3) ks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B6) Visible on Aerial Im degetated Concave S	ne is required: nagery (B7) Surface (B8)	check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)	Secondar  Surfa  Drain  Dry-S  Crayl  (C3) Satur  Stunt  G Geon	v Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) teason Water Table (C2) tish Burrows (C8) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) torphic Position (D2)
Hydrolog Wetland Hydro Primary Indicat Surface W High Wate Saturation Water Mar. Sediment I Drift Depos Algal Mat of Iron Depos Inundation Sparsely V Field Observat	Y cology Indicators; tors (minimum of on fater (A1) or Table (A2) (A3) ks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B6) Visible on Aerial Im fegetated Concave S tions: Present?	ne is required: nagery (B7) Surface (B8)	check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)	Secondar  Surfa  Drain  Dry-S  Crayl  (C3) Satur  Stunt  G Geon	v Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) teason Water Table (C2) tish Burrows (C8) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) torphic Position (D2)
IYDROLOG Wetland Hydre Primary Indicat Surface W High Wate Saturation Water Man Sediment I Drift Depos Algal Mat of Iron Depos Inundation Sparsely V Field Observat Surface Water	Y cology Indicators; tors (minimum of on fater (A1) or Table (A2) (A3) rks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B6) Visible on Aerial Im regetated Concave Stons; Present? Yes	ne is required: nagery (B7) Surface (B8) s No _ s No _	check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)  Depth (inches):	Secondar Surfa Drain Dry-S Crayl (C3) Satur Stunt 6) Geon FAC-	v Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) ieason Water Table (C2) ish Burrows (C8) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2) Neutral Test (D5)
Wetland Hydre Primary Indicat Surface W High Wate Saturation Water Man Sediment I Drift Depos Algal Mat of Iron Depos Inundation Sparsely V Field Observat Surface Water Water Table Pr Saturation Pres	Y cology Indicators: tors (minimum of on fater (A1) ar Table (A2) (A3) ds (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B6) Visible on Aerial Im regetated Concave stons: Present? Yes eent? Yes	ne is required: nagery (B7) Surface (B8)	check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)  Depth (inches):	Secondar Surfa Drain Dry-S Crayl (C3) Satur Stunt 6) Geon FAC-	y Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) ieason Water Table (C2) ish Burrows (C8) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) iorphic Position (D2)
IYDROLOG Wetland Hydro Primary Indicat Surface W High Wate Saturation Water Mar. Sediment I Drift Depos Algal Mat of Inundation Sparsely V Field Observat Surface Water I Water Table Pr Saturation Press Includes capilla	Y cology Indicators; tors (minimum of on a ater (A1) or Table (A2) (A3) ks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B6) Visible on Aerial Image (A2) tions: Present? resent?	nagery (B7) Surface (B8) s No _ s No _ s No _	check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)  Depth (inches):  Depth (inches):  Wet	Secondar Surfa Drain Dry-8 Crayl (C3) Satur Stunt 6) Geon FAC-	v Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) ieason Water Table (C2) ish Burrows (C8) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2) Neutral Test (D5)
Wetland Hydre Primary Indicate Surface W High Wate Saturation Water Man Sediment I Drift Depos Algal Mat of Iron Depos Inundation Sparsely V Field Observation Surface Water Water Table President Includes capillate Describe Record	Y cology Indicators; tors (minimum of on fater (A1) or Table (A2) (A3) oks (B1) Deposits (B2) sits (B3) or Crust (B4) sits (B6) Visible on Aerial Im regetated Concave stors; Present? Present? Yes earty fringe) reded Data (stream g	nagery (B7) Surface (B8) s No _ s No _ s No _	check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)  Depth (inches):	Secondar  Surfa  Drain  Dry-S  Crayl  (C3) Satur  Stunt  6) Geon  FAC-	v Indicators (minimum of two required) ce Soil Cracks (B6) age Patterns (B10) season Water Table (C2) sish Burrows (C8) ation Visible on Aerial Imagery (C9) ed or Stressed Plants (D1) norphic Position (D2) Neutral Test (D5)

Project/Site: 302899: Hardin Sola	IN II City/County: Have	Din County Sampling Date: 6/13/1
Applicant/Owner: TRC/Inveneray, LL	<u>_C,</u>	State: OH Sampling Point: WET-HS
Investigator(s): MMM, SKB 33	Section, Township, Ra	inge: N/A
Landform (hillslope, terrace, etc.): Den ression/		
Slope (%): . 50/0 Lat: 40.63086	Long: - 83,795	345 Datum; W6584
Soil Map Unit Name: PKA) PEMA MOSI HUCL	ayloam,0-1010 slo	1265 NWI classification: Mond
Are climatic I hydrologic conditions on the site typical for this	s time of year? Yes No_	(If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology s	ignificantly disturbed? Are	"Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology n	aturally problematic? N (If no	eeded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map	showing sampling point l	ocations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes V	o	
——————————————————————————————————————	s the Sample	. /
f	o within a Wetla	
Remarks: 3 wetland criterial	have been met	•
Active ou farmed	radiacent A	EP construction
VEGETATION Use scientific names of plants.		
Tree Stratum (Plot size: 30 )	Absolute Dominant Indicator	Dominance Test worksheet:
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	% Cover Species? Status	Number of Dominant Species That Are OBL, FACW, or FAC: (A)
1.		
3.		Total Number of Dominant Species Across All Strata: (B)
4		1
5		Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
5	= Total Cover	Prevalence Index worksheet:
Sapling/Shrub Stratum (Plot size:)		Total % Cover of: Multiply by:
2		OBL species x1=
3.		FACW species x 2 =
4.		FAC species x 3 =
5.		FACU species x 4 =
	= Total Cover	UPL species x 5 =
Herb Stratum (Plot size:)	2	Column Totals: (A) (B)
1. Ambrosia tritida	<u> </u>	Prevalence Index = B/A =
3.		Hydrophytic Vegetation Indicators:
4.	Alexander and the second and the sec	1 - Rapid Test for Hydrophytic Vegetation
5.		2 - Dominance Test is >50%
6.		3 - Prevalence Index is ≤3.01
7		4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
8		Problematic Hydrophytic Vegetation¹ (Explain)
9	* ************************************	Tobiethesio Hydrophytio vagetation (Explain)
10		¹Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: 30)	= Total Cover	be present, unless disturbed or problematic.
1.		Hydrophytic
2		Vegetation
70.	= Total Cover	Present? Yes No
Remarks: (Include photo numbers here or on a separate s	sheet)	ms hown mot
Remarks: (Include photo numbers here or on a separate of Hydro Phytic Vegetal	non criterion	I WELL TO LAND LA
Coarselly venetated	concare. and	Face. Hydrophytic
US Army Corne of Expirence 100 4 to 100	0000000	Michaet Region - Version 20

Sampling Point:	WE	T-HS-	Μ	
Sampling Point:	ME	1_UD-	1~1	U

DepthMatrix	Redox Features	_
1 = 3 = 11	Color (maist) % Type¹ Loc²	Texture Remarks
0-6" 10YR 3/1 100 -		- CYALL
6-18" 104 R3/1 50 7	354RYGZOC M	CVAIA
7		
<u> </u>		
	<del></del>	
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Re	duced Matrix, MS=Masked Sand Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :
Histosol (A1)	Sandy Gleyed Matrix (S4)	Coast Prairie Redox (A16)
Histic Epipedon (A2)	Sandy Redox (S5)	Dark Surface (S7)
Black Histic (A3)	Stripped Matrix (S6)	iron-Manganese Masses (F12)
Hydrogen Sulfide (A4)	Loamy Mucky Mineral (F1)	Very Shallow Dark Surface (TF12)
Stratified Layers (A5)	Loamy Gleyed Matrix (F2)	Other (Explain in Remarks)
2 cm Muck (A10)	Depleted Matrix (F3)	,
Depleted Below Dark Surface (A11)	Redox Dark Surface (F6)	
Thick Dark Surface (A12)	Depleted Dark Surface (F7)	<sup>a</sup> Indicators of hydrophytic vegetation and
Sandy Mucky Mineral (S1)	Redox Depressions (F8)	wetland hydrology must be present,
5 cm Mucky Peat or Peat (S3)		unless disturbed or problematic.
Restrictive Layer (if observed):		
Type: Nove		
Depth (inches):		Hydric Soil Present? Yes V No
Hydric Soil Criti	or for your bean i	net.
	er fort vias bear t	net.
HYDROLOGY	er fortylas beart	MET.
HYDROLOGY Wetland Hydrology Indicators:		
IYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required: o	theck all that apply)	Secondary indicators (minimum of two required)
IYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required: o	theck all that apply) Water-Stained Leaves (B9)	Secondary Indicators (minimum of two required)  Surface Soil Cracks (86)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required: c  Surface Water (A1)  High Water Table (A2)	theck all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)	Secondary Indicators (minimum of two required)  Surface Soil Cracks (B6)  Drainage Patterns (B10)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required: o  Surface Water (A1)  High Water Table (A2)  Saturation (A3)	theck all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)	Secondary Indicators (minimum of two required)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required; of surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)	theck all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)	Secondary Indicators (minimum of two required)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required; of surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)	theck all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots	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)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required; of the control of the	theck all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)	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)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required; of surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)	theck all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C	Secondary Indicators (minimum of two required)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  (C3)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required: of surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)	theck all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C	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)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required: of the surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)	theck all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)	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)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required; of surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)	theck all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C	Secondary Indicators (minimum of two required)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  (C3)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required; of surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Field Observations:	wheck all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  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)  (C3)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required; of the surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Field Observations:	theck all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)	Secondary Indicators (minimum of two required)  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  (C3)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required: of surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Field Observations:  Surface Water Present?  Yes \( \) No	wheck all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  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)  (C3)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required; of Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Field Observations:  Surface Water Present?  Water Table Present?  Yes No  Saturation Present?  Yes No  Saturation Present?	Mater-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)  Depth (inches):  Depth (inches):  Wet	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)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required; of the control of the	Mater-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)  Depth (inches):  Depth (inches):  Wet	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)
HYDROLOGY  Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required; of Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Field Observations:  Surface Water Present?  Water Table Present?  Water Table Present?  Yes No  Saturation Present?  Yes No  Situration Present?  Secondary Filinge)  Describe Recorded Data (stream gauge, monitoring the secondary of the se	Mater-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  Other (Explain in Remarks)  Depth (inches):  Depth (inches):  Wet	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)

WETLAND DETERMINATION DATA FORM - Midwest Region Project/Site: 302899: Hardin Solar II city/County: Hardin County Sampling Date: (2) Investigator(s): MMM, SKB Section, Township, Range: \_\_N/A Landform (hilfstope, terrace, etc.): COLLIND MALL Local relief (concave, convex, none): CON VUX Long: -83,79345 Datum: WG SS 4 Soil Map Unit Name (PKA) Pewamos Huclay Inam, 0+0/0 slopes NWI classification: NOME Are climatic / hydrologic conditions on the site typical for this time of year? Yes (If no. explain in Remarks.) Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ \_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ 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\_ is the Sampled Area Hydric Soil Present? within a Wetland? Wetland Hydrology Present? No Remarks' been met. of 3 wetland VEGETATION - Use scientific names of plants. Absolute Dominant Indicator Dominance Test worksheet: Tree Stratum (Plot size: % Cover Species? Status Number of Dominant Species That Are OBL, FACW, or FAC: Total Number of Dominant<sup>2</sup> Species Across All Strata: (B) Percent of Dominant Species That Are OBL, FACW, or FAC: = Total Cover Sapling/Shrub Stratum (Plot size: Prevalence Index worksheet: Total % Cover of: OBL species x1=\_\_\_\_ FACW species \_ \_ x2=\_\_\_ FAC species FACU species \_\_\_\_\_ ≖ Total Cover x5= Herb Stratum (Plot size: Column Totals: \_\_ Prevatence Index = B/A = Hydrophytic Vegetation Indicators: \_ 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.01 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation<sup>1</sup> (Explain) <sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. <u> Woody Vine Stratum</u> (Plot size: رُحِية Hydrophytic Vegetation Present? = Total Cover Remarks: (Include photo numbers here or on a separate sheet.) Hydrophytic vegetation criterion has not been met.

Profile Description: (Describe to the depth r	needed to document the indicator or confi	irm the absence of indicators.)
Depth Matrix	Redox Features	<b>_</b>
m (d) 21 10 (d)	Color (moist) % Type¹ Loc²	Remarks
0-18" 104R2/1 100 -		<u>Clay</u>
(i,j,j)		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	· · · · · · · · · · · · · · · · · · ·	
		<u> </u>
	· · · · · · · · · · · · · · · · · · ·	
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Re-	duced Matrix, MS=Masked Sand Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :
Histosol (A1)	Sandy Gleyed Matrix (S4)	Coast Prairie Redox (A16)
Histic Epipedon (A2)	Sandy Redox (S5)	Dark Surface (S7)
Black Histic (A3)	Stripped Matrix (S6)	Iron-Manganese Masses (F12)
Hydrogen Sulfide (A4)	Loamy Mucky Mineral (F1)	Very Shallow Dark Surface (TF12)
Stratifled Layers (A5)	Loamy Gleyed Matrix (F2)	Other (Explain in Remarks)
2 cm Muck (A10)	Depleted Matrix (F3)	
Depleted Below Dark Surface (A11)	Redox Dark Surface (F6)	
Thick Dark Surface (A12)	Depleted Dark Surface (F7)	<sup>8</sup> Indicators of hydrophytic vegetation and
Sendy Mucky Mineral (S1)	Redox Depressions (F8)	wetland hydrology must be present,
5 cm Mucky Peat or Peat (S3)		unless disturbed or problematic.
Restrictive Layer (if observed):		
Type: NOVL		
Depth (inches): _NA	· -	Hydric Soil Present? Yes No V
Remarks: Hydric soil crite		<u> </u>
HYDROLOGY		
·		·
Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is required:	check all that apply)	Secondary Indicators (minimum of two required)
Surface Water (A1)	Water-Stained Leaves (B9)	Surface Scil Cracks (B8)
High Water Table (A2)	Aquatic Fauna (B13)	Drainage Patterns (B10)
Saturation (A3)	True Aquatic Plants (B14)	Dry-Season Water Table (C2)
Water Marks (B1)	Hydrogen Sulfide Odor (C1)	Crayfish Burrows (C8)
Sediment Deposits (B2)		s (C3) Saturation Visible on Aerial Imagery (C9)
Drift Deposits (B3)	Presence of Reduced Iron (C4)	Stunted or Stressed Plants (D1)
Algal Mat or Crust (B4)	Recent Iron Reduction in Tilled Soils (0	
Iron Deposits (B5)	Thin Muck Surface (C7)	FAC-Neutral Test (D5)
Inundation Visible on Aerial Imagery (B7)	Gauge or Well Data (D9)	
Sparsely Vegetated Concave Surface (B8)	Other (Explain in Remarks)	ia.
Field Observations:	Other (Explain in Nemarks)	
	/ Day Garage NI/A	
Surface Water Present? Yes No _	Depth (inches):	
Water Table Present? Yes No _	Depth (inches):	
Saturation Present? Yes No.	Depth (Inches): We	tland Hydrology Present? Yes No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitor	ing well goriel photos provious beneations	\ if evallable:
besome Recorded Data (Stream gauge, Monitor	ing weil, dentit priotos, previous inspections	у, и ачанаше.
NIA		
wetland hydrolog	gy criterion ha	s not been met.
	·	

Project/Site: 302899: Hardin S	Solar II city	County: Have	din County sai	and the same
Applicant/Owner: TRC/Invenergy	, LLL.		State: O Sar	mpling Point: WET-
investigator(s):	Sec	tion, Township, R	ange: <u>510, 755</u>	RYE
Landform (hillslope, terrace, etc.): Plain			f (concave, convex, none):	one
Slope (%): 0-5 Lat: 40.62780	Lon	g: -83.8188	4 Dat	um: WGS84
Soil Map Unit Name: PKA - Fewams	5. Hy Clay los	in 061	16 1000 NWI classification	. None
Are climatic / hydrologic conditions on the site typical	al for this time of year?	Yes No_	(If no, explain in Rema	rks.)
Are Vegetation, Soil, or Hydrology _	significantly dist	urbed? Are	"Normal Circumstances" prese	ent? Yes No
Are Vegetation, Soil, or Hydrology _			eeded, explain any answers in	the second secon
SUMMARY OF FINDINGS – Attach site				
Hydrophytic Vegetation Present? Yes √	No			
Hydric Soil Present? Yes		Is the Sample	/	
Wetland Hydrology Present? Yes	No	within a Wetla	nd? Yes	No
	riahave be	een met	•	
/EGETATION – Use scientific names of p			[	
Tree Stratum (Plot size: 30')	% Cover Sp		Number of Dominant Specie That Are OBL, FACW, or FA	es )
2			Total Number of Dominant Species Across All Strata:	2 (B)
4			Percent of Dominant Specie	
-1	= To	otal Cover	That Are OBL, FACW, or FA	(A/B)
Sapling/Shrub Stratum (Plot size: 5	_)		Prevalence Index workshe	et:
1. Nyne			Total % Cover of:	Multiply by:
2			OBL species	x1=
3			FACW species	x2= (54
4			FACU species	x3= 105
5			Tribo openios	x4=
Herb Stratum (Plot size: 5)	= 10	tal Cover	UPL species U	(A) 259 (B)
1. Phalaris acho dinques	95 p	FACH	Column Totals.	(A)(B)
2. Januar tennis	25 4	FAC	Prevalence Index = Br	A = 2.3/
3. Echinochlun crus-gall:	10 )	V tach	Hydrophytic Vegetation In	dicators:
4. Allaria Actolata	5 1	/ FAC	1 - Rapid Test for Hydro	A Section 1 Section 2 Section 2 Section 2
5. Apocynian Carrabinan		V FAC	2 - Dominance Test is >	
6. Mentha spicate		V FACH	✓ 3 - Prevalence Index is:	
7			4 - Morphological Adapt data in Remarks or o	ations <sup>1</sup> (Provide supporting
8			Problematic Hydrophytic	ACTION OF THE PROPERTY OF THE
9			Problematic Hydrophytic	vegetation (Explain)
10 Woody Vine Stratum (Plot size: 30		tal Cover	<sup>1</sup> Indicators of hydric soil and be present, unless disturbed	
	.)		CONTRACTOR OF THE PROPERTY OF	
1. Nent			Hydrophytic Vegetation	1
0				No
2		tal Cover	Present? Yes V	No

Sampling Point: WET-45-14

Depth Matrix		Features			
(inches) Color (moist) %	Color (moist)	% Typ	pe¹ Loc²	Texture	Remarks
)-14	100	5		Sic	
Firms Co-Consentration Deposition PM	Importunation Matrix Mon	Mankad Sand	d Coolean	2) costion: F	L=Pore Lining, M=Matrix.
Type: C=Concentration, D=Depletion, RM ydric Soil Indicators:	-Reduced Matrix, MS-	-Masked Sand	Grains.	Indicators for	Problematic Hydric Soils <sup>3</sup> :
Histosol (A1)	Sandy Gle	eyed Matrix (S	34)		irie Redox (A16)
Histic Epipedon (A2)	Sandy Re		54)	Dark Surf	
Black Histic (A3)		Matrix (S6)			anese Masses (F12)
_ Hydrogen Sulfide (A4)		ucky Mineral (	F1)		low Dark Surface (TF12)
Stratified Layers (A5)		eyed Matrix (f			plain in Remarks)
2 cm Muck (A10)		Matrix (F3)	2)	Office (EX	plani in Nemarks)
Depleted Below Dark Surface (A11)		rk Surface (F	6)		
Thick Dark Surface (A12)	Depleted I	Dark Surface	(F7)	3Indicators of	hydrophytic vegetation and
_ Sandy Mucky Mineral (S1)	Redox De	pressions (F8	3)		drology must be present,
5 cm Mucky Peat or Peat (S3)				unless dis	turbed or problematic.
estrictive Layer (if observed):					/
Type:	-			Hydric Soil Pre	esent? Yes V No
Depth (inches):					
Hydric soil or	iterion l	nas b	een v	net.	
	iterion 1	nas b	een v	net.	•
/DROLOGY	iterion 1	nas b	een v	net.	
/DROLOGY /etland Hydrology Indicators:			een v		ndicators (minimum of two required
/DROLOGY /etland Hydrology Indicators; rimary Indicators (minimum of one is requi	ired: check all that appli	v)		Secondary	
/DROLOGY /etland Hydrology Indicators; rimary Indicators (minimum of one is requi	ired: check all that appl Water-Staine	v) ed Leaves (B9		Secondary Surface	Soil Cracks (B6)
/DROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2)	ired: check all that appl Water-Staine Aquatic Faur	y) ed Leaves (B9 na (B13)	9)	Secondary Surface Drainag	Soil Cracks (B6) te Patterns (B10)
/DROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3)	ired: check all that appl — Water-Staine — Aquatic Faur — True Aquatic	v) ed Leaves (B9 na (B13) : Plants (B14)	9)	Secondary Surface Drainag Dry-Se	Soil Cracks (B6) e Patterns (B10) ason Water Table (C2)
'DROLOGY  letland Hydrology Indicators; rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)	ired: check all that appl	y) ed Leaves (B9 na (B13) : Plants (B14) ulfide Odor (C	9)	Secondary Surface Drainag Dry-Se: Crayfisi	Soil Cracks (B6) te Patterns (B10) ason Water Table (C2) n Burrows (C8)
PROLOGY  Vetland Hydrology Indicators;  rimary Indicators (minimum of one is requited by Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)	ired: check all that appl Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi	y) ed Leaves (B9 na (B13) : Plants (B14) ulfide Odor (C izospheres on	1) Living Roots	Secondary Surface Drainag Dry-Se: Crayfisi (C3)	Soil Cracks (B6) te Patterns (B10) ason Water Table (C2) the Burrows (C8) on Visible on Aerial Imagery (C9)
/DROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	ired: check all that appli Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of	y) ed Leaves (B9 na (B13) : Plants (B14) ulfide Odor (C izospheres on Reduced Iron	1) a Living Roots (C4)	Secondary Surface Drainag Dry-See Crayfisi (C3) Saturat Stunted	Soil Cracks (B6) te Patterns (B10) ason Water Table (C2) the Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1)
/DROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	ired: check all that appli Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron I	v) ed Leaves (B9 na (B13) Plants (B14) ulfide Odor (C izospheres on Reduced Iron	1) a Living Roots (C4)	Secondary Surface Drainag Dry-Se: Crayfisi (C3) Saturat Stunted Go Geomo	Soil Cracks (B6) the Patterns (B10) the Son Water Table (C2) the Burrows (C8) tion Visible on Aerial Imagery (C9) or Stressed Plants (D1) trphic Position (D2)
/DROLOGY  /etland Hydrology Indicators: rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)	ired: check all that appli Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron I Thin Muck Si	y) ed Leaves (B9 na (B13) : Plants (B14) ulfide Odor (C izospheres on Reduced Iron Reduction in T	1) a Living Roots (C4)	Secondary Surface Drainag Dry-Se: Crayfisi (C3) Saturat Stunted Go Geomo	Soil Cracks (B6) te Patterns (B10) ason Water Table (C2) the Burrows (C8) ton Visible on Aerial Imagery (C9) or Stressed Plants (D1)
/DROLOGY  letland Hydrology Indicators: rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B	ired: check all that apply  Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron I Thin Muck St	ed Leaves (B9) na (B13) Plants (B14) Ulfide Odor (C izospheres on Reduced Iron Reduction in T urface (C7) ell Data (D9)	1) a Living Roots i (C4) Tilled Soils (C	Secondary Surface Drainag Dry-Se: Crayfisi (C3) Saturat Stunted Go Geomo	Soil Cracks (B6) the Patterns (B10) the Son Water Table (C2) the Burrows (C8) tion Visible on Aerial Imagery (C9) or Stressed Plants (D1) trphic Position (D2)
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/DROLOGY //etland Hydrology Indicators: rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B  Sparsely Vegetated Concave Surface (ield Observations: urface Water Present?  //ater Table Present?  Yes  aturation Present?  Yes  aturation Present?  Yes	ired: check all that apple  Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron I Thin Muck St 7) Gauge or We B8) Other (Explain	ed Leaves (BS) na (B13) Plants (B14) Ilfide Odor (C izospheres on Reduced Iron Reduction in Turface (C7) ell Data (D9) in in Remarks es): es):	1) a Living Roots (C4) Filled Soils (C4)	Secondary Surface Drainag Dry-Se: Crayfisi Saturat Stunted FAC-No	soil Cracks (B6) se Patterns (B10) ason Water Table (C2) a Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1) rphic Position (D2) autral Test (D5)
/DROLOGY //etland Hydrology Indicators: rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B'  Sparsely Vegetated Concave Surface (ield Observations: urface Water Present? Yes  //ater Table Present? Yes  aturation Present? Yes  includes capillary fringe) escribe Recorded Data (stream gauge, mo	ired: check all that apply  Water-Staine Aquatic Faur True Aquatic Hydrogen Su Oxidized Rhi Presence of Recent Iron I Thin Muck St To Gauge or We B8) Other (Explained) No Depth (inches) No Depth (inches) No Depth (inches)	ed Leaves (B9 na (B13) Plants (B14) Ulfide Odor (C Ecospheres on Reduced Iron Reduction in T urface (C7) ell Data (D9) in in Remarks es): es):	1) a Living Roots (C4) Filled Soils (C4) s) Wet	Secondary Surface Surface Drainag Dry-Se: Crayfisi Saturat Stunted Geomo FAC-Ne	soil Cracks (B6) se Patterns (B10) ason Water Table (C2) a Burrows (C8) for Visible on Aerial Imagery (C9) or Stressed Plants (D1) replic Position (D2) eutral Test (D5)
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WEILAND DEI	ERMINA	HON DAT	A FURN	A - Midwest Region
Project/Site: 302899: Hardin Sola	CII	City/County	Har	Qin County Sampling Date: 5/22/18
Applicant/Owner: TRC/Inveneval				State: OH Sampling Point: UPL-HS-
Investigator(s): JDV, LM, TR				ange: 510 , 755 R1E
Landform (hillslope, terrace, etc.):Plain		1000	Local relie	f (concave, convex, none): None
Slope (%): 0-5 Lat: 40.62651		Long: -8	3.8183	8 Datum: WG 58 4
				Slopes NWI classification: None
Are climatic / hydrologic conditions on the site typical for the				
Are Vegetation, Soil, or Hydrology				
Are Vegetation, Soil, or Hydrology				"Normal Circumstances" present? Yes No
				eeded, explain any answers in Remarks.) locations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	-1			, , , , , , , , , , , , , , , , , , , ,
Hydric Soil Present? Yes	. /	Is the	Sample	d Area
Wetland Hydrology Present? Yes	11	withi	n a Wetla	nd? Yes No
of 3 wetland with	ren'a	have	bee	n met. Area is not a
VEGETATION - Use scientific names of plants	s			
30'	Absolute			Dominance Test worksheet:
Tree Stratum (Plot size: 30)	% Cover	Species?	Status	Number of Dominant Species
1. None				That Are OBL, FACW, or FAC: (A)
3.			_	Total Number of Dominant
4.	-			Species Across All Strata: (B)
5.				Percent of Dominant Species
:=1		= Total Cove	er	That Are OBL, FACW, or FAC: (A/B)
Sapling/Shrub Stratum (Plot size: 151)				Prevalence Index worksheet:
1. Nonc				Total % Cover of: Multiply by:
2	-			OBL species O x1 = 6
3	-			FACW species x2 =
4	-		_	FAC species $\frac{8}{2}$ x3 = $\frac{34}{2}$
b				FACU species <u>85</u> x4 = <u>346</u>
Herb Stratum (Plot size: 5		= Total Cove	er	UPL species (5 x5 = 75
1. Festaga rapra	40	+	FACU	Column Totals: 105 (A) 434 (B)
2. Phlenm Aratense	20	4	FACH	Prevalence Index = B/A =
3. Cirsian Grvense	-20	k	FACH	Hydrophytic Vegetation Indicators:
4. Viola oderata	15	N	MPL	1 - Rapid Test for Hydrophytic Vegetation
5. Augynam Carra Singa	8	N	FAC	2 - Dominance Test is >50%
6. Dysaus fallunga	5	N	FACL	3 - Prevalence Index is ≤3.0¹
7				4 - Morphological Adaptations¹ (Provide supporting
8				data in Remarks or on a separate sheet)
9				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
10	108	= Total Cove	er	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: 30 )				, , , , , , , , , , , , , , , , , , ,
1. None 2.	_		_	Hydrophytic Vegetation
٤.		= Total Cove		Present? Yes No
Remarks: (Include photo numbers here or on a separate		- Total Cove	1	
Hydrophytic vegetation	crit	evion	has	not been met.

Depth Matrix	Redox Feat				
(inches) Color (moist) %	Color (moist) %	Type'	Loc²		Remarks
J 14 104K 12 100	· ————			SIC	
				-	
Type: C=Concentration, D=Depletion, RN	1=Reduced Matrix, MS=Mas	ked Sand Gra	ains.	<sup>2</sup> Location: F	L=Pore Lining, M=Matrix.
lydric Soil Indicators:				Indicators for	Problematic Hydric Soils3:
_ Histosol (A1)	Sandy Gleyed	and the second second		Coast Pra	airie Redox (A16)
Histic Epipedon (A2)	Sandy Redox			Dark Surf	Control of the contro
Black Histic (A3) Hydrogen Sulfide (A4)	Stripped Matrix				ganese Masses (F12)
Stratified Layers (A5)	Loamy Mucky				low Dark Surface (TF12)
_ 2 cm Muck (A10)	Loamy Gleyed Depleted Matri			Other (Ex	plain in Remarks)
Depleted Below Dark Surface (A11)	Redox Dark St				
Thick Dark Surface (A12)	Depleted Dark			3Indicators of	hydrophytic vegetation and
_ Sandy Mucky Mineral (S1)	Redox Depres				/drology must be present,
_ 5 cm Mucky Peat or Peat (S3)	0=10:37:04				turbed or problematic.
lestrictive Layer (if observed):					
Type:					
Donth (Inches)				Hydric Soil Pre	esent? Yes No
emarks: Hydivic soil cri	terion has	1107	Thee	2 A 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	+.
Hydric soil cr	terion has	Not	bee	2 A 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	+.
Mydric soil cr	terion has	Not	'gee	2 A 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	+,
PROLOGY  Vetland Hydrology Indicators:		Noz	'nee	ne me	
PROLOGY  Setland Hydrology Indicators:	red: check all that apply)		'gee	Me.	ndicators (minimum of two required
PROLOGY  Vetland Hydrology Indicators: rimary Indicators (minimum of one is requi	red: check all that apply) Water-Stained Le	aves (B9)	'nee	Secondary I	ndicators (minimum of two required Soil Cracks (B6)
PROLOGY  Vetland Hydrology Indicators: rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)	red: check all that apply) Water-Stained Le Aquatic Fauna (B	aves (B9)	'nee	Secondary I Surface Drainag	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10)
PROLOGY  Vetland Hydrology Indicators: rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)	red: check all that apply) Water-Stained Le: Aquatic Fauna (B: True Aquatic Plan	aves (B9) 13) ts (B14)	De.	Secondary I Surface Drainag Dry-Sea	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ison Water Table (C2)
PROLOGY  Vetland Hydrology Indicators: rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)	red: check all that apply)  Water-Stained Le: Aquatic Fauna (B True Aquatic Plan Hydrogen Sulfide	aves (B9) 13) ts (B14) Odor (C1)		Secondary I Surface Drainag Dry-Sea Crayfish	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ison Water Table (C2)
PROLOGY  Vetland Hydrology Indicators: rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)	red: check all that apply)  Water-Stained Le Aquatic Fauna (B True Aquatic Plan Hydrogen Sulfide Oxidized Rhizospl	aves (B9) 13) ts (B14) Odor (C1) neres on Livin	g Roots (C	Secondary I Surface Drainag Dry-Sea Crayfish Saturati	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ason Water Table (C2) a Burrows (C8) on Visible on Aerial Imagery (C9)
PROLOGY  Vetland Hydrology Indicators: rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)	red: check all that apply)  Water-Stained Le Aquatic Fauna (B True Aquatic Plan Hydrogen Sulfide Oxidized Rhizospl	aves (B9) 13) ts (B14) Odor (C1) neres on Living ced Iron (C4)	g Roots (C	Secondary I Surface Drainag Dry-Sea Crayfish Saturati Stunted	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ason Water Table (C2) a Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1)
remarks:  Hydr C SOID con  TOROLOGY  Tetland Hydrology Indicators: rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)	red: check all that apply)  Water-Stained Le Aquatic Fauna (B True Aquatic Plan Hydrogen Sulfide Oxidized Rhizospl Presence of Redu	aves (B9) 13) ts (B14) Odor (C1) neres on Living ced Iron (C4)	g Roots (C	Secondary I Surface Drainag Dry-Sea Crayfish Saturati Stunted Geomor	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ason Water Table (C2) a Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1) phic Position (D2)
remarks:  Hydr C SOL Con  PROLOGY  Idetland Hydrology Indicators:  rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)	red: check all that apply)  Water-Stained Le Aquatic Fauna (B True Aquatic Plan Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Redu	aves (B9) 13) ts (B14) Odor (C1) neres on Living ced Iron (C4) ction in Tilled S	g Roots (C	Secondary I Surface Drainag Dry-Sea Crayfish Saturati Stunted Geomor	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ason Water Table (C2) a Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1)
remarks:  Hydr C SOID con  TOROLOGY  Tetland Hydrology Indicators: rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)	red: check all that apply)  Water-Stained Let Aquatic Fauna (B True Aquatic Plan Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Reduct Thin Muck Surface Gauge or Well Da	aves (B9) 13) ts (B14) Odor (C1) neres on Living ced Iron (C4) ction in Tilled (C7) ta (D9)	g Roots (C	Secondary I Surface Drainag Dry-Sea Crayfish Saturati Stunted Geomor	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ason Water Table (C2) a Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1) phic Position (D2)
PROLOGY  Setland Hydrology Indicators:  Imary Indicators (minimum of one is required by Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (I	red: check all that apply)  Water-Stained Let Aquatic Fauna (B True Aquatic Plan Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Reduct Thin Muck Surface Gauge or Well Da	aves (B9) 13) ts (B14) Odor (C1) neres on Living ced Iron (C4) ction in Tilled (C7) ta (D9)	g Roots (C	Secondary I Surface Drainag Dry-Sea Crayfish Saturati Stunted Geomor	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ason Water Table (C2) a Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1) phic Position (D2)
PROLOGY  Vetland Hydrology Indicators: rimary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (Ield Observations:	red: check all that apply)  Water-Stained Let Aquatic Fauna (B True Aquatic Plan Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Reduct Thin Muck Surface Gauge or Well Da	aves (B9) 13) ts (B14) Odor (C1) neres on Livin; ced Iron (C4) ction in Tilled 3 e (C7) ta (D9) Remarks)	g Roots (C	Secondary I Surface Drainag Dry-Sea Crayfish Saturati Stunted Geomor	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ason Water Table (C2) a Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1) phic Position (D2)
rimary Indicators (minimum of one is required by Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (Bill of Sparsely Vegetated Concave Surface (Ield Observations:	red: check all that apply)  Water-Stained Le Aquatic Fauna (B True Aquatic Plan Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Redu Thin Muck Surface Gauge or Well Da B8) Other (Explain in f	aves (B9) 13) ts (B14) Odor (C1) neres on Living ced Iron (C4) ction in Tilled 3 e (C7) ta (D9) Remarks)	g Roots (C	Secondary I Surface Drainag Dry-Sea Crayfish Saturati Stunted Geomor	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ason Water Table (C2) a Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1) phic Position (D2)
remarks:  Hydr C SOL CV  Part C SOL CV  Petland Hydrology Indicators:  rimary Indicators (minimum of one is required in the second in the seco	red: check all that apply)  Water-Stained Le.  Aquatic Fauna (B  True Aquatic Plan  Hydrogen Sulfide  Oxidized Rhizospl  Presence of Redu  Recent Iron Redu  Thin Muck Surface  To Gauge or Well Da  Bab)  Other (Explain in Faunt)  No  Depth (inches):  No  Depth (inches):	aves (B9) 13) Is (B14) Odor (C1) neres on Living ced Iron (C4) ction in Tilled S e (C7) ta (D9) Remarks)	g Roots (C Soils (C6)	Secondary I Surface Drainag Dry-Sea Crayfish Saturati Stunted Geomor	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ason Water Table (C2) a Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1) phic Position (D2)
remarks:  Hydr C SOL CV  Part C SOL CV  Petland Hydrology Indicators:  rimary Indicators (minimum of one is required in the second in the seco	red: check all that apply)  Water-Stained Le.  Aquatic Fauna (B  True Aquatic Plan  Hydrogen Sulfide  Oxidized Rhizospl  Presence of Redu  Recent Iron Redu  Thin Muck Surface  To Gauge or Well Da  Bab)  Other (Explain in Faunt)  No  Depth (inches):  No  Depth (inches):	aves (B9) 13) Is (B14) Odor (C1) neres on Living ced Iron (C4) ction in Tilled S e (C7) ta (D9) Remarks)	g Roots (C Soils (C6)	Secondary I Surface Drainag Dry-Sea Crayfish Saturati Stunted Geomor	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ison Water Table (C2) is Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1) phic Position (D2) utral Test (D5)
// C SON Q CV  // CETAIN Hydrology Indicators:  rimary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B)  Sparsely Vegetated Concave Surface (Indicated Water Present?  Indicated Water Present?  Indicated Water Present?  Yes Indicated Concave Surface (Indicated Water Present? Yes Indicated Water Present?	red: check all that apply)  Water-Stained Let Aquatic Fauna (B True Aquatic Plan Hydrogen Sulfide Oxidized Rhizospl Presence of Redu Recent Iron Redu Thin Muck Surface Thin Muck Surface Other (Explain in B Depth (inches): Depth (inches): No Depth (inches):	aves (B9) 13) ts (B14) Odor (C1) neres on Living ced Iron (C4) ction in Tilled (C7) ta (D9) Remarks)	g Roots (C6) Soils (C6) Wetlan	Secondary I Surface Drainag Dry-Sea Crayfish Saturati Stunted Geomor	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ison Water Table (C2) is Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1) phic Position (D2) utral Test (D5)

WETLAND DETERMINATION DATA FORM - Midwest Region Project/Site: 302899: Hardin Solar II City/County: Hardin County Sampling Date: State: OH Sampling Point: WET-45-Applicant/Owner: TRC/Invenerau, LLC. Investigator(s): TOV LM. TR JJ Section, Township, Range: 59 Landform (hillslope, terrace, etc.): Perros sub-Slope (%): <u>0-5</u> Lat: <u>40.62732</u> Long: <u>-83.82878</u> Datum: <u>WG 58 4</u> Soil Map Unit Name: (PkA) Pewamo silty clay loam, 0-1% slopes NWI classification: Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No \_\_\_\_\_ (If no, explain in Remarks.) Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ 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 v Is the Sampled Area Hydric Soil Present? within a Wetland? Wetland Hydrology Present? VEGETATION - Use scientific names of plants. Dominance Test worksheet: Absolute Dominant Indicator Tree Stratum (Plot size: % Cover Species? Status Number of Dominant Species That Are OBL, FACW, or FAC: Total Number of Dominant Species Across All Strata: Percent of Dominant Species That Are OBL, FACW, or FAC: = Total Cover Prevalence Index worksheet: Sapling/Shrub Stratum (Plot size: Total % Cover of: OBL species FACW species FAC species FACU species UPL species = Total Cover Herb Stratum (Plot size: Column Totals: Junear tening Prevalence Index = B/A = 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 Vegetation (Explain) <sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Woody Vine Stratum (Plot size: 5 Hydrophytic Vegetation Present? = Total Cover Remarks: (Include photo numbers here or on a separate sheet.) vegetation criterion has been met.

Sampling Point: WET-HS-VB

Depth Matrix	Redox Features	
(inches) Color (moist) %	Color (moist) % Type <sup>1</sup> Loc <sup>2</sup>	Texture Remarks
0-12 10464/2 90	75 YR 4/4 10 C M	CL
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)	M=Reduced Matrix, MS=Masked Sand Grains.  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)	2Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils³:  Coast Prairie Redox (A16)  Dark Surface (S7)  Iron-Manganese Masses (F12)  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):		unless disturbed of problematic.
Type:		
		11 11 0 11 0 11 11
Depth (inches):	iterion has been i	Hydric Soil Present? Yes V No
Depth (inches):Remarks: Hydric Soil Cr	iterion has been i	OF SECTION ASSESSMENT AND ASSESSMENT OF SECTION ASSESSMENT ASSESSM
Depth (inches):Remarks: Hydric Soil cr	iterion has been i	OF SECTION ASSESSMENT AND ASSESSMENT OF SECTION ASSESSMENT ASSESSM
Depth (inches):		met.
Primary Indicators (minimum of one is required Solution (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B4) Sparsely Vegetated Concave Surface (B4)	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)	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)
Primary Indicators:  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Sparsely Vegetated Concave Surface (B4)  Irol Deservations:	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (Canada and Canada and C	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)
Proposition (Ba)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Sparsely Vegetated Concave Surface (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B4)	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (Canonic Control Contr	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)
Permarks:  Proposition (Page 1)  Proposition	ired: check all that apply)  — Water-Stained Leaves (B9)  — Aquatic Fauna (B13)  — True Aquatic Plants (B14)  — Hydrogen Sulfide Odor (C1)  — Oxidized Rhizospheres on Living Roots  — Presence of Reduced Iron (C4)  — Recent Iron Reduction in Tilled Soils (C  — Thin Muck Surface (C7)  17) — Gauge or Well Data (D9)  (B8) — Other (Explain in Remarks)  No — Depth (inches): —	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)

Project/Site: 302899: Hardin Solar	II City	County Hav	Din County someting Date: 3/20/18
		County. TICK!	Sampling Date:
Applicant/Owner: 1KC/ Inveneral,	LLC.		State: OH Sampling Point: UPL-HS-
Investigator(s): Thy LM, TR			ange: <u>S9 T5S, R9E</u>
Landform (hillslope, terrace, etc.): Plain			(concave, convex, none): Cun Vex
			Datum: WG 584
Soil Map Unit Name: (Gwd5C2) Glynwood clay loam,			
Are climatic / hydrologic conditions on the site typical for this tir		/	
Are Vegetation, Soil, or Hydrology sign			"Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology natu			eeded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sh	owing sa	mpling point I	ocations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No _	-,-		
Hydric Soil Present? Yes No _	1	Is the Sampled	nd? Yes No
Wetland Hydrology Present? Yes No Remarks:		All Control of the second	
emarks:  of 3 wetland crite  wetland.	n'a h	ave bee	n Met. Area is not a
VEGETATION – Use scientific names of plants.			
4/1		minant Indicator	Dominance Test worksheet:
1. //Ar		ecies? Status	Number of Dominant Species That Are OBL, FACW, or FAC: (A)
2			
3.			Total Number of Dominant Species Across All Strata: (B)
4.			
5			Percent of Dominant Species That Are OBL, FACW, or FAC:
Sapling/Shrub Stratum (Plot size: 15')	= To	otal Cover	
			Prevalence Index worksheet:
1. NONE			Total % Cover of: Multiply by:
2			OBL species XI-
.3			FACW species x2 =
4			FACU species
o	- To	otal Cover	UPL species 8 x5 = 40
Herb Stratum (Plot size:)		ital Cover	Column Totals: 8 (A) 40 (B)
1. GlyCAS MAY	8	[ UPL	-
2.			Prevalence Index = B/A =
3			Hydrophytic Vegetation Indicators:
4			1 - Rapid Test for Hydrophytic Vegetation
5			2 - Dominance Test is >50%
6			3 - Prevalence Index is ≤3.0¹
7			4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
8			Problematic Hydrophytic Vegetation¹ (Explain)
9			
Woody Vine Stratum (Plot size: 30' –	8 = To	tal Cover	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. // // Y			
2.			Hydrophytic Vegetation
		tal Cover	Present? Yes No
Remarks: (Include photo numbers here or on a separate shee		00701	

			11-	
Sampling Point:	UP	L-	HJ-	VL

SOIL

Denth	cription: (Describe		D.J.	v Ecob				
Depth (inches)	Color (moist)	100	Color (moist)	x Features %	Type	_Loc²	S-CL	Remarks
0-14	(U4A 4/)	100		_			CL	
ydric Soil I  Histosol Histic Ep Black Hi Hydroge Stratified 2 cm Mu Depleted Thick Da	pipedon (A2) stic (A3) on Sulfide (A4) I Layers (A5)		Sandy C Sandy F Stripped Loamy M Loamy C Depleted Redox D Depleted	S=Masked  Sleyed Mat Redox (S5) Matrix (S6 Mucky Mine Gleyed Mat d Matrix (F3 Dark Surfac d Dark Surfac Depressions	rix (S4)  8) eral (F1) trix (F2)  3) ee (F6) face (F7)	ins.	Indicators for  Coast Pra Dark Surfa Iron-Mang Very Shall Other (Exp	L=Pore Lining, M=Matrix.  Problematic Hydric Soils <sup>3</sup> : irie Redox (A16) ace (S7) anese Masses (F12) ow Dark Surface (TF12) blain in Remarks)  hydrophytic vegetation and idrology must be present,
	cky Peat or Peat (S	3)	1100001	cpi cooloii	3 (1 0)			turbed or problematic.
	ayer (if observed):							V
Type:	hes):	2 cnit	erion h	05.	not	been	Hydric Soil Pre	rsent? Yes No X
Type: Depth (inc emarks: Hyd	IVIC SOIS	2 cnit	erion r	105.	not	been	N. Carlo Sales	
Type:	Y, C 5015	2 cnit	erion h	105.	not	been	N. Carlo Sales	
Type:	GY  drology Indicators:				not	been	_ me	t
Type:	GY  drology Indicators: ators (minimum of one of the content of th	ne is required	: check all that app — Water-Stain — Aquatic Fan — True Aquati — Hydrogen S — Oxidized R — Presence of — Recent Iron — Thin Muck S	oly) ned Leaves una (B13) ic Plants (B Sulfide Odo hizosphere f Reduced i Reduction Surface (C	s (B9) B14) or (C1) es on Livir Iron (C4) n in Tilled 77) D9)	ng Roots ((	Secondary II Surface Drainag Dry-Sea Crayfish Saturati Stunted Geomor	t
Type:	GY  Irology Indicators: ators (minimum of orwater (A1) ter Table (A2) in (A3) arks (B1) t Deposits (B2) osits (B3) t or Crust (B4) osits (B5) in Visible on Aerial II Vegetated Concave rations: ar Present? Present? Yesent?	magery (B7) s Surface (B8) es No es No	: check all that app  Water-Stain  Aquatic Fai  True Aquati  Hydrogen S  Oxidized R  Presence of Recent Iror  Thin Muck of Gauge or W  Other (Expi	oly) ned Leaves una (B13) ic Plants (B Sulfide Odo hizosphere f Reduced Reduction Surface (C Vell Data (B ain in Rem hes): hes):	s (B9) B14) or (C1) es on Livir Iron (C4) n in Tilled (7) D9) narks)	ng Roots (0 Soils (C6)	Secondary II Surface Drainag Dry-Sea Crayfish Saturati Stunted Geomor FAC-Ne	ndicators (minimum of two required Soil Cracks (B6) e Patterns (B10) ison Water Table (C2) is Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1) phic Position (D2)

WETLAND DETERMINATION DATA FORM - Midwest Region Project/Site: 302899: Hardin Solar II City/County: Hardin County Sampling Date: 5/23/ Applicant/Owner: TRC/Invenergy, LLC. Sampling Point: WET-HS-State: OH Section, Township, Range: <u>S4</u> T55, R9E Investigator(s): The Lm + Landform (hillstope, terrace, etc.): Novera in Local relief (concave, convex, none): Conthice Long: \_-83.83163 \_\_\_\_\_\_ Datum: WGS84 Slope (%): 0-5 Lat: 40.63208 \_\_\_ NWI classification: PFO I Soil Map Unit Name: (PkA) Pewamo silty clay loam, 0-1% Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_ No \_\_\_\_\_ (If no, explain in Remarks.) Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes (If needed, explain any answers in Remarks.) Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Is the Sampled Area Hydric Soil Present? within a Wetland? Wetland Hydrology Present? iteriahave been met. VEGETATION - Use scientific names of plants. Absolute Dominant Indicator Dominance Test worksheet: Tree Stratum (Plot size: 30) % Cover Species? Status Number of Dominant Species 1. Acer rubenno FAC That Are OBL, FACW, or FAC: FALL 2. Itaskens hiera Total Number of Dominant Species Across All Strata: (B) Percent of Dominant Species That Are OBL, FACW, or FAC: Sapling/Shrub Stratum (Plot size: 15 = Total Cover Prevalence Index worksheet: FAL Total % Cover of: Multiply by: 1. Acer performs **OBL** species FACIN **FACW** species FAC species FACU species **UPL** species = Total Cover Herb Stratum (Plot size: Column Totals: 205 OBL 1. Glyceria Strigta 1.47 Prevalence Index = B/A = FALL Hydrophytic Vegetation Indicators: FAL 3. Bucheren Unlagets 11/ 15 1 - Rapid Test for Hydrophytic Vegetation N FALLY 13 2 - Dominance Test is >50% Alliaria petiolata N FAC 10 3 - Prevalence Index is ≤3.01 FACW 4 - Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet) 8 Problematic Hydrophytic Vegetation<sup>1</sup> (Explain) 9 <sup>1</sup>Indicators of hydric soil and wetland hydrology must = Total Cover be present, unless disturbed or problematic. Woody Vine Stratum (Plot size: FACU Hydrophytic Vegetation Present? = Total Cover Remarks: (Include photo numbers here or on a separate sheet.) Hydrophytic vegetation criterion has been met.

Sampling Point: WET- HJ-VC

Profile Description: (Describe to the de Depth Matrix	Redox Features	
(inches) Color (moist) %	Color (moist) % Type <sup>1</sup> Loc <sup>2</sup>	Texture Remarks
0-4 25 43/1 100		CL
1-14 1040 3/1 95	1048 4/4 5 -C M	<u> </u>
10 10 17	1011 J 11	
Type: C=Concentration, D=Depletion, RM	M=Reduced Matrix, MS=Masked Sand Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
lydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :
_ Histosol (A1)	Sandy Gleyed Matrix (S4)	Coast Prairie Redox (A16)
Histic Epipedon (A2)	Sandy Redox (S5)	Dark Surface (S7)
_ Black Histic (A3)	Stripped Matrix (S6)	Iron-Manganese Masses (F12)
_ Hydrogen Sulfide (A4)	Loamy Mucky Mineral (F1)	Very Shallow Dark Surface (TF12)
_ Stratified Layers (A5)	Loamy Gleyed Matrix (F2)	Other (Explain in Remarks)
_ 2 cm Muck (A10)	Depleted Matrix (F3)	
Depleted Below Dark Surface (A11)	Redox Dark Surface (F6)	31
_ Thick Dark Surface (A12) _ Sandy Mucky Mineral (S1)	Depleted Dark Surface (F7)	<sup>3</sup> Indicators of hydrophytic vegetation and
_ 5 cm Mucky Peat or Peat (S3)	Redox Depressions (F8)	wetland hydrology must be present,
estrictive Layer (if observed):		unless disturbed or problematic.
T		/
Type:		11 11 0 11 10 11 11
D 0 0 1 1		HVdric Soil Present? Yes V No
Depth (Inches): Remarks: Hydric Soil or	iterion has been i	Hydric Soil Present? Yes V No
emarks: Hydric soil cr	iterion has been i	
Hydric soil cr	iterion has been i	
PROLOGY  Vetland Hydrology Indicators;		met.
emarks: Hydric Soil or  DROLOGY  Tetland Hydrology Indicators:  Timary Indicators (minimum of one is required)	ired: check all that apply)	Met.
PROLOGY  Tetland Hydrology Indicators;  rimary Indicators (minimum of one is required)  Surface Water (A1)	ired: check all that apply)  Water-Stained Leaves (B9)	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)
PROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requested as Surface Water (A1) High Water Table (A2)	iired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)
PROLOGY  Sort Correction  Process of the correction of the correct	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)	Secondary Indicators (minimum of two required  X Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)
PROLOGY  Sort Cord Cord Cord Cord Cord Cord Cord Cord	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)
PROLOGY  [etland Hydrology Indicators: rimary Indicators (minimum of one is requ  Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)
PROLOGY  [etland Hydrology Indicators: rimary Indicators (minimum of one is required)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)
remarks:  Hydric Soil Cr  TDROLOGY  Tetland Hydrology Indicators:  Timary Indicators (minimum of one is requested to the second of the second	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots	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)
remarks:  Hydric Soil Cr  TDROLOGY  Tetland Hydrology Indicators:  Timary Indicators (minimum of one is requested to the second of the second	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  S(C3)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)
remarks:  Hydric Soil Cr  TDROLOGY  Tetland Hydrology Indicators:  Timary Indicators (minimum of one is requested to the second of the second	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  S(C3)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
emarks: Hydric Soil or  TDROLOGY  etland Hydrology Indicators: imary Indicators (minimum of one is requested by the second of th	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  (C3)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
rimary Indicators (minimum of one is requested by Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B Sparsely Vegetated Concave Surface (B4)	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  (C3)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
remarks: Hydric Soil or  PROLOGY  Vetland Hydrology Indicators: rimary Indicators (minimum of one is requived by the second of t	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (Canonic March Control	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  (C3)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
// January Indicators: // January Indicators (minimum of one is required from the second of the seco	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  (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)  (C3)  Saturation Visible on Aerial Imagery (C9)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
/DROLOGY //etland Hydrology Indicators: rimary Indicators (minimum of one is required by Mater Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (Besparsely Vegetated Concave Surface (Beld Observations: Urface Water Present?  Yes  //eter Table Present?	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  (B8)  Other (Explain in Remarks)  No  Depth (inches):	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)
Property of the control of the contr	iired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  (B8) Other (Explain in Remarks)  No Depth (inches): Well  No Depth (inches): Well	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)
/ PROLOGY /etland Hydrology Indicators: rimary Indicators (minimum of one is requested Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B Sparsely Vegetated Concave Surface (Beld Observations: urface Water Present? //eter Table Present? //esturration Present?	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  (B8)  Other (Explain in Remarks)  No  Depth (inches):	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)
remarks: Hydric Soil or  PROLOGY  Vetland Hydrology Indicators: rimary Indicators (minimum of one is required.)  Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B Sparsely Vegetated Concave Surface (Beld Observations: Unface Water Present? Ves  Auturation Present?  Ves  Auturation Present?  Ves  Ves  Ves  Ves  Ves  Ves  Ves  Ve	iired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  (B8) Other (Explain in Remarks)  No Depth (inches): Well  No Depth (inches): Well	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)
remarks:  Hydro Sorlor  Torontogy  Vetland Hydrology Indicators: rimary Indicators (minimum of one is requested Sorlor (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B  Sparsely Vegetated Concave Surface (B1)  Sparsely V	ired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (Canonic Medical Control Contr	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)
remarks:  Hydro Sorlor  TOROLOGY  Tetland Hydrology Indicators:  rimary Indicators (minimum of one is required.)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B  Sparsely Vegetated Concave Surface (Beld Observations:  Inface Water Present?  Alter Table Present?  Yes  Auturation Present?  Yes  Cludes capillary fringe)  Pascribe Recorded Data (stream gauge, minus present)	iired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  Gauge or Well Data (D9)  (B8) Other (Explain in Remarks)  No Depth (inches): Well  No Depth (inches): Well	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)

WETLAND DETERMINATION DATA FORM - Midwest Region Project/Site: 302899: Hardin Solar II city/County: Hardin County sampling Date: 5/23/1) Applicant/Owner: TRC/Inveneral, LLC. State: OH Sampling Point: UPL- 415- VC/D Investigator(s): JOV Section, Township, Range: 54 TSS RGE Landform (hillslope, terrace, etc.): Slope (%): 0-5 Lat: 40.63230 Long: \_\_-83.83053 Datum: WG 58 4 Soil Map Unit Name: (Blg1A1) Blount silt loam, ground moraine, 0-2% slopes \_\_\_\_ NWI classification: None Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_X \_\_ (If no, explain in Remarks.) Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ 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 Is the Sampled Area Hydric Soil Present? within a Wetland? Wetland Hydrology Present? Yes Remarks: of 3 wetland criteria have been m VEGETATION - Use scientific names of plants. Absolute Dominant Indicator Dominance Test worksheet: Tree Stratum (Plot size: 30 % Cover Species? Status Number of Dominant Species 1. Acer rubrum FAL That Are OBL, FACW, or FAC: 2. Jugland storg Total Number of Dominant Species Across All Strata: Percent of Dominant Species That Are OBL, FACW, or FAC: Sapling/Shrub Stratum (Plot size: 5 = Total Cover Prevalence Index worksheet: 1. Nune Total % Cover of: 0 OBL species **FACW** species 164 FAC species 241 FACU species UPL species = Total Cover Herb Stratum (Plot size: 150 5/2 Column Totals: 1. Agrimania rustellata 2. Padio hallam selfatum FACIN Prevalence Index = B/A = Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.01 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation<sup>1</sup> (Explain) <sup>1</sup>Indicators of hydric soil and wetland hydrology must = Total Cover be present, unless disturbed or problematic. Woody Vine Stratum (Plot size: FALL Hydrophytic Vegetation Present? = Total Cover Remarks: (Include photo numbers here or on a separate sheet.) Hudrophytic vegetation criterion has Not

Depth (inches) Color (moist), %  D=16	Redox Features Color (moist) % Type¹ Loc²	Texture Remarks
Type: C=Concentration, D=Depletion, RM= lydric 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)	Reduced Matrix, MS=Masked Sand Grains.  Sandy Gleyed Matrix (S4) Sandy Redox (S5) Stripped Matrix (S6) Loarny Mucky Mineral (F1) Loamy Gleyed Matrix (F2) Depleted Matrix (F3) Redox Dark Surface (F6) Depleted Dark Surface (F7) Redox Depressions (F8)	2Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils3:  Coast Prairie Redox (A16)  Dark Surface (S7)  Iron-Manganese Masses (F12)  Very Shallow Dark Surface (TF12)  Other (Explain in Remarks)  3Indicators of hydrophytic vegetation and wetland hydrology must be present,
5 cm Mucky Peat or Peat (S3) sestrictive Layer (if observed):  Type:  Depth (inches):	(redox Depressions (re)	unless disturbed or problematic.  Hydric Soil Present? Yes No
Hydric soil cri-	terion has had been	met.
Hydric soil cri-	terion has had been	met.
Hydric soil crit	terion has hat been	met.
PROLOGY  Vetland Hydrology Indicators: rimary Indicators (minimum of one is require		met.  Secondary Indicators (minimum of two require
PROLOGY  Vetland Hydrology Indicators: rimary Indicators (minimum of one is require Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B6)	d; check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Well Data (D9)	Secondary Indicators (minimum of two require  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)
/ CPROLOGY // Cetland Hydrology Indicators: rimary Indicators (minimum of one is required and surface Water (A1)  - High Water Table (A2)  - Saturation (A3)  - Water Marks (B1)  - Sediment Deposits (B2)  - Drift Deposits (B3)  - Algal Mat or Crust (B4)  - Iron Deposits (B5)  - Inundation Visible on Aerial Imagery (B7)  - Sparsely Vegetated Concave Surface (B1)	d; check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches): Depth (inches): Wetla	Secondary Indicators (minimum of two require 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)
/ CDROLOGY // Vetland Hydrology Indicators: rimary Indicators (minimum of one is required a Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (Bit in its indicated water Present?  // Sparsely Vegetated Concave Surface (Bit in its indicated water Present?  // Yes Note that its indicated water Present?	d; check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches):	Secondary Indicators (minimum of two require 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)

WETLAND DETERMINATION DATA FORM - Midwest Region Project/Site: 302899: Hardin Solar II City/County: Hardin County Sampling Date: 5/33/18 Applicant/Owner: TRC/Invenergy, LLC. state: OH sampling Point: WET-HS-VD Section, Township, Range: 54, T55, R9E Investigator(s): JDV, Ln, TR Local relief (concave, convex, none): \_\_\_\_\_\_\_ Landform (hillslope, terrace, etc.): Descrition Long: -83.82940 Datum: WGS84 Slope (%): 0-5 Lat: 40.63222 Soil Map Unit Name: (Blg1A1) Blount silt loam, ground moraine, 0-2% slopes NWI classification: None Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No (If no, explain in Remarks.) Are "Normal Circumstances" present? Yes V Are Vegetation , Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ 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? Is the Sampled Area Hydric Soil Present? within a Wetland? Wetland Hydrology Present? VEGETATION - Use scientific names of plants. Dominance Test worksheet: Absolute Dominant Indicator Tree Stratum (Plot size: 30) % Cover Species? Status Number of Dominant Species 1. Nyster Sxlyntica FAL That Are OBL, FACW, or FAC: FAL 2. Acco mboum Total Number of Dominant FALL Species Across All Strata: Percent of Dominant Species That Are OBL, FACW, or FAC: 70 = Total Cover Prevalence Index worksheet: Total % Cover of: 1. Linders benzuin OBL species FACW species FAC species 15 FACU species \_ UPL species = Total Cover Herb Stratum (Plot size: 10 1. Alliania Detiolo Prevalence Index = B/A = 2. Poar vontensis Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% X3 - Prevalence Index is ≤3.01 4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation<sup>1</sup> (Explain) Indicators of hydric soil and wetland hydrology must = Total Cover be present, unless disturbed or problematic. 1. Almr Hydrophytic Vegetation

= Total Cover

Hydrophytic vegetation criterion has been me

Midwest Region - Version 2.0

Present?

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

Sampling Point: WET- HS-VD

Depth	Type'			
1/ 1/1 - 11 - 1		Loc2	Texture	Remarks
1-14 164A 3/2 95 104A 4/4 5			S;CL	(Normanio
	(	n	CL	
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked	Sand Grain	ns.	<sup>2</sup> Location: PL	=Pore Lining, M=Matrix.
yaric Soil Indicators:			Indicators for I	Problematic Hydric Soils3:
Histosol (A1) Sandy Gleyed Matr				ie Redox (A16)
Histic Epipedon (A2) Sandy Redox (S5)  Black Histic (A3) Stripped Matrix (S6)			Dark Surface	
				nese Masses (F12)
				w Dark Surface (TF12)
Stratified Layers (A5) Loamy Gleyed Matrix (F3  2 cm Muck (A10) Depleted Matrix (F3			Other (Expl	ain in Remarks)
Depleted Below Dark Surface (A11)  Redox Dark Surface				
_ Thick Dark Surface (A12) Depleted Dark Surface			3Indicators of h	drophytic vegetation and
Sandy Mucky Mineral (S1) Redox Depressions				rology must be present,
5 cm Mucky Peat or Peat (S3)	1.3		unless distu	rbed or problematic.
strictive Layer (if observed):				LSignifican
Type:				/
Depth (Inches):			Hydric Soil Pres	ent? Yes V No
DROLOGY				
etland Hydrology Indicators:				
etland Hydrology Indicators:			Secondary Ind	icetors (minimum of two require
stland Hydrology Indicators: mary Indicators (minimum of one is required: check all that apply)	/R9)			icators (minimum of two required
tland Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  Water-Stained Leaves	(B9)		Surface S	oil Cracks (B6)
tland Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Water-Stained Leaves  Aquatic Fauna (B13)			Surface S Drainage	oil Cracks (B6) Patterns (B10)
tland Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water-Stained Leaves  — Aquatic Fauna (B13)  — True Aquatic Plants (B1	14)		Surface \$ Drainage   Dry-Seaso	oil Cracks (B6) Patterns (B10) on Water Table (C2)
tland Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Water Marks (B1)  Hydrogen Sulfide Odor	14) (C1)	Roots (C3	Surface S Drainage   Dry-Seaso Crayfish B	oil Cracks (B6) Patterns (B10) on Water Table (C2) urrows (C8)
tland Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Water Marks (B1)  Water Marks (B2)  Cylidzed Rhizospheres	14) (C1) on Living	Roots (C3	Surface S Drainage Dry-Seaso Crayfish B Saturation	oil Cracks (B6) Patterns (B10) on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9)
stland Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Mary Indicators:  Water All that apply)  Water Stained Leaves  Aquatic Fauna (B13)  True Aquatic Plants (B1)  Hydrogen Sulfide Odor  Oxidized Rhizospheres  Presence of Reduced In	14) (C1) on Living		Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or	oil Cracks (B6) Patterns (B10) on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) Stressed Plants (D1)
stland Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Water Marks (B5)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Water Marks (B1)  Algal Mat or Crust (B4)  Thin Muck Surface (C7)	14) (C1) on Living ron (C4) in Tilled So		Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or Geomorph	oil Cracks (B6) Patterns (B10) on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) Stressed Plants (D1) ic Position (D2)
triand Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Water All that apply)  Water-Stained Leaves  Aquatic Fauna (B13)  True Aquatic Plants (B1)  Hydrogen Sulfide Odor  Oxidized Rhizospheres  Presence of Reduced in  Recent Iron Reduction in  Thin Muck Surface (C7)  Inundation Visible on Aerial Imagery (B7)  Gauge or Well Data (D8)	14) (C1) s on Living ron (C4) in Tilled Sc		Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or Geomorph	oil Cracks (B6) Patterns (B10) on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) Stressed Plants (D1)
triand Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Water All that apply)  Water-Stained Leaves  Aquatic Fauna (B13)  True Aquatic Plants (B1  Hydrogen Sulfide Odor  Oxidized Rhizospheres  Presence of Reduced in  Recent Iron Reduction in  Thin Muck Surface (C7)  Inundation Visible on Aerial Imagery (B7)  Gauge or Well Data (D8)	14) (C1) s on Living ron (C4) in Tilled So )		Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or Geomorph	oil Cracks (B6) Patterns (B10) on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) Stressed Plants (D1) ic Position (D2)
tland Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Water-Stained Leaves  Aquatic Fauna (B13)  True Aquatic Plants (B1  Hydrogen Sulfide Odor  Oxidized Rhizospheres  Presence of Reduced in  Recent Iron Reduction in  Thin Muck Surface (C7)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Other (Explain in Remand Observations:	14) (C1) s on Living ron (C4) in Tilled So )		Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or Geomorph	oil Cracks (B6) Patterns (B10) on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) Stressed Plants (D1) ic Position (D2)
tland Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Water-Stained Leaves  Aquatic Fauna (B13)  True Aquatic Plants (B1  Hydrogen Sulfide Odor  Oxidized Rhizospheres  Presence of Reduced in  Recent Iron Reduction in  Thin Muck Surface (C7)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Other (Explain in Remand Observations:	14) (C1) s on Living ron (C4) in Tilled So )		Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or Geomorph	oil Cracks (B6) Patterns (B10) on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) Stressed Plants (D1) ic Position (D2)
titland Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  d Vater Marks (B1)  Presence of Reduced in Recent Iron Reduction in Muck Surface (C7)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Depth (inches):	14) (C1) s on Living ron (C4) in Tilled So )		Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or Geomorph	oil Cracks (B6) Patterns (B10) on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) Stressed Plants (D1) ic Position (D2)
etland Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Id Observations:  face Water Present?  Yes No Depth (inches):  Juration Present?  Yes No Depth (inches):  Juration Present?  Juration Present?  Juration Present?  Yes No Depth (inches):  Juration Present?  Juration Present?  Juration Present?  Yes No Depth (inches):  Juration Present?  Juration Present?  Juration Present?  Yes No Depth (inches):  Juration Present?  Juration Present?	14) (C1) s on Living ron (C4) in Tilled Sc ) 9) urks)	oils (C6)	Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or Geomorph FAC-Neuth	oil Cracks (B6) Patterns (B10) on Water Table (C2) currows (C8) Visible on Aerial Imagery (C9) Stressed Plants (D1) cic Position (D2) ral Test (D5)
High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B6) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Dother (Explain in Remaild Observations:  face Water Present?  Yes No Depth (Inches): Under Table Present?  Yes No Depth (inches): Under Table Present?  Presence of Reduced in Recent Iron Reduction in Remaild Observations:  Face Water Present?  Yes No Depth (Inches): Under Table Present?  Yes No Depth (inches):	14) (C1) s on Living ron (C4) in Tilled Sc ) 9) urks)	oils (C6)	Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or Geomorph FAC-Neuth	oil Cracks (B6) Patterns (B10) on Water Table (C2) currows (C8) Visible on Aerial Imagery (C9) Stressed Plants (D1) cic Position (D2) ral Test (D5)
etland Hydrology Indicators:  mary Indicators (minimum of one is required: check all that apply)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Id Observations:  face Water Present?  Yes No Depth (inches):  Uration Present?	14) (C1) s on Living ron (C4) in Tilled Sc ) 9) urks)	Wetland	Surface S Drainage I Dry-Seaso Crayfish B Saturation Stunted or Geomorph FAC-Neutr	oil Cracks (B6) Patterns (B10) on Water Table (C2) ourrows (C8) Visible on Aerial Imagery (C9) Stressed Plants (D1) ilc Position (D2) ral Test (D5)  ent? Yes No

Project/Site: 30899: Hardin Wind Energy Project City/County: Havd	Din County Sampling Date: 5/15/18
Applicant/Owner: TRC/Invenergy, LLC.	State: OH Sampling Point: WET-HW
Investigator(s): M. Mol m r. J. WW + Lo Section, Township, Rai	
Landform (hillstope, terrace, etc.): <u>ALDYESSION</u> Local relief	(concave, convex, none): On Carre
Slope (%): (20/2 Let: 40.65226 Long: -83.79237	Datum: W6584
Soil Map Unit Name: (Ro) Roundhead Muck	NWI classification; None
Are climatic $l$ hydrologic conditions on the site typical for this time of year? Yes $X$ No	
	Normal Circumstances" present? Yes X No
	eded, explain any answers in Remarks.)
,	
SUMMARY OF FINDINGS - Attach site map showing sampling point le	ocations, transects, important features, etc.
Hydrophylic Vegetation Present?  Yes No Is the Sampled	Arms (
Hydric Son Present?	
Wetland Hydrology Present?	
Remarks: 3 wetland criteria have been met.	
Ditched adredged	
VEGETATION – Use scientific names of plants.	
Absolute Dominant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30 ) % Cover Species? Status	Number of Dominant Species That Are OBL, FACW, or FAC: (A)
7	
4 -	Total Number of Dominant Species Across All Strata: (8)
4.	
5	Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
= Total Cover	
Sapling/Shrub Stratum (Plot size: \\)	Prevalence Index worksheet:
1,	Total % Cover of: Multiply by:
2	OBL species x1=
3	FACW species x 2 =
4	FAC species x3 =
5	FACU species x 4 = UPL species x 5 =
Herb Stratum (Plot size:)= Total Cover	i :
1. Tu pha x al auca 20 V OISL	Column Totals: (A) (B)
2. Phalans arundinocea 30 V FACW	Prevatence Index = B/A =
3. Rumer Crispis To EAC	Hydrophytic Vegetation Indicators:
4. Allisama subcardatum 8 OBI	1 - Rapid Test for Hydrophytic Vegetation
5. Ranunculus scaluratus 3 OBI	∠ 2 - Dominance Test is >50%
6.	3 - Prevalence Index is ≤3.0 <sup>1</sup>
7.	4 - Morphological Adaptations¹ (Provide supporting
8.	data in Remarks or on a separate sheet)
9.	Problematic Hydrophytic Vegetation¹ (Explain)
10.	11.6.4
Woody Vine Stratum (Plot size: 20) = Total Cover	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1 Transfer Film Street Control of the Control of th	Hydrophytic
2.	Vegetation
= Total Cover	Present? Yes No No
	100 (1-1-
Remarks: (Include photo numbers here or on a separate sheet.) Hydrophytic vegetation criterion	rus deun vivet.
Light of Direct and Louisian in	

Profile Description: (Describe to the de	pth needed to docum	ent the indicate	or or confirm	the absence	Sampling Point: WE
Depth Matrix		Features			
(inches) Color (moist) %	Color (moist)	%Type	Loc²	<u>Texture</u>	Remarks
0-20 4.54R3/ 40	BR 2/8	<u>30 C</u>	_ <u>PL</u> _	MUCK	
			<del></del>		
· ·			<del></del>	·	37. 18
				·	
				·	
ype: C=Concentration, D=Depletion, RM	=Reduced Matrix MS	Masked Sand G	traine	.21 sastions	PL≂Pore Lining, M=Matrix.
ydric Soil Indicators:	Treatment institut, 1410-	-Mesked Galid C	nemo.	Indicators	for Problematic Hydric Soils <sup>3</sup> :
_ Histosol (A1)	Sandy Glo	eyed Matrix (S4)			Preirie Redox (A16)
Histic Epipedon (A2)	Sandy Re				urface (\$7)
Black Histic (A3)	•	Matrix (S6)			inganese Masses (F12)
_ Hydrogen Sulfide (A4)		ucky Mineral (F1			nallow Dark Surface (TF12)
_ Stratified Layers (A5)		eyed Matrix (F2)		Other (I	Explain in Remarks)
2 cm Muck (A10) Depleted Below Dark Surface (A11)		Matrix (F3)			
_ Depleted below bark Surface (A11) _ Thick Dark Surface (A12)		rk Surface (F6)		N	
Sandy Mucky Mineral (S1)		Dark Surface (F) pressiona (F8)	') '		of hydrophytic vegetation and
5 cm Mucky Peat or Peat (S3)	11040X DC	hressiona (1 D)			hydrology must be present, fisturbed or problematic.
estrictive Layer (if observed):				direct (	returbed of problematic.
Type: Nowl					1
Depth (inches): N/A			ĺ	Hydric Soil F	resent? Yes 🔽 No
Hydric soil cr	temion V	nas be	en m	et.	-
Hydric Soik on	temion V	1as be	en m	et.	
DROLOGY atland Hydrology Indicators:	·		en m	· .	
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is required)	ed: check all that apply	0	en m	· .	/ Indicators (minimum of two require
DROLOGY  atland Hydrology Indicators:  imary Indicators (minimum of one is required)  Surface Water (A1)	ed: check all that apply	r) d Leaves (B9)	en m	Secondari	ce Soil Cracks (B6)
DROLOGY  etland Hydrology Indicators:  mary Indicators (minimum of one is required)  Surface Water (A1)  High Water Table (A2)	ed: check all that apply Water-Stained	r) d Leaves (B9) a (B13)	en m	Secondary Surface X Draina	ce Soil Cracks (B6) age Patterns (B10)
DROLOGY  etland Hydrology Indicators:  mary Indicators (minimum of one is requir  Surface Water (A1)  High Water Table (A2)  Saturation (A3)	ed: check all that apply Water-Stained Aquatic Faunt X True Aquatic	r) d Leaves (B9) a (B13) Plants (B14)	en m	Secondar Surface X Draine	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2)
DROLOGY  atland Hydrology Indicators:  mary Indicators (minimum of one is require).  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)	ed: check all that apply Water-Stained Aquatic Faunt X True Aquatic Hydrogen Sui	() d Leaves (B9) a (B13) Plants (B14) lfide Odor (C1)	-	Secondary Surface X Draine Dry-S Crayfi	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8)
DROLOGY  etland Hydrology Indicators:  mary Indicators (minimum of one is requir  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)	ed: check all that apply  — Water-Staine — Aquatic Faun — True Aquatic — Hydrogen Sui	r) d Leaves (B9) a (B13) Plants (B14) ffide Odor (C1) cospheres on Liv	ing Roots (C	Secondary Surface Dry-S Crayfi S X Satura	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9)
DROLOGY  atland Hydrology Indicators:  mary Indicators (minimum of one is required)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)	ed: check all that apply  — Water-Staine — Aquatic Faunt — True Aquatic — Hydrogen Sut — Oxidized Rhiz — Presence of F	d Leaves (B9) a (B13) Plants (B14) Mide Odor (C1) cospheres on Liv Reduced Iron (C4	ing Roots (C:	Secondary Surface Dry-S Crayfi Satura Stunte	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1)
DROLOGY  atland Hydrology Indicators:  mary Indicators (minimum of one is required)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)	ed: check all that apply Water-Stainer Aquatic Faunt True Aquatic Hydrogen Sut Oxidized Rhiz Presence of F	d Leaves (B9) a (B13) Plants (B14) lide Odor (C1) cospheres on Liv Reduced Iron (C-	ing Roots (C:	Secondari Surface Dry-S Crayfi Satura Stunte X Geom	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2)
DROLOGY  Itland Hydrology Indicators:  mary Indicators (minimum of one is required Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)	ed: check all that apply  Water-Stainer Aquatic Faun True Aquatic Hydrogen Sut Oxidized Rhiz Presence of F Recent Iron R	d Leaves (B9) a (B13) Plants (B14) ifide Odor (C1) cospheres on Liv Reduced Iron (C4) adduction in Tille	ing Roots (C:	Secondari Surface Dry-S Crayfi Satura Stunte X Geom	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1)
DROLOGY tland Hydrology Indicators: mary Indicators (minimum of one is required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Grust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7)	ed: check all that apply  Water-Stainer Aquatic Faunt True Aquatic Hydrogen Sut Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su	d Leaves (B9) a (B13) Plants (B14) ifide Odor (C1) cospheres on Liv Reduced Iron (C4) and the control of the co	ing Roots (C:	Secondari Surface Dry-S Crayfi Satura Stunte X Geom	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2)
DROLOGY  tland Hydrology Indicators: nary Indicators (minimum of one is required Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aeriel Imagery (B7)  Sparsely Vegetated Concave Surface (B8)	ed: check all that apply  Water-Stainer Aquatic Faunt True Aquatic Hydrogen Suit Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su	d Leaves (B9) a (B13) Plants (B14) ifide Odor (C1) cospheres on Liv Reduced Iron (C4) and the control of the co	ing Roots (C:	Secondari Surface Dry-S Crayfi Satura Stunte X Geom	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2)
DROLOGY  Itland Hydrology Indicators:  mary Indicators (minimum of one is required Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aeriel Imagery (B7)  Sparsely Vegetated Concave Surface (B)  d Observations:	ed: check all that apply  — Water-Stainer — Aquatic Faun X True Aquatic — Hydrogen Sut X Oxidized Rhiz — Presence of F — Recent Iron R — Thin Muck Su ) — Gauge or Wel 8) — Other (Explain	d Leaves (B9) a (B13) Plants (B14) Mide Odor (C1) cospheres on Liv Reduced Iron (C4 Reduction in Tille riface (C7) Il Data (D9) n in Remarks)	ing Roots (C:	Secondari Surface Dry-S Crayfi Satura Stunte X Geom	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2)
DROLOGY  atland Hydrology Indicators:  mary Indicators (minimum of one is required)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B6)  Inundation Visible on Aeriel Imagery (B7)  Sparsely Vegetated Concave Surface (B1)  Id Observations:  face Water Present?	ed: check all that apply  Water-Stainer Aquatic Faunt True Aquatic Hydrogen Suit Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su Gauge or Wel Other (Explain	d Leaves (B9) a (B13) Plants (B14) Ifide Odor (C1) cospheres on Liv Reduced Iron (C- Reduction in Tille rface (C7) Il Data (D9) n in Remarks) s):	ing Roots (C: I) d Solis (C6)	Secondari Surface Dry-S Crayfi Satura Stunte X Geom	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2)
DROLOGY  atland Hydrology Indicators:  mary Indicators (minimum of one is required Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B1)  Id Observations:  face Water Present?  YesN	ed: check all that apply  Water-Stainer Aquatic Faunt True Aquatic Hydrogen Suit Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su Gauge or Wel Other (Explain	d Leaves (B9) a (B13) Plants (B14) Iffide Odor (C1) cospheres on Liv Reduced Iron (C- Reduction in Tille rface (C7) Il Data (D9) n in Remarks) s): 4	ing Roots (Col) d Soils (C6)	Secondary Surface Dry-S Crayfi Satura Stunte X Geom	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2) Neutral Test (D5)
DROLOGY  atland Hydrology Indicators:  mary Indicators (minimum of one is required Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aeriel Imagery (B7)  Sparsely Vegetated Concave Surface (B1)  Id Observations:  face Water Present?  ter Table Present?  puration Present?	ed: check all that apply  Water-Stainer Aquatic Faum True Aquatic Hydrogen Sut X Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su Other (Explair Depth (inches	d Leaves (B9) a (B13) Plants (B14) Mide Odor (C1) Cospheres on Liv Reduced Iron (C4 Reduction in Tille Irrace (C7) II Data (D9) n in Remarks) s): Lil s) SOSUPFA	ing Roots (C.1) d Soils (C6)  Wetland	Secondary Surface Dry-S Crayfit Satura Stunte X Geom FAC-M	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2) Neutral Test (D5)
DROLOGY  Itland Hydrology Indicators:  mary Indicators (minimum of one is required)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aeriel Imagery (B7  Sparsely Vegetated Concave Surface (B1  Id Observations:  face Water Present?  Ves Note of the Market Present of the Concave Surface (B1  Inundation Present of the Concave Surface (B1  Id Observations:  Idea Table Present of the Concave Surface (B1  Inundation Present of the Concave Surface (B1  Id Observations:  Idea Table Present of the Concave Surface (B1  Idea Surface (B1  Ide	ed: check all that apply  Water-Stainer Aquatic Faum True Aquatic Hydrogen Sut X Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su Other (Explair Depth (inches	d Leaves (B9) a (B13) Plants (B14) Mide Odor (C1) Cospheres on Liv Reduced Iron (C4 Reduction in Tille Irrace (C7) II Data (D9) n in Remarks) s): Lil s) SOSUPFA	ing Roots (C.1) d Soils (C6)  Wetland	Secondary Surface Dry-S Crayfit Satura Stunte X Geom FAC-M	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2) Neutral Test (D5)
DROLOGY  atland Hydrology Indicators:  mary Indicators (minimum of one is required Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aeriel Imagery (B7)  Sparsely Vegetated Concave Surface (B1)  Id Observations:  face Water Present?  YesN	ed: check all that apply  Water-Stainer Aquatic Faum True Aquatic Hydrogen Sut X Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su Other (Explair Depth (inches	d Leaves (B9) a (B13) Plants (B14) Mide Odor (C1) Cospheres on Liv Reduced Iron (C4 Reduction in Tille Irrace (C7) II Data (D9) n in Remarks) s): Lil s) SOSUPFA	ing Roots (C.1) d Soils (C6)  Wetland	Secondary Surface Dry-S Crayfit Satura Stunte X Geom FAC-M	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2) Neutral Test (D5)
DROLOGY  etland Hydrology Indicators: mary Indicators (minimum of one is required Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B6)  Inundation Visible on Aeriel Imagery (B7  Sparsely Vegetated Concave Surface (B1)  Id Observations: face Water Present?  Ves Note Table Present?  Iter Table Present?  Invarion Prese	ed: check all that apply  Water-Stainer Aquatic Faum True Aquatic Hydrogen Sut Coxidized Rhiz Presence of F Recent Iron R Thin Muck Su Gauge or Wel Company Depth (inchesion Depth (inchesion)	d Leaves (B9) a (B13) Plants (B14) Iffide Odor (C1) Cospheres on Liv Reduced Iron (C4 Reduction in Tille Irface (C7) II Data (D9) n in Remarks) s): L1 II s) OSUP A tos, previous ins	ing Roots (Call) d Soils (C6)  Wetland pections), if a	Secondary Surface X Draine Dry-S X Crayfit Stunte X Geom FAC-N	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2) Neutral Test (D5)
DROLOGY  Itland Hydrology Indicators: nary Indicators (minimum of one is required Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aeriel Imagery (B7 Sparsely Vegetated Concave Surface (B4) d Observations: ace Water Present?  Table Present?  Table Present?  Test Table Presen	ed: check all that apply  Water-Stainer Aquatic Faum True Aquatic Hydrogen Sut Coxidized Rhiz Presence of F Recent Iron R Thin Muck Su Gauge or Wel Company Depth (inchesion Depth (inchesion)	d Leaves (B9) a (B13) Plants (B14) Iffide Odor (C1) Cospheres on Liv Reduced Iron (C4 Reduction in Tille Irface (C7) II Data (D9) n in Remarks) s): L1 II s) OSUP A tos, previous ins	ing Roots (Call) d Soils (C6)  Wetland pections), if a	Secondary Surface X Draine Dry-S X Crayfit Stunte X Geom FAC-N	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2) Neutral Test (D5)
IROLOGY  Iand Hydrology Indicators: Iary Indicators (minimum of one is required Surface Water (A1)  High Water Table (A2)  Seturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aeriel Imagery (B7)  Sparsely Vegetated Concave Surface (B1)  In Observations: Ince Water Present?  In Table Present?  In T	ed: check all that apply  Water-Stainer Aquatic Faum True Aquatic Hydrogen Sut Coxidized Rhiz Presence of F Recent Iron R Thin Muck Su Gauge or Wel Company Depth (inchesion Depth (inchesion)	d Leaves (B9) a (B13) Plants (B14) Iffide Odor (C1) Cospheres on Liv Reduced Iron (C4 Reduction in Tille Irface (C7) II Data (D9) n in Remarks) s): L1 II s) OSUP A tos, previous ins	ing Roots (Call) d Soils (C6)  Wetland pections), if a	Secondary Surface X Draine Dry-S X Crayfit Stunte X Geom FAC-N	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2) Neutral Test (D5)
ROLOGY  and Hydrology Indicators:  ary Indicators (minimum of one is require  curface Water (A1)  ligh Water Table (A2)  atturation (A3)  Vater Marks (B1)  ediment Deposits (B2)  rift Deposits (B3)  ligal Mat or Crust (B4)  on Deposits (B5)  undation Visible on Aeriel Imagery (B7  parsely Vegetated Concave Surface (B  Observations:  the Water Present?  Table Present?  Table Present?  Yes  N  N  N  N  N  N  N  N  N  N  N  N  N	ed: check all that apply  Water-Stainer Aquatic Faum True Aquatic Hydrogen Sut Coxidized Rhiz Presence of F Recent Iron R Thin Muck Su Gauge or Wel Company Depth (inchesion Depth (inchesion)	d Leaves (B9) a (B13) Plants (B14) Iffide Odor (C1) Cospheres on Liv Reduced Iron (C4 Reduction in Tille Irface (C7) II Data (D9) n in Remarks) s): L1 II s) OSUP A tos, previous ins	ing Roots (Call) d Soils (C6)  Wetland pections), if a	Secondary Surface X Draine Dry-S X Crayfit Stunte X Geom FAC-N	ce Soil Cracks (B6) age Patterns (B10) eason Water Table (C2) sh Burrows (C8) ation Visible on Aerial Imagery (C9) ad or Stressed Plants (D1) orphic Position (D2) Neutral Test (D5)

metho /et michigan	/ 110ject City	County: _1 1CAY	Air County Sampling Date: 5/15/18
oplicant/Owner: TRC/Invenery u			
vestigator(s): M. Molnan, J. Whitt (#			
andform (hillslope, terrace, etc.): Elak	<u> </u>	Local relief	(concave, convex, none): None
ope (%): 00 Lat: 40.65227	Lon	g: <u>-83.79237</u>	7 Datum: WG 58 4
oil Map Unit Name: (Ro) Roundhead Muck			NWI classification: None
e climatic / hydrologic conditions on the site typical for thi	e time of year?	Ves No	(If no, explain in Remarks.)
			"Normal Circumstances" present? Yes No
e Vegetation, Soil, or Hydrology			-
e Vegetation, Soil, or Hydrologyt		-	eeded, explain any answers in Remarks.) ocations, transects, important features, etc.
Hydrophytic Vegetation Present? YesN		The state of the s	
lydric Soil Present? Yes N	,	is the Sampled	d Area
Vetland Hydrology Present? Yes N	lo_V_	within a Wetlan	·
Remarks: O of 3 wetland cnit	eria h	ave bee	n met. Area is not a
	i aa.		
EGETATION – Use scientific names of plants			
Tree Stratum (Plot size: 30')		minant Indicator ectes? Status	Dominance Test worksheet:
	75 0075.		Number of Dominant Species That Are OBL, FACW, or FAC:  (A)
			Total Number of Dominant Species Across All Strata:  (B)
			Openies Ani ossi in circus.
			Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
		otal Cover	That Are OBL, PACVI, of PAC. (AVB)
Sapling/Shrub Stratum (Plot size: 15)		olal Covor	Prevalence Index worksheet:
l,			Total % Cover of:Multiply by:
		<u></u>	OBL species x 1 =
			FACW species x 2 =
			FAC species x 3 =
			FACU species x 4 =
<u> </u>	<b>(</b> )= T	otal Cover	UPL species x 5 =
Herb Stratum (Plot size:)			Column Totals: (A) (B)
. Copsella birda-pastoris	_ 🌉 _	FACU	D 1 10100 - DIA -
2 Fea mays	- <del>3</del> 5-7	L UPL	Prevalence Index = B/A =
* Framium pumporeum	<u> </u>	V UPL	Hydrophytic Vegetation Indicators:
			1 - Rapid Test for Hydrophytic Vegetation (V
			2 - Dominance Test is >50%
			3 - Prevalence Index is \$3.0  4 - Morphological Adaptations <sup>1</sup> (Provide supporting
7			data in Remarks or on a separate sheet)
3.	<del></del>		Problematic Hydrophytic Vegetation1 (Explain)
)			
10	- Ta 🗢 -		Indicators of hydric soil and wetland hydrology must
30'	<u> </u>	otal Cover	be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: 30'			
1			Hydrophytic Vegetation
			1
2		otal Cover	Present? Yes No V

Depth <u>Matrix</u>	needed to document the indicator or conf Redox Features	
(inches) Color (moist) %	Color (moist) % Type¹ Loc²	
0-20" 104R 2/1 100 <del>0</del> -		sit loam
<del></del>		
<u> </u>		
	•	
		1 1111111111111111111111111111111111111
	<u> </u>	
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Re	educed Matrix, MS=Masked Sand Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
Hydric Soil Indicators:		Indicators for Problematic Hydric Soils3:
Histosol (A1)	Sandy Gleyed Matrix (S4)	Coast Prairie Redox (A16)
Histic Epipedon (A2)	Sandy Redox (S5)	Dark Surface (S7)
Black Histic (A3)	Stripped Matrix (S6)	Iron-Manganese Masses (F12)
Hydrogen Sulfide (A4)	Loamy Mucky Mineral (F1)	Very Shallow Dark Surface (TF12)
Stratified Layers (A5)	Loamy Gleyed Matrix (F2)	Other (Explain in Remarks)
2 cm Muck (A10)	Depleted Matrix (F3)	valor (=xptein in Netherica)
Depleted Below Dark Surface (A11)	Redox Dark Surface (F6)	*.
Thick Dark Surface (A12)	Depleted Dark Surface (F7)	3Indicators of hydrophytic vegetation and
Sandy Mucky Mineral (S1)	Redox Depressions (F8)	wetland hydrology must be present,
5 cm Mucky Peat or Peat (S3)		unless disturbed or problematic.
Restrictive Layer (if observed):		
Type: None		
Depth (inches): N/A	-	Hydric Soil Present? Yes No
Remarks:		
YDROLOGY		· · · · · · · · · · · · · · · · · · ·
Vetland Hydrology Indicators:		
	ch and all the state of the	
rimary Indicators (minimum of one is regulred:		
rimary Indicators (minimum of one is required: Surface Water (A1)	Water-Stained Leaves (B9)	Surface Soil Cracks (B6)
rimary Indicators (minimum of one is required: Surface Water (A1) High Water Table (A2)	Water-Stained Leaves (B9) Aquatic Fauna (B13)	
rimary Indicators (minimum of one is required: Surface Water (A1) High Water Table (A2) Saturation (A3)	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2)
rimary Indicators (minimum of one is required: Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)
Primary Indicators (minimum of one is required: Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Suifice Odor (C1) Oxidized Rhizospheres on Living Roots	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)
rimary Indicators (minimum of one is required: Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)
rimary Indicators (minimum of one is required: Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Suifice Odor (C1) Oxidized Rhizospheres on Living Roots	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)
Primary Indicators (minimum of one is required:  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Suifide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4)	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)
Primary Indicators (minimum of one is required:  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roote Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C	Surface Soil Cracks (B6) Dreinage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
rimary Indicators (minimum of one is required:  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roote Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C	Surface Soil Cracks (B6) Dreinage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
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rimary Indicators (minimum of one is required: Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algai Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8)	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)	Surface Soil Cracks (B6) Dreinage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
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rimary Indicators (minimum of one is required: Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) leld Observations: urface Water Present? Yes No	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Suifide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches):	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)
Primary Indicators (minimum of one is required:  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8) ield Observations:  urface Water Present?  Ves No aturation Present? Yes No according to the process of the process of the process of the process of the present of the pres	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches):  Depth (inches): We	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)
Primary Indicators (minimum of one is required:  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8) ield Observations:  urface Water Present?  Ves No aturation Present? Yes No according to the process of the process of the process of the process of the present of the pres	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches):  Depth (inches): We	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)
Primary Indicators (minimum of one is required:  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8) ield Observations:  urface Water Present?  Ves No aturation Present? Yes No according to the process of the process of the process of the process of the present of the pres	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches):  Depth (inches): We	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)
Primary Indicators (minimum of one is required:  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  iteld Observations:  surface Water Present?  Vater Table Present?  Vater Table Present?  Ves No saturation Present? Yes No saturation Present?  Proceedings of the process	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches): Depth (inches): Wering well, aerial photos, previous Inspections)	Surface Soil Cracks (B6) Dreinage 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)  tland Hydrology Present? Yes No
rimary Indicators (minimum of one is required:  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  eld Observations:  urface Water Present?  yes No aturation Present? Yes No aturation Present? Yes No acturation Present? Yes No acturat	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches): Depth (inches): Wering well, aerial photos, previous Inspections)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) s (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) FAC-Neutral Test (D5)  tland Hydrology Present? Yes No
rimary Indicators (minimum of one is required:  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  eld Observations:  urface Water Present? Yes No seturation Present?	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches): Depth (inches): Wering well, aerial photos, previous Inspections)	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)  tland Hydrology Present? Yes No
Primary Indicators (minimum of one is required:  Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) ield Observations: urface Water Present? Yes No aturation Present? Yes No aturation Present? Yes No acturation Present? Yes No	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches): Depth (inches): Wering well, aerial photos, previous Inspections)	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)  tland Hydrology Present? Yes No

YEM

Project/Site: 302899: Hardin Solar II citylo	County: Havein County Sampling Date: 6/14/18
Applicant/Owner: TRC/Inveneray, LLC.	
Investigator(s): MMM, SKB 33	on, Township, Range: <u>SQ, T5S, RQE</u>
Landform (hillslope, terrace, etc.): AUD VESSION	Local relief (concave, convex, none): LONCAVE
Slope (%): 0% Lat: 40.63541 Long:	
Soil Map Unit Name: Ln) Lniwood Muck	NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Y	7
,	,
Are Vegetation, Soll, or Hydrology significantly distur	· ——
Are Vegetation, Soil, or Hydrology naturally problems	•
SUMMARY OF FINDINGS – Attach site map showing same Hydrophytic Vegetation Present?  Yes No	iping point locations, transects, important reatures, etc.
Hydrophytic Vegetation Present? Yes No  Hydric Soll Present? Yes No	Is the Sampled Area
Wetland Hydrology Present? Yes No	within a Wetland? Yes No
Remarks: 3 wetland criteria have be	en met.
Ditobac	
VEGETATION – Use scientific names of plants.	
Absolute Dom	
Tree Stratum (Plot size: 30 ) % Cover Spec	cies? Status   Number of Dominant Species   That Are OBL, FACW, or FAC:(A)
2.	Total Number of Dominant
3.	Species Across All Strata; (B)
4	Becaute of Descious Species 120
5	Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
= Tota	al Cover
Sapling/Shrub Stratum (Plot size: )	Prevalence Index worksheet:
1.	Total % Cover of: Multiply by:
2	OBL species x1=
3	FACW species x 2 =  FAC species x 3 =
4	FACU species x 4 =
- To:	al Cover UPL species x 5 =
Herb Stratum (Plot size:)	Column Totals: (A) (B)
1. Tupha x alauca 10	<u> OBL</u>
2 Sparganym americanum 45 V	Prevalence Index = B/A =
3. Peltandra girainica 10	Hydrophytic Vegetation Indicators:
4. Ambrosio trifida 5	1 - Rapid Test for Hydrophytic Vegetation
5. Jemna minor 5	OBL 2 - Dominance Test is >50%
6	3 - Prevalence index is ≤3.0¹
7	4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
8	Problematic Hydrophytic Vegetation¹ (Explain)
9	The state of the s
10	Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woodv Vine Stratum (Plot size: 30)	
THE PARTY OF THE P	Hydrophytic Vegetation
2	Present? Yes No No
B	ar cover
Hydro Phytic vegetation cri	terion has been met.
1 Tigator Gilo vogo tation or	

PEM

-	_	
	ru	

Sampling Point: WET-HW-ML

	pth needed to document the indicator or confir	in the absence of indicators.)
Depth Matrix	Redox Features	
(inches) Color (moist) %	Color (moist) % Type¹ Loc²	Texture Remarks
0-18, 10/K3/1 (0	7.5YR3/4 15 C M	<u>Siltyclay</u>
10YR4/1 20	75YR 5/2 5 C PL	· ,
		· · · · · · · · · · · · · · · · · · ·
<sup>1</sup> Type: C=Concentration, D=Depletion, RM	=Reduced Matrix, MS=Masked Sand Grains.	2) postleni Di pipera i intera titale di si
Hydric Soil Indicators:	Treduced Man M. Me-Masked Carlo Grants.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soits <sup>3</sup> :
Histosoi (A1)	Sandy Gleyed Matrix (S4)	-
Histic Epipedon (A2)	Sandy Redox (S5)	Coast Prairie Redox (A16) Dark Surface (S7)
Black Histic (A3)	Stripped Matrix (S6)	Iron-Manganese Masses (F12)
X Hydrogen Sulfide (A4)	Loamy Mucky Mineral (F1)	Very Shallow Dark Surface (TF12)
Stratified Layers (A5)	Loamy Gleyed Matrix (F2)	Other (Explain in Remarks)
2 cm Muck (A10)	Depleted Matrix (F3)	
Depleted Below Dark Surface (A11)	Redox Dark Surface (F6)	
Thick Dark Surface (A12)	Depleted Dark Surface (F7)	<sup>a</sup> Indicators of hydrophytic vegetation and
Sandy Mucky Mineral (S1)	Redox Depressions (F8)	wetland hydrology must be present,
S cm Mucky Peat or Peat (S3)  Restrictive Layer (if observed):		unless disturbed or problematic.
Type: Nove		
		Hydric Soil Present? Yes No
Depth (inches): NA		Hydric Soil Present? Yes V No
łydrology		
Wetland Hydrology Indicators:		
Primary Indicators (minimum of one is regula	ed: check all that apply)	Secondary Indicators (minimum of two required)
X Suπace Water (A1)	Water-Stained Leaves (B9)	Surface Soil Cracks (B6)
K High Water Table (A2)		
Saturation (A3)	X Aquatic Fauna (B13)	➤ Drainage Patterns (B10)
	Aquatic Fauna (B13) True Aquatic Plants (B14)	★ Drainage Patterns (B10)  Dry-Season Water Table (C2)
Water Marks (B1)	True Aquatic Plants (B14)	Dry-Season Water Table (C2)
• •	True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1)	Dry-Season Water Table (C2) Crayfish Burrows (C8)
Water Marks (B1)	True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (	Dry-Season Water Table (C2) Crayfish Burrows (C8) (C3) Saturation Visible on Aerial Imagery (C9)
Water Marks (B1) Sediment Deposits (B2)	True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots ( Presence of Reduced Iron (C4)	Dry-Season Water Table (C2) Crayfish Burrows (C8) (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (	Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	<ul> <li>True Aquatic Plants (B14)</li> <li>Hydrogen Sulfide Odor (C1)</li> <li>Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4)</li> <li>Recent Iron Reduction in Tilled Soils (C6)</li> <li>Thin Muck Surface (C7)</li> </ul>	Dry-Season Water Table (C2) Crayfish Burrows (C8) (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots ( Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Well Data (D9)	Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B	True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots ( Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Well Data (D9)	Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7 Sparsely Vegetated Concave Surface (B	True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots ( Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Solis (C6) Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)	Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (BField Observations: Surface Water Present? Yes	True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots ( Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)	Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (BField Observations: Surface Water Present? Water Table Present? Yes N Saturation Present? Yes N (includes capillary fringe)	True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches): USUFFACE Depth (inches): OSUFFACE Wetla	Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) )
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (BField Observations: Surface Water Present? Water Table Present? Yes N Water Table Present? Yes N Saturation Present? Yes N (includes capillary fringe) Describe Recorded Data (stream gauge, mon	True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots ( Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6 Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches):	Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) )
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (BField Observations: Surface Water Present? Water Table Present? Yes N Saturation Present? Yes N Cincludes capillary fringe) Describe Recorded Data (stream gauge, mon	True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  Depth (inches): USUFFACE Depth (inches): OSUFFACE Wetla	Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) )

			Win County Sampling Date: 6/14/18
Applicant/Owner: TRC/Inveneral			State: OH Sampling Point: UP4-HWT
nvestigator(s): MMM SKB	Section	n, Township, Rai	nge: NA
		Local relief	(concave, convex, none):
Slope (%): 0% Lat: 40.63534	Long:_	-83,797	273 Datum: WG S8 4
Soil Map Unit Name: (Ln) Linwood Much	(		NWI classification: NOW
Are climatic / hydrologic conditions on the site typical for t		sNoV_	(If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology	significantly disturb	ed? Are"	Normal Circumstances" present? Yes V. No
Are Vegetation, Soil, or Hydrology			eded, explain any answers in Remarks.)
		•	ocations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes	No		·
•	· 10	is the Sampled	
	····	within a Wetlan	
Remarks:	tenia ha	ve been	nmet. Area is not a
	11: -		
	ive farm		
/EGETATION – Use scientific names of plant	<b>S</b> .		
Tree Stratum (Plot size: 30' )		nant Indicator	Dominance Test worksheet:
1	<u>% Cover</u> Speci		Number of Dominant Species That Are OBL, FACW, or FAC:  (A)
2.			Total Number of Dominant
3,			Species Across All Strata: (B)
4.			Percent of Dominant Species
5			That Are OBL, FACW, or FAC: (A/B)
Sapling/Shrub Stratum (Plot size: 15')	=   ota	Cover	Prevalence Index worksheet:
1,		· · · · · · · · · · · · · · · · · · ·	Total % Cover of: Multiply by:
2:			OBL species x 1 =
3			FACW species x 2 =
4	<del></del>		FAC species x 3 =
5		<del></del>	FACU species x 4 =
Herb Stratum (Plot size: 5 )	= Tota	l Çover	UPL species x 5 =
1. Glyanil max	50 V	UPL	Column Totals: (A) (B)
2			Prevatence Index = B/A =
3.		· · · · · · · · · · · · · · · · · · ·	Hydrophytic Vegetation Indicators:
4.			1 - Rapid Test for Hydrophytic Vegetation
5			2 - Dominance Test is >50%
6.			3 - Prevalence Index is ≤3.01
7.			4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
8.			Problematic Hydrophytic Vegetation (Explain)
9.			
10	50 = Tota		<sup>1</sup> Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: 30°)	<u> 50</u> = Tota	i Çover	be present, unless disturbed or problematic.
1.			Hydrophytic
2.			Vegetation /
	O = Tota	l Cover	Present? Yes No
Remarks: (Include photo numbers here or on a separate	sheet.)		1 1 10 0 0
Hydrophytic vegetation	1 criterii	on has	not been mut.
	•		

Profile Description: (Describe to the	e depth needed to docu	ment the	indicator	or confin	m the absence of inc	Sampling Point: <u>UPL</u> -
Depth Matrix (inches) Color (moist) 9	Red  Color (moist)	ox Feature %	Tvpe <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
0-HI 104R3/2 10			1,400		Siltloam	Kemarks
4-18" 10YQ 8/2 91		<u> </u>			<u>Sirroum</u>	
7 19 101×12 91	0 75YRSG	_10_		<u> </u>	Sitty clay	
					·	· 13
			_			
<sup>1</sup> Type: C=Concentration, D=Depletion,	DM-Deduced Matrix M	Caldaska			2,	
Hydric Soil Indicators:	, KIM-Keduced Matrix, M	S=Masker	а Sала Gr	апѕ.		Pore Lining, M=Matrix. oblematic Hydric Soils <sup>3</sup> :
Histosol (A1)	Sandy	Gleyed Ma	atriv (SA)			•
Histic Epipedon (A2)		Redox (S5			Coast Frame	Rédex (A16) (S7)
Black Histic (A3)		d Matrix (9	-			ese Masses (F12)
Hydrogen Sulfide (A4)		Mucky Mi				Dark Surface (TF12)
Stratifled Layers (A5)		Gleyed Ma				n in Remarks)
2 cm Muck (A10) Depleted Below Dark Surface (A11		d Matrix (				
Depleted Below Dark Surface (A11 Thick Dark Surface (A12)		Dark Surfa d Dark Su	ace (F6) irface (F7)		31-di-store of bus	· · · · · · · · · · · · · · · · · · ·
Sandy Mucky Mineral (S1)		o Dark St Depressio		1		rophytic vegetation and logy must be present,
5 cm Mucky Peat or Peat (S3)		Jep. 000.0	ne (i e)		•	ed or problematic.
Restrictive Layer (if observed):	· · · · · · · · · · · · · · · · · · ·	*****		****	1	4 :
Type: NOW						. /
Banda da Cara NIA						\ /
Remarks: NA C	niterion r	705	bec	en .	Hydric Soil Prese	nt? Yes V No
Remarks:	niterion r	705	bea	2M_		nt? Yes V No
Remarks: Hydricsoil c	niterion r	705	bec	<u> </u>		nt? Yes V No
Remarks: HydviC Soi Q C  YDROLOGY  Vetland Hydrology Indicators:			bec	em.		nt? Yes V No
Remarks:  HydvicsoiQ c  YDROLOGY  Vetland Hydrology Indicators:  Primary Indicators (minimum of one is re			bea	<u> </u>	met.	nt? Yes V No
Remarks:  HydvicsoiQ c  YDROLOGY  Vetland Hydrology Indicators:  Primary Indicators (minimum of one is re  Surface Water (A1)	equired: check all that ap Water-Stai	ply) ned Leave	es (B9)	<u> </u>	met.	
Remarks:  HydvicsoiQ c  YDROLOGY  Vetland Hydrology Indicators:  Primary Indicators (minimum of one is re  Surface Water (A1)  High Water Table (A2)	equired: check all that ap Water-Stai Aquatic Fa	ply) ned Leavs una (B13)	es (B9)	2M	Secondary India  Surface So	ators (minimum of two required
Primary Indicators:  Surface Water (A1)  High Water Table (A2)  Saturation (A3)	eduired: check all that ap Water-Stai Aquatic Fa True Aquat	ply) ned Leave una (B13) tic Plants (	es (B9) (B14)	em .	Secondary Indic	ators (minimum of two required
Primary Indicators:  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)	equired: check all that ap Water-Stai Aquatic Fa True Aquat Hydrogen t	ply) ned Leavs una (B13) tic Plants ( Sulfide Od	es (B9) (B14) (or (C1)		Secondary India Surface So Drainage P Dry-Seasor Crayfish Bu	ators (minimum of two required I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8)
Property of the property of th	equired: check all that ap Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R	ply) ned Leavs una (B13) tic Plants ( Sulfide Od hizospher	es (B9) (B14) (or (C1) es on Livit	ng Roots (	Secondary India Surface So Drainage P Dry-Seasor Crayfish Bu C3) Saturation	ators (minimum of two required I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8) /isible on Aerial Imagery (C9)
Proposits (B2)  Proposits (B2)  Primary Indicators (minimum of one is really to the proposits (B2)  Primary Indicators (Minimum of one is really to the proposits (B2)  Print Deposits (B3)	equired: check all that ap  Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R Presence c	ply) ned Leave una (B13) tic Plants ( Sulfide Od hizospher of Reduce	es (B9) (B14) (or (C1) es on Livin d Iron (C4)	ng Roots (	Secondary India Surface So Drainage P Dry-Seasor Crayfish Bu C3) Saturation Stunted or	ators (minimum of two required) I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8) /isible on Aerial Imagery (C9) Stressed Plants (D1)
Permarks:  YDROLOGY  Vetland Hydrology Indicators:  Primary Indicators (minimum of one is re  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)	equired: check all that ap  Water-Stai  Aquatic Fa  True Aquat  Hydrogen 8  Oxidized R  Presence c	ply) ned Leave una (B13) tic Plants ( Sulfide Od hizospher of Reduce	es (B9) (B14) (or (C1) es on Livin d Iron (C4 on in Tilled	ng Roots (	Secondary India Surface So Drainage P Dry-Seasor Crayfish Bu C3) Saturation Stunted or Geomorphi	ators (minimum of two required) I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8) /isible on Aerial Imagery (C9) Stressed Plants (D1)
Property of the property of th	equired: check all that ap  Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R Presence co	ply) ned Leave una (B13) tic Plants ( Sulfide Od hizospher of Reduced n Reduction	es (B9) (B14) for (C1) es on Livit d Iron (C4) on in Tilled	ng Roots (	Secondary India Surface So Drainage P Dry-Seasor Crayfish Bu C3) Saturation Stunted or	ators (minimum of two required) I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8) /isible on Aerial Imagery (C9) Stressed Plants (D1)
Permarks:  YDROLOGY  Vetland Hydrology Indicators:  Primary Indicators (minimum of one is re  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery	equired: check all that ap  Water-Stai  Aquatic Fa  True Aquat  Hydrogen S  Oxidized R  Presence of  Recent Iron  Thin Muck  (B7) Gauge or V	ply) ned Leave una (B13) tic Plants ( Sulfide Od hizospher of Reduced n Reduction Surface ((	es (B9) (B14) for (C1) res on Livin d Iron (C4) on in Tilled (C7) (D9)	ng Roots (	Secondary India Surface So Drainage P Dry-Seasor Crayfish Bu C3) Saturation Stunted or Geomorphi	ators (minimum of two required) I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8) /isible on Aerial Imagery (C9) Stressed Plants (D1)
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YDROLOGY  Vetland Hydrology Indicators:  Primary Indicators (minimum of one is re  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B6)  Inundation Visible on Aerial Imagery  Sparsely Vegetated Concave Surface	equired: check all that ap  Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R Presence c Recent Iror Thin Muck (B7) Gauge or V ce (B8) Other (Exp	ply) ned Leave una (B13) tic Plants ( Sulfide Od hizospher of Reduceto surface (C Vell Data (	es (B9) (B14) for (C1) res on Livin d Iron (C4) on in Tilled (C7) (D9)	ng Roots (	Secondary India Surface So Drainage P Dry-Seasor Crayfish Bu C3) Saturation Stunted or Geomorphi	ators (minimum of two required) I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8) /isible on Aerial Imagery (C9) Stressed Plants (D1)
Property Control Contr	equired: check all that ap  Water-Stai  Aquatic Fa  True Aquat  Hydrogen S  Oxidized R  Presence o  Recent Iror  Thin Muck  (B7) Gauge or V  ce (B8) Depth (inc	ply) ned Leave una (B13) tic Plants ( Sulfide Od hizospher of Reducelo Reducelo Surface (Control Vell Data (Control Tain in Rer	es (B9) (B14) for (C1) res on Livin d Iron (C4) on in Tilled (C7) (D9)	ng Roots (	Secondary India Surface So Drainage P Dry-Seasor Crayfish Bu C3) Saturation Stunted or Geomorphi	ators (minimum of two required) I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8) /isible on Aerial Imagery (C9) Stressed Plants (D1)
Property of the present?  YDROLOGY  Vetland Hydrology Indicators:  Primary Indicators (minimum of one is reserved by the property of the prope	equired: check all that ap  Water-Stai  Aquatic Fa  True Aquat  Hydrogen S  Oxidized R  Presence of  Recent Iror  Thin Muck  (B7) Gauge or V  Ce (B8) Depth (inc.)  No Depth (inc.)	ply) ned Leave una (B13) tic Plants ( Sulfide Od hizospher of Reducelo Reductio Surface (( Vell Data ( Jain in Rer hes):	es (B9) (B14) for (C1) res on Livin d Iron (C4) on in Tilled (C7) (D9)	ng Roots ( ) ! Soils (C6)	Secondary India Surface So Drainage P Dry-Seasor Crayfish Bu Saturation Stunted or Geomorphi FAC-Neutra	eators (minimum of two required) I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8) /isible on Aerial Imagery (C9) Stressed Plants (D1) C Position (D2) Il Teat (D5)
Property of the present?  YDROLOGY  Vetland Hydrology Indicators:  Primary Indicators (minimum of one is research of the present)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial imagery Sparsely Vegetated Concave Surface ield Observations:  urface Water Present?  Yes  aturation Present?  Yes  Includes capillary fringe)	equired: check all that ap  Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R Presence of Recent Iror Thin Muck (B7) Gauge or V ce (B8) Other (Exp	ply) ned Leave una (B13) tic Plants ( Sulfide Od hizospher of Reduceto Reductio Surface (C Vell Data ( tain in Rer hes):	es (B9) (B14) for (C1) res on Livit d Iron (C4) on in Tilled (C7) (D9) marks)	ng Roots ( )   Soils (C6)	Secondary India Surface So Surface So Drainage P Dry-Seasor Crayfish Bu Saturation Stunted or a Geomorphi FAC-Neutra	eators (minimum of two required) I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8) /isible on Aerial Imagery (C9) Stressed Plants (D1) C Position (D2) Il Teat (D5)
Property Control Contr	equired: check all that ap  Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R Presence of Recent Iror Thin Muck (B7) Gauge or V ce (B8) Other (Exp	ply) ned Leave una (B13) tic Plants ( Sulfide Od hizospher of Reduceto Reductio Surface (C Vell Data ( tain in Rer hes):	es (B9) (B14) for (C1) res on Livit d Iron (C4) on in Tilled (C7) (D9) marks)	ng Roots ( )   Soils (C6)	Secondary India Surface So Surface So Drainage P Dry-Seasor Crayfish Bu Saturation Stunted or a Geomorphi FAC-Neutra	eators (minimum of two required) I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8) /isible on Aerial Imagery (C9) Stressed Plants (D1) C Position (D2) Il Teat (D5)
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YDROLOGY  Vetland Hydrology Indicators:  Primary Indicators (minimum of one is re  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial imagery  Sparsely Vegetated Concave Surfactive Water Present?  Ves  Vater Table Present?  Ves  aturation Present?  Yes  cludes capillary fringe)  escribe Recorded Data (stream gauge,	equired: check all that ap  Water-Stai Aquatic Fa True Aquat Hydrogen Is Oxidized R Presence of Recent Iron Thin Muck (B7) Gauge or V (ce (B8) Other (Exp	ply) ned Leave una (B13) tic Plants of Sulfide Od hizospher of Reduceto Surface (Control Vell Data of tain in Reduceto hes): hes):	es (B9) (B14) for (C1) es on Livit d iron (C4) on in Tilled (C7) (D9) marks)	ng Roots (*)   Soils (C6)	Secondary India Surface So Surface So Drainage P Dry-Seasor Crayfish Bu Saturation Stunted or Geomorphi FAC-Neutra	rators (minimum of two required) I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8) /isible on Aerial Imagery (C9) Stressed Plants (D1) C Position (D2) Il Test (D5)
Property of the present?  YDROLOGY  Vetland Hydrology Indicators:  Primary Indicators (minimum of one is research of the present)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial imagery Sparsely Vegetated Concave Surface ield Observations:  urface Water Present?  Yes  aturation Present?  Yes  Includes capillary fringe)	equired: check all that ap  Water-Stai Aquatic Fa True Aquat Hydrogen Is Oxidized R Presence of Recent Iron Thin Muck (B7) Gauge or V (ce (B8) Other (Exp	ply) ned Leave una (B13) tic Plants of Sulfide Od hizospher of Reduceto Surface (Control Vell Data of tain in Reduceto hes): hes):	es (B9) (B14) for (C1) es on Livit d iron (C4) on in Tilled (C7) (D9) marks)	ng Roots (*)   Soils (C6)	Secondary India Surface So Surface So Drainage P Dry-Seasor Crayfish Bu Saturation Stunted or Geomorphi FAC-Neutra	rators (minimum of two required) I Cracks (B6) atterns (B10) I Water Table (C2) rrows (C8) /isible on Aerial Imagery (C9) Stressed Plants (D1) C Position (D2) Il Test (D5)

Project/Site: 302899: Hardin Solar T City/County: Hard	IN COUNTY Sampling Date: 9/14/2
Applicant/Owner: TRC/Inveneral, LLC.	State: O 4 Sampling Point WET-HS-JA
Investigator(s): TP/DK Section, Township, Ra	
	(concave, convex, none): CONCAVE
	588540 Dalum: WGS84
	NWI classification: NONE
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No _	
1	
	"Normal Circumstances" present? Yes No
· · · · · · · · · · · · · · · · · · ·	eeded, explain any answers in Remarks.) 🤺
SUMMARY OF FINDINGS – Attach site map showing sampling point I	ocations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No	
Hydric Soil Present? Yes No Is the Sampled	1/2
Wetland Hydrology Present? Yes V No within a Wetlan	nd? Yes No
Remarks: All 3 wetland onteria have been	met. Area is a wetland.
* WETLAND IS LOCATED WITHIN CRUPPED FIELD; NOT	THE "NORMAL CIRCUMSTANCE".
VEGETATION – Use scientific names of plants.	
Tree Stratum (Plot size: 30' ) Absolute Dominant Indicator Species? Status	Dominance Test worksheet:
Tree Stratum (Plot size: O ) % Cover Specles? Status	Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
2	That Are OBL, FACW, or FAC: (A)
3	Total Number of Dominant
4.	Species Across All Strata: (B)
5	Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)
= Total Cover	THATATE OBL, FACW, BI FAC. 100 (A/B)
Sapling/Shrub Stratum (Plot size:)	Prevalence Index worksheet:
1	Total % Cover of: Multiply by:
2	OBL species x 1 =
3	FACW species x 2 =
4 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	FAC species x 3 =
5.	FACU species x 4 = UPL species x 5 =
Herb Stratum (Plot size: 5	Column Totals: (A) (B)
1. Panicum dichotomiflorum 70 V FACW	Column rotals.
2 Lindernia dubia 45 V OBL	Prevalence Index = B/A =
3. Cyperus esculentus 10 PACW	
4.	1 - Rapid Test for Hydrophytic Vegetation
5	✓2 - Dominance Test is >50%
6	3 - Prevalence Index is ≤3.0¹
7.	4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
8.	Problematic Hydrophytic Vegetation¹ (Explain)
9	
10	<sup>1</sup> Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: 30' )	be present, unless disturbed or problematic.
1	Hydrophytic
2.	Vegetation
	Present? Yes V No No
Remarks: (include photo numbers here or on a separate sheet.)	Troseries (Co

Profile Description: (Describe to the dep	oth needed to docum	nent the	indicator	OL COMMIN	If the absence of indicators.)
Depth Matrix		x Feature			
(inches) Color (moist) %	Color (moist)	%	Type <sup>1</sup>	_Loc <sup>2</sup>	Texture Remarks
0-16 2.54 2.5/1 90	2.5 YR 3/2	10_	<u> </u>	PL	ORGANOC
16-20 104R 3/3 100					· · · · · · · · · · · · · · · · · · ·
	7.5 YR 3/4	5	<u></u>	M	SILO
20-24 104R 3/2 95					The second secon
17. O Comparison Department Date	-C			-1	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
<sup>1</sup> Type: C=Concentration, D=Depletion, RM Hydric Soil Indicators:	=Reduced Matrix, Mis	=Masket	ı Sand Gi	ams.	Indicators for Problematic Hydric Soils <sup>3</sup> :
Histosol (A1)	Sandy C	Noved M	atrix (S4)		Coast Prairie Redox (A16)
Histic Epipedon (A2)		Redox (S5			Dark Surface (S7)
Black Histic (A3)		Matrix (\$			iron-Manganese Masses (F12)
Hydrogen Sulfide (A4)			neral (F1)		Very Shallow Dark Surface (TF12)
Stratified Layers (A5)		-	atrix (F2)		Other (Explain in Remarks)
2 cm Muck (A10)	Depleted				
Depleted Below Dark Surface (A11)		ark Surfa			
Thick Dark Surface (A12)	Depleted	J Dark Su	ırface (F7	)	<sup>3</sup> Indicators of hydrophytic vegetation and
Sandy Mucky Mineral (S1)	Redox D	epressio	ns (F8)		wetland hydrology must be present,
5 cm Mucky Peat or Peat (\$3)	√°-	· .	1 .		unless disturbed or problematic.
Restrictive Layer (if observed):	\$	1			
Type: None	· · ·				Hydric Soil Present? Yes No
Depth (inches): NONE					Hydric Soil Present: Tes No
Remarks:					
Hydric soil crit	enion ha	S 100	20M	met	· · · · · · · · · · · · · · · · · · ·
	1. 3.				
1					
1					
HYDROLOGY		· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	
HYDROLOGY  Wetland Hydrology Indicators:		· · · · ·			
	red; check all that ap	piv)	North Co.		Secondary Indicators (minimum of two required)
Wetland Hydrology Indicators: Primary Indicators (minimum of one is requi		100	res (B9)		Secondary Indicators (minimum of two required) Surface Soil Cracks (B6)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is requi Surface Water (A1)	Water-Stai	ned Leav	4.7		
Wetland Hydrology Indicators: Primary Indicators (minimum of one is requi	Water-Stai Aquatic Fa	ned Leav una (B13	3)		Surface Soil Cracks (B6)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3)	Water-Stai Aquatic Fa True Aqua	ned Leav una (B13 tic Plants	6) (B14)		Surface Soil Cracks (B6) Drainage Patterns (B10)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	Water-Stain Aquatic Fa True Aquat Hydrogen S	ned Leav una (B13 tic Plants Sulfide O	6) (B14) dor (C1)	ving Roots	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	Water-Stai Aquatic Fa True Aqua	ned Leav una (B13 tic Plants Sulfide O thizosphe	i) (B14) dor (C1) eres on Li	-	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R Presence of	ned Leav una (B13 tic Plants Sulfide O thizosphe of Reduce	i) (B14) dor (C1) eres on Li ed iron (C	4)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)	Water-Stai Aquatic Fa True Aquat Hydrogen 8	ned Leav una (B13 tic Plants Sulfide O thizosphe of Reduct n Reduct	i) (B14) dor (C1) eres on Li ed Iron (C ion In Tille	4)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B6)	Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R Presence of Recent Iron Thin Muck	ned Leav una (B13 tic Plants Sulfide O thizosphe of Reduct n Reduct Surface	(B14) dor (C1) eres on Lived Iron (C fon In Tille (C7)	4)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B6)  Inundation Visible on Aerial Imagery (B	Water-Stail Aquatic Fa Aquatic Fa True Aquat Hydrogen S Oxidized R Presence C Recent Iron Thin Muck T) Gauge or N	ned Leav una (B13 tic Plants Sulfide O thizosphe of Reduct n Reduct Surface Well Data	(B14) dor (C1) eres on Lired Iron (C fon In TIBE (C7) (D9)	4)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B6)	Water-Stail Aquatic Fa Aquatic Fa True Aquat Hydrogen S Oxidized R Presence C Recent Iron Thin Muck T) Gauge or N	ned Leav una (B13 tic Plants Sulfide O thizosphe of Reduct n Reduct Surface Well Data	(B14) dor (C1) eres on Lired Iron (C fon In TIBE (C7) (D9)	4)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B6)  Inundation Visible on Aerial Imagery (B  Sparsely Vegetated Concave Surface (A1)	Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Cauge or V B8) Other (Exp	ned Leav una (B13 tic Plants Sulfide O thizosphe of Reduct Reduct Surface Well Data	(B14) dor (C1) eres on Lired iron (C ion in Tille (C7) i (D9) emarks)	4)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2)
Wetland Hydrology Indicators:  Primary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B  Sparsely Vegetated Concave Surface (Field Observations:  Surface Water Present?  Yes	Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Gauge or N Other (Exp	ned Leav una (B13 tic Plants Sulfide O thizosphe of Reduct Reduct Surface Well Data lain in Re	(B14) (B14) (dor (C1) eres on Lited Iron (Citon In Tille (C7) (C9) emarks)	4)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2)
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Wetland Hydrology Indicators:  Primary Indicators (minimum of one is requi  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B  Sparsely Vegetated Concave Surface (Field Observations:  Surface Water Present?  Water Table Present?  Yes  Saturation Present?  Yes  (Includes capillary fringe)	Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Gauge or V B8) Other (Exp No Depth (Inc No Depth (Inc	ned Leavuna (B13 tic Plants Sulfide Othizosphe of Reduction Reduct	(C7) (D9) (D9) (D9) (D9) (D9) (D9) (D9) (D9	4) ed Soils (C	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) 6) Geomorphic Position (D2) FAC-Neutral Test (D5)
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Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required.)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B  Sparsely Vegetated Concave Surface (Field Observations:  Surface Water Present? Yes  Water Table Present? Yes  Saturation Present? Yes  (Includes capillary fringe)  Describe Recorded Data (stream gauge, m	Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Gauge or N Other (Exp No Depth (Inc No Depth (Inc onitoring well, aerial p	ned Leav una (B13 tic Plants Sulfide O thizosphe of Reduct n Reduct Surface Well Data plain in Re ches):	(C1) der (C1) der (C1) deres en Li der (C1) deres en Li der (C1) deres en Li d	4) ed Soils (C	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) 6) Geomorphic Position (D2) FAC-Neutral Test (D5)  land Hydrology Present? Yes No
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Wetland Hydrology Indicators:  Primary Indicators (minimum of one is required.)  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Imagery (B  Sparsely Vegetated Concave Surface (Field Observations:  Surface Water Present? Yes  Water Table Present? Yes  Saturation Present? Yes  (Includes capillary fringe)  Describe Recorded Data (stream gauge, m	Water-Stai Aquatic Fa True Aquat Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Gauge or N Other (Exp No Depth (Ind No Depth (Ind onitoring well, aerial p	ned Leav una (B13 tic Plants Sulfide O thizosphe of Reduct n Reduct Surface Well Data plain in Re ches):	(C1) der (C1) der (C1) deres en Li der (C1) deres en Li der (C1) deres en Li d	4) ed Soils (C	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) 6) Geomorphic Position (D2) FAC-Neutral Test (D5)  land Hydrology Present? Yes No

Project/Site: 302899: Hardin Solar II city/county: Hard	Qin County Sampling Date: 9/14/18
Applicant/Owner: TRC/Invenerou, LLC.	State: OH Sampling Point: <u>UPL-HS-JA</u>
Investigator(s): JP/DK Section, Township, Rar	ige: N/A
Landform (hillslope, terrace, etc.): NONE Local relief (	concave, convex, none): NONE
Slope (%): 0 Lat: 40.62642705 Long: -83.805	43765 Datum: WG S84
Soil Map Unit Name: Ln - IJN WOOD MUCK	NWI classification: NONE
	(If no, explain in Remarks.)
Are Vegetation, Soll, or Hydrology significantly disturbed? Are "	Normal Circumstances" present? Yes No
	eded, explaîn any answers in Remarks.) 😽
SUMMARY OF FINDINGS - Attach site map showing sampling point to	ocations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes No	
Hydric Soil Present? Yes No Is the Sampled	
Wetland Hydrology Present? Yes No within a Wetlan	<del></del> -
Remarks: Of 3 wetland criteria have been	n met. Area is not a
wetland * FARMLAND (ACTIVE	E CROPPING)
VEGETATION – Use scientific names of plants.	
Abraba Paralmost Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30' ) Absolute Dominant indicator % Cover Species? Status	Number of Dominant Species That Are OBL, FACW, or FAC:(A)
1	
3.	Total Number of Dominant Species Across All Strata: (B)
4.	Percent of Dominant Species
5	That Are OBL, FACW, or FAC: (A/B)
Sapling/Shrub Stratum (Plot size: 15) = Total Cover	Prevalence Index worksheet:
	Total % Cover of:Multiply by:
1	OBL species x 1 =
2.	FACW species x 2 =
	FAC species x3=
4	FACU species x 4 =
= Total Cover	UPL species x 5 =
Herb Stratum (Plot size:)	Column Totals: (A) (B)
1. Glycine max 75 V UPL	Prevalence Index = B/A =
2	Hydrophytic Vegetation Indicators:
3	1 - Rapid Test for Hydrophytic Vegetation N
4	2 - Dominance Test is >50%N
5	3 - Prevalence Index is ≤3.0¹ N
6	4 - Morphological Adaptations <sup>1</sup> (Provide supporting
7	data in Remarks or on a separate sheet)
8	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
9,	
10	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: 30 )	Hydrophytic
2.	Vegetation
= Total Cover	Present? Yes No
Remarks: (Include photo numbers here or on a separate sheet.)	21-21-21-21-21
Remarks: (Include photo numbers here or on a separate sheet.)  Hydrophytic vegetation criterion has	MOI BEEN LINE.
1.3	

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Sampling Poin UPL-HS-JA

Depth	Matrix	epth needed to document the indicator or confi Redox Features	,
A	r (moist) %	Color (moist) % Type <sup>1</sup> Loc <sup>2</sup>	<u>Texture</u> <u>Remarks</u>
<u> </u>	R 3/1 100		Silo_
			-
<u> </u>		· · · · · · · · · · · · · · · · · · ·	
		The second secon	
			•
Type: C=Concentrati	on, D=Depletion, Rt	M≃Reduced Matrix, MS=Masked Sand Grains.	3 Austina Di Dani Litta de Asa de
lydric Soil Indicators	s:	THE INCOME OF THE INCOME OF THE OFFICE OFFIC	<sup>2</sup> Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils <sup>3</sup> :
_ Histosol (A1)		Sandy Gleyed Matrix (S4)	Coast Prairie Redox (A16)
_ Histic Epipedon (A	(2)	Sandy Redox (S5)	Dark Surface (S7)
Black Histic (A3)		Stripped Matrix (S6)	Iron-Manganese Masses (F12)
Hydrogen Sulfide		Loamy Mucky Mineral (F1)	Very Shallow Dark Surface (TF12)
_ Stratified Layers (/	<del>1</del> 5)	Loamy Gleyed Matrix (F2)	Other (Explain in Remarks)
_ 2 cm Muck (A10)	,	Depleted Matrix (F3)	
_ Depleted Below Da		Redox Dark Surface (F6)	
_ Thick Dark Surface		Depleted Dark Surface (F7)	<sup>3</sup> Indicators of hydrophytic vegetation and
Sandy Mucky Mine		Redox Depressions (F8)	wetland hydrology must be present,
_ 5 cm Mucky Peat of			unless disturbed or problematic.
estrictive Layer (if o			
Type:	NONE	<del></del>	//
Depth (inches):	NONE	<del></del>	Hydric Soil Present? Yes No
		,	
DROLOCY	<u> </u>		
		)	
etland Hydrology Inc		)	
etland Hydrology Ind mary Indicators (mini	mum of one is requi	ired: check all that apply)	Secondary Indicators (minimum of two requirec
etland Hydrology Ind imary indicators (mini Surface Water (A1)	mum of one is requ	Water-Stained Leaves (B9)	.  Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)
etland Hydrology Indinary Indicators (mint Surface Water (A1) High Water Table (A	mum of one is requ		· · · · · · · · · · · · · · · · · · ·
etland Hydrology Indinary Indicators (mint Surface Water (A1) High Water Table (/ Saturation (A3)	mum of one is requ	Water-Stained Leaves (B9)	Surface Soil Cracks (B6) Drainage Patterns (B10)
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Surface Water (A1) High Water Table (A2) Water Marks (B1) Sediment Deposits Drift Deposits (B3) Algal Mat or Crust (In In Deposits (B6) Inundation Visible of Sparsely Vegetated (B1) Indeposits (B2) Indeposits (B3) Indeposi	Mum of one is required.  (B2)  B4)  n Aerial Imagery (B' Concave Surface (I)  Yes I  Yes I	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots ( Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  No Depth (inches): N/A	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)
etland Hydrology Indinary Indicators (minital Surface Water (A1)  High Water Table (A2)  Water Marks (B1)  Sediment Deposits (B3)  Algal Mat or Crust (Indicators)  Inundation Visible of Sparsely Vegetated (and Observations:  Iface Water Present?  Stater Table Present?	Mum of one is required.  (B2)  B4)  n Aerial Imagery (B' Concave Surface (I)  Yes I  Yes I	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots ( Presence of Reduced Iron (C4) Recent Iron Reduction In Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Weil Data (D9) Other (Explain in Remarks)  Depth (inches):  Depth (inches):	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) ) Geomorphic Position (D2) FAC-Neutral Test (D5)
etland Hydrology Indimary Indicators (minimary Indicators (minimary Indicators (minimary Indicators (Material Control	Mum of one is required.  (B2)  (B2)  A2i  A2i  A2i  A2i  A2i  A2i  A2i  A	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Recent Iron Reduction In Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Well Data (D9) B8) Other (Explain in Remarks) No Depth (inches): No Depth (inches): Wetla	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) ) Geomorphic Position (D2) FAC-Neutral Test (D5)  and Hydrology Present? Yes No
etland Hydrology Indicators (minital Mydrology Indicators (minital Mydrology Indicators (minital Mydrology Indicators (Male Mydrology Indicators (Mydrology Indicators (Mydrolog	Mum of one is required.  (B2)  (B2)  A2i  A2i  A2i  A2i  A2i  A2i  A2i  A	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (Presence of Reduced Iron (C4) Recent Iron Reduction In Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Well Data (D9) B8) Other (Explain in Remarks) No Depth (inches): No Depth (inches): Wetla	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) ) Geomorphic Position (D2) FAC-Neutral Test (D5)  and Hydrology Present? Yes No
etland Hydrology Individual Indicators (minimary Indicators (minimary Indicators (minimary Indicators (Mater Table (A)) High Water Table (A) Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (Indicators (B5) Inundation Visible of Sparsely Vegetated (Indicators (Mater Present) (Indicators (Mater Table Present) (Indicator	Mum of one is required.  (B2)  (B2)  A2i  A2i  A2i  A2i  A2i  A2i  A2i  A	Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots ( Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Gauge or Well Data (D9) Other (Explain in Remarks)  No Depth (inches): N/A	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)  and Hydrology Present? Yes No

Project/Site: 302899: Hardin Solar II	City/C	ounty: Have	livi County Sampling Date: 9/14/19
Applicant/Owner: TRC/Inveneray, LLC	-		State: O A Sampling Point: WET-HS-JB
Investigator(s): JP/DK	Section	n, Township, R	ange: N/A
Landform (hillslope, terrace, etc.): DEPRESSION			f (concave, convex, none):CONICAVE
Slope (%): 0 Lat: 40.62716460			0368124 Datum: WGS84
Soil Map Unit Name: LN - LINWOOD MUCK	44 4		NWI classification: NONE
Are climatic / hydrologic conditions on the site typical for this tim	· ·	es V No	•
Are Vegetation, Soil, or Hydrology signi			"Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology natur	=		eeded, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map sho		ttanki najvi	rana kilondari da katalan da kalendari da katalan da katalan da katalan da katalan da katalan da katalan da ka
Hydrophytic Vegetation Present? Yes V No	4. 19		99 J
Hydric Soil Present? Yes No		Is the Sample	
Wetland Hydrology Present? Yes V No		within a Wetla	nd? Yes No
			met. Area is a wetland.
WETLAND IS LOCATED LITTIN CRUI	PPED FIL	ELD; NOT	THE "NORMAL CIRCUMSTANCES".
VEGETATION - Use scientific names of plants.		The Wall of the	
Δh	solute Dom	inant Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 30') %	Cover Spec	cles? Status	Number of Dominant Species That Are OBL, FACW, or FAC: (A)
2			Total Number of Dominant
3.			Species Across All Strata: (B)
4.	<del> </del>		Percent of Dominant Species
5.	<del></del>		That Are OBL, FACW, or FAC: 100 (A/B)
Sapling/Shrub Stratum (Plot size: 15 )	= Tota	al Cover	Prevalence Index worksheet:
1.		<u> </u>	Total % Cover of: Multiply by:
2	<del></del>		OBL species x 1 =
3.			FACW species x 2 =
4		<u></u>	FAC species x3=
5		The state of the s	FACU species x 4 =
Herb Stratum (Plot size; 5	= Tota	al Cover	UPL species x 5 =
	00 \	FACW	Column Totals: (A) (B)
2. 2. 14 91 14 14 14 14 14		•.	Prevalence Index = B/A =
3.		1 1	Hydrophytic Vegetation Indicators:
4			1 - Rapid Test for Hydrophylic Vegetation
5	<del></del>	<del> </del>	✓ 2 - Dominance Test is >50%
6			3 - Prevalence Index is ≤3.0¹
7	<del></del>	<u> </u>	4 - Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
8.		<del></del>	Problematic Hydrophytic Vegetation¹ (Explain)
9.	<del></del>	<del></del>	
	00 = Tota	al Cover	Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: 30')	100	ar 001c,	be present, unless disturbed or problematic.
1	<del></del>		Hydrophytic
2.	<u> </u>	· · · · · · · · · · · · · · · · · · ·	Vegetation Present? YesNo
		al Cover	
Remarks: (Include photo numbers here or on a separate sheet Hydrop Nytic vegetation	^	oun inn V	has been muti
Hydrophync regenumon	1 611.1	en Co.	
		-	

Depth	4	Matrix				x Feature		·	
(inches)	Color (		%	Color (r		%	Type <sup>1</sup>	_Loc <sup>2</sup>	<u>Texture</u> Remarks
0-6	2.54	<u>25/1                                    </u>	90	2.5 YR	3/2	10		PL	ORGANIC
6-20	IDYR	3/2	90	7.5 YR	3/4	10	<u> </u>	<u>M</u>	SILO
Ti									
	· · · ·				<del></del>				
	<del></del>	<del> </del>	· <del></del>	<del></del>					
ļ <del></del>		<del> </del>	<del></del> ,	. <del></del>	<u> </u>			<del></del>	
		<del>, </del>					<del></del>		The state of the s
<sup>1</sup> Type: C=Co			letion, RM	=Reduced N	/atrix, MS	6=Masked	Sand Gr	ains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix.
Hydric Soil I	ndicators:				The state of		7 - 11		Indicators for Problematic Hydric Soils <sup>3</sup> :
Histosol				_	_	Sleyed Ma			Coast Prairie Redox (A16)
	ipedon (A2	2)				Redox (S5	-		Dark Surface (S7)
Black His		141		_		l Matrix (S	io) heral (F1)		Iron-Manganese Masses (F12) Very Shallow Dark Surface (TF12)
and the second second	n Sulfide (A Layers (At			<u></u>		Sleyed Ma			Other (Explain in Remarks)
2 cm Mu		0,			Depleted	1.194	1 /4		
	Below Dai	rk Surface	(A11)	$\overline{Z}$		ark Surfa			
	rk Surface				•		ırface (F7	)	<sup>3</sup> Indicators of hydrophytic vegetation and
	ucky Miner			<del></del>	Redox D	epressio	ns (F6)		wetland hydrology must be present,
	cky Peat or		-		4.78	· · · · · · · · · · · · · · · · · · ·			unless disturbed or problematic.
Restrictive L									,
Type:	701		· · ·			*			Hydric Soil Present? Yes No
Depth (inc	hes);	NONE	٠						
Hyd	TNC S	oo.V.	CVIT	enov	i Ma	5 <i>(</i> )(	en i	mlt	
HYDROLOG									
Wetland Hyd	• •								
Primary Indic			ne is requi						Secondary Indicators (minimum of two required)
	Nater (A1)				/ater-Stai				Surface Soil Cracks (B6)
	er Table (A	12)			quatic Fa		•		Drainage Patterns (B10)
✓ Saturatio			÷		rue Aquai				Dry-Season Water Table (C2) Crayfish Burrows (C8)
Water Ma		/DO\			ydrogen (			ing Roots	The state of the s
	t Deposits ( osits (B3)	(62)					ed Iron (C		Stunted or Stressed Plants (D1)
Algai Mat		R4)						حر d Soils (C6	
iron Depo	=	J-,			hin Muck				FAC-Neutral Test (D5)
	n Visible o	n Aerial Ir	madery (B		auge or \				· · · · · · · · · · · · · · · · · · ·
-	Vegetated				ther (Exp	lain in Re	emarks)		
Field Observ	ations:						•		
Surface Wate	r Present?	· Ye	es 👤	No I	Depth (inc	ches): 🙆	SURFA	<u>(</u>	
Water Table I	Present?	Ye	es 🗸	No I	Depth (inc	ches).	snefac	E	,
Saturation Pro	esent?	Ye	es 🗸	No I	Depth (inc	ches):	SURFA	CE Wet	and Hydrology Present? Yes No
(includes cap		) .		4 4 9 9 9					if qualitable)
Describe Rec	NA	a (sueam	gauge, m	onnoning we	n, aenai p	motos, pi	evious in	spections),	п ауапаше.
Remarks:	etlan	Q n	iy dv	olog	y cv	itev	1.0 N	has	been met.

Project/Site: 302899: Hardin Solar II City/County:	Havein County Sampling Date: 9/14/18
Applicant/Owner: TRC/Inveneral, LLC.	State: State: Sampling Point: UPL-HS-JB
Investigator(s): JP/OK Section, Town	ship, Renge: N/A
Landform (hillslope, terrace, etc.): NONE Loc	cal relief (concave, convex, none): NONE
8lope (%): () Lat: 40.62721887 Long: -83	3, 9 <i>04</i> 380 <i>3</i> 1 Datum: WG 58 4
Soil Map Unit Name: Ln - LINHOUD MVCK	NWI classification; NONE
Are climatic / hydrologic conditions on the site typical for this time of year? Yes	
Are Vegetation, Soil, or Hydrology significantly disturbed?	Are "Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology naturally problematic?	(If needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS - Attach site map showing sampling	
Is the S	Sampled Area
Watered Hydrology Present? Yes No within	a Wetland? Yes No
Remarks: of 3 wetland criteria have	been met. Area is not a
wetland of PARMIANO (AC	
	INE CEOFFINO
VEGETATION – Use scientific names of plants.	dicator   Dominance Test worksheet:
Tree Stratum (Plot size: 30' ) Absolute Dominant In % Cover Species?	
1	That Are OBL, FACW, or FAC: (A)
2.	Total Number of Dominant
3.	Species Across All Strata: (B)
4.	Percent of Dominant Species
5	That Are OBL, FACW, or FAC: (A/B)
Sapling/Shrub Stratum (Plot size: 15) — — = Total Cover	Prevalence Index worksheet:
Sapling/Shrub Stratum (Plot size: 1 )	Total % Cover of: Multiply by:
1.	OBL species x 1 =
2	FACW species x 2 =
3	FAC species x 3 =
	FACU species x 4 =
. Total Covel	UPL species x 5 =
Herb Stratum (Plot size:	Cotumn Totals: (A) (B)
1. (Tycine max 70 V	Prevalence Index = B/A =
2,	Hydrophytic Vegetation Indicators:
3.	1 - Rapid Test for Hydrophytic Vegetation
4	D. Duminana Tast is \$500/
5,	3 - Prevalence index is ≤3.0 <sup>4</sup>
6.	4 - Morphological Adaptations <sup>1</sup> (Provide supporting
7	data in Remarks or on a separate sheet)
8.	Problematic Hydrophytic Vegetation1 (Explain)
10.	
	Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: 30 ) +0 = Total Cove	
1	Hydrophytic Vegetation
2.	Present? Yes No V
Remarks: (Include photo numbers here or on a separate sheet.)	
Remarks: (Include photo numbers here or on a separate sheet.)  Hydrophytic vegetation criterion	has NOT REENMET.
440.104 0.105	

Profile Desi Depth (inches)	Matrix Color (moist)	%	Cele-(	Features			
0-20			Color (moist)			Texture	Remarks
2 20	104R 3/1	<u> 100 _</u>				SILO	-
						<del></del>	· · · · · · · · · · · · · · · · · · ·
			<del></del>				
Turas 0-0-							
lydric Soil I	ncentration, D=Dept	etion, RM=R	educed Matrix, MS=	Masked Sand Gra	ins.	<sup>2</sup> Location: P	L=Pore Lining, M=Matrix.
					-	indicators for	Problematic Hydric Soils3:
Histosof (			Sandy Gle	eyed Matrix (S4)			iria Redox (A16)
	pedon (A2)		Sandy Re			Dark Surfa	
Black His			Stripped N	/latrix (S6)			anese Masses (F12)
	Sulfide (A4)		Loamy Mu	icky Mineral (F1)		Very Shall	ow Dark Surface (TF12)
	Layers (A5)		Loamy Gle	eyed Matrix (F2)		Other (Exr	plain in Remarks)
2 cm Muc	k (A10)			Matrix (F3)			Man III To Hairaj
Depleted	Below Dark Surface	(A11)	Redox Dar	rk Surface (F6)			
	k Surface (A12)		Depleted [	Dark Surface (F7)		3Indicators of h	nydrophytic vegetation and
_ Sandy Mu	cky Mineral (\$1)		Redox De	pressions (F8)		wetland hy	drology must be present,
5 cm Muc	ky Peat or Peat (S3)	<u></u>		. ,		unless dist	urbed or problematic.
	yer (if observed):		<del></del>	<del></del>	<del>- "</del> T		aree or problemate.
Type:	NONE		_		1		
Depth (inch	00): 1	<b>.</b>			1	Hydric Soil Pres	sent? Yes No 🗸
	es): <u>' NO N</u>						
emarks:	CC SOV'Q		erion ho	IS NOT	3EEN		
Hyd)	ric soi?		wion ho	IS NOT 1	3EEN		7,
Hyd	rcsoil		urion ho	IS NOT	3EEN		
DROLOG	Y ology Indicators:	crite			3EEN		7.
DROLOG mary Indicate	Y ology Indicators:	crite			3EEN	_ met	
DROLOG  etland Hydromary Indicate Surface Wa	Y  logy Indicators:  ors (minimum of one ster (A1)	crite			3een	Med	dicators (minimum of two require
DROLOG  etland Hydro  mary Indicate Surface Water	Y  logy Indicators:  ors (minimum of one ater (A1)  Table (A2)	crite	theck all that apply)	Leaves (B9)	3een	Secondary In	dicators (minimum of two require
DROLOG  tland Hydro  mary Indicate Surface Wa High Water Saturation (	Y  logy Indicators:  ors (minimum of one ater (A1)  Table (A2)  A3)	crite	theck all that apply)  Water-Stained  Aquatic Fauna	Leaves (B9) (B13)	3een	Secondary Inc.  Surface S	dicators (minimum of two require Soil Cracks (B6) Patterns (B10)
DROLOGI btland Hydromary Indicate Surface Wa High Water Saturation (	Y  logy Indicators:  ors (minimum of one atter (A1)  Table (A2)  A3) s (B1)	crite	theck all that apply)  Water-Stained  Aquatic Fauna  True Aquatic F	Leaves (B9) (B13) Plants (B14)	3een	Secondary Inc. Surface S Drainage Dry-Seas	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2)
DROLOG etland Hydromary Indicate Surface Wa High Water Saturation ( Water Mark Sediment D	Y  Plogy Indicators:  Ors (minimum of one	crite	theck all that apply)  Water-Stained  Aquatic Fauna  True Aquatic F  Hydrogen Sulfi	Leaves (B9) (B13) Plants (B14) ide Odor (C1)		Secondary Inc. Surface S Drainage Dry-Seas Crayfish I	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8)
DROLOGI tland Hydromary Indicate Surface Wa High Water Saturation (	Y  Plogy Indicators:  Ors (minimum of one	crite	theck all that apply)  Water-Stained  Aquatic Fauna  True Aquatic F  Hydrogen Suifi  Oxidized Rhizc	Leaves (B9) (B13) Plants (B14) ide Odor (C1) aspheres on Living		Secondary in Surface S Drainage Dry-Seas Crayfish I Saturation	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) n Visible on Aerial imagery (C9)
DROLOG  Stland Hydro  Mary Indicate  Surface Wa  High Water  Saturation (  Water Mark  Sediment D  Drift Deposi	y clogy Indicators: cos (minimum of one ater (A1) Table (A2) (A3) s (B1) eposits (B2) ts (B3)	crite	theck all that apply)  Water-Stained  Aquatic Fauna  True Aquatic F  Hydrogen Sulfi  Oxidized Rhizo	Leaves (B9) (B13) Plants (B14) ide Odor (C1) aspheres on Living	Roots (C3	Secondary Inc. Surface S Drainage Dry-Seas Crayfish I Saturation Stunted o	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) n Visible on Aerial Imagery (C9) r Stressed Plants (D1)
DROLOG etland Hydromary Indicate Surface Wa High Water Saturation ( Water Mark Sediment D	Y  Plogy Indicators: DIS (minimum of one of the (A1) Table (A2) A3) s (B1) eposits (B2) ts (B3) Crust (B4)	crite	theck all that apply)  Water-Stained  Aquatic Fauna  True Aquatic F  Hydrogen Sulfi  Oxidized Rhizo  Presence of Ro	Leaves (B9) (B13) Plants (B14) ide Odor (C1) aspheres on Living educed Iron (C4) eduction in Tilled S	Roots (C3	Secondary Inc. Surface S Drainage Dry-Seas Crayfish I Saturation Stunted o	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) n Visible on Aerial Imagery (C9) r Stressed Plants (D1) bic Positlon (D2)
DROLOG' Atland Hydro Mary Indicate Surface Wa High Water Saturation ( Water Mark Sediment D Drift Deposi Algal Mat or Iron Deposi	Y  Plogy Indicators: DIS (minimum of one of the (A1) Table (A2) A3) s (B1) eposits (B2) ts (B3) Crust (B4) s (B5)	is required:	theck all that apply)  Water-Stained Aquatic Fauna True Aquatic F Hydrogen Sulfi Oxidized Rhizo Presence of Ro Recent Iron Re	Leaves (B9) (B13) Plants (B14) ide Odor (C1) aspheres on Living educed fron (C4) eduction in Tilled S face (C7)	Roots (C3	Secondary Inc. Surface S Drainage Dry-Seas Crayfish I Saturation Stunted o	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) n Visible on Aerial Imagery (C9) r Stressed Plants (D1)
DROLOG  Itland Hydro  Mary Indicate  Surface Water Mark  Sediment D  Drift Deposi  Algal Mat or  Iron Deposit  Inundation \( \)	Y  Ilogy Indicators:  Ors (minimum of one ater (A1)  Table (A2)  A3)  s (B1)  eposits (B2)  ts (B3)  Crust (B4)  s (B5)  Visible on Aerial Image	is required: (	theck all that apply)  Water-Stained Aquatic Fauna True Aquatic F Hydrogen Sulfi Oxidized Rhizo Presence of Re Recent Iron Re Thin Muck Suri	Leaves (B9) (B13) Plants (B14) ide Odor (C1) aspheres on Living educed fron (C4) eduction in Tilled S face (C7) Data (D9)	Roots (C3	Secondary Inc. Surface S Drainage Dry-Seas Crayfish I Saturation Stunted o	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) n Visible on Aerial Imagery (C9) r Stressed Plants (D1) bic Positlon (D2)
DROLOG  Atland Hydro  Mary Indicate  Surface Wa  High Water  Saturation (  Water Mark  Sediment D  Drift Deposi  Algal Mat or  Iron Deposi  Inundation (  Sparsely Ve	Y  Ilogy Indicators:  Ors (minimum of one ater (A1)  Table (A2)  A3)  s (B1)  eposits (B2)  ts (B3)  Crust (B4)  s (B5)  //sible on Aerial Imagestated Concave St	is required: (	theck all that apply)  Water-Stained Aquatic Fauna True Aquatic F Hydrogen Sulfi Oxidized Rhizo Presence of Ro Recent Iron Re	Leaves (B9) (B13) Plants (B14) ide Odor (C1) aspheres on Living educed fron (C4) eduction in Tilled S face (C7) Data (D9)	Roots (C3	Secondary Inc. Surface S Drainage Dry-Seas Crayfish I Saturation Stunted o	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) n Visible on Aerial Imagery (C9) r Stressed Plants (D1) bic Positlon (D2)
DROLOG  etland Hydro mary Indicate Surface Wa High Water Saturation ( Water Mark Sediment D Drift Deposi Indicate Indicate Sparsely Ve d Observati	y  Plogy Indicators:  Ors (minimum of one of the (A1)  Table (A2)  A3)  s (B1)  eposits (B2)  ts (B3)  Crust (B4)  s (B5)  Plaible on Aerial Imagetated Concave Suons:	is required: (	check all that apply)  Water-Stained  Aquatic Fauna  True Aquatic F  Hydrogen Sulfi Oxidized Rhizo  Presence of Ro  Recent Iron Re  Thin Muck Surl  Gauge or Well  Other (Explain	Leaves (B9) (B13) Plants (B14) ide Odor (C1) aspheres on Living educed fron (C4) eduction in Tilled S face (C7) Data (D9) in Remarks)	Roots (C3	Secondary Inc. Surface S Drainage Dry-Seas Crayfish I Saturation Stunted o	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) n Visible on Aerial Imagery (C9) r Stressed Plants (D1) bic Positlon (D2)
DROLOG  atland Hydro  mary Indicate  Surface Wa  High Water  Saturation ( Water Mark  Sediment D  Drift Deposit  Algal Mat on  Iron Deposit  Inundation \ Sparsely Ved  d Observati  face Water P	Y  Plogy Indicators: DIS (minimum of one ater (A1) Table (A2) A3) s (B1) eposits (B2) ts (B3) Crust (B4) is (B5) //sible on Aerial Imagetated Concave Stores: resent? Yes	is required: (gery (B7)	check all that apply)  Water-Stained  Aquatic Fauna  True Aquatic F  Hydrogen Sulfi Oxidized Rhizo  Presence of Ro  Recent Iron Re  Thin Muck Sunl  Gauge or Well  Other (Explain	Leaves (B9) (B13) Plants (B14) ide Odor (C1) expheres on Living educed from (C4) eduction in Tilled S face (C7) Data (D9) in Remarks)	Roots (C3	Secondary Inc. Surface S Drainage Dry-Seas Crayfish I Saturation Stunted o	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) n Visible on Aerial Imagery (C9) r Stressed Plants (D1) bic Positlon (D2)
DROLOG' etland Hydro mary Indicate Saturation ( Water Mark Sediment D Drift Deposi Algal Mat on Iron Deposi Inundation \ Sparsely Ve d Observati ace Water P er Table Pre-	Y  Ilogy Indicators: Drs (minimum of one ater (A1) Table (A2) A3) s (B1) eposits (B2) ts (B3) Crust (B4) s (B5) //sible on Aerial Image getated Concave Subons: resent? Yes _ sent? Yes _	is required: ( gery (B7) urface (B8)	theck all that apply)  Water-Stained  Aquatic Fauna  True Aquatic F  Hydrogen Sulfi Oxidized Rhizo  Presence of Re Recent Iron Re  Thin Muck Sun  Gauge or Well Other (Explain  Depth (Inches)	Leaves (B9) (B13) Plants (B14) ide Odor (C1) aspheres on Living educed fron (C4) eduction in Tilled S face (C7) Data (D9) in Remarks)	Roots (C3	Secondary Inc. Surface S Drainage Dry-Seas Crayfish I Saturation Stunted o	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) n Visible on Aerial Imagery (C9) r Stressed Plants (D1) bic Positlon (D2)
DROLOG  atland Hydro  mary Indicate  Surface Wa  High Water  Saturation ( Water Mark  Sediment D  Drift Deposi  Algal Mat on  Iron Deposi  Inundation \ Sparsely Ve  d Observati  face Water P  er Table Prese  Iration Prese	y  logy Indicators:  los (minimum of one ater (A1)  Table (A2)  A3)  s (B1)  eposits (B2)  ts (B3)  Crust (B4)  s (B5)  //sible on Aeriel Image getated Concave Successives  resent?  yes  ht?  Yes	is required: ( gery (B7) urface (B8)	theck all that apply)  Water-Stained  Aquatic Fauna  True Aquatic F  Hydrogen Sulfi Oxidized Rhizo  Presence of Re Recent Iron Re  Thin Muck Sun  Gauge or Well  Other (Explain  Depth (inches)	Leaves (B9) (B13) Plants (B14) ide Odor (C1) aspheres on Living educed fron (C4) eduction in Tilled S face (C7) Data (D9) in Remarks)	Roots (C3	Secondary in Surface S Drainage Dry-Seas Crayfish I Saturation Stunted o Geomorpi FAC-Neul	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) o Visible on Aerial Imagery (C9) or Stressed Plants (D1) hic Position (D2) oral Test (D5)
DROLOG  etland Hydro mary Indicate Surface Water Mark Sediment D Drift Deposi Algal Mat or Iron Deposi Inundation \ Sparsely Ve d Observati face Water P er Table Pre- iration Prese udes capiliar	Y  Ilogy Indicators:  Ors (minimum of one ster (A1)  Table (A2)  A3)  s (B1)  eposits (B2)  ts (B3)  Crust (B4)  s (B5)  //sible on Aerial Imagetated Concave Storis:  resent?  yes_ y (fringe)	is required: ( gery (B7) urface (B8) No 1	check all that apply)  Water-Stained Aquatic Fauna True Aquatic F Hydrogen Sulfi Oxidized Rhizo Presence of Ro Recent Iron Re Thin Muck Suri Gauge or Well Other (Explain Depth (inches) Depth (inches)	Leaves (B9) I (B13) Plants (B14) ide Odor (C1) aspheres on Living educed fron (C4) eduction in Tilled S face (C7) Data (D9) in Remarks)	Roots (C3)	Secondary in Surface S Drainage Dry-Seas Crayfish I Saturation Stunted o Geomorpi FAC-Neul	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) o Visible on Aerial Imagery (C9) or Stressed Plants (D1) hic Position (D2) oral Test (D5)
DROLOG  etland Hydro mary Indicate Surface Water Mark Sediment D Drift Deposi Algal Mat or Iron Deposi Inundation \ Sparsely Ve d Observati face Water P er Table Pre- iration Prese udes capiliar	y  logy Indicators:  los (minimum of one ater (A1)  Table (A2)  A3)  s (B1)  eposits (B2)  ts (B3)  Crust (B4)  s (B5)  //sible on Aeriel Image getated Concave Successives  resent?  yes  ht?  Yes	is required: ( gery (B7) urface (B8) No 1	check all that apply)  Water-Stained Aquatic Fauna True Aquatic F Hydrogen Sulfi Oxidized Rhizo Presence of Ro Recent Iron Re Thin Muck Suri Gauge or Well Other (Explain Depth (inches) Depth (inches)	Leaves (B9) I (B13) Plants (B14) ide Odor (C1) aspheres on Living educed fron (C4) eduction in Tilled S face (C7) Data (D9) in Remarks)	Roots (C3)	Secondary in Surface S Drainage Dry-Seas Crayfish I Saturation Geomorpi FAC-Neul	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) o Visible on Aerial Imagery (C9) or Stressed Plants (D1) hic Position (D2) oral Test (D5)
DROLOG' etland Hydro mary Indicate Surface Wa High Water Saturation ( Water Mark Sediment D Drift Deposi Inundation \ Sparsely Ve d Observati ace Water P er Table Pre- iration Prese udes capiliar cribe Record	Y  Ilogy Indicators: DIS (minimum of one ater (A1) Table (A2) A3) s (B1) eposits (B2) ts (B3) Crust (B4) is (B5) //sible on Aerial Imagetated Concave Strons: resent? yes_ent? yes_yringe) ed Data (stream gaugetate)	is required: ( gery (B7) urface (B8) No V No V No V uge, monitorir	check all that apply)  Water-Stained  Aquatic Fauna  True Aquatic F  Hydrogen Sulfi Oxidized Rhizo  Presence of Ro  Recent Iron Re  Thin Muck Suri  Gauge or Well  Other (Explain  Depth (inches)  Depth (inches)	Leaves (B9) (B13) Plants (B14) ide Odor (C1) espheres on Living educed fron (C4) eduction in Tilled S face (C7) Data (D9) in Remarks)  E. NA E.	Roots (C3)	Secondary Inc. Surface S Drainage Dry-Seas Crayfish I Saturation Stunted o Geomorpi FAC-Neul	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) on Visible on Aerial Imagery (C9) or Stressed Plants (D1) hic Position (D2) trai Test (D5)
DROLOG' Itland Hydromary Indicate Surface Water Mark Sediment D Drift Deposit Inundation N Sparsely Ved Observation ace Water P er Table Presented Second	Y  Ilogy Indicators: DIS (minimum of one ater (A1) Table (A2) A3) s (B1) eposits (B2) ts (B3) Crust (B4) is (B5) //sible on Aerial Imagetated Concave Strons: resent? yes_ent? yes_yringe) ed Data (stream gaugetate)	is required: ( gery (B7) urface (B8) No V No V No V uge, monitorir	check all that apply)  Water-Stained  Aquatic Fauna  True Aquatic F  Hydrogen Sulfi Oxidized Rhizo  Presence of Ro  Recent Iron Re  Thin Muck Suri  Gauge or Well  Other (Explain  Depth (inches)  Depth (inches)	Leaves (B9) (B13) Plants (B14) ide Odor (C1) espheres on Living educed fron (C4) eduction in Tilled S face (C7) Data (D9) in Remarks)  E. NA E.	Roots (C3)	Secondary Inc. Surface S Drainage Dry-Seas Crayfish I Saturation Stunted o Geomorpi FAC-Neul	dicators (minimum of two require Soil Cracks (B6) Patterns (B10) on Water Table (C2) Burrows (C8) o Visible on Aerial Imagery (C9) or Stressed Plants (D1) hic Position (D2) oral Test (D5)

Project/Site: 302899: Hardin Solar II city/c	ounty: Hardin County Sampling Date: 9/14/18
Applicant/Owner: TRC/Inveneray, LLC.	State: OH Sampling Point: WET-HS-JC
Investigator(s): JP/DK Section	n, Township, Range: N/A
	Local relief (concave, convex, none):CONCホッモ
	- 83, 80607327 Datum: WGS84
Soil Map Unit Name: LN - LINWOOD MUCK.	
Are climatic / hydrologic conditions on the site typical for this time of year? Ye	es No (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturb	
Are Vegetation, Soit, or Hydrology naturally problems	tic? (If needed, explain any answers in Remarks.) 🦟
SUMMARY OF FINDINGS - Attach site map showing sam	pling point locations, transects, important features, etc.
Hydrophytic Vegetation Present?  Hydric Soil Present?  Wetland Hydrology Present?  Yes No	Is the Sampled Area within a Wetland? Yes No
Remarks: All 3 wetland conteria has	rebeen met. Area is a wetland.
* THE WETLAND IS LOCATED LITHIN	
VEGETATION – Use scientific names of plants.	CIRCUMSTANCE"
Tree Stratum (Plot size: 30') Absolute Dom % Cover Spec	
2.	Total Number of Dominant Species Across All Strata: (8)
4	Percent of Dominant Species
5	That Are OBL, FACW, or FAC: (A/B)
Sapling/Shrub Stratum (Plot size: 15 )	Prevalence Index worksheet:
1	
2.	OBL species x 1 =  FACW species x 2 =
4.	FAC species x3=
6	FACU species x4 =
= Tota	I Cover UPL species x 5 =
Herb Stratum (Plot size:)	Column Totals: (A) (B)
1. C-Lycine max 10 v	Prevalence Index = B/A =
3.	Hydrophytic Vegetation Indicators:
4.	1 - Rapîd Test for Hydrophytic Vegetation
5.	2 - Dominance Test is >50%
6.	3 - Prevalence Index is ≤3.0¹
7	4 - Morphological Adaptations' (Provide supporting
8	data in Remarks or on a separate sheet)  ✓ Problematic Hydrophytic Vegetation¹ (Explain) ★★
9	
Woody Vine Stratum (Plot size: 30' ) /U = Total	al Cover 1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1.	Hydrophytic
2	Vegetation Present? Yes No
	al Gover
4. Amonutic reactation unit	enion has been mut.
** WETLAND LOCATED IN CROPPED FIELD; LACK	S A NATURAL PLANT COMMUNITY.
OF WIFE AS ASTOLAT IN Other	A V 1 HOURS II ) LEATERATES

US Army Corps of Engineers

REVIEW OF AERIAL IMAGERY (HISTORIC) INDICATES
Midwest Region - Version 2.0

ARTH HAS NOT BEEN SUCCESSFULLY CROPPED IN

RECENT YEARS; INCLUDING WER A THREE YEAR SPAN (2015 - 2018)

Sampling Point:	WET-HS-JC
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	onphain (necessor	to the dopth				OL COMMIT	n the absence of Indicators.)
Depth	Matrix	n/		Features	Tue1	Loc <sup>2</sup>	Texture Remarks
(inches)	Color (moist)	<u> </u>	Color (moist)		Type¹		Dr. GANIC
0-6	2.54 25/1		25423/2	<u> 10</u>		PL	
6-20	10 YR 3/2	90	7.54R3/4	10	_ <u></u>	<u>m</u>	SILO
							eli en eli
71, 1		· <del></del>		-			
		·					
				<del></del>	<del></del>		
		. <u> </u>			<del></del>		The second secon
	oncentration, D=Dep	letion, RM=R	leduced Matrix, MS	=Masked	Sand Gr	ains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils <sup>3</sup> :
Hydric Soil							Coast Prairie Redox (A16)
Histosol				leyed Ma edox (S5)			Dark Surface (S7)
	pipedon (A2) istic (A3)		t-	Matrix (S			Iron-Manganese Masses (F12)
	en Sulfide (A4)			lucky Min			Very Shallow Dark Surface (TF12)
	d Layers (A5)		-	leyed Ma			Other (Explain in Remarks)
	uck (A10)			l Matrix (F	1. 74		•
Deplete	d Below Dark Surface	e (A11)	Redox D				9
_	ark Surface (A12)			I Dark Su	-	)	<sup>8</sup> Indicators of hydrophytic vegetation and
7.7	Mucky Mineral (S1)	<b>.</b>	Redox D	epression	ns (F6)		wetland hydrology must be present, unless disturbed or problematic.
	ucky Peat or Peat (S3						unless distanced of problematic.
1	Layer (if observed): No PE						/
Type:				•			Hydric Soil Present? Yes V No No
Depth (in Remarks:	cnes): 1907 9 2		······································				
HYDROLO	n <b>GY</b>	, , , , , , , , , , , , , , , , , , ,		<del></del>	· · · · · · · · · · · · · · · · · · · ·		
	drology Indicators:	·		1			And the second s
	cators (minimum of o	ne is require	d check all that an				
	•	ite is reduite.		rains)			Secondary Indicators (minimum of two required)
Sunace	Mintor (A1)				ec /RQ1		Secondary Indicators (minimum of two required)
	Water (A1)	,	Water-Stai	ned Leave	4.7.7		Surface Soil Cracks (B8)
High W	ater Table (A2)	,	Water-Stail	ned Leave una (B13)	)	· .	Surface Soil Cracks (B6) Drainage Patterns (B10)
High Wa	ater Table (A2) on (A3)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Water-Stain Aquatic Fa True Aquat	ned Leave una (B13) tic Plants	) (B14)	· · · · · · · · · · · · · · · · · · ·	Surface Soil Cracks (B8) Drainage Patterns (B10) Dry-Season Water Table (C2)
High Wa Saturati Water M	ater Table (A2) on (A3) farks (B1)		Water-Stail Aquatic Fe True Aquat	ned Leave una (B13) lic Plants Sulfide Oc	) (B14) dor (C1)	ring Roots	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)
High Wa Saturati Water M Sedime	ater Table (A2) on (A3) farks (B1) nt Deposits (B2)		Water-Stain Aquatic Fa True Aquat Hydrogen S Oxidized R	ned Leave una (B13) tic Plants Sulfide Od hizosphe	) (B14) dor (C1) res on Liv	-	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)
High Wa Saturati Water M Sedime Drift De	ater Table (A2) on (A3) farks (B1)		Water-Stail Aquatic Fe True Aquat	ned Leave una (B13) tic Plants Sulfide Oc hizosphe of Raduce	) (B14) dor (C1) res on Liv d Iron (C	4)	Surface Soil Cracks (B8) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
High Wa Saturati Water N Sedime Drift De Algal M	ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3)		Water-Stail Aquattc Fa True Aquat Hydrogen S Oxidized R Presence of	ned Leave una (B13) tic Plants Sulfide Oc hizosphe of Raduce n Reduction	) (B14) dor (C1) res on Liv d Iron (C on in Tills	4)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)
High Wa Saturati Water M Sedime Drift De Algal Ma	ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4)	magery (B7)	Water-Stail Aquatic Fa True Aquat Hydrogen S Oxidized R Presence C Recent Iron Thin Muck Gauge or N	ned Leave una (B13) tic Plants Sulfide Od hizosphei of Raduce of Reducti Surface (	) (B14) dor (C1) res on Liv d Iron (C on in Tills C7) (D9)	4)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2)
High Water M Sedimer Drift De Algal Mater M Iron Dej Inundati	ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5)		Water-Stail Aquatic Fa True Aquat Hydrogen S Oxidized R Presence C Recent Irol Thin Muck Gauge or N	ned Leave una (B13) tic Plants Sulfide Od hizosphei of Raduce of Reducti Surface (	) (B14) dor (C1) res on Liv d Iron (C on in Tills C7) (D9)	4)	Surface Soil Cracks (B8) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2)
High Water Mater M	ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial I y Vegetated Concave	s Surface (B8	Water-Stail Aquatic Fa True Aquat Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Gauge or V Other (Exp	ned Leavi una (B13) itc Plants Sulfide Oc hizosphei of Raduce n Reducti Surface ( Well Data lain in Re	(B14) (B14) dor (C1) res on Liv d Iron (C on in Tills (C7) (D9) marks)	4)	Surface Soil Cracks (B8) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2)
High Waler Mater M	ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B6) ion Visible on Aerial I y Vegetated Concave vations:	e Surface (B8	Water-Stail Aquatic Fa True Aquat Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Gauge or N Other (Exp	ned Leavi una (B13) iic Plants Sulfide Oc hizosphei of Raduce n Reducti Surface ( Well Data lain in Re	(B14) (B14) dor (C1) res on Liv d Iron (C on in Tills (C7) (D9) marks)	4)	Surface Soil Cracks (B8) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2)
High Water M Sedimer Drift Der Algal Mater M Iron Der Inundati Sparsei	ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial I y Vegetated Concave vations:	e Surface (B8	Water-Stail Aquatic Fa True Aquat Hydrogen 3 Oxidized R Presence c Recent Iron Thin Muck Gauge or V Other (Exp	ned Leavi una (B13) tic Plants Sulfide Oc hizosphei f Raduce n Reducti Surface ( Well Data lain in Re	(B14) (B14) dor (C1) res on Liv d Iron (C on in Tills (C7) (D9) marks)	4) d Soils (C	Surface Soil Cracks (B8) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2) FAC-Neutral Test (D5)
High Water M Saturati Water M Sedimer Drift De Algal Mater of De Inundati Sparsei Field Obser Surface Wat Water Table Saturation F	ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial I y Vegetated Concave vations: ter Present? Y Present? Y	es Notes	Water-Stail Aquatic Fa True Aquat Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Gauge or N Other (Exp	ned Leavi una (B13) tic Plants Sulfide Oc hizosphei f Raduce n Reducti Surface ( Well Data lain in Re	(B14) (B14) dor (C1) res on Liv d Iron (C on in Tills (C7) (D9) marks)	4) d Soils (C	Surface Soil Cracks (B8) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2)
High Water M Sedimer Drift Der Algal Mater M Iron Der Inundati Sparsei Field Obser Surface Water Table Saturation F	ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B8) ion Visible on Aerial I y Vegetated Concave vations: ter Present? Present? Y Present? Y	es Notes	Water-Stail Aquatic Fa True Aquati Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Gauge or N Other (Exp	ned Leavi una (B13) iic Plants Sulfide Oc hizosphei of Raduce n Reducti Surface ( Well Data lain in Re	(B14) (B14) dor (C1) res on Liu d Iron (C on in Tills (C7) (D9) marks)	4) ad Soils (C	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2) FAC-Neutral Test (D5)
High Water M Sedimer Drift Der Algal Mater M Iron Der Inundati Sparsei Field Obser Surface Water Table Saturation F (includes ca	ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial I y Vegetated Concave vations: ter Present? Y Present? Y	es Notes	Water-Stail Aquatic Fa True Aquati Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Gauge or N Other (Exp	ned Leavi una (B13) iic Plants Sulfide Oc hizosphei of Raduce n Reducti Surface ( Well Data lain in Re	(B14) (B14) dor (C1) res on Liu d Iron (C on in Tills (C7) (D9) marks)	4) ad Soils (C	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2) FAC-Neutral Test (D5)
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High Water N Saturati Water N Sedime Drift De Algal Mater N Iron Del Inundati Sparsel Field Obser Surface Water Table Saturation F (Includes ca Describe Re	ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial I y Vegetated Concave vations: ter Present? Present? Y pillary fringe) icorded Data (stream	es No es No es No gauge, mon	Water-Stail Aquatic Fa True Aquati Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Gauge or N Other (Exp	ned Leavi una (B13) ilic Plants Sulfide Oc hizosphei of Raduce n Reducti Surface ( Well Data lain in Re ches):	(B14) (B14) dor (C1) res on Liv dol Iron (C on in Tills (C7) (D9) marks)	4) d Soils (C	Surface Soil Cracks (B8) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2) FAC-Neutral Test (D5)  tland Hydrology Present? Yes No  , if available:
High Water N Saturati Water N Sedime Drift De Algal Mater N Iron Del Inundati Sparsel Field Obser Surface Water Table Saturation F (Includes ca Describe Re	ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial I y Vegetated Concave vations: ter Present? Present? Y pillary fringe) icorded Data (stream	es No es No es No gauge, mon	Water-Stail Aquatic Fa True Aquati Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Gauge or N Other (Exp	ned Leavi una (B13) ilic Plants Sulfide Oc hizosphei of Raduce n Reducti Surface ( Well Data lain in Re ches):	(B14) (B14) dor (C1) res on Liv dol Iron (C on in Tills (C7) (D9) marks)	4) d Soils (C	Surface Soil Cracks (B8) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)  (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)  6) Geomorphic Position (D2) FAC-Neutral Test (D5)
High Water N Saturati Water N Sedime Drift De Algal Mater N Inundati Sparsei Field Obser Surface Water Table Saturation F (includes ca Describe Re	ater Table (A2) on (A3) flarks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial I y Vegetated Concave vations: ter Present? Present? Y pillary fringe) icorded Data (stream	es No es No es No gauge, mon	Water-Stail Aquatic Fa True Aquati Hydrogen S Oxidized R Presence of Recent Iron Thin Muck Gauge or N Other (Exp	ned Leavi una (B13) ilic Plants Sulfide Oc hizosphei of Raduce n Reducti Surface ( Well Data lain in Re ches):	(B14) (B14) dor (C1) res on Liv dol Iron (C on in Tills (C7) (D9) marks)	4) d Soils (C	Surface Soil Cracks (B8) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) 6) Geomorphic Position (D2) FAC-Neutral Test (D5)  tland Hydrology Present? Yes No , if available:

Project/Site: 302899: Hard in Solar II city/county: Ha	voin County Sampling Date: 9/14/18
Applicant/Owner: TRC/Inveneral, LLC.	State: Off Sampling Point: UPL-HS-JC
Investigator(s): JP/DK Section, Township,	Range: N/A
Landform (hillslope, terrace, etc.): NONE Local re	ief (concave, convex, none): NONE
Slope (%): 0 Lat: 40,62799089 Long: -83,	00682519 Datum: WG 584
Soil Map Unit Name: Lin - Linwood Myck	NWI classification: NONE
Are climatic / hydrologic conditions on the site typical for this time of year? Yes N	o (if no, explain in Remarks.)
Are Vegetation Soil, or Hydrology significantly disturbed? A	re "Normal Circumstances" present? Yes No
· · · · · · · · · · · · · · · · · · ·	f needed, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map showing sampling point	The state of the s
Hydrophytic Vegetation Present? YesNo	
Hydric Soil Present? Yes No V Is the Same	
Wetland Hydrology Present? Yes No V within a We	
Remarks: of 3 wetland witeria have be	en met. Area is not a
wetland * ACTIVE CROPPING	
VEGETATION – Use scientific names of plants.	
Absolute Developed Indicate	or   Dominance Test worksheet:
Tree Stretum (Plot size: 30 ) % Cover Species? Statu	
2	Total Number of Dominant
3.	Species Across All Strata: (B)
4.	Percent of Dominant Species
5.	That Are OBL, FACW, or FAC: (A/B)
Sapling/Shrub Stratum (Plot size: 15) = Total Cover	Prevalence Index worksheet:
Sapind/Snrub Stratum (Plot size:)	Total % Cover of: Multioly by:
1.	OBL species x 1 =
3	FACW species x 2 =
4	FAC species X3=
5.	FACU species x 4 =
= Total Cover	UPL species x 5 =
Herb Stratum (Plot size:)	Column Totals: (A) (B)
1. Glycine max 70 V NPI	Prevalence Index = B/A =
2	Hydrophytic Vegetation Indicators:
3.	1 - Rapid Test for Hydrophytic Vegetation N
4	2 - Dominance Test is >50% N
5,	3 - Prevalence index is ≤3.01 N
6.       7.	4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
8.	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
9	
10	Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: 30)	be present, unest distance a prosecution
1.	— Hydrophytic
2	Vegetation   Yes No
= Total Cover	
Remarks: (Include photo numbers here or on a separate sheet.) Hydrophytic vegetation criterion ho	K NOT BEEN MILT.
Hydrophy IIC Vegetation Christian II	- Andrews

						Sampling Point: UPL-HS-J
	cription: (Describe t	o the depth	needed to docur	nent the indicator or con	ifirm the absence o	f indicators.)
Depth	Matrix	n/		x Features	, ·	
(inches)	Color (moist)		Color (moist)	% Type <sup>1</sup> Loc		Remarks
<u>U-20</u>	104R 3/1	100		The second second second second	S.Lu	
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			A			
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· · · · · · · · · · · · · · · · · · ·			·			
<del></del>			<del></del>	<del></del>	<u> </u>	
		tion, RM=Re	duced Matrix, MS	S=Masked Sand Grains.	<sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Hydric Soil I						or Problematic Hydric Soils <sup>3</sup> :
Histosol	•			lleyed Matrix (S4)		airie Redox (A16)
Histic Ep	pipedon (A2)		-	ledox (S5)		face (S7)
	n Sulfide (A4)			Matrix (S6) Aucky Mineral (F1)		ganese Masses (F12) illow Dark Surface (TF12)
	Layers (A5)			Bleyed Matrix (F2)		xplain in Remarks)
2 cm Mu				Matrix (F3)	00101 (2.	Appear of Mariney
	Below Dark Surface	(A11)		ark Surface (F6)		
	rk Surface (A12)			l Dark Surface (F7)	<sup>3</sup> Indicators o	f hydrophytic vegetation and
	ucky Mineral (S1)		Redox D	epressions (F8)		ydrology must be present,
	cky Peat or Peat (S3) ayer (if observed):				unless di	sturbed or problematic.
						·
Type:			±		Hydric Soil Pr	resent? Yes No
Depth (inc	nes);		-			
Remarks:	1000 Ca. 0	يهلن برير	noina la	AP INT DE	F-1	L
Hyo	11 C 501 X	CALLE	N 1001 11	as not be	EN YYV	τ,
-						
•			1		•	
VDDOL OF			,		*	
Wetland Hyd	rology Indicators:				•	
Wetland Hyd Primary Indica	rology Indicators: ators (minimum of one	is required;		· · · · · · · · · · · · · · · · · · ·	Secondary	Indicators (minimum of two required)
Wetland Hyd Primary Indica Surface V	rology Indicators: ators (minimum of one Vater (A1)	is required;	Water-Stain	ed Leaves (B9)		Indicators (minimum of two required) e Soil Cracks (B6)
Wetland Hyd Primary Indica Surface V High Wate	rology Indicators: ators (minimum of one Vater (A1) er Table (A2)	is required:	Water-Stain Aquatic Fau	ed Leaves (B9) ina (B13)	Surface Draina	e Soil Cracks (B6) ge Patterns (B10)
Wetland Hyd Primary Indica Surface V High Wate Saturation	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) n (A3)	is required;	Water-Stain Aquatic Fau True Aquati	ed Leaves (B9) ina (B13) c Plants (B14)	Surface Draina Dry-Se	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2)
Wetland Hyd Primary Indica Surface V High Wate Saturation Water Ma	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) or (A3) urks (B1)	is required;	Water-Stain Aquatic Fau True Aquati Hydrogen S	ed Leaves (B9) ina (B13) c Plants (B14) ulfide Odor (C1)	Surface Drainae Dry-Se Crayfis	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) th Burrows (C8)
Wetland Hyd Primary Indica Surface V High Wate Saturation Water Ma	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) n (A3) urks (B1) Deposits (B2)	is required;	Water-Stain Aquatic Fau True Aquatic Hydrogen S Oxidized Rt	ed Leaves (B9) ina (B13) c Plants (B14) ulfide Odor (C1) nizospheres on Living Roo	Surface Draina Dry-Se Crayfis  ts (C3) Saturat	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9)
Wetland Hyd Primary Indica Surface V High Wate Saturation Water Ma Sediment Drift Depo	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) or (A3) urks (B1) Deposits (B2)	is required:	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rt	ed Leaves (B9) ina (B13) c Plants (B14) ulfide Odor (C1) nizospheres on Living Roo r Reduced Iron (C4)	Surface Draina Dry-Se Crayfis Saturat Stunted	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1)
Wetland Hyd Primary Indica Surface V High Wate Saturation Water Ma Sediment Drift Depo	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) or (A3) orks (B1) Deposits (B2) or Crust (B4)	is required;	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rh Presence of Recent Iron	ed Leaves (B9) una (B13) c Plants (B14) ulfide Odor (C1) vizospheres on Living Roo r Reduced Iron (C4) Reduction in Tilled Solls (	Surface	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) th Випоws (С8) tion Visible on Aerial Imagery (С9) d or Stressed Plants (D1) orphic Position (D2)
Wetland Hyd Primary Indica Surface V High Wate Saturation Water Ma Sediment Drift Depo	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) or (A3) orks (B1) Deposits (B2) orsits (B3) or Crust (B4)		Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rt Presence of Recent Iron Thin Muck S	ed Leaves (B9) ina (B13) c Plants (B14) ulfide Odor (C1) nizospheres on Living Roo r Reduced Iron (C4) Reduction in Tilled Solls ( Surface (C7)	Surface	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1)
Wetland Hyd Primary Indica Surface V High Wate Saturation Water Ma Sediment Drift Depo Algal Mat Iron Depo	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) n (A3) nrks (B1) Deposits (B2) osits (B3) or Crust (B4) esits (B5) n Visible on Aerial Ima	agery (B7)	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rt Presence of Recent Iron Thin Muck S Gauge or W	led Leaves (B9) Ina (B13) c Plants (B14) ulfide Odor (C1) izospheres on Living Roo Reduced Iron (C4) Reduction in Tilled Solls ( Surface (C7) fell Data (D9)	Surface	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) th Випоws (С8) tion Visible on Aerial Imagery (С9) d or Stressed Plants (D1) orphic Position (D2)
Wetland Hyd Primary Indica Surface V High Wate Saturation Water Ma Sediment Drift Depo Algal Mat Iron Depo Inundation Sparsely V	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) n (A3) urks (B1) Deposits (B2) osits (B3) or Crust (B4) esits (B5) n Visible on Aerial Ima Vegetated Concave S	agery (B7)	Water-Stain Aquatic Fau True Aquati Hydrogen S Oxidized Rt Presence of Recent Iron Thin Muck S Gauge or W	ed Leaves (B9) ina (B13) c Plants (B14) ulfide Odor (C1) nizospheres on Living Roo r Reduced Iron (C4) Reduction in Tilled Solls ( Surface (C7)	Surface	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) th Випоws (С8) tion Visible on Aerial Imagery (С9) d or Stressed Plants (D1) orphic Position (D2)
Wetland Hyd Primary Indica Surface V High Wate Saturation Water Ma Sediment Drift Depo Algal Mat Iron Depo Inundation Sparsely V Field Observa	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) n (A3) urks (B1) Deposits (B2) osits (B3) or Crust (B4) esits (B5) n Visible on Aerial Ima Vegetated Concave S ations:	agery (B7) turface (B8)	Water-Stain Aquatic Fau True Aquatic Hydrogen S Oxidized Rt Presence of Recent Iron Thin Muck S Gauge or W Other (Explain	led Leaves (B9) Ina (B13) Ina (B13) Ina (B14) Indice Odor (C1) Inizospheres on Living Roo Indice Reduced Iron (C4) Indice (C4) Indice (C7) Indice (C7) Indice (C9)	Surface	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) th Випоws (С8) tion Visible on Aerial Imagery (С9) d or Stressed Plants (D1) orphic Position (D2)
Wetland Hyd Primary Indica Surface V High Water Ma Sediment Drift Depo Algal Mat Iron Depo Inundation Sparsely V Field Observa	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) or (A3) or (A3) or (A3) or (B1) Deposits (B2) or Grust (B4) or Grust (B4) or Visible on Aerial Ima Vegetated Concave S ations: Present? Yes	agery (B7) turface (B8)	Water-Stain Aquatic Fau True Aquatic Hydrogen S Oxidized Rt Presence of Recent Iron Thin Muck S Gauge or W Other (Expla	red Leaves (B9) Ina (B13) Ina (B13) Ina (B14) Indide Odor (C1) Inizospheres on Living Roof Reduced Iron (C4) Reduction in Tilled Solls (Surface (C7) Irell Data (D9) Irell in Remarks) Ines): N/A-	Surface	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) th Випоws (С8) tion Visible on Aerial Imagery (С9) d or Stressed Plants (D1) orphic Position (D2)
Wetland Hyd Primary Indica Surface V High Wate Saturation Water Ma Sediment Drift Depo Algal Mat Iron Depo Inundation Sparsely V Field Observa Surface Water	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) or (A3) orks (B1) Deposits (B2) or Crust (B4) orits (B5) or Visible on Aerial Ima Vegetated Concave S attors: Present? Yes	agery (B7) urface (B8) No _ No _	Water-Stain Aquatic Fau True Aquatic Hydrogen S Oxidized Rt Presence of Recent Iron Thin Muck S Gauge or W Other (Expla	red Leaves (B9) Ina (B13) Ina (B14) Ina (B14) Indice Odor (C1) Inizospheres on Living Roo Reduced Iron (C4) Reduction in Tilled Solls (Surface (C7) Ireli Data (D9) Irinian In Remarks) Ines): Ines): Ines: Indice (B9) Ines:	Surface Draina Dry-Se Crayfis Sturate (C6) Geomo	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2) eutral Test (D5)
Primary Indica Surface V High Water Saturation Water Ma Sediment Drift Depo Algal Mat Iron Depo Inundation Sparsely V Field Observa Surface Water Water Table P Saturation Pre	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) n (A3) nrks (B1) Deposits (B2) osits (B3) or Crust (B4) esits (B5) n Visible on Aerial Ima Vegetated Concave S ations: Present? Yes esent? Yes	agery (B7) turface (B8)	Water-Stain Aquatic Fau True Aquatic Hydrogen S Oxidized Rt Presence of Recent Iron Thin Muck S Gauge or W Other (Expla	red Leaves (B9) Ina (B13) Ina (B14) Ina (B14) Indice Odor (C1) Inizospheres on Living Roo Reduced Iron (C4) Reduction in Tilled Solls (Surface (C7) Ireli Data (D9) Irinian In Remarks) Ines): Ines): Ines: Indice (B9) Ines:	Surface	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C6) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2) eutral Test (D5)
Wetland Hyd Primary Indica Surface V High Water Ma Sediment Drift Depo Algal Mat Iron Depo Inundation Sparsely Field Observa Surface Water Water Table P Saturation Pre Includes capil	rology Indicators: ators (minimum of one Vater (A1) er Table (A2) or (A3) or (A3) or (B1) Deposits (B2) osits (B3) or Crust (B4) osits (B5) or Visible on Aerial Ima Vegetated Concave S ations: Present? Yes esent? Yes lary fringe)	agery (B7) turface (B8) No _ No _	Water-Stain Aquatic Fau True Aquatic Hydrogen S Oxidized Rt Presence of Recent Iron Thin Muck S Gauge or W Other (Expla	red Leaves (B9) Ina (B13) Ina (B14) Ina (B14) Indice Odor (C1) Inizospheres on Living Roo Reduced Iron (C4) Reduction in Tilled Solls (Surface (C7) Ireli Data (D9) Irinian In Remarks) Ines): Ines): Ines: Indice (B9) Ines:	Surface Draina Dry-Se Crayfis Sturae Stuntee (C6) Geome FAC-N	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C6) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2) eutral Test (D5)

wetland hydrology criterion has <u>not been</u> met.

	y, LLC	Section Township	State: OH Sampling Point: <u>VPL-BR-</u> Range: 53, 755, R 9 E
vestigator(s):			
		Long: -83.8184	ief (concave, convex, none):
ope (%): 0-5 Lat: 40.63257			
il Map Unit Name: FRA - Yewamu Sity Clo	14 loan, U	to PERCONT, SW	NWI classification: None
e climatic I hydrologic conditions on the site typical for	this time of year	ar? Yes No	(If no, explain in Remarks.)
e Vegetation, Soil, or Hydrology	significantly	disturbed? Ar	re "Normal Circumstances" present? Yes No
e Vegetation, Soil, or Hydrology	_ naturally pro	blematic? (If	needed, explain any answers in Remarks.)
UMMARY OF FINDINGS - Attach site ma	ap showing	sampling poin	t locations, transects, important features, etc
Hydrophytic Vegetation Present? Yes	No_X	0.00	
Hydric Soil Present? Yes	No_X	Is the Sampl	7
Vetland Hydrology Present? Yes	No	within a Wet	
Remarks: L of 3 wetland cn' wetland.	tenia	have be	en met. Area is not a
EGETATION – Use scientific names of plar	nts.		
ree Stratum (Plot size: 30')	Absolute		
		Species? Status	Number of Dominant Species That Are OBL, FACW, or FAC:(A)
Mar			_ Inat Are Obt., FACVV, or FAC (A)
			Total Number of Dominant Species Across All Strata: (B)
			Species Across All Strata: (B)
			Percent of Dominant Species That Are OBL, FACW, or FAC: (A/B)
		= Total Cover	- Mat Ale Obl., FACVY, of FAC (A/B)
Sapling/Shrub Stratum (Plot size: 15°)			Prevalence Index worksheet:
. Nuke			Total % Cover of: Multiply by:
			OBL species
			1.01.01.01.01
			_ I Ao species xo
			- I Add species A4
lerb Stratum (Plot size: 5		= Total Cover	01 L species x 0 =
· Barbaren Valgaris	- 45	Y FAL	(-)
	15	Y FACU	Prevalence Index = B/A = 3.3 6
, 9	10	Y FACH	Hydrophytic Vegetation Indicators:
taraxallya officinals			
- taraxalla officiale	- 13	Y FACU	
- taraxara afficients - Galling aparine - Hulans laggins	10		
- taraxalla officiale Gallina azarine - Hulans lanatus - Persicara hydropiperides - Cirsian arvense	8 5	Y FACU	1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50%
- taraxaria afficiente - Gallina aparine - Huluni lanatus - Persicara hydropiperides - Cirsiam arvense	8 5	N OBL	1 - Rapid Test for Hydrophytic Vegetation2 - Dominance Test is >50%3 - Prevalence Index is ≤3.0¹4 - Morphological Adaptations¹ (Provide supporting
- taraxalla officiale Gallina aparine - Hulans langtas - Persicara hydropipercides - Cirsum arvense - Symphynteichna laterfluram	\$ 5 2	N FACE	1 - Rapid Test for Hydrophytic Vegetation2 - Dominance Test is >50%3 - Prevalence Index is ≤3.0¹4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- taraxallan afficients - Gallina aparine - Hulans langtas - Persicara hydropiperuites - Cirsian arvense - Symphynte: chan lake; floran	\$ \$ \$ \$	N FACE	1 - Rapid Test for Hydrophytic Vegetation2 - Dominance Test is >50%3 - Prevalence Index is ≤3.0¹4 - Morphological Adaptations¹ (Provide supporting
- taraxalla officiale Galling grafine - Hulcons lanatus - Persicara hydropiperaides - Cirsiam arvense - Symphyuticham laterfluram - O.	8 5 5	Y FACH N OBL N FACH N FACH	1 - Rapid Test for Hydrophytic Vegetation2 - Dominance Test is >50%3 - Prevalence Index is ≤3.0¹4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) ¹Indicators of hydric soil and wetland hydrology must
E. taravalla officiale.  B. Gallina aparine  B. Hulcon langtas  B. Persicara hydropiperides  Cirsiam arvense  Symphysticham lake: floram  B.  B.  Noody Vine Stratum (Plot size: 30)	8 8 8 2	N FACE	1 - Rapid Test for Hydrophytic Vegetation2 - Dominance Test is >50%3 - Prevalence Index is ≤3.0¹4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain)
E. taravalla officiale  B. Gallina aparine  Hulans langtas  Persona hydropiperates  Cirsian arvente	9 8 5 E	Y FACH N OBL N FACH N FACH	1 - Rapid Test for Hydrophytic Vegetation2 - Dominance Test is >50%3 - Prevalence Index is ≤3.0¹4 - 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.
Le taravalla afficiente  Callina aparine  Hulcons langtas  Persicara hydropiperides  Cirsina arvense  Symphystichan laterfloran  O.  Noody Vine Stratum (Plot size: 30)		Y FACH N OBL N FACH N FACH	1 - Rapid Test for Hydrophytic Vegetation2 - Dominance Test is >50%3 - Prevalence Index is ≤3.0¹4 - 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.

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Sampling Point: UPL - ()0-V |

Depth Matrix	Redox Features	
(inches) Color (moist) %	Color (moist) % Type¹ Loc²	Texture Remarks
D-15 2723/1 1M		SiL
		-
		<del></del>
Type: C=Concentration D=Depletion E	RM=Reduced Matrix, MS=Masked Sand Grains.	2
lydric Soil Indicators:	M-Reduced Matrix, Mo-Masked Sand Grains.	<sup>2</sup> Location: PL=Pore Lining, M=Matrix. Indicators for Problematic Hydric Soils <sup>3</sup> :
_ Histosol (A1)	Sandy Gleyed Matrix (S4)	
_ Histic Epipedon (A2)	Sandy Gleyed Marrix (S4) Sandy Redox (S5)	Coast Prairie Redox (A16) Dark Surface (S7)
_ Black Histic (A3)	Stripped Matrix (S6)	Iron-Manganese Masses (F12)
_ Hydrogen Sulfide (A4)	Loamy Mucky Mineral (F1)	Very Shallow Dark Surface (TF12)
_ Stratified Layers (A5)	Loamy Gleyed Matrix (F2)	Other (Explain in Remarks)
_ 2 cm Muck (A10)	Depleted Matrix (F3)	_ , , , , , , , , , , , , , , , , , , ,
_ Depleted Below Dark Surface (A11)	Redox Dark Surface (F6)	
_ Thick Dark Surface (A12)	Depleted Dark Surface (F7)	3 Indicators of hydrophytic vegetation and
_ Sandy Mucky Mineral (S1)	Redox Depressions (F8)	wetland hydrology must be present,
_ 5 cm Mucky Peat or Peat (S3)		unless disturbed or problematic.
estrictive Layer (if observed):		
Type:		Hydric Soil Present? Yes No
± 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		DVUIG SOIL PLESENTY YES NO
emarks: Hydivic soil cr	riterion has Not b	
Hydric soil cr	riterion has Not b	
Hydric soil cr	riterion has Not b	
DROLOGY etland Hydrology Indicators:		een met.
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is req	uired: check all that apply)	secondary Indicators (minimum of two required
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requestion). Surface Water (A1)	uired: check all that apply) Water-Stained Leaves (B9)	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)
DROLOGY etland Hydrology Indicators: mary Indicators (minimum of one is req. Surface Water (A1) High Water Table (A2)	uired: check all that apply) Water-Stained Leaves (B9) Aquatic Fauna (B13)	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requestrated Water (A1) High Water Table (A2) Saturation (A3)	uired: check all that apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2)
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is req Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	uired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)	Secondary Indicators (minimum of two required Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8)
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is req Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	uired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots	Secondary Indicators (minimum of two required  Surface Soil Cracks (B6)  Drainage Patterns (B10)  Dry-Season Water Table (C2)  Crayfish Burrows (C8)  S (C3) Saturation Visible on Aerial Imagery (C9)
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requested by Mater Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	uired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4)	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)
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requested by Marker (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	uired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C	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)
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requested by the second of	uired: check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C	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)
DROLOGY etland Hydrology Indicators: mary Indicators (minimum of one is requested by the second of t	uired: check all that apply)  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  True Aquatic Plants (B14)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Roots  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled Soils (C  Thin Muck Surface (C7)  B7)  Gauge or Well Data (D9)	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)
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requested by Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (I Sparsely Vegetated Concave Surface	uired: check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7)	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)
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PROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requested water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (Inspection of the content of the	uired: check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (Called The Mark Surface (C7) B7) Gauge or Well Data (D9) (B8) Other (Explain in Remarks)  No Depth (inches): No Depth (inches):	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)
PROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requested Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (Inc.) Sparsely Vegetated Concave Surface (B1)	uired: check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (Called The Mark Surface (C7) B7) Gauge or Well Data (D9) (B8) Other (Explain in Remarks)  No Depth (inches): No Depth (inches):	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)
DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requested Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (Inc.) Sparsely Vegetated Concave Surface (Inc.) Indicators: Indicators (Yes	uired: check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) B7) Gauge or Well Data (D9) (B8) Other (Explain in Remarks)  No Depth (inches):  No Depth (inches):  Well	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)
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DROLOGY etland Hydrology Indicators: imary Indicators (minimum of one is requested by the second of	uired: check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C Thin Muck Surface (C7) B7) Gauge or Well Data (D9) (B8) Other (Explain in Remarks)  No Depth (inches):  No Depth (inches):  Well	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)  Itland Hydrology Present? Yes No

WETLAND DETERMINATION DATA FORM - Midwest Region Project/Site: 302899: Hardin Solar II City/County: Hardin County Sampling Date: 5/50/18 Sampling Point: UPL- DP Applicant/Owner: TRC/ Section, Township, Range: 510 Investigator(s): Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Lun (que 40.62585 -83.81725 Datum: WG SS 4 Soil Map Unit Name: PKA-Oto ( Recont Slove) NWI classification: None Are climatic / hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.) Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.) SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. No. Hydrophytic Vegetation Present? Yes Is the Sampled Area No > Hydric Soil Present? within a Wetland? Wetland Hydrology Present? Remarks: of 3 wetland been me VEGETATION - Use scientific names of plants. Absolute Dominant Indicator Dominance Test worksheet: Tree Stratum (Plot size: Status % Cover Species? Number of Dominant Species 1. QUARICINS FACL That Are OBL, FACW, or FAC: 2. Justons nigra FALLA Total Number of Dominant FAL Species Across All Strata: (B) Percent of Dominant Species That Are OBL, FACW, or FAC: = Total Cover Sapling/Shrub Stratum (Plot size: Prevalence Index worksheet: Cornus amonum Total % Cover of: Multiply by: **OBL** species FACW species 3. 30 FAC species 51 FACU species 0 0 **UPL** species = Total Cover Herb Stratum (Plot size: 15 511 Column Totals: Prevalence Index = B/A = 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 Vegetation<sup>1</sup> (Explain) <sup>1</sup>Indicators of hydric soil and wetland hydrology must = Total Cover be present, unless disturbed or problematic. Woody Vine Stratum (Plot size: Hydrophytic Vegetation 2. Present? = Total Cover Remarks: (Include photo numbers here or on a separate sheet.) vegetation criterion has not

Depth M	latrix	Redox	Features				
(inches) Color (mo		Color (moist)	%	Type <sup>1</sup>	Loc2	Texture	Remarks
0-8 1048 3/	001 5					Sil	TOMANO
8-16 2543	(11)				-	201	
			-				
			-		4		
Tuno: C=Connecticities F	D=D1-/ D11-		ir and	17.0			
Type: C=Concentration, E lydric Soil Indicators:	D=Depletion, RM=I	Reduced Matrix, MS=	Masked S	Sand Gra	ins.	Location:	PL=Pore Lining, M=Matrix.
_ Histosol (A1)		01-0					r Problematic Hydric Soils <sup>3</sup> :
Histic Epipedon (A2)		Sandy Gle Sandy Re		1x (S4)			airie Redox (A16)
Black Histic (A3)		Stripped N	44.74				face (S7)
_ Hydrogen Sulfide (A4)		Loamy Mu					ganese Masses (F12) llow Dark Surface (TF12)
_ Stratified Layers (A5)		Loamy Gl					rplain in Remarks)
2 cm Muck (A10)		Depleted I				Onler (E)	cplain in Remarks)
_ Depleted Below Dark S	Surface (A11)	Redox Da	project plant of the sale				
_ Thick Dark Surface (A1		Depleted I				3Indicators of	hydrophytic vegetation and
Sandy Mucky Mineral (		Redox De					ydrology must be present,
_ 5 cm Mucky Peat or Pe							sturbed or problematic.
estrictive Layer (if obser	rved):						
Type:		_					
						Hydric Soil Pr	esent? Yes No 🔨
emarks: Hydv.C.SO	nil crit	erion ho	05 _	not		_ me	
Hydric so	niQ crit	erion ha	15 _	not		17.00.04.80	
marks: Hydricso		erion ho	15 1	not		17.00.04.80	
PROLOGY  [etland Hydrology Indicate	tors:			not		_ me	+.
PROLOGY  Timary Indicators (minimum	tors:	l: check all that apply	0			Me.	th,
PROLOGY  Surface Water (A1)	tors:	l: check all that apply Water-Staine	() d Leaves			Secondary Surface	Indicators (minimum of two required
PROLOGY  Surface Water (A1)  High Water Table (A2)	tors:	l: check all that apply Water-Staine Aquatic Faun	d Leaves	(B9)		Secondary Surface Drainag	Indicators (minimum of two required Soil Cracks (B6) pe Patterns (B10)
PROLOGY  Setland Hydrology Indicationary Indicators (minimum Surface Water (A1) High Water Table (A2)  Saturation (A3)	tors:	I: check all that apply Water-Staine Aquatic Faun True Aquatic	d Leaves a (B13) Plants (B1	(B9)		Secondary Surface Drainag Dry-Sea	Indicators (minimum of two required e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2)
PROLOGY  etland Hydrology Indicationary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	tors: n of one is required	l: check all that apply  Water-Staine Aquatic Faun True Aquatic Hydrogen Sul	d Leaves a (B13) Plants (B1	(B9) 14)	been	Secondary Surface Drainag Dry-Se: Crayfisl	Indicators (minimum of two required Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) n Burrows (C8)
PROLOGY  etland Hydrology Indicationary Indicators (minimum Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)	tors: n of one is required	l: check all that apply  Water-Staine Aquatic Faun True Aquatic Hydrogen Sul	d Leaves a (B13) Plants (B1 difide Odor cospheres	(B9) 14) (C1) s on Living	been	Secondary Surface Drainag Dry-See Crayfisl Saturat	Indicators (minimum of two required e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) in Burrows (C8) on Visible on Aerial Imagery (C9)
PROLOGY  Toronto Toron	tors: n of one is required	: check all that apply  Water-Stainer Aquatic Faun True Aquatic Hydrogen Sul Oxidized Rhiz	d Leaves a (B13) Plants (B1 lifide Odor cospheres	(B9) 14) (C1) s on Livingron (C4)	been g Roots (Ca	Secondary Surface Drainag Dry-Se Crayfisl Saturat Stunted	Indicators (minimum of two required e Soil Cracks (B6) ge Patterns (B10) gason Water Table (C2) gason Water Table (C2) gason Water Table (C2) gason Visible on Aerial Imagery (C9) gason Visible on Aerial Imagery (C9)
PROLOGY  [etland Hydrology Indicationary Indicators (minimum  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)	tors: n of one is required	: check all that apply  Water-Staine Aquatic Faun True Aquatic Hydrogen Sul Oxidized Rhiz Presence of F	d Leaves a (B13) Plants (B1 lifide Odor cospheres Reduced In	(B9) 14) (C1) s on Livingron (C4) in Tilled s	been g Roots (Ca	Secondary Surface Drainag Dry-Se: Crayfisl Saturat Stunted Geomo	Indicators (minimum of two required e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) in Burrows (C8) ion Visible on Aerial Imagery (C9) or Stressed Plants (D1) rphic Position (D2)
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emarks:  Hydrology  [etland Hydrology Indicationary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Ae Sparsely Vegetated Cone and Observations: Inface Water Present?	tors: n of one is required erial Imagery (B7) ncave Surface (B8)	E: check all that apply Water-Staine Aquatic Faun True Aquatic Hydrogen Sul Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su Gauge or Wel Other (Explain	d Leaves a (B13) Plants (B1 difide Odor cospheres Reduced In Reduction i rface (C7) Il Data (D8 n in Rema	(B9) 14) (C1) s on Living ron (C4) in Tilled (	been g Roots (Ca	Secondary Surface Drainag Dry-Se: Crayfisl Saturat Stunted Geomo	Indicators (minimum of two required e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) in Burrows (C8) ion Visible on Aerial Imagery (C9) or Stressed Plants (D1) rphic Position (D2)
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PROLOGY  Vetland Hydrology Indicationary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Ae Sparsely Vegetated Cone and Observations: Inface Water Present? Internation Pr	tors: n of one is required erial Imagery (B7) ncave Surface (B8)  Yes No Yes No	E: check all that apply  Water-Staine Aquatic Faun True Aquatic Hydrogen Sul Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su Gauge or Wel Other (Explair  Depth (inche	d Leaves a (B13) Plants (B1 fide Odor cospheres Reduced In Reduction i rface (C7) II Data (D8 n in Rema s):	(B9)  14) (C1) s on Livingron (C4) in Tilled (3) 9) arks)	g Roots (C3 Soils (C6)	Secondary Surface Drainag Dry-See Crayfisl Saturat Stunted Geomo FAC-Ne	Indicators (minimum of two required soil Cracks (B6) ge Patterns (B10) gason Water Table (C2) gen Burrows (C8) gen Visible on Aerial Imagery (C9) grows or Stressed Plants (D1) grows (D2) gentral Test (D5)
rimary Indicators (minimum Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Ae Sparsely Vegetated Cone and Observations: Inface Water Present? Inturation	tors: n of one is required erial Imagery (B7) ncave Surface (B8)  Yes No Yes No	Echeck all that apply Water-Staine Aquatic Faun True Aquatic Hydrogen Sul Oxidized Rhiz Presence of F Recent Iron R Thin Muck Su Gauge or Wel Other (Explain Depth (inche Depth (inche	d Leaves a (B13) Plants (B1 fide Odor cospheres Reduced In Reduction i rface (C7) II Data (D8 n in Rema s): s): tos, previo	(B9)  14)  (C1)  s on Living ron (C4)  in Tilled s  ()  9)  arks)	g Roots (C3 Soils (C6)	Secondary Surface Drainag Dry-Se: Crayfisl Saturat Stunted Geomo FAC-Ne	Indicators (minimum of two required soil Cracks (B6) ge Patterns (B10) gason Water Table (C2) gen Burrows (C8) gen Visible on Aerial Imagery (C9) grows or Stressed Plants (D1) grows (D2) gentral Test (D5)
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# Appendix D Ohio EPA ORAM Data Forms

category 1

wetland HS-MA

Site: 302899 Hardin Solar II	Rater(s): MMM	SUB	Date: 5/22/18
Site. JOR 8-1-1 Flavia WI Skyat 11.			
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.	Oha) (5 pts)		
10 to <25 acres (4 to <10.1 ha			
3 to <10 acres (1.2 to <4ha) ( 0.3 to <3 acres (0.12 to <1.2h			
0.3 to <3 acres (0.12 to <1.21 oc. 12			
<0.1 acres (0.04ha) (0 pts)			
\	uffers and si	irrounding la	nd use.
max 14 pts. subtotal 2a. Calculate average buffer width. Se			
WIDE. Buffers average 50m	(164ft) or more around wetla	nd perimeter (7)	•
MEDIUM. Buffers average 28 NARROW. Buffers average	0m to <25m (32ft to <82ft):	around wetland perimeter (1	1)
VERY NARROW. Buffers av	erage <10m (<32ft) around v	vetland perimeter (0)	
2b. Intensity of surrounding land use.  VERY LOW. 2nd growth or o	Select one or double check Ider forest, prairie, savannal	and average. n, wildlife area, etc. (7)	
LOW, Old field (>10 years), s	hrubland, young second gro	wth forest (5)	allow field (3)
MODERATELY HIGH. Resid	pasture row cropping, min	ing, construction. (1)	morr nois. (o)
1 5 Metric 2 Hydrolos			
Metric 3. Hydrolog max 30 pts. subtotal 3a. Sources of Water. Score all that ap		3b. Connectivity. Scor	e all that apply.
max 30°pts. subtotal 3a. Sources of Water. Score all that all High pH groundwater (5)	ppry.	100 year flood	dplain (1)
Other groundwater (3) Precipitation (1)	(0		am/lake and other human use (1) nd/upiand (e.g. forest), complex (1)
Seasonal/Intermittent surface			n or upland corridor (1) n/saturation. Score one or dbl check.
Perennial surface water (lake 3c. Maximum water depth. Select only		· <u> · · ·</u> ·	nanently inundated/saturated (4)
>0.7 (27.6in) (3)	,	Regularly inur	ndated/saturated (3)
0.4 to 0.7m (15.7 to 27.6in) (2 <0.4m (<15.7in) (1)		Seasonally sa	aturated in upper 30cm (12in) (1)
3e. Modifications to natural hydrologic			
None or none apparent (12) Recovered (7)	Check all disturbances ob- ditch		(nonstormwater)
( I ) Recovering (3)	tile	filling/grading	ll l
Recent or no recovery (1)	dike weîr	road bed/RR i	liack
	stormwater input	other	
<u>3   7  </u> Metric 4. Habitat A			it.
max 20 pts. subtotal 4a. Substrate disturbance. Score one	or double check and average	<b>e</b> .	
Recovered (3)			2
Recovering (2) Recent or no recovery (1)			
4b. Habitat development. Select only of	опе and assign score.		
Excellent (7) Very good (6)			
Good (5)	,	11	
Moderately good (4) Fair (3)	÷		
Poor to fair (2) Poor (1)			
4c. Habitat alteration. Score one or do	uble check and average.		
None or none apparent (9)	Check all disturbances of		a romaval
Recovered (6) Recovering (3)	mowing grazing	shrub/sapling herbaceous/a	aquatic bed removal
Recent or no recovery (1)	clearcutting	sedimentatio dredging	n .
5	selective cutting woody debris remov	al <b>S</b> farming	
	toxic pollutants	nutrient enric	:hment
subtotal this page	<u> </u>		<del></del>

ORAM v. 5.0 Field Form Quantitative Rating

Wetland HS-MA

Metric 5. Special Wetlands.  Metric 5. Special Wetlands.  Special Wetlands.  Metric 5. Special Wetlands.  Special Growth forest (10)  Maker forested wetland (6)  Lake Eric coestatifribulary wetland-verstricted hydrology (10)  Relick Wet Preilres (10)  Nonen cocurrence state/fedural trinsatened or endangared species (10)  Significant migratory somphict/water fowl habitat or usage (10)  Category 1 Wetland. See Question 1 Qualifizative Raking (10)  Category 1 Wetlands.  Socre all present using 0 to 3 scale.  Aquatic bed  Aquatic	Site:	302	899	Rater(s): MMM	SKB	Date: 5/22/18
Metric 5. Special Wetlands.  Check all that apply and score as indicated.  Bog (10)  Old growth forest (10)  Itake Eric cosstal/firbulary wetland-urrestricted hydrology (10)  Lake Eric cosstal/firbulary wetland-developed (5)  Lake Eric cosstal/firbulary wetland-developed (5)  Lake Eric cosstal/firbulary wetland-restricted hydrology (5)  Lake Primes (10)  Relict Wet Primes (10)  Renow no cocurrence state/federal triveterend or endangered species (10)  Significant migratory songhird/water frow habitar or usage (10)  Category 1 Wetland. See Question 1 Qualiflat/wetlands (10)  Sea. Wetland Vegetation Communities, interspersion, microtopography.  Wetland Vegetation Communities, interspersion, microtopography.  Vegetation community cover scale  O Absent or comprises small part of wetland's vegetation and is of moderate part of wetland's veg		8		•		
The composition of the compositi		1	Metric 5 Special M	Vetlands	•	
Bog (10) Fen (10) Old growth forest (13) Mature forested wetland (5) Lake Erie coastal/tributary wetland-unrestricted hydrology (10) Lake Diain Coastal/tributary wetland-restricted hydrology (5) Relict Wet Prairies (10) Known occurrence state/federal threatened or endengered species (10) Significant migratory songbird/water fowl habitat or usage (10) Category 1 Wetland. See Question 1 Qualifative Rating (-10)  Wetric 6. Plant communities, interspersion, microtopography.  Vegetation Community Cover Scale Score all present using 0 to 3 scale.  Aquatic bad 7 Emergent Shrub Forest Mudditats Open water Other O	<u> </u>					
Lake Eric coastal/fributary wetland-unrestricted hydrology (10) Lake Fine coastal/fributary wetland-restricted hydrology (5) Lake Plain Sand Prairies (040 Openings) (10) Relict Wet Praires (10) Reli	max 10 pts.	subtotal	Bog (10) Fen (10) Old growth forest (10)			
Rnown 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)   Metric 6. Plant communities, interspersion, microfopography.   Ga. Wetland Vegetation Communities.   Score all present using 0 to 3 scale.	0		Lake Erie coastal/tributary wetl Lake Erie coastal/tributary wetl Lake Plain Sand Prairies (Oak	land-restricted hydrology (5)		
Vegetation Community Cover Scale  Aquatic bed Aguatic bed Communities.  Score all present using 0 to 3 scale.  Aquatic bed Community Cover Scale  Aquatic bed Community Cover Scale  Aquatic bed Coverage of India (1) to 3 scale.  Aquatic bed Coverage of Invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage  Extensive >75% cover (-1)  Nearly Absent < 5% cover (-1)  Absent or comprises <0.1 ha (0.2471 acres)  O Absent or comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality  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  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  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  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 or comprises a small part and is of high quality or comprises a small part and is of moderate quality or comprises as mall part and is of high quality or comprises as mall part and is of high quality.  Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises as mall part and is of high quality.  Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises as mall part and is of high quality.  Present and either comprises significant part of wetland's vegetation and is of high quality.  Present and either comprises significant part of wetland's vegetation and is of high quality.  Present and either comprises as mall part of wetland's vegetation and is of high quality.			Known occurrence state/federa Significant migratory songbird/	water fowl habitat or usage (	(10)	
Score all present using 0 to 3 scale.  Aquatic bed Temergint Shrub Forest Mudritats Open water Other O	1	9 1	Metric 6. Plant con			crotopography.
Aquatic bed    Aquatic bed   Fersert and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality   Forest   Shrub   Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality   Other   3   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	max 20 pts.					(0.2474 pares) configurate area
Vegetation and is of moderate quality, or comprises a significant part but is of low quality		8				
Shrub   Forest   Shrub   Forest   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   Other			<del> </del>	•		
Forest Mudflats Open water Other Other 3 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 Present and comprises significant part, or more, of wetland's vegetation and is of high quality Present and comprises significant part, or more, of wetland's vegetation and is of high quality  Negretation and is of high quality Present and comprises significant part, or more, of wetland's vegetation and is of high quality  Negretation and is of moderate part and is of high quality  Negretation and is of moderate part and is of high quality Present and comprises significant part, or more, of wetland's vegetation and is of high quality  Narrative Description of Vegetation Quality  Iow Low spp diversity and/or predominance of nonnative or disturbance tolerant native species  (isturbance tolerant native species  moderately high, but generallywlo presence of rare threatened or endangered spp  A predominance of native species, with nonnative spp and/or disturbance tolerant native spp and/or disturbance tolerant nati		_		· ·		
Mudflats Open water Other 3 Present and is of high quality Open water Other 3 Present and comprises significant part, or more, of wetland's vegetation and is of high quality Negetation and is of high quality  Negetation and is of high quality  Negetation and is of high quality  Negetation and is of high quality  Negetation and is of high quality  Negetation and is of high quality  Negetation and is of moderate part in and is of high quality  Negetation and is of high quality  Negetation and is of moderate part in and is of high quality  Negetation and is of moderate part in a los of high quality  Negetation and is of moderate part in a los of high quality  Negetation and is of moderate part in a los of high quality  Negetation and is of high quality  Narrative Description of Vegetation Quality  Narrative Descr			<b>—</b>	2		
Other 3 Present and comprises significant part, or more, of wetland's vegetation and is of high quality  Select only one. High (5) Moderately high(4) Low sp diversity and/or predominance of nonnative or disturbance tolerant native species  Moderately low (2) Low (1) Low (1) Low (1) Low (1) Low (1) Low (2) Low (2) Low (3) Low (4) Low (5) Low (1) Low (1) Low (1) Low (1) Low (1) Low (2) Low (3) Low (4) Low (5) Low (5) Low (6) Low (7) Low (1) Low						
Select only one.  High (5) Moderately high(4) 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 (-5) Moderate 25-75% cover (-1) Nearly absent <5% cover (0) Absent (1)  6d. Microtopography. Score all present using 0 to 3 scale.  Vegetated hummucks/tussucks  Vegetated nummucks/tussucks  Vegetated nummucks/tussucks  Vegetated nummucks/tussucks  Vegetated nummucks/tussucks  Vegetated nummucks/tussucks  Vegetated nummucks/tussucks  Vegetated numnucks/tussucks  Vegetated numatic of vegetation Quality  Low Sprederint native spoecies with nonnative or disturbance tolerant native spoecies, with nonn	-		<b>—</b>			
Select only one.  High (5)  Moderately high(4)  Moderatel (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.  Description of Vegetation Quality  Low spp diversity and/or predominance of nonnative or disturbance tolerant native spe adminant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generallyw/o presence of rare threatened or endangered spp  A predominance of native species, with nonnative spp and/or disturbance tolerant native sp		6	Other	3	1	
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) Absent (1)  6d. Microtopography.  6d						
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 (-1) Nearly absent <5% cover (0) Nearly absent <5% cover (0) Score all present using 0 to 3 scale.  Description  Moderate (3)  Moderate (3)  Moderate (3)  Moderate (3)  Moderate (3)  Moderate (3)  Moderately low (2)  Low (1)  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 generallyw/o presence of rare threatened or endangered spp  A predominance of native species, with nonnative spp and/or disturbance of native species of native species diversity moderate to moderately high, but generallyw/or presence of rare threatened or endangered spp and/or disturbance tolerant native spp and/or disturbance tolerant native spp and/or disturbance tolerant native species, with nonnative spp and/or disturbance of native species, with nonnative spp and/or disturbance of native species, with nonnative spp and/or disturbance of native species, with nonnative species, with nonn			High (5)	Narrative Description	n of Vegetation Quality	
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 (-1) Nearly absent <5% cover (0) Absent (1) 6d. Microtopography. Score all present using 0 to 3 scale.    Wegetated hummucks/tussucks   D			<b>—</b>	low		
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.  Vegetated hummucks/tussucks O Coarse woody debris >15cm (6in) Standing dead >25cm (10in) dbh  aithough nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generallyw/o presence of rare threatened or endangered spp  A predominance of native species, with nonnative spp and/or disturbance tolerant native spp and/or disturbance tolerant native spp and/or disturbance of rare threatened or endangered spp  A predominance of native species, with nonnative spp and/or disturbance tolerant native spp and/or disturbance of native species, with nonnative spp and/or disturbance of native species.			\ <del> </del>			
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.    D   O	•	( )	, <del></del>	mod		
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.    Description of the points of the process of th			/ <del>  </del>			
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.  Vegetated hummucks/tussucks Ocarse woody debris >15cm (6in)  Standing dead >25cm (10in) dbh  threatened or endangered spp  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) Low 0.1 to <1ha (0.247 acres)  Wegetated hummucks/tussucks 1 Low 0.1 to <1ha (0.247 to 2.47 acres) Wegetated hummucks/tussucks 1 High 4ha (9.88 acres) or more		_				
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)  Mudflat and Open Water Class Quality  6d. Microtopography.  Score all present using 0 to 3 scale.  Vegetated hummucks/tussucks  Coarse woody debris >15cm (6in)  Standing dead >25cm (10in) dbh  Nigh  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	7	a a				
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.  Vegetated hummucks/tussucks  Coarse woody debris >15cm (6in)  Standing dead >25cm (10in) dbh  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)  Wegetated hummucks/tussucks  2 Moderate 1 to <4ha (2.47 to 9.88 acres)  High 4ha (9.88 acres) or more			<del>-</del>	high	A predominance of native so	necies, with nonnative spo
Moderate 25-75% cover (-3) Sparse 5-25% cover (-1) Nearly absent <5% cover (0) Absent (1) Microtopography. Score all present using 0 to 3 scale.  Vegetated hummucks/tussucks Coarse woody debris >15cm (6in) Standing dead >25cm (10in) dbh  Absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp  Mudflat and Open Water Class Quality  Absent <0.1ha (0.247 acres)  Low 0.1 to <1ha (0.247 to 2.47 acres)  Moderate 1 to <4ha (2.47 to 9.88 acres)  High 4ha (9.88 acres) or more			· · · · · · · · · · · · · · · · · · ·	High		
Sparse 5-25% cover (-1)  Nearly absent <5% cover (0) Absent (1)  Mudflat and Open Water Class Quality  6d. Microtopography.  Score all present using 0 to 3 scale.  Vegetated hummucks/tussucks Coarse woody debris >15cm (6in)  Standing dead >25cm (10in) dbh  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)  Moderate 1 to <4ha (2.47 to 9.88 acres)  High 4ha (9.88 acres) or more			}			
Nearly absent <5% cover (0) Absent (1)  Mudflat and Open Water Class Quality  6d. Microtopography.  Score all present using 0 to 3 scale.  Vegetated hummucks/tussucks Coarse woody debris >15cm (6in)  Standing dead >25cm (10in) dbh  Mudflat and Open Water Class Quality  0 Absent <0.1ha (0.247 acres)  Low 0.1 to <1ha (0.247 to 2.47 acres)  Moderate 1 to <4ha (2.47 to 9.88 acres)  High 4ha (9.88 acres) or more		(=	· <del></del> 1			
Absent (1)  6d. Microtopography.  Score all present using 0 to 3 scale.  5 Vegetated hummucks/tussucks  Coarse woody debris >15cm (6in)  Standing dead >25cm (10in) dbh  Mudflat and Open Water Class Quality  0 Absent <0.1ha (0.247 acres)  Low 0.1 to <1ha (0.247 to 2.47 acres)  Moderate 1 to <4ha (2.47 to 9.88 acres)  High 4ha (9.88 acres) or more		(0	/ <del>]</del>			
6d. Microtopography.  Score all present using 0 to 3 scale.  D Vegetated hummucks/tussucks  Coarse woody debris >15cm (6in)  Standing dead >25cm (10in) dbh			<del></del>	Mudflat and Open W	later Class Quality	
Score all present using 0 to 3 scale.  Description:    Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh      Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh     Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm (10in) dbh     Description:   Coarse woody debris >15cm (6in)   Standing dead >25cm		. 6	<b>—</b>			s)
Coarse woody debris >15cm (6in) 3 High 4ha (9.88 acres) or more  Standing dead >25cm (10in) dbh		, E	Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.	47 acres)
Standing dead >25cm (10in) dbh			Vegetated hummucks/tussucks	s <u>2</u>	Moderate 1 to <4ha (2.47 to	9.88 acres)
			<del></del>		High 4ha (9.88 acres) or mo	ire
Amphibian breeding pools Microtopography Cover Scale		(0	Standing dead >25cm (10in) dl Amphibian breeding pools		over Scale	·
0 Absent					Absent	
1 Present very small amounts or if more common of marginal quality				1	of marginal quality	
Present in moderate amounts, but not of highest quality or in small amounts of highest quality				2	Present in moderate amoun	its, but not of highest s of highest quality
3 Present in moderate or greater amounts				3		
and of highest quality		_			and of highest quality	· · · · · · · · · · · · · · · · · · ·

GRAND TOTAL(max 100 pts)

Modufred Cat, 2.
ORAM v. 5.0 Field Form Quantitative Rating

Wetland HS-MB

Site: 302899 Hardin Sol	ar II Rater(s):MM	M. SKB	Date:5/22/18
	etland Area (size)	. Circle:	PEM PSS (PFO) plated Adjacent Abutting off-site: NO
max 6 pts. subtotal Select one size class and >50 acres (>20.		Circle: (Is	polated rojumi
25 to <50 acres	(10.1 to <20.2ha) (5 pts) (4 to <10.1ha) (4 pts)		Abutting
3 to <10 acres (	1.2 to <4ha) (3 pts)		accide: NO
0.1 to <0.3 acre	(0.12 to <1.2ha) (2pts) s (0.04 to <0.12ha) (1 pt)	Continues	3000
<0.1 acres (0.04	ha) (0 pts)	: .	# of flags: 20
	land buffers and		
max 14 pls. subtotal 2a. Calculate average but	fer width. Select only one and assig average 50m (164ft) or more around	л score. Do not double check wetland perimeter (7)	VV
MEDIUM, Buffe	rs average 25m to <50m (82 to <164 ers average 10m to <25m (32ft to <6	ft) around wetland perimeter (4)	$\sim -+$ $\sim$
VERY NARROV	<ol> <li>Buffers average &lt;10m (&lt;32ft) around</li> </ol>	und wetland perimeter (0)	·
VERY LOW. 2n	g land use. Select one or double ch d growth or older forest, prairie, sava	nnah, wildlife area, etc. (7)	
(3) MODERATELY	>10 years), shrubland, young secon HIGH. Residential, fenced pasture, p	oark, conservation tillage, new f	allow field. (3)
HIGH. Urban, ir	dustrial, open pasture, row cropping	, mining, construction. (1)	
9   8   Metric 3. Hy	drology.		
max 30 pts. subtotal 3a. Sources of Water, So		3b. Connectivity. Sco 100 year floo	dplain (1)
Other groundwai		Between stre	am/lake and other human use (1) nd/upland (e.g. forest), complex (1)
Seasonal/Interm	ittent surface water (3) e water (lake or stream) (5)	Part of riparia	n or upland corridor (1) n/saturation. Score one or dbl check.
3c. Maximum water depth	Select only one and assign score.	Semi- to perm	nanently inundated/saturated (4) ndated/saturated (3)
>0.7 (27.6in) (3) 0.4 to 0.7m (15.7		Seasonally in	undated (2)
~0.4ft (<15.7ft)	(1) il hydrologic <u>regime. Score one or d</u>		aturated in upper 30cm (12in) (1)
None or none ap	parent (12) Check all disturbance		(nonstormwater)
Recovering (3)	tile	filling/grading	
Recent or no rec	overy (1) dike weir	road bed/RR dredging	track.
	stormwater inpu	other	
C/ D G Matric 1 Ha	bitat Alteration a	nd Develonme	nt
1	Score one or double check and ave		(6)
None or none ap Recovered (3)	parent (4)		
Recovering (2) Recent or no rec	overy (1)		÷
4b. Habitat development.	Select only one and assign score.		
Excellent (7) Very good (6)			
Good (5)  Moderately good	<b>(4)</b>		
Fair (3) Poor to fair (2)			
Poor (1) 4c. Habitat alteration. So	ore one or double check and average	<u>.</u>	
None or none ap	parent (9) Check all disturbance	es observed	- son dual
Recovered (6) Recovering (3)	mowing grazing	<b>`</b>	aquatic bed removal
Recent or no rec	covery (1) clearcutting selective cutting	sedimentation dredging	n 🍴
26	woody debris re toxic pollutants	Prince Pr	chment
subtotal this page	Lovid postatel 10		

ORAM v. 5.0 Field Form Quantitative Rating	<b>V</b> V	Q (   Dak	The state of the s
Site: 302899	Rater(s): MMA	1,5KB	Date: 5/22/18
	<del>ng Persentan di Jerondon di Kalendaria.</del> Manggaran	<b>(a)</b>	
00			
$\angle O$			
sublotal this page			
O OMetric 5. Special \	Wetlands.		
max 10 pts. subtotal Check all that apply and score as indica			
Bog (10)			
Fen (10)			
Old growth forest (10)			
Mature forested wetland (5)	No. 4 Garage and the dealers of	10)	$C = \frac{1}{2}$
Lake Erie coastal/tributary we	etland-unrestricted hydrology (	(0)	
Lake Plain Sand Prairies (Oa	the state of the s		
Relict Wet Praires (10)	ik openinge/ (.e/		
	ral threatened or endangered	species (10)	
Significant migratory songbird	l/water fowl habitat or usage (	10)	
Category 1 Wetland. See Qu	estioπ 1 Qualitative Rating (-1	0)	
11 25			
3 <del>.7</del>   Metric 6. Plant coi	mmunities, int	erspersion, i	microtopography.
mex 20 pts. subtotal 6a. Wetland Vegetation Communities.	Vegetation Communi	ty Cover Scale	
Score all present using 0 to 3 scale.	0		.1ha (0.2471 acres) contiguous area
Aquatic bed	1		orises small part of wetland's oderate quality, or comprises a
D Emergent		significant part but is	
Shrub	2	Present and either com	orises significant part of wetland's
A Forest Mudflats	2	vegetation and is of m	oderate quality or comprises a small
Open water	$\mathcal{L} = \frac{1}{2} \left( \frac{1}{2} - \frac{1}{2} \right) = \frac{1}{2} \left( \frac{1}{2} - \frac{1}{2} - \frac{1}{2} \right) = \frac{1}{2} \left( \frac{1}{2} - \frac{1}{2} - \frac{1}{2} - \frac{1}{2} \right) = \frac{1}{2} \left( \frac{1}{2} - $	part and is of high qua	
Other	3		significant part, or more, of wetland's
6b. horizontal (plan view) Interspersion		vegetation and is of hi	gh quality
Select only one.			
High (5)	Narrative Description	of Vegetation Quality	
Moderately high(4)	low		r predominance of nonnative or
Moderate (3)		disturbance tolerant n	t component of the vegetation,
Moderately low (2)	mod	although nonnative ar	d/or disturbance tolerant native spp
Low (1) None (0)		can also be present a	and species diversity moderate to
6c. Coverage of invasive plants. Refer			generallyw/o presence of rare
to Table 1 ORAM long form for list. Add		threatened or endang	ered spp
or deduct points for coverage	high	A predominance of nati	ve species, with nonnative spp
Extensive >75% cover (-5)			erant native spp absent or virtually
Moderate 25-75% cover (-3)		absent, and high spp	diversity and often, but not always,
( -   ) Sparse 5-25% cover (-1)		the presence of rare,	threatened, or endangered spp
Nearly absent <5% cover (0)	Mudflat and Open Wa	ator Class Ouglity	
Absent (1) 6d. Microtopography.	0	Absent <0.1ha (0.247	acres)
Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247	
Vegetated hummucks/tussuck	cs 2	Moderate 1 to <4ha (2.	
Coarse woody debris >15cm		High 4ha (9.88 acres) c	r more
Standing dead >25cm (10in) of			
Amphibian breeding pools	Microtopography Co		<u></u>
	0	Absent	vieto or if more common
	1		ounts or if more common
		of marginal quality	nounts, but not of highest
	2		ounts of highest quality
	3	Present in moderate or	
	·	and of highest quality	

37 GRAND TOTAL (max 100 pts)

Site: 302899 Hav	rdin Solar II	Rater(s):		Date:
	ic 1. Wetland A	Area (size).		
max 6 pts. sublotal Select one	e size class and assign score. >50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20.2h 10 to <25 acres (4 to <10.1ha) 3 to <10 acres (1.2 to <4ha) (3 0.3 to <3 acres (0.12 to <1.2ha) 0.1 to <0.3 acres (0.04 to <0.12 <0.1 acres (0.04ha) (0 pts)	na) (5 pts) (4 pts) pts) (2pts)		
5 7 Metr	ic 2. Upland bu	uffers and surrou	unding land us	se.
max 14 pts. subtotat 2a. Calcu	late average buffer width. Sele WIDE. Buffers average 50m (1 MEDIUM. Buffers average 25m NARROW. Buffers average 10 VERY NARROW. Buffers average 10 VERY LOW. 2nd growth or old LOW. Old field (>10 years), shu MODERATELY HIGH. Resider	ct only one and assign score. Do not fett) or more around wetland pering to <50m (82 to <164ft) around we ment to <25m (32ft to <82ft) around we age <10m (<32ft) around wetland pelect one or double check and average forest, prairie, savannah, wildlife rubland, young second growth forestal, fenced pasture, park, conservasture, fow cropping, mining, conservature.	not double check. neter (7) tland perimeter (4) vetland perimeter (1) perimeter (0) rage. area, etc. (7) st. (5) ation tillage, new fallow field. (	
	ic 3. Hydrolog		Ownership Cours all that a	nnlu
3c. Maxin	es of Water. Score all that app High pH groundwater (5) Other groundwater (3) Precipitation (1) Seasonal/Intermittent surface w Perennial surface water (lake on num water depth. Select only o >0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) (2) <0.4m (<15.7in) (1) ications to natural hydrologic re	rater (3) r stream) (5) 3d.	Connectivity. Score all that ap 100 year floodplain (1) Between stream/lake and Part of wetland/upland (e) Part of riparian or upland Duration inundation/saturation Semi- to permanently int Regularly inundated/saturated in the seminary saturated in the seminary approach in the seminary saturated in the	d other human use (1) e.g. forest), complex (1) d corridor (1) n. Score one or dbl check. undated/saturated (4) urated (3) )
(12)	None or none apparent (12) Recovered (7) Recovering (3) Recent or no recovery (1)	Check all disturbances observed ditch tile dike weir stormwater input	point source (nonstormw filling/grading road bed/RR track dredging other_	/ater)
14 39 Metric 4. Habitat Alteration and Development.				
4b. Habit	trate disturbance. Score one or None or none apparent (4) Recovered (3) Recovering (2) Recent or no recovery (1) at development. Select only on Excellent (7) Very good (6) Good (5) Moderately good (4) Fair (3) Poor to fair (2) Poor (1) at alteration. Score one or dou	e and assign score.		
39 subtotal this page	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 sedimentation dredging farming nutrient enrichment	i removal

letland HS-MC ORAM v. 5.0 Field Form Quantitative Rating Rater(s): MMM.5K 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 Praires (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) Metric 6. Plant communities, interspersion, microtopography. 6a. Wetland Vegetation Communities. Score all present using 0 to 3 scale.

	Aquatic bed	_
	Emergent	
	Shrub	
3)	Forest	10
	Mudflats	
	Open water	
	Other	_
6b. i	horizontal (plan view) Interspersio	on
0-1-		

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.

O Vegetated hummucks/tussucks Coarse woody debris >15cm (6in) Standing dead >25cm (10in) dbh Amphibian breeding pools

Vege	tation Comm	nunity 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					
, A	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 spp diversity and/or predominance of nonnative or low disturbance tolerant native species Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generallyw/o presence of rare threatened or endangered spp A predominance of native species, with nonnative spp high 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 Absent <0.1ha (0.247 acres) Low 0.1 to <1ha (0.247 to 2.47 acres) Moderate 1 to <4ha (2.47 to 9.88 acres) High 4ha (9.88 acres) or more

Microtopography Cover Scale 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



Wetland HS-MD

Site: 302899 Hardin Sofar II Rater(s): MMM. SKB	Date: 9/22/
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)	
<ul><li></li></ul>	
7 Q Matric 2 Unland buffers and currounding land us	Δ.
Metric 2. Upland buffers and surrounding land us  max 14 pts. subtotal 2a. Calculate average buffer width. Select only one and assign score. Do not double check.	<b>C.</b>
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), shrubland, young second growth forest. (5)	11
MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3 HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)	
C IC Matria 2 Hydrology	
Metric 3. Hydrology.  max 30 pts. subtotal 3a. Sources of Water. Score all that apply.  3b. Connectivity. Score all that apply.	ply.
High pH groundwater (5)	
Other groundwater (3)  Precipitation (1)  Between stream/lake and 'Part of wetland/upland (e.	
Seasonal/Intermittent surface water (3) Part of riparian or upland Perennial surface water (lake or stream) (5) 3d. Duration inundation/saturation.	
3c. Maximum water depth. Select only one and assign score. Semi-to permanently inut	ndated/saturated (4)
>0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) (2) Regularly inundated/satur	ated (3)
<0.4m (<15.7in) (1) Seasonally saturated in u	per 30cm (12in) (1)
3e. Modifications to natural hydrologic regime. Score one or double check and average.  None or none apparent (12)  Check all disturbances observed	
Recovered (7) Aditch point source (nonstormwa	ter)
Recovering (3)  Recent or no recovery (1)  Recent or no recovery (1)  Recent or no recovery (1)	
weirdredging	
stormwater input otherother	
9 25 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) Check all disturbances observed	
Recovered (6) mowing shrub/sapling removal herbaceous/aquatic bed	removal
Recent or no recovery (1)   Clearcutting   sedimentation	
selective cutting dredging woody debris removal farming	
toxic pollutants nutrient enrichment	
subtotal this page	

3

Present in moderate or greater amounts

and of highest quality

HS-MQ MS.

Site: +	ardin	Solar	II	Rater(s):	MMM	SKB	Date: 6	113/15
	a M	letric 1.	Wetland A	Area (si	ze).			
max 6 pts.	<del></del>	>50 acres 25 to <50 10 to <25 3 to <10 a 0.3 to <3 0.1 to <0	ss and assign score. s (>20.2ha) (6 pts) acres (10.1 to <20.2 acres (4 to <10.1ha) acres (1.2 to <4ha) (3 acres (0.12 to <1.2ha 3 acres (0.04 to <0.1 s (0.04ha) (0 pts)	ha) (5 pts) (4 pts) i pts) a) (2pts)		• • • • • • • • • • • • • • • • • • •		
	3 1	letric 2.	Upland b	uffers a	nd surro	ounding land	i use.	
max 14 pts.	subtotal 2a	Calculate aver WIDE. B MEDIUM NARRON VERY NA Intensity of sur VERY LO LOW. O MODERA	age buffer width. Sel uffers average 50m ( . Buffers average 25 V. Buffers average 1 ARROW. Buffers aver rounding land use. 50 DW. 2nd growth or old Id field (>10 years), s	ect only one and 164ft) or more at m to <50m (82 to 0m to <25m (32 to prage <10m (<32 Select one or do der forest, prairie hrubland, young ential, fenced par	assign score. Do cound wetland per color (164ft) around vetland it of the color (164ft) around wetland as color (164ft) around wetland as color (164ft) around wetland as color (164ft) around a color (164f	o not double check. rimeter (7) vetland perimeter (4) I wetland perimeter (1) I perimeter (0) verage. Ife area, etc. (7) rest. (5) veryation tillage, new fallow		,
6	9 1	 letric 3.	Hydrolog	ıy.				
mex 30 pts.	subtotel 3a	Sources of Wallingh pH Other grundle Seasona Perennia Maximum water >0.7 (27	ater. Score all that ap groundwater (5) bundwater (3) tion (1) I/Intermittent surface Il surface water (lake er depth. Select only	water (3) or stream) (5) one and assign	30	Part of riparian or  Duration inundation/sat Semi- to permane Regularly inundat Seasonally inundat	in (1) ake and other hum- bland (e.g. forest), o upland corridor (1) turation. Score one ently inundated/satu ed/saturated (3) ated (2)	complex (1) ) e or dbl check. urated (4)
	36	<0.4m ( <li>Modifications</li>	:15.7in) (1) to natural hydrologic	regime. Score o	ne or double chec		ated in upper 30cm	(12in) (1)
Na .	(1	Recover Recover	1.1	Check all distuditch tile dike weir stormwat	rbances observed	point source (non filling/grading road bed/RR traced dredging other		
3	12	Netric 4.	Habitat A	 Alteratio	n and De	evelopment.		
max 20 pts.	subtotal 48	a. Substrate dist None or Recovel Recovel Recent Recent Description Recovel Recent Recovel Recent Recovel Recent Recovel Recent Recovel Recove	urbance. Score one none apparent (4) ed (3) ing (2) or no recovery (1) opment. Select only of (7) od (6) ) ely good (4)	or double check one and assign s	and average.			
	Subtotal this page	None of Recove	none apparent (9) red (6)	Check all distribution of the common of the	urbances observering cutting birs removal	shrub/sapling rer herbaceous/aqua sedimentation dredging farming nutrient enrichme	atic bed removal	

Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

Vegetated hummucks/tussucks Coarse woody debris >15cm (6in) Standing dead >25cm (10in) dbh Amphibian breeding pools

Mudflat and Open Water Class Quality Absent < 0.1ha (0.247 acres) Low 0.1 to <1ha (0.247 to 2.47 acres) Moderate 1 to <4ha (2.47 to 9.88 acres) 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



wetland \_\_\_

Site: 3	3028	99 Hardin Solar II Rater(s): JAV	IN TR	Date:
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)	Circle:	Date:  PEM PSS PFO  Isolated Adjacent  Abutting  es off-site:
		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)	Continu	es off-site:
7	15	Metric 2. Upland buffers and s	urrounding	land use.
max 14 pts.	subtotal	2a. Calculate average buffer width. Select only one and assign so WIDE. Buffers average 50m (164ft) or more around weth MEDIUM. Buffers average 25m to <50m (82 to <164ft) and NARROW. Buffers average 10m to <25m (32ft to <82ft) VERY NARROW. Buffers average <10m (<32ft) around 2b. Intensity of surrounding land use. Select one or double check VERY LOW. 2nd growth or older forest, prairie, savanna LOW. Old field (>10 years), shrubland, young second growth or older forest, prairie, savanna LOW. Old field (>10 years), shrubland, young second growth	and perimeter (7)  fround wetland perimeter around wetland perime wetland perimeter (0) and average.  h, wildlife area, etc. (7) owth forest. (5) , conservation tillage, ne	er (4) eter (1)
17	14	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 doubled the properties of the pr	100 year Between Part of we Part of rip 3d. Duration inund Semi- to p Regularly Seasonal Seasonal seasonal e check and average.  point sour filling/grad	Score all that apply. floodplain (1) stream/lake and other human use (1) etland/upland (e.g. forest), complex (1) parian or upland corridor (1) lation/saturation. Score one or dbl check. permanently inundated/saturated (4) inundated/saturated (3) ly inundated (2) ly saturated in upper 30cm (12in) (1)  roce (nonstormwater) ding IRR track
7.5	716	weir stormwater input	dredging √ other / ·	Her Forming
max 20 pts.	subtotal	Metric 4. Habitat Alteration and  4a. Substrate disturbance. Score one or double check and average		ent.
		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.		
	JI.5	None or none apparent (9) Recovered (6) Recovering (3) Recent or no recovery (1)  Check all disturbances of mowing grazing clearcutting selective cutting woody debris remove toxic pollutants	shrub/sap herbaced sediment dredging al	10 TO

Site: 302 80	na Hardin Solar II R	ater(s): Thu	LM TR	Date: 5/20/26/5
subtotal th	5 is page			
0 11	S Marking Consideration	Handa		
8-1-	Metric 5. Special We	tianus.		
max 10 pts. subto				
	Bog (10)			
	Fen (10) Old growth forest (10)			
	Mature forested wetland (5)			
	Lake Erie coastal/tributary wetland	-unrestricted hydrolog	y (10)	
	Lake Erie coastal/tributary wetland	-restricted hydrology	(5)	
	Lake Plain Sand Prairies (Oak Ope	enings) (10)		
	Relict Wet Praires (10)	toward or andonger	ad enociae (10)	
	Known occurrence state/federal the Significant migratory songbird/water	eatened or endanger	e (10)	
	Category 1 Wetland. See Question	n 1 Qualitative Rating	(-10)	
3 124.	Metric 6. Plant comn	nunities, ir	terspersion, m	nicrotopography.
	- 11.11 11.1 1 0	Vegetation Comm	unity Cover Scale	
max 20 pts. subto	Score all present using 0 to 3 scale.	0	Absent or comprises < 0.1	ha (0.2471 acres) contiguous area
	Aquatic bed	1	Present and either compri	ses small part of wetland's
	Emergent		vegetation and is of mod	derate quality, or comprises a
	Shrub		significant part but is of	
	Forest	2	Present and either compri	ses significant part of wetland's
	Mudflats			derate quality or comprises a small
	Open water		part and is of high qualit	gnificant part, or more, of wetland's
	Other	3	vegetation and is of high	
	6b. horizontal (plan view) Interspersion.	-	vegetation and to or mgr	, quanty
	Select only one. High (5)	Narrative Descript	ion of Vegetation Quality	
	Moderately high(4)	low	Low spp diversity and/or p	oredominance of nonnative or
	Moderate (3)		disturbance tolerant nat	
	→ Moderately low (2)	mod	Native spp are dominant of	component of the vegetation,
	Low (1)		although nonnative and	/or disturbance tolerant native spp
	None (0)			d species diversity moderate to
	6c. Coverage of invasive plants. Refer		threatened or endanger	nerallywlo presence of rare
	to Table 1 ORAM long form for list. Add	high		species, with nonnative spp
	or deduct points for coverage  Extensive >75% cover (-5)	nign	and/or disturbance toler	rant native spp absent or virtually
	Moderate 25-75% cover (-3)		absent, and high spp di	versity and often, but not always,
	Sparse 5-25% cover (-1)			reatened, or endangered spp
	Nearly absent <5% cover (0)	7.1.		
	Absent (1)	Mudflat and Open	Water Class Quality	
	6d. Microtopography.	0	Absent < 0.1ha (0.247 ac	
	Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to	
	Vegetated hummucks/tussucks	2	Moderate 1 to <4ha (2.4	
	Coarse woody debris >15cm (6in)	3	High 4ha (9.88 acres) or	Illoie
	Standing dead >25cm (10in) dbh	Microtopography	Cover Scale	
	Amphibian breeding pools	Microtopography	Absent	
		1	Present very small amou	ints or if more common
			of marginal quality	
		2	Present in moderate amo	ounts, but not of highest
			quality or in small amo	unts of highest quality
		3	Present in moderate or g	reater amounts
			and of highest quality	



Wetland 15-18

Site: 3028	99 Hardin Sovar II Rater(s): TOV LM TR Date: 5/20/2018
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)
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), shrubland, 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)
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)  3d. Duration inundation/saturation. Score one or dbl check.  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)  A secondary stormwater input  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)  Semi-to permanently inundated/saturated (4)  Semi- to permanently inundated/saturated (3)  Seasonally inundated (2)  Seasonally inundated (2)  Seasonally saturated in upper 30cm (12in) (1)  3e. Modifications to natural hydrologic regime. Score one or double check and average.  Check all disturbances observed  ditch  ditch  ditch  filling/grading  road bed/RR track  dredging  other  A storm 4
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) Recovering (2) 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) Recovered (6) Recovering (3) Recent or no recovery (1) Recent or no recovery (1)  Recent or no recovery (1)

Site: 302 84	a Hardin Solar II R	ater(s): TNV	LM, TR	Date: 5/23/2011
30	>			
subtotal th		4landa		
0 10	Metric 5. Special We	tianus.		
max 10 pts. subto				
	Bog (10)			
	Fen (10)			
	Old growth forest (10)  Mature forested wetland (5)			
	Lake Erie coastal/tributary wetland	-unrestricted hydrolog	y (10)	
	Lake Erie coastal/tributary wetland			
	Lake Plain Sand Prairies (Oak Ope	enings) (10)		
	Relict Wet Praires (10)		ACHAGE	
	Known occurrence state/federal thr			
	Significant migratory songbird/water			
	Category 1 Wetland. See Question	n 1 Qualitative Raung	(-10)	
7 3-	Metric 6. Plant comn	nunities in	terenersion n	icrotopography.
/ 1		Martines, II	mits Cover Scale	nor otopograpiny.
max 20 pts. subtot		Vegetation Commo	Absent or comprises <0.1	ha (0.2471 acres) contiguous area
	Score all present using 0 to 3 scale,  Aquatic bed	1		ises small part of wetland's
	1 Emergent			derate quality, or comprises a
	Shrub		significant part but is of	low quality
	Forest	2	Present and either compri	ises significant part of wetland's
	Mudflats		vegetation and is of mo	derate quality or comprises a small
	Open water		part and is of high quali	
	Other	3		gnificant part, or more, of wetland's
	6b. horizontal (plan view) Interspersion.		vegetation and is of high	n quality
	Select only one.		ion of Vagatation Quality	
	High (5)	Narrative Descript	ion of Vegetation Quality	predominance of nonnative or
	Moderately high(4)	low	disturbance tolerant nat	
	Moderate (3)  Moderately low (2)	mod		component of the vegetation,
	Low (1)		although nonnative and	/or disturbance tolerant native spp
	None (0)		can also be present, an	d species diversity moderate to
	6c. Coverage of invasive plants. Refer		moderately high, but ge	nerallywlo presence of rare
	to Table 1 ORAM long form for list. Add		threatened or endanger	
	or deduct points for coverage	high	A predominance of native	species, with nonnative spp
	Extensive >75% cover (-5)			rant native spp absent or virtually versity and often, but not always,
	Moderate 25-75% cover (-3)			reatened, or endangered spp
	Sparse 5-25% cover (-1)		the presence of rare, th	reateried, or oridarigered opp
	Nearly absent <5% cover (0)	Mudflat and Onen	Water Class Quality	
	Absent (1)  6d. Microtopography.	0	Absent <0.1ha (0.247 ac	cres)
	Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to	The state of the s
	Vegetated hummucks/tussucks	2	Moderate 1 to <4ha (2.4)	7 to 9.88 acres)
	Coarse woody debris >15cm (6in)	3	High 4ha (9.88 acres) or	more
	O Standing dead >25cm (10in) dbh		Company of the control of the contro	
	3 Amphibian breeding pools	Microtopography		
		0	Absent	nts or if more common
		1	Present very small amou	ints of it more common
			of marginal quality  Present in moderate amount	ounts but not of highest
		2	quality or in small amo	
		3	Present in moderate or g	
			and of highest quality	
Total Control of the				

wetland HS-VC

Site: 302	899 Hardin Solar II Rater(s): Thu, LM, TR	Date: 5/23/18
2 2	Metric 1. Wetland Area (size). Circle: PEM	PSS PFO
max 6 pts. sub		
9 1		
max 14 pls. sub	Metric 2. Upland buffers and surrounding land us  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), shrubland, 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 2	Metric 3. Hydrology.	
max 30 pts. subt	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)  1 (0.4m (<15.7in) (1)  3e. Modifications to natural hydrologic regime. Score one or double check and average.	other human use (1) g. forest), complex (1) corridor (1) Score one or dbl check. ndated/saturated (4) ated (3)
,	None or none apparent (12) Recovered (7) Recovering (3) Recent or no recovery (1)  Check all disturbances observed ditch  tile dike weir stormwater input  Check all disturbances observed point source (nonstormwater input)	
11,5 34.	Metric 4. Habitat Alteration and Development.	
max 20 pts. subto	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.	
34	None or none apparent (9) Recovered (6) Recovering (3) Recent or no recovery (1)  Check all disturbances observed mowing grazing clearcutting sedimentation dredging woody debris removal toxic pollutants  Check all disturbances observed shrub/sapling removal herbaceous/aquatic bed r sedimentation dredging yoody debris removal nutrient enrichment	emoval

Wetland HS-VC

Site: Jo2 899 Hardin Solar	Ra Ra	ater(s): Inv	LM TR Date: 5/23/1
JY.S subtotal this page			
62 24 2			
0 34.5 Metric 5.	Special We	tlands.	
	and score as indicated.		
Bog (10)			
Fen (10)			
	n forest (10) rested wetland (5)		
	coastal/tributary wetland-	unrestricted hydrolog	v (10)
	coastal/tributary wetland-		
	Sand Prairies (Oak Ope		
Relict Wet	Praires (10)		
Known occ	currence state/federal thre	eatened or endanger	ed species (10)
Significant	migratory songbird/wate	r fowl habitat or usag	e (10)
Category 1	1 Wetland. See Question	1 Qualitative Rating	(-10)
( 11. 5			
6 40.5 Metric 6.	Plant comm	iunities, ir	nterspersion, microtopography
ex 20 pts. subtotal 6a. Wetland Vegeta	tion Communities.	Vegetation Comm	
Score all present usi	. <del> </del>	0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
Aquatic be	d	- 1	Present and either comprises small part of wetland's
Emergent			vegetation and is of moderate quality, or comprises a
Shrub ) Forest		2	significant part but is of low quality  Present and either comprises significant part of wetland's
Mudflats		2	vegetation and is of moderate quality or comprises a small
Open wate	er.		part and is of high quality
Other		3	Present and comprises significant part, or more, of wetland's
6b. horizontal (plan	view) Interspersion.		vegetation and is of high quality
Select only one.	Tarket Tarket Tarket 1		
High (5)		Narrative Descript	on of Vegetation Quality
Moderately	(1) a (1) a	low	Low spp diversity and/or predominance of nonnative or
Moderate (			disturbance tolerant native species
2 Moderately	low (2)	mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp
Low (1)			can also be present, and species diversity moderate to
None (0) 6c, Coverage of inva	asive plants. Refer		moderately high, but generallyw/o presence of rare
to Table 1 ORAM Ion			threatened or endangered spp
or deduct points for d		high	A predominance of native species, with nonnative spp
	>75% cover (-5)	1000	and/or disturbance tolerant native spp absent or virtually
Moderate 2	25-75% cover (-3)		absent, and high spp diversity and often, but not always,
-/ Sparse 5-2	25% cover (-1)		the presence of rare, threatened, or endangered spp
Nearly abs	ent <5% cover (0)		
Absent (1)			Water Class Quality
6d. Microtopography		0	Absent <0.1ha (0.247 acres)
Score all present usin	4-Tile - Line - 1945, 44 - 1945, 4.	2	Low 0.1 to <1ha (0.247 to 2.47 acres)  Moderate 1 to <4ha (2.47 to 9.88 acres)
	hummucks/tussucks ody debris >15cm (6in)	3	High 4ha (9.88 acres) or more
	lead >25cm (10in) dbh		Lingui and faree del sel more
1	breeding pools	Microtopography	Cover Scale
		0	Absent
		11	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

GRAND TOTAL(max 100 pts)

wetland HU-VD

Site: 3	0280	99 Hardin Solar II Rat	er(s): JAV	LM. TR	Date: 5/23/18
0	6	Metric 1. Wetland Are	a (size).	Circle:	PEM PSS (PFO
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  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	)	Continue	s off-site: No_
4	4	Metric 2. Upland buffe	ers and s	urrounding la	and use.
max 14 pls.	subtotal	2a. Calculate average buffer width. Select only  WIDE. Buffers average 50m (164ft) of  MEDIUM. Buffers average 25m to <5  // NARROW. Buffers average 10m to very NARROW. Buffers average <  Intensity of surrounding land use. Select of very Low. 2nd growth or older fore S. Low. Old field (>10 years), shrublan MODERATELY HIGH. Residential, fe	y one and assign so or more around wet 50m (82 to <164ft) a <25m (32ft to <82ft) 10m (<32ft) around one or double check est, prairie, savanna d, young second gr enced pasture, park	ore. Do not double check. and perimeter (7) fround wetland perimeter (4 around wetland perimeter wetland perimeter (0) and average. h, wildlife area, etc. (7) owth forest. (5) , conservation tillage, new teath	i) (1)
11	15	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 streat streat surface)  3c. Maximum water depth. Select only one and source streat surface water (12)	m) (5) d assign score.	Part of wetla Part of riparia  3d. Duration inundatio Semi- to peri Regularly in Seasonally in Seasonally see check and average.	
		Recovering (3)  Recent or no recovery (1)	lle like veir tormwater input	filling/grading road bed/RR dredging	
9.5	24.5	Metric 4. Habitat Alter	ation and	Developme	nt.
max 20 pts.	subtotal	4a. Substrate disturbance. Score one or double None or none apparent (4) Recovered (3) Recovering (2) Recent or no recovery (1)  4b. Habitat development. Select only one and 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 che	assign score.	e.	
	24, 5	Recovered (6) Recovering (3) Recent or no recovery (1)	all disturbances of nowing grazing elearcutting elective cutting woody debris remov oxic pollutants	shrub/sapling herbaceous/ sedimentation dredging	aquatic bed removal

Wetland HU-UD

Site: 10189	ia Hardin Solar II R	tater(s): Thy	LM TR Date: 5/23/18
24,	S page		
O 24.	Metric 5. Special We	tlands	
_		tianus.	
x 10 pts. subtota	그는 그리트 이 없이 그렇게 그렇게 있었다면 살아 있었다. 그리스 나타에서 아니스 얼마나 이 경기가 하나 되었다.		
	Bog (10) Fen (10)		
	Old growth forest (10)		
	Mature forested wetland (5)		
	Lake Erie coastal/tributary wetland	d-unrestricted hydrolog	gy (10)
	Lake Erie coastal/tributary wetland		
	Lake Plain Sand Prairies (Oak Op-	enings) (10)	
	Relict Wet Praires (10)		
	Known occurrence state/federal th	A SANTAGE AND A	
	Significant migratory songbird/wat		
	Category 1 Wetland. See Question	n 1 Qualitative Rating	(-10)
1 200	c		
1 28.	Metric 6. Plant comm	nunities, ii	nterspersion, microtopography.
x 20 pts. subtota	6a. Wetland Vegetation Communities.	Vegetation Comm	
	Score all present using 0 to 3 scale.	0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
	Aquatic bed	1	Present and either comprises small part of wetland's
	_/_Emergent		vegetation and is of moderate quality, or comprises a
	Shrub		significant part but is of low quality
	Forest	2	Present and either comprises significant part of wetland's
	Mudflats		vegetation and is of moderate quality or comprises a small
	Open water	3	part and is of high quality  Present and comprises significant part, or more, of wetland's
	Other  6b. horizontal (plan view) Interspersion.	3	vegetation and is of high quality
	Select only one.		rogolation and to or riight quality
	High (5)	Narrative Descript	ion of Vegetation Quality
	Moderately high(4)	low	Low spp diversity and/or predominance of nonnative or
	Moderate (3)		disturbance tolerant native species
	Moderately low (2)	mod	Native spp are dominant component of the vegetation,
	1 Low (1)		although nonnative and/or disturbance tolerant native spp
	None (0)		can also be present, and species diversity moderate to
	6c. Coverage of invasive plants. Refer		moderately high, but generallyw/o presence of rare
	to Table 1 ORAM long form for list. Add		threatened or endangered spp
	or deduct points for coverage	high	A predominance of native species, with nonnative spp
	Extensive >75% cover (-5)		and/or disturbance tolerant native spp absent or virtually
	Moderate 25-75% cover (-3)		absent, and high spp diversity and often, but not always,
	Sparse 5-25% cover (-1)		the presence of rare, threatened, or endangered spp
	Nearly absent <5% cover (0) Absent (1)	Mudflat and Open	Water Class Quality
	6d. Microtopography.	0	Absent <0.1ha (0.247 acres)
	Score all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 acres)
	Vegetated hummucks/tussucks	2	Moderate 1 to <4ha (2.47 to 9.88 acres)
	Coarse woody debris >15cm (6in)	3	High 4ha (9.88 acres) or more
	O Standing dead >25cm (10in) dbh		
	/ Amphibian breeding pools	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

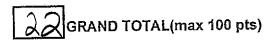
⊋₭. ∫ GRAND TOTAL(max 100 pts)

Older V. C.D Fleid Form Quantitative Flating		
Site: 302899 Hardin Solar	II Rater(s): M. Mo Inar	Date: 5/15/18
2 2 Metric 1. Wetla	and Area (size). Crcl	Date: 5/15/18 e: (PEM) PSS PFO ISODATED Adjacent Abutting nues off-site: Us
max 6 pts. subtotal Select one size class and assign	n score.	ISOLOTEGE CONTRACT
>50 acres (>20.2ha) ( 25 to <50 acres (10.1	6 pts) to <20 2ha) (5 pts)	Abuttina
10 to <25 acres (4 to	<10.1ha) (4 pts)	
3 to <10 acres (1.2 to	<4ha) (3 pts)	cc ita: Yls
② 3 to <3 acres (0.12 to	10 <1.2ha) (2pts)	ives off-site
0.1 to <0.3 acres (0.0 <0.1 acres (0.04ha) (0	1 to <0.12ha) (1 pt)	
<0.1 acres (0.0411a) (0	· pis)	
1 2 Metric 2 Unlar	nd buffers and surroundin	a land use
max 14 pts. subtotal 2a. Calculate average buffer wi	dth. Select only one and assign score. Do not double on the sound wetland perimeter (7)	crieck.
	erage 25m to <50m (82 to <164ft) around wetland perimeter (7)	neter (4)
	verage 10m to <25m (32ft to <82ft) around wetland peri	
VERY NARROW. But	ffers average <10m (<32ft) around wetland perimeter (0	))
	d use. Select one or double check and average.	
	wth or older forest, prairie, savannah, wildlife area, etc. (	( <b>/</b> )
	ears), shrubland, young second growth forest. (5) . Residential, fenced pasture, park, conservation tillage	, new fallow field. (3)
HIGH, Urban, industri	al, open pasture, row cropping, mining, construction. (1)	)
\	ology.	
max 30 pts. subtotal 3a. Sources of Water. Score al	I that apply. 3b. Connectivity	y. Score all that apply.
High pH groundwater		ear floodplain (1)
Other groundwater (3)		en stream/lake and other human use (1) f wetland/upland (e.g. forest), complex (1)
Precipitation (1) Seasonal/Intermittent		f riparian or upland corridor (1)
Perennial surface water	(	undation/saturation. Score one or dbl check.
3c. <u>Maxi</u> mum water depth. Sele		to permanently inundated/saturated (4)
>0.7 (27.6in) (3)		arly inundated/saturated (3)
0.4 to 0.7m (15.7 to 27 <0.4m (<15.7in) (1)	7.6in) (2) Seaso	onally inundated (2) onally saturated in upper 30cm (12in) (1)
0.11.1	rologic regime. Score one or double check and average	
None or none apparen		
Recovered (7)	ditch point s	source (nonstormwater)
Recovering (3)		grading
Recent or no recovery		ped/RR track
·	weir dredgi	ing
	stormwater input other_	
	at Alfanation and Davidon	
4 11 % Metric 4. Habit	at Alteration and Develop	ment.
	re one or double check and average.	
None or none apparer Recovered (3)	it (4)	
Recovering (2)		
Recent or no recovery		
4b. Habitat development. Selec	nt 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 on	e or double check and average	
None or none apparer Recovered (6)		/sapling removal
Recovering (3)		ceous/aquatic bed removal
Recent or no recovery		entation
	selective cutting dredg	· · · ·
ll& I	woody debris removal famir toxic pollutants nutrie	ng ent enrichment
subtotal this page	Licono posidicario	

Site:	302594	7	Rater(s): M.Mo	Inar	Date: 5/18/18
	101			•	
	110				
	subtotal this page				
		Market Market Company			
$\bigcirc$	↑ R   Me	tric 5. Special W	etlands.		
		call that apply and score as indicated			
max 10 pts.	subtotal Crieco	Bog (10)	<b>1.</b>		•
	<b> </b>	Fen (10)		. 1	
	/ [	Old growth forest (10)			
	/ F	Mature forested wetland (5)			
		Lake Erie coastal/tributary wetlar	nd-unrestricted hydrology (	10)	
$\mathcal{C}$	\	Lake Erie coastal/tributary wetlar	nd-restricted hydrology (5)		•
	, / [	Lake Piain Sand Prairies (Oak O	penings) (10)		
	\	Relict Wet Praires (10)			
	`  -	Known occurrence state/federal t	-		
	· -	Significant migratory songbird/wa		•	
·	<u>,                                    </u>	Category 1 Wetland. See Questi	юл 1 Qualitative Rating (-1	0)	•
0	100	trie G. Dlant com	munitiaa int	arabaraian miar	otonography
$\Delta$		tric 6. Plant com		·-	otohograpily.
max 20 pts.		etland Vegetation Communities.	Vegetation Communi		
	Score	all present using 0 to 3 scale.	0	Absent or comprises <0.1ha (0.24	
	ļ <del>.</del>	Aquatic bed	1	Present and either comprises sm	
	H	Emergent		vegetation and is of moderate or significant part but is of low qua	
,	. <u>.</u>	Shrub Forest	2	Present and either comprises sign	
	(T) H	Mudflats	. 4	vegetation and is of moderate of	
		Open water		part and is of high quality	,
	M	Other	3	Present and comprises significan	t part, or more, of wetland's
	6b. ho	rizontal (pian view) Interspersion.		vegetation and is of high quality	
	Select	only one.			
		High (5)	Narrative Description	of Vegetation Quality	
		Moderately high(4)	low	Low spp diversity and/or predomi	лапсе of nonnative or
		Moderate (3)		disturbance tolerant native spec	
	レリト	Moderately low (2)	mod	Native spp are dominant compon	
		Low (1)	4	although nonnative and/or distu	- ·
		None (0)		cen also be present, and specie	
		verage of invasive plants. Refer		moderately high, but generallyw threatened or endangered spp	No bieselice or rate
		e 1 ORAM long form for list. Add uct points for coverage	high	A predominance of native species	s with nonnative son
	Cr deal	Extensive >75% cover (-5)	mgn ·	and/or disturbance tolerant nati	
		Moderate 25-75% cover (-3)		absent, and high spp diversity a	
	(-3)	Sparse 5-25% cover (-1)		the presence of rare, threatened	
		Nearly absent <5% cover (0)			
		Absent (1)	Mudflat and Open Wa	iter Class Quality	
	6d. Mid	crotopography.	. 0	Absent <0.1ha (0.247 acres)	
	Score a	all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2.47 ac	res)
	L	Vegetated hummucks/tussucks	2	Moderate 1 to <4ha (2.47 to 9.88	acres)
		Coarse woody debris >15cm (6in)	)	High 4ha (9.88 acres) or more	<del></del>
	(3)L	Standing dead >25cm (10in) dbh		0 !-	•
		Amphibian breeding pools	Microtopography Cov		
			0 1	Absent Present very small amounts or if	more common
	-		l	· ·	nore common
			2	of marginal quality  Present in moderate amounts, bu	ut not of highest
				quality or in small amounts of h	
			3	Present in moderate or greater a	<del></del>
			<del>-</del>	and of highest quality	·
	•				

	- 1-1/6
Site: 302899 Hardin Solar II Rater(s): MI	<u> </u>
Metric 1. Wetland Area (size).	Circle: PEM PSS PFO Circle: Isolated Adjacent Abutting Continues off-site: Mes
max 6 pts. subtotal Select one size class and assign score.  >50 acres (>20.2ha) (6 pts)	Circle Isolated (13)
25 to <50 acres (10.1 to <20.2ha) (5 pts)	Abutting
10 to <25 acres (4 to <10.1ha) (4 pts) 3 to <10 acres (1.2 to <4ha) (3 pts)	racite: Mes
0.3 to <3 acres (0.12 to <1.2ha) (2pts) 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)	Continues of +3110
<0.1 acres (0.04ha) (0 pts)	
Metric 2. Upland buffers and	surrounding land use
max 14 pts. subtotal 2a. Calculate average buffer width. Select only one and assign	
WIDE. Buffers average 50m (164ft) or more around w	vetland perimeter (7)
MEDIUM. Buffers average 25m to <50m (82 to <164f NARROW. Buffers average 10m to <25m (32ft to <8.5m)	2ft) around wetland perimeter (1)
VERY NARROW. Buffers average <10m (<32ft) arounce 2b. Intensity of surrounding land use. Select one or double che	
VERY LOW. 2nd growth or older forest, prairie, savar	nnah, wildlife area, etc. (7)
LOW. Old field (>10 years), shrubland, young second MODERATELY HIGH. Residential, fenced pasture parture.	ark, conservation tillage, new fallow field. (3)
HIGH. Urban, industrial, open pasture, row cropping,	mining, construction. (1)
Metric 3. Hydrology.	
max 30 pts. subtotal 3a. Sources of Water. Score all that apply.	3b. Connectivity. Score all that apply.
High pH groundwater (5) Other groundwater (3)	100 year floodplain (1)  Between stream/lake and other human use (1)
Precipitation (1) Seasonal/Intermittent surface water (3)	Part of wetland/upland (e.g. forest), complex (1) Part of ripanan or upland conidor (1)
Perennial surface water (lake or stream) (5)	<ol> <li>Duration inundation/saturation. Score one or dbl check.</li> </ol>
3c. Maximum water depth. Select only one and assign score.	Semi- to permanently inundated/saturated (4) Regularly inundated/saturated (3)
0.4 to 0.7m (15.7 to 27.6in) (2)	Seasonally inundated (2) Seasonally saturated in upper 30cm (12in) (1)
<ul><li>&lt;0.4m (&lt;15.7in) (1)</li><li>3e. Modifications to natural hydrologic regime. Score one or do</li></ul>	
None or none apparent (12) Check all disturbances	s observed point source (nonstormwater)
Recovering (3)	filling/grading
Recent or no recovery (1) dike weir	road bed/RR track dredging
stormwater input	
<mark>℃  </mark>	
mex 20 pts. subtotal 4a. Substrate disturbance. Score one or double check and ave	rage.
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) Check all disturbances	
Recovered (6) mowing	shrub/sapling removal herbaceous/aquatic bed removal
Recovering (3) Recent or no recovery (1) grazing clearcutting	sedimentation
selective cutting woody debris rer	
toxic pollutants	nutrient enrichment
subtotal this page	

letland HW ORAM v. 5.0 Field Form Quantitative Rating Rater(s): 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 Praires (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) Metric 6. Plant communities, interspersion, microtopography. Vegetation Community Cover Scale 6a. Wetland Vegetation Communities. max 20 pts. Absent or comprises <0.1ha (0.2471 acres) contiguous area 0 Score all present using 0 to 3 scale. Present and either comprises small part of wetland's Aquatic bed vegetation and is of moderate quality, or comprises a Emergent significant part but is of low quality Shrub Present and either comprises significant part of wetland's 2 Forest vegetation and is of moderate quality or comprises a small Mudfiats part and is of high quality Open water Present and comprises significant part, or more, of wetland's 3 Other\_ vegetation and is of high quality 6b. horizontal (plan view) Interspersion. Select only one. Narrative Description of Vegetation Quality High (5) Low spp diversity and/or predominance of nonnative or low Moderately high(4) disturbance tolerant native species Moderate (3) Native spp are dominant component of the vegetation, mod Moderately low (2) although nonnative and/or disturbance tolerant native spp Low (1) can also be present, and species diversity moderate to None (0) moderately high, but generallyw/o presence of rare 6c. Coverage of invasive plants. Refer threatened or endangered spp to Table 1 ORAM long form for list. Add A predominance of native species, with nonnative spp high or deduct points for coverage and/or disturbance tolerant native spp absent or virtually Extensive >75% cover (-5) absent, and high spp diversity and often, but not always, Moderate 25-75% cover (-3) the presence of rare, threatened, or endangered spp Sparse 5-25% cover (-1) Nearly absent <5% cover (0) Mudflat and Open Water Class Quality Absent (1) Absent < 0.1ha (0.247 acres) 0\_ 6d. Microtopography. Low 0.1 to <1ha (0.247 to 2.47 acres) Score all present using 0 to 3 scale. Moderate 1 to <4ha (2.47 to 9.88 acres) Vegetated hummucks/tussucks 2 High 4ha (9.88 acres) or more Coarse woody debris >15cm (6in) Standing dead >25cm (10in) dbh Microtopography Cover Scale Amphibian breeding pools Present very small amounts or if more common of marginal quality Present in moderate amounts, but not of highest 2 quality or in small amounts of highest quality Present in moderate or greater amounts 3



and of highest quality

wetland HS-JA

Site: 3	0289	9 Hardin Solar II	Rater(s): JP/	DK	Date: 9/14/2018
2 max 6 pts.	2 subtotal	Metric 1. Wetland A Selectione size class and assign score.	Area (size).	Circle: P	EM) PSS_PFO Dated (Adjacent)
		>50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20.2) 10 to <25 acres (4 to <10.1ha) 3 to <10 acres (1.2 to <4ha) (3  0.3 to <3 acres (0.12 to <1.2ha) 0.1 to <0.3 acres (0.04 to <0.1) <0.1 acres (0.04ha) (0 pts)	(4 pts) pts) ) (2pts)	Corrhinues C	Date: 9/14/2018 EM) PSS PFO Dated Adjacent Abutting Aff-site: NO
,	3	Metric 2. Upland b	uffers and s	urrounding land	d use.
max 14 pts.	subtotal O	2a. Calculate average buffer width. Sele WIDE. Buffers average 50m (1 MEDIUM. Buffers average 25m NARROW. Buffers average 10 X VERY NARROW. Buffers average 25m Intensity of surrounding land use. S VERY LOW. 2nd growth or old LOW. Old field (>10 years), sh	ect only one and assign so 164ft) or more around wet in to <50m (82 to <164ft) of in to <25m (32ft to <82ft) age <10m (<32ft) around delect one or double chect ler forest, prairie, savanna rubland, young second go intial, fenced pasture, parl	core. Do not double check.  Iand perimeter (7)  around wetland perimeter (4)  around wetland perimeter (1)  wetland perimeter (0)  and average.  an, wildlife area, etc. (7)  control forest (5)  c, conservation tillage, new fallow	
5	8	Metric 3. Hydrolog	y.		
max 30 pts.	subtotal	3a. Sources of Water. Score all that appulation (1)  High pH groundwater (3)  Other groundwater (3)  Precipitation (1)  Seasonal/Intermittent surface water (lake of the perennial surface water (la	vater (3) r stream) (5) ne and assign score.	Part of wettand/up Part of riparian or 3d. Duration inundation/sat Semi-to permane Regularly inundation Seasonally inundation Seasonally satura	n (1) ake and other human use (1) ake and other human use (1) aland (e.g. forest), complex (1) upland corridor (1) uration. Score one or dbl check. ntly inundated/saturated (4) ed/saturated (3)
	ļ	None or none apparent (12) Recovered (7) Recovering (3) Recent or no recovery (1)	Check all disturbances of ditch ditch title dike weir stormwater input	point source (none filling/grading road bed/RR track dredging other	
4	12	Metric 4. Habitat A	Iteration and	d Development.	
max 20 pts.	subtotal	4a. Substrate disturbance. Score one or None or none apparent (4) Recovered (3) Recent or no recovery (1)  4b. Habitat development. Select only on Excellent (7) Very good (6) Good (5) Moderately good (4) Fair (3) Poor to fair (2) Poor (1)  4c. Habitat alteration. Score one or doul	double check and average eand assign score.		
_ Su	12 Indicated this page	None or none apparent (9)  Recovered (6)  Recovering (3)  Recent or no recovery (1)	Check all disturbances o mowing grazing clearcutting selective cutting woody debris remove toxic pollutants	shrub/sapling rem herbaceous/aqua sedimentation dredging	tic bed removal

3

and of highest quality

wetland HS-JB

Site: 3	02899	Hardin Solar II	Rater(s):	JPIDK		Date:
2	2 N	letric 1. Wetland	Area (siz	ze).	ircle	Date: PEM PSS PEQ Isolated Adjacent Abutting ues off-site: NO
max 6 pts.	subtotal Se	lect one size class and assign score >50 acres (>20.2ha) (6 pts)		Ci	cele:	ISOUATED POJULONIN
		25 to <50 acres (10.1 to <20 10 to <25 acres (4 to <10.1h 3 to <10 acres (1.2 to <4ha)	a) (4 pts)			10011119
		0.3 to <3 acres (0.12 to <1.2 0.1 to <0.3 acres (0.04 to <0 <0.1 acres (0.04ha) (0 pts)	ha) (2pts)		DUTTIN	ves off-site.
	3 M	letric 2. Upland l	buffers aı	nd surro	unding	g land use.
max 14 pts.	subtotal 2a.	Calculate average buffer width. S WIDE. Buffers average 50m MEDIUM. Buffers average 2	elect only one and a 1 (164ft) or more ard 25m to <50m (82 to	assign score. Do ound wetland peri <164ft) around w	not double ch imeter (7) vetland perime	ter (4)
,	0	NARROW. Buffers average VERY NARROW. Buffers average	verage <10m (<32ft	) around wetland	perimeter (0)	eter (1)
	26.	Intensity of surrounding land use.  VERY LOW. 2nd growth or LOW. Old field (>10 years), MODERATELY HIGH. Resi	older forest, prairie, shrubland, young s dential, fenced past	savannah, wildlit econd growth for ure, park, conser	fe area, etc. (7 est. (5) vation tillage, i	
Q	9 M	etric 3. Hydrolo	gy.			
max 30 pts.	subtotal 3a.	Sources of Water. Score all that a High pH groundwater (5) Other groundwater (3) Precipitation (1) Seasonal/Intermittent surface Perennial surface water (lake Maximum water depth. Select only >0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) (1)  <0.4m (<15.7in) (1) Modifications to natural hydrologic	apply. e water (3) e or stream) (5) y one and assign so 2)	3d. core. 2	100 year Between Part of v Part of v Part of in the second	Score all that apply.  In stream/lake and other human use (1) In stream/lake and other human use (1) In stream/lake and other human use (1) In stream/lake and conidor (1) Indation/saturation. Score one or dbl check. In permanently inundated/saturated (4) In inundated/saturated (3) In inundated (2) In inundated in upper 30cm (12in) (1)
· `	1	None or none apparent (12) Recovered (7) Recovering (3) Recent or no recovery (1)		pances observed	point so	ource (nonstormwater) rading rd/RR track
Ч	13 M	etric 4. Habitat	Alteration	and De	velopn	nent.
max 20 pts.	4b.	Substrate disturbance. Score one None or none apparent (4) Recovered (3) Recovering (2) Recent or no recovery (1) Habitat development. Select only Excellent (7) Very good (6) Good (5) Moderately good (4) Fair (3) Poor to fair (2) Poor (1) Habitat alteration. Score one or development.	one and assign sco	ore.		
	13 ubtotal this page	None or none apparent (9) Recovered (6) Recovering (3) Recent or no recovery (1)	Check all disturi mowing grazing clearcutting selective c	pances observed . dutting ris removal	shrub/s herbace sedime dredgin	- "

Present in moderate or greater amounts

and of highest quality

wetland Hs-1c

Site: 3	02899	Hardin Solar II	Rater(s):	JP/OK		Date:	9/14/2018
		letric 1. Wetland	Area (siz	ze).	ircle	PEMPS	5 PFO
max 6 pts.	subtotal Se	elect one size class and assign scon >50 acres (>20.2ha) (6 pts) 25 to <50 acres (10.1 to <20	).2ha) (5 pts)	Cir	cle:	Isolated ( Abuttiv	ig .
		10 to <25 acres (4 to <10.1h 3 to <10 acres (1.2 to <4ha) 0.3 to <3 acres (0.12 to <1.2  ✓ 0.1 to <0.3 acres (0.04 to <0  <0.1 acres (0.04ha) (0 pts)	(3 pts) Pha) (2pts)	i <b>(</b>	ONHINI	Date: PEMDPS ISOLATED ( Abuttiv	: <u>NO</u>
1	2 N	letric 2. Upland	buffers aı	าd surroเ	unding	ı land use.	
max 14 pls.		. Calculate average buffer width. S WIDE. Buffers average 50m	elect only one and	assign score. Do r	not double ch		
	D	MEDIUM. Buffers average ANARROW. Buffers average	25m to <50m (82 to 10m to <25m (32fi	<164ft) around we to <82ft) around v	tland perime vetland perim	ter (4) veter (1)	
	2b.	Intensity of surrounding land use.  VERY LOW. 2nd growth or	Select one or doul older forest, prairie,	ble check and aver savannah, wildlife	rage. : area, etc. (7	)	
	1	LOW. Old field (>10 years), MODERATELY HIGH. Resi HIGH. Urban, industrial, ope	shrubland, young sidential, fenced past	econd growth fore ure, park, conserv	st. (5) ation tillage, (		
5	7 N	letric 3. Hydrolo	gy.				
max 30 pts.		Sources of Water. Score all that a High pH groundwater (5)		. 3b.		Score all that apply. ir floodplain (1)	
	3c.	Other groundwater (3) Precipitation (1) Seasonal/Intermittent surfac Perennial surface water (lak Maximum water depth. Select onl >0.7 (27.6in) (3) 0.4 to 0.7m (15.7 to 27.6in) (1) <0.4m (<15.7in) (1)	e or stream) (5) y one and assign so		Part of v Part of v Part of v Duration inur Semi- to Regular Season	n stream/lake and other hum wetland/upland (e.g. forest), iparian or upland corridor (1 dation/saturation. Score on permanentiy inundated/sat ly inundated/saturated (3) ally inundated (2) ally saturated in upper 30cm	complex (1) ) e or dbì check. urated (4)
	3e.	Modifications to natural hydrologic	regime. Score one	or double check	<del></del>		
		None or none apparent (12) Recovered (7) Recovering (3) Recent or no recovery (1)	Check all disturt ditch tile dike weir stormwatei	eances observed	filling/gr	d/RR track	3
3	10 N	letric 4. Habitat	Alteration	and Dev	velopn	nent.	
max 20 pts.	١	Substrate disturbance. Score one None or none apparent (4) Recovered (3) Recovering (2) Recent or no recovery (1) Habitat development. Select only Excellent (7) Very good (6) Good (5)					
	40	Moderately good (4) Fair (3) Poor to fair (2) Poor (1) Habitat alteration. Score one or defined to the second seco	louble check and av	verage.			
	10	None or none apparent (9) Recovered (6) Recovering (3) Recent or no recovery (1)	mowing grazing clearcuttin	utting oris removal	herbac sedime dredgir		i.

ORAM v.	5.0 Field Form Q	uantitative Rating		Jetlana _	
Site:	302899	HARDIN SOLAR I	Rater(s): ノP/	/DK	Date: 9 /14/201
	subtotal this page				
0	10 M	etric 5. Special V	Vetlands.		
max 10 pts.		ck all that apply and score as indicated Bog (10) Fen (10) Old growth forest (10) Mature forested wetland (5) Lake Erie coastal/tributary wetlake Erie coastal/tributary wetlake Plain Sand Prairies (Oak Relict Wet Praires (10) Known occurrence state/feder	ted. tland-unrestricted hydrology tland-restricted hydrology (5 : Openings) (10) al threatened or endangere	od species (10)	
	T LL M	Category 1 Wetland. See Que	estion 1 Qualitative Rating (	(-10)	icrotopography.
max 20 pts.		Wetland Vegetation Communities.	Vegetation Commu		
1,12x 20 pto.		e all present using 0 to 3 scale.	0		a (0.2471 acres) contiguous area
		Aquatic bed Emergent	1	1 5	erate quality, or comprises a
	٥	Shrub Forest Mudflats	2		es significant part of wetland's erate quality or comprises a small
		Open water Other	3		nificant part, or more, of wetland's
	6h	horizontal (plan view) Interspersion.	5	vegetation and is of high	
		ct only one.			-
		High (5)	Narrative Description	on of Vegetation Quality	
		Moderately high(4) Moderate (3)	low	Low spp diversity and/or pr disturbance tolerant nativ	edominance of nonnative or re species
		Moderately low (2) Low (1) None (0) Coverage of invasive plants. Refer	mod	although nonnative and/o can also be present, and moderately high, but gen	omponent of the vegetation, or disturbance tolerant native spp species diversity moderate to erallyw/o presence of rare
		able 1 ORAM long form for list. Add educt points for coverage  Extensive >75% cover (-5)  Moderate 25-75% cover (-3)  Sparse 5-25% cover (-1)	high	and/or disturbance tolera absent, and high spp dive	species, with nonnative spp  nt native spp absent or virtually ersity and often, but not always, eatened, or endangered spp
	,	Néarly absent <5% cover (0)			
	בת י	Absent (1)	Mudflat and Open V	Absent <0.1ha (0.247 acre	es)
		Microtopography. e all present using 0 to 3 scale.	1	Low 0.1 to <1ha (0.247 to 2	
	300	Vegetated hummucks/tussuck		Moderate 1 to <4ha (2.47	•
	0	Coarse woody debris >15cm (	Sin) 3	High 4ha (9.88 acres) or m	
	U	Standing dead >25cm (10in) d		Savan Caala	•
		Amphibian breeding pools	Microtopography C		
		•	0 1	Present very small amount	s or if more common
•			2	of marginal quality  Present in moderate amou quality or in small amour	
		•	3	Present in moderate or gre and of highest quality	

## Appendix E Ohio EPA Stream Data Forms

### Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

	*,	
<u> </u>	_	: (23)
UHEI	Score	<u>. (</u> ( ) (
<b>—</b>		

Stream & Location:	HS-MI					RM:	Date	05/18	<u>118</u>
Scioto R	Wex		_Scorers	Full Name &	Affiliation:	M. Mo	olnarT	RC	
River Code:	-	_STORET#:		Lat./Long. (NAD 83 - decimal °)	:40.063	<u>sz</u> /8 <u>3</u> .	2926		verified ocation
1] SUBSTRATE Chec	k <i>ONLY</i> Two st	ubstrate <i>TYPE BOX</i> every type present	ES;		Check O	NE ( <i>Or 2 &amp;</i>	average)		
BEST TYPES	POOL RIFFLE  5 5  TYPES: 04	OTHER TYI	[4] FOOL [5] [4] [5] [5] [5] [5] [5] [5] [5] [5] [5] [5	RIFFLE   LIM   TIL   TIL	ORIGIN IESTONE [1] LS [1] TLANDS [0] RDPAN [0]	SILT	QUAL  HEAVY [ MODERA NORMAI FREE [1] EXTENS MODERA NORMAI NONE [1]	-2] ATE [-1] L [0]	Substrate  Substrate  Maximum 20
quality; 3-Highest quality diameter log that is stable UNDERCUT BANK OVERHANGING V SHALLOWS (IN SI ROOTMATS [1]	quality; 2-N in moderate or e, well develope (S [1] EGETATION [1	oderate amounts, but greater amounts (end rootwad in deep proof Pools of Rootwall and Rootwall amounts).	out not of high g., very large / fast water, o > 70cm [2] _ (ADS [1]	nest quality or in the boulders in de- to deep, well-def DOXBOW DOXBOW	small amounts o ep or fast water,	of highest large pools. [ RS [1] [ ES [1] [	Check ONE (C EXTENSIVE MODERATE SPARSE 5- NEARLY AE	Or 2 & aver E >75% [11 E 25-75% [ <25% [3] BSENT <5% Cover	] 7] <sub>,</sub>
Comments	1							Maximum 20	
☐ HIGH [4] ☐ I ☐ MODERATE [3] ☐ 0 ☐ LOW [2] ☐ 1	HOLOGY CH VELOPMEN EXCELLENT [7 GOOD [5] FAIR [3] POOR [1]	T CHANNI ]   NONE [6]   RECOVER   RECOVER	ELIZATION ED [4]	N S1	FABILITY IIGH [3] IODERATE [2] OW [1]			<b>Channel</b> Maximum 20	
4) BANK EROSION		IAN ZONE Ched	k ONE in eac	ch category for E	ACH BANK (Or	2 per bank	& average)		
River right looking downstre  EROSION  NONE / LITTLE [3]  MODERATE [2]  HEAVY / SEVERE [4]	RIPA	ARIAN WIDTH > 50m [4] ERATE 10-50m [3] ROW 5-10m [2] ' NARROW < 5m [1	L R FOF SHF RES D RES	FLOOD PL REST, SWAMP RUB OR OLD F	.AIN QUALIT [3] IELD [2] RK, NEW FIELD   = [1]	Y	ONSERVATION RBAN OR INI INING / CONS predominant lo Om riparian.	DUSTRIAL STRUCTIO	[0]
5] POOL / GLIDE AN	ID RIFFLE /	RUN QUALITY							<del></del>
MAXIMUM DEPTH Check ONE (ONLY!)  □ > 1m [6] □ 0.7-<1m [4] ■ 0.4-<0.7m [2] □ 0.2-<0.4m [1] □ < 0.2m [0]  Comments	Check POOL WIL	ANNEL WIDTH ONE (Or 2 & averag OTH > RIFFLE WIDT OTH = RIFFLE WIDT OTH < RIFFLE WIDT	ge) TH[2] □ TC TH[1] □ VE TH[0] □ FA	Check ALI DRRENTIAL [-1] ERY FAST [1] AST [1] ODERATE [1] Indicate for reac	☐ INTERSTITI ☐ INTERMITT ☐ EDDIES [1] h - pools and riffl	ENT [-2] es.		Contact y Conta	t ct
Indicate for func of riffle-obligate				rge enough 2 & average).	to support a	populat	ion	RIFFLE [n	netric=0]
RIFFLE DEPTH  BEST AREAS > 10cm [2]  BEST AREAS 5-10cm [4]  BEST AREAS < 5cm [metric=0]	RUN 2]   MAXIMI 1]   MAXIMI	DEPTH   JM > 50cm [2]	RIFFLE / R STABLE (e.g WOD. STABL	RUN SUBSTI ., Cobble, Boul	der) [2] Gravel) [1]		I EMBEDDI DNE [2] DW [1] DDERATE [0] TENSIVE [-1]	Riffle /	
Comments				<u> </u>				Maximum 8	١٩
DRAINAGE AREA	\	ERY LOW - LOW [ IODERATE [6-10] IGH - VERY HIGH	<u>.</u>	%PO( %RUI		%GLIDE 6RIFFLE	=	<b>Gradient</b> Maximum 10 06/	16/06

PLED sck ALL D	ш 🖠	Comment RE: Reach consistency/Is   amps: 12 s radi:	reach typical of steam?, Recreation ata Levto La, wathe	/Observed - Inferred, Other	Comment RE: Reach consistency/ Is reach typical of steam?, Recreation/Observed - Inferred, Other/Sampling observations, Concerns, Access directions, etc. しのmpsiという になればれる といれのよびなものがですの	ess directions, etc.
ш ж	HIGH O UP O NORMAL O COW	OF MATON MMHO				
0.5 Km   CLARITY   0.2 Km   1st -sample pass-0.15 Km   0.15 Km   0.12 Km   0.12 Km   0.12 Km   0.12 Km   0.12 Km   0.14 Cm   0.14 Km   0.15 Km	CLARITY    CLARITY   CLARI	BJAESTHETICS  □ NUISANCE ALGAE  □ INVASIVE MACROPHYTES  □ EXCESS TURBIDITY  □ DISCOLORATION  □ FOAM / SCUM  □ OIL SHEEN  □ TRASH / LITTER  □ TRASH / LITTER  □ NUISANCE ODOR  □ SLUDGE DEPOSITS  □ CSOS/SSOS/OUTFALLS  SATION AREA DEPTH  POOL: □ > 100ft² □ > 3ft	DJ MAINTENANCE PUBLIC / PRIVATE / BOTH / NA ACTIVE / HISTORIC / BOTH / NA YOUNG-SUCCESSION-OLD SPRAY / SNAG / REMOVED MODIFIED / DIPPED OUT / NA LEVEED / ONE SIDED RELOCATED / CUTOFFS MOVING-BEDLOAD-STABLE ARMOURED / SLUMPS ISLANDS / SCOURED IMPOUNDED / DESICCATED	Circle some & COMMENT	EJ ISSUES WWTP / CSO / NPDES / INDUSTRY HARDENED / URBAN / DIRT&GRIME CONTAMINATED / LANDFILL BMPS-CONSTRUCTION-SEDIMENT LOGGING / IRRIGATION / COOLING BANK / EROSION / SURFACE FALSE BANK / MANURE / LAGOON WASH H <sub>2</sub> 0 / TILE / H <sub>2</sub> 0 TABLE ACID / MINE / QUARRY / FLOW NATURAL / WETLAND / STAGNANT PARK / GOLF / LAWN / HOME ATMOSPHERE / DATA PAUCITY	F) MEASUREMENTS  x̄ width  x̄ depth max. depth x̄ bankfull width bankfull x̄ depth W/D ratio bankfull max. depth floodprone x² width entrench. ratio Legacy Tree:
Stream Drawing:	ng:					
		cobble	ROW Crop	0 6		,
	is a GS		MODE			
	8			2		

## Flow regime: Intermittent Mod. Class I

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



SITE NAMELOCATION Hardin Sovar II	
SITE NAME/LOCATION HOT 72 TY SOVAY.  302899 SITE NUMBER HO M2 RIVER BASIN DRAINAGE AREA (mi) S.	<u> </u>
LENGTH OF STREAM REACH (#) 50 LAT. 40, 662 LONG 83,796 RIVER CODE RIVER MILE	<del></del>
DATE 5/18/18 SCORER M. MO INO COMMENTS	
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instru	
STREAM CHANNEL ONONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERED	ÆRY
MODIFICATIONS: CUIVEV-	
SUBSTRATE (E-throsto percent of every type of substrate present, Check ONLY two predominant substrate TYPE boxes	HHEI
(Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of buces A 8 in the second (Max of 8).	Metric
TYPE SILT 13 pt] 40	Points
BOULDER (>256 mm) [16 pts] LEAF PACKWOODY DEBRIS [3 pts]	Substrate
BEDROCK [16 pt]	Max = 40
COBBLE (65-256 mm) [12 pts]	10
SAND (<2 mm) [6 pts] ARTIFICIAL [3 pts]	
Total of Percentages of (A)	A+B
Bldr Stabs, Boulder, Cobble, Bedrock	· · · · · · · · · · · · · · · · · · ·
SCORE OF 1990 most FREDOMINATE CODE 115	Pool Depth
<ol> <li>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):</li> </ol>	Max = 30
□ > 30 centimeters [20 pts] > 5 cm - 10 cm [10 pts]	
> 22.5 - 30 cm [30 pts]	
MAYIMIN POOL DEPTH (SOUTH SS):	
	Bankfuli
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):    > 4.0 meters (> 13) [30 pts]   > 1.0 m - 1.5 m (> 3' 3"- 4' 8") [15 pts]	Width
☐ > 3.0 m - 4.0 m (> 9' 7" - 13") [25 pts] ≤ 1.0 m (≤ 3"3") [5 pts]	Max=30
-> 1.5 m - 3.0 m (> 4'8"-9'7") [20 pts]	5
COMMENTSAVERAGE BANKFULL WIDTH (MINUS)	1
This information <u>must</u> also be completed	1.
RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstreams?	
L R (Most Predominent per Bank) L R	
☐ Wide >10m ☐ Mature Forest, Wetland ☐ ☐ Conservation Tillage	
☐ Moderate 5-10m ☐ Immature Forest, Shrub or Old ☐ ☐ Urban or Industrial Field	
☐ Narrow <5m Residential, Park, New Field ☐ Crop	•
None Fenced Pasture Mining or Construction	
COMMENTS	
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):  Street Flowing	
Stream Flowing  Subsurface flow with isolated pools (Interstitial)  Dry channel, no water (Ephemeral)	•
COMMENTS	-
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):	
None	•
STREAM GRADIENT ESTIMATE	
Flat (0.5 pt/100 n)	00 ft)

DOMANIQUEA	AM DESIGNATED USE(S)		
☐ WWH Name:		Distance from Evaluated Stre	
		Distance from Evaluated Stree	
EWH Name:	11, 200 11 101 10 10 10 10 10 10 10 10 10 10	Distance from Evaluated Street	
MAPPING: ATT		ENTIRE WATERSHED AREA. CLEARLY MARK THE SI	
USGS Quadrangle Name		NRCS Soil Map Page: NA NRCS Soil Map S	and the second s
county: <u>Hardi</u>	in County Tom	unship/city: Marion Townsl	<u> 14                                   </u>
MISCELLANEC	ous		1
Base Flow Conditions? (Y	(/N): Date of last precipitation:	5/18/18 quentity: < . 5 ''	
Pholograph Information:			
Elevated Turbidity? (Y/N):	: Canopy (% open):	20%	
Were samples collected to	or water chemistry? (Y/N): (Note I	ab sample no. or id. and attach results) Lab Number:_	
Field Measures: Temp	o (°C) NA Dissolved Oxygen (mg/l)	PH (S.U.) NA Conductivity (µmhos/cm	NA
and the second s	resentative of the stream (Y/N)	"	-:
•			
Additional comments/desc	cription of pollution impacts:		
BIOTIC EVALU	(If Yes, Record all observations. Voud	her collections optional. NOTE: all voucher samples mus	t be labeled with the site
Performed? (Y/N):  Fish Observed? (Y/N)  Frogs or Tadpoles Observed?	(If Yes, Record all observations. Voud ID number. Include appropriate field d: Voucher? (Y/N)ASalamanders red?, (Y/N)YAqu	her collections optional. NOTE: all voucher samples must ata sheets from the Primary Headwater Habitat Assessme Observed? (Y/N) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	ent Manual)
Performed? (Y/N):	(If Yes, Record all observations. Voud ID number. Include appropriate field d: Voucher? (Y/N)ASalamanders red?, (Y/N)YAqu	ata sheets from the Primary Headwater Habitat Assessme	ent Manual)
Performed? (Y/N):  Fish Observed? (Y/N)  Frogs or Tadpoles Observed?	(If Yes, Record all observations. Voud ID number. Include appropriate field d: Voucher? (Y/N)ASalamanders red?, (Y/N)YAqu	ata sheets from the Primary Headwater Habitat Assessme	ent Manual)
Performed? (Y/N):  Fish Observed? (Y/N)  Frogs or Tadpoles Observe  Comments Regarding Biol	(if Yes, Record all observations. Vouch ID number. Include appropriate field d:  Voucher? (Y/N) ASalamanders ved?, (Y/N) Voucher? (Y/N) Aqu logy:	ata sheets from the Primary Headwater Habitat Assessme Observed? (Y/N)	ner? (Y/N)
Performed? (Y/N):  Fish Observed? (Y/N)  Frogs or Tadpoles Observed  Comments Regarding Biology  DRAWING	(If Yes, Record all observations. Voud ID number. Include appropriate field d:  Voucher? (Y/N) ASalamanders red? (Y/N) Voucher? (Y/N) Aqu logy:  AND NARRATIVE DESCRIPTIO	ata sheets from the Primary Headwater Habitat Assessment Observed? (Y/N) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	mer? (Y/N)
Performed? (Y/N):  Fish Observed? (Y/N)  Frogs or Tadpoles Observed  Comments Regarding Biology  DRAWING	(If Yes, Record all observations. Voud ID number. Include appropriate field d:  Voucher? (Y/N) ASalamanders red? (Y/N) Voucher? (Y/N) Aqu logy:  AND NARRATIVE DESCRIPTIO	ata sheets from the Primary Headwater Habitat Assessme Observed? (Y/N)	mer? (Y/N)
Performed? (Y/N):  Fish Observed? (Y/N)  Frogs or Tadpoles Observed  Comments Regarding Biology  DRAWING  Include Important Include Import	(If Yes, Record all observations. Voud ID number. Include appropriate field d:  Voucher? (Y/N) ASalamanders red? (Y/N) Voucher? (Y/N) Aqu logy:  AND NARRATIVE DESCRIPTIO	ata sheets from the Primary Headwater Habitat Assessment Observed? (Y/N) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	mer? (Y/N)
Performed? (Y/N):  Fish Observed? (Y/N)  Frogs or Tadpoles Observed  Comments Regarding Biology  DRAWING	(If Yes, Record all observations. Voud ID number. Include appropriate field d:  Voucher? (Y/N) ASalamanders red? (Y/N) Voucher? (Y/N) Aqu logy:  AND NARRATIVE DESCRIPTIO	ata sheets from the Primary Headwater Habitat Assessment Observed? (Y/N) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	mer? (Y/N)
Performed? (Y/N):  Fish Observed? (Y/N)  Frogs or Tadpoles Observed  Comments Regarding Biology  DRAWING  Include Important Include Import	(If Yes, Record all observations. Voud ID number. Include appropriate field d:  Voucher? (Y/N) ASalamanders red? (Y/N) Voucher? (Y/N) Aqu logy:  AND NARRATIVE DESCRIPTIO	ata sheets from the Primary Headwater Habitat Assessment Observed? (Y/N) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	mer? (Y/N)
Performed? (Y/N):  Fish Observed? (Y/N)  Frogs or Tadpoles Observed  Comments Regarding Biology  DRAWING  Include Important Include Import	(If Yes, Record all observations. Voud ID number. Include appropriate field d:  Voucher? (Y/N) ASalamanders red? (Y/N) Voucher? (Y/N) Aqu logy:  AND NARRATIVE DESCRIPTIO	ata sheets from the Primary Headwater Habitat Assessment Observed? (Y/N) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	mer? (Y/N)
Performed? (Y/N):  Fish Observed? (Y/N)  Frogs or Tadpoles Observed:  Comments Regarding Biole  DRAWING  Include Important I:	(If Yes, Record all observations. Voud ID number. Include appropriate field d:  Voucher? (Y/N) ASalamanders red? (Y/N) Voucher? (Y/N) Aqu logy:  AND NARRATIVE DESCRIPTIO	ata sheets from the Primary Headwater Habitat Assessment Observed? (Y/N) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	mer? (Y/N)
Performed? (Y/N):  Fish Observed? (Y/N)  Frogs or Tadpoles Observed:  Comments Regarding Biole  DRAWING  Include Important I:	(If Yes, Record all observations. Voud ID number. Include appropriate field d:  Voucher? (Y/N) ASalamanders red? (Y/N) Voucher? (Y/N) Aqu logy:  AND NARRATIVE DESCRIPTIO	ata sheets from the Primary Headwater Habitat Assessment Observed? (Y/N) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	mer? (Y/N)
Performed? (Y/N):  Fish Observed? (Y/N)  Frogs or Tadpoles Observed:  Comments Regarding Biole  DRAWING  Include Important I:	(If Yes, Record all observations. Voud ID number. Include appropriate field d:  Voucher? (Y/N) ASalamanders red? (Y/N) Voucher? (Y/N) Aqu logy:  AND NARRATIVE DESCRIPTIO	ata sheets from the Primary Headwater Habitat Assessment Observed? (Y/N) \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	mer? (Y/N)

#### Stream HS-M'3 Flow regime: <u>Intermittent</u> Mod. Class I

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

SITE NAMELOCATION HONDEN SOLOY TO DRAINAGE AREA (m²) SO2899 SITE NUMBER HS-M3 RIVER BASIN DRAINAGE AREA (m²) S	
LENGTH OF STREAM REACH (II) 40 LAT. 40.661 LONG. \$3.797 RIVER CODE RIVER MILE	
	- 1. 1 - 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
DATE 5/5/18 SCORER M MOIND COMMENTS Manual for Ohio's PHWH Streams" for Instr	uctions
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instr	and a
STREAM CHANNEL   NONE / NATURAL CHANNEL   RECOVERED RECOVERING   RECENT OR NO RECO	)VERY
MODIFICATIONS: CULVER+ +++ led	•
	71
SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes     (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.	HHEI
TYPE PERCENT TYPE	Metric Points
BLDR SLABS [16 pts]	
D BOULDER (>256 mm) [16 pts] LEAF PACKWOODY DEBRIS [3 pts]  BEDROCK [16 pt] D FINE DETRITUS [3 pts]	Substrate Max = 40
COBBLE (65-256 mm) [12 pts] CLAY or HARDPAN [0 pt]	
GRAVEL (2-84 mm) [9-pts] MUCK [0-pts] MUCK [0-pts] ARTIFICIAL [3-pts]	+
AND (52 mil) to pist	
Total of Percentages of (A) 3	A + B
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES:	
the time of	Pool Depth
evaluation. Avoid plungs pools from road culverts or storm water pipes) (Check UVILY dis box).	Max = 30
> 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]	
> 22.5 - 30 cm [30 pts]	
COMMENTS MAXIMUM POOL DEPTH (centimaters):	
	Bankfull
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):  > 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4"8") [15 pts]	Width
→ 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	Max=30
- > 1.5 m - 3.0 m (> 4'8"-9'7") [20 pts]	15
COMMENTSAVERAGE BANKFULL WIDTH (makes)	
This information <u>must</u> also be completed RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆	
RIPARIAN WIDTH FLOODPLAIN QUALITY	
L R (Per Bank) L R (Most Predominant per Bank) L R  ☐ Wide >10m ☐ Mature Forest, Wetland ☐ ☐ Conservation Tillage	
Immature Forest, Shrub or Old	
Field Open Pasture, Row	
Narrow Com	
may notice to toposal assets	_
	:
FLOW REGIME (At Time of Evaluation) (Check ONLY one box):  Stream Flowing	t)
Subsurface flow with isolated pools (Interstitial)  Dry channel, no water (Ephemeral)	
COMMENTS	_

2.0 2.5

☐ Moderate to Severe

Severe (10 ft/100 ft)

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

Moderate (2 1/100 ft)

1.0

1.5

☐ Flat (0.5 h/100 ft)

None

STREAM GRADIENT ESTIMATE

Flat to Moderate

0.5

#### Stream HS-M3

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed	);
QHEI PERFORMED? - Yes No QHEI Score (If Yes, A	
DOWNSTREAM DESIGNATED USE(S)	
DOWNSTREAM DESIGNATED USE(S)  ☐ WWH Name:	Distance from Evaluated Stream
CWH Name:	Distance from Evaluated Stream
EWH Name:	Distance from Evaluated Stream
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSH	ED AREA. CLEARLY MARK THE SITE LOCATION
USGS Quadrangle Name: NRCS Soil Ma	p Page: $NR$ NRCS Soil Map Stream Order $NR$
county Hardin County Township/City M	arion Township
MISCELLANEOUS	
Base Flow Conditions? (Y/N): V Date of last precipitation: 5/18/18	Quantity: < . \
Photograph Information:	
Elevated Turbidity? (Y/N): Canopy (% open): C	
Were samples collected for water chemistry? (Y/N): (Note lab sample no. or id	I, and attach results) Lab Number: NA
Field Measures: Temp (°C) NADissolved Oxygen (mg/l) NA pH (S.U.)	
Is the sampling reach representative of the stream (Y/N) If not, please explain:	
is the sampling reach representative of the stream (Y/N) If not, prease exprain:_	
Additional comments/description of pollution impacts:	
	<u> </u>
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations. Voucher collections option	nal. NOTE; all voucher samples must be labeled with the site
ID number. Include appropriate field data sheets from the	
Fish Observed? (Y/N) Voucher? (Y/N) Asalamanders Observed? (Y/N) Frogs or Tadpotes Observed? (Y/N) Voucher? (Y/N) Aquatic Macroinverteb	N/ Voucher? (Y/N) N/A
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) Aquatic Macroinverteb	rates Observed? (Y/N) \ \ Voucher? (Y/N) \ \ V
Comments Regarding Biology:	
DDAMENO AND NADDATE DECORPTION OF CHIEFA	DEACU/This must be completedly
DRAWING AND NARRATIVE DESCRIPTION OF STREAM Include Important landmarks and other features of interest for site evaluation	
include anjudical randinants and other leadines of like est for site evaluation	and a manage description of the scream a recursor
1 (till	
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	-104
FLOW TO CONTRACT OF THE PROPERTY OF THE PROPER	, 76
THE COLORS	Va
	ver l'ox
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1	<b>\</b>

PHWH Form Page - 2



#### Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score:	25
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Stream & Location:	RM:Date:\\\5/\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
Stream HS-MH sa	orers Full Name & Affiliation: M. Moinar TR C
River Code:STORET #:	Lat./Long.:40.6598 /83.7978 Office verified location
1] SUBSTRATE Check ONLYTwo substrate TYPE BOXES; estimate % or note every type present	Check ONE (Or 2 & average)
BEST TYPES POOL RIFFLE OTHER TYPES	POOL RIFFLE ORIGIN QUALITY
☐ ☐ BLDR /SLABS [10] ☐ ☐ HARDPAN [4]	LIMESTONE [1]   HEAVY [-2]   WE TILLS [1]   WITH MODERATE [-1] Substrate
□ □ BOULDER [9]       □ □ DETRITUS [3]         □ □ COBBLE [8]       □ MUCK [2]	SILT   MODERATE [-1] Substrate
GRAVEL [7] TO HO   SILT [2]	BO BO HARDPAN [0] FREE [1] SANDSTONE [0] LODE LEXTENSIVE [-2]
SAND [6] 2O	ibstrates; ignore ☐ RIP/RAP [0] Maximum
NUMBER OF BEST TYPES: 4 or more [2] sludge from	point-sources) LACUSTURINE [0] I NORMAL [0] 20
Comments	☐ SHALE [-1] ☐ NONE [1] ☐ COAL FINES [-2]
7+2+0+0-1-1	
2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1	of highest quality of in small amounts of highest
quality; 3-Highest quality in moderate or greater amounts (e.g., ve diameter log that is stable, well developed rootwad in deep / fast v	ery large boulders in deep or fast water, large Check ONE (Or 2 & average)
	m [2] OXBOWS, BACKWATERS [1] MODERATE 25-75% [7]
OVERHANGING VEGETATION [1] Q ROOTWADS	[1] O AQUATIC MACROPHYTES [1] SPARSE 5-<25% [3]
SHALLOWS (IN SLOW WATER) [1] BOULDERS [	1] O LOGS OR WOODY DEBRIS [1] NEARLY ABSENT <5% [1]
Comments	Maximum 🦪
<u> </u>	20 Q
3] CHANNEL MORPHOLOGY Check ONE in each categor	
SINUOSITY DEVELOPMENT CHANNELIZ  One of the control	ATION STABILITY  ☐ HIGH [3]
☐ MODERATE [3] ☐ GOOD [5] ☐ RECOVERED [4]	MODERATE [2]
□ LOW [2]         □ FAIR [3]         ■ RECOVERING [3]           ■ NONE [1]         □ RECENT OR NO	Channel
■ NONE [1] ■ POOR [1] □ RECENT OR NO Comments	Maximum (C)
1+1+3+1	20 5
4] BANK EROSION AND RIPARIAN ZONE Check ON River right looking downstream RIPARIAN WIDTH	
R KII AKAM	FLOOD PLAIN QUALITY FOREST, SWAMP [3]  CONSERVATION TILLAGE [1]
□ □ NONE / LITTLE [3] □ □ MODERATE 10-50m [3] □	☐ SHRUB OR OLD FIELD [2] ☐ ☐ URBAN OR INDUSTRIAL [0]
	☐ RESIDENTIAL, PARK, NEW FIELD [1] ☐ ☐ MINING / CONSTRUCTION [0] ☐ FENCED PASTURE [1] Indicate predominant land use(s)
□ NONE [0]	Indicate predominant land use(s)  Pen Pasture, ROWCROP [N]  Indicate predominant land use(s) past 100m riparian. Riparian
O a manuscrate	
Comments	Maximum
Q+ 1+O	Maximum 10
2+ + O 5] POOL / GLIDE AND RIFFLE / RUN QUALITY	10 18
5] POOL / GLIDE AND RIFFLE / RUN QUALITY MAXIMUM DEPTH CHANNEL WIDTH Check ONE (ONLY!) Check ONE (Or 2 & average)	10 2/18
5] POOL / GLIDE AND RIFFLE / RUN QUALITY MAXIMUM DEPTH CHANNEL WIDTH Check ONE (ONLY!) Check ONE (Or 2 & average)	CURRENT VELOCITY Check ALL that apply TORRENTIAL [-1] SLOW [1]  Recreation Potential Primary Contact Secondary Contact
5] POOL / GLIDE AND RIFFLE / RUN QUALITY MAXIMUM DEPTH CHANNEL WIDTH Check ONE (ONLY!) Check ONE (Or 2 & average)	CURRENT VELOCITY Check ALL that apply  Recreation Potential Primary Contact
5] POOL / GLIDE AND RIFFLE / RUN QUALITY  MAXIMUM DEPTH Check ONE (ONLY!)    > 1m [6]	CURRENT VELOCITY Check ALL that apply  TORRENTIAL [-1] SLOW [1] VERY FAST [1] INTERSTITIAL [-1] FAST [1] INTERMITTENT [-2]  MODERATE [1] EDDIES [1]  Pool/
Channel Width   Check One (ONLY!)	CURRENT VELOCITY Check ALL that apply TORRENTIAL [-1] SLOW [1] VERY FAST [1] INTERSTITIAL [-1] FAST [1] EDDIES [1] Indicate for reach - pools and riffles.  Recreation Potential Primary Contact Secondary Contact (circle one and comment on back)
5] POOL / GLIDE AND RIFFLE / RUN QUALITY  MAXIMUM DEPTH  Check ONE (ONLY!)    > 1m [6]	CURRENT VELOCITY Check ALL that apply TORRENTIAL [-1] SLOW [1] VERY FAST [1] INTERSTITIAL [-1] FAST [1] DINTERMITTENT [-2] MODERATE [1] EDDIES [1] Indicate for reach - pools and riffles.  Recreation Potential Primary Contact Secondary Contact (circle one and comment on back)  Pool/Current Maximum 12
5] POOL / GLIDE AND RIFFLE / RUN QUALITY  MAXIMUM DEPTH Check ONE (ONLY!)    > 1m [6]	CURRENT VELOCITY Check ALL that apply TORRENTIAL [-1] SLOW [1] VERY FAST [1] INTERSTITIAL [-1] FAST [1] DINTERMITTENT [-2] MODERATE [1] EDDIES [1] Indicate for reach - pools and riffles.  Recreation Potential Primary Contact Secondary Contact (circle one and comment on back)  Pool/Current Maximum 12
5] POOL / GLIDE AND RIFFLE / RUN QUALITY  MAXIMUM DEPTH Check ONE (ONLY!)    > 1m [6]	CURRENT VELOCITY Check ALL that apply TORRENTIAL [-1] SLOW [1] VERY FAST [1] INTERSTITIAL [-1] FAST [1] INTERMITTENT [-2] MODERATE [1] EDDIES [1] Indicate for reach - pools and riffles.  De large enough to support a population INE (Or 2 & average).  LE / RUN SUBSTRATE RIFFLE / RUN EMBEDDEDNESS
5] POOL / GLIDE AND RIFFLE / RUN QUALITY  MAXIMUM DEPTH Check ONE (ONLY!)    > 1m [6]	CURRENT VELOCITY Check ALL that apply TORRENTIAL [-1] SLOW [1] VERY FAST [1] INTERSTITIAL [-1] FAST [1] EDDIES [1] Indicate for reach - pools and riffles.  De large enough to support a population INE (Or 2 & average).  LE / RUN SUBSTRATE RIFFLE / RUN EMBEDDEDNESS  LE (e.g., Cobble, Boulder) [2]  Recreation Potential Primary Contact Secondary Contact (circle one and comment on back)  Recreation Potential Primary Contact Secondary Contact Sec
5] POOL / GLIDE AND RIFFLE / RUN QUALITY  MAXIMUM DEPTH Check ONE (ONLY!)    > 1m [6]	CURRENT VELOCITY Check ALL that apply TORRENTIAL [-1] SLOW [1] VERY FAST [1] INTERSTITIAL [-1] FAST [1] INTERMITTENT [-2] MODERATE [1] EDDIES [1] Indicate for reach - pools and riffles.  be large enough to support a population INE (Or 2 & average).  LE / RUN SUBSTRATE RIFFLE / RUN EMBEDDEDNESS LE (e.g., Cobble, Boulder) [2] STABLE (e.g., Large Gravel) [1]  ABLE (e.g., Fine Gravel, Sand) [0]  Recreation Potential Primary Contact Secondary Contact (circle one and comment on back)  Recreation Potential Primary Contact Secondary Con
5] POOL / GLIDE AND RIFFLE / RUN QUALITY  MAXIMUM DEPTH CHANNEL WIDTH  Check ONE (ONLY!) Check ONE (Or 2 & average)    > 1m [6]   POOL WIDTH > RIFFLE WIDTH [7]    0.7-<1m [4]   POOL WIDTH = RIFFLE WIDTH [7]    0.2-<0.4m [7] POOL WIDTH < RIFFLE WIDTH [8]    0.2-<0.4m [9]  Comments	CURRENT VELOCITY Check ALL that apply TORRENTIAL [-1] SLOW [1] VERY FAST [1] INTERSTITIAL [-1] FAST [1] INTERMITTENT [-2] MODERATE [1] EDDIES [1] Indicate for reach - pools and riffles.  be large enough to support a population INE (Or 2 & average).  LE / RUN SUBSTRATE RIFFLE / RUN EMBEDDEDNESS  LE (e.g., Cobble, Boulder) [2] STABLE (e.g., Large Gravel) [1]  Recreation Potential Primary Contact Secondary Contact (circle one and comment on back)  Recreation Potential Primary Contact Secondary Co
5] POOL / GLIDE AND RIFFLE / RUN QUALITY  MAXIMUM DEPTH CHANNEL WIDTH  Check ONE (ONLY!) Check ONE (Or 2 & average)    > 1m [6]   POOL WIDTH > RIFFLE WIDTH [7]    0.7-<1m [4]   POOL WIDTH = RIFFLE WIDTH [7]    0.2-<0.4m [1] POOL WIDTH < RIFFLE WIDTH [0]    0.2-<0.4m [1] POOL WIDTH < RIFFLE WIDTH [0]    0.2-<0.4m [1] ROUL WIDTH < RIFFLE WIDTH [0]    0.2	CURRENT VELOCITY Check ALL that apply TORRENTIAL [-1] SLOW [1] VERY FAST [1] INTERSTITIAL [-1] FAST [1] EDDIES [1] Indicate for reach - pools and riffles.  be large enough to support a population INE (Or 2 & average).  LE / RUN SUBSTRATE RIFFLE / RUN EMBEDDEDNESS LE (e.g., Cobble, Boulder) [2] STABLE (e.g., Large Gravel) [1] ABLE (e.g., Fine Gravel, Sand) [0]  Recreation Potential Primary Contact Secondary Contact (circle one and comment on back)  Recreation Potential Primary Contact Secondary
5] POOL / GLIDE AND RIFFLE / RUN QUALITY  MAXIMUM DEPTH CHANNEL WIDTH  Check ONE (ONLY!) Check ONE (Or 2 & average)    > 1m [6]   POOL WIDTH > RIFFLE WIDTH [7]    0.7-<1m [4]   POOL WIDTH = RIFFLE WIDTH [7]    0.2-<0.4m [7] POOL WIDTH < RIFFLE WIDTH [8]    0.2-<0.4m [9]  Comments	CURRENT VELOCITY Check ALL that apply TORRENTIAL [-1] SLOW [1] VERY FAST [1] INTERSTITIAL [-1] FAST [1] INTERMITTENT [-2] MODERATE [1] EDDIES [1] Indicate for reach - pools and riffles.  be large enough to support a population INE (Or 2 & average).  LE / RUN SUBSTRATE RIFFLE / RUN EMBEDDEDNESS LE (e.g., Cobble, Boulder) [2] STABLE (e.g., Large Gravel) [1]  ABLE (e.g., Fine Gravel, Sand) [0]  Recreation Potential Primary Contact Secondary Contact (circle one and comment on back)  Recreation Potential Primary Contact Secondary Con

#### **ChioEPA**

#### Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI	Score:	53	5

OL OL OL OLO BLC	
Stream & Location: STR-HS-MG	RM:Date:05/23/18
Elder Creck Scorers Full Name & Affiliation:	
River Code: STORET #: Lat./ Long.: 식인 . 실니 [	\ \ \ /83. \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
1] SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present Check C	NE (Or 2 & average)
BEST TYPES POOL RIFFLE OTHER TYPES POOL RIFFLE ORIGIN	QUALITY
BLDR /SLABS [10] — HARDPAN [4] — LIMESTONE [1]	☐ HEAVY [-2]
BOULDER [9] DETRITUS [3] TILLS [1]	SILT MODERATE [-1] Substrate
□□ COBBLE [8]	SILI □ NORMAL [0] □ FREE [1]
SAND [6] ARTIFICIAL [0] SANDSTONE [0]	CDDEA DEXTENSIVE [-2]
□ □ BEDROCK [5] (Score natural substrates; ignore □ RIP/RAP [0]	MODERATE [-1] Maximum
NUMBER OF BEST TYPES: 4 or more [2] sludge from point-sources) LACUSTURINE [0]	DEO ☐ EXTENSIVE [-2]  Maximum  NORMAL [0]  NONE [1]
☐ COAL FINES [-2]	
2+6+7+1-1-1	
2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common quality; 2-Moderate amounts, but not of highest quality or in small amounts	n of marginal AMOUNT
quality: 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water.	large Check ONE (Or 2 & average)
diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional UNDERCUT BANKS [1] POOLS > 70cm [2] OXBOWS, BACKWATE	·
OVERHANGING VEGETATION [1] ROOTWADS [1] AQUATIC MACROPHYT	
SHALLOWS (IN SLOW WATER) [1] BOULDERS [1] LOGS OR WOODY DEB	BRIS [1]
ROOTMATS [1]	Cover
	Maximum 20
3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)	
SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY	
☐ HIGH [4] ☐ EXCELLENT [7] ☐ NONE [6] ☐ HIGH [3]	
☐ MODERATE [3] ☐ GOOD [5] ☐ RECOVERED [4]	
□ LOW [2] ■ FAIR [3] ■ RECOVERING [3] ■ LOW [1] ■ NONE [1] □ POOR [1] □ RECENT OR NO RECOVERY [1]	Channel
Comments	Maximum 8,5
1+3+3+1,5	20 35
4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or	
River right looking downstream RIPARIAN WIDTH FLOOD PLAIN QUALIT	<u> </u>
ROSION   ☐   WIDE > 50m [4]   ☐ ☐ FOREST, SWAMP [3]   ☐ ☐ NONE / LITTLE [3]   ☐ MODERATE 10-50m [3]   ☐ SHRUB OR OLD FIELD [2]	☐ ☐ CONSERVATION TILLAGE [1] ☐ ☐ URBAN OR INDUSTRIAL [0]
■ MODERATE [2] □ □ NARROW 5-10m [2] □ □ RESIDENTIAL, PARK, NEW FIELD	
☐ HEAVY / SEVERE [1] ■	Indicate predominant land use(s)
☐ NONE [0] ☐ OPEN PASTURE, ROWCROP [0]  Comments	past 100m riparian. <b>Riparian</b> Anaximum
2+1+0	10
5] POOL / GLIDE AND RIFFLE / RUN QUALITY	
MAXIMUM DEPTH CHANNEL WIDTH CURRENT VELOCITY	Recreation Potential
Check ONE (ONLY!) Check ONE (Or 2 & average) Check ALL that apply  ☐ > 1m [6] POOL WIDTH > RIFFLE WIDTH [2] ☐ TORRENTIAL [-1] ■ SLOW [1]	Primary Contact
0.7-<1m [4] POOL WIDTH = RIFFLE WIDTH [1] VERY FAST [1] INTERSTIT	Secondary Contact  [AL [-1] (circle one and comment on back)
■ 0.4-<0.7m [2] POOL WIDTH < RIFFLE WIDTH [0] FAST [1] INTERMIT	ENT [-2]
☐ 0.2-<0.4m [1] ■ MODERATE [1] ■ EDDIES [1] ☐ < 0.2m [0] Indicate for reach - pools and riff	
Comments	Maximum 7 44 5
Indicate for functional riffler Boot areas much be large anough to armout	72
Indicate for functional riffles; Best areas must be large enough to support a of riffle-obligate species:  Check ONE (Or 2 & average).	NO RIFFLE [metric=0]
RIFFLE DEPTH RUN DEPTH RIFFLE / RUN SUBSTRATE RIFF	LE / RUN EMBEDDEDNESS
	□ NONE [2]
BEST AREAS > 10cm [2] MAXIMUM > 50cm [2] STABLE (e.g., Cobble, Boulder) [2]	П . е. с.
☐ BEST AREAS 5-10cm [1] ☐ MAXIMUM < 50cm [1] ■ MOD. STABLE (e.g., Large Gravel) [1]	□ LOW [1] ■ MODERATE IOI Riffle /
☐ BEST AREAS 5-10cm [1] ☐ MAXIMUM < 50cm [1] ☐ MOD. STABLE (e.g., Large Gravel) [1] ☐ BEST AREAS < 5cm ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0] [metric=0]	MODERATE IOI Riffle /
☐ BEST AREAS 5-10cm [1] ☐ MAXIMUM < 50cm [1] ■ MOD. STABLE (e.g., Large Gravel) [1] ☐ BEST AREAS < 5cm ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	
□ BEST AREAS 5-10cm [1] □ MAXIMUM < 50cm [1] ■ MOD. STABLE (e.g., Large Gravel) [1] □ BEST AREAS < 5cm □ UNSTABLE (e.g., Fine Gravel, Sand) [0] Comments □ + □ + □ + □ ← □ GRADIENT (□, %5 ft/mi) ■ VERY LOW - LOW [2-4] %POOL: □ (□)	MODERATE [0] Riffle / Run   S   LIP   S   LIP
BEST AREAS 5-10cm [1] MAXIMUM < 50cm [1] MOD. STABLE (e.g., Large Gravel) [1] UNSTABLE (e.g., Fine Gravel, Sand) [0]  Comments UNSTABLE (e.g., Fine Gravel, Sand) [0]  GRADIENT (4,85 ft/mi) VERY LOW - LOW [2-4] %POOL: ONE MODERATE [6-10]	MODERATE [0] Riffle / Run   S   H9.5
□ BEST AREAS 5-10cm [1] □ MAXIMUM < 50cm [1] ■ MOD. STABLE (e.g., Large Gravel) [1] □ BEST AREAS < 5cm □ UNSTABLE (e.g., Fine Gravel, Sand) [0]   Comments □ + 2 + 1 + 6  6] GRADIENT (□, 55f/mi) ■ VERY LOW - LOW [2-4] %POOL: □ MODERATE [6-10]	MODERATE [0] Riffle / Run   S   L/9   S   WGLIDE: (4) Gradient (1)

ess directions, etc.		FI MEASUREMENTS  x width x depth max. depth y bankfull width bankfull x depth W/D ratio bankfull max. depth floodprone x² width entrench. ratio Legacy Tree:	TO TO TO		AN AN
Comment RE: Reach consistency/ is reach typical of steam?, Recreation/Observed - Inferred, Other/Sampling observations, Concerns, Access directions, etc.   O'F+O+WM  U_C-Location   O + Location   O + L		EJ ISSUES WWATP / CSO / NPDES / INDUSTRY HARDENED / URBAN / DIRTAGRIME CONTAMINATED / LANDFILL BMPS-CONSTRUCTION-SEDIMENT LOGGING / IRRIGATION / COOLING BANK / EROSION / SURFACE FALSE BANK / MANURE / LAGOON WASH H <sub>2</sub> 0 / TILE / H <sub>2</sub> 0 TABLE ACID / MINE / QUARRY / FLOW NATURAL / WETLAND / STAGNANT PARK / GOLF / LAWN / HOME ATMOSPHERE / DATA PAUCITY		2000 July 2000	
n/Observed - Inferred, <i>Other</i> r		Circle same & COMMENT		Riun Riun sand ba	Don Coop
The Att M	}	DJ MAINTENANCE PUBLIC / PRIVATE / BOTH / NA ACTIVE / HISTORIC / BOTH / NA YOUNG-SUCCESSION-OLD SPRAY / SNAG / REMOVED MODIFIED / DIPPED OUT / NA LEVEED / ONE SIDED RELOCATED / CUTOFFS MOVING-BEDLOAD-STABLE ARMOURED / SLUMPS ISLANDS / SCOURED IMPOUNDED / DESICCATED	Gos mox		
10' Ft OHW M		ARITY  BJAESTHETICS  PIP PRISS-2nd   NUISANCE ALGAE  SIM   INVASIVE MACROPHYTES  CIM   INVASIVE MACROPHYTES  CIM		grade	VB OB COBBR
GE Dass-2nd		CL CL 20:44	Stream Drawing:		Share state of the

			<b>A</b>
U	•	7	4

#### Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: (ユラ)
/ 1 <del>                                    </del>

Stream & Location; Stream HS-MO RM: Date:06/21/8
Scorers Full Name & Affiliation: M. Molnar
River Code: STORET #: Lat./Long.:40.6746/183.8050 Office verified location
1] SUBSTRATE Check ONLYTwo substrate TYPE BOXES; estimate % or note every type present Check ONE (Or 2 & average)
BEST TYPES POOL RIFFLE OTHER TYPES POOL RIFFLE ORIGIN QUALITY    BLDR /SLABS [10]
NUMBER OF BEST TYPES: 4 or more [2] sludge from point-sources) LACUSTURINE [0] \$\frac{1}{20}\$ NORMAL [0] \$\frac{1}{20}\$ NONE [1]
COAL FINES [-2]
2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal AMOUNT
2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.  UNDERCUT BANKS [1]
3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)
SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY
☐ HIGH [4]       ☐ EXCELLENT [7]       ☐ NONE [6]       ☐ HIGH [3]         ☐ MODERATE [3]       ☐ GOOD [5]       ☐ RECOVERED [4]       ☐ MODERATE [2]         ☐ LOW [2]       ☐ FAIR [3]       ☐ RECOVERING [3]       ☐ LOW [1]         ☐ NONE [1]       ☐ POOR [1]       ☐ RECENT OR NO RECOVERY [1]         Comments       Maximum 20
4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)  River right looking downstream RIPARIAN WIDTH FLOOD PLAIN QUALITY  EROSION
Comments  Maximum 10
5] POOL / GLIDE AND RIFFLE / RUN QUALITY MAXIMUM DEPTH CHANNEL WIDTH CURRENT VELOCITY Recreation Potential
Check ONE (ONLY!) Check ONE (Or 2 & average) Check ALL that apply  > 1m [6] POOL WIDTH > RIFFLE WIDTH [2] TORRENTIAL [-1] SLOW [1]  0.7-<1m [4] POOL WIDTH = RIFFLE WIDTH [1] VERY FAST [1] INTERSTITIAL [-1]  0.4-<0.7m [2] POOL WIDTH < RIFFLE WIDTH [0] FAST [1] DINTERMITTENT [-2]  0.2-<0.4m [1] MODERATE [1] DEDIES [1]    o.2-m [0] Indicate for reach - pools and riffles.
Comments 2+2+\
Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:  Check ONE (Or 2 & average).  RIFFLE DEPTH RUN DEPTH RIFFLE / RUN SUBSTRATE RIFFLE / RUN EMBEDDEDNESS  BEST AREAS > 10cm [2] MAXIMUM > 50cm [2] STABLE (e.g., Cobble, Boulder) [2] NONE [2]  BEST AREAS 5-10cm [1] MAXIMUM < 50cm [1] MOD. STABLE (e.g., Large Gravel) [1] LOW [1]  BEST AREAS < 5cm MODERATE [0] Riffle / Run MAXIMUM
6] GRADIENT (1,75 ft/mi) VERY LOW - LOW [2-4]  DRAINAGE AREA MODERATE [6-10] MODERATE [6-10] WRUN: 0 %RIFFLE:  Maximum 10 %RUN: 0 %RIFFLE:

# stream HS-MG

cess directions, etc.			, , , , , , , , , , , , , , , , , , ,		F] MEASUREMENTS	x width x death	max depth	x bankfull width	bankfull ⊼ depth	W/D ratio	bankfull max. depth	floodprone x* width	entrench. ratio	Legacy Tree:	
typical of steam?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.			* 4	٠	EJ ISSUES	HARDENED/URBAN/DIRT&GRIME	CONTAMINATED / LANDFILL	BMPs-CONSTRUCTION-SEDIMENT	LUGGING / IRRIGATION / COULING BANK / EROSION / SURFACE	FALSE BANK / MANURE / LAGOON	WASH H <sub>2</sub> 0 / TILE / H <sub>2</sub> 0 TABLE	ACID / MINE / QUARRY / FLOW	NATURAL / WETLAND / STAGNANT	PARK / GOLF / LAWN / HOME	ATMOSPHERE / DATA PAUCITY
/ Observed - Inferred, <i>Other</i> /					Circle some & COMMENT										
reach typical of steam?, <i>Recreation</i>				The state of the s	DJ NAINTENANCE	ACTIVE / HISTORIC / BOTH / NA	YOUNG-SUCCESSION-OLD	SPRAY / SNAG / REMOVED	MODIFIED / DIPPED OUT / NA LEVEED / ONE SIDED	RELOCATED / CUTOFFS	MOVING-BEDLOAD-STABLE	ARMOURED / SLUMPS	ISLANDS / SCOURED	IMPOUNDED / DESICCATED	FLOOD CONTROL / DRAINAGE
Comment RE: Reach consistency/ Is reach Recent rayo	CHWM: K' wid				BJAESTHETICS	☐ INVASIVE MACROPHYTES	☐ EXCESS TURBIDITY	DISCOLORATION	☐ FUAM / SCUM	☐ TRASH / LITTER	☐ NUISANCE ODOR	SLUDGE DEPOSITS	CSOs/SSOs/OUTFALLS	ATION AREA DEPTH	POOL: □>100ft²□>3ft
AJ SAMPLED REACH Check ALL that apply	0	<u> </u>	OTHER ONDRINAL	DISTANCE DRY D.	☐ 0.5 Km CLARITY ☐ 0.2 Km 1stsample pass 2nd	□ 0.15 Km □ < 20 cm □ 0.12 Km □		+0-10 cm	meters SECCHI DEPTH	CANOPY 1st cm	sse	☐ 55%.~<85% 2nd		☐ 10%.<30% CI PROPRATION	SED

Stream Drawing:

ROW Crop

001 dML

# STR-45-M10

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

		5g	
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SITE NAMELOCATION HOLL SOVOY TO SOVOY T	).99
NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Ins	structions
STREAM CHANNEL ONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO REMODIFICATIONS:	
1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.  TYPE PERCENT TYPE  BLDR SLABS [16 pts] SILT [3 pt]  BOULDER (>256 mm) [16 pts] SILT [3 pt]  CGBBLE (65-256 mm) [12 pts] SILT [3 pts]  CGBBLE (65-256 mm) [12 pts] SILT [3 pts]  CLAY or HARDPAN [0 pts]  GRAVEL (2-64 mm) [9 pts] MUCK [0 pts]  SAND (<2 mm) [6 pts] ARTIFICIAL [3 pts]  Total of Percentages of Bidr Stabs, Boulder, Cobble, Bedrock  SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:	HHEI Metric Points Substrate Max = 40
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):    > 30 centimeters [20 pts]	Pool Depth Max = 30
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):    > 4.0 m eters (> 13) [30 pts]	Bankfull Width Max=30
This information must also be completed  RIPARIAN ZONE AND FLOODPLAIN QUALITY ANOTE: River Left (L) and Right (R) as looking downstream RIPARIAN WIDTH FLOODPLAIN QUALITY  I R (Per Bank)	e , , ion
SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):  None	10 R/100 R)

## Stream HS-MID

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed	<u>):</u>
QHEI PERFORMED? - Yes No QHEI Score(If Yes, /	Attach Completed QHEI Form)
DOWNSTREAM DESIGNATED USE(S)  WWH Name:  CWH Name:	
MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSH	•
	p Page: NA NRCS Soil Map Stream Order N/A
County: Hardin County Township/City: M	WINDER COMITS AND
MISCELLANEOUS	. "
Base Flow Conditions? (Y/N): Date of last precipitation: 6/11/18	Quantity: 1
Photograph Information:	·
Elevated Turbidity? (Y/N): Canopy (% open): \( \frac{100%}{\logote}	
Were samples collected for water chemistry? (Y/N):(Note lab sample no. or k	d. and attach results) Lab Number
Field Measures: Temp (°C)NAA Dissolved Oxygen (mg/l) NAA pH (S.U.)	NA Conductivity (µmhos/cm)
is the sampling reach representative of the stream (Y/N) / If not, please explain:_	4.
Additional comments/description of pollution Impacts:	
BIOTIC EVALUATION	
Performed? (Y/N): (If Yes, Record all observations. Voucher collections option ID number. Include appropriate field data sheets from the	nal. NOTE; all voucher samples must be labeled with the site Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) Voucher? (Y/N) Salamanders Observed? (Y/N) Frogs or Tadpoles Observed? (Y/N) Voucher? (Y/N) WAquatic Macroinverteb	Voucher? (Y/N) N/A vates Observed? (Y/N) N Voucher? (Y/N) W/A
Comments Regarding Biology:	
DRAWING AND NARRATIVE DESCRIPTION OF STREAM	M REACH (This <u>must</u> be completed):
Include Important landmarks and other features of Interest for sita evaluation	and a narrative description of the stream's location
ROW Crops	cobble
80	
FLOW -	
Company of the second s	manage of the same
gravel David (vo)	)5 granel cobble curent
0 2011	The colvert
	· '

## **ChioEPA**

## Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score:	47
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Stream & Location: STR-HS-MII	RM: Date: 6/  4/  8
Scorers Full Name & Affiliation.	
River Code: STORET #: Lat./ Long.:40 . ( 52	5 /83 8376 Office verified location □
1] SUBSTRATE Check ONLYTwo substrate TYPE BOXES; estimate % or note every type present  BEST TYPES POOL RIFFLE OTHER TYPES POOL RIFFLE ORIGIN	ONE (Or 2 & average)  QUALITY
BLDR /SLABS [10]	☐ HEAVY [-2]  SHIT ■ MODERATE [-1] Substrate
□ COBBLE [8] □ MUCK [2] □ WETLANDS [0] □ GRAVEL [7] □ GR	□ NORMAL [0]
SAND [6] SANDSTONE [0] SANDSTONE [0] SANDSTONE [0] SCore natural substrates; ignore RIP/RAP [0] NUMBER OF BEST TYPES: 4 or more [2] sludge from point-sources) LACUSTURINE [0]	MODERATE [-1]  Moderate [-1]  Maximum  Normal [0]  None [1]
Comments Shale [-1] SHALE [-1] COAL FINES [-2]	□ NONE [1]
7+2+2+(-\-) 2] INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common	on of morainal
quality; 2-Moderate amounts, but not of highest quality or in small amounts quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functiona    UNDERCUT BANKS [1]	cof highest r, large Check ONE ( <i>Or 2 &amp; average</i> )  I pools. □ EXTENSIVE >75% [11]  ERS [1] ■ MODERATE 25-75% [7]  /TES [1] □ SPARSE 5-<25% [3]
Comments	Maximum 2
1+1+1+1+7	20 20
3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average) SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY	
☐ HIGH [4]       ☐ EXCELLENT [7]       ☐ NONE [6]       ☐ HIGH [3]         ☐ MODERATE [3]       ☐ GOOD [5]       ☐ RECOVERED [4]       ☐ MODERATE [2]         ☐ LOW [2]       ☐ FAIR [3]       ☐ RECOVERING [3]       ☐ LOW [1]         ☐ NONE [1]       ☐ POOR [1]       ☐ RECENT OR NO RECOVERY [1]	Channel
Comments 2+3+3+1.5	Maximum M.S.31.5
4] BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (C	· - /
River right looking downstream RIPARIAN WIDTH FLOOD PLAIN QUALI	TY
□ □ NONE / LITTLE [3] □ □ MODERATE 10-50m [3] □ □ SHRUB OR OLD FIELD [2]	☐ ☐ URBAN OR INDUSTRIAL [0]
■ MODERATE [2]	Indicate predominant land use(s)
Comments	Maximum 3
2+1+0	10 33
5] POOL / GLIDE AND RIFFLE / RUN QUALITY MAXIMUM DEPTH CHANNEL WIDTH CURRENT VELOCITY	Recreation Potential
Check <b>ONE</b> ( <i>ONLY!</i> ) Check ONE ( <i>Or 2 &amp; average</i> ) Check ALL that apply ☐ > 1m [6] POOL WIDTH > RIFFLE WIDTH [2] ☐ TORRENTIAL [-1] ■ SLOW [1]	Primary Contact Secondary Contact
9 0.7-<1m [4] POOL WIDTH = RIFFLE WIDTH [1] VERY FAST [1] INTERSTION OF THE PROPERTY OF THE PR	TIAL [-1] (circle one and comment on back) TENT [-2]
<b>2</b> 0.2-<0.4m [1]	
Comments $ +2+ + + $	Maximum 39.5
Indicate for functional riffles; Best areas must be large enough to support of riffle-obligate species:  Check ONE (Or 2 & average).	a population ☐NO RIFFLE [metric=0]
	FLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2] ☐ MAXIMUM > 50cm [2] ☐ STABLE (e.g., Cobble, Boulder) [2] ☐ BEST AREAS 5-10cm [1] ☐ MAXIMUM < 50cm [1] ☐ MOD. STABLE (e.g., Large Gravel) [1]	□ NONE [2] □ LOW [1]
☐ BEST AREAS < 5cm ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0] [metric=0]	MODERATE [0] Riffle / Run   S   S   S   S   S   S   S   S   S
Comments 1+1+1.5+0	- Waximum 8
6] GRADIENT (4,83 ft/mi) 届 VERY LOW - LOW [2-4] %POOL: DRAINAGE AREA	%GLIDE: 45 Gradient
(I, I mi2) HIGH - VERY HIGH [10-6] %RUN:	%RIFFLE:

3"

		<del></del>		
ess directions, etc.	F) MEASUREMENTS  X width X depth max. depth X bankfull width bankfull X depth W/D ratio bankfull max. depth floodprone x² width entrench. ratio Legacy Tree:		phys Sood Sood	
Comment RE: Reach consistency/ Is reach typical of steam?, Recreation/Observed - Inferred, Other/Sampling observations, Concerns, Access directions, etc.   CHN M aveaugh ら	EJ ISSUES WWYTP / CSO / NPDES / INDUSTRY HARDENED / URBAN / DIRT&GRIME CONTAMINATED / LANDFILL BMPS-CONSTRUCTION-SEDIMENT LOGGING / IRRIGATION / COOLING BANK / EROSION / SURFACE FALSE BANK / MANURE / LAGOON WASH H <sub>2</sub> 0 / TILE / H <sub>2</sub> 0 TABLE ACID / MINE / QUARRY / FLOW NATURAL / WETLAND / STAGNANT PARK / GOLF / LAWN / HOME ATMOSPHERE / DATA PAUCITY		Solder Sith Sand Sith Sand Solder gravel	
v/ Observed - Inferred, <i>Other</i>	Circle some & COMMENT			
reach typical of steam?, Recreatio	DJ MAINTENANCE PUBLIC / PRIVATE / BOTH / NA ACTIVE / HISTORIC / BOTH / NA YOUNG-SUCCESSION-OLD SPRAY / SNAG / REMOVED MODIFIED / DIPPED OUT / NA LEVEED / ONE SIDED RELOCATED / CUTOFFS MOVING-BEDLOAD-STABLE ARMOURED / SLUMPS ISLANDS / SCOURED IMPOUNDED / DESICCATED FLOOD CONTROL / DRAINAGE	Crop		Crop
CHWM ANWAR	BJ AESTHETICS  □ NUISANCE ALGAE  □ INVASIVE MACROPHYTES  □ EXCESS TURBIDITY  □ DISCOLORATION  □ FOAM / SCUM  □ OIL SHEEN  □ TRASH / LITTER  □ NUISANCE ODOR  □ SLUDGE DEPOSITS  □ CSOS/SSOS/OUTFALLS  470M AREA DEPTH  POOL: □ >100ft² □>3ft	ROM		Row
EACH at apply STAGE sample pass. 2nd HIGH UP	DISTANCE	Stream Drawing:	Pool Sand Day	
4.4	•		1 .	

## **OhioEPA**

## Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI	Score:	(A3)
QHEI	Score:	(42)

River Code: STORET #: Lat / Long 1.1. (2.11 + 183 & 2.0.8 ) Office verified DISS Lat / Long 1.1. (2.11 + 183 & 2.0.8 ) Office verified DISS Lat / Long 1.1. (2.11 + 183 & 2.0.8 ) Office verified DISS Lat / Long 1.1. (2.11 + 183 & 2.0.8 ) Office verified DISS Lat / Long 1.1. (2.11 + 183 & 2.0.8 ) Office verified DISS Lat / Long 1.1. (2.11 + 183 & 2.0.8 ) Office verified DISS Lat / Long 1.1. (2.11 + 183 & 2.0.8 ) Office verified DISS Lat / Long 1.1. (2.11 + 183 & 2.0.8 ) Office verified DISS Lat / Long 1.1. (2.11 + 183 & 2.0.8 ) Office verified DISS Lat / Long 1.1. (2.11 + 183 & 2.0.8 ) OCIALITY CHAPTER DISS Lat / Long 1.1. (2.11 + 183 & 2.0.8 ) OCIALITY CHAPTE
SALLOWS (N. SLOWWATER)   POOL STABLITY   SALLOWS (N. SLOWWATER)   RECOVERED   POOL STABLITY   SALLOWS (N. SLOWWATER)   POOL STABLITY   POOL STABLIT
BEST TYPES POOL RIFLE OTHER TYPES POOL RIFLE ON GRIGIN ORIGIN OUALITY    BEURISLASS [10]
BEST TYPES POOL RIFFLE   OTHER TYPES   OTHER
BeDUNGER [9]
COBBLE (8)
GRAVEL [7] 20 1 SAIL [7] SAID HARDEAN [9] FREE[1] SAID STORE [1] S
BEDROCK [5]   (Score natural substrates; (gnore   REPRARAJO)   (Score natural substrates; (gnore natural substrates;
NUMBER OF BEST TYPES:
Comments    Sor loss [0]   SHALE[f1]   DINNE[f1]
DOAD-Nies 127   Channel
2] INSTREAM COVER   Indicate presence 0 to 3: 0-Absent 1-Very small amounts or if more common of marginal quality; 3-Highest
cuality, 3-Highest quality in moderatio or greater amounts (e.g., very large boulders in deep or fast wator, large demoter tog that is stable, well-developed rockyad in deep? fast wator, large demoter tog that is stable, well-developed rockyad in deep? fast wator, or deep, vell-defined, functional pools.  D. UNDERCUT BANKS [1] POOLS > Toom [12] OXEOWS, BACKWATKERS [1] STABLLOWS (IN SLOW WATER) [1] ROOTWADS [1] ADJATIC MACROPHYTES [1] SPARSE \$5.25%, [3] NALLOWS (IN SLOW WATER) [1] BOULDERS [1] LOGS OR WOODY DEBRIS [1] SPARSE \$5.25%, [3] NEARLY ASSENT \$5.5% [1] SPARSE \$5.25%, [3]
Queneter of that is stable, well developed roctyred in deep / fast water, or deep, vell-defined, functional pools.   EXTENSIVE \$75%, [11]
OVERHANGING VEGETATION [1]
SHALLOWS (IN SLOW WATER) [1]
Comments    +   +   +     3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)   SINUOSITY DEVELOPMENT
I +   +   +
3] CHANNEL MORPHOLOGY Check ONE in each category (Or 2 & average)  SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY    High [4]
SINUOSITY DEVELOPMENT CHANNELIZATION STABILITY    High [3]
High [4]
LOW [2]
NONE [1] POOR [1] RECENT OR NO RECOVERY [1]  Comments    + + + + + + + + + + + + + + + + + +
A   BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)   River right looking downstream   RIPARIAN WIDTH   FLOOD PLAIN QUALITY   Conservation TILLAGE [1]   Gonservation TILLAGE [1]   Indicate predominant land use(s) past 100m riparian. Reparian Maximum [1]   Gonservation Tillage (Gonservation Tillage (Gonse
RIPARIAN WIDTH REROSION RIPARIAN WIDTH RESIDENTIAL PARK, NEW FIELD [2] RESIDENTIAL PARK, NEW FIELD [1] RESIDENTIAL PARK, NEW FIELD [2] RIPARIAN WIDTH RESIDENTIAL FIELD [2] RESIDENTIAL PARK, NEW FIELD [2] RESIDENTIAL FIEL
RIPARIAN WIDTH REROSION RIPARIAN WIDTH RESIDENTIAL PARK, NEW FIELD [2] RESIDENTIAL PARK, NEW FIELD [1] RESIDENTIAL PARK, NEW FIELD [2] RIPARIAN WIDTH RESIDENTIAL FIELD [2] RESIDENTIAL PARK, NEW FIELD [2] RESIDENTIAL FIEL
EROSION
NONE / LITTLE [3]
HEAVY / SEVERE [1]   VERY NARROW < 5m [1]   FENCED PASTURE [4]   Indicate predominant land use(s) past 100m riparian. Riparian Maximum [10]   S   POOL / GLIDE AND RIFFLE / RUN QUALITY   MAXIMUM DEPTH   CHANNEL WIDTH   Check ONE (ONLY)   Check ONE (Or 2 & average)   Check All that apply   POOL WIDTH > RIFFLE WIDTH [2]   TORRENTIAL [-1]   SLOW [1]   POOL WIDTH = RIFFLE WIDTH [1]   VERY FAST [1]   INTERSTITIAL [-1]   Secondary Contact (circle one and comment on back)   Comments   Pool / Winder Fast [1]   Indicate for reach - pools and riffles.   Current   Pool / Maximum   Pool / Poo
Comments    OPEN PASTURE ROWCROP   Open Past 100m riparian.   Riparian   Ripa
Comments    April   Ap
5] POOL / GLIDE AND RIFFLE / RUN QUALITY MAXIMUM DEPTH CHANNEL WIDTH CHANNEL WIDTH Check ONE (ONLY!) Check ONE (Or 2 & average) Check ALL that apply Check ONE (Or 2 & average) Check ALL that apply Check ALL that apply Contact Secondary Contact Secondary Contact Secondary Contact (circle one and comment on back)    0.7-<1m [4]   POOL WIDTH = RIFFLE WIDTH [7]   VERY FAST [7]   INTERMITTENT [-2]     0.4-<0.7m [2]   POOL WIDTH < RIFFLE WIDTH [9]   FAST [7]   INTERMITTENT [-2]     0.2-<0.4m [7]   MODERATE [7]   EDDIES [7]   Pool / Current Maximum 12
MAXIMUM DEPTH Check ONE (ONLY) Check ONE (ONLY) Check ONE (Or 2 & average) Check ALL that apply POOL WIDTH > RIFFLE WIDTH [1] Check ONE (Or 2 & average) Check ALL that apply Primary Contact Secondary Contact Secondary Contact (circle one and comment on back)    0.4 < 0.7 m [2]   0.2 < 0.4 m [1]   0.3 < 0.2 m [0]   0.4 < 0.7 m [2]   0.4 < 0.7 m [2]   0.5 < 0.5 m [0]   0.5 m [0
Check ONE (ONLY)  Check ONE (Or 2 & average)  Check ALL that apply  Primary Contact  Secondary Contact  Seco
Secondary Contact   Seco
O.A-<0.7m [2] POOL WIDTH < RIFFLE WIDTH [0] FAST [1] INTERMITTENT [-2]:  MODERATE [1] DEDDIES [1] Pool/ Indicate for reach - pools and riffles.  Comments + 2 + +
□ 0.2-<0,4m [1]  ■ < 0.2m [0]  Comments  → → → → → → → → → → → → → → → → → → →
Comments 0 + 2 + 1+1
0 + 2 + 1+ 12
Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:  Check ONE (Or 2 & average).
RIFFLE DEPTH RUN DEPTH RIFFLE / RUN SUBSTRATE RIFFLE / RUN EMBEDDEDNESS
☐ BEST AREAS > 10cm [2] ☐ MAXIMUM > 50cm [2] ☐ STABLE (e.g., Cobble, Boulder) [2] ☐ NONE [2]
☐ BEST AREAS 5-10cm [1] ☐ MAXIMUM < 50cm [1] ☐ MOD. STABLE (e.g., Large Gravel) [1] ☐ LOW [1] ☐ LOW [1] ☐ BEST AREAS < 5cm ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0] ☐ MODERATE [0] Riffle /
[metric=u] TEXTENSIVE [-1] Run [
Comments 19
6] GRADIENT ( ), 64 ft/mi) VERY LOW - LOW [2-4] %POOL: %GLIDE: 6 Gradient 44

oncems, Access directions, etc.					STAGNANT entrench ratto / HOME <i>Legacy Tree:</i> PAUCITY			book			B	(A.D. 190	· ·	
r/Sampling observations, C				WWTP / CSO / NPDES / INDUSTRY HARDENED / URBAN / DIRTRGRIME CONTAMINATED / LANDFILL BWIPS-CONSTRUCTION-SEDIMENT LOGGING / IRRIGATION / COOLING BANK / EROSION / SURFACE FALSE BANK / MANURE / LAGOON WASH H <sub>2</sub> 0 / TILE / H <sub>2</sub> 0 TABLE ACID / MINE / QUARRY / FLOW	NATURAL / WETLAND / STAGNANT PARK / GOLF / LAWN / HOME ATMOSPHERE / DATA PAUCITY		P. M. C. Office on the State of				CONTRACTOR OF THE PROPERTY OF		ر و ب	sit/sond
الالا Observed - Inferred, Othe				Circle some & COMMENT						8 8		Ken	80°	orange.
Comment RE: Reach consistency, Is reach typical of steam?, Recreation/Observed - Inferred, Other/Sampling observations, Concerns, Access directions, etc.    Dock Observations, Concerns, Access directions, etc.				DJ MAINTENANCE PUBLIC / PRIVATE / BOTH / NA ACTIVE / HISTORIC / BOTH / NA YOUNG-SUCCESSION-OLD SPRAY / SNAG / REMOVED MODIFIED / DIPPED OUT / NA LEVEED / ONE SIDED RELOCATED / CUTOFFS MOVING-BEDLOAD-STABLE ARMOURED / SLUMPS	IMPOUNDED / DESICCATED FLOOD CONTROL / DRAINAGE		CR 110			THE SAME OF THE PARTY OF THE PA	,	JON COD		· · · · · · · · · · · · · · · · · · ·
Comment RE: Reach consistency  DOCK ODSEVICE				BJAESTHETICS    NUISANCE ALGAE   INVASIVE MACROPHYTES   EXCESS TUTRIBIDITY   DISCOLORATION   FOAM / SCUM   OIL SHEEN   NUISANCE OBOOR   SLUBGE DEPOSITS   CSOS/SSOS/OUTFAILS	' <i>ДТјОN</i> акеа Вертн <i>РООL:</i> □>100f2 □>3ft			And the second s				X		
PLED REACH ock ALL that apply D STAGE	BOAT	OTHER	~	CLARITY  0.2 Km	☐ 10%-<30%	Stream Drawing:						Z		
<b>∀</b> ≥	니니!		ឧរ		100 <b>i</b> 6	J	. [		The state of the s	<del></del> -	A STATE OF THE STA			

## ChieEPA

# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score:		10	
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Stream & Location:	<u> </u>	UT roscit	TO KI	Hr	RM:	Date	5/10/13
River Code: -				me & Affiliation:		Inar	TRC
1] SUBSTRATE Chec	<del></del>		(NAD 83 - de	ong.:40 - 6 6 6	<u> </u>	8307	Office verified location
BEST TYPES	rate % or note every type	nresent '			ONE (Or 2 &	<b>O</b> ,	
BLDR/SLABS[10] BOULDER[9] COBBLE [8] GRAVEL [7] SAND [6] BEDROCK[5]	10 10 10 10 10 10 10 10 10 10 10 10 10 1	ARTIFICIÁL [0] (Score natural substr [2] sludge from poi	ates; ignore Int-sources)	ORIGIN LIMESTONE [1] TILLS [1] WETLANDS [0] HARDPAN [0] SANDSTONE [0] RIP/RAP [0] LACUSTURINE [0]	SILT	QUAI HEAVY MODER NORMA FREE 11 EXTENS MODER NORMA NONE 11	[-2] ATE [-1] Substrat L [0]
Comments	3 or less [	נט <u>ן</u>	_	☐SHALE [-1] ☐COAL FINES [-2]		∐ NONE [1	1
<u> </u>	morpho man	<u>.</u>					
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	TWP IRC		

## **Exhibit I**

## PJM Feasibility Study AD1-130 May 2018

Christine M.T. Pirik (0029759) (Counsel of Record) William V. Vorys (0093479) Dickinson Wright PLLC 150 East Gay Street, Suite 2400 Columbus, Ohio 43215 Phone: (614) 591-5461

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Attorneys for Hardin Solar Energy II LLC

## Generation Interconnection Feasibility Study Report

## For

## PJM Generation Interconnection Request Queue Position AD1-130

Hardin Switch 345 kV

**May 2018** 

#### **Preface**

The intent of the feasibility study is to determine a plan, with ballpark cost and construction time estimates, to connect the subject generation to the PJM network at a location specified by the Interconnection Customer. The Interconnection Customer may request the interconnection of generation as a capacity resource or as an energy-only resource. As a requirement for interconnection, the Interconnection Customer may be responsible for the cost of constructing: (1) Direct Connections, which are new facilities and/or facilities upgrades needed to connect the generator to the PJM network, and (2) Network Upgrades, which are facility additions, or upgrades to existing facilities, that are needed to maintain the reliability of the PJM system.

In some instances a generator interconnection may not be responsible for 100% of the identified network upgrade cost because other transmission network uses, e.g. another generation interconnection, may also contribute to the need for the same network reinforcement. The possibility of sharing the reinforcement costs with other projects may be identified in the feasibility study, but the actual allocation will be deferred until the impact study is performed.

The Feasibility Study estimates do not include the feasibility, cost, or time required to obtain property rights and permits for construction of the required facilities. The project developer is responsible for the right of way, real estate, and construction permit issues. For properties currently owned by Transmission Owners, the costs may be included in the study.

#### General

Invenergy Solar Development North America, LLC proposes to install PJM Project #AD1-130, a 170.0 MW (115.0 MW Capacity) solar generating facility in Hardin County, OH (see Figure 2). The point of interconnection for the generating facility will be to interconnect to the proposed Hardin Switch 345 kV switching station connecting to AEP's East Lima – Marysville 345 kV line being built for PJM Project #U2-041 (See Figure 1).

The requested in service date is December 31, 2019.

#### **Attachment Facilities**

#### Point of Interconnection (Hardin Switch 345 kV)

To be constructed by PJM Project #U2-041.

**Note:** It is assume that the 345 kV revenue metering and gen lead installed for #U2-041 will be adequate for the additional generation.

#### **Interconnection Customer Requirements**

The Generation Interconnection Agreement does not in or by itself establish a requirement for American Electric Power to provide power for consumption at the developer's facilities. A separate agreement may be reached with the local utility that provides service in the area to ensure that infrastructure is in place to meet this demand and proper metering equipment is installed. It is the responsibility of the developer to contact the local service provider to determine if a local service agreement is required.

#### Requirement from the PJM Open Access Transmission Tariff:

- 1. An Interconnection Customer entering the New Services Queue on or after October 1, 2012 with a proposed new Customer Facility that has a Maximum Facility Output equal to or greater than 100 MW shall install and maintain, at its expense, phasor measurement units (PMUs). See Section 8.5.3 of Appendix 2 to the Interconnection Service Agreement as well as section 4.3 of PJM Manual 14D for additional information.
- 2. The Interconnection Customer may be required to install and/or pay for metering as necessary to properly track real time output of the facility as well as installing metering which shall be used for billing purposes. See Section 8 of Appendix 2 to the Interconnection Service Agreement as well as Section 4 of PJM Manual 14D for additional information.

#### **Revenue Metering and SCADA Requirements**

#### **PJM Requirements**

The Interconnection Customer will be required to install equipment necessary to provide Revenue Metering (KWH, KVARH) and real time data (KW, KVAR) for IC's generating Resource. See PJM Manuals M-01 and M-14D, and PJM Tariff Sections 24.1 and 24.2.

#### **AEP Requirements**

The Interconnection Customer will be required to comply with all AEP Revenue Metering Requirements for Generation Interconnection Customers. The Revenue Metering Requirements may be found within the "Requirements for Connection of New Facilities or Changes to Existing Facilities Connected to the AEP Transmission System" document located at the following link:

http://www.pjm.com/~/media/planning/plan-standards/private-aep/aep-interconnection-requirements.ashx

#### **Network Impacts**

The Queue Project AD1-130 was evaluated as a 170.0 MW (Capacity 115.0 MW) injection to the U2-041 345kV switching station in the AEP area. Project AD1-130 was evaluated for compliance with applicable reliability planning criteria (PJM, NERC, NERC Regional Reliability Councils, and Transmission Owners). Project AD1-130 was studied with a commercial probability of 53%. Potential network impacts were as follows:

#### <u>Summer Peak Analysis – 2021</u>

#### **Contingency Descriptions**

The following contingencies resulted in overloads:

Contingency Name	Description				
AEP_P1-2_#6497	CONTINGENCY 'AEP_P1-2_#6497' OPEN BRANCH FROM BUS 242939 TO BUS 247540 CKT 1 345 1 END	/ 242939 05MARYSV 345 247506 U2-072 C			
AEP_P1-2_#6496	CONTINGENCY 'AEP_P1-2_#6496' OPEN BRANCH FROM BUS 242935 TO BUS 247506 CKT 1 345 1 END	/ 242935 05E LIMA 345 247506 U2-041 C			

Table 1

#### **Generator Deliverability**

(Single or N-1 contingencies for the Capacity portion only of the interconnection)

None

#### **Multiple Facility Contingency**

(Double Circuit Tower Line, Fault with a Stuck Breaker, and Bus Fault contingencies for the full energy output)

None

#### **Contribution to Previously Identified Overloads**

(This project contributes to the following contingency overloads, i.e. "Network Impacts", identified for earlier generation or transmission interconnection projects in the PJM Queue)

None

#### **Steady-State Voltage Requirements**

None

#### **Short Circuit**

(Summary of impacted circuit breakers)

New circuit breakers found to be over-duty:

None

#### **Affected System Analysis & Mitigation**

#### **LGEE Impacts:**

LGEE Impacts to be determined during later study phases (as applicable).

#### **MISO Impacts:**

MISO Impacts to be determined during later study phases (as applicable).

#### **Duke, Progress & TVA Impacts:**

Duke Carolina, Progress, & TVA Impacts to be determined during later study phases (as applicable).

#### **OVEC Impacts:**

OVEC Impacts to be determined during later study phases (as applicable).

#### **Delivery of Energy Portion of Interconnection Request**

PJM also studied the delivery of the energy portion of this interconnection request. Any problems identified below are likely to result in operational restrictions to the project under study. The developer can proceed with network upgrades to eliminate the operational restriction at their discretion by submitting a Merchant Transmission Interconnection request.

Note: Only the most severely overloaded conditions are listed below. There is no guarantee of full delivery of energy for this project by fixing only the conditions listed in this section. With a Transmission Interconnection Request, a subsequent analysis will be performed which shall study all overload conditions associated with the overloaded element(s) identified.

	Contingency		Bus			Loading		Rating		) (IV)		
#	Туре	Name	Affected Area	<b>Facility Description</b>	From	To	PF	Initial	Final	Typ e	MV A	MW Con.
1	N-1	AEP_P1-2_#6497	AEP - AEP	U2-041 C-05ELIMA 345 kV line	247506	242935	DC	88.99	107.93	NR	897	169.96
2	N-1	AEP_P1-2_#6496	AEP-AEP	U2-072 C-05MARYSV 345 kV line	247540	242939	DC	88.99	107.93	NR	897	169.96

Table 2

#### **System Reinforcements**

None

#### **Schedule**

It is anticipated that the time between receipt of executed agreements and Commercial Operation may range from 12 to 18 months if no line work is required. If line work is required, construction time would be between 24 to 36 months after signing an interconnection agreement.

**Note:** The time provided between anticipated normal completion of System Impact, Facilities Studies, subsequent execution of ISA and ICSA documents, and the proposed Backfeed Date is shorter than usual and may be difficult to achieve.

#### Conclusion

Based upon the results of this Feasibility Study, the construction of the 170.0 MW (115.0 MW Capacity) solar generating facility of Invenergy Solar (PJM Project #AD1-130) will not require additional interconnection charges.

Figure 1: Point of Interconnection (Hardin Switch 345 kV)

Single-Line Diagram

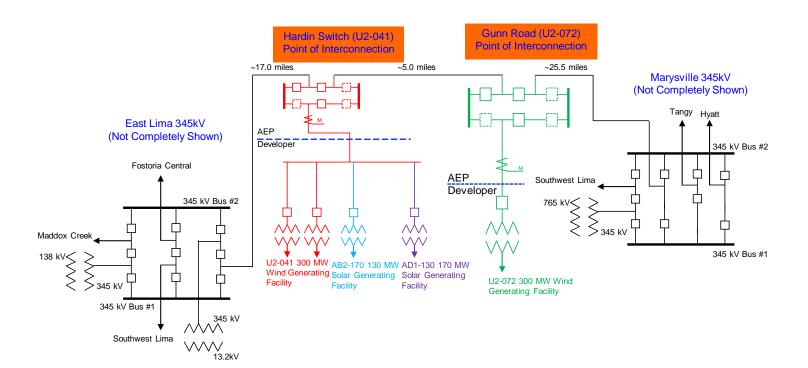
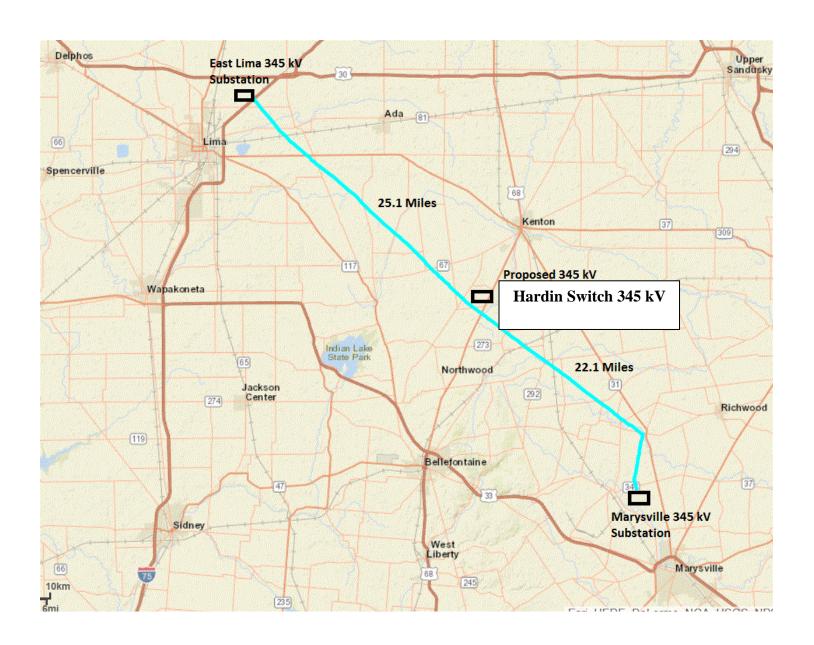




Figure 2: Point of Interconnection (Hardin Switch 345 kV)



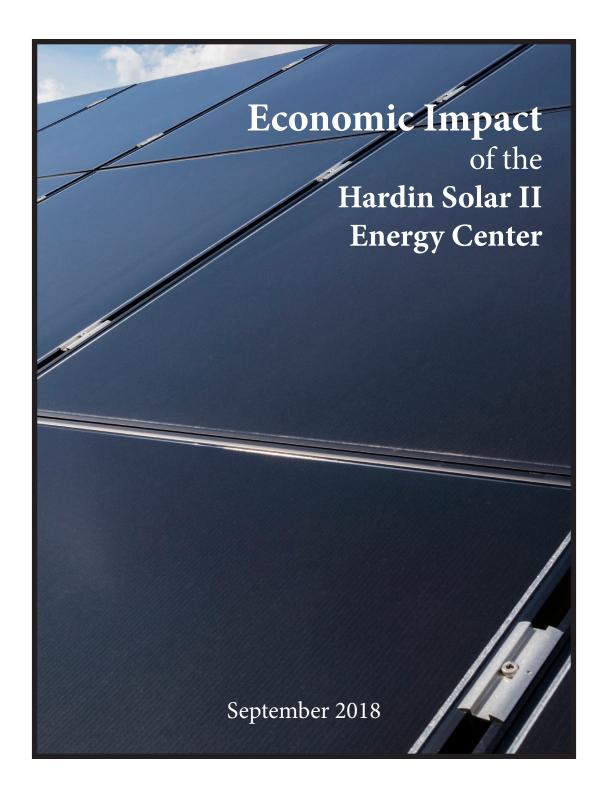
## **Exhibit J**

## **Economic Impact Report September 2018**

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# About the Author



Dr. David G. Loomis is President of Strategic Economic Research, LLC and Professor of Economics at Illinois State University and Co-Founder of the Center for Renewable Energy. He has over 10 years of experience in the renewable energy field and has performed economic analyses at the county, region, state and national levels for utility-scale wind and solar generation. In particular, he has performed economic impact analyses for renewable energy projects in

Illinois, Iowa, Kansas, Michigan, Nebraska, New Mexico, New York, Ohio, Pennsylvania, and South Dakota. He has served as a consultant for Apex, Clean Line Energy Partners, EDF Renewables, EO.N, Geronimo Energy, Invenergy, J-Power, the National Renewable Energy Laboratories, Ranger Power, State of Illinois, Tradewind, and others. Dr. Loomis is a widely recognized expert and has been quoted in the Wall Street Journal, Forbes Magazine, Associated Press, and Chicago Tribune as well as appearing on CNN.

Dr. Loomis has published over 25 peer-reviewed articles in leading energy policy and economics journals. He has raised and managed over \$7 million in grants and contracts from government, corporate and foundation sources. He received the 2011 Department of Energy's Midwestern Regional Wind Advocacy Award and the 2006 Best Wind Working Group Award. Dr. Loomis received his Ph.D. in economics from Temple University in 1995.

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# Executive Summary



Invenergy Solar Development LLC is developing the Hardin Solar II Energy Center, a second phase of the Hardin Solar Energy Center project in Hardin County, Ohio. Invenergy Solar Development North America LLC is North America's largest independent, privately held renewable energy provider. The Company develops, owns and operates large-scale renewable and other clean energy generation and storage facilities in North America, Latin America, Japan and Europe. The purpose of this report is to aid decision makers in evaluating the economic impact of this project on Hardin County and the State of Ohio. The basis of this analysis is to study the direct, indirect and induced impacts on job creation, wages and total economic output.

The Hardin Solar II is a 170 MWac solar project using the next generation of single-axis tracking panels. The project represents an investment in excess of \$200 million. The total development is anticipated to result in the following:

#### Jobs

- 153 new local jobs during construction for Hardin County which is 2.1% of non-governmental employment
- 888 new local jobs during construction for the State of Ohio
- 17.4 new local long-term jobs for Hardin County
- 24.2 new local long-term jobs for the State of Ohio

#### Earnings

- Almost \$4 million in new local earnings during construction for Hardin County
- Over \$52 million in new local earnings during construction for the State of Ohio
- Almost \$597 thousand in new local long-term earnings for Hardin County annually
- Over \$1.1 million in new local long-term earnings for the State of Ohio annually

<u>Output</u> - the value of production in the state or local economy. It is an equivalent measure to the Gross Domestic Product.

- Almost \$11 million in new local output during construction for Hardin County
- Over \$87 million in new local output during construction for the State of Ohio
- Over \$2 million in new local long-term output for Hardin County annually
- Over \$3.5 million for the State of Ohio in new local long-term output annually

#### **Government Revenue**

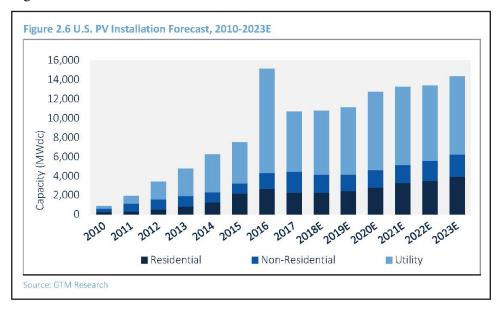
- Upper Scioto Valley School District will receive over \$706 thousand annually from the Project
- Hardin County General Fund will receive over \$63 thousand annually
- Total government revenue paid will exceed \$1.1 million annually.

The U.S. solar industry is growing at a rapid but uneven pace. From 2013 to 2016, the amount of electricity generated from solar had more than doubled increasing from 0.305 quadrillion Btu in 2013 to 0.624 quadrillion Btu in 2016 (EIA, 2018). The industry continued to add increasing numbers of PV systems to the grid. In 2016, the U.S. installed 15,128 MWdc of solar PV driven mostly by utility-scale PV. In 2017, the U.S. installed 10,608 MWdc of solar PV, a 30% decrease from 2016. Yet, as Figure 1 clearly shows, the capacity additions in 2017 still outpaced any previous year except the record-breaking 2016. The solar industry forecast is for slow but steady growth for the next five years.

The primary driver of this overall sharp pace of growth is large price declines. Since 2009, the price of solar PV has declined from about \$7.50/watt in 2009 to about \$1.50/watt in 2017 according to Figure 2. Solar PV also benefits from the Federal Investment Tax Credit (ITC) which provides 30 percent tax credit for residential and commercial properties. Still, various federal tax reform measures and new tariffs on imported solar panels by the Trump Administration may lessen the price declines in 2018 and beyond.

Utility-scale PV leads the installation growth in the U.S. A total of 6.2 GWdc of utility PV projects were completed in 2017 and accounted for 59% of the total installed capacity in 2017. An additional 2.0 GWdc are under construction and are expected to come on-line in 2018. According to Figure 3, there are 32,447 MWdc of utility-scale PV solar operating in the U.S. and an additional 19,331 MWdc has been contracted as well as another 30,121 MWdc announced.

Figure 1.—Annual U.S. Solar PV Installations, 2010 - 2023

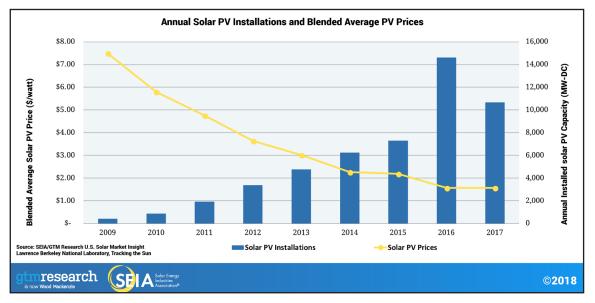


Source: Solar Energy Industries Association, Solar Market Insight Report 2018 Q2

## II. U.S. Solar PV Industry Growth and Economic Development

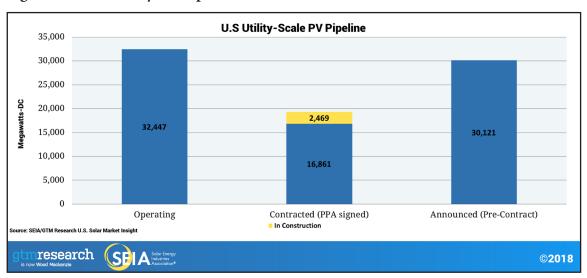
a. U.S. Solar PV Industry Growth

Figure 2.—U.S. Annual Solar PV Installations and Prices



Source: Solar Energy Industries Association, Solar Market Insight Report 2018 Q2

Figure 3.—U.S. Utility PV Pipeline



Source: Solar Energy Industries Association, Solar Market Insight Report 2018 Q2

According to SEIA, Ohio is ranked 28th among the states in cumulative installations of solar PV. California, North Carolina, and Arizona are the top 3 states for solar PV which may not be surprising because of the high solar radiation that they receive. However, other states with similar or lower solar potential rank highly including New Jersey (5th), Massachusetts (6th), New York (11th), and Maryland (13th). In 2017, Ohio installed 40.1 MW of solar electric capacity bringing its cumulative capacity to 175.9 MW.

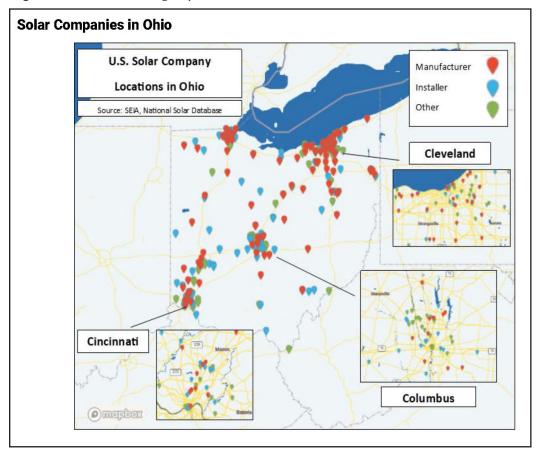
There are more than 274 solar companies in Ohio including 109 manufacturers, 89 installers/developers and 70 others. Figure 4 is a map showing the locations of solar companies in Ohio. Currently, there are 5,831 solar jobs in the State of Ohio according to SEIA.

Ohio has several sizeable solar projects. DG AMP Solar Bowling Green is a 20 MW project that went into operation in January, 2017 and was the largest solar installation in the State of Ohio at that time. A 10 MW solar PV project, BNB Napolean Solar, was completed in 2014 by developer BNB Renewable Energy Holdings. Wyandot Solar facility is a 10 MW installation completed in 2010 by developer Juwi Solar, Inc. Many large Ohio companies have purchased solar energy including General Motors, IKEA, Assurant, Walmart and Staples. Campbell's Soup has installed a 10 MW system at their location in Napoleon, OH.

Figure 5 shows the Ohio historical installed capacity by year according to the SEIA. The large spike in 2017 is due top the DG AMP Solar Bowling Green project coming on-line. Hardin Solar II would almost double the present installed Ohio capacity of 175.9 MW with its 170 MW size.

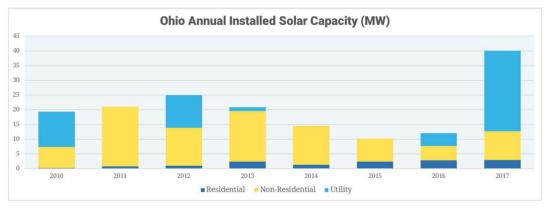
b. Ohio Solar Industry

Figure 4. — Solar Company Locations in Ohio



Source: Solar Energy Industries Association, Solar Spotlight: Ohio

Figure 5. — Ohio Annual Solar Installations



Source: Solar Energy Industries Association, Solar Spotlight: Ohio

Utility-scale solar energy projects have numerous economic benefits. Solar installations create job opportunities in the local area during both the short-term construction phase and the long-term operational phase. Solar projects strengthen the local tax base helping to improve county services, schools, police and fire departments and infrastructure improvements, such as public roads.

Numerous studies have quantified the economic benefits of Solar PV projects across the United States in peer-reviewed academic journals using the same methodology used in this report. Some of the studies examine smaller-scale solar systems and some studies utility-scale solar energy. Croucher (2012) uses JEDI modeling methodology to find which state will receive the greatest economic impact from installing one hundred 2.5 kW systems which are smaller residential systems. He shows that Pennsylvania ranked first supporting 28.98 jobs during installation and 0.20 jobs during operations. Virginia ranked thirty-sixth supporting 23.51 jobs during construction and 0.15 jobs during operations.

Jin (2016) analyzes the financing options and economic impact of solar photovoltaic systems in Normal, IL and uses the JEDI model to determine the county and state economic impact. The study examines the effect of 100 residential retrofit fixed-mount crystalline-silicone systems having a nameplate capacity of 5kW. Eight JEDI models estimated the economic impacts using different input assumptions. They found that county employment impacts varied from 377 to 1,059 job years during construction and 18.8 to 40.5 job years during the operating years.

#### c. Economic Benefits of Utility-Scale Solar Energy





Loomis (2016) estimates the economic impact for the State of Illinois if the state were to reach its maximum potential for solar PV. They estimate the economic impact of three different scenarios for Illinois – building new solar installations of 2,292 MW, 2,714 MW or 11,265 MW. They assume the 60% of the capacity is utility-scale solar, 30% of the capacity is commercial, and 10% of the capacity of the systems are residential. They find the employment impacts vary from 26,753 to 131,779 job years during construction and from 1,223 to 6,010 job years during operating years.

Several other reports quantify the economic impact of solar energy. Bezdek (2006) estimated the economic impact for the State of Ohio. He estimated the PV market in Ohio to be \$25 million with 200 direct jobs and 460 total jobs. The Center for Competitive Florida (2009) estimated the impact if the state were to install 1,500 MW of solar. They found that 45,000 direct jobs and 50,000 indirect jobs could be created. The Solar Foundation (2013) used the JEDI modeling methodology to show that Colorado's solar PV installation to date created 10,790 job-years. They also analyzed what would happen if the state were to install 2,750 MW of solar PV from 2013 to 2030 and found that it would result in almost 32,500 job years. Berkman et. al (2011) estimate the economic and fiscal impacts of the Desert Sunlight Solar Farm. The project created approximately 440 construction jobs over a 26 month period, \$15 million in new sales tax revenues and \$12 million in new property revenues for Riverside County and \$336 million if indirect benefits to local businesses in the county.

A property tax is imposed on the value of taxable property located within a county or taxing jurisdiction. There are generally four different categories of property – real property, personal property, tangible property and intangible property. Real property is usually land, buildings or objects that cannot be moved from one location to another. Personal property is generally an object of value that can be moved such as a vehicle, table chair, etc. Intangible property does not exist in physical form but nevertheless has value such as trademarks, copyrights, etc. Each state or local government has its own definition for taxable property and how a particular asset will be classified and valued.

Property taxes are an important source of funds for county and other local units of government. In Ohio, most property taxes go to school districts. "On a statewide basis, approximately two-thirds of all real property taxes collected by counties are distributed to school districts." (County Commissioners Association of Ohio, p.3). In Hardin County, the Upper Scioto Valley School District receives slightly less than two-thirds of all real property taxes. As a percentage of the total tax rate, Upper Scioto Valley School District receives approximately 57% to 61% of the total property taxes received depending on the township.

Generally, utility-scale power plants pay property taxes in the county in which they are located. Often, a state agency such as the Department of Revenue centrally assess the real and personal property of utilities but sometimes local tax assessors value utility property. In Ohio, generation facilities are valued by the Ohio Department of Taxation (Martin, p. 6). Public utility tangible personal property valuation is assessed at 24% of true value (County Commissioners Association of Ohio, p.15). Although the tax assessor will have the final say on the assessed value, it seems likely that the Hardin Solar Energy will be assessed like public utility property.

For the current project, Invenergy plans to enter a Payment in Lieu of Taxes (PILOT) agreement via the Ohio Development Services Agency. The PILOT agreement will abate real property and tangible personal property taxes and replace them with a payment of \$7,000 to \$9,000 per MWac of installed capacity. For purposes of this report, we have assumed this payment to be \$7,000 per MWac and the installed capacity to be 170 MWac.

#### d. Solar PV and Ohio Taxes

## III. Hardin Solar II Energy Center Project Description and Location

a. Hardin Solar II EnergyCenter ProjectDescription



Invenergy Solar Development North America LLC is developing the Hardin Solar II Energy Center in Hardin County, Ohio. Hardin Solar II Energy Center is the next generation of single-axis tracking solar energy projects providing large-scale, low-cost energy in Ohio designed to fully capitalize on the federal Investment Tax Credit (ITC). The 170 MWac project will pursue commercial operations as early as the second quarter of 2020. The Project will interconnect to the existing East Lima to Marysville transmission line. Local permitting is superseded by the Ohio Power Siting Board (OPSB). The Project will require a Qualified Energy Project Certification from the OPSB. Invenergy will submit applications for this state permit in August 2018 and is targeting receipt of the permits in October 2019. To date, no significant environmental findings have been reported. The Project will capitalize on full utilization of the investment tax credit.

As shown later in the results section, the project will support 153 new local jobs during construction for Hardin County which is 2.1% of non-governmental employment; 888 new local jobs during construction for the State of Ohio; 17.4 new local long-term jobs for Hardin County which is 0.2% of non-governmental employment; and 24.2 new local long-term jobs for the State of Ohio.

Invenergy is North America's largest independent, privately held renewable energy provider. The Company develops, owns and operates large-scale renewable and other clean energy generation and storage facilities in North America, Latin America, Japan and Europe. Invenergy's expertise includes a complete range of fully integrated in-house capabilities, including: Project Development, Permitting, Transmission, Interconnection, Energy Marketing, Finance, Engineering, Project Construction, Operations and Maintenance. To date, the Company has developed more than 19,900 MW of large-scale wind, solar, natural gas and energy storage facilities in North America, Latin America, Japan and Europe. The 127 completed projects include:

- 93 Wind Projects 13,058 MW
- 18 Solar Projects 735 MW
- 12 Natural Gas Projects 6,126 MW
- 4 Storage Projects 68 MW

Invenergy is headquartered in Chicago with regional development offices in the United States, Canada, Latin America, Japan and Europe.

Hardin County is located in the west central part of Ohio (see Figure 6). It has a total area of 471 square miles and the U.S. Census estimates that the 2017 population was 31,364 with 13,100 housing units. The County has a population density of 27.8 (persons per square Figure mile) compared to 282 for the State of Ohio. Median household

income in the county was \$41,343 (2010).

Hardin County top employers include Ohio Northern University, International Paper, ADA technologies and Hardin Memorial Hospital. As shown in Table 2, the largest industry sector is educational services followed by manufacturing, retail trade, accommodations and food services, health care and social assistance, and administrative. The small number of workers in the construction sector (113) limits the local employment impacts from the solar energy project construction.

b. Hardin County, Ohio

Figure 6.—Map of Hardin County, Ohio



Table 1. — Non-Governmental Employment by Industry in Hardin County

Industry	Number	Percent
Educational Services	1,000-2,499	13.8-34.5%
Manufacturing	2,104	29.1%
Retail trade	869	12.0%
Accommodations and food services	811	11.2%
Health care and social assistance	664	9.2%
Transportation and warehousing	398	5.5%
Administrative	229	3.2%
Other services (except public administration)	228	3.2%
Finance and insurance	207	2.9%
Construction	113	1.6%
Wholesale trade	107	1.5%
Professional, Scientific, and Technical Service	s 81	1.1%
Arts, entertainment, and recreation	52	0.7%
Information	47	0.6%
Utilities	36	0.5%
Real estate and rental and leasing	31	0.4%
Mining, quarrying, and oil and gas extraction	0-19	0.0-0.3%
Other Services	0-19	0.0-0.3%

Source: 2016 County Business Patterns, U.S. Census

## IV. Methodology



NREL: National Renewable Energy Laboratory

JEDI: Jobs and Economic Development Impacts

IMPLAN: IMpact Analysis for PLANning

The economic analysis of solar PV project development presented here uses the NREL's latest Jobs and Economic Development Impacts (JEDI) PV Model (PV12.23.16). The JEDI PV Model is an inputoutput model that measures the spending patterns and locationspecific economic structures that reflect expenditures supporting varying levels of employment, income, and output. That is, the JEDI Model takes into account that the output of one industry can be used as an input for another. For example, when a PV system is installed, there are both soft costs consisting of permitting, installation and customer acquisition costs, and hardware costs, of which the PV module is the largest component. The purchase of a module not only increases demand for manufactured components and raw materials, but also supports labor. When an installer/developer purchases a module from a manufacturing facility, the manufacturer uses some of that money to pay employees. The employees use a portion of their compensation to purchase goods and services within their community. Likewise, when a developer pays workers to install the systems, those workers spend money in the local economy that boosts economic activity and employment in other sectors. The goal of economic impact analysis is to quantify all of those reverberations throughout the economy.

The first Jobs and Economic Development Impacts (JEDI) Model was developed in 2002 to demonstrate the economic benefits associated with developing wind farms in the United States. Since then, JEDI models have been developed for biofuels, natural gas, coal, transmission lines and many other forms of energy. These models were created by Marshall Goldberg of MRG & Associates, under contract with the National Renewable Energy Laboratory. The JEDI model utilizes state-specific industry multipliers obtained from IMPLAN (IMpact analysis for PLANning). IMPLAN software and data are managed and updated by the Minnesota IMPLAN Group, Inc., using data collected at federal, state, and local levels. This study analyzes the gross jobs that the new solar energy project development supports and does not analyze the potential loss of jobs due to declines in other forms of electric generation.

The total economic impact can be broken down into three distinct types: direct impacts; indirect impacts and inducted impacts. **Direct impacts** during the construction period refer to the changes that occur in the onsite construction industries in which the direct final demand (i.e., spending on construction labor and services) change is made. Onsite construction-related services include installation labor, engineering, design, and other professional services. Direct impacts during operating years refer to the final demand changes that occur in the onsite spending for the solar operations and maintenance workers.

The initial spending on the construction and operation of the PV installation creates a second layer of impacts, referred to as "supply chain impacts" or "indirect impacts." **Indirect impacts** during construction period consist of the changes in inter-industry purchases resulting from the direct final demand changes and include construction spending on materials and PV equipment and other purchases of goods and offsite services.

Induced impacts during construction refer to the changes that occur in household spending as household income increases or decreases as a result of the direct and indirect effects of final demand changes. Local spending by employees working directly or indirectly on the PV project who receive their paychecks and then spend money in the community is included. Additional local jobs and economic activity are supported by these purchases of goods and services.



## V. Results



The economic impact results were derived from detailed project estimates supplied by Invenergy. In addition, Invenergy also estimated the percentages of project materials and labor that will be coming from within Hardin County and the State of Ohio.

Two separate JEDI models produced results to show the economic impact of the Hardin Solar II Energy Center. The first JEDI model used the 2016 Hardin County multipliers from IMPLAN. The second JEDI model used the 2016 JEDI state multipliers for the State of Ohio and the same project costs.

Tables 2-4 show the output from these models. Table 2 lists the total employment impact from the Hardin Solar II Energy Center for Hardin County and the State of Ohio. Table 3 shows the impact on total earnings and Table 4 contains the impact on total output.

Table 2. — Total Employment Impact from the Hardin Solar II Energy Center

	Hardin County Jobs	State of Ohio Jobs
Construction	·	
Project Development and Onsite Labor Impacts (direct)	88	559
Turbine and Supply Chain Impacts (indirect)	51	161
Induced Impacts	14	168
New Local Jobs during Construction	153	888
Operations		
Onsite Labor Impacts (direct)	5.0	5.0
Local Revenue and Supply Chain Impacts (indirect)	8.7	10.9
Induced Impacts	3.7	8.3
New Local Long Term Jobs	17.4	24.2

The results from the JEDI model show significant employment impacts from the Hardin Solar II Energy Center. Employment impacts can be broken down into several different components. The employment numbers presented in Table 2 from the JEDI model are based on a full time equivalent (FTE) basis for a year. In other words, 1 job = 1 FTE = 2,080 hours worked in a year. A part time or temporary job would constitute only a fraction of a job according to the JEDI model. For example, the JEDI model results show 153 new direct jobs during construction in Hardin County, though the construction of the solar center may actually involve hiring closer to 306 half-time workers. Construction of this Project is expected to take 12-18 months.

As shown in Table 2, new local jobs created or retained during construction total 153 for Hardin County, and 888 for the State of Ohio. New local long-term jobs created from the Hardin Solar II Energy Center total 17.4 for Hardin County and 24.2 for the State of Ohio.

Direct jobs created during the operational phase last the life of the solar energy center, typically 20-30 years. Direct construction jobs and operations and maintenance jobs both require highly-skilled workers in the fields of construction, management, and engineering. These well-paid professionals boost economic development in rural communities where new employment opportunities are welcome due to economic downturns. Accordingly, it is important to not just look at the number of jobs but also the earnings that they produce. Table 3 shows the earnings impacts from the Hardin Solar II Energy Center, which are categorized by construction impacts and operations impacts. The new local earnings during construction total almost \$4 million for Hardin County and over \$52 million for the State of Ohio. The new local long-term earnings total almost \$597 thousand for Hardin County and over \$1.1 million for the State of Ohio.



Table 3. — Total Earnings Impact from the Hardin Solar II Energy Center

	Hardin	State of
	County	Ohio
Construction		
Project Development and Onsite Earnings Impacts	\$1,860,409	\$36,332,153
Module and Supply Chain Impacts	\$1,671,453	\$7,997,496
Induced Impacts	\$396,333	\$7,722,325
New Local Earnings during Construction	\$3,928,195	\$52,051,974
Operations		
Onsite Labor Impacts	\$175,525	\$175,525
Local Revenue and Supply Chain Impacts	\$312,935	\$581,945
Induced Impacts	\$108,512	\$384,945
New Local Long Term Earnings	\$596,972	\$1,142,415

Output refers to economic activity or the value of production in the state or local economy. It is an equivalent measure to the Gross Domestic Product, which measures output on a national basis. According to Table 4, the new local output during construction totals almost \$11 million for Hardin County and over \$87 million for the State of Ohio. The new local long-term output totals over \$2 million for Hardin County and over \$3.5 million for the State of Ohio.

Table 4. — Total Output Impact from the Hardin Solar II Energy Center

	Hardin County	State of Ohio
Construction		
Project Development and Onsite Jobs Impacts on Output	\$4,194,722	\$39,342,285
Module and Supply Chain Impacts	\$5,421,895	\$24,515,654
Induced Impacts	\$1,382,831	\$23,885,055
New Local Jobs during Construction	\$10,999,448	\$87,742,994
Operations (Annual)		
Onsite Labor Impacts	\$175,525	\$175,525
Local Revenue and Supply Chain Impacts	\$1,517,748	\$2,159,765
Induced Impacts	\$383,953	\$1,198,085
New Local Long Term Jobs	\$2,077,226	\$3,533,375

Solar PV projects increase the property tax base of a county, creating a new revenue source for education and other local government services. Although it is difficult to calculate the precise assessed value and taxes of the project until construction is completed, we can calculate the taxes on an illustrative example to get an idea of the size of the contributions that a project of this magnitude will have on the local tax base. The Hardin Solar II Energy Center is expected to represent an investment of over \$230 million and will be located in the Scioto Valley Local School District. Using a \$230 million cost basis, we can calculate the expected taxes paid by the project.

Table 5 details the government revenue implications of the Hardin Solar Energy Project. There are several important assumptions built into the analysis in this table. First, the analysis assumes that Invenergy enters into Payment in Lieu of Taxes (PILOT) agreement via the Ohio Development Services Agency. The PILOT agreement will abate real property and tangible personal property taxes and replace them with a payment of \$7,000 to \$9,000 per MWac of installed capacity. For purposes of this report, we have assumed this payment to be \$7,000 per MWac and the installed capacity to be 170 MWac. . Second, the table assumes the Tax Year 2017 tax rates posted on the Ohio Department of Revenue website for each taxing body. Third, the projections assume that the tax rate and the cost do not change before the project is put into service in 2020. Fourth, the township revenue assumes that 59% of the assessed value will be in Marion Township, 23% of the assessed value will be in Roundhead Township, and 18% of the assessed value will be in McDonald Township.

According to Table 5, Upper Scioto Valley School District will receive over \$706 thousand annually from the Hardin Solar II Energy Project and the Hardin County General Fund will receive over \$63 thousand annually. The total taxes paid will exceed \$1.1 million annually. Other taxing districts will receive between \$409 and \$90,826 annually as detailed in Table 5. These amounts could be higher if the final PILOT amount is greater than \$7,000 MWac.

 ${\bf Table~5. - Illustration~of~Government~Revenue~by~the~Hardin~Solar~II~Energy~Project}$ 

Taxing District	<b>Estimated Annual Government Revenue</b>
Upper Scioto Valley Local School District	\$706,171
Mental Retardation and Development Disabilities (MRDD)	\$90,826
County General Fund	\$63,578
Ohio Hi-Point JVSD	\$45,413
Upper Scioto Ambulance District	\$40,872
Mental Health and Retardation	\$36,330
Council on Aging	\$34,060
Joint Mental Health District	\$34,060
Marion Township General Fund	\$26,794
Sheriff Operating Fund	\$22,706
Roundhead Township General Fund	\$18,801
9-1-1 Emergency	\$17,030
Marion Township Fire and EMS	\$13,397
Roundhead Township Fire	\$10,445
McDonald Township General Fund	\$10,422
OSU Extension Office	\$7,947
Roundhead Township Fire and EMS	\$5,222
McDonald Township Cemetary Fund	\$3,065
McDonald Township Fire and EMS	\$2,452
McDonald Township Road and Bridge	\$409
TOTAL	\$1,190,000

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# VII. Curriculum Vita - David Loomis

#### **Education**

Doctor of Philosophy, Economics, Temple University, Philadelphia, Pennsylvania, May 1995.

Bachelor of Arts, Mathematics and Honors Economics, Temple University, Magna Cum Laude, May 1985.

#### Experience

1996-present Illinois State University, Normal, IL Full Professor – Department of Economics (2010-present) Associate Professor - Department of Economics (2002-2009) Assistant Professor - Department of Economics (1996-2002)

- Taught Regulatory Economics, Telecommunications Economics and Public Policy, Industrial Organization and Pricing, Individual and Social Choice, Economics of Energy and Public Policy and a Graduate Seminar Course in Electricity, Natural Gas and Telecommunications Issues.
- Supervised as many as 5 graduate students in research projects each semester.
- Served on numerous departmental committees.

1997-present Institute for Regulatory Policy Studies, Normal, IL Executive Director (2005-present) Co-Director (1997-2005)

- Grew contributing membership from 5 companies to 16 organizations.
- Doubled the number of workshop/training events annually.
- Supervised 2 Directors, Administrative Staff and internship program.
- Developed and implemented state-level workshops concerning regulatory issues related to the electric, natural gas, and telecommunications industries.

#### Experience (cont'd)

# 2006-2018 Illinois Wind Working Group, Normal, IL Director

- Founded the organization and grew the organizing committee to over 200 key wind stakeholders
- Organized annual wind energy conference with over 400 attendees
- Organized strategic conferences to address critical wind energy issues
- Initiated monthly conference calls to stakeholders
- Devised organizational structure and bylaws

# 2007-2018 Center for Renewable Energy, Normal, IL Director

- Created founding document approved by the Illinois State University Board of Trustees and Illinois Board of Higher Education.
- Secured over \$150,000 in funding from private companies.
- Hired and supervised 4 professional staff members and supervised 3 faculty members as Associate Directors.
- Reviewed renewable energy manufacturing grant applications for Illinois Department of Commerce and Economic Opportunity for a \$30 million program.
- Created technical "Due Diligence" documents for the Illinois
  Finance Authority loan program for wind farm projects in Illinois.

# 2011-present Strategic Economic Research, LLC President

- Performed economic impact analyses on policy initiatives and energy projects such as wind energy, solar energy, natural gas plants and transmission lines at the county and state level.
- Provided expert testimony before state legislative bodies, state public utility commissions, and county boards.
- Wrote telecommunications policy impact report comparing Illinois to other Midwestern states.

#### 1997-2002 International Communications Forecasting Conference Chair

• Expanded Planning Committee with representatives from over 18 different international companies and delivered high quality conference attracting over 500 people over 4 years.

#### Experience (cont'd)

1985-1996 Bell Atlantic, Philadelphia, Pa.

Economist - Business Research

- Wrote and taught Applied Business Forecasting multimedia course.
- Developed and documented 25 econometric demand models that were used in regulatory filings.
- Provided statistical and analytic support to regulatory costing studies.
- Served as subject matter expert in switched and special access.
- Administered \$4 million budget including \$1.8 million consulting budget.

#### **Professional Awards and Memberships**

2016 Outstanding Cross-Disciplinary Team Research Award with Jin Jo and Matt Aldeman – recognizes exemplary collaborative research conducted by multiple investigators from different disciplines.

2011 Midwestern Regional Wind Advocacy Award from the U. S. Department of Energy's Wind Powering America presented at Wind-Power 2011

2009 Economics Department Scott M. Elliott Faculty Excellence Award – awarded to faculty who demonstrate excellence in teaching, research and service.

2009 Illinois State University Million Dollar Club – awarded to faculty who have over \$1 million in grants through the university.

2008 Outstanding State Wind Working Group Award from the U. S. Department of Energy's Wind Power America presented at WindPower 2008.

1999 Illinois State University Teaching Initiative Award

Member of the American Economic Association, National Association of Business Economists, International Association for Energy Economics, Institute for Business Forecasters; Institute for International Forecasters, International Telecommunications Society.

#### **Professional Publications**

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#### **Expert Testimony**

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- 22. New Mexico Public Regulation Commission, Case No. 17-00275-UT, Application of Sagamore Wind Energy LLC, on behalf of Invenergy, LLC, Direct Written Testimony filed November 6, 2017.

#### **Expert Testimony (cont'd)**

- 21. Ohio Power Siting Board, Case No. 17-773-EL-BGN, In the Matter of Hardin Solar Energy LLC for a Certificate of Environmental Compatibility and Public Need to Construct a Solar-Powered Electric Generation Facility in Hardin County, Ohio, on behalf of Invenergy, LLC, Exhibit with Report filed July 5, 2017.
- 20. Macon County (Illinois) Environmental, Education, Health and Welfare Committee, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of E.ON Energy, Direct Oral Testimony, August 20, 2015.
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- 17. Illinois Commerce Commission, Case No. 15-0277, Written Rebuttal Testimony on behalf of Grain Belt Express Clean Line LLC filed August 7, 2015.
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- 14. Bureau County (Illinois) Zoning Board of Appeals, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of Berkshire Hathaway Energy/Geronimo Energy, Direct Oral Testimony, June 16, 2015.
- 13. Illinois Commerce Commission, Case No. 15-0277, Written Direct Testimony on behalf of Grain Belt Express Clean Line LLC filed April 10, 2015.
- 12. Livingston County (Illinois) Zoning Board of Appeals, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of Invenergy, Oral Cross-Examination, December 8-9, 2014.

#### Expert Testimony (cont'd)

- 11. Missouri Public Service Commission, Case No. EA-2014-0207, Oral Cross-examination Testimony on behalf of Grain Belt Express Clean Line LLC appeared before the Commission on November 21, 2014.
- 10. Livingston County (Illinois) Zoning Board of Appeals, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of Invenergy, Direct Oral Testimony, November 17-19, 2014.
- 9. Missouri Public Service Commission, Case No. EA-2014-0207, Written Surrebuttal Testimony on behalf of Grain Belt Express Clean Line LLC, filed October 14, 2014.
- 8. Missouri Public Service Commission, Case No. EA-2014-0207, Written Direct Testimony on behalf of Grain Belt Express Clean Line LLC, filed March 26, 2014.
- 7. Illinois Commerce Commission, Case No. 12-0560, Oral Cross-examination Testimony on behalf of Rock Island Clean Line LLC appeared before the Commission on December 11, 2013.
- 6. Illinois Commerce Commission, Case No. 12-0560, Written Rebuttal Testimony on behalf of Rock Island Clean Line LLC filed August 20, 2013.
- 5. Boone County (Illinois) Board, Examination of Wind Energy Conversion System Ordinance, Direct Testimony and Cross-Examination, April 23, 2013.
- 4. Illinois Commerce Commission, Case No. 12-0560, Written Direct Testimony on behalf of Rock Island Clean Line LLC filed October 10, 2012.
- 3. Whiteside County (Illinois) Board and Whiteside County Planning and Zoning Committee, Examination of Wind Energy Conversion System Ordinance, Direct Testimony and Cross-Examination, on behalf of the Center for Renewable Energy, April 12, 2012.
- 2. State of Illinois Senate Energy and Environment Committee, Direct Testimony and Cross-Examination, on behalf of the Center for Renewable Energy, October 28, 2010.
- 1. Livingston County (Illinois) Zoning Board of Appeals, Application for Special Use Permit for a Wind Energy Conversion System, on behalf of the Center for Renewable Energy, Direct Testimony and Cross-Examination, July 28, 2010.

#### **Selected Presentations**

"Smart Cities and Micro Grids: Cost Recovery Issues," presented September 12,2017 at the National Association of Regulatory Utility Commissioners Staff Subcommittee on Accounting and Finance Meeting, Springfield, IL.

"Cloud Computing: Regulatory Principles and ICC NOI," presented September 11,2017 at the National Association of Regulatory Utility Commissioners Staff Subcommittee on Accounting and Finance Meeting, Springfield, IL.

"Illinois Wind, Illinois Solar and the Illinois Future Energy Jobs Act," presented July 25, 2017 at the Illinois County Assessors Meeting, Normal, IL.

"Illinois Wind, Illinois Solar and the Illinois Future Energy Jobs Act," presented April 21, 2017 at the Illinois Association of County Zoning Officers Meeting, Bloomington, IL.

"Energy Storage Economics and RTOs," presented October 30, 2016 at the Energy Storage Conference at Argonne National Laboratory.

"Wind Energy in Illinois," on October 6, 2016 at the B/N Daybreak Rotary Club, Bloomington, IL.

"Smart Grid for Schools," presented August 17, 2016 to the Ameren External Affairs Meeting, Decatur, IL.

"Solar Energy in Illinois," presented July 28, 2016 at the 3rd Annual K-12 Teachers Clean Energy Workshop, Richland Community College, Decatur, IL

"Wind Energy in Illinois," presented July 28, 2016 at the 3rd Annual K-12 Teachers Clean Energy Workshop, Richland Community College, Decatur, IL

"Smart Grid for Schools," presented June 21, 2016 at the ISEIF Grantee and Ameren Meeting, Decatur, IL.

"Costs and Benefits of Renewable Energy," presented November 4, 2015 at the Osher Lifelong Learning Institute at Bradley, University, Peoria, IL.

"Energy Sector Workforce Issues," presented September 17, 2015 at the Illinois Workforce Investment Board, Springfield, IL.

"The Past, Present and Future of Wind Energy in Illinois," presented March 13, 2015 at the Peoria Rotary Club, Peoria, IL.

"Where Are All the Green Jobs?" presented January 28, 2015 at the 2015 Illinois Green Economy Network Sustainability Conference, Normal, IL.

"Teaching Next Generation Energy Concepts with Next Generation Science Standards: Addressing the Critical Need for a More Energy-Literate Workforce," presented September 30, 2014 at the Mathematics and Science Partnerships Program 2014 Conference in Washington, DC.

"National Utility Rate Database," presented October 23, 2013 at Solar Power International, Chicago, IL.

"Potential Economic Impact of Offshore Wind Energy in the Great Lakes," presented May 6, 2013 at WindPower 2013, Chicago, IL.

"Why Illinois? Windy City, Prairie Power," presented May 5, 2013 at WindPower 2013, Chicago, IL.

"National Utility Rate Database," presented January 29, 2013 at the EUEC Conference, Phoenix, AZ.

"Energy Learning Exchange and Green Jobs," presented December 13, 2012 at the TRICON Meeting of Peoria and Tazewell County Counselors, Peoria, IL.

"Potential Economic Impact of Offshore Wind Energy in the Great Lakes," presented November 12, 2012 at the Offshore Wind Jobs and Economic Development Impacts Webinar.

"Energy Learning Exchange," presented October 31, 2012 at the Utility Workforce Development Meeting, Chicago, IL.

"Wind Energy in McLean County," presented June 26, 2012 at BN By the Numbers, Normal, IL.

"Wind Energy," presented June 14, 2012 at the Wind for Schools Statewide Teacher Workshop, Normal, IL.

"Economic Impact of Wind Energy in Illinois," presented June 6, 2012 at AWEA's WINDPOWER 2012, Atlanta, GA.

"Trends in Illinois Wind Energy," presented March 6, 2012 at the AWEA Regional Wind Energy Summit – Midwest in Chicago, IL.

"Challenges and New Growth Strategies in the Wind Energy Business," invited plenary session speaker at the Green Revolution Leaders Forum, November 18, 2011 in Seoul, South Korea.

"Overview of the Center for Renewable Energy," presented July 20, 2011 at the University-Industry Consortium Meeting at Illinois Institute of Technology, Chicago, IL.

"Building the Wind Turbine Supply Chain," presented May 11, 2011 at the Supply Chain Growth Conference, Chicago, IL

"Building a Regional Energy Policy for Economic Development," presented April 4, 2011 at the Midwestern Legislative Conference's Economic Development Committee Webinar.

"Wind Energy 101," presented February 7, 2011 at the Wind Power in Central Illinois - A Public Forum, CCNET Renewable Energy Group, Champaign, IL.

"Alternative Energy Strategies," presented with Matt Aldeman November 19, 2010 at the Innovation Talent STEM Education Forum, Chicago, IL.

"Siting and Zoning in Illinois," presented November 17, 2010 at the Wind Powering America Webinar.

"What Governor Quinn Should Do about Energy?" presented November 15, 2010 at the Illinois Chamber of Commerce Energy Forum Conference, Chicago, IL.

"Is Wind Energy Development Right for Illinois," presented with Matt Aldeman October 28, 2010 at the Illinois Association of Illinois County Zoning Officials Annual Seminar in Utica, IL.

"Economic Impact of Wind Energy in Illinois," presented July 22, 2010 at the AgriEnergy Conference in Champaign, IL.

"Renewable Energy Major at ISU," presented July 21, 2010 at Green Universities and Colleges Subcommittee Webinar.

"Economics of Wind Energy," presented May 19, 2010 at the U.S. Green Building Council meeting in Chicago, IL.

"Forecasting: A Primer for the Small Business Entrepreneur," presented with James E. Cox, Jr. April 14, 2010 at the Allied Academies' Spring International Conference in New Orleans, LA.

"Are Renewable Portfolio Standards a Policy Cure-All? A Case Study of Illinois' Experience," presented January 30, 2010 at the 2010 William and Mary Environmental Law and Policy Review Symposium in Williamsburg, VA.

"Creating Partnerships between Universities and Industry," presented November 19, 2009, at New Ideas in Educating a Workforce in Renewable Energy and Energy Efficiency in Albany, NY.

"Educating Illinois in Renewable Energy, presented November 14, 2009 at the Illinois Science Teachers Association in Peoria, IL.

"Green Collar Jobs," invited presentation October 14, 2009 at the 2009 Workforce Forum in Peoria, IL.

"The Role of Wind Power in Illinois," presented March 4, 2009 at the Association of Illinois Electric Cooperatives Engineering Seminar in Springfield, IL.

"The Economic Benefits of Wind Farms," presented January 30, 2009 at the East Central Illinois Economic Development District Meeting in Champaign, IL.

"Green Collar Jobs in Illinois," presented January 6, 2009 at the Illinois Workforce Investment Board Meeting in Macomb, Illinois.

"Green Collar Jobs: What Lies Ahead for Illinois?" presented August 1, 2008 at the Illinois Employment and Training Association Conference.

"Mapping Broadband Access in Illinois," presented October 16, 2007 at the Rural Telecon '07 conference.

"A Managerial Approach to Using Error Measures to Evaluate Forecasting Methods," presented October 15, 2007 at the International Academy of Business and Economics.

"Dollars and Sense: The Pros and Cons of Renewable Fuel," presented October 18, 2006 at Illinois State University Faculty Lecture Series.

"Broadband Access in Illinois," presented July 28, 2006 at the Illinois Association of Regional Councils Annual Meeting.

"Broadband Access in Illinois," presented November 17, 2005 at the University of Illinois' Connecting the e to Rural Illinois.

"Improving Forecasting Through Textbooks – A 25 Year Review," with James E. Cox, Jr., presented June 14, 2005 at the 25th International Symposium on Forecasting.

"Telecommunications Demand Forecasting with Intermodal Competition, with Christopher Swann, presented April 2, 2004 at the Telecommunications Systems Management Conference 2004.

"Intermodal Competition," with Christopher Swann, presented April 3, 2003 at the Telecommunications Systems Management Conference 2003.

"Intermodal Competition in Local Exchange Markets," with Christopher Swann, presented June 26, 2002 at the 20th Annual International Communications Forecasting Conference.

"Assessing Retail Competition," presented May 23, 2002 at the Institute for Regulatory Policy Studies' Illinois Energy Policy for the 21st Century workshop.

"The Devil in the Details: An Analysis of Default Service and Switching," with Eric Malm presented May 24, 2001 at the 20th Annual Advanced Workshop on Regulation and Competition.

"Forecasting Challenges for U.S. Telecommunications with Local Competition," presented June 28, 1999 at the 19th International Symposium on Forecasting.

"Acceptance of Forecasting Principles in Forecasting Textbooks," presented June 28, 1999 at the 19th International Symposium on Forecasting.

"Forecasting Challenges for Telecommunications With Local Competition," presented June 17, 1999 at the 17th Annual International Communications Forecasting Conference.

"Measures of Market Competitiveness in Deregulating Industries," with Eric Malm, presented May 28, 1999 at the 18th Annual Advanced Workshop on Regulation and Competition.

"Trends in Telecommunications Forecasting and the Impact of Deregulation," Proceedings of EPRI's 11th Forecasting Symposium, 1998.

"Forecasting in a Competitive Age: Utilizing Macroeconomic Forecasts to Accurately Predict the Demand for Services," invited speaker, Institute for International Research Conference, September 29, 1997.

"Regulatory Fairness and Local Competition Pricing," presented May 30, 1996 at the 15th Annual Advanced Workshop in Regulation and Public Utility Economics.

"Optimal Pricing For a Regulated Monopolist Facing New Competition: The Case of Bell Atlantic Special Access Demand," presented May 28, 1992 at the Rutgers Advanced Workshop in Regulation and Public Utility Economics.

#### **Grants**

"SmartGrid for Schools 2018 and Energy Challenge," with William Hunter, Illinois Science and Energy Innovation Foundation, RSP Award # A15-0092-002 - extended, January 2017, \$300,000.

"Energy Learning Exchange - Implementing Nationally Recognized Energy Curriculum and Credentials in Illinois," Northern Illinois University, RSP Award # A17-0098, February, 2017, \$13,000.

"SmartGrid for Schools 2017 and Energy Challenge," with William Hunter, Illinois Science and Energy Innovation Foundation, RSP Award # A15-0092-002 - extended, January 2017, \$350,000.

"Illinois Jobs Project," University of California Berkeley, RSP Award # A16-0148, August, 2016, \$10,000.

"Energy Workforce Ready Through Building Performance Analysis," Illinois Department of Commerce and Economic Opportunity through the Department of Labor, RSP # A16-0139, June, 2016, \$328,000 (grant was de-obligated before completion).

"SmartGrid for Schools 2016 and Smart Appliance Challenge," with William Hunter, Brad Christenson and Jeritt Williams, Illinois Science and Energy Innovation Foundation, RSP Award # A15-0092-002, January 2016, \$450,000.

"SmartGrid for Schools 2015," with William Hunter and Matt Aldeman, Illinois Science and Energy Innovation Foundation, RSP Award # A15-0092-001, February 2015, \$400,000.

"Economic Impact of Nuclear Plant Closings: A Response to HR 1146," Illinois Department of Economic Opportunity, RSP Award # 14-025001 amended, January, 2015, \$22,000.

"Partnership with Midwest Renewable Energy Association for Solar Market Pathways" with Missy Nergard and Jin Jo, U.S. Department of Energy Award Number DE-EE0006910, October, 2014, \$109,469 (ISU Award amount).

"Renewable Energy for Schools," with Matt Aldeman and Jin Jo, Illinois Department of Commerce and Economic Opportunity, Award Number 14-025001, June, 2014, \$130,001.

"SmartGrid for Schools 2014," with William Hunter and Matt Aldeman, Illinois Science and Energy Innovation Foundation, RSP # 14B116, March 2014, \$451,701.

"WINDPOWER 2014 Conference Exhibit," Illinois Department of Commerce and Economic Opportunity, RSP #14C167, March, 2014, \$95,000.

#### Grants (cont'd)

"Lake Michigan Offshore Wind Energy Buoy," with Matt Aldeman, Illinois Clean Energy Community Foundation, Request ID 6435, November, 2013, \$90,000.

"Teaching Next Generation Energy Concepts with Next Generation Science Standards," with William Hunter, Matt Aldeman and Amy Bloom, Illinois State Board of Education, RSP # 13B170A, October, 2013, second year, \$159,954; amended to \$223,914.

"Solar for Schools," with Matt Aldeman, Illinois Green Economy Network, RSP # 13C280, August, 2013, \$66,072.

"Energy Learning Exchange Implementation Grant," with William Hunter and Matt Aldeman, Illinois Department of Commerce and Economic Opportunity, Award Number 13-052003, June, 2013, \$350,000.

"Teaching Next Generation Energy Concepts with Next Generation Science Standards," with William Hunter, Matt Aldeman and Amy Bloom, Illinois State Board of Education, RSP # 13B170, April, 2013, \$159,901.

"Illinois Sustainability Education SEP," Illinois Department of Commerce and Economic Opportunity, Award Number 08-431006, March, 2013, \$225,000.

"Illinois Pathways Energy Learning Exchange Planning Grant," with William Hunter and Matt Aldeman, Illinois State Board of Education (Source: U.S. Department of Education), RSP # 13A007, December, 2012, \$50,000.

"Illinois Sustainability Education SEP," Illinois Department of Commerce and Economic Opportunity, Award Number 08-431005, June 2011, amended March, 2012, \$98,911.

"Wind for Schools Education and Outreach," with Matt Aldeman, Illinois Department of Commerce and Economic Opportunity, Award Number 11-025001, amended February, 2012, \$111,752.

"A Proposal to Support Solar Energy Potential and Job Creation for the State of Illinois Focused on Large Scale Photovoltaic System," with Jin Jo (lead PI), Illinois Department of Commerce and Economic Opportunity, Award Number 12-025001, January 2012, \$135,000.

"National Database of Utility Rates and Rate Structure," U.S. Department of Energy, Award Number DE-EE0005350TDD, 2011-2014, \$850,000.

"Illinois Sustainability Education SEP," Illinois Department of Commerce and Economic Opportunity, Award Number 08-431005, June 2011, \$75,000.

#### Grants (cont'd)

"Wind for Schools Education and Outreach," with Matt Aldeman, Illinois Department of Commerce and Economic Opportunity, Award Number 11-025001, March 2011, \$190,818.

"Using Informal Science Education to Increase Public Knowledge of Wind Energy in Illinois," with Amy Bloom and Matt Aldeman, Scott Elliott Cross-Disciplinary Grant Program, February 2011, \$13,713.

"Wind Turbine Market Research," with Matt Aldeman, Illinois Manufacturers Extension Center, May, 2010, \$4,000.

"Petco Resource Assessment," with Matt Aldeman, Petco Petroleum Co., April, 2010 amended August 2010 \$34,000; original amount \$18,000.

"Wind for Schools Education and Outreach," with Anthony Lornbach and Matt Aldeman, Scott Elliott Cross-Disciplinary Grant Program, February, 2010, \$13,635.

"IGA IFA/ISU Wind Due Diligence," Illinois Finance Authority, November, 2009, \$8,580 amended December 2009; original amount \$2,860.

"Green Industry Business Development Program, with the Shaw Group and Illinois Manufacturers Extension Center, Illinois Department of Commerce and Economic Opportunity, Award Number 09-021007, August 2009, \$245,000.

"Wind Turbine Workshop Support," Illinois Department of Commerce and Economic Opportunity, June 2009, \$14,900.

"Illinois Wind Workers Group," with Randy Winter, U.S. Department of Energy, Award Number DE-EE0000507, 2009-2011, \$107,941.

"Wind Turbine Supply Chain Study," with J. Lon Carlson and James E. Payne, Illinois Department of Commerce and Economic Opportunity, Award Number 09-021003, April 2009, \$125,000.

"Renewable Energy Team Travel to American Wind Energy Association WindPower 2009 Conference, Center for Mathematics, Science and Technology, February 2009, \$3,005.

"Renewable Energy Educational Lab Equipment," with Randy Winter and David Kennell, Illinois Clean Energy Community Foundation (peer-reviewed), February, 2008, \$232,600.

#### Grants (cont'd)

"Proposal for New Certificate Program in Electricity, Natural Gas and Telecommunications Economics," with James E. Payne, Extended Learning Program Grant, April, 2007, \$29,600.

"Illinois Broadband Mapping Study," with J. Lon Carlson and Rajeev Goel, Illinois Department of Commerce and Economic Opportunity, Award Number 06-205008, 2006-2007, \$75,000.

"Illinois Wind Energy Education and Outreach Project," with David Kennell and Randy Winter, U.S. Department of Energy, Award Number DE-FG36-06GO86091, 2006-2010, \$990,000.

"Wind Turbine Installation at Illinois State University Farm," with Doug Kingman and David Kennell, Illinois Clean Energy Community Foundation (peer-reviewed), May, 2004, \$500,000.

"Illinois State University Wind Measurement Project," Doug Kingman and David Kennell, Illinois Clean Energy Community Foundation (peer-reviewed), with August, 2003, \$40,000.

"Illinois State University Wind Measurement Project," with Doug Kingman and David Kennell, NEG Micon matching contribution, August, 2003, \$65,000.

"Distance Learning Technology Program," Illinois State University Faculty Technology Support Services, Summer 2002, \$3,000.

"Providing an Understanding of Telecommunications Technology By Incorporating Multimedia into Economics 235," Instructional Technology Development Grant (peer-reviewed), January 15, 2001, \$1,400.

"Using Real Presenter to create a virtual tour of GTE's Central Office," with Jack Chizmar, Instructional Technology Literacy Mentoring Project Grant (peer-reviewed), January 15, 2001, \$1,000.

"An Empirical Study of Telecommunications Industry Forecasting Practices," with James E. Cox, College of Business University Research Grant (peer-reviewed), Summer, 1999, \$6,000.

"Ownership Form and the Efficiency of Electric Utilities: A Meta-Analytic Review" with L. Dean Hiebert, Institute for Regulatory Policy Studies research grant (peer-reviewed), August 1998, \$6,000.

**Total Grants: \$7,740,953** 

#### **External Funding**

Corporate Funding for Institute for Regulatory Policy Studies, Ameren (\$7,500), Aqua Illinois (\$7,500); Commonwealth Edison (\$7,500); Exelon (\$7,500); Illinois American Water (\$7,500); Midcontinent ISO (\$7,500); NICOR Energy (\$7,500); People Gas Light and Coke (\$7,500); PJM Interconnect (\$7,500); Fiscal Year 2017, \$67,500 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2017, \$18,342.

Corporate Funding for Institute for Regulatory Policy Studies, Ameren (\$7,500), Aqua Illinois (\$7,500); Commonwealth Edison (\$7,500); Exelon (\$7,500); Illinois American Water (\$7,500) ITC Holdings (\$7,500); Midcontinent ISO (\$7,500); NICOR Energy (\$7,500); People Gas Light and Coke (\$7,500); PJM Interconnect (\$7,500); Fiscal Year 2017, \$75,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2016, \$19,667.

Corporate Funding for Energy Learning Exchange, Calendar Year 2016, \$53,000.

Corporate Funding for Institute for Regulatory Policy Studies, Ameren (\$7,500), Aqua Illinois (\$7,500); Commonwealth Edison (\$7,500); Exelon/Constellation NewEnergy (\$7,500); Illinois American Water (\$7,500) ITC Holdings (\$7,500); Midcontinent ISO (\$7,500); NICOR Energy (\$7,500); People Gas Light and Coke (\$7,500); PJM Interconnect (\$7,500); Utilities, Inc. (\$7,500) Fiscal Year 2016, \$82,500 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2015, \$15,897.

Corporate Funding for Institute for Regulatory Policy Studies, Ameren (\$7,500), Alliance Pipeline (\$7,500); Aqua Illinois (\$7,500); AT&T (\$7,500); Commonwealth Edison (\$7,500); Exelon/Constellation NewEnergy (\$7,500); Illinois American Water (\$7,500) ITC Holdings (\$7,500); Midcontinent ISO (\$7,500); NICOR Energy (\$7,500); People Gas Light and Coke (\$7,500); PJM Interconnect (\$7,500); Fiscal Year 2015, \$90,000 total.

Corporate Funding for Energy Learning Exchange, Calendar Year 2014, \$55,000.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2014, \$12,381.

Corporate Funding for Institute for Regulatory Policy Studies, Ameren (\$7,500), Alliance Pipeline (\$7,500); Aqua Illinois (\$7,500); AT&T (\$7,500); Commonwealth Edison (\$7,500); Constellation NewEnergy (\$7,500); Illinois American Water (\$7,500) ITC Holdings (\$7,500); Midwest Energy Efficiency Alliance (\$4,500); Midwest Generation (\$7,500); MidWest ISO (\$7,500); NICOR Energy (\$7,500); People Gas Light and Coke (\$7,500); PJM Interconnect (\$7,500); Fiscal Year 2014, \$102,000 total.

Corporate Funding for Energy Learning Exchange, Calendar Year 2013, \$53,000.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2013, \$17,097.

Corporate Funding for Institute for Regulatory Policy Studies, Ameren (\$7,500), Alliance Pipeline (\$7,500); Aqua Illinois (\$7,500); AT&T (\$7,500); Commonwealth Edison (\$7,500); Constellation NewEnergy (\$7,500); Illinois American Water (\$7,500) ITC Holdings (\$7,500); Midwest Generation (\$7,500); MidWest ISO (\$7,500); NICOR Energy (\$7,500); People Gas Light and Coke (\$7,500); PJM Interconnect (\$7,500); Fiscal Year 2013, \$97,500 total.

Corporate Funding for Illinois Wind Working Group, Calendar Year 2012, \$29,325.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2012, \$16,060.

Corporate Funding for Institute for Regulatory Policy Studies, Alliance Pipeline (\$7,500); Aqua Illinois (\$7,500); AT&T (\$7,500); Commonwealth Edison (\$7,500); Constellation New-Energy (\$7,500); Illinois American Water (\$7,500) ITC Holdings (\$7,500); Midwest Generation (\$7,500); MidWest ISO (\$7,500); NICOR Energy (\$7,500); People Gas Light and Coke (\$7,500); PJM Interconnect (\$7,500); Fiscal Year 2012, \$90,000 total.

Corporate Funding for Illinois Wind Working Group, Calendar Year 2011, \$57,005.

Workshop Surplus for Institute for Regulatory Policy Studies, with Adrienne Ohler, Fiscal Year 2011, \$13,562.

Corporate Funding for Institute for Regulatory Policy Studies, Alliance Pipeline (\$7,500); Aqua Illinois (\$7,500); AT&T (\$7,500); Commonwealth Edison (\$7,500); Constellation New-Energy (\$7,500); Illinois American Water (\$7,500) ITC Holdings (\$7,500); Midwest Generation (\$7,500); MidWest ISO (\$7,500); NICOR Energy (\$7,500); People Gas Light and Coke (\$7,500); PJM Interconnect (\$7,500); Fiscal Year 2011, \$90,000 total.

Corporate Funding for Center for Renewable Energy, Calendar Year 2010, \$50,000.

Corporate Funding for Illinois Wind Working Group, Calendar Year 2010, \$49,000.

Workshop Surplus for Institute for Regulatory Policy Studies, with Lon Carlson, Fiscal Year 2010, \$17,759.

Corporate Funding for Institute for Regulatory Policy Studies, Alliance Pipeline (\$7,500); Ameren (\$7,500); AT&T (\$7,500); Commonwealth Edison (\$7,500); Constellation NewEnergy (\$7,500); ITC Holdings (\$7,500); Midwest Generation (\$7,500); MidWest ISO (\$7,500); NICOR Energy (\$7,500); People Gas Light and Coke (\$7,500); PJM Interconnect (\$7,500); Fiscal Year 2010, \$82,500 total.

Corporate Funding for Illinois Wind Working Group, Calendar Year 2009, \$57,140.

Workshop Surplus for Institute for Regulatory Policy Studies, with Lon Carlson, Fiscal Year 2009, \$21,988.

Corporate Funding for Institute for Regulatory Policy Studies, Alliance Pipeline (\$7,500); Ameren (\$7,500); AT&T (\$7,500); Commonwealth Edison (\$7,500); Constellation NewEnergy (\$7,500); MidAmerican Energy (\$7,500); MidWest Generation (\$7,500); MidWest ISO (\$7,500); NICOR Energy (\$7,500); People Gas Light and Coke (\$7,500); PJM Interconnect (\$7,500); Fiscal Year 2009, \$82,500 total.

Corporate Funding for Center for Renewable Energy, Calendar Year 2008, \$157,500.

Corporate Funding for Illinois Wind Working Group, Calendar Year 2008, \$38,500.

Workshop Surplus for Institute for Regulatory Policy Studies, with Lon Carlson, Fiscal Year 2008, \$28,489.

Corporate Funding for Institute for Regulatory Policy Studies, Alliance Pipeline (\$5,000); Ameren (\$5,000); AT&T (\$5,000); Commonwealth Edison (\$5,000); Constellation NewEnergy (\$5,000); MidAmerican Energy (\$5,000); MidWest Generation (\$5,000); MidWest ISO (\$5,000); NICOR Energy (\$5,000); Peabody Energy (\$5,000), People Gas Light and Coke (\$5,000); PJM Interconnect (\$5,000); Fiscal Year 2008, \$60,000 total.

Corporate Funding for Illinois Wind Working Group, Calendar Year 2007, \$16,250.

Workshop Surplus for Institute for Regulatory Policy Studies, with Lon Carlson, Fiscal Year 2007, \$19,403.

Corporate Funding for Institute for Regulatory Policy Studies, AARP (\$3,000), Alliance Pipeline (\$5,000), Ameren (\$5,000); Citizens Utility Board (\$5,000); Commonwealth Edison (\$5,000); Constellation NewEnergy (\$5,000); MidAmerican Energy (\$5,000); Midwest Generation (\$5,000); MidWest ISO (\$5,000); NICOR Energy (\$5,000); Peabody Energy (\$5,000), People Gas Light and Coke (\$5,000); PJM Interconnect (\$5,000); SBC (\$5,000); Verizon (\$5,000); Fiscal Year 2007, \$73,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with Lon Carlson, Fiscal Year 2006, \$13,360.

Corporate Funding for Institute for Regulatory Policy Studies, AARP (\$1,500), Alliance Pipeline (\$2,500), Ameren (\$5,000); Citizens Utility Board (\$5,000); Commonwealth Edison (\$5,000); Constellation NewEnergy (\$5,000); DTE Energy (\$5,000); MidAmerican Energy (\$5,000); Midwest Generation (\$5,000); MidWest ISO (\$5,000); NICOR Energy (\$5,000); Peabody Energy (\$2,500), People Gas Light and Coke (\$5,000); PJM Interconnect (\$5,000); SBC (\$5,000); Verizon (\$5,000); Fiscal Year 2006, \$71,500 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Fiscal Year 2005, \$12,916.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS (\$5,000); Citizens Utility Board (\$5,000); Commonwealth Edison (\$5,000); Constellation New-Energy (\$5,000); Illinois Power (\$5,000); MidAmerican Energy (\$5,000); Midwest Generation (\$5,000); MidWest ISO (\$5,000); NICOR Energy (\$5,000); People Gas Light and Coke (\$5,000); PJM Interconnect (\$5,000); SBC (\$2,500); Verizon (\$2,500); Fiscal Year 2005, \$60,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Fiscal Year 2004, \$17,515.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS (\$5,000); Commonwealth Edison (\$5,000); Constellation NewEnergy (\$5,000); Illinois Power (\$5,000); MidAmerican Energy (\$5,000); Midwest Generation (\$5,000); NICOR Energy (\$5,000); People Gas Light and Coke (\$5,000); PJM Interconnect (\$5,000); Fiscal Year 2004, \$45,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Fiscal Year 2003, \$8,300.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS (\$5,000); AT&T (\$2,500); Commonwealth Edison (\$5,000); Illinois Power (\$5,000); MidAmerican Energy (\$5,000); NICOR Energy (\$5,000); People Gas Light and Coke (\$5,000); Fiscal Year 2003, \$32,500 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Calendar Year 2002, \$15,700.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS (\$2,500); AT&T (\$5,000); Commonwealth Edison (\$2,500); Illinois Power (\$2,500); MidAmerican Energy (\$2,500); NICOR Energy (\$2,500); People Gas Light and Coke (\$2,500); Calendar Year 2002, \$17,500 total.

Corporate Funding for International Communications Forecasting Conference, National Economic Research Associates (\$10,000); Taylor Nelson Sofres Telecoms (\$10,000); Calendar Year 2002, \$20,000 total

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS (\$5,000); AT&T (\$5,000); Commonwealth Edison (\$5,000); Illinois Power (\$5,000); MidAmerican Energy (\$5,000); NICOR Energy (\$5,000); People Gas Light and Coke (\$5,000); Calendar Year 2001, \$35,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Calendar Year 2001, \$19,400.

Corporate Funding for International Communications Forecasting Conference, National Economic Research Associates (\$10,000); Taylor Nelson Sofres Telecoms (\$10,000); SAS Institute (\$10,000); Calendar Year 2001, \$30,000 total.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS (\$5,000); AT&T (\$5,000); Commonwealth Edison (\$5,000); Illinois Power (\$5,000); MidAmerican Energy (\$5,000); NICOR Energy (\$5,000); People Gas Light and Coke (\$5,000); Calendar Year 2000, \$35,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Calendar Year 2000, \$20,270.

Corporate Funding for International Communications Forecasting Conference, National Economic Research Associates (\$10,000); Taylor Nelson Sofres Telecoms (\$10,000); Calendar Year 2000, \$20,000 total.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS (\$5,000); AT&T (\$5,000); Commonwealth Edison (\$5,000); Illinois Power (\$5,000); MidAmerican Energy (\$5,000); NICOR Energy (\$5,000); People Gas Light and Coke (\$5,000); Calendar Year 1999, \$35,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Calendar Year 1999, \$10,520.

Corporate Funding for International Communications Forecasting Conference, National Economic Research Associates (\$10,000); PNR Associates (\$10,000); Calendar Year 1999, \$20,000 total.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS (\$5,000); CILCO (\$5,000); Commonwealth Edison (\$5,000); Illinois Power (\$5,000); MidAmerican Energy (\$5,000); People Gas Light and Coke (\$5,000); Calendar Year 1998, \$30,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Calendar Year 1998, \$44,334.

Corporate Funding for International Communications Forecasting Conference, National Economic Research Associates (\$10,000); PNR Associates (\$10,000); Calendar Year 1998, \$20,000 total.

Corporate Funding for Institute for Regulatory Policy Studies, with L. Dean Hiebert, AmerenCIPS (\$5,000); CILCO (\$5,000); Commonwealth Edison (\$5,000); Illinois Power (\$5,000); MidAmerican Energy (\$5,000); People Gas Light and Coke (\$5,000); Calendar Year 1997, \$30,000 total.

Workshop Surplus for Institute for Regulatory Policy Studies, with L. Dean Hiebert, Calendar Year 1997, \$19,717.

**Total External Funding: \$2,492,397** 



Strategic Economic Research, LEC

Economic Impact of the Hardin Solar II Energy Center

# Exhibit K

# **Complaint Resolution Plan**

Christine M.T. Pirik (0029759) (Counsel of Record) William V. Vorys (0093479) Dickinson Wright PLLC 150 East Gay Street, Suite 2400 Columbus, Ohio 43215 Phone: (614) 591-5461

Email: <a href="mailto:cpirik@dickinsonwright.com">cpirik@dickinsonwright.com</a> wvorys@dickinsonwright.com

Attorneys for Hardin Solar Energy II LLC

#### HARDIN SOLAR ENERGY II, LLC ("Hardin Solar II") Case No 18-1360-EL-BGN

#### Hardin Solar II Complaint Resolution Plan

**PURPOSE:** To provide a transparent and effective method for residents of the community to lodge concerns, problems and complaints related to the solar facility.

**BACKGROUND:** Hardin Solar II is committed to ensuring that an accessible process is in place for community members to voice concerns and for those concerns to be addressed as quickly and effectively as possible.

Maintaining a detailed record of all complaints and the resolutions that follow is an important aspect of the complaint resolution plan.

**POLICY:** The policy of Hardin Solar II is to take reasonable necessary actions to rectify legitimate interference or disturbances that are a direct result of the solar facilities.

#### **PROCEDURE:**

- 1.) Hardin Solar II will establish an 800-phone number prior to the solar facility being commercially operational and will ensure that the phone number is provided to the county commissioners, township trustees, emergency responders, the schools, and public libraries within the project area. A resident who has a complaint about the solar facility may either call the 800# and leave a message 24 hours a day or go to the Operations and Maintenance Facility for the solar facility during regular business hours to register a complaint.
- 2.) Hardin Solar II will document every complaint that is received, including all pertinent information about the person making the complaint, the issues surrounding the complaint and the date that the complaint was received. The logbook will also contain the resolution that Hardin Solar II suggests, the date the complaining party agreed to the proposed resolution and the date when the proposed resolution was implemented. Hardin Solar II will investigate each complaint.
- 3.) Hardin Solar II personnel will generate a quarterly report about the nature and resolution of all complaints received in that quarter and file the report with the Ohio Power Siting Board on the following date of each year (April 15th, July 15th, October 15<sup>th</sup>, and January 15th).
- 4.) Residents who register a complaint with Hardin Solar II will be contacted by the company no later than 48 hours after registering the complaint. The intent of the initial contact is to garner more information from the individual's complaint. Within 30 days of the complaint being received Hardin Solar II will initiate reasonable action to resolve the legitimate interference or disturbance that is a direct result of the solar facility.

Hardin Solar Compliant Resolution Plan Page 2 of 2

5.) If Hardin Solar II and the complaining resident cannot agree to a resolution proposed by Hardin Solar II or one negotiated with the complaining resident, Hardin Solar II will provide a summary of the complaint and proposed resolution to the complaining resident so that the resident may bring the complaint to the Ohio Power Siting Board.

# **Exhibit L Certificate of Liability Insurance**

### **CONFIDENTIAL**

FILED UNDER SEAL

Hardin Solar Energy II LLC has requested confidential treatment of this document in accordance with OAC Rule 4906-2-21.

This document contains policy numbers and certificate numbers and, as such, is entitled to confidential treatment under state and/or federal statutes and regulations.

An unredacted version of the following document has been submitted to the Docketing Division of the OPSB in accordance with OAC Rule 4906-2-21(D)(2):

Christine M.T. Pirik (0029759) (Counsel of Record) William V. Vorys (0093479) Dickinson Wright PLLC 150 East Gay Street, Suite 2400 Columbus, Ohio 43215

Phone: (614) 591-5461

Email: <a href="mailto:cpirik@dickinsonwright.com">cpirik@dickinsonwright.com</a> wvorys@dickinsonwright.com

Attorneys for Hardin Solar Energy II LLC

DATE(MM/DD/YYYY)

07/12/2018

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#### CERTIFICATE OF LIABILITY INSURANCE

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this

certificate does not confer rig	hts to the certificate holder in lieu of such (	endorsemen	t(s).				
PRODUCER		CONTACT NAME:					
Aon Risk Services Central, In Chicago IL Office	nc.	PHONE (A/C. No. Ext):	FAX (A/C. No.): (800) 363-01	L05			
200 East Randolph Chicago IL 60601 USA		E-MAIL ADDRESS:			_		
-			VERAGE	NAIC#			
INSURED		INSURER A:	Great Northern Insuran	ce Co.	20303		
Hardin Solar Energy LLC One South Wacker Suite 1900 Chicago IL 60606 USA		INSURER B: Federal Insurance Company			20281		
		INSURER C:	Arch Insurance Company		11150		
		INSURER D:					
		INSURER E:					
		INSURER F:					
COVERAGES	CERTIFICATE NUMBER:		REVISION	NUMBER:			

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

	CLUSIONS AND CONDITIONS OF SUCH						Limits sho	own are as requested
INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER		POLICY EXP (MM/DD/YYYY)	LIMITS	1
В	X COMMERCIAL GENERAL LIABILITY				06/01/2018	06/01/2019	EACH OCCURRENCE	\$1,000,000
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	\$1,000,000
							MED EXP (Any one person)	\$25,000
							PERSONAL & ADV INJURY	\$2,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:						GENERALAGGREGATE	\$2,000,000
	POLICY PRO- JECT X LOC						PRODUCTS - COMP/OP AGG	Included
	OTHER:							
Α	AUTOMOBILE LIABILITY				06/01/2018	06/01/2019	COMBINED SINGLE LIMIT (Ea accident)	\$1,000,000
	X ANY AUTO						BODILY INJURY ( Per person)	
	OWNED SCHEDULED AUTOS						BODILY INJURY (Per accident)	
	AUTOS ONLY HIRED AUTOS ONLY AUTOS NON-OWNED AUTOS ONLY						PROPERTY DAMAGE (Per accident)	
В	X UMBRELLA LIAB X OCCUR				06/01/2018	06/01/2019	EACH OCCURRENCE	\$25,000,000
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	\$25,000,000
	DED RETENTION							
В	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY				06/01/2018	06/01/2019	X PER STATUTE OTH-	
	ANY PROPRIETOR / PARTNER / EXECUTIVE	N/A					E.L. EACH ACCIDENT	\$1,000,000
	(Mandatory in NH)	N/A					E.L. DISEASE-EA EMPLOYEE	\$1,000,000
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE-POLICY LIMIT	\$1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

RE: Location: Hardin County, OH. Evidence of Insurance.

CERTIFICATE HOLDER	CANCELLATION
CERTIFICATE HOLDER	CANCELLATIO

Hardin Solar Energy LLC One South Wacker, Suite 1900 Chicago IL 60606 USA

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

Aon Rish Services Central Inc

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LOC #:



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AGEN						NAME	DINSURED din Solar E			
POLICY NUMBER						Har	um Solar E	nergy LLC		
	Certificate Number:				Luuro cons					
CARRI See	Certificate Number:				NAIC CODE	EFFE(	CTIVE DATE:			
ADE	DITIONAL REMARKS				1					
	ADDITIONAL REMARKS						_			
FOR	M NUMBER: ACORD 25	FORM II	ILE:	Certificate	of Liability Ins	uranc	:e 			
INSURER(S) AFFORDING COVERAGE NAIC #										
INSU	JRER									
INSU	JRER									
INSU	IRER									
INSU	JRER									
ΑΓ	DDITIONAL POLICIES			w does not for policy		nforn	nation, refer to	the correspond	ling policy on the	e ACORD
INSR LTR		ADDL INSD	SUBR WVD	POI	LICY NUMBER		POLICY EFFECTIVE DATE (MM/DD/YYYY)	POLICY EXPIRATION DATE (MM/DD/YYYY)	LIN	MITS
	EXCESS LIABILITY									
С							06/01/2018	06/01/2019	Aggregate	\$25,000,000
									Each Occurrence	\$25,000,000

### **Exhibit M**

# **Determination of Average Ambient Noise Levels**

Christine M.T. Pirik (0029759) (Counsel of Record) William V. Vorys (0093479) Dickinson Wright PLLC 150 East Gay Street, Suite 2400 Columbus, Ohio 43215

Phone: (614) 591-5461

Email: <a href="mailto:cpirik@dickinsonwright.com">cpirik@dickinsonwright.com</a> wvorys@dickinsonwright.com

Attorneys for Hardin Solar Energy II LLC



August 22, 2016

Kent N. Truckor Manager, Business Development Invenergy LLC One South Wacker Drive, Suite 1800 Chicago, IL 60606

Re: Hardin Wind Farm Project: Calculation of 24-Hour Average Ambient Noise Level

Kent,

Per your request, Hankard Environmental calculated the site-wide, 24-hour average ambient noise level for the Hardin Wind Farm Project, which is located in Hardin County, Ohio. Described herein are details regarding this calculation, the resulting noise levels, and the recommended noise criterion for use in the Ohio Power and Siting Board (OPSB) impact assessment. For more detailed information regarding the ambient noise level survey conducted for this project, refer to the report entitled *Hardin Wind Farm Baseline Sound Survey Report* (Tetra Tech, December 2009). For more information regarding noise emissions from the project, refer to the *Application of Hardin Wind Energy LLC for a Third Amendment to its Certificate of Environmental Compatibility* (June 2016, OPSB Case No. 16-469-EL-BGA).

Ambient noise levels were measured at four locations in the fall of 2009 within the Hardin Project study area. Ambient noise levels at this time of year are relatively low, owing to the fact that leaves are off the trees, bird and insect noise is at a minimum, and harvest activities were concluded. Noise levels were measured continuously for a period of approximately three weeks. The A-weighted equivalent noise level ( $L_{\rm eq}$ , dBA), was measured in 10-minute intervals, 24 hours per day. I processed the resulting noise level dataset in two ways. First, periods during which there was precipitation were removed. Second, noise level versus time plots for each location were reviewed to identify anomalies. Two were observed. Noise levels for one entire night at Location 3 were abnormally high due to the wind, as were levels for about two hours at Location 1 for unknown reasons. These data were removed for the purposes of this calculation. The 24-hour 'energy-average' noise level ( $L_{\rm eq}$ , dBA) was calculated for each location, as well as for the site as a whole. The resulting noise levels are listed in the table below.

The site-wide, 24-hour average ambient noise level at Hardin is 46 dBA ( $L_{\rm eq,\,24-hour}$ ). The criterion for Hardin, described as condition 36 in the OPSB Joint Stipulation and Recommendation (Case No. 09-0479-EL-BGN), is the ambient noise level plus 5 dBA. Based on this, the criterion for Hardin would be 51 dBA. However, I recommend a criterion of 50 dBA, as to operate the project in a manner that will minimize potential noise impacts.



24-Hour Ambient Noise Levels for the Hardin Wind Farm Project					
Location	Average 24-Hour L <sub>eq</sub> (dBA)				
M1	44				
M2	45				
МЗ	49				
M4	46				
Site-Wide (energy average)	46				

Thank you for commissioning Hankard Environmental to conduct this analysis for the Hardin Wind Farm Project. If you have any questions or would like additional information, please call.

Sincerely,

Michael Hankard, INCE and ASA Member

Principal Acoustical Consultant

Michael Haul

This foregoing document was electronically filed with the Public Utilities

**Commission of Ohio Docketing Information System on** 

10/12/2018 10:51:38 AM

in

Case No(s). 18-1360-EL-BGN

Summary: Application Part 4 of 6, Exhibits H through M electronically filed by Christine M.T. Pirik on behalf of Hardin Solar Energy II LLC