

Supplemental Appendix B: Supplemental Ecological Assessment

Wetland and Waterbody Delineation Report

Hardin Wind LLC

Scioto Ridge Transmission Line



Document Information

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Acronyms

BMP	Best Management Practice
CECPN	Certificate of Environmental Compatibility and Public Need
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWH	Cold Water Habitat
DOW	Division of Wildlife
FAC	Facultative Plants
FACU	Facultative Upland Plants
FACW	Facultative Wetland Plants
FLS	Federally Listed Species
GIS	Geographic Information Systems
GPS	Global Positioning System
HDD	horizontal directional drill
HHEI	Headwater Habitat Evaluation Index
JD	Jurisdictional Determination
kV	Kilovolt
NHD	National Hydrography Dataset
NLCD	National Land Cover Database
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NWP	Nationwide Permit
OAC	Ohio Administrative Code
OBL	Obligate Wetland Plants
ODNR	Ohio Division of Natural Resources
OEPA	Ohio Environmental Protection Agency
OHWM	Ordinary High Water Mark
OPSB	Ohio Power Siting Board
ORAM	Ohio Rapid Assessment Methodology
OSHPO	Ohio State Historic Preservation Office

OWI	Ohio Wetland Inventory
PHWH	Primary Headwater Stream
Project	Scioto Ridge Transmission Line
QHEI	Qualitative Habitat Evaluation Index
ROW	right-of-way
RTE	Rare, Threatened or Endangered species
SOH	Streams
UPL	Obligate Upland Plants
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Survey
WOTUS	Waters of the U.S.
WQC	Water Quality Certification
WWH	Warm Water Habitat

1 Introduction

Hardin Wind LLC proposed construction of the Scioto Ridge Transmission Line (the Project) in Hardin County, Ohio to the Ohio Power Siting Board (OPSB) under case 13-1768-EL-BTX in 2013. On March 17th, 2014 the OPSB certificated the Scioto Ridge Transmission Line Project. As certificated, the Project involves construction of a 345 kilovolt (kV) transmission line and Point of Interconnect Substation within a 120-foot right-of-way (ROW) extending approximately 5 miles to connect the Scioto Ridge wind Farm Collector Substation to the Point of Interconnect Substation. The Project will deliver power from the Scioto Ridge Wind Farm to American Electric Power's East Lima – Marysville 345kV Line. For this Wetland Report, Cardno reports on the desktop and field delineations within the Project Corridor (200-feet on either side of proposed infrastructure). The Project Corridor consists of 156.28 acres in McDonald Township, as shown in Figure 1.1.

This report describes the methodology used by Cardno to complete the wetland and waterbody delineation survey and the results of a desktop assessment and a field survey. Specifically, Section 2 of the report identifies the methodology used during the identification of wetlands and surface waters within the Project Corridor. Section 3 of the report outlines the findings of the desktop assessment of the site. Section 4 of the report identifies the results of the field surveys. Section 5 presents the conclusions of the delineation and site survey. Section 6 provides a list of references cited in this report.

The report is accompanied by several appendices. Appendix A contains representative photographic documentation of the delineated wetland and waterbody features. Appendix B contains maps depicting the delineated wetlands and waterbodies. Appendix C contains the completed stream assessment forms.

Figure 1.1 Project Overview



2 Survey Methodology

This section of the report identifies the methodologies used during the desktop review and field delineations of wetland and open waterbodies within the Project Corridor. Surveys were conducted in July of 2013.

2.1 Desktop Review

Prior to field surveys, Cardno conducted a desktop review of the Project Corridor using publicly available Geographic Information Systems (GIS) data to identify and classify potential environmental resources and create field maps for use during survey. Sources of this reference material included, but was not limited to: the National Land Cover Database (NLCD); the United States Department of Agriculture (USDA) National Resource Conservation Service (NRCS) Soil Survey for Highland County; historic aerial photographs; United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps; United States Geological Survey (USGS) topographic maps; the USGS National Hydrography Dataset (NHD); and the Ohio Wetland Inventory (OWI).

2.2 Field Delineation Methodologies

Surveys were conducted in the Project Corridor to determine the extent of wetlands and waterbodies in accordance with applicable Federal and State regulations and guidelines. A Trimble® Global Positioning System (GPS) with sub-meter accuracy was used to collect data points for mapping. As wetland and waterbody point features were collected, they were assigned a FEATURE_ID with the format of FOH-XXX-YY, where:

F = Feature Type

- S – Waterbodies
- W – Wetlands

OH = State (Ohio)

XXX = Three-digit number as the unique identifier

YY = Flag number per each unique feature identified

The information collected in the field was post-processed in the office using (ArcGIS) and verified by the field team for accuracy. If a feature continued outside of the Project Corridor, it was noted by the field teams.

2.2.1 Wetland Delineation Methodologies

Wetland delineations were conducted according to the 1987 United States Army Corps of Engineers (USACE) *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the applicable regional supplements; *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (USACE 2010). Together, these documents are referred to as “The Manual.” The methodology outlined in the Manual requires that three wetland criteria be met in order for a wetland to be determined to be present; that is, the area being evaluated must have a dominance of hydrophytic vegetation, hydric soils, and sufficient hydrology to be identified as a wetland.

Dominant vegetation is assessed for hydrophytic preference. The hydrophytic vegetation criterion is met when more than 50 percent of the dominant plant community is hydrophytic, as determined by species dominance and the assigned species-specific indicator status of the identified species. Table 2-1 shows the indicator status categories for plants.

Table 2-1 Plant Indicator Categories

Indicator Category	Indicator Symbol	Definition
Obligate Wetland Plants	OBL	Plants that occur almost always (estimated probability > 99 percent) in wetlands under natural conditions, but which may also occur rarely (estimated probability <1 percent) in nonwetlands.
Facultative Wetland Plants	FACW	Plants that occur usually (estimated probability >67 percent to 99 percent) in wetlands, but also occur (estimated probability 1 percent to 33 percent) in nonwetlands.
Facultative Plants	FAC	Plants with a similar likelihood (estimated probability 33 percent to 67 percent) of occurring in both wetlands and nonwetlands.
Facultative Upland Plants	FACU	Plants that occur sometimes (estimated probability 1 percent to <33 percent) in wetlands, but occur more often (estimated probability >67 percent to 99 percent) in nonwetlands.
Obligate Upland Plants	UPL	Plants that occur rarely (estimated probability <1 percent) in wetlands, but occur almost always (estimated probability >99 percent) in nonwetlands under natural conditions.

After identifying the plant species present within a sampling area of a potential wetland, the dominance and indicator status for each identified unique species was determined. Based on the results, the vegetation community being evaluated was determined to be indicative of either a wetland or upland.

Under certain circumstances, such as after disturbance from storm events or surveys occurring outside of the prime growing season, additional methods are employed to evaluate the vegetative communities of suspected wetlands. This can include calculating a prevalence index which weighs the coverage of a particular class of species (using its wetland indicator status) against the total coverage within the sampling area. If a sampling area passes this test (which requires the value to be less than or equal to 3), it can be considered a wetland. Another potential evaluation method is the presence of morphological adaptations, which can include root buttressing, shallow roots, or multi-stemmed trunks. The presence of such adaptations is considered evidence that the plants (even FACU species) have adapted to survive in prolonged inundation or root saturation. Another method is to report "Problematic Hydrophytic Vegetation." This method is used sparingly, and reflects the delineator's opinion that conditions outside of those considered normal may be present, such as vegetation being bent or damaged to such a degree that identification to species level is impracticable. Under this method, the vegetation present would be treated as consistent with a wetland, but the vegetation could not be reliably identified.

The hydric soils criterion is met when the soils identified are officially listed as hydric soils or the soils demonstrate characteristics representative of soils in reducing (hydric) conditions. The latter is determined in the field when the soils fall within the hydric ranges on the Munsell Color Chart, examining soil profiles for other evidence of reducing conditions, and/or observing other indicators of anaerobic activity per the Manual.

The hydrology criterion is met when sufficient hydrologic indicators are present. The indicators must be representative of sufficient saturation or inundation occurring over the growing season sufficient to support a hydrophytic plant-dominated vegetative community. Such indicators may include evidence of standing water, saturated soils, geomorphic position within the landscape, drainage patterns, water-stained leaves, and morphologic adaptation of vegetation.

Wetland delineation data are reported on routine wetland determination data forms. The perimeter of each wetland was mapped using the GPS systems. In addition to identifying the boundaries of wetlands, additional data points are taken with the GPS to locate delineation data collection center points.

After delineations, the identified wetlands are scored using the Ohio Environmental Protection Agency's (OEPA) Ohio Rapid Assessment Method (ORAM). The ORAM wetland functional assessment was developed to determine the ecological "quality" and level of function of a particular wetland in order to meet requirements under Section 401 of the Clean Water Act (CWA). Wetlands are scored on the basis of hydrology, upland buffer, habitat alteration, special wetland communities, and vegetation communities. Each of these subject areas is further divided into sub-categories under ORAM v5.0 resulting in a score that describes the wetland using a range from 0 (low quality and high disturbance) to 100 (high quality and low disturbance).

Wetlands scored from 0 to 29.9 are grouped into "Category 1," 30 to 59.9 are "Category 2" and 60 to 100 are "Category 3." Transitional zones exist between "Categories 1 and 2" from 30 to 34.9 and between "Categories 2 and 3" from 60 to 64.9. However, wetland scores that fall into one of these transitional ranges should be assigned to the higher category unless collected data suggests the wetland should be placed in the lower category.

Category 1 consists of wetlands that are often isolated emergent marshes dominated by cattails with little or no upland buffers located in active agricultural fields. Category 2 consists of wetlands for which rare, threatened or endangered species and their habitat are absent, but may have well developed habitat for other more common species. Category 2 wetlands constitute the broad middle category of "good" quality wetlands. A "Modified Category 2" wetland appears to have some signs of degradation but also has the potential to restore some of the lost functionality. Category 3 wetlands are typified by high levels of diversity, a high proportion of native species, and/or high functional values. Category 3 wetlands include wetlands that contain or provide habitat for threatened or endangered species, are high quality mature forested wetlands, vernal pools, bogs, fens, or which are scarce regionally and/or statewide.

2.2.2 Waterbody Delineation Methodologies

Linear waterbodies, such as ditches and streams, were surveyed by locating the path (typically the centerline if water depth was shallow, or the top-of-bank if the centerline was not accessible) and documenting widths (both as Ordinary High Water Mark (OHWM) to OHWM and top-of-bank to top-of-bank) at each survey point. Observational notes about the characteristics of each waterbody (such as flow regime and substrate) were recorded by the field team to enable the categorization of the types of waterbodies encountered. To be classified as a waterbody, however, each feature must have a defined bed and bank with indications of a channel flow; grassy swales are not waterbodies, and were not identified as such. Table 2-2 identifies the definitions used in assigning waterbody flow.

Table 2-2 Waterbody Flow Categories

Flow Category	Definition
Perennial	Flow is continuous and likely permanent across the seasons (although it may vary). Such flow can be surface based or occur as interstitial flow, which would include the flow driving underground for a portion of the channel.
Intermittent	Flow is present during extended periods of time during some seasons, but gradually returns to a state of isolated pools in the channel or a dry channel. There may be indications of subsurface flow.
Ephemeral	Flow is often not present during the majority of the year, and only occurs after a precipitation event. Channels of ephemeral streams will be dry with no evidence of isolated pools of water.

All flowing waterbodies (streams and ditches, but not ponds) delineated in the Project Corridor were assessed using the Headwater Habitat Evaluation Index (HHEI). The HHEI allows for uniform scoring of various waterbodies using a standard methodology that identifies pertinent information about the waterbody including substrates, pool depths, and ecological value or condition. HHEI forms typically are completed, however, only for waterbodies with a drainage area of less than one square mile.

Larger features are evaluated using the Qualitative Habitat Evaluation Index (QHEI). The QHEI form is used to describe similar aspects of waterbodies, but is focused on larger (often higher quality) waterbodies. Typically, QHEI forms are completed only for those perennial features with drainage areas greater than one square mile and pools deeper than 40 centimeters (approximately 15 inches). In cases where a feature scored highly on the HHEI forms and failed to meet either of QHEI criteria, however, they were still evaluated with the QHEI to better record the conditions present.

Table 2-3 Headwater Habitat Evaluation Index (HHEI) Scoring

Final HHEI Score	Definition
<30	Class I PHWH (Ephemeral streams, normally dry channel, little to no aquatic life)
30 - 50	Class II PHWH (Intermittent flow, summery-dry, warm water streams)
>50	Class II or III PHWH (depending on conditions)
>75	Class III (Perennial flow, cool-cold Water Streams)

PHWH – Primary Headwater Stream

2.2.3 Ohio Mussel Survey

All native mussels in the State of Ohio are protected per Ohio Revised Code Section 1533.324, as are the 10 federally protected species which may occur in the state. In order to protect these species, the Ohio Department of Natural Resources' Division of Wildlife (ODNR DOW) and USFWS developed a series of survey protocols to identify the presence or absence of mussels in a waterbody, as detailed in the Ohio Mussel Survey Protocol (updated April 2018) (ODNR 2018). The protocols identify five types of streams based on their size and potential for federally listed species (FLS), including:

Table 2-4 Stream Classifications according to Mussel Survey Protocol, per ODNR and USFWS

Group	Definition
Unlisted	Streams not listed in the Survey Protocol, having a watershed larger than 10 square miles with the potential for mussels, but no FLS are expected
Group 1	Small to mid-sized streams, FLS not expected
Group 2	Small to mid-sized streams, FLS expected
Group 3	Large Rivers, FLS not expected
Group 4	Large Rivers, FLS expected

Such mussel surveys are required to be conducted by trained and accredited individuals, with the Group of stream determining exact scale of surveys required. The unlisted streams and Group 1 streams may have visual reconnaissance surveys completed, with the results being forwarded to ODNR who then determine need for any additional surveys. All Group 2, 3, and 4 streams require a full survey.

The survey protocols were initially developed in 2015, after the completion of the bulk of the field surveys for the Project. However, Cardno field staff conducted visual reconnaissance surveys as part of the typical delineation process prior to its development. If any mussels are found during stream delineations

and if the stream is to be impacted, Cardno identifies the stream for a follow-up survey. The survey protocol notes that use of horizontal directional drill (HDD) to cross a stream eliminates the need for surveys, and streams with a drainage area less than 10 square miles also do not require surveys. Based on this criteria, full mussel surveys are not required for the waterbodies identified within the Project Corridor.

2.2.4 Jurisdictional Determination

While Cardno cannot formally determine the jurisdictional status of a waterbody or wetland, Cardno has identified features it considers potentially jurisdictional. Any determination made by the USACE would be binding, and may vary from Cardno's interpretation. Our interpretation is made based on available documentation from the United States Environmental Protection Agency (USEPA), including guidance on the "Current Implementation of Waters of the United States"¹ which refers to the original 1986/1988 promulgation and subsequent Supreme Court cases which further defined the term. In general, the term Waters of the U.S. (WOTUS) means:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
 - a. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
 - b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - c. Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as WOTUS under this definition;
5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;
6. The territorial sea;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 Code of Federal Regulations (CFR) 423.11(m) which also meet the criteria of this definition) are not WOTUS.

Although no navigable WOTUS were identified in the Project, many of the features could be considered tributaries that eventually flow into a WOTUS. Tributaries themselves may not be navigable, but have a significant impact on water quality 'downstream' in the WOTUS. Status as a tributary was primarily assessed on the presence or absence of a USGS NHD blue line feature and possibility for flow into a larger WOTUS. Additionally, if the waterbody or wetland abutted a potentially jurisdictional feature and had a permanent or potentially permanent hydrologic connection, then both waterbodies would be considered jurisdictional. For clarity, any features identified as jurisdictional, will be referred to as jurisdictional for the purposes of this wetland delineation report. However, final determinations of jurisdiction are the responsibility of the USACE. Any determination made by the USACE would be

¹ <https://www.epa.gov/cwa-404/definition-waters-united-states-under-clean-water-act>

binding and modifications to a feature's jurisdictional status that varies from Cardno's would have to be honored.

A formal Jurisdictional Determination (JD) was sought for the Scioto Ridge Wind Farm Project in 2016, and both Preliminary and Approved Jurisdictional Determinations were received on June 28th, 2016. The features associated with the Transmission Line were also included for review in these JDs.

3 Desktop Assessment Results

Multiple sources were reviewed prior to field investigations to identify potential resources as part of a preliminary desktop assessment. The findings of the desktop assessment were also verified during the field surveys.

3.1 National Land Cover Database Review

Based on a review of available aerial imagery, the Project Corridor appeared to generally occur in cultivated crop areas. Review of the 2011 NLCD (Homer et al. 2015) confirmed this assessment, which showed that cultivated crops accounted for approximately 92 percent of the total acreage in the Project Corridor. The second most prominent land use within the Project Corridor was classified as pasture areas, for approximately 4 percent of the acreage. The next most prominent land use within the Project Corridor was “Developed, Open Space” (4 percent), which occurred primarily has housing and residential lots scattered across the Project Corridor. All other land use types identified made up less than 1 percent of the total acreage in the Project Corridor. A summary is provided in Table 3-1 below.

Table 3-1 Land Use within the Project Corridor

Type	Project Corridor (acres)	Project Corridor (%)
Cultivated Crops	143.79	92%
Hay/Pasture	6.21	4%
Developed, Open Space	5.62	4%
Grassland/Herbaceous	0.52	<1%
Developed, Low Intensity	0.14	<1%
Deciduous Forest	0.000452	<1%
TOTAL	156.28	100%

Compiled from NLCD 2011, amended 2014

The field teams observed that the land use in the Project Corridor closely matched the remote land use data described above.

3.2 Geology

This Project is located within the Central Lowland Physiographic Province of Ohio, which covers the central and western portions of the state south of Lake Erie. The Central Lowland is characterized by glacial till plains with gently rolling hills. Most hills are a series of moraines, which are glacier-created mounds of rock and soil that are up to 100 feet high and 6 miles wide (ODNR). Elevations in the Central Lowlands range from 700 to 1,150 feet above mean sea level with moderate topographic relief (ODNR Division of Geological Survey, 1998, Physiographic Regions of Ohio²).

3.3 Soils

Cardno reviewed soil types for the Project Corridor using the Web Soil Survey, an application of the NRCS (USDA-NRCS 2016). Based upon Table 3-2, below, there were 11 soil types identified, with two

² <http://www.dnr.state.oh.us/Portals/10/pdf/physio.pdf>

soil type identified as predominately hydric (90 or higher in Hydric Rating) accounting for 67.07 acres of the Project Corridor. The poor draining qualities of hydric soils combined with local flat or bowl-shaped topography can make locations predisposed to wetlands.

Table 3-2 Soil Types within the Project Corridor

Type	Map Unit Description	Hydric Rating	Acreage	Project Corridor (%)
PkA	Pewamo silty clay loam, 0 to 1 percent slopes	91	54.08	35%
Ble1B1	Blount silt loam, end moraine, 2 to 4 percent slopes	6	24.98	16%
Blg1B1	Blount silt loam, ground moraine, 2 to 4 percent slopes	9	24.65	16%
DeA	Del Rey silt loam, 0 to 3 percent slopes	3	13.21	8%
Mf	Milford silty clay loam, 0 to 2 percent slopes	93	12.99	8%
Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	9	12.22	8%
Gwd5C2	Glynwood clay loam, 6 to 12 percent slopes, eroded	0	6.54	4%
Gwe5B2	Glynwood clay loam, end moraine, 2 to 6 percent slopes, eroded	6	3.33	2%
Gwg5C2	Glynwood clay loam, ground moraine, 6 to 12 percent slopes, eroded	7	1.62	1%
KaB	Kendallville silt loam, 2 to 6 percent slopes	4	1.35	1%
Ble1A1	Blount silt loam, end moraine, 0 to 2 percent slopes	6	1.31	1%
TOTAL			156.28	100%

Compiled from NLCD 2011, amended 2014

3.4 Navigable Waters

The Project is located wholly within the North Fork of the Great Miami River drainage area, which flows southwest through Hardin County into Logan County. The North Fork Great Miami River is not considered a navigable waterway. No other navigable waterways are located within the Project Corridor.

3.5 Remote Wetland and Waterbody Identification

Prior to site investigations, the Project Corridor was screened using the USFWS NWI and USGS NHD remote data for potential wetlands and waterbodies in the vicinity of the Project. The NWI data shows remotely identified wetlands, which may be based on previous aerial imagery interpretation and soils surveys, while the NHD uses digital stream information to identify potential waterways.

Four wetlands and two waterbodies were identified within the Project Corridor, with some additional streams and wetlands occurring in the vicinity. The majority of the waterbodies remotely identified appeared to be open agricultural canals or ditches. Most of the wetlands identified by ODNR occurred in forested areas with some minor areas along fringes of woods, with moderate overlap with NWI features. NWI and ODNR wetlands are shown on the Wetland and Waterbody Maps included in Appendix B where they occur outside of the Project Corridor.

3.6 Desktop Review Summary

The desktop review indicated potential for wetlands to be located in multiple forested areas near the Project Corridor. The area also included a number of ditches and streams running through agricultural

areas. The vast majority of the Project Corridor is cultivated crop area that limits the development of wetlands. The remotely identified features and land use information was expected given the region's heavy, historic manipulation of land use to accommodate and maintain farming operations.

4 Field Survey Results

The following is a discussion of the results of field surveys conducted within the Project Corridor. Appendix A contains representative photographic documentation of the delineated wetland and waterbody features. Appendix B contains maps depicting the delineated wetlands and waterbodies. Appendix C contains the completed stream assessment forms.

4.1 General Habitat within the Project Corridor

The data obtained during the desktop review was found to be generally consistent with the results of the field survey. As identified in Table 3-1, the predominant land use in the Project Corridor is agricultural.

The agricultural areas were primarily devoted to production of soybean and corn crops. The cultivated areas within the Project Corridor are expected to occupy the same general area from year to year, with the potential for the type of crop to change seasonally. In between many of the fields, as well as along many roadsides, there were grassy swales (consisting of *Festuca* and *Fescue* grasses) that helped to direct stormwater runoff away from the crop area. Many of the fields appeared to be tilled to help with additional field drainage and this water travels to the nearby ditches. Located within the crop areas are multiple agricultural ditches which provide drainage. These ditches were characterized by steep sloping sides vegetated by reed canary grass (*Phalaris arundinacea*). The dense growth of grasses on many of the banks will likely limit erosion. The ditches within the Project Corridor lacked any significant plant communities of value due to the high density of grasses. Further reducing the quality of the vegetation communities on the banks was the annual mowing of the banks by the landowners.

A small portion of forested area in the Project Corridor existed as narrow wind rows, which existed primarily for the purpose of property boundaries. The tree rows were often sparsely populated with individuals of maples (*Acer sp.*), oaks (*Quercus sp.*), elms (*Ulmus sp.*) walnuts (*Juglans sp.*) and American beech (*Fagus grandifolia*). The herbaceous vegetation in the wind rows included aggressive weedy species such as pokeweed (*Phytolacca americana*), blackberry (*Rubus sp.*), and poison ivy (*Toxicodendron radicans*).

The habitats surveyed during field efforts appear to lack significant or obvious evidence of rare, threatened or endangered (RTE) species. Visual reconnaissance surveys were conducted during the wetland and waterbody delineations and did not observe any Federal-listed RTE species. The modification of the majority of available habitat due to agricultural activities has likely degraded the quality and limited potential RTE habitat. Wooded areas in the Project Corridor were typically of low quality, with isolated occurrences of relatively large, high quality trees surrounded by weedy vegetation and active crop areas. The delineated waterbodies and riparian buffers could potentially provide RTE species habitat, but at reduced quality due to the surrounding land use impacting the water chemistry (i.e., high sediment loading during storms and fertilizer in runoff). Similarly, the open pasture area is routinely disturbed by agricultural operations (either in cattle related damage or harvesting of hay) which further limits biological utilization. During the field surveys, Cardno staff observed minimal wildlife use in the Project Corridor and observed no federally listed RTE species due to the Project Corridor being relatively low quality and highly disturbed.

4.2 Description of the Delineated Wetlands in the Project Corridor

There were no wetlands delineated in the Project Corridor due to its siting within active agricultural areas.

4.3 Description of the Delineated Waterbodies in the Project Corridor

A total of two waterbodies were delineated within the current Project Corridor, accounting for 4,158 linear feet. The waterbody delineation results are summarized in Table 4-2. Representative photographs of typical waterbodies can also be found in Appendix A. Waterbodies were delineated in the field and further categorized for the report as either streams or ditches.

Ditches were identified as man-made or modified channels, which were manipulated by landowners or communities to improve drainage among farm fields. Modification to channels could include the mowing of bank vegetation, altering of channel morphology, or removal of debris to maintain flow conditions. Many ditches have ephemeral or intermittent flows and heavily vegetated channels. At the time of the survey, most were flowing though due to the recent rains and saturated soils. If a ditch crossed under a road, the deepest pools of water were normally located at the edges of the culvert, which occur as a result of eddies and currents of storm water flow creating erosion.

Streams were more often considered natural channels that had indications of significant recovery since any historic modification had occurred. Some streams were flowing at the time of the survey, with slightly elevated turbidity, which was attributed to runoff from nearby ditches and cultivated areas during recent rains. Streams were more likely to have vegetated riparian buffers along the banks, variety of substrates in the channel, and pools of water which might support aquatic species.

The OEPA's HHEI forms were completed for each stream and ditch and serve to record and score a variety of aspects about the feature. The HHEI forms score the types and percent composition of substrates, maximum pool depth, and average bankfull width. Additional descriptive information is recorded in the forms regarding flow regime, riparian width and quality, morphology, and modification. Stream channel modification is referenced in many of the descriptions below, as either 'naturalized' or 'modified.' Naturalized features are those that have either never been modified or have historic signs of modification but appear to have recovered to a natural state. Modified features are those that appear to have recently been modified (such as through dredging or armoring of the banks) and may have little to no evidence of recovery. Scores are tallied for each feature, and result in a HHEI Category of Class I, II, or III as described in Section 2.2.2 above.

While delineating the waterbodies in the Project Corridor, Cardno evaluated the features for suitability as habitat for RTE species, including mussels. Due to the modification and disturbance present in the surrounding area, none of the waterbodies were identified as highly likely to serve as habitat for any RTE species. A dominance of silty substrates in the majority of waterbodies also limited potential RTE occurrence. Frequently a waterbody may be able to provide physical habitat, but lack suitable water chemistry due to intensive land use in the upland areas.

Both of the waterbodies delineated in the Project Corridor were considered perennial Modified Class II waterbodies. Characteristic traits of the delineated Category II waterbodies were a mix of substrates, including some with gravel and cobble bottoms, deeper water depths and wider channels. Along with much higher maximum pool depth measurements, they also had flowing water at the time of the survey. Both of the waterbodies were previously reviewed by the USACE for a JD and determined to be jurisdictional.

Table 4-2 Waterbodies Delineated in the Project Corridor

Stream ID	Type	Linear Feet in Project Corridor	HHEI Score	QHEI Score	PHWH Class Designation	Flow Regime	Drainage Basin	Considered Jurisdictional*	Potential RTE Habitat	Mussels Observed	S R W	W W H	E W H	M W H	S S H	C W H	L R W	P W S	A W S	I W S	B W	P C R	SCR
SOH-018	Ditch	440.16	37	NA	Modified Class II	Perennial	North Fork Great Miami River	Yes	Low	No		X		X					X			X	
SOH-034	Ditch	31,007.35	36	NA	Modified Class II	Perennial	North Fork Great Miami River	Yes	Low	No		X		X					X			X	

Total **1,447.51**

* - Reviewed by USACE and formalized in JD Received 6/13/2016

** - Not reviewed by USACE

QHEI – Scoring	HHEI – Scoring	Use Designations	
< 32: Limited Resource Water (LRW)	< 30: Class I PHWH (typically ephemeral streams)	SRW – State Resource Water	AWS – Agricultural Water Supply
32 to 60: Modified Warmwater Habitat (MWH)	30 to 50 Class II PHWH (intermittent warm water streams)	PWS – Public Water Supply	IWS – Industrial Water Supply
60 to 75: Warmwater Habitat (WWH)	> 50: Class II or III PHWH (depending on conditions)	BW – Bathing Waters	PCR – Primary Contact Recreation
> 75: Possible Exceptional Warmwater Habitat (EWH)	> 75: Class III PHWH (perennial cool water streams)		SCR – Secondary Contact Recreation

5 Permits and Regulatory Approvals

The Scioto Ridge Wind Farm Transmission Line was issued a Certificate of Environmental Compatibility and Public Need (CECPN) by the OPSB on March 17, 2014³. The OPSB CECPN process includes a rigorous project review process involving review from the OPSB, Ohio State Historic Preservation Office (OSHPO), USFWS, and ODNR, among other agencies prior to certifying.

A summary of the permits and approvals obtained by the Project is provided in Table 5-1 below.

Table 5-1 Agency Notifications, Permits and Approvals for the Project

Agency	Permit or Approval	Status
Ohio Power Siting Board	Certificate of Environmental Compatibility and Public Need	Approved March 17, 2014 Docket # 13-1768-EL-BTX
Ohio Environmental Protection Agency	Section 401 Water Quality Certificate	Anticipated to be Eligible under USACE Nationwide Permit (NWP) (see Section 5.1)
Ohio State Historic Preservation Office	Section 106 National Historic Preservation Act Clearance	SHPO Concurrence, dated May 25, 2017
U.S. Fish and Wildlife Service	Section 7 of the Endangered Species Act, Threatened and Endangered Species Consultation	Technical Assistance Letter dated, September 20, 2016
U.S. Army Corps of Engineers	Section 404	Self-Certify – No Jurisdictional Impacts

5.1 OEPA 401 Water Quality Certification (WQC)

In Ohio, the 401 Water Quality Certification and Isolated Wetland Permitting Section of the OEPA reviews applications for projects that propose the placement of fill or dredged material into WOTUS as well as isolated waterbodies and wetlands that do not have a significant nexus to Traditional Navigable Waters, which are considered waters of Ohio (as defined under Ohio Administrative Code [OAC] Rule 3745-1-02 (b)(77)⁴).

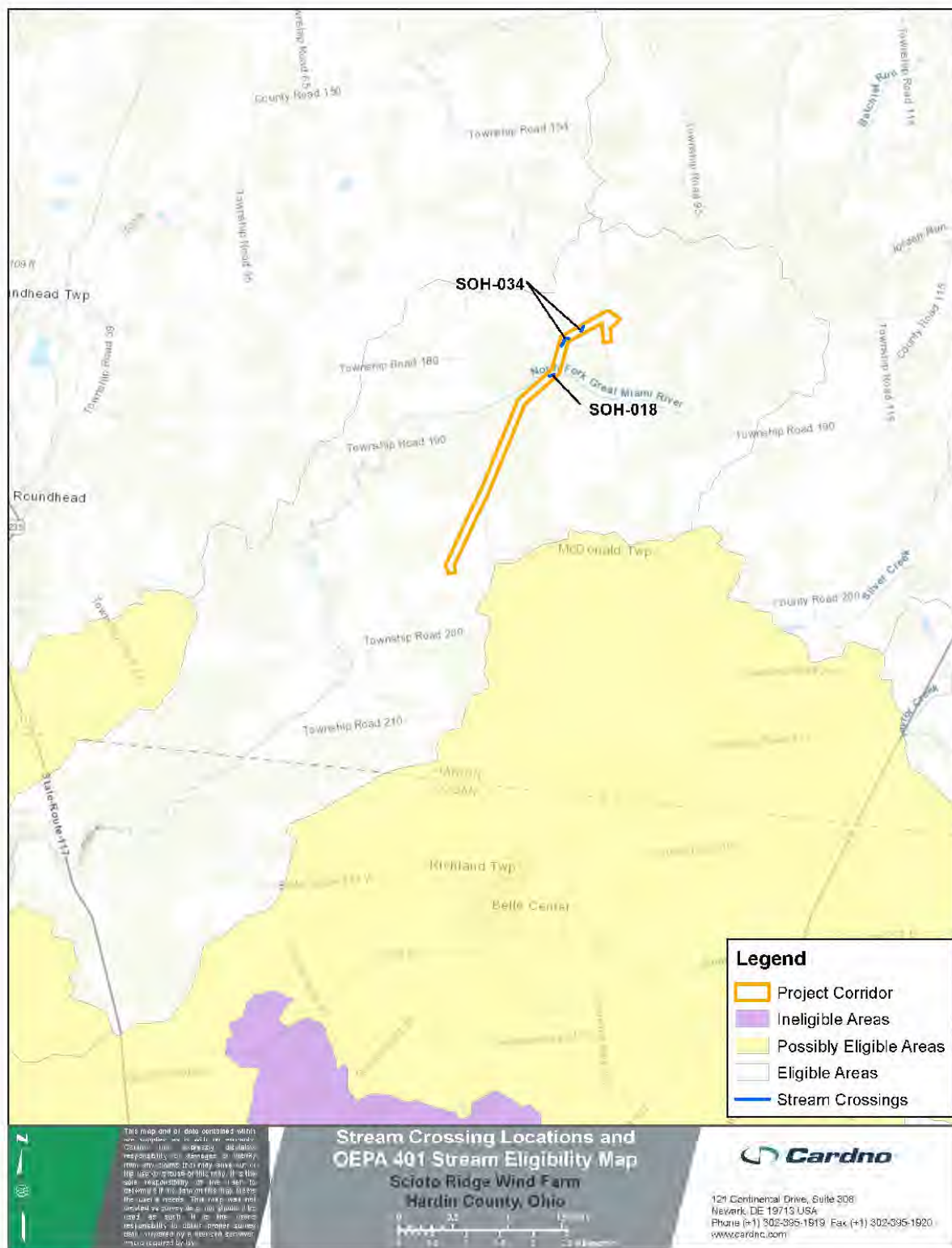
On March 17, 2017, OEPA finalized the 401 WQC and Response to Comments for the 2017 Nationwide Permits (NWP) published by the U.S. Army Corps of Engineers. Based on those 2017 NWP requirements, projects seeking a NWP (including #12), may review the OEPA's Stream Eligibility Map⁵ to help determine if an Individual WQC is required or not. This map identifies areas where projects are 'Eligible', 'Ineligible', or 'Possibly Eligible' to use a NWP for 401 coverage, with the Project being located wholly in an 'Eligible Area'.

³ OPSB Filings for Scioto Ridge Wind Energy Project can be found at: <http://dis.puc.state.oh.us/CaseRecord.aspx?CaseNo=13-1768>

⁴ [OAC 3745-1-02](#).

⁵ <https://oeпа.maps.arcgis.com/apps/webappviewer/index.html?id=e6b46d29a38f46229c1eb47deefe49b6>

Figure 5.1 Stream Crossing Locations and OEPA 401 Stream Eligibility Map



Infrastructure for this Project is proposed for only 'Eligible' areas, which are defined as follows:

1. **Eligible Areas:** As long as a Project meets the Ohio 401 Certification Special Limitation and Conditions described below, no Individual WQC is needed, except if there are impacts to the following resources:
 - a. **≥0.10 acres of Category 3 wetlands AND authorized under NWP 12 (et al); or**
 - b. **≥0.10 acres of Category 1 or 2 wetland AND authorized under NWP 12 (et al);**
 - c. **All streams proposed for impact in 'Eligible' areas of the OEPA's Stream Eligibility Map.**

The majority of the Scioto Ridge Wind Project falls within the 'Eligible' area (depicted as white in Figure 2), including four stream crossings. Current Project siting has no anticipated impacts to Category 3 wetlands, nor anticipated impacts to wetlands ≥0.10 acres.

The 2017 NWP 12 Ohio 401 Certification special limitations and conditions are:

1. Ohio state certification general limitations and conditions apply to this NWP.
2. Except for maintenance activities authorized under this NWP, individual 401 WQC is required for use of this NWP when temporary or permanent impacts are proposed on or in any of the following waters:
 - a. Category 1 or 2 wetlands when impacts exceed 0.50 acres;
 - b. streams located in '*Ineligible*' areas as depicted in the GIS NWPs Stream Eligibility Map (see Figure 5.1);
 - c. streams located in 'Possibly Eligible' areas as depicted in the GIS NWPs Stream Eligibility Map determined to be high quality through one of the NWP eligibility flowcharts;
 - d. state wild and scenic rivers;
 - e. national wild and scenic rivers; and
 - f. general high quality water bodies which harbor federally and state-listed threatened or endangered aquatic species.
3. Temporary or permanent impacts to Category 3 wetlands are limited to less than 0.10 acres for activities involving the repair, maintenance, replacement, or safety upgrades to existing infrastructure that meets the definition of public need. OEPA will make the determination if a project meets public need during the ODNr's ORAM verification process.
4. Temporary or permanent impacts as a result of stream crossings shall not exceed a total of three per stream mile per stream.
5. For an individual stream, while the repair or replacement of an existing culvert of any length is not limited by this certification, any culvert extension shall not exceed 300 linear feet.
6. All hydric soils up to 12 inches in depth within wetlands shall be stockpiled and replaced as the topmost backfill layer. Best Management Practices (BMP), such as silt fencing and soil stabilization, shall be implemented to reduce erosion and sediment runoff into adjacent wetlands.
7. Buried utility lines shall be installed at a 90-degree angle to the stream bank to the maximum extent practicable. When a 90-degree angle is not possible, the length of any buried utility line within any single water body shall not exceed twice the width of that water body at the location of the crossing.
8. The total width of any excavation, grading or mechanized clearing of vegetation and soil shall not exceed a maximum of 50 feet.

We anticipate that the Project meets the 2017 NWP 12 Ohio 401 Certification special limitations and conditions; therefore, no Individual 401 WQC Permit will required.

5.2 CWA Section 404

There are no impacts to jurisdictional features (i.e. wetlands, waterbodies, etc.); therefore, no Section 404 permitting required.

6 Conclusions

The Project Corridor is dominated by agricultural land use (cultivated crops). The history of land conversion for farming and other landscape manipulation to support farming operations has reduced the land available for wetlands to develop. The waterbodies encountered were simple agricultural canals, with trapezoidal cross sections and maintained grassy banks. High silt and poor habitat prevented these ditches from being classified as high quality, despite the HHEI scores indicating the all features as Modified Class II. Ongoing manipulation of the canals, through field tile installation and maintenance dredging, may further degrade some of the streams as well.

During the field surveys, Cardno did not observe any federally listed RTE species in the Project Corridor or vicinity or freshwater mussel species in the waterbodies in the Project Corridor. Though they may have potential habitat, the water quality may not support the development of rich faunal communities. No water quality samples were taken, though field observations indicate several significant stressors present in many of the streams. Streams located between agricultural fields lack any significant sources of shade since the stream banks are regularly mowed. The lack of cover will lead to higher temperatures in the summer, which is further compounded by the relative lack of depth in many of the streams. The surrounding land use also results in significant nutrient loading from fertilizer run off in the overland flow during rain events. The implementation of field tiling may also increase the loading onto streams.

In summary, Cardno delineated two waterbodies (both identified as jurisdictional per the received JD) and no wetlands within the Project Corridor. The findings of this investigation represent a study of the Project Corridor for non-tidal wetlands and waterbodies. The findings depend on the season, the conditions at that time of year, site-specific influences (e.g. anthropogenic disturbance), and individual professional judgment. This report represents a professional estimate of the Project Corridor' wetlands and waterbodies based upon available information and techniques.

7 References

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Scioto Ridge Transmission Line

APPENDIX

A

SITE PHOTOS

**Scioto Ridge Wind Farm Transmission Line, Ohio
Wetland and Waterbody Field Delineation Surveys
Photolog
July 2013**

Photo: SOH-034 Typical

Date: 7/23/2013

Description: Typical conditions along SOH-034 which was located between two active crop areas with grassy banks. Vegetation along banks obscured several field tiles that were draining into feature.



Photo: SOH-018 Typical

Date: 7/23/2013

Description: Typical conditions along stream which was located between two active crop areas with grassy banks. Vegetation along banks obscured several field tiles that were draining into feature.



**Scioto Ridge Wind Farm Transmission Line, Ohio
Wetland and Waterbody Field Delineation Surveys
Photolog
July 2013**

Photo: Habitat Typical

Date: 7/23/2013

Description: Photo of a woodlot (near SOH-018) with no evidence of wetlands that had been previously mapped as potential wetland. No wetlands were found during field verification. Many of the potential sites exhibited similar compositions of upland species and lacked hydrology.



Photo: Habitat Typical

Date: 7/24/2013

Description: Typical farm conditions during the time of the survey. The Project Corridor is dominated by active crop areas such as this. The crops grown likely cycle between corn/soy/wheat depending on market conditions and crop rotation schedule.

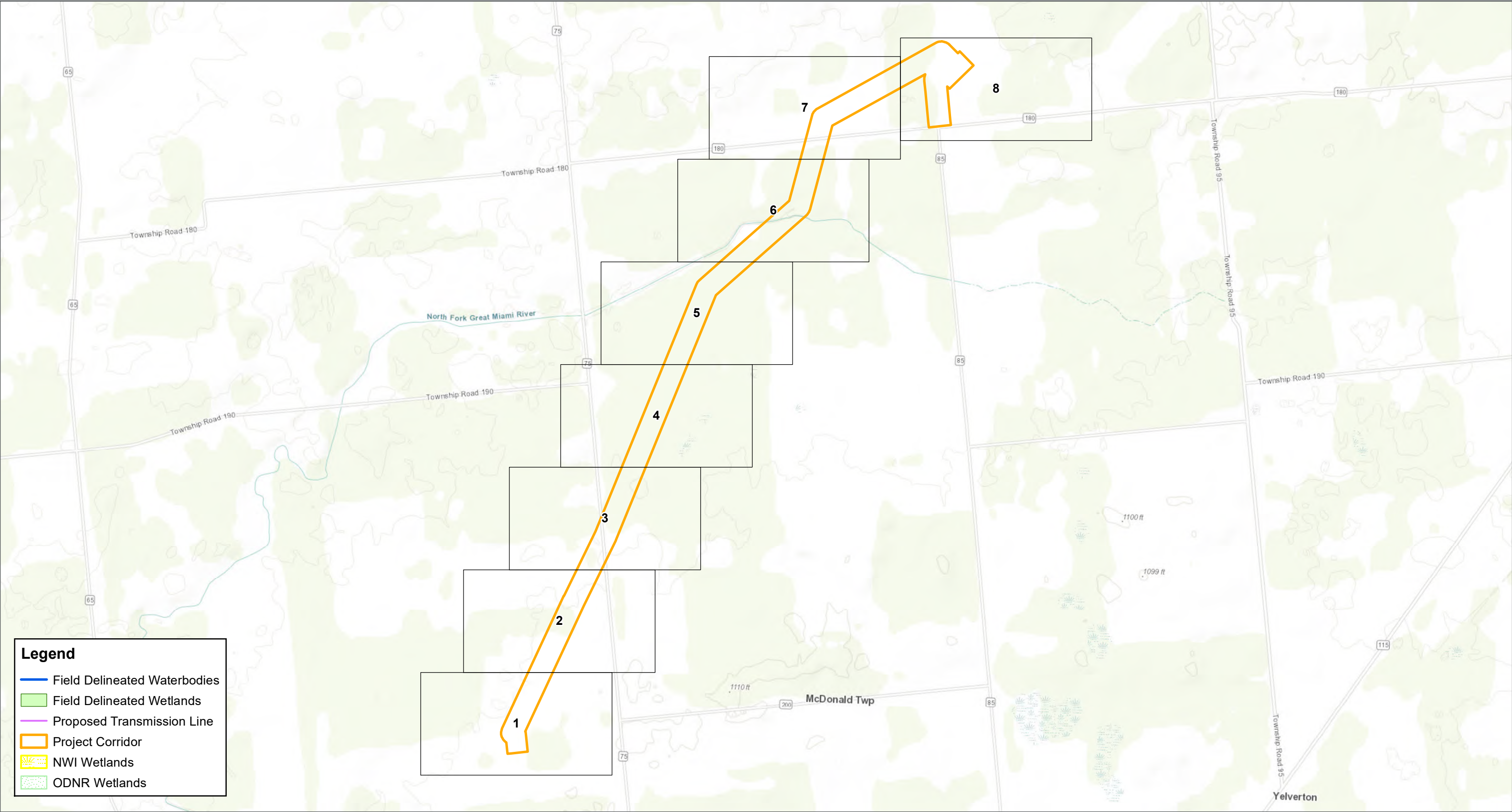



Scioto Ridge Transmission Line

APPENDIX

B

WETLAND AND WATERBODY MAPS






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0 500 1,000 1,500 2,000 2,500 3,000 Feet

0 200 400 600 800 1,000 Meters


Wetland and Waterbody Maps - Overview

Scioto Ridge Wind Farm
Hardin and County, Ohio



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





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0 100 200 300 400 Feet

0 25 50 75 100 125 Meters


Wetland and Waterbody Maps (Sheet 1 of 8)

Scioto Ridge Wind Farm
Hardin and Logan Counties, Ohio



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0 100 200 300 400 Feet

0 25 50 75 100 125 Meters


Wetland and Waterbody Maps (Sheet 2 of 8)

Scioto Ridge Wind Farm
Hardin and Logan Counties, Ohio



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0100200300400 Feet

0255075100125 Meters


Wetland and Waterbody Maps (Sheet 3 of 8)

Scioto Ridge Wind Farm
Hardin and Logan Counties, Ohio



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0 100 200 300 400 Feet

0 25 50 75 100 125 Meters


Wetland and Waterbody Maps (Sheet 4 of 8)

Scioto Ridge Wind Farm
Hardin and Logan Counties, Ohio



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0 100 200 300 400 Feet

0 25 50 75 100 125 Meters


Wetland and Waterbody Maps (Sheet 5 of 8)

Scioto Ridge Wind Farm
Hardin and Logan Counties, Ohio



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0100200300400 Feet

0255075100125 Meters


Wetland and Waterbody Maps (Sheet 6 of 8)

Scioto Ridge Wind Farm
Hardin and Logan Counties, Ohio



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0 100 200 300 400 Feet

0 25 50 75 100 125 Meters


Wetland and Waterbody Maps (Sheet 7 of 8)

Scioto Ridge Wind Farm
Hardin and Logan Counties, Ohio



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0 100 200 300 400 Feet

0 25 50 75 100 125 Meters

Wetland and Waterbody Maps (Sheet 8 of 8)

Scioto Ridge Wind Farm
Hardin and Logan Counties, Ohio



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Scioto Ridge Transmission Line

APPENDIX

C

STREAM ASSESSMENT FORMS



Primary Headwater Habitat Evaluation Form

37

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

SITE NAME/LOCATION: **Hardin Wind Farm**SITE NUMBER: **SOH-018**

RIVER BASIN:

DRAINAGE AREA (mi²): **0.06**LENGTH OF STREAM REACH (ft): **600**LAT: **40.57746**LONG: **-83.73566**

RIVER CODE:

RIVER MILE:

DATE: **12/08/12**SCORER: **NLE**

COMMENTS:

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

STREAM CHANNEL MODIFICATIONS:

☐ NONE / NATURAL CHANNEL☐ REMOVED☒ RECOVERING☐ RECENT OR NO RECOVERY1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)	0%	<input checked="" type="checkbox"/> SILT (3 pt)	44%
<input type="checkbox"/> BOULDER (>256 mm) (10 pts)	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS (3 pts)	0%
<input type="checkbox"/> BEDROCK (16 pts)	0%	<input type="checkbox"/> FINE DETRITUS (1 pt)	0%
<input type="checkbox"/> COBBLE (63-256 mm) (12 pts)	14%	<input type="checkbox"/> CLAY or HARPAN (0 pt)	7%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) (19 pts)	26%	<input type="checkbox"/> MUCK (0 pts)	0%
<input type="checkbox"/> SAND (<2 mm) (6 pts)	9%	<input type="checkbox"/> ARTIFICIAL (3 pts)	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock

14.00%

(A)

100%

(B)

SCORE OF TWO MOST PREDOMINANT SUBSTRATE TYPES:

12

TOTAL NUMBER OF SUBSTRATE TYPES:

5

HHEI Metric Points

Substrate
Max = 40

17

A+B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 81 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water (here). (Check ONLY one box).

<input type="checkbox"/> > 60 centimeters (20 pts)	<input type="checkbox"/> < 5 cm - 10 cm (15 pts)
<input type="checkbox"/> > 23.5 - 30 cm (30 pts)	<input type="checkbox"/> < 5 cm (5 pts)
<input type="checkbox"/> > 10 - 22.5 cm (25 pts)	<input type="checkbox"/> NO WATER OR MOIST CHANNEL (0 pts)

COMMENTS:

MAXIMUM POOL DEPTH (centimeters):

15

Pool Depth
Max = 30

15

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

<input type="checkbox"/> > 4.0 meters (170 ft) (20 pts)	<input type="checkbox"/> > 1.0 m - 1.5 m (15 ft) - 20 ft (15 pts)
<input type="checkbox"/> > 3.0 m - 4.0 m (9.75 - 13.12) (35 pts)	<input type="checkbox"/> 1.0 m - 1.5 m (30 pts)
<input type="checkbox"/> > 1.5 m - 3.0 m (4.75 - 9.75) (20 pts)	

COMMENTS:

AVERAGE BANKFULL WIDTH (meters):

5.00

Bankfull
Width
Max=30

5

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY (NOTES: River Left (L) and Right (R) as looking downstream)

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

COMMENTS:

FLOW REGIME (At time of evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (intermittent)	<input type="checkbox"/> Dry channel, no action (ephemeral)

COMMENTS:

SILT/CLAY (Number of bands per 91 m (200 ft) of channel) (Check ONLY one box):

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

STREAM GRADIENT ESTIMATE

☒ Flat (0.00000) ☐ Flat to Moderate ☐ Moderate to Steep ☐ Moderate to Steep ☐ Steep to 10 degrees

ADDITIONAL STREAM INFORMATION (This information must also be completed):QHEI PERFORMED? ☐ Yes ☒ No QHEI Score (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

WWF Name:		Distance from Evaluated Stream	
CWH Name:		Distance from Evaluated Stream	
EWV Name:		Distance from Evaluated Stream	

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: Silver Creek NRCs Soil Map Page: NRCs Soil Map Stream Order:
County: Hardin Township / City:

MISCELLANEOUS

Base flow Conditions? (Y/N): ☒ N Date of last precipitation: 12/08/12 Quantity: 0.75
Photograph Information:
Evaluated Turbidity? (Y/N): ☒ Y Canopy (% open): 95%
Water samples collected for water chemistry? (Y/N): ☒ N (Note lab sample no., lot no. and attach results lab number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) ☒ Y If not, please explain:
Additional comments/description of pollution impacts:

BIOLOGIC EVALUATION

Performed? (Y/N): ☒ N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Hardwater Habitat Assessment Manual)
Fish Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N Salamanders Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N
Frogs or Tadpoles Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N Aquatic Macroinvertebrates Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N
Comments Regarding Biology:

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

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



SITE NAME/LOCATION **Hardin Wind Farm**SITE NUMBER **SOH-034**

RIVER BASIN

DRAINAGE AREA (mi²) **0.17**LENGTH OF STREAM REACH (ft) **470**LAT. **40.58002**LONG. **-83.74120**

RIVER CODE

RIVER MILE

DATE **12/12/12**SCORER **NLE**

COMMENTS

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for InstructionsSTREAM CHANNEL
MODIFICATIONS:☐ NONE / NATURAL CHANNEL☐ RECOVERED☒ RECOVERING☐ RECENT OR NO RECOVERY

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS (16 pts)	0%	<input type="checkbox"/> SILT (3 pt)	40%
<input type="checkbox"/> BOULDER (>250 mm) (16 pts)	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS (3 pts)	0%
<input type="checkbox"/> BEDROCK (16 pts)	0%	<input type="checkbox"/> FINE DETRITUS (3 pts)	0%
<input type="checkbox"/> COBBLE (65-250 mm) (12 pts)	0%	<input type="checkbox"/> CLAY or HARDPAN (0 pt)	2%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) (8 pts)	35%	<input type="checkbox"/> MUCK (0 pts)	0%
<input type="checkbox"/> SAND (<2 mm) (6 pts)	13%	<input type="checkbox"/> ARTIFICIAL (3 pts)	0%

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

Total of Percentages of
Silt, Leaf Pack/Woody Debris, Fine Detritus, Clay or Hardpan, Muck, Artificial **100%**

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **12**TOTAL NUMBER OF SUBSTRATE TYPES: **4****HHEI
Metric
Points**Substrate
Max = 40**16**

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box).

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

COMMENTS

MAXIMUM POOL DEPTH (centimeters): **15**Pool Depth
Max = 20**15**

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

<input type="checkbox"/> < 1.0 meters (1-15) (30 pts)	<input checked="" type="checkbox"/> > 1.0 m - 1.5 m (16-32) - 4-6 ft (15 pts)
<input type="checkbox"/> > 3.0 m - 4.0 m (16-32) - 13' (25 pts)	<input type="checkbox"/> > 1.0 m (16-32) (15 pts)
<input type="checkbox"/> > 1.5 m - 3.0 m (8-16) - 4'-8" (20 pts)	

COMMENTS

AVERAGE BANKFULL WIDTH (meters): **5.00**Bankfull
Width
Max=30**5**

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY (NOTE: River Left (L) and Right (R) as looking downstream)

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

COMMENTS

- FLOW REGIME** (at Time of Evaluation). (Check ONLY one box):

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE☒ Flat (0-2000)☐ Flat to Moderate☐ Moderate to Steep☐ Moderate to Steep☐ Steep to Vertical

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

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

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: Silver Creek NRCS Soil Map Page: NRCS Soil Map Stream Order:
County: Hardin Township / City: **MISCELLANEOUS**Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: 12/08/12 Quantity: 0.75
Photograph Information:
Elevated Turbidity? (Y/N): ☒ Y Canopy (% open): 100%
Wass samples collected for water chemistry? (Y/N): ☒ N (Note lab sample no. or id and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (B.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream? (Y/N) ☒ Y If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): ☒ N (If Yes, Record all observations. Voucher collection is optional. NOTE: All voucher samples must be labeled with the site ID number. Include appropriate field data directly from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N): ☒ N Voucher? (Y/N): ☒ N Salamanders Observed? (Y/N): ☒ N Voucher? (Y/N): ☒ N
Frogs or Tadpoles Observed? (Y/N): ☒ N Voucher? (Y/N): ☒ N Aquatic Macroinvertebrates Observed? (Y/N): ☒ N Voucher? (Y/N): ☒ N
Comments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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



About Cardno

Cardno is an ASX-200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage, and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

Cardno Zero Harm



At Cardno, our primary concern is to develop and maintain safe and healthy conditions for anyone involved at our project worksites. We require full compliance with our Health and Safety Policy Manual and established work procedures and expect the same protocol from our subcontractors. We are committed to achieving our Zero Harm goal by continually improving our safety systems, education, and vigilance at the workplace and in the field. Safety is a Cardno core value and through strong leadership and active employee participation, we seek to implement and reinforce these leading actions on every job, every day.

This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

9/6/2019 4:52:03 PM

in

Case No(s). 19-1740-EL-BTA

Summary: Application to Amend Certificate (Appendix B) electronically filed by Mr. Michael J. Settineri on behalf of Hardin Wind LLC