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June 27, 2019

Ms. Tanowa Troupe, Secretary
Ohio Power Siting Board
Docketing Division
180 East Broad Street, 11th Floor
Columbus, OH 43215

Re: Case Nos. 09-479-EL-BGN, 11-3446-EL-BGA, 16-469-EL-BGA, and 16-2404-EL-BGA
In the Matter of the Application of Hardin Wind Energy LLC for a Certificate of Environmental Compatibility and Public Need for the Hardin Wind Farm.

Phase 3 – Compliance with Condition 57(a), Case No. 09-479-EL-BGN – 2019 Wetlands Delineation Report (Laydown Areas)

Dear Ms. Troupe:

Hardin Wind Energy LLC ("Applicant") is certified to construct a wind-powered electric generation facility in Hardin County, Ohio, in accordance with the orders issued by the Ohio Power Siting Board ("OPSB") in the above-referenced cases.

The Applicant is currently preparing to begin Phase 3 of the project, which will entail construction of the access roads and turbine foundations that were not included in Phases 1 and 2.

At this time, for purposes of complying with the certificate conditions for Phase 3, the Applicant is filing the attached Addendum 2 to the 2019 Wetlands Delineation Report ("Addendum 2"). Addendum 2, together with the 2018 and 2019 Wetlands Delineation Reports filed with the OPSB on June 20, 2019, ensures that all final turbine locations, laydown areas, access roads, and turning radii required for the project have been screened for the presence of wetlands and other waters. This document is being provided in compliance with Condition 57(a) of OPSB's March 22, 2010 Order in Case No. 09-479-EL-BGN.

We are available, at your convenience, to answer any questions you may have.

Respectfully submitted,

/s/ *Christine M.T. Pirik*
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COLUMBUS 39579-20 118258v1

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

ADDENDUM 2

Hardin Wind Energy Project

Hardin County, Ohio

June 2019

TRC Project No. 339845.0000.0000

Prepared For:

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CONFIDENTIAL BUSINESS INFORMATION

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B. Photographic Log

    *Refer to August 2018 Wetland and Other Waters of the US Delineation Report for photos of streams HW-M1 and HW-M7.

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D. Ohio EPA ORAM Data Forms

E. Ohio EPA Stream Data Forms

ACRONYMS

August 2018 Report	August 2018 Hardin Wind Energy Project Wetlands and Other Waters of the U.S. Delineation Report
Addendum 1	May 2019 Hardin Wind Energy Project Wetlands and Other Waters of the U.S. Delineation Report Addendum 1
FEMA	Federal Emergency Management Agency
GPS	Global Positioning System
HHEI	Headwater Habitat Evaluation Index
HUC	Hydrologic Unit Code
HWE	Hardin Wind Energy LLC
NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OAC	Ohio Administrative Code
ODNR	Ohio Department of Natural Resources
Ohio EPA	Ohio Environmental Protection Agency
OHWM	Ordinary High-Water Mark
ORAM	Ohio Rapid Assessment Method
PEM	Palustrine emergent
PFO	Palustrine forested
PHWH	Primary Headwater Habitat
Project	Hardin Wind Energy Project
PSS	Palustrine scrub-shrub

POW	Palustrine open-water
QHEI	Qualitative Habitat Evaluation Index
TNM	The National Map
TRC	TRC Environmental Corporation
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

1.0 INTRODUCTION

On behalf of Hardin Wind Energy LLC (HWE), TRC Environmental Corporation (TRC) has prepared this Addendum 2 to the August 2018 Hardin Wind Energy Project Wetlands and Other Waters of the U.S. Delineation Report (August 2018 Report) (TRC Environmental Corporation 2018), for the Hardin Wind Energy Project (Project), located in Hardin County, Ohio (Appendix A, Figure 1). At the request of HWE, TRC conducted a wetlands and other waters of the U.S. survey for modifications to construction access roads, and inclusion of roadway intersection turning radii assessments and laydown yards associated with the proposed Project. This Addendum contains the methodology and results of additional wetland and other waters of the U.S. identification and delineation investigations performed by TRC. Combined with the August 2018 Report (TRC Environmental Corporation 2018) and May 2019 Hardin Wind Energy Project Wetlands and Other Waters of the U.S. Delineation Report Addendum 1 (Addendum 1) (TRC Environmental Corporation 2019), Addendum 2 ensures that all final turbine locations, laydown areas, access roads, and turning radii required for the Project have been screened for presence of wetlands and other waters of the US. Mr. Matthew Ray (TRC), Ms. Sarah Bender (TRC), and Mr. Tom Radford (TRC), environmental scientists with over 15 years of combined experience, were the lead field scientists and authors of this Addendum.

The primary objective of the survey was to identify and evaluate wetlands and other waters of the U.S. within the June 2019 Hardin Wind Addendum 2 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).

For this Addendum, TRC surveyed an additional 147 acres (59 hectares) on June 19th and 20th, 2019. In total, the combined August 2018 Hardin Wind Study Area, May 2019 Hardin Wind Addendum Study Area, and June 2019 Hardin Wind Addendum 2 Study Area for the Project is approximately 1,377 acres (557 hectares), including areas of Marion, Cessna, Lynn, McDonald, and Roundhead Townships, in Hardin County, Ohio, where sixty (60) proposed turbines, collection lines and access roads may be located (Appendix A, Figure 1). The June 2019 Hardin Wind Addendum 2 Study Area includes no buffer for laydown yards and a 60-foot buffer (30 feet on either side of centerline) for turbine access roads and turning radii located within the boundary of this survey.

The Project lies within the Eastern Corn Belt Plains, which typically have loamy and well-drained soils, and most commonly characterized by its rolling plains and local end moraines (Wilken, Jiménez Nava, & 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 958 feet (292 meters) to 1030 feet (314 meters) above mean sea level. The proposed Project is located within the Ohio River and Lake Erie drainage basins. 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 mostly within the Upper Scioto River watershed (8-Digit HUC: 05060001) with a small portion, located northeast of SR-309, within the Blanchard River watershed (8-Digit HUC: 04100008) (USDA/NRCS, 2013).

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 June 2019 Hardin Wind Addendum 2 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 June 2019 Hardin Wind Addendum 2 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 June 2019 desktop review included the following: the United States Geological Survey (USGS) Alger, Foraker, 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 (b) 2019) for Hardin County, Ohio (Appendix A, Figure 2 [Pages 1 through 6]); the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory Map (NWI) near Alger, Ohio (USFWS 2019) and the USGS National Hydrography Dataset (NHD) (USGS 2017) (Appendix A, Figure 3); the Federal Emergency Management Agency (FEMA) flood hazard risk map (FEMA 2019) (Appendix A, Figure 4) and the Ohio EPA OAC Chapter 3745-1 Water Quality Standards (Ohio EPA 2017). Sources were reviewed to identify conditions that may be present within the June 2019 Hardin Wind Addendum 2 Study Area. The results of the desktop review were used to aid in the June 2019 field investigation.

2.2 Field Methodology-Wetlands

Wetland resources within the June 2019 Hardin Wind Addendum 2 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 2010). 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 and completed USACE Wetland Determination Data Forms-Midwest Region are presented in Appendix C.

Wetlands 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.W-MRR-1, W-MRR-2, W-MRR-3, etc.), and correspond to the wetlands illustrated on the Delineated Resource map provided in Appendix A, as Figure 5 (Pages 1 through 8). The wetland boundaries were mapped as polygons and the wetland areal extents were calculated using the shapefile properties utility in ArcMap.

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 June 2019 Hardin Wind Addendum 2 Study Area were evaluated using the Ohio Rapid Assessment Method (ORAM) 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). 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. ORAM scores are considered preliminary until verified by the Ohio EPA. Delineated wetlands are illustrated in Appendix A, Figure 5 (Pages 1 through 8). Completed ORAM data forms are included in Appendix D.

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

The June 2019 Hardin Wind Addendum 2 Study Area was screened for the presence of areas that meet the criteria for "other waters of the U.S." specified in the *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 (OHWM) in the channel were identified and delineated as jurisdictional streams. Drainage channels that do not exhibit an OHWM and/or defined bed and bank were regarded as non-jurisdictional drainages. Non-jurisdictional drainages were not delineated as part of the study.

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.

The June 2019 Hardin Wind Addendum 2 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 OHWM, where aquatic vegetation is either non-emergent, spares 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-HW-M1*, *WB-HW-M2* etc.) and areas area mapped as polygons.

3.0 RESULTS

Five (5) wetlands, W-MRR-1, W-MRR-2, W-MRR-3, W-MRR-4, and W-MRR-5; one (1) stream, S-MRR-2; and one (1) freshwater pond, WB-MRR-1, were identified and delineated within the June 2019 Hardin Wind Addendum 2 Study Area (Tables 3.1, 3.2.1, 3.2.2). Additionally, two (2) streams, HW-M1 and HW-M7, previously identified from the August 2018 field investigation were extended to include their reach within the June 2019 Hardin Wind Addendum 2 Study Area during the field investigation.

Table 3.1 Potential Wetlands and Other Waters of the U.S. Investigated and Jurisdictional Determinations within the June 2019 Hardin Wind Addendum 2 Study Area

Resource ID	Field Survey Date	Location (Latitude, Longitude)	Provisional Determination[1]	Acreage (Hectares) of Jurisdictional Waters[1] in Study Area and Cowardin Classification[2]
W-MRR-1	6/19/19	40.70983, -83.74916	Waters of the U.S., Wetland	0.01 (0.004) PEM
W-MRR-2	6/19/19	40.69928, -83.72057	Waters of the U.S., Wetland	0.16 (0.065) PEM
W-MRR-3	6/19/19	40.70358, -83.74453	Waters of the U.S., Wetland	0.01 (0.004) PEM
W-MRR-4	6/20/19	40.63745, -83.78126	Waters of the U.S., Wetland	0.16 (0.065) PEM
W-MRR-5	6/20/20	40.63585, -83.76518	Waters of the U.S., Wetland	0.27 (0.11) PEM
S-MRR-2	6/19/19	40.6744, -83.7534	Waters of the U.S., Stream	< 0.01 (< 0.004) R5
HW-M1 (Cooney Ditch)	5/10/18	40.69978, -83.78465	Waters of the U.S., Stream	< 0.01 (< 0.004) R5
HW-M7	5/14/18	40.6745, -83.8419	Waters of the U.S., Stream	< 0.01 (< 0.004) R5
WB-MRR-1	6/19/19	40.69928, -83.72057	Waters of the U.S., Pond	0.50 (0.20) PUB

[1] Preliminarily assigned. Not considered final until verified by the USACE
[2] Cowardin Classification
PEM = Palustrine Emergent
PSS = Palustrine Scrub/Shrub
PFO = Palustrine Forested
PUB = Palustrine Unconsolidated Bottom
R5 = Perennial Stream

3.1 Background Resources

3.1.1 USGS Topographic Map

Based on the desktop review, the June 2019 Hardin Wind Addendum 2 Study Area contained no wetland features according to the Alger, Foraker, and Roundhead, Ohio (1985) 7.5-minute series topographical quadrangles (USGS 1994) (Appendix A, Figure 1).

3.1.2 Soils

According to the soil dataset acquired from the NRCS Web Soil Survey for Hardin County, Ohio, the June 2019 Hardin Wind Addendum 2 Study Area at wetland W-MRR-1, W-MRR-2, W-MRR-3, W-MRR-4, and W-MRR-5 is underlain by one (1) soil type: Pewamo silty clay loam, 0-1% slopes (PkA). The Pewamo silty clay loam, 0-1% percent slopes soil type is listed as a hydric soil in Hardin County, Ohio (USDA (a) 2019) (Appendix A, Figure 2 [Pages 1 through 6]). As detailed in the August 2018 Report (TRC Environmental Corporation 2018), the August 2018 Hardin Wind Study Area for the Project is underlain by twenty-five (25) different soil types; thirteen (13) soils are mapped as non-hydric and twelve (12) soils are mapped as hydric (USDA (a) 2019).

3.1.3 National Wetland Inventory

According to the USFWS NWI (USFWS 2019), one (1) freshwater pond is located within the June 2019 Hardin Wind Addendum 2 Study Area. (Appendix A, Figure 3).

3.1.4 National Hydrography Dataset

According to the USGS NHD (USGS 2017) Downloadable Data Collection from The National Map (TNM), there are mapped streams identified within the June 2019 Hardin Wind Addendum 2 Study Area (Appendix A, Figure 3).

3.1.5 FEMA Flood Hazard

According to the FEMA Flood Hazard mapping, a portion of the June 2019 Hardin Wind Addendum 2 Study Area is located within FEMA Flood Zone A (FEMA 2019) (Appendix A, Figure 4).

3.1.6 Water Quality Standards

One (1) stream, HW-M1, within the June 2019 Hardin Wind Addendum 2 Study Area has a Designated Use from Ohio EPA according to OAC Chapter 3745-1 Water Quality Standards (Ohio EPA 2017). Cooney Ditch (HW-M1) is listed as Warmwater Habitat (WWH). This designation is based on the results of a

biological field assessment performed by the Ohio EPA. According to the OAC Chapter 3745-1 Water Quality Standards, WWH are capable of supporting and maintaining a balanced community of warmwater aquatic organisms.

3.2 Field Delineations

TRC performed this wetland and other waters of the U.S. identification and delineation on June 19th and 20th, 2019 during the normal growing season. Weather conditions on June 19th were warm, reaching a high of 86 degrees Fahrenheit (30 degrees Celsius), with some heavy rain observed in the evening. On June 20th it was overcast and cool, reaching a high of 72 degrees Fahrenheit (22 degrees Celsius) with intermittent light to steady rain. The presence of apparent hydrology and hydric soil indicators, as well as identifiable plant species within the wetland area, 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 the June 2019 investigation, five (5) wetlands, W-MRR-1, W-MRR-2, W-MRR-3, W-MRR-4, W-MRR-5, were identified and delineated within the June 2019 Hardin Wind Addendum 2 Study Area. The wetlands identified are listed in Table 3.2.1, described below and shown in Appendix A, Figure 5. The completed USACE Wetland Determination Data Forms-Midwest Region are presented in Appendix C and Ohio EPA ORAM Data Forms are presented in Appendix D.

Table 3.2.1 Wetlands Delineated within the June 2019 Hardin Wind Addendum 2 Study Area

Wetland ID	Vegetation Class[1]	Extends Offsite?	Acres (Hectares)[2]	ORAM Score[3]	ORAM Category[3]	Jurisdictional Status[4]
W-MRR-1	PEM	No	0.01 (0.004)	20	Category 1	Jurisdictional
W-MRR-2	PEM	No	0.16 (0.065)	46	Category 2	Jurisdictional
W-MRR-3	PEM	Yes	0.01 (0.004)	24.5	Category 1	Jurisdictional
W-MRR-4	PEM	Yes	0.16 (0.065)	52	Category 2	Jurisdictional
W-MRR-5	PEM	Yes	0.27 (0.11)	31.5	Category 2	Jurisdictional

[1] PEM = palustrine emergent, PSS = palustrine scrub/shrub, PFO = palustrine forested
[2] Represents delineated acreage within June 2019 Hardin Wind Addendum 2 Study Area
[3] Preliminarily assigned. Not considered final until verified by Ohio EPA
[4] Preliminarily assigned. Not considered final until verified by the USACE

Wetland W-MRR-1

Wetland W-MRR-1 (Appendix A, Figure 5 [Page 1 of 8]) is a 0.01-acre (0.004 hectare) PEM wetland dominated by rough-leaved dogwood (*Cornus drummondi),* reed canary grass (*Phalaris arundinacea*) and crested sedge (*Carex cristatella*). This area abuts a previously farmed area; however, the abutting field is fallow. The wetland is preliminary assigned an ORAM score of 20, corresponding to a Category 1 wetland (low quality). The score was limited by disturbances to the hydrology, substrate, and habitat of Wetland W-MRR-1 (i.e. stormwater input, and farming).

Wetland W-MRR-2

Wetland W-MRR-2 (Appendix A, Figure 5 [Page 2 of 8]) is a 0.16-acre (0.065 hectare) PEM wetland, with areas of scrub-shrub and tree vegetation, dominated by pin oak (*Quercus palustris*), eastern cottonwood (*Populus deltoides*), sandbar willow (*Salix interior*), narrow-leaf cattail (*Typha angustifolia*), and hybrid cattail (*Typha x glauca)*. Wetland W-MRR-2 is associated with and located along the fringe of an artificial pond (WB-MRR-1); WB-MRR-1 is described below in Section 3.2.2 Other Waters of the U.S. The wetland is preliminary assigned an ORAM score of 46, corresponding to a Category 2 wetland (moderate quality). The score was limited by disturbances to the hydrology, substrate, and habitat of Wetland W-MRR-2 (i.e. tiling, mowing, clearcutting, and farming).

Wetland W-MRR-3

Wetland W-MRR-3 (Appendix A, Figure 5 [Page 3 of 8]) is a 0.01-acre (0.004 hectare) PEM wetland dominated by eastern cottonwood (*Populus deltoides*), rough-leaved dogwood (*Cornus drummondi*) and reed canary grass (*Phalaris arundinacea*). This depressional wetland extends west outside the June 2019 Hardin Wind Addendum 2 Study Area and is connected to a larger PSS wetland. The wetland complex abuts an adjacent stream that is also located outside the June 2019 Hardin Wind Addendum 2 Study Area. The wetland is preliminary assigned an ORAM score of 24.5, corresponding to a Category 1 wetland (low quality). The score was limited by disturbances to the hydrology, substrate, and habitat of Wetland W-MRR-3 (i.e. tiling, nutrient enrichment and farming).

Wetland W-MRR-4

Wetland W-MRR-4 (Appendix A, Figure 5 [Page 4 of 8]) is a 0.16-acre (0.065 hectare) PEM wetland dominated by swamp white oak (*Quercus bicolor*), rough-leaved dogwood (*Cornus drummondi*) and hop sedge (*Carex lupilina*). Wetland W-MRR-4 extends outside the June 2019 Hardin Wind Addendum 2 Study Area and is connected to a large second growth forested wetland complex west of County Road 130.

The wetland is preliminary assigned an ORAM score of 52, corresponding to a Category 2 wetland (moderate quality).

Wetland W-MRR-5

Wetland W-MRR-5 (Appendix A, Figure 5 [Page 5 of 8]) is a 0.27-acre (0.11 hectare) PEM wetland dominated by water plantain (*Alisma plantago-aquatica*), water pepper (*Persicaria hydropiper*) and blunt spikerush (*Eleocharis obtusa*). This area has been actively farmed; however, excess rain has caused saturation and the field to be left fallow. The wetland is preliminary assigned an ORAM score of 31.5, corresponding to a Category 2 wetland (moderate quality). The score was limited by disturbances to the hydrology, substrate, and habitat of Wetland W-MRR-5 (i.e. tiling, nutrient enrichment and farming).

3.2.2 Other Waters of the U.S.

A. Streams

One (1) new stream, S-MRR-2, was delineated during the June 2019 field investigation. Additionally, two (2) streams, HW-M1 and HW-M7, from the August 2018 field investigation were extended during the June 2019 field investigation; HW-M1(Cooney Ditch) and HW-M7.

Streams identified within the June 2019 Hardin Wind Addendum 2 Study Area are all located within the Upper Scioto River watershed (8-Digit HUC: 05060001) (USDA/NRCS 2013). The streams are listed in Table 3.2.2, described below and shown in Appendix A, Figure 5. 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. Completed Ohio EPA stream assessment data forms are provided in Appendix E. 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 June 2019 Hardin Wind Addendum 2 Study Area

Stream/Waterbody ID[1]	Flow Regime	Length[2] (ft; m)	Drainage Area (sq mi; sq km)[3]	QHEI (Q)/HHEI (H) Score[4]	HHEI Class/ QHEI Rating
S-MRR-2	Perennial	73.4 (22.4)	2.81 (7.27)	26 (Q)	Very Poor
HW-M1 (Cooney Ditch)	Perennial	54.5 (16.6)	0.30 (0.77)	22 (Q)	WWH
HW-M7	Perennial	26.4 (8.0)	2.53 (6.55)	30 (Q)	WWH

1 Preliminary assigned. Not considered final until verified by the USACE
2 Represents delineated length, in feet, and meters within Study Area
3 Where within coverage, drainage area was calculated using automated basin characteristics from USGS StreamStats v 4.0: Ohio (USGS 2018).
4 Qualitative Habitat Evaluation Index (QHEI), for larger streams with greater than 1.0 square mile.

S-MRR-2

Stream S-MRR-2 (Appendix A; Figure 5 [Page 6 of 8]) is a perennial stream with a drainage area of approximately 2.81 square miles (7.27 square kilometers). The stream flows south to north through the June 2019 Hardin Wind Addendum 2 Study Area for approximately 73.4 feet (22.4 meters). S-MRR-2 drains to Scioto River, and as such, is preliminarily determined to be a jurisdictional water of the U.S. Based on the QHEI habitat assessment method, dominant substrates are comprised of silt; instream cover (i.e. overhanging vegetation, shallows in slow water, and aquatic macrophytes) is nearly absent; channel sinuosity is low, development is poor, channelization is recovering, stability is moderate; bank erosion is none/little; riparian width is non-existent; floodplain quality is row crop; maximum pool depth is less than 24 inches (0.62 meter); and bank full width is approximately 30 feet (9.1meters). Stream S-MRR-2 does not have an Ohio EPA designated use. This stream has been preliminarily assigned a QHEI score of 26; therefore, categorized as in the Very Poor QHEI narrative range.

HW-M1 (Cooney Ditch)

Stream HW-M1 (Cooney Ditch) (Appendix A; Figure 5 [Page 7 of 8]) is a perennial stream with a drainage area of approximately 0.3 square miles (0.48 square kilometers). The stream flows west to east through the June 2019 Hardin Wind Addendum 2 Study Area for approximately 54.5 feet (16.6 meters). Stream HW-M1 (Cooney Ditch) drains to Scioto River, and as such, is preliminarily determined to be a jurisdictional water of the U.S. Based on the QHEI habitat assessment method, dominant substrates are comprised of silt and gravel; riparian width is narrow; floodplain quality is row crop; maximum pool depth is less than 16 inches (0.40 meter); and bank full width is approximately 30 feet (9.1 meters). Cooney Ditch (Stream HW-M1) has an Ohio EPA designated use of WWH. This stream has been preliminarily assigned a QHEI score of 22; therefore, categorized as in the Very Poor QHEI narrative range.

HW-M7

Stream HW-M7 (Appendix A; Figure 5 [Page 8 of 8]) is a perennial stream with a drainage area of approximately 2.53 square miles (6.55 square kilometers). The stream flows west to east through the June 2019 Hardin Wind Addendum 2 Study Area for approximately 26.4 feet (8.0 meters) HW-M7 drains to Scioto River, and as such, is preliminarily determined to be a jurisdictional water of the U.S. Based on the QHEI habitat assessment method, dominant substrates are comprised of silt; instream cover (i.e. overhanging vegetation, shallows in slow water, and aquatic macrophytes) is nearly absent; channel sinuosity is low, development is poor, channelization is recovery, stability is moderate; bank erosion is none/little; riparian width is non-existent; floodplain quality is row crop and urban/industrial; maximum

pool depth is less than 47.28 inches (1.2 meter); and bank full width is approximately 30 feet (9.1meters). Stream HW-M7 does not have an Ohio EPA designated use of WWH. This stream has been preliminarily assigned a QHEI score of 30; therefore, categorized as in the Very Poor QHEI narrative range.

B. Waterbody (Ponds)

One (1) waterbody was delineated within the June 2019 Hardin Wind Addendum 2 Study Area. Waterbody WB-MRR-1 is a pond with wetland fringe (W-MRR-2, see above) surrounding it. The waterbody is listed in Table 3.2.2, described below and shown in Appendix A, Figure 5 (Page 2 of 8).

Table 3.2.3 Waterbodies Delineated within the June 2019 Hardin Wind Addendum 2 Study Area

Waterbody ID[1]	Acres (Hectares)
WB-MRR-1	0.50 (0.20)

[1] Preliminary assigned. Not considered final until verified by the USACE

WB-MRR-1

Waterbody WB-MRR-1 (Appendix A; Figure 5 [Page 2 of 8]) is a palustrine unconsolidated bottom freshwater pond with drain tile and stormwater input. As described above in Section 3.2.1 Wetlands, W-MRR-2 is located along the perimeter of WB-MRR-1. The pond is located in the June 2019 Hardin Wind Addendum 2 Study Area for approximately 0.50 acre (0.20 hectare). WB-MRR-1 abuts jurisdictional waters and is hydrologically connected to the Scioto River, and as such, is preliminarily determined to be a jurisdictional water of the U.S.

4.0 REFERENCES CITED

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Appendix A

Figures

TRC - GIS

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Legend

- Hardin Wind Turbine Location (August 2018)
- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- Point of Interconnection Facility Studied 2017
- Township
- USGS 7.5-minute Topographic Quadrangle

0 2,500 5,000 Feet

1 " = 5,000 '
1:60,000

PROJECT:
HARDIN WIND ENERGY LLC
HARDIN WIND ENERGY PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:
USGS TOPOGRAPHIC MAP
PROPOSED SURVEY LOCATION MAP

DRAWN BY:	P. JACQUES	PROJ NO.:	339845.0000.0000
CHECKED BY:	M. MOLNAR		FIGURE 1
APPROVED BY:	J. PITTS		
DATE:	JUNE 2019		

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FILE NO.: HW_Fig1_USGS_11x17_Update_Addendum_2.mxd

TRC - GIS

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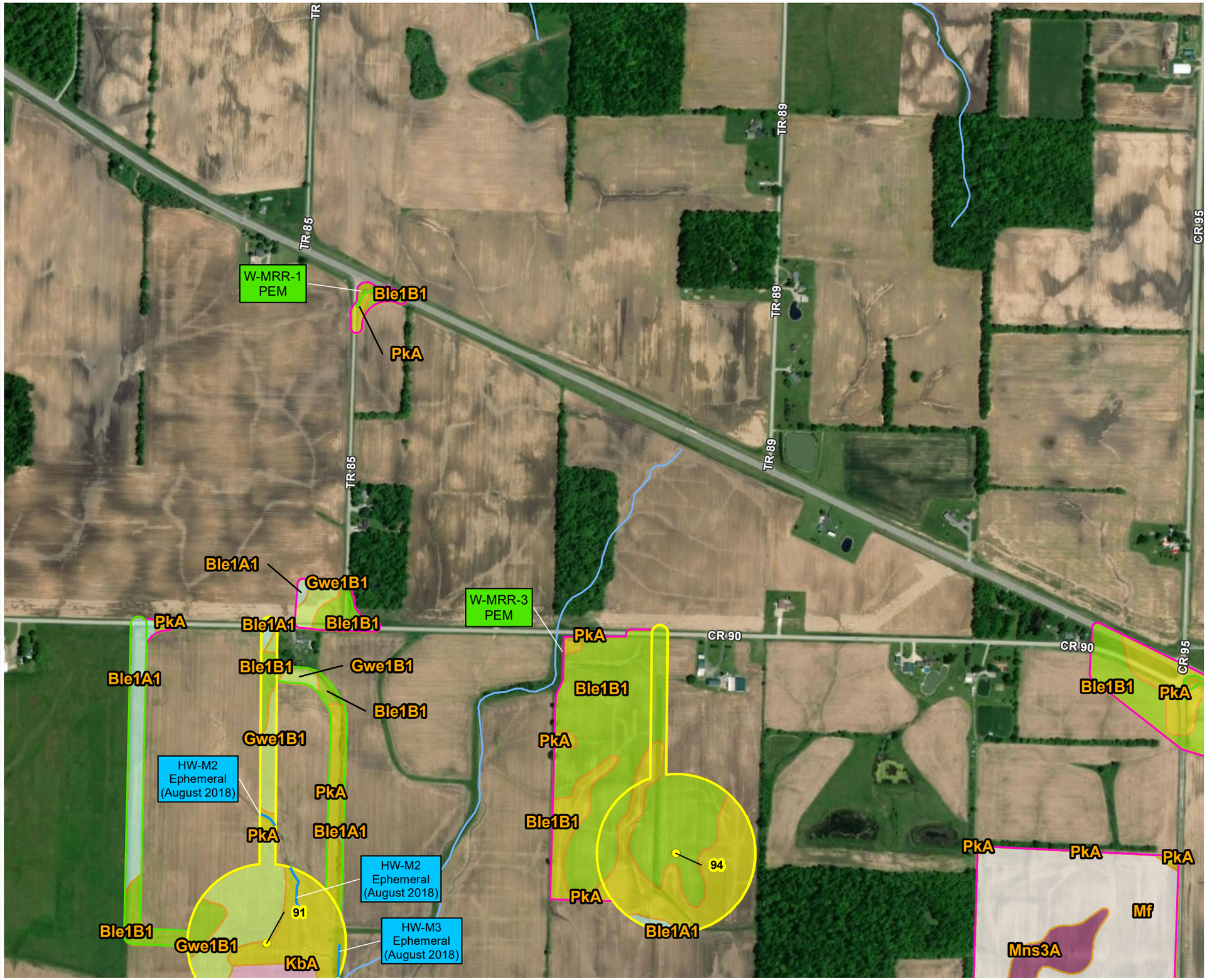
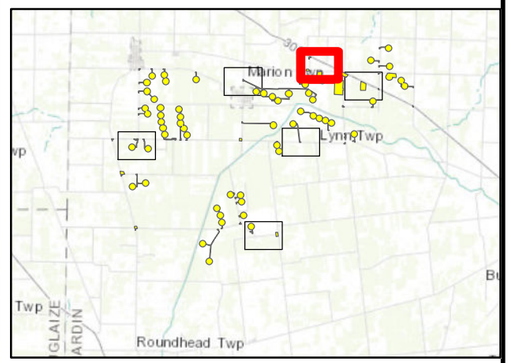


Legend

- Hardin Wind Turbine Location (August 2018)
- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- TRC Delineated Stream
- National Hydrography Dataset (NHD) Stream
- PEM Wetland

SOIL LIST

- Ble1A1 - Blount silt loam, end moraine, 0 to 2 percent slopes
- Ble1B1 - Blount silt loam, end moraine, 2-4% slopes
- Gwe1B1 - Glynwood silt loam, end moraine, 2-6% slopes
- KbA - Kibbie loam, 0-3% slopes
- Mf - Milford silty clay loam, 0-2% slopes
- Mns3A - Minster silty clay loam, 0 to 1 percent slopes
- PkA - Pewamo silty clay loam, 0-1% slopes



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APPROVED BY:	J. PITTS		**FIGURE 2**
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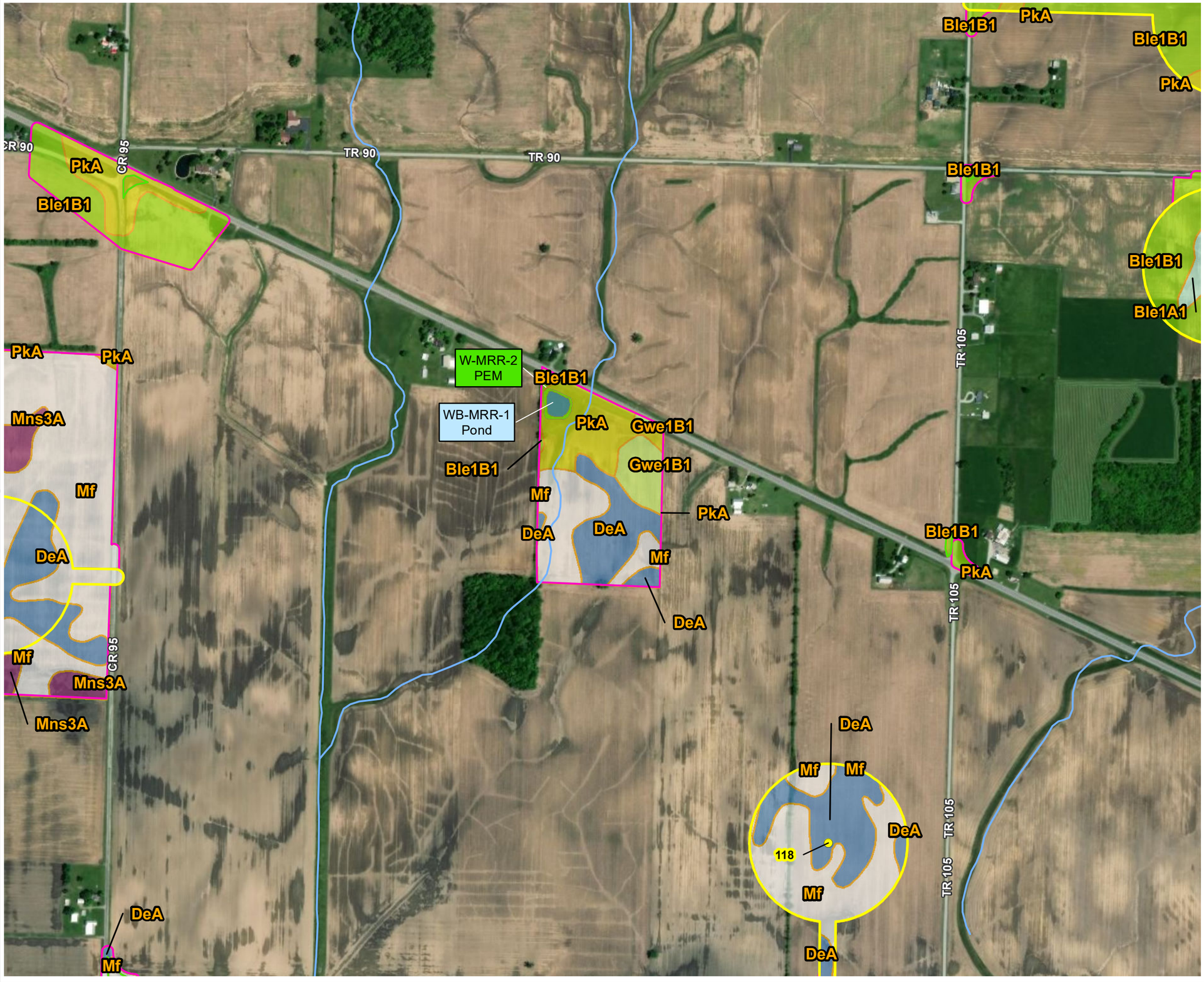

Legend

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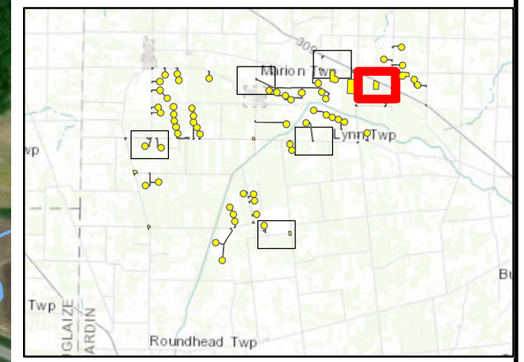
- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- National Hydrography Dataset (NHD) Stream
- Waterbody / Pond
- PEM Wetland

SOIL LIST

- Ble1A1 - Blount silt loam, end moraine, 0 to 2 percent slopes
- Ble1B1 - Blount silt loam, end moraine, 2-4% slopes
- DeA - Del Rey silt loam, 0 to 3 percent slopes
- Gwe1B1 - Glynwood silt loam, end moraine, 2-6% slopes
- Mf - Milford silty clay loam, 0-2% slopes
- Mns3A - Minster silty clay loam, 0 to 1 percent slopes
- PkA - Pewamo silty clay loam, 0-1% slopes



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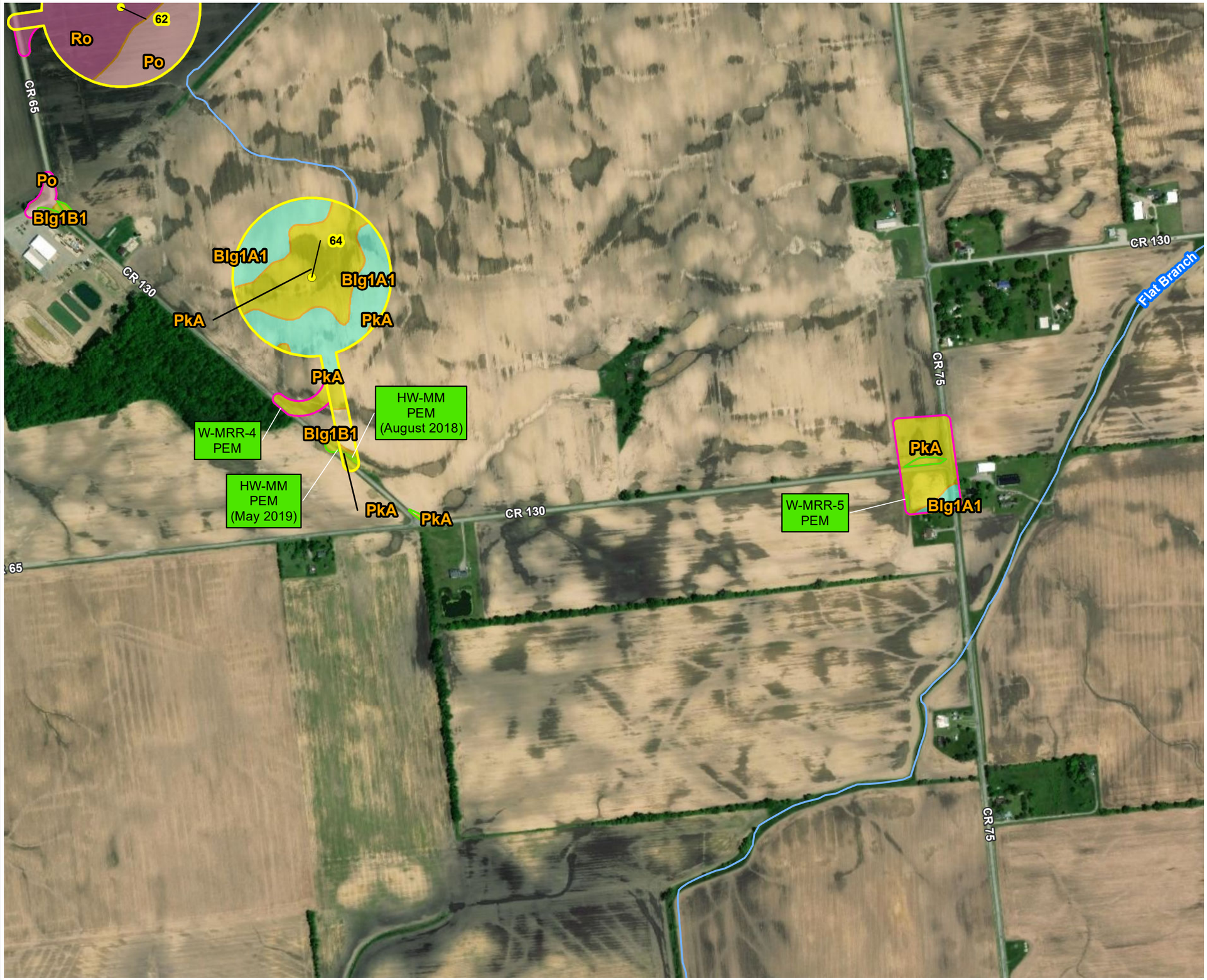
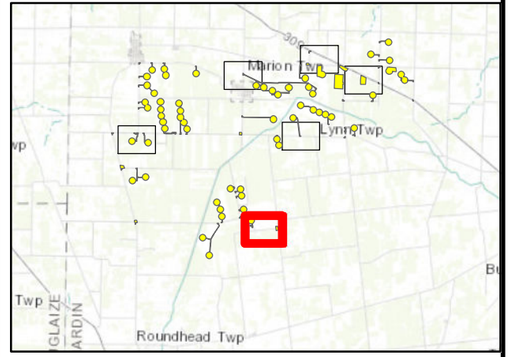


Legend

- Hardin Wind Turbine Location (August 2018)
- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- National Hydrography Dataset (NHD) Stream
- PEM Wetland

SOIL LIST

- Blg1A1 - Blount silt loam, ground moraine, 0 to 2 percent slopes
- Blg1B1 - Blount silt loam, ground moraine, 2 to 4 percent slopes
- PkA - Pewamo silty clay loam, 0-1% slopes
- Po - Pewamo variant muck
- Ro - Roundhead muck



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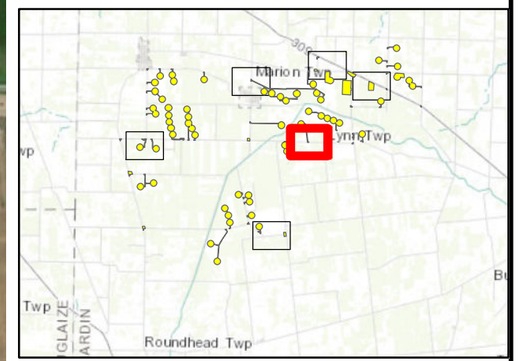
Legend

- Hardin Wind Turbine Location (August 2018)
- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- TRC Delineated Stream
- National Hydrography Dataset (NHD) Stream

SOIL LIST

- Mc - McGuffey muck
- Mf - Milford silty clay loam, 0-2% slopes
- PkA - Pewamo silty clay loam, 0-1% slopes
- Po - Pewamo variant muck
- Ro - Roundhead muck



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Map Rotation: 0

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Legend

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- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- TRC Delineated Stream

SOIL LIST

- KbA - Kibbie loam, 0-3% slopes
- Mf - Milford silty clay loam, 0-2% slopes
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- We - Westland clay loam

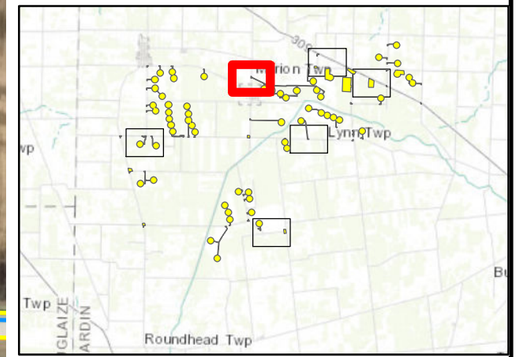

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FIGURE 2
Page 5 of 6

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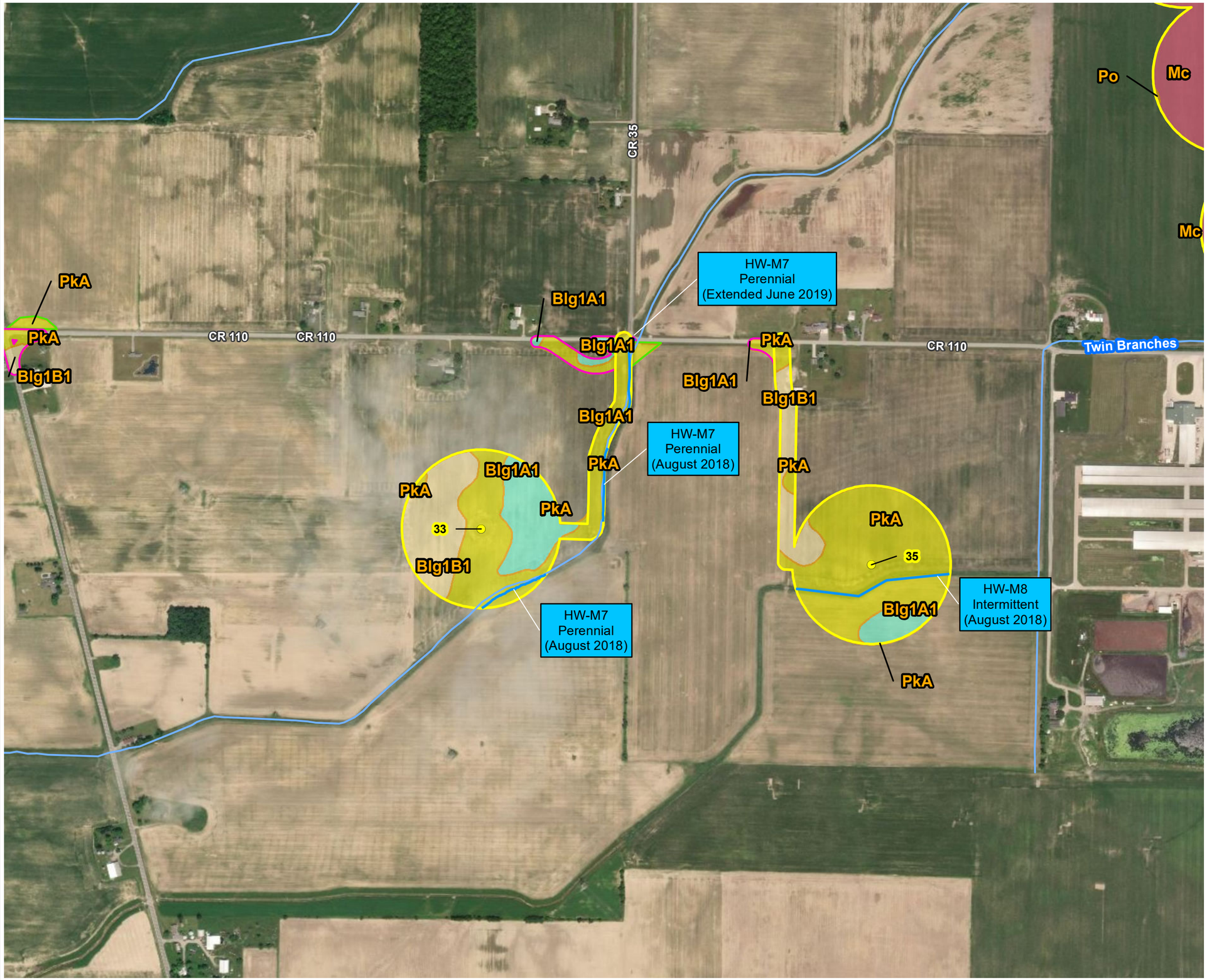

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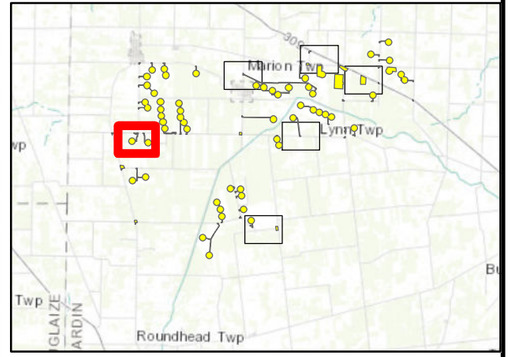
- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- TRC Delineated Stream
- National Hydrography Dataset (NHD) Stream

SOIL LIST

- Blg1A1 - Blount silt loam, ground moraine, 0 to 2 percent slopes
- Blg1B1 - Blount silt loam, ground moraine, 2 to 4 percent slopes
- Mc - McGuffey muck
- PkA - Pewamo silty clay loam, 0-1% slopes
- Po - Pewamo variant muck



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PROJECT:
HARDIN WIND ENERGY LLC
HARDIN WIND ENERGY PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:
USDA SOIL SURVEY MAP

DRAWN BY:	P. JACQUES	PROJ NO.:	339845.0000.0000
CHECKED BY:	M. MOLNAR		
APPROVED BY:	J. PITTS		
DATE:	JUNE 2019		

FIGURE 2

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FILE NO.: HW_Fig2_SSURGO_Soils_11x17_Update_Addendum_2.mxd

TRC - GIS

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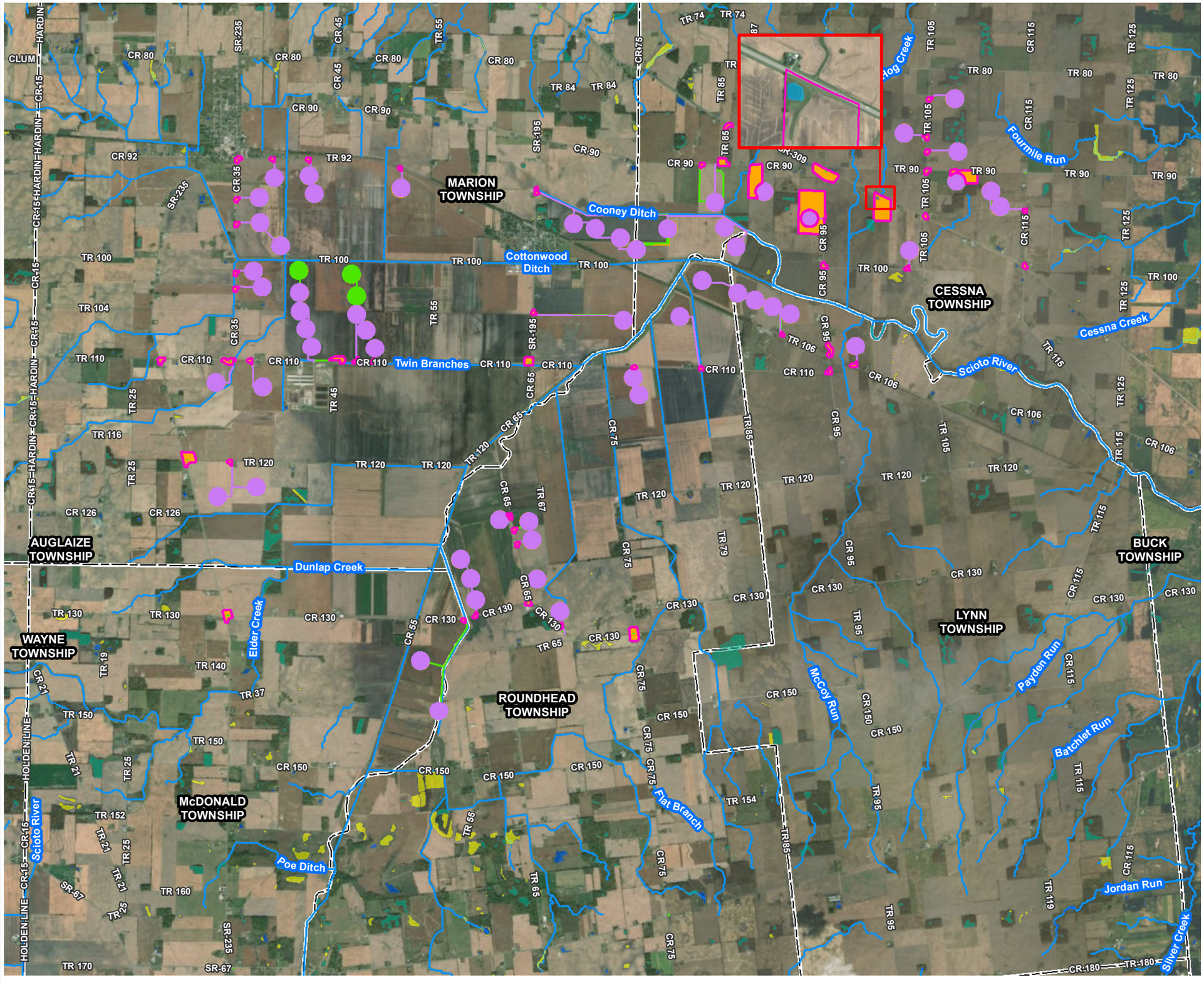

Legend

- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- Township
- National Hydrography Dataset (NHD) Stream

National Wetlands Inventory (NWI) Type

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond

N

0 2,500 5,000 Feet

1 " = 5,000 '

1:60,000

PROJECT:
HARDIN WIND ENERGY LLC
HARDIN WIND ENERGY PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:
NATIONAL WETLANDS INVENTORY MAP

DRAWN BY:	P. JACQUES	PROJ NO.:	339845.0000.0000
CHECKED BY:	M. MOLNAR		
APPROVED BY:	J. PITTS		**FIGURE 3**
DATE:	JUNE 2019		

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MARION TOWNSHIP
CESSNA TOWNSHIP
WAYNE TOWNSHIP
ROUNDHEAD TOWNSHIP
McDONALD TOWNSHIP
LYNN TOWNSHIP
ALGER
CLUM
Cooney Ditch
Cottonwood Ditch
Twin Branches
Scioto River
Dunlap Creek
Elder Creek
Poe Ditch
Flat Branch
McCoy Run
Payden Run
Batchlet Run
Jordan Run
Silver Creek
Hog Creek
Fourmile Run
Cessna Creek
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SR-195
SR-309
SR-67
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CR-15=HARDIN=CR-15=HARDIN
CR-15=HARDIN=CR-15=HARDIN=CR-15
CR-15=HARDIN=CR-15=HARDIN=CR-15=HOLDEN LINE
CR-15=HOLDEN LINE
CR-75=CR-75
MERTZ JOINT
HOLDEN LINE

Legend

- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- National Hydrography Dataset (NHD) Stream
- FEMA 100-year Floodplain Addendum 2 Impact (0.57 Acres)
- FEMA 100-year Floodplain
- Township

N

0 2,500 5,000 Feet

1 " = 5,000 '

1:60,000

PROJECT:

HARDIN WIND ENERGY LLC
HARDIN WIND ENERGY PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:

FEMA FLOOD HAZARD MAP

DRAWN BY:	P. JACQUES	PROJ NO.:	339845.0000.0000
CHECKED BY:	M. MOLNAR		
APPROVED BY:	J. PITTS		**FIGURE 4**
DATE:	JUNE 2019		

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FILE NO.: HW_Fig4_FEMA_11x17_Update_Addendum_2.mxd

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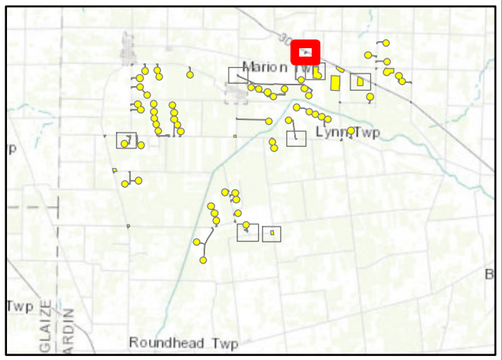
Coordinate System: NAD 1983 2011 StatePlane Ohio South FIPS 3402 Ft US (Foot US)
Map Rotation: 0

Legend

- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- PEM Wetland
- Sample Point



N

0 125 250 Feet

1 " = 250 '

1:3,000

PROJECT:

HARDIN WIND ENERGY LLC
HARDIN WIND ENERGY PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:

DELINEATED RESOURCE MAP
W-MRR-1

DRAWN BY:	P. JACQUES	PROJ NO.:	339845.0000.0000
CHECKED BY:	M. MOLNAR		
APPROVED BY:	J. PITTS		**FIGURE 5**
DATE:	JUNE 2019		Page 1 of 8

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FILE NO.: HW_Fig5_Delineated_Wetland_11x17_Update_Addendum_2.mxd

Coordinate System: NAD 1983 2011 StatePlane Ohio South FIPS 3402 Ft US (Foot US)
Map Rotation: 0

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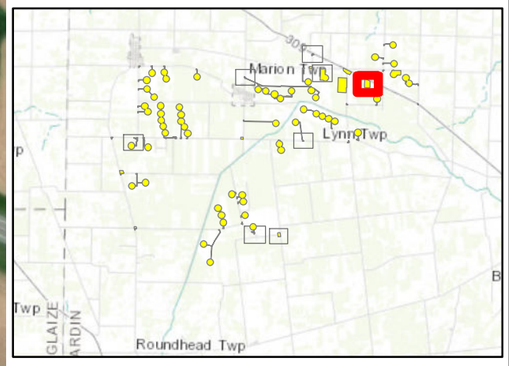
Path: S:\1-PROJECTS\INVENERGY\302899-HARDIN_WIND_SOLAR_IIHW_Fig5_Delineated_Wetland_11x17_Update_Addendum_2.mxd

TRC - GIS

Legend

- Hardin Wind Addendum 2 Study Area (June 2019)
- Waterbody / Pond
- PEM Wetland
- Sample Point



N

0 125 250 Feet

1 " = 250 '

1:3,000

PROJECT:

HARDIN WIND ENERGY LLC
HARDIN WIND ENERGY PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:

DELINEATED RESOURCE MAP
W-MRR-2 & WB-MRR-1

DRAWN BY:	P. JACQUES	PROJ NO.:	339845.0000.0000
CHECKED BY:	M. MOLNAR		
APPROVED BY:	J. PITTS		**FIGURE 5**
DATE:	JUNE 2019		Page 2 of 8

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Plot Date: 6/25/2019, 16:44:21 PM by PJACQUES – LAYOUT: ANSI B(11"x17")
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Coordinate System: NAD 1983 2011 StatePlane Ohio South FIPS 3402 Ft US (Foot US)
Map Rotation: 0

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Coordinate System: NAD 1983 2011 StatePlane Ohio South FIPS 3402 Ft US (Foot US)
Map Rotation: 0

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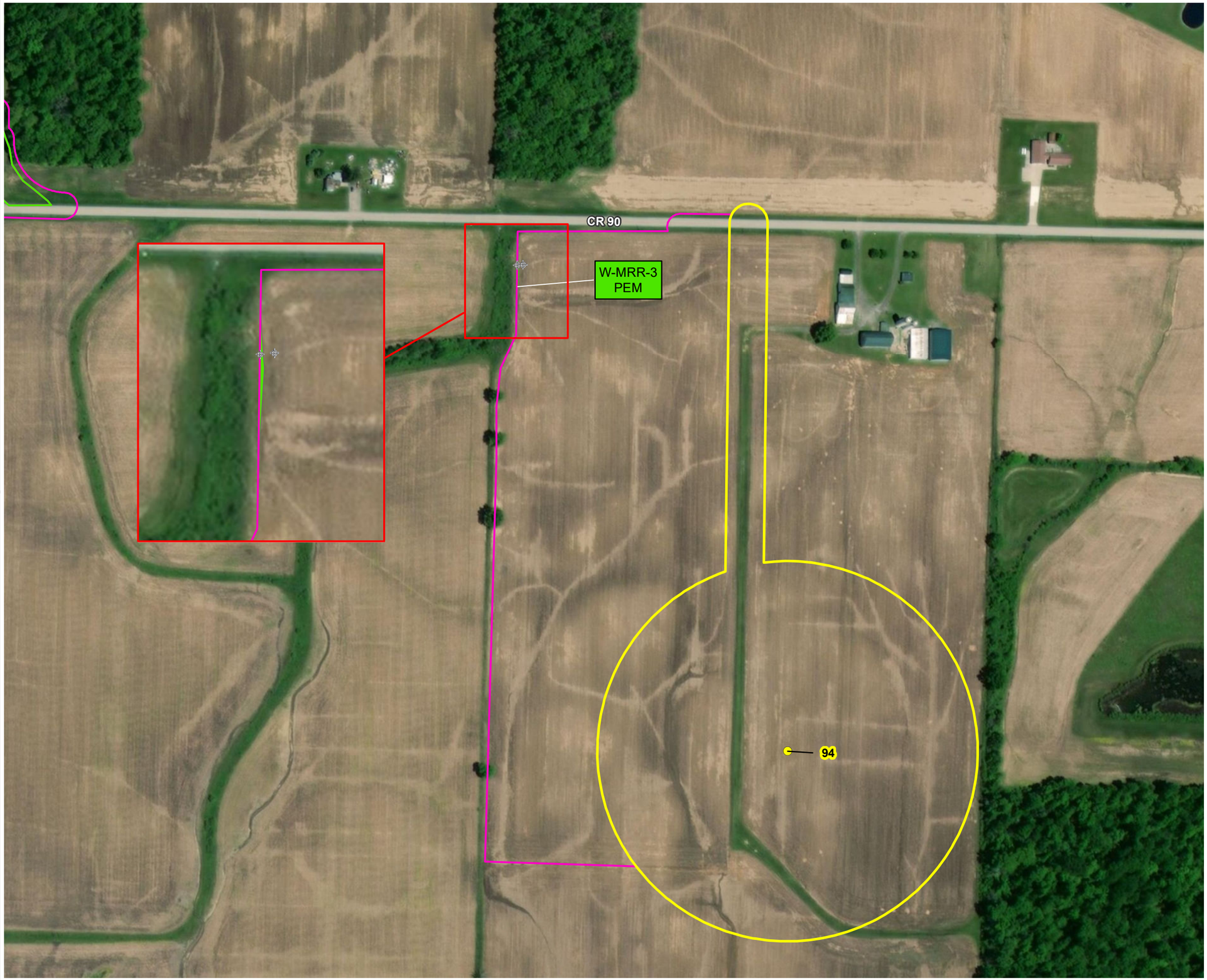
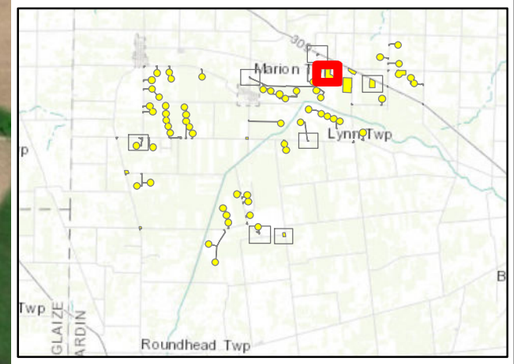


Legend

- Hardin Wind Turbine Location (August 2018)
- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- PEM Wetland
- Sample Point



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1 " = 250 '

1:3,000

PROJECT:
HARDIN WIND ENERGY LLC
HARDIN WIND ENERGY PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:
DELINEATED RESOURCE MAP
W-MRR-3

DRAWN BY:	P. JACQUES	PROJ NO.:	339845.0000.0000
CHECKED BY:	M. MOLNAR		
APPROVED BY:	J. PITTS		
DATE:	JUNE 2019		

FIGURE 5

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FILE NO.: HW_Fig5_Delineated_Wetland_11x17_Update_Addendum_2.mxd

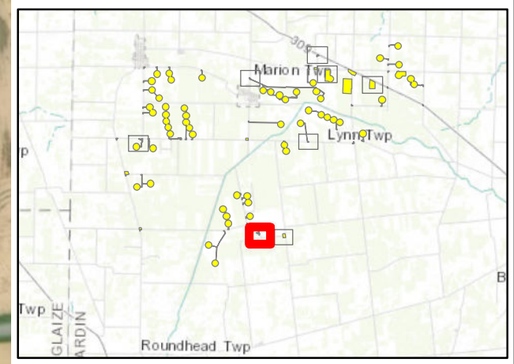
TRC - GIS

Coordinate System: NAD 1983 2011 StatePlane Ohio South FIPS 3402 Ft US (Foot US)
Map Rotation: 0

Plot Date: 6/25/2019, 16:44:21 PM by PJACQUES -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\INVENERGY\302899-HARDIN_WIND_SOLAR_II\HW_Fig5_Delineated_Wetland_11x17_Update_Addendum_2.mxd

Legend

- Hardin Wind Turbine Location (August 2018)
- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- PEM Wetland
- Sample Point



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1 " = 250 '

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PROJECT:

HARDIN WIND ENERGY LLC
HARDIN WIND ENERGY PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:

DELINEATED RESOURCE MAP W-MRR-4

DRAWN BY:	P. JACQUES	PROJ NO.:	339845.0000.0000
CHECKED BY:	M. MOLNAR		
APPROVED BY:	J. PITTS		**FIGURE 5**
DATE:	JUNE 2019		Page 4 of 8

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FILE NO.: HW_Fig5_Delineated_Wetland_11x17_Update_Addendum_2.mxd

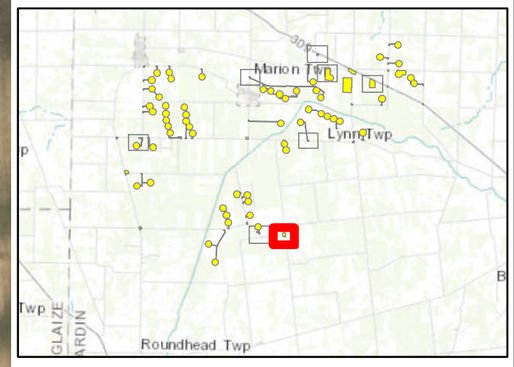
TRC - GIS

Coordinate System: NAD 1983 2011 StatePlane Ohio South FIPS 3402 Ft US (Foot US)
Map Rotation: 0

Plot Date: 6/25/2019, 16:44:21 PM by PJACQUES -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\INVENERGY\302899-HARDIN_WIND_SOLAR_IIHW_Fig5_Delineated_Wetland_11x17_Update_Addendum_2.mxd

Legend

- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- PEM Wetland
- Sample Point



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1 " = 250 '

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PROJECT:
HARDIN WIND ENERGY LLC
HARDIN WIND ENERGY PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:
DELINEATED RESOURCE MAP
W-MRR-5

DRAWN BY:	P. JACQUES	PROJ NO.:	339845.0000.0000
CHECKED BY:	M. MOLNAR		
APPROVED BY:	J. PITTS		**FIGURE 5**
DATE:	JUNE 2019		Page 5 of 8

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FILE NO.: HW_Fig5_Delineated_Wetland_11x17_Update_Addendum_2.mxd

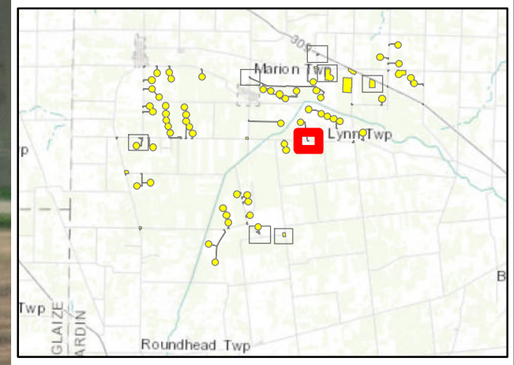
TRC - GIS

S-MRR-2
Perennial

CR 110

Legend

- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- TRC Delineated Stream



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1 " = 250 '
1:3,000

PROJECT:
HARDIN WIND ENERGY LLC
HARDIN WIND ENERGY PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:
DELINEATED RESOURCE MAP
S-MRR-2

DRAWN BY:	P. JACQUES	PROJ NO.:	339845.0000.0000
CHECKED BY:	M. MOLNAR		
APPROVED BY:	J. PITTS		**FIGURE 5**
DATE:	JUNE 2019		Page 6 of 8

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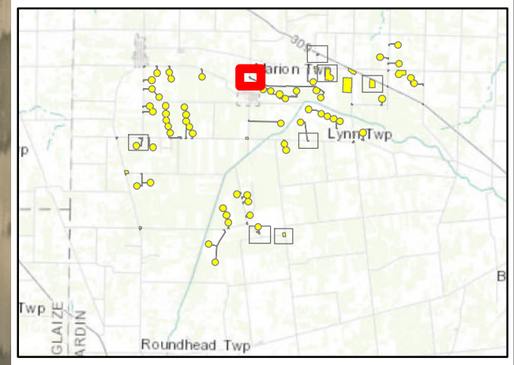
Legend

- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- TRC Delineated Stream



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0 125 250 Feet

1 " = 250 '

1:3,000

PROJECT:

HARDIN WIND ENERGY LLC
HARDIN WIND ENERGY PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:

DELINEATED RESOURCE MAP
HW-M1

DRAWN BY:	P. JACQUES	PROJ NO.:	339845.0000.0000
CHECKED BY:	M. MOLNAR		
APPROVED BY:	J. PITTS		**FIGURE 5**
DATE:	JUNE 2019		Page 7 of 8

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FILE NO.: HW_Fig5_Delineated_Wetland_11x17_Update_Addendum_2.mxd

Coordinate System: NAD 1983 2011 StatePlane Ohio South FIPS 3402 Ft US (Foot US)
Map Rotation: 0

Plot Date: 6/25/2019, 16:44:21 PM by PJACQUES – LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\INVENERGY\302899-HARDIN_WIND_SOLAR_II\HW_Fig5_Delineated_Wetland_11x17_Update_Addendum_2.mxd

TRC - GIS

CR 35

CR 110

CR 110

HW-M7
Perennial
(Extended June 2019)

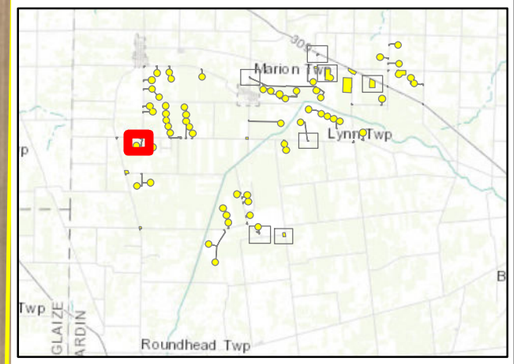
33

HW-M7
Perennial
(August 2018)

HW-M7
Perennial
(August 2018)

Legend

- Hardin Wind Turbine Location (August 2018)
- Hardin Wind Study Area (August 2018)
- Hardin Wind Addendum 1 Study Area (May 2019)
- Hardin Wind Addendum 2 Study Area (June 2019)
- TRC Delineated Stream



N

0 125 250 Feet

1 " = 250 '

1:3,000

PROJECT:

HARDIN WIND ENERGY LLC
HARDIN WIND ENERGY PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:

DELINEATED RESOURCE MAP
HW-M7

DRAWN BY:	P. JACQUES	PROJ NO.:	339845.0000.0000
CHECKED BY:	M. MOLNAR		
APPROVED BY:	J. PITTS		**FIGURE 5**
DATE:	JUNE 2019		Page 8 of 8

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FILE NO.: HW_Fig5_Delineated_Wetland_11x17_Update_Addendum_2.mxd

Coordinate System: NAD 1983 2011 StatePlane Ohio South FIPS 3402 Ft US (Foot US)
Map Rotation: 0

Plot Date: 6/25/2019, 16:44:21 PM by PJACQUES -- LAYOUT: ANSI B(11"x17")
Path: S:\1-PROJECTS\INVENERGY\302899-HARDIN_WIND_SOLAR_II\HW_Fig5_Delineated_Wetland_11x17_Update_Addendum_2.mxd

TRC - GIS

Appendix B

Photographic Log

PHOTOGRAPHIC RECORD
2019 Hardin Wind Addendum 2 Wetland and Other Waters of the US Delineation

Client Name:	Site Location:	Project No.
Hardin Wind Energy LLC	Hardin County, Ohio	339845.0000.0000

Photo No. 1. **Date:** June 19, 2019 **Description:** **View** View of wetland W-MRR-1 facing north.	

Photo No. 2. **Date:** June 19, 2019 **Description:** **View** View of wetland W-MRR-1 facing east.	

PHOTOGRAPHIC RECORD
2019 Hardin Wind Addendum 2 Wetland and Other Waters of the US Delineation

Client Name:	Site Location:	Project No.
Hardin Wind Energy LLC	Hardin County, Ohio	339845.0000.0000

Photo No. 3. **Date:** June 19, 2019 **Description:** **View** View of wetland W-MRR-1 facing south.	

Photo No. 4. **Date:** June 19, 2019 **Description:** **View** View of wetland W-MRR-1 facing west.	

PHOTOGRAPHIC RECORD
2019 Hardin Wind Addendum 2 Wetland and Other Waters of the US Delineation

Client Name:	Site Location:	Project No.
Hardin Wind Energy LLC	Hardin County, Ohio	339845.0000.0000

Photo No. 5. **Date:** June 19, 2019 **Description:** **View** View of wetland W-MRR-2 facing north.	

Photo No. 6. **Date:** June 19, 2019 **Description:** **View** View of wetland W-MRR-2 facing east.	

PHOTOGRAPHIC RECORD
2019 Hardin Wind Addendum 2 Wetland and Other Waters of the US Delineation

Client Name:	Site Location:	Project No.
Hardin Wind Energy LLC	Hardin County, Ohio	339845.0000.0000

Photo No. 7. **Date:** June 19, 2019 **Description:** **View** View of wetland W-MRR-2 facing south.	

Photo No. 8. **Date:** June 19, 2019 **Description:** **View** View of wetland W-MRR-2 facing west.	

PHOTOGRAPHIC RECORD
2019 Hardin Wind Addendum 2 Wetland and Other Waters of the US Delineation

Client Name:	Site Location:	Project No.
Hardin Wind Energy LLC	Hardin County, Ohio	339845.0000.0000

Photo No. 9. **Date:** June 19, 2019 **Description:** **View** View of wetland W-MRR-3 facing north.	

Photo No. 10. **Date:** June 19, 2019 **Description:** **View** View of wetland W-MRR-3 facing east.	

PHOTOGRAPHIC RECORD
2019 Hardin Wind Addendum 2 Wetland and Other Waters of the US Delineation

Client Name:	Site Location:	Project No.
Hardin Wind Energy LLC	Hardin County, Ohio	339845.0000.0000

Photo No. 11. **Date:** June 19, 2019 **Description:** **View** View of wetland W-MRR-3 facing south.	

Photo No. 12. **Date:** June 19, 2019 **Description:** **View** View of wetland W-MRR-3 facing west.	

PHOTOGRAPHIC RECORD
2019 Hardin Wind Addendum 2 Wetland and Other Waters of the US Delineation

Client Name:	Site Location:	Project No.
Hardin Wind Energy LLC	Hardin County, Ohio	339845.0000.0000

Photo No. 13. **Date:** June 20, 2019 **Description:** **View** View of wetland W-MRR-4 facing north.	

Photo No. 14. **Date:** June 20, 2019 **Description:** **View** View of wetland W-MRR-4 facing east.	

PHOTOGRAPHIC RECORD
2019 Hardin Wind Addendum 2 Wetland and Other Waters of the US Delineation

Client Name:	Site Location:	Project No.
Hardin Wind Energy LLC	Hardin County, Ohio	339845.0000.0000

Photo No. 15. **Date:** June 20, 2019 **Description:** **View** View of wetland W-MRR-4 facing south.	

Photo No. 16. **Date:** June 20, 2019 **Description:** **View** View of wetland W-MRR-4 facing west.	

PHOTOGRAPHIC RECORD
2019 Hardin Wind Addendum 2 Wetland and Other Waters of the US Delineation

Client Name:	Site Location:	Project No.
Hardin Wind Energy LLC	Hardin County, Ohio	339845.0000.0000

Photo No. 17. **Date:** June 20, 2019 **Description:** **View** View of wetland W-MRR-5 facing north.	

Photo No. 18. **Date:** June 20, 2019 **Description:** **View** View of wetland W-MRR-5 facing east.	

PHOTOGRAPHIC RECORD
2019 Hardin Wind Addendum 2 Wetland and Other Waters of the US Delineation

Client Name:	Site Location:	Project No.
Hardin Wind Energy LLC	Hardin County, Ohio	339845.0000.0000

Photo No. 19. **Date:** June 20, 2019 **Description:** **View** View of wetland W-MRR-5 facing south.	

Photo No. 20. **Date:** June 20, 2019 **Description:** **View** View of wetland W-MRR-5 facing west.	

PHOTOGRAPHIC RECORD
2019 Hardin Wind Addendum 2 Wetland and Other Waters of the US Delineation

Client Name:	Site Location:	Project No.
Hardin Wind Energy LLC	Hardin County, Ohio	339845.0000.0000

Photo No. 21. **Date:** June 19, 2019 **Description:** **View** View of stream S-MRR-2 facing upstream.	

Photo No. 22. **Date:** June 19, 2019 **Description:** **View** View of stream S-MRR-2 facing downstream.	

PHOTOGRAPHIC RECORD
2019 Hardin Wind Addendum 2 Wetland and Other Waters of the US Delineation

Client Name:	Site Location:	Project No.
Hardin Wind Energy LLC	Hardin County, Ohio	339845.0000.0000

Photo No. 23.

Date:

June 19, 2019

Description:
View

View of excess turbidity observed within stream S-MRR-2.

Photo No. 24.

Date:

June 19, 2019

Description:
View

Representative view of WB-MRR-1 facing south. Wetland W-MRR-2 is located on the fringe of WB-MRR-1.

Appendix C

USACE Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 339845: Hardin Wind Energy Project City/County: Hardin County Sampling Date: 6/19/14

Applicant/Owner: Hardin Wind Energy, LLC. (Invenergy) State: OH Sampling Point: W-MRR-1

Investigator(s): ~~T. Pitts~~; S. Bender, M. Ray, T. Rodlin Section, Township, Range: Marion

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): _____ Lat: 40.70983° Long: -83.71916 Datum: WGS84

Soil Map Unit Name: _____ NWI classification: _____

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

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

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 X	No _____	Is the Sampled Area within a Wetland? Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:
All 3 criteria have been met. Area is a wetland.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. N/A			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Cornus drummondi	15	Yes	FAC
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Phalaris arundinacea	30	Yes	FACW
2. Carex Cristatella	30	Yes	FACW
3. Carex vulpinoidea	10	No	FACW
4. Eupatorium perfoliatum	5	No	OBL
5. Apocynum Cannabinum	5	No	FAC
6.			
7.			
8.			
9.			
10.			
	= Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	70	x 2 =	140
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		205 (B)

Prevalence Index = B/A = 2.16

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation criterion has been met.

SOIL

Sampling Point: W-MRN-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	80	10YR 5/6	20	C	M	clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Hydric soil criterion has been met.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- X 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 (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ 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)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): 1/2 in

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 6 in

Wetland Hydrology Present? Yes X No _____

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

N/A

Remarks:

Wetland hydrology criterion has been met.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 339845: Hardin Wind Energy Project City/County: Hardin County Sampling Date: 6/19/19

Applicant/Owner: Hardin Wind Energy, LLC. (Invenergy) State: OH Sampling Point: UPL-MRR-1

Investigator(s): J, Pitts; S. Bender Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____

Slope (%): _____ Lat: 40.70937 Long: -83.74905 Datum: WGS84

Soil Map Unit Name: _____ 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 _____ No _____

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 _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

___ of 3 criteria have been met. Area is not a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. N/A			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Annual Bluegrass	5		
2. Ground Ivy	5		
3. Canada Thistle	10		
4. Poa annua	10		
5. Lamium purpureum	5		
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x 1 =	_____
FACW species	_____	x 2 =	_____
FAC species	_____	x 3 =	_____
FACU species	_____	x 4 =	_____
UPL species	_____	x 5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No ✓

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

Hydrophytic vegetation criterion has _____ met.

SOIL

Sampling Point: UPL-MLR-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 4/1	100					Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Hydric soil criterion has Not Been met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary 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 (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ 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)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

N/A

Remarks:

Wetland hydrology criterion has Not Been met.

WETLAND DETERMINATION DATA FORM – Midwest Region

345: Hardin Wind Energy Project City/County: Hardin County Sampling Date: 6/19/1
Hardin Wind Energy, LLC. (Invenergy) State: OH Sampling Point: Wetland-2
J, Pitts; S. Bender Section, Township, Range:
hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave
): Lat: 40.69928 Long: -83.72057 Datum: WGS84
Map Unit Name: NWI classification:
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 ✓ No ____
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 X No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:
All 3 criteria have been met. Area is a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus Palustris	70	Yes	FacW
2.			
3.			
4.			
5.			
	70 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Populus deltoides	20	Yes	Fac
2. Salix interior	20	Yes	FacW
3. Salix exigua	10	NO	FacW
4. Quercus Palustris	5	NO	FacW
5. Rough leaved Dogwood	15	Yes	Fac
	70 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Typha angustifolia	20	Yes	OBL
2. Typha x glauca	50	Yes	OBL
3. Carex Crisatella	5	NO	FacW
4. Carex Vulpinoidea	5	NO	FacW
5. Carex Hystericina	5	NO	FacW
6. Hemp dogbane	10	NO	Fac
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	____ = Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 70	x 1 = 70
FACW species 60	x 2 = 120
FAC species 45	x 3 = 135
FACU species 0	x 4 = 0
UPL species 0	x 5 = 0
Column Totals: 175 (A)	325 (B)

Prevalence Index = B/A = 1.86

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation criterion has been met.

SOIL

Sampling Point: W-MRA

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 4/1	80	10YR 5/8	20	RM	M	clayey	
10-22	10YR 5/1	80	10YR 5/8	20	C	M	clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Hydric soil criterion has been met.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- X 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 (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ 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)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): > 12 in

Water Table Present? Yes ___ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 10 in

Wetland Hydrology Present? Yes X No _____

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

N/A

Remarks:

Wetland hydrology criterion has been met.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 339845: Hardin Wind Energy Project City/County: Hardin County Sampling Date: 6/18/19

Applicant/Owner: Hardin Wind Energy, LLC. (Invenergy) State: OH Sampling Point: UPL-MRR-2

Investigator(s): J, Pitts; S. Bender Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): convex

Slope (%): _____ Lat: 40.69960 Long: -83.72009 Datum: WGS84

Soil Map Unit Name: _____ 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 _____ No _____

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 _____ No _____	Is the Sampled Area within a Wetland? Yes _____ No X
Hydric Soil Present?	Yes _____ No _____	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

___ of 3 criteria have been met. Area is not a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Juglans nigra	10	Yes	FacU
2.			
3.			
4.			
5.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Diplachis fusca	10	No	FacW
2. Solidago gigantea	30	Yes	FacW
3. Milkweed	10	No	FacU
4. English plantain (Narrow leaf)	10	No	FacU
5. Lolium perenne	30	Yes	FacU
6. Rumex crispus	10	No	UpL
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	10	x 5 =	50
Column Totals:	110 (A)		450 (B)

Prevalence Index = B/A = 4.09

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No X

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

Hydrophytic vegetation criterion has Not Been met.

SOIL

Sampling Point: UPL-MKR-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/2	100						
12-22	10YR 4/2	90	10YR 5/8	10	C	M	clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Hydric soil criterion has Been Not met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary 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 (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ 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)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

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

N/A

Remarks:

Wetland hydrology criterion has Not Been met.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 339845: Hardin Wind Energy Project City/County: Hardin County Sampling Date: 6/16/19

Applicant/Owner: Hardin Wind Energy, LLC. (Invenergy) State: OH Sampling Point: W-NPR-3

Investigator(s): J, Pitts; S. Bender, M. Ray Section, Township, Range:

Landform (hillslope, terrace, etc.): Depressional Local relief (concave, convex, none): Concave

Slope (%): _____ Lat: 40.70358 Long: 83.74453 Datum: WGS84

Soil Map Unit Name: _____ 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 X No _____

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 X No _____	Is the Sampled Area within a Wetland? Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:
All 3 criteria have been met. Area is a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juglans Nigra	10	Yes	FacU
2. Populus deltoides	10	Yes	FAC
3.			
4.			
5.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. rough leaved Dogwood	80	Yes	FAC
2.			
3.			
4.			
5.			
	80 = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Phalaris arundinacea	50	Yes	FACW
2. Solidago gigantea	20	Yes	FACW
3. Carex hyalinolepis	10	NO	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 30' radius)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 0	x 1 =	0
FACW species 80	x 2 =	160
FAC species 90	x 3 =	270
FACU species 10	x 4 =	40
UPL species 0	x 5 =	0
Column Totals: 180 (A)		470 (B)

Prevalence Index = B/A = 2.61

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation criterion has been met.

SOIL

Sampling Point: W-MRR-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/2	95	10YR 5/8	5	D	M	Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Hydric soil criterion has been met.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- X 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 (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- X 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)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 4 in

Water Table Present? Yes ___ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 8 in

Wetland Hydrology Present? Yes X No _____

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

N/A

Remarks:

Wetland hydrology criterion has been met.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 339845: Hardin Wind Energy Project City/County: Hardin County Sampling Date: 6/19/18

Applicant/Owner: Hardin Wind Energy, LLC. (Invenergy) State: OH Sampling Point: UPL-MH-3

Investigator(s): J, Pitts; S. Bender Section, Township, Range: _____

Landform (hillslope, terrace, etc.): [redacted] Hillside Local relief (concave, convex, none): Convex

Slope (%): _____ Lat: 40.70357 Long: [redacted] Datum: WGS84

Soil Map Unit Name: _____ 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 X No _____

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 _____	No X	
Hydric Soil Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

3 of 3 criteria have been met. Area is not a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. N/A			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Golden ragwort	5	No	FacU
2. Poa annua	25	Yes	FacU
3. Rumex crispus	5	No	FacU
4. Fleabane	10	Yes	FacU
5.			
6.			
7.			
8.			
9.			
10.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	45	x 4 =	180
UPL species	0	x 5 =	0
Column Totals:	45 (A)		180 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No X

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

Hydrophytic vegetation criterion has Not Been met.

SOIL

Sampling Point: UPL-MR-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/4	100					Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Hydric soil criterion has Not Been met.

Previus used as agriculture & planted with corn last season)

HYDROLOGY

Wetland Hydrology Indicators:

Primary 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 (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ 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)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes _____ No ___ Depth (inches): _____

Water Table Present? Yes _____ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ___ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

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

N/A

Remarks:

Wetland hydrology criterion has Not Been met.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 339845: Hardin Wind Energy Project City/County: Hardin County Sampling Date: 6/20/19

Applicant/Owner: Hardin Wind Energy, LLC. (Invenergy) State: OH Sampling Point: W-MRL-4

Investigator(s): ~~T. Mitts~~; S. Bender, M. Ray Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none):

Slope (%): Lat: 40.637115 Long: -83.18126 Datum: WGS84

Soil Map Unit Name: 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 X No

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 X No	Is the Sampled Area within a Wetland? Yes X No
Hydric Soil Present?	Yes X No	
Wetland Hydrology Present?	Yes X No	

Remarks:
All 3 criteria have been met. Area is a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus bicolor	30	Yes	FACW
2. Populus deltoides	10	NO	FAC
3. Quercus palustris	10	NO	FACW
4.			
5.			
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Ravin-leaved Dogwood	20	Yes	FAC
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 5')			
1. Carex lupilina	20	Yes	FACW
2. Phalaris arundinacea	40	Yes	FACW
3. Hemp dogbane	10	NO	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 100	x 2 = 200
FAC species 100	x 3 = 300
FACU species 0	x 4 = 0
UPL species 0	x 5 = 0
Column Totals: 200 (A)	506 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation criterion has been met.

SOIL

Sampling Point: W-MRM-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	95	10YR 5/8	5	RM	M	clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Hydric soil criterion has been met.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- X 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 (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ 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)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 10 in

Water Table Present? Yes ___ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 6 in

Wetland Hydrology Present? Yes X No _____

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

N/A

Remarks:

Wetland hydrology criterion has been met.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 339845: Hardin Wind Energy Project City/County: Hardin County Sampling Date: 6/20/14

Applicant/Owner: Hardin Wind Energy, LLC. (Invenergy) State: OH Sampling Point: UPL-MRN-4

Investigator(s): J, Pitts; S. Bender Section, Township, Range:

Landform (hillslope, terrace, etc.): Hill Side Local relief (concave, convex, none): Convex

Slope (%): Lat: 40.63748 Long: -83.78122 Datum: WGS84

Soil Map Unit Name: 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 X No ____

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 ____	No X	
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

____ of 3 criteria have been met. Area is not a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. N/A			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Lolium prenne	40	Yes	FacU
2. Broad leaved English Plantain	40	Yes	FacU
3. Rumex Crispus	10	No	FacU
4. Giant Ragweed	10	No	FacU
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	0	x 5 =	0
Column Totals:	100 (A)		400 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ____ No X

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

Hydrophytic vegetation criterion has Not been met.

SOIL

Sampling Point: UPL-MRR-4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-18	10YR 4/4	100					clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Hydric soil criterion has Not been met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary 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 (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ 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)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

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

N/A

Remarks:

Wetland hydrology criterion has Not been met.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 339845: Hardin Wind Energy Project City/County: Hardin County Sampling Date: 6/20/14

Applicant/Owner: Hardin Wind Energy, LLC. (Invenergy) State: OH Sampling Point: W - MRA - 5

Investigator(s): J, Pitts; S. Bender Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Con Cave

Slope (%): _____ Lat: 40.62585 Long: -83.76518 Datum: WGS84

Soil Map Unit Name: _____ NWI classification: _____

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

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

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 X No _____	Is the Sampled Area within a Wetland? Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:
All 3 criteria have been met. Area is a wetland.

Approx 5m of Rain inpost 6 well

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. N/A			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Alisma plantago-aquatica	20	Yes	OBL
2. Silverleaf Rush	10	No	FACW
3. Persicaria hydropiper	20	Yes	FACW
4. Eleocharis obtusa	20	Yes	OBL
5. Typha angustifolia	5	No	OBL
6.			
7.			
8.			
9.			
10.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	75 (A)		105 (B)

Prevalence Index = B/A = 1.40

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation criterion has been met.

SOIL

Sampling Point: W-MRR-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/1	98	10YR 5/8	2	RM	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Hydric soil criterion has been met.

HYDROLOGY

Wetland Hydrology Indicators:

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

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal 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)
- X True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ 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)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 10 in

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): 16 in

Wetland Hydrology Present? Yes X No ___

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

N/A

Remarks:

Wetland hydrology criterion has been met.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 339845: Hardin Wind Energy Project City/County: Hardin County Sampling Date: 6/20/14

Applicant/Owner: Hardin Wind Energy, LLC. (Invenergy) State: OH Sampling Point: UPL-MH-5

Investigator(s): J, Pitts; S. Bender Section, Township, Range: _____

Landform (hillslope, terrace, etc.): hill side Local relief (concave, convex, none): convex

Slope (%): _____ Lat: 40.63584 Long: -83.76523 Datum: WGS84

Soil Map Unit Name: _____ NWI classification: _____

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

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

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 _____ No X	Is the Sampled Area within a Wetland? Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

___ of 3 criteria have been met. Area is not a wetland. Approx. 8in rain in last six week

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. N/A			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Poa pratensis	20	Yes	FacU
2. Rumex crispus	10	NO	FacU
3. Lolium prenne	30	Yes	FacU
4. Elm Seedling	5	No	FacU
5. goldenrod sp.	5	NO	FacU
6.			
7.			
8.			
9.			
10.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column Totals:	70 (A)		280 (B)

Prevalence Index = B/A = 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No X

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

Hydrophytic vegetation criterion has Not been met.

SOIL

Sampling Point: UPL-MRR-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/1	100					clay-cy	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

Hydric soil criterion has Not been met.

HYDROLOGY

Wetland Hydrology Indicators:

Primary 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 (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ 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)

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

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

N/A

Remarks:

Wetland hydrology criterion has Not been met.

Appendix D

Ohio EPA ORAM Data Forms

ORAM v. 5.0 Field Form Quantitative Rating

Wetland W - MKR-1

Site: Ra-4 / Hale County	Rater(s): M. Ray	Date: 6/19/18

Metric 1. Wetland Area (size).

max 6 pts. | subtotal: 0 | 0

Circle: PEM PSS PFO

Circle: Isolated Adjacent Abutting

# of flags: 6

Continue offsite? No

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)
- [x] <0.1 acres (0.04ha) (0 pts)

Metric 2. Upland buffers and surrounding land use.

max 14 pts. | subtotal: 1 | 1

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)
- [x] 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)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

max 30 pts. | subtotal: 12 | 13

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

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

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

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)
- [x] <0.4m (<15.7in) (1)

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

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

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

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [ ] tile
- [ ] dike
- [ ] weir
- [x] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

Metric 4. Habitat Alteration and Development.

max 20 pts. | subtotal: 7 | 20

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

- [ ] None or none apparent (4)
- [ ] Recovered (3)
- [x] 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)
- [x] Poor to fair (2)
- [ ] Poor (1)

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

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [x] farming
- [ ] nutrient enrichment

20

subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland W - MRR - 1

Site: RA-4, Hardin County	Rater(s): M, Ray	Date: 6/19/19

28 subtotal this page

Metric 5. Special Wetlands.

0 (max 10 pts.) | 0 (subtotal)

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.

0 (max 20 pts.) | 20 (subtotal)

6a. Wetland Vegetation Communities. Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion. Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [X] 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)
- [X] 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
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

20 **GRAND TOTAL(max 100 pts)**

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

ORAM v. 5.0 Field Form Quantitative Rating

Wetland W-MRR-2

Site: LY-41	Rater(s): T. Radford, M. Ray	Date: 6/16/15

Metric 1. Wetland Area (size).

2 (max 6 pts.) | 2 (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)
- [x] 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)

Circle: (PEM) PSS PFO

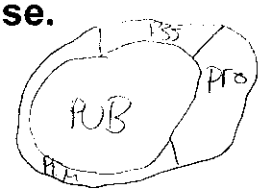
Circle: Isolated (Adjacent) Abutting

# of flags: 12

Continue offsite? No

Metric 2. Upland buffers and surrounding land use.

1 (max 14 pts.) | 3 (subtotal)



N

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)
- [x] 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)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

21 (max 30 pts.) | 24 (subtotal)

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

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

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [x] Part of riparian or upland corridor (1)

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

- [ ] >0.7 (27.6in) (3)
- [x] 0.4 to 0.7m (15.7 to 27.6in) (2)
- [ ] <0.4m (<15.7in) (1)

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

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

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

- [x] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] ditch
- [x] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

Metric 4. Habitat Alteration and Development.

13 (max 20 pts.) | 37 (subtotal)

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

- [x] None or none apparent (4)
- [x] 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)
- [x] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

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

- [x] None or none apparent (9)
- [x] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [x] mowing
- [x] grazing
- [x] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [x] farming
- [ ] nutrient enrichment

37 subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland W- MRP-2

Site: Hardin Wind	Rater(s): M. Ray	Date: 6/19/19

37
subtotal this page

max 10 pts.	subtotal
0	0

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)

max 20 pts.	subtotal
9	46

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [1] Aquatic bed
- [1] Emergent
- [2] Shrub
- [1] Forest
- [0] Mudflats
- [1] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [✓] Moderate (3)
- [ ] Moderately low (2)
- [ ] Low (1)
- [ ] None (0)

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

- [ ] Extensive >75% cover (-5)
- [X] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

46	**GRAND TOTAL(max 100 pts)**

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

ORAM v. 5.0 Field Form Quantitative Rating

Wetland W-MRR-3

Site: Hardin Addendum 2 | Rater(s): SKB, M.Ray | Date: 6/19/19

Metric 1. Wetland Area (size).

2 | 2 (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)
- [x] 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)

(2)

Circle: PEM PSS PFO

Circle: Isolated Adjacent Abutting

# of flags: 7

Continue offsite? Yes

Metric 2. Upland buffers and surrounding land use.

1 | 3 (max 14 pts. | subtotal)

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

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

0 (1)

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)
- [x] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

1

Metric 3. Hydrology.

13 | 16 (max 30 pts. | subtotal)

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

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

1

3b. Connectivity. Score all that apply.

- [x] 100 year floodplain (1)
- [x] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

2

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)
- [x] <0.4m (<15.7in) (1)

(9) 1

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

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

4

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

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

5

Check all disturbances observed

- [ ] ditch
- [x] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

Metric 4. Habitat Alteration and Development.

7.5 | 23,5 (max 20 pts. | subtotal)

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

- [ ] None or none apparent (4)
- [x] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

2.5

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

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

2

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

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

3

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [x] farming
- [x] nutrient enrichment

23,5 (subtotal this page)

ORAM v. 5.0 Field Form Quantitative Rating

Wetland W-MRR-3

Site: Hardin Addendum 2	Rater(s): SKB	Date: 6/19/19

23,5
subtotal this page

0	23,5
max 10 pts.	subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

0

- [ ] 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)

1	24,5
max 20 pts.	subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

2

- [1] Aquatic bed
- [1] Emergent
- [1] Shrub
- [2] Forest
- [0] Mudflats
- [0] Open water
- [0] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [X] 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

-3

- [ ] Extensive >75% cover (-5)
- [X] Moderate 25-75% cover (-3)
- [ ] Sparse 5-25% cover (-1)
- [ ] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

0

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

24,5	GRAND TOTAL(max 100 pts)

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

ORAM v. 5.0 Field Form Quantitative Rating

Wetland W-MRR-4

Site: W-MRR-4/Hardin County	Rater(s): M. Ray	Date: 6/2019

Metric 1. Wetland Area (size).

max 6 pts. | subtotal: 4 | 4

Select one size class and assign score.

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

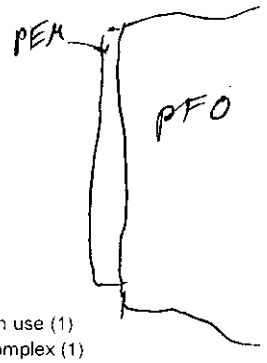
Circle: (PEM) PSS (PFO)

Circle: Isolated (Adjacent) Abutting

# of flags: 4

Continue offsite? Yes

Large PFO wetland abutting PEM wetland



Metric 2. Upland buffers and surrounding land use.

max 14 pts. | subtotal: 4 | 8

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

Metric 3. Hydrology.

max 30 pts. | subtotal: 16 | 24

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

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

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest) complex (1)
- [ ] Part of riparian or upland corridor (1)

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)
- [x] <0.4m (<15.7in) (1)

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

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

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

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [x] ditch
- [x] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

Metric 4. Habitat Alteration and Development.

max 20 pts. | subtotal: 18 | 42

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

- [x] 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)
- [x] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [ ] Poor to fair (2)
- [ ] Poor (1)

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

- [x] None or none apparent (9)
- [ ] Recovered (6)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [ ] farming
- [ ] nutrient enrichment

42

subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland _____ N-MRR-4

Site: Harden County wood	Rater(s): M, Ray	Date: 6/20/18

42
subtotal this page

5 | 47 **Metric 5. Special Wetlands.**

max 10 pts. | subtotal

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [X] 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)

5 | 52 **Metric 6. Plant communities, interspersion, microtopography.**

max 20 pts. | subtotal

6a. Wetland Vegetation Communities. Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [2] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion. Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [X] 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)
- [X] 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)
- [1] Standing dead >25cm (10in) dbh
- [ ] Amphibian breeding pools

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

52 **GRAND TOTAL(max 100 pts)**

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

ORAM v. 5.0 Field Form Quantitative Rating

Wetland W-MRR-5

Site: Hardin county wmd	Rater(s): M. Ray	Date: 6/20/19

Metric 1. Wetland Area (size).

2 (max 6 pts.) | 2 (subtotal)

Circle: (PEM) PSS PFO

Circle: Isolated (Adjacent) Abutting

# of flags: 4

Continue offsite? yes

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)
- [x] 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)

Metric 2. Upland buffers and surrounding land use.

3 (max 14 pts.) | 5 (subtotal)

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

- [ ] WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- [ ] MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- [ ] NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- [x] 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)
- [x] MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- [ ] HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

Metric 3. Hydrology.

15 (max 30 pts.) | 20 (subtotal)

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

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

3b. Connectivity. Score all that apply.

- [ ] 100 year floodplain (1)
- [ ] Between stream/lake and other human use (1)
- [ ] Part of wetland/upland (e.g. forest), complex (1)
- [ ] Part of riparian or upland corridor (1)

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)
- [x] <0.4m (<15.7in) (1)

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

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

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

- [ ] None or none apparent (12)
- [x] Recovered (7)
- [ ] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [x] ditch
- [x] tile
- [ ] dike
- [ ] weir
- [ ] stormwater input
- [ ] point source (nonstormwater)
- [ ] filling/grading
- [ ] road bed/RR track
- [ ] dredging
- [ ] other_____

Metric 4. Habitat Alteration and Development.

7,5 (max 20 pts.) | 27,5 (subtotal)

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

2,5

- [ ] None or none apparent (4)
- [x] Recovered (3)
- [x] Recovering (2)
- [ ] Recent or no recovery (1)

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

2

- [ ] Excellent (7)
- [ ] Very good (6)
- [ ] Good (5)
- [ ] Moderately good (4)
- [ ] Fair (3)
- [x] Poor to fair (2)
- [ ] Poor (1)

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

3

- [ ] None or none apparent (9)
- [ ] Recovered (6)
- [x] Recovering (3)
- [ ] Recent or no recovery (1)

Check all disturbances observed

- [ ] mowing
- [ ] grazing
- [ ] clearcutting
- [ ] selective cutting
- [ ] woody debris removal
- [ ] toxic pollutants
- [ ] shrub/sapling removal
- [ ] herbaceous/aquatic bed removal
- [ ] sedimentation
- [ ] dredging
- [x] farming
- [x] nutrient enrichment

27,5 subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland W- MR-5

Site: Hardin County wnd	Rater(s): M, Ryy	Date: 6/20/19

27.5
subtotal this page

0 | 27.5 max 10 pts. | subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- [ ] Bog (10)
- [ ] Fen (10)
- [ ] Old growth forest (10)
- [ ] Mature forested wetland (5)
- [ ] Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- [ ] Lake Erie coastal/tributary wetland-restricted hydrology (5)
- [ ] Lake Plain Sand Prairies (Oak Openings) (10)
- [ ] Relict Wet 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)

4 | 31.5 max 20 pts. | subtotal

Metric 6. Plant communities, interspersion, microtopography.

6a. Wetland Vegetation Communities.
Score all present using 0 to 3 scale.

- [ ] Aquatic bed
- [1] Emergent
- [ ] Shrub
- [ ] Forest
- [ ] Mudflats
- [ ] Open water
- [ ] Other_____

6b. horizontal (plan view) Interspersion.
Select only one.

- [ ] High (5)
- [ ] Moderately high(4)
- [ ] Moderate (3)
- [X] 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)
- [X] Nearly absent <5% cover (0)
- [ ] Absent (1)

6d. Microtopography.
Score all present using 0 to 3 scale.

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

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
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Narrative Description of Vegetation Quality

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

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

31.5 **GRAND TOTAL(max 100 pts)**

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories at the following address: http://www.epa.state.oh.us/dsw/401/401.html

Appendix E

Ohio EPA Stream Data Forms

Ohio EPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 76

Stream & Location: RA-19 S-Mrr-2 (UT to Scioto River) **RM:** ___.__ **Date:** 06/19/06

Scorers Full Name & Affiliation:

River Code: ___-___-___ **STORET #:** ____ **Lat./Long.:** (NAD 83 - decimal °) 40.6744 / 83.7534 Office verified location ☐

1] SUBSTRATE
Check *ONLY* **Two** substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR /SLABS [10]			☐☐ HARDPAN [4]	20	
☐☐ BOULDER [9]			☐☐ DETRITUS [3]		
☐☐ COBBLE [8]	10		☐☐ MUCK [2]		
☐☐ GRAVEL [7]			☒☒ SILT [2]	25	
☒☒ SAND [6]	40		☐☐ ARTIFICIAL [0]	5	
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN
- ☐ LIMESTONE [1]
- ☒ TILLS [1]
- ☐ WETLANDS [0]
- ☐ HARDPAN [0]
- ☐ SANDSTONE [0]
- ☐ RIP/RAP [0]
- ☐ LACUSTURINE [0]
- ☐ SHALE [-1]
- ☐ COAL FINES [-2]

QUALITY

SILT
- ☒ HEAVY [-2]
- ☐ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ FREE [1]

EMBEDDEDNESS
- ☒ EXTENSIVE [-2]
- ☐ MODERATE [-1]
- ☐ NORMAL [0]
- ☐ NONE [1]

Comments

Substrate 5 *Maximum 20*

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]
- ___ OVERHANGING VEGETATION [1]
- ___ SHALLOWS (IN SLOW WATER) [1]
- ___ ROOTMATS [1]
- 1 POOLS > 70cm [2]
- ___ ROOTWADS [1]
- ___ BOULDERS [1]
- ___ OXBOWS, BACKWATERS [1]
- ___ AQUATIC MACROPHYTES [1]
- ___ LOGS OR WOODY DEBRIS [1]

AMOUNT
Check ONE (*Or 2 & average*)
- ☐ EXTENSIVE >75% [11]
- ☐ MODERATE 25-75% [7]
- ☐ SPARSE 5-<25% [3]
- ☒ NEARLY ABSENT <5% [1]

Comments

Cover 3 *Maximum 20*

3] CHANNEL MORPHOLOGY
Check ONE in each category (*Or 2 & average*)

SINUOSITY
- ☐ HIGH [4]
- ☐ MODERATE [3]
- ☐ LOW [2]
- ☐ NONE [1]

DEVELOPMENT
- ☐ EXCELLENT [7]
- ☐ GOOD [5]
- ☐ FAIR [3]
- ☒ POOR [1]

CHANNELIZATION
- ☐ NONE [6]
- ☐ RECOVERED [4]
- ☐ RECOVERING [3]
- ☒ RECENT OR NO RECOVERY [1]

STABILITY
- ☐ HIGH [3]
- ☒ MODERATE [2]
- ☐ LOW [1]

Comments

Channel 5 *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

EROSION (L R)
- ☐☐ NONE / LITTLE [3]
- ☒☐ MODERATE [2]
- ☐☐ HEAVY / SEVERE [1]

RIPARIAN WIDTH (L R)
- ☐☐ WIDE > 50m [4]
- ☐☐ MODERATE 10-50m [3]
- ☐☐ NARROW 5-10m [2]
- ☒☒ VERY NARROW < 5m [1]
- ☐☐ NONE [0]

FLOOD PLAIN QUALITY (L R)
- ☐☐ FOREST, SWAMP [3]
- ☐☐ SHRUB OR OLD FIELD [2]
- ☐☐ RESIDENTIAL, PARK, NEW FIELD [1]
- ☐☐ FENCED PASTURE [1]
- ☒☒ OPEN PASTURE, ROWCROP [0]

(L R)
- ☐☐ CONSERVATION TILLAGE [1]
- ☐☐ URBAN OR INDUSTRIAL [0]
- ☐☐ MINING / CONSTRUCTION [0]

Indicate predominant land use(s) past 100m riparian.

Comments

Riparian 3 *Maximum 10*

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH
Check **ONE** (*ONLY!*)
- ☐ > 1m [6]
- ☐ 0.7-<1m [4]
- ☒ 0.4-<0.7m [2]
- ☐ 0.2-<0.4m [1]
- ☐ < 0.2m [0]

CHANNEL WIDTH
Check ONE (*Or 2 & average*)
- ☒ POOL WIDTH > RIFFLE WIDTH [2]
- ☐ POOL WIDTH = RIFFLE WIDTH [1]
- ☐ POOL WIDTH > RIFFLE WIDTH [0]

CURRENT VELOCITY
Check ALL that apply
- ☐ TORRENTIAL [-1]
- ☐ VERY FAST [1]
- ☐ FAST [1]
- ☒ MODERATE [1]
- ☐ SLOW [1]
- ☐ INTERSTITIAL [-1]
- ☐ INTERMITTENT [-2]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments

Pool / Current 6 *Maximum 12*

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ☒ NO RIFFLE [metric=0]

RIFFLE DEPTH
- ☐ BEST AREAS > 10cm [2]
- ☐ BEST AREAS 5-10cm [1]
- ☐ BEST AREAS < 5cm [metric=0]

RUN DEPTH
- ☐ MAXIMUM > 50cm [2]
- ☐ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE
- ☐ STABLE (e.g., Cobble, Boulder) [2]
- ☐ MOD. STABLE (e.g., Large Gravel) [1]
- ☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS
- ☐ NONE [2]
- ☐ LOW [1]
- ☐ MODERATE [0]
- ☐ EXTENSIVE [-1]

Comments

Riffle / Run 0 *Maximum 8*

6] GRADIENT (ft/mi)
DRAINAGE AREA (mi²)

- ☒ VERY LOW - LOW [2-4]
- ☐ MODERATE [6-10]
- ☐ HIGH - VERY HIGH [10-6]

%POOL: ___ %GLIDE: 0
%RUN: 100 %RIFFLE: ___

Gradient 4 *Maximum 10*

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☒ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-		2nd
☐	HIGH	☐
☒	UP	☒
☐	NORMAL	☐
☐	LOW	☐
☐	DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☒ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass--		2nd
☒	< 20 cm	☒
☐	20-<40 cm	☐
☐	40-70 cm	☐
☐	> 70 cm/ CTB	☐
☐	SECCHI DEPTH	☐

CANOPY

- ☒ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

1st pass _____ cm

2nd _____ cm

C] RECREATION AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Stream Reach observed is typical of this stream

B] AESTHETICS

- ☒ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☒ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

D] MAINTENANCE

Circle some & *COMMENT*

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

E] ISSUES

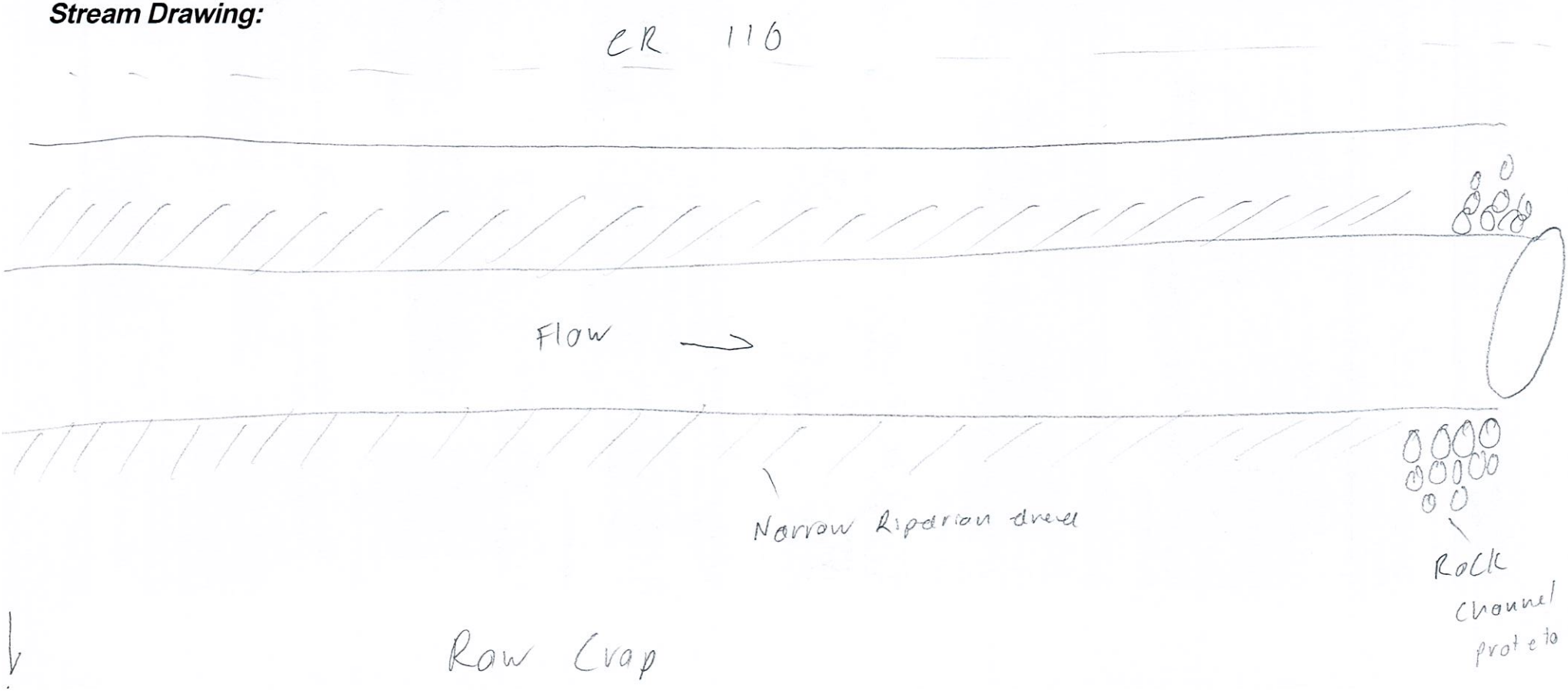
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



OhioEPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 22

Stream & Location: Hardin Wind + Solar **RM:** ___ **Date:** 5/10/18

STR - HW-M1

Scorers Full Name & Affiliation: M. Molnar TRC

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 40.69671 83.7600 Office verified location ☐

1] SUBSTRATE
Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR/SLABS [10]	___	___	☐☐ HARDPAN [4]	___	___
☐☐ BOULDER [9]	___	___	☐☐ DETRITUS [3]	___	___
☐☐ COBBLE [8]	___	___	☐☐ MUCK [2]	35	35
☐☐ GRAVEL [7]	___	___	■■ SILT [2]	60	60
☐☐ SAND [6]	5	5	☐☐ ARTIFICIAL [0]	___	___
☐☐ BEDROCK [5]	___	___	(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ■ 3 or less [0]

Check ONE (Or 2 & average)

ORIGIN	QUALITY		
☐ LIMESTONE [1]	■ HEAVY [-2]		
■ TILLS [1]	☐ MODERATE [-1]	SILT	Substrate
☐ WETLANDS [0]	☐ NORMAL [0]		1
☐ HARDPAN [0]	☐ FREE [1]		
☐ SANDSTONE [0]	■ EXTENSIVE [-2]	EMBEDDEDNESS	Maximum 20
☐ RIP/RAP [0]	☐ MODERATE [-1]		
☐ LACUSTURINE [0]	☐ NORMAL [0]		
☐ SHALE [-1]	☐ NONE [1]		
☐ COAL FINES [-2]			

Comments: 4+0+1-2-2

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.

0 UNDERCUT BANKS [1]	0 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]	AMOUNT (Check ONE (Or 2 & average))
1 OVERHANGING VEGETATION [1]	0 ROOTWADS [1]	1 AQUATIC MACROPHYTES [1]	☐ EXTENSIVE >75% [11]
1 SHALLOWS (IN SLOW WATER) [1]	1 BOULDERS [1]	0 LOGS OR WOODY DEBRIS [1]	☐ MODERATE 25-75% [7]
1 ROOTMATS [1]			■ SPARSE 5-<25% [3]
			☐ NEARLY ABSENT <5% [1]

Comments: 1+1+1+1+3

Cover Maximum 20: 8 → 9

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: 1+1+1+1

Channel Maximum 20: 4 → 13

4] BANK EROSION AND RIPARIAN ZONE
Check ONE in each category for EACH BANK (Or 2 per bank & average)

River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	(L R)
☐☐ NONE / LITTLE [3]	☐☐ WIDE > 50m [4]	☐☐ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
■■ MODERATE [2]	☐☐ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	☐☐ URBAN OR INDUSTRIAL [0]
☐☐ HEAVY / SEVERE [1]	☐☐ NARROW 5-10m [2]	☐☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	☐☐ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]	
	■■ NONE [0]	■■ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments: 2+0+0

Riparian Maximum 10: 2 → 15

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY
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] ☐ INTERMITTENT [-2]
■ 0.2-<0.4m [1]		■ MODERATE [1] ☐ EDDIES [1]
☐ < 0.2m [0]		Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments: 1+0+1+1

Pool / Current Maximum 12: 3 → 18

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (Or 2 & average). ☐ NO RIFFLE [metric=0]

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 [metric=0]		■ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0]
			■ EXTENSIVE [-1]

Comments: 0+1+0-1

Riffle / Run Maximum 8: 0 → 18

6] GRADIENT
(2.3 ft/mi) ■ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]

DRAINAGE AREA (1294 mi²)

%POOL: 15 %GLIDE: 5 %RUN: 80 %RIFFLE: 0

Gradient Maximum 10: 4

A] SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

DISTANCE

- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY

- ☒ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

pass: 1st _____ cm; 2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

B] AESTHETICS

- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION

AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE

Circle some & *COMMENT*

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

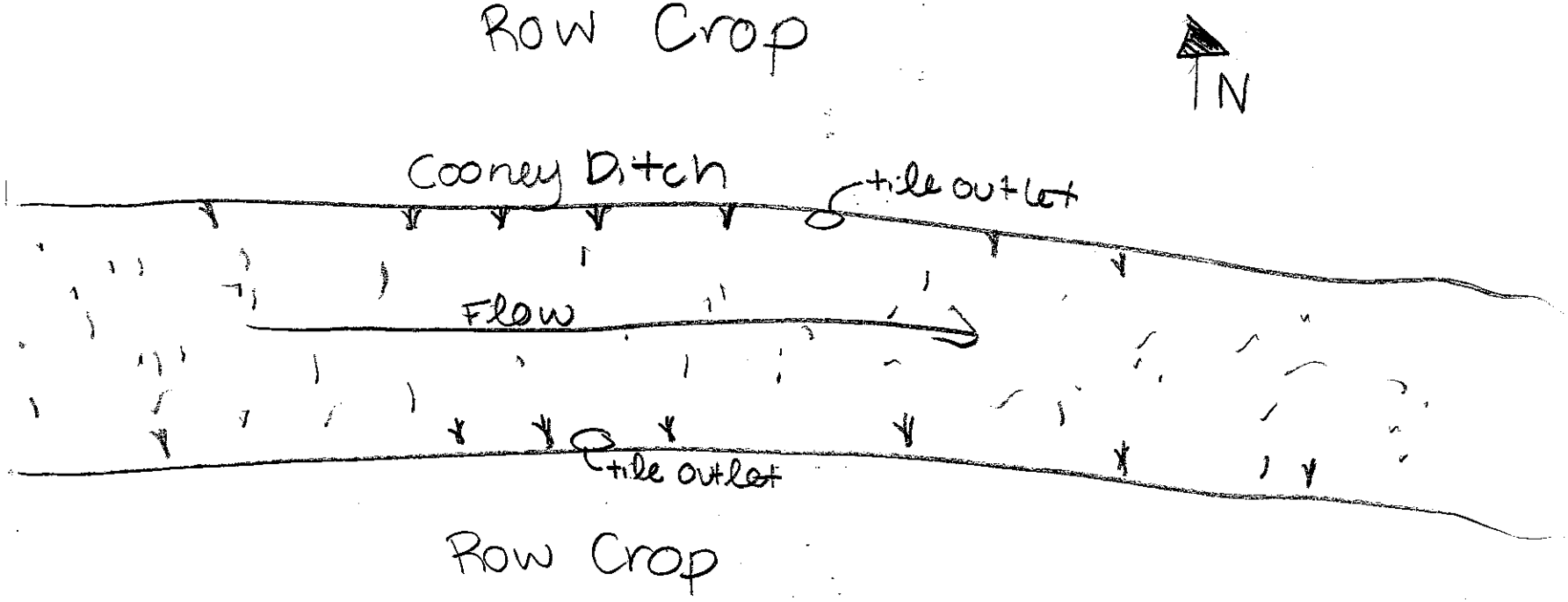
E] ISSUES

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_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS

- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio
- *Legacy Tree:*

Stream Drawing:



STR-HW-M7

Ohio EPA Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 27

Stream & Location: _____ *RM:* ____ *Date:* 5/14/17

Scorers Full Name & Affiliation: M. Molnar TRC

River Code: ___-___-___ *STORET #:* _____ *Lat./ Long.:* (NAD 83 - decimal °) 40.6876 / 83.8422 *Office verified location* ☐

1] SUBSTRATE
Check *ONLY* Two substrate *TYPE BOXES*; estimate % or note every type present

BEST TYPES	POOL	RIFFLE	OTHER TYPES	POOL	RIFFLE
☐☐ BLDR/SLABS [10]			☐☐ HARDPAN [4]		
☐☐ BOULDER [9]			☐☐ DETRITUS [3]		
☐☐ COBBLE [8]			☐☐ MUCK [2]		
☐☐ GRAVEL [7]	25	25	■■ SILT [2]	60	60
☐☐ SAND [6]	15	15	☐☐ ARTIFICIAL [0]		
☐☐ BEDROCK [5]			(Score natural substrates; ignore sludge from point-sources)		

NUMBER OF BEST TYPES: ☐ 4 or more [2] ■ 3 or less [0]

Check ONE (*Or 2 & average*)

ORIGIN	SILT / EMBEDDEDNESS	QUALITY
☐ LIMESTONE [1]		☐ HEAVY [-2]
■ TILLS [1]		■ MODERATE [-1]
☐ WETLANDS [0]		☐ NORMAL [0]
☐ HARDPAN [0]		☐ FREE [1]
☐ SANDSTONE [0]		☐ EXTENSIVE [-2]
☐ RIP/RAP [0]		■ MODERATE [-1]
☐ LACUSTURINE [0]		☐ NORMAL [0]
☐ SHALE [-1]		☐ NONE [1]
☐ COAL FINES [-2]		

Substrate 3 *Maximum 20*

Comments 2+2+0+1-1-1

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.

1 UNDERCUT BANKS [1]	0 POOLS > 70cm [2]	0 OXBOWS, BACKWATERS [1]	
1 OVERHANGING VEGETATION [1]	0 ROOTWADS [1]	0 AQUATIC MACROPHYTES [1]	
0 SHALLOWS (IN SLOW WATER) [1]	0 BOULDERS [1]	0 LOGS OR WOODY DEBRIS [1]	
0 ROOTMATS [1]			

AMOUNT Check ONE (*Or 2 & average*)
☐ EXTENSIVE >75% [11]
☐ MODERATE 25-75% [7]
☐ SPARSE 5-<25% [3]
■ NEARLY ABSENT <5% [1]

Comments 1+1+1

Cover Maximum 20 3 → 6

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 2+1+3+1

Channel Maximum 20 7 → 13

4] BANK EROSION AND RIPARIAN ZONE
Check ONE in each category for *EACH BANK* (*Or 2 per bank & average*)
River right looking downstream

EROSION (L R)	RIPARIAN WIDTH (L R)	FLOOD PLAIN QUALITY (L R)	
☐☐ NONE / LITTLE [3]	☐☐ WIDE > 50m [4]	☐☐ FOREST, SWAMP [3]	☐☐ CONSERVATION TILLAGE [1]
■■ MODERATE [2]	☐☐ MODERATE 10-50m [3]	☐☐ SHRUB OR OLD FIELD [2]	☐☐ URBAN OR INDUSTRIAL [0]
☐☐ HEAVY / SEVERE [1]	☐☐ NARROW 5-10m [2]	☐☐ RESIDENTIAL, PARK, NEW FIELD [1]	☐☐ MINING / CONSTRUCTION [0]
	■■ VERY NARROW < 5m [1]	☐☐ FENCED PASTURE [1]	
	☐☐ NONE [0]	■■ OPEN PASTURE, ROWCROP [0]	

Indicate predominant land use(s) past 100m riparian.

Comments 2+1+0

Riparian Maximum 10 3 → 16

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH Check ONE (*ONLY!*)
☐ > 1m [6]
☐ 0.7-<1m [4]
☐ 0.4-<0.7m [2]
■ 0.2-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH Check ONE (*Or 2 & average*)
■ POOL WIDTH > RIFFLE WIDTH [2]
☐ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY Check ALL that apply
☐ TORRENTIAL [-1]
☐ VERY FAST [1]
☐ FAST [1]
■ MODERATE [1]
■ SLOW [1]
☐ INTERSTITIAL [-1]
☐ INTERMITTENT [-2]
☐ EDDIES [1]
Indicate for reach - pools and riffles.

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Comments 1+2+1+1

Pool / Current Maximum 12 5 → 21

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: Check ONE (*Or 2 & average*). ■ NO RIFFLE [metric=0]

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 [metric=0]		☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]	☐ MODERATE [0]
			☐ EXTENSIVE [-1]

Comments

Riffle / Run Maximum 8 0

6] GRADIENT (4.9 ft/mi)
DRAINAGE AREA (2.52 mi²)

☐ VERY LOW - LOW [2-4]
■ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: ____ %GLIDE: 100
%RUN: ____ %RIFFLE: ____

Gradient Maximum 10 6 → 27

A] SAMPLED REACH
Check ALL that apply

METHOD
- ☐ BOAT
- ☐ WADE
- ☐ L. LINE
- ☐ OTHER

DISTANCE
- ☐ 0.5 Km
- ☐ 0.2 Km
- ☐ 0.15 Km
- ☐ 0.12 Km
- ☐ OTHER

_____ meters

STAGE

1st -sample pass-	2nd
☐ HIGH	☐
☐ UP	☐
☐ NORMAL	☐
☐ LOW	☐
☐ DRY	☐

CLARITY

1st --sample pass--	2nd
☐ < 20 cm	☐
☐ 20-<40 cm	☐
☐ 40-70 cm	☐
☐ > 70 cm/ CTB	☐
☐ SECCHI DEPTH	☐

CANOPY
- ☐ > 85%- OPEN
- ☐ 55%-<85%
- ☐ 30%-<55%
- ☐ 10%-<30%
- ☐ <10%- CLOSED

pass: 1st _____ cm; 2nd _____ cm

Comment RE: Reach consistency/ Is reach typical of steam?, *Recreation/* Observed - Inferred, *Other/* Sampling observations, Concerns, Access directions, etc.

Fish observed

OHWM width: 8'

Depth: 1.5'

B] AESTHETICS
- ☐ NUISANCE ALGAE
- ☐ INVASIVE MACROPHYTES
- ☐ EXCESS TURBIDITY
- ☐ DISCOLORATION
- ☐ FOAM / SCUM
- ☐ OIL SHEEN
- ☐ TRASH / LITTER
- ☐ NUISANCE ODOR
- ☐ SLUDGE DEPOSITS
- ☐ CSOs/SSOs/OUTFALLS

C] RECREATION
AREA DEPTH

POOL: ☐ >100ft² ☐ >3ft

D] MAINTENANCE
Circle some & *COMMENT*

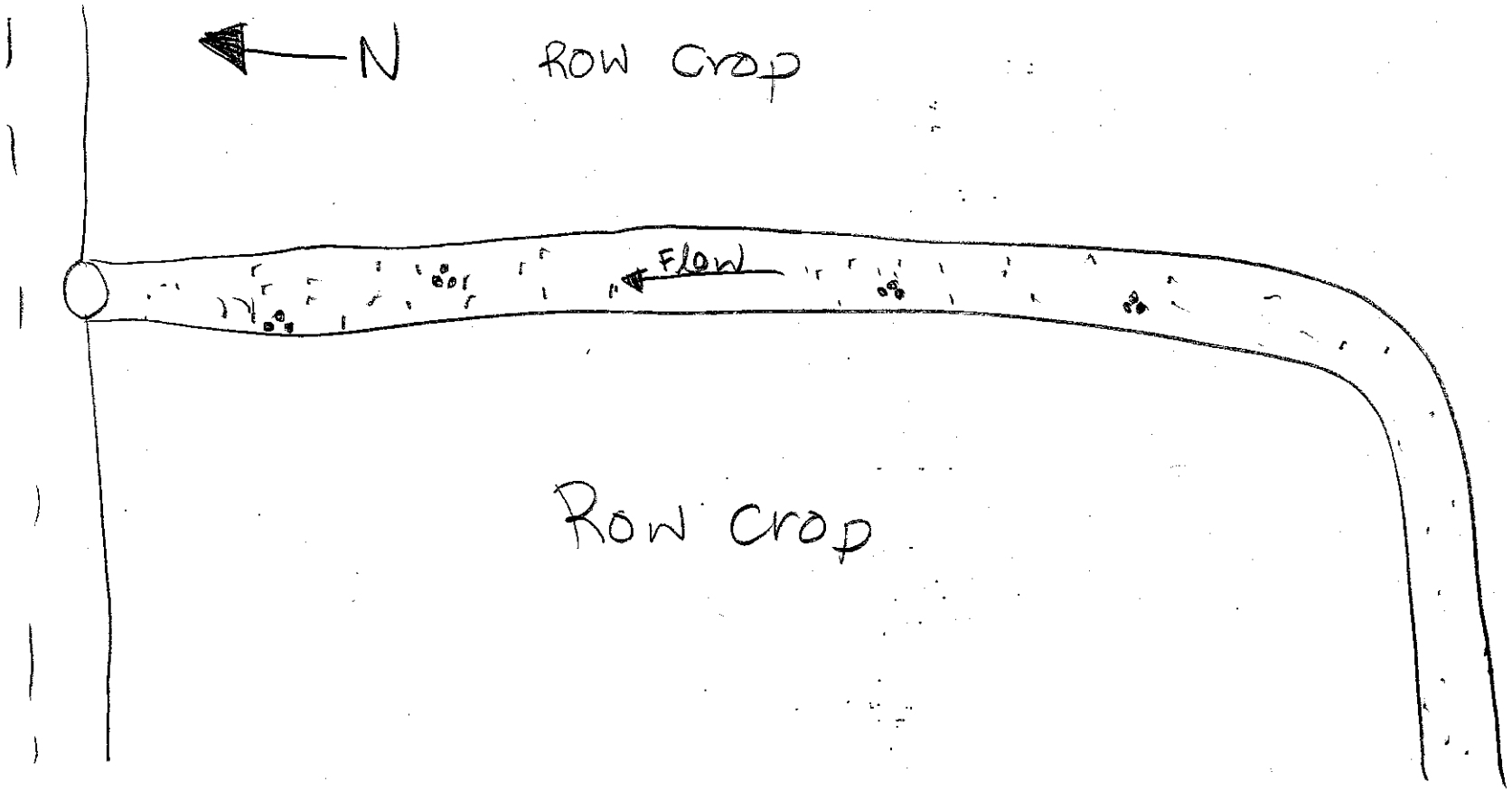
PUBLIC / PRIVATE / BOTH / NA
ACTIVE / HISTORIC / BOTH / NA
YOUNG-SUCCESSION-OLD
SPRAY / SNAG / REMOVED
MODIFIED / DIPPED OUT / NA
LEVEED / ONE SIDED
RELOCATED / CUTOFFS
MOVING-BEDLOAD-STABLE
ARMOURED / SLUMPS
ISLANDS / SCOURED
IMPOUNDED / DESICCATED
FLOOD CONTROL / DRAINAGE

E] 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_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN / HOME
ATMOSPHERE / DATA PAUCITY

F] MEASUREMENTS
- $\bar{x}$ width
- $\bar{x}$ depth
- max. depth
- $\bar{x}$ bankfull width
- bankfull $\bar{x}$ depth
- W/D ratio
- bankfull max. depth
- floodprone x^2 width
- entrench. ratio

Legacy Tree:

Stream Drawing:



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Case No(s). 09-0479-EL-BGN, 11-3446-EL-BGA, 16-0469-EL-BGA, 16-2404-EL-BGA

Summary: Notification of Phase 3 – Compliance with Condition 57(a), 2019 Wetlands Delineation Report (Laydown Areas) electronically filed by Christine M.T. Pirik on behalf of Hardin Wind Energy LLC