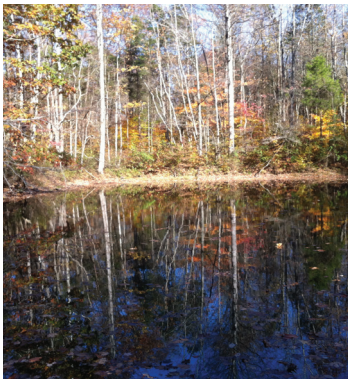
Appendix D

WATERS OF THE U.S. DELINEATION REPORT

Jennings County Indiana • Des. No. 1173374 • September 2013

US 50 NORTH VERNON BYPASS - EAST

WETLAND AND OTHER WATERS DELINEATION REPORT



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1.0 Introduction

1.1 Project Background

In December 2011, the Federal Highway Administration (FHWA) issued a Finding of No Significant Impact (FONSI) for the U.S. 50 North Vernon Bypass – West project (FHWA, 2011). That project, which is currently under construction, represents half of a northern bypass of North Vernon. The Bypass – West project leaves the existing U.S. 50 alignment near CR 400 W and travels northeast to end at SR 3 on the north side of North Vernon. The approximate length of the roadway will be 4.5 miles. This new roadway will help alleviate some of the operational concerns created by commercial truck traffic by creating a new, more efficient access to the industrial areas of North Vernon. The northern terminus at SR 3 was chosen to allow for the continuation of the roadway to the east at a later date while maintaining sufficient separation from the intersection of SR 3 and CR 350 N.

In the spring of 2012, Parsons Transportation Group and INDOT began the planning phase for the remaining half of the bypass, known as the U.S. 50 North Vernon Bypass – East project. This project begins on SR 3 at the terminus of the Bypass – West project, and reconnects with existing U.S. 50 east of North Vernon. Several land-use constraints, such as Selmier State Forest, St. Anne's Golf Course, the North Vernon Airport, Berry Materials Rock Quarry, and several industrial parks, shaped the alternative development process. The alternatives considered for the Bypass – East project fell into two broad groups: those that went north of Selmier State Forest, and those that went south of the forest. A total of sixteen possible alternatives were examined before a pair of alternatives (6D and 4B) were selected in Fall 2012 for further study. These alternatives, along with the "No Build" option will undergo detailed analysis in an Environmental Assessment (EA).

The engineering and environmental analysis, in conjunction with public comments, led INDOT to select Alternative 6D as the preferred alternative (see Figure 1). This combination best meets the project's Purpose and Need and achieves several other desirable outcomes. Specifically, the preferred alternative:

- Aligns with INDOT's long-term goals for the U.S. 50 corridor by completing a bypass around North Vernon.
- Provides for an efficient connection with existing U.S. 50 to facilitate use of the new roadway.
- Supports the planning and economic development goals of North Vernon and Jennings County.
- Provides the best balance between construction cost and access.
- Minimizes impacts to residences and businesses.
- Minimizes impacts to wetlands and streams.
- Received broad support from the community and agency stakeholders.

While two lanes are sufficient to effectively carry traffic in this corridor for the foreseeable future, in accordance with the designation of U.S. 50 as a Statewide Mobility Corridor, INDOT plans to acquire sufficient right-of-way for a future four-lane roadway. The two-lane roadway constructed as part of this project would serve as the westbound lanes of that roadway. Through most of the corridor, a 300-foot wide right-of-way will be acquired, allowing for construction of the eastbound lanes in the future. The impact assessment performed in the EA will be based on this full-width corridor. Likewise, for this report, the Study Area is defined as the full 300-foot wide corridor as shown in the accompanying figures.

This report describes the ponds, streams and wetlands that have been identified within the 300-foot wide Study Area. Water features were located during two field visits – in October 2012 and May 2013. The proposed project may result in impacts to these features. Therefore, INDOT anticipates the need to obtain verification from the US Army Corps of Engineers (USACE) regarding the jurisdictional status of wetlands, streams and ponds located within the Study Area, and that authorization from the USACE and the Indiana Department of Environmental Management (IDEM) to discharge fill in these features is necessary.

1.2 Project Area Description

Location

The U.S. 50 North Vernon Bypass – East project is located on the north and east sides of North Vernon, Jennings County, Indiana. The new roadway will begin at SR 3 about 1,000 feet south of CR 350, and travel east and then southeast to reconnect to existing U.S. 50 just west of Deer Creek Road (CR 75 E). The new roadway will be about 3.3 miles long.

General Land Use

The Study Area is located within the Level IV ecoregion 55d: Pre-Wisconsinan Drift Plains, part of the Eastern Corn Belt Plain ecoregion as delineated by the U.S. Environmental Protection Agency (USEPA, 2011). The area is dominated by agriculture, including both row-crop and livestock farming operations. Trees including black walnut (*Juglans nigra*), silver maple (*Acer saccharinum*), sweetgum (*Liquidambar styraciflua*), sycamore (*Platanus occidentalis*), and green ash (*Fraxinus pennsylvanica*) are common in this area. Black raspberry (*Rubus occidentalis*), and swamp rose (*Rosa palustris*) are located on the edges of farm fields and woodlots, while nuisance exotic bushes like honeysuckle (*Lonicera maackii*) dominate the understory of some disturbed woodlands. The project corridor traverses several land use types, including row-crop agricultural, forested, undeveloped industrial park, and a few scattered residential parcels.

Topography and Drainage

The elevation of the 3.3 mile-long Study Area ranges from about 730 feet above mean sea level (AMSL) at SR 3 to a low of about 650 feet AMSL at the Vernon Fork of the Muscatatuck River and then rises again at the tie-in to existing U.S. 50 east of North Vernon to an elevation of nearly 750 feet AMSL. The Study Area spans two different 12-digit sub-watersheds (Sixmile Creek and Long Branch – Vernon Fork Muscatatuck River, See Figure 3). The western portion of the project is drained by tributaries to Sixmile Creek, while the eastern portion is drained by the tributaries of Woods Branch and Indian Creeks or by streams that outlet directly to the Vernon Fork. There is one mapped Federal Emergency Management Agency (FEMA) floodplain within the Study Area, which lies in the narrow valley of the Vernon Fork (see Figure 4).

National Wetland Inventory Mapped Wetlands

National Wetland Inventory (NWI) mapping of the Study Area identified three ponds (PUBG) and one wetland (PFO1A) within the Study Area (see Figure 2). The ponds are man-made impoundments within a naturally-occurring drainage. Despite being accurately shown on the NWI mapping, all ponds within the Study Area were delineated in the field as part of the waters survey. The NWI polygon identified as a forested wetland (PFO1A) seen in Figure2, Sheet 3, was not identified in the field during the site visits. The actual landscape in this area is a steep, rocky slope above the Vernon Fork and no wetlands were identified in this area during site visits by Parsons' ecological investigators.

The NWI maps identify potential wetlands. The NWI maps were prepared from high-altitude photography and were not field-checked in most cases. Because of this, wetlands are sometimes identified incorrectly or missed. Additionally, the criteria used in indentifying these wetlands were different from the criteria currently used by the USACE. The USACE does not accept the use of the NWI maps to make a wetland determination.

Soil Associations and Series

The US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey identifies twenty-five different soil types within the Study Area (Figure 5). Only one soil unit, Cobbsfork silt loam, 0 to 1 percent slopes, is designated as hydric. All other soils within the Study Area are designated as non-hydric (See Table 1).

Table 1: Soils in the Study Area

Symbol	Description	Hydric rating
AddA	Avonburg silt loam, 0 to 2 percent slopes	Not Hydric
AddB2	Avonburg silt loam, 2 to 4 percent slopes, eroded	Not Hydric
BlbB2	Blocher, soft black shale substratum-Jennings silt loams 2 to 6 percent slopes, eroded	Not Hydric
BlcC2	Blocher, soft black shale substratum-Jennings silt loams 2 to 6 percent slopes, eroded	Not Hydric
BlgC2	Blocher-Cincinnati silt loams, 6 to 12 percent slopes, eroded	Not Hydric
BlkE2	Bonnell-Blocher-Hickory silt loams, 12 to 25 percent slopes, eroded	Not Hydric
CcaG	Caneyville-Rock outcrop complex, 25 to 60 percent slopes	Not Hydric
CcbC2	Caneyville-Zenas silt loams, karst, rolling, eroded	Not Hydric
CcgD3	Caneyville and Grayford silt loams, 12 to 25 percent slopes, severely eroded	Not Hydric
ClfA	Cobbsfork silt loam, 0 to 1 percent slopes	Hydric
DtwC2	Deputy silt loam, 6 to 15 percent slopes, eroded	Not Hydric
DtzC3	Deputy-Tappist silty clay loams, 6 to 15 percent slopes, severely eroded	Not Hydric
EesB2	Elkinsvile-Millstone complex, 2 to 6 percent slopes, eroded	Not Hydric
HizE2	Hickory-Grayford silt loams, 12 to 25 percent slopes, eroded	Not Hydric
HleAW	Holton silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration	Not Hydric
NaaB2	Nabb silt loam, 2 to 6 percent slopes, eroded	Not Hydric
Pml	Pits, quarry	Not Hydric
RzfA	Ryker-Muscatatuck silt loams, terrace, 0 to 2 percent slopes	Not Hydric
RzfB2	Ryker-Muscatatuck silt loams, terrace, 2 to 6 percent slopes, eroded	Not Hydric
RzgC2	Ryker-Muscatatuck silt loams, karst, rolling, eroded	Not Hydric
ScfB2	Scottsburg-Deputy silt loams, 2 to 6 percent slopes, eroded	Not Hydric
Uby	Udorthents, loamy	Not Hydric
UfdA	Urban land-Cobbsfork-Avonburg complex, 0 to 2 percent slopes	Not Hydric
WnmA	Whitcomb silt loam, 0 to 2 percent slopes	Not Hydric
ZnsB	Zenas silt loam, karst, undulating	Not Hydric

Hydric soils are soils that have formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper layer of the soil. Hydric soils are a strong indication that wetlands currently exist or recently existed within the mapped soil unit. Hydric soil units alone are not sufficient to classify an area as wetland and must be verified during a wetland field determination.

1.3 Jurisdictional Guidance

The USACE and IDEM regulate impacts to surface water resources within the State of Indiana. Jurisdictional waters of the United States are protected under Sections 401 and 404 of the Clean Water Act (CWA) and Executive Order 11990. The USACE has the primary regulatory authority for enforcing Section 404 requirements for waters of the United States. Indiana also has a state program protecting surface waters for both isolated and non-isolated wetlands and other "waters of the State."

1.3.1 Federal Jurisdiction

Wetlands are a category of waters of the United States, and they are defined by the USACE as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3, 1986). Typical wetlands include bogs, marshes and swamps but also may include temporarily or seasonally flooded depressions that receive overland storm-water runoff or overbank floodwaters.

In 1987 the USACE published a document to assist in determining the boundaries of a wetland (Environmental Laboratory, 1987). This document, referred to as the 1987 Corps Manual, contains information related to soils, hydrology and plants. Section 2 further describes the methodologies for determining wetland boundaries.

Rapanos Guidance

Based on current guidance by the USEPA, only those wetlands that are adjacent to traditional navigable waters or wetlands that directly abut non-navigable tributaries having a seasonal (3-month minimum) flow are now considered jurisdictional under the CWA. The USEPA and USACE issued a joint memo (USEPA/USACE, 2007a) with the following key points that has become known as "Rapanos Guidance."

The agencies will assert jurisdiction over the following waters:

- Traditional navigable waters;
- Wetlands adjacent to traditional navigable waters;
- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and
- Wetlands that directly abut such tributaries.

The agencies will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with traditional navigable water:

- Non-navigable tributaries that are not relatively permanent;
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and
- Wetlands adjacent to but not directly abutting a relatively permanent non-navigable tributary.

The agencies generally will not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow); and
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

The agencies will apply the significant nexus standard as follows:

- A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters; and
- Significant nexus includes consideration of hydrologic and ecologic factors.

JD Guidebook

The document titled *The U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook* ("JD Guidebook") was created by the USACE and USEPA (USEPA/USACE, 2007b) as a joint effort to aid field staff in preparing the *Approved Jurisdictional Determination Form* ("JD Form"). The JD Form is a seven page "key" that assists practitioners in determining the jurisdictional status of a given wetland, stream, pond or other type of water body. The JD Guidebook was determined to be necessary following the issuance of the Rapanos Guidance.

This guide book helps clarify the USACE expectation for documentation of waters of the United States. The document helps with clarifying the difference between Traditional Navigable Waters (TNWs), Relatively Permanent Waters (RPWs), and Non-Relatively Permanent Waters (Non-RPWs). It also contains helpful information related to wetland adjacency—wetlands directly abutting other waters, impoundments, isolated wetlands, pipes, ditches, swales, and erosional features. The JD Guidebook also assists in determining significant nexus.

1.3.2 State Jurisdiction

"Waters" within the State of Indiana are defined as bodies of water—on the surface and underground, natural and artificial, public and private—which are wholly within, flow through or border upon Indiana (IC 13-11-2-265). The term includes all waters of the United States, as defined in Section 502(7) of the federal Clean Water Act (33 U.S.C. 1362 (7)), that are located in Indiana.

Although not specifically mentioned within the Indiana Code's definition of state "waters," Indiana "waters" do include, and are not limited to, streams and wetlands (both isolated and non-isolated). State of Indiana "waters" do not include exempt isolated wetlands, private ponds, or off-stream ponds, reservoirs, wetlands, or other facilities built for reduction or control of pollution or cooling of water before discharge (IC 13-11-2-265). The State of Indiana relies on the USACE decision regarding wetland determinations and delineations, including whether or not a wetland is isolated or non-isolated.

2.0 Methods

Delineation methodology for wetlands, ponds, and streams located in the Study Area are described in this section as well as criteria for assessing the functions and values of these resources.

2.1 Wetlands

Wetlands are identified using the guidance provided in the 1987 Corps Manual. The presence of potentially jurisdictional wetlands is determined by the positive indication of three criteria in accordance with the 1987 Corps Manual: the presence of greater than 50% hydrophytic (wetland) vegetation, a minimum of one primary or two secondary indicators of hydrology and one positive hydric soil indicator. In addition, the USACE recently finalized the "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region" (RS) which covers most of Indiana (USACE, 2010). Methodologies are utilized in accordance with the RS.

A dominance of hydrophytic vegetation is the first indicator used during the field determination effort to identify wetlands within the Study Area. Although the presence of wetland vegetation is the first indicator used to identify wetland, topographic signatures such as depressional features, and areas exhibiting signs of wetland hydrology, such as saturated soils, water marks, algal mats, etc., if observed, are also investigated as potential wetlands. Soil pits are dug in representative areas to evaluate soil characteristics and assist in determining if indicators of wetland hydrology are present. Evidence of wetland hydrology is assessed within the soil pit by observing saturated soils within the upper 12 inches and/or documenting the presence of water within the upper 12 inches of the pit. Other signs of hydrology may include, but are not limited to, drainage patterns, surface water, rafted debris, and crayfish burrows.

Once it is determined that the wetland vegetation, soil, and hydrology criteria are met, notes pertaining to flora, soil and hydrology are recorded on a Wetland Determination Data Form (see Appendix B), following guidance provided in the RS. Data is collected from one wetland and one upland data point for each wetland system. A photo point is taken, usually in proximity to the wetland data point, but occasionally a better vantage point away from the data point is used to better depict the characteristics of a wetland (see Appendix A).

Each wetland is delineated using a sub-meter GPS unit (Trimble Geo-XH). Notes pertaining to significant nexus and the potential for USACE jurisdiction are also recorded at each wetland. Wetlands are identified as isolated waters if they do not directly connect to, are not adjacent to, or do not abut a jurisdictional channel.

Wetlands are classified utilizing the Cowardin Classification System (Cowardin et.al., 1979), which identifies three principal classes of wetland and open water habitats: Palustrine, Riverine, and Lacustrine. Palustrine wetland communities are divided into eight types. The three Palustsrine types frequently encountered in Indiana are Palustrine Emergent (PEM), Palustrine Scrub-Shrub (PSS), and Palustrine Forested (PFO). PEM wetlands are characterized by a vegetation pattern that is dominated by herbaceous species such as wildflowers and grasses and lack a shrub or tree stratum. PSS wetlands are defined as areas where woody vegetation such as smaller trees and shrubs (< 20 feet tall) dominate the area. PFO wetlands are dominated by trees taller than 20 feet.

Function and Value Assessment of Wetlands

The methodology used in assessing the functions and values of wetlands located within the Study Area is the Indiana Wetland Rapid Assessment Protocol (In-WRAP). In-WRAP was developed by Taylor University Environmental Research Group (TERG) as an efficient way to quickly, and with a confident level of accuracy, assess the quality of a wetland (TERG, 2005). The In-WRAP utilizes three tiers of assessment in evaluating wetlands.

Tier 1: Assessment Overview. This tier examines the size and landscape position of the wetland and if it is located on an NWI map. This tier also examines the wetland's connectivity to other wetlands and the type and intensity of the surrounding land use.

Tier 2: Preliminary Assessment. This tier documents the geomorphic position, hydrology, soil, and the wetland community type. This tier also documents disturbances to hydrology and observations of invasive plant species and the presence of federal or state rare, threatened or endangered species.

Tier 3: Rapid Indicators. This tier examines water quality, flood and storm water storage, and animal habitat and plant species located within the wetland. Each documented plant species has a corresponding Coefficient of Conservatism (C) that ranges from 0 to 10. The concept is that plants with a higher C value are more likely to be found in communities with less habitat disturbance.

For each wetland identified in the Study Area, an In-WRAP form was completed during the site visit. Corresponding C values for each species recorded on the USACE delineation form was used to calculate the average C value for the wetland. Based on this information, an In-WRAP summary (see Appendix C) was prepared for each wetland to determine the overall quality of the wetland system. This summary includes information on the number of dominant species at each wetland data point and the average C of those species.

2.2 Ponds

Open water systems such as lakes, aesthetic ponds, farm ponds, dammed streams, retention ponds, reservoirs, borrow pits and similar are open water systems, and the limits are defined by the Ordinary High Water Mark (OHWM) near the shoreline or the edge of its littoral fringe (if one is present and meets the 1987 Corps Manual criteria for a wetland). The OHWM is the line on the shore or bank established by flowing and/or standing water, marked by characteristics such as a clear, natural line impressed on the bank, erosion shelving, changes in the character of the soil, destruction of terrestrial vegetation, presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Ponds encountered during the field determination effort were identified as bodies of open water if no emergent vegetation was visible above the surface of the water. These areas were designated as ponds, not wetlands. All of the ponds delineated were considered jurisdictional if they were connected via a channel containing a continuous OHWM and met the significant nexus criteria.

2.3 Streams

Potential boundaries for these water resources were delineated in the field at the OHWM. Typically, waterways with an OHWM are identified as perennial, intermittent or ephemeral. An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral streambeds are located above the water table year-round. Furthermore, groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for ephemeral stream flow. An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow, and runoff provides a supplemental source of water. During dry periods, intermittent streams may not have flowing water. Perennial streams have flow throughout the year except during drought conditions. The water table is located above the stream bed for most of the year. (Federal Register, 2000)

The USGS quadrangle maps provide limited assistance in locating stream types as they depict solid blue lines to indicate perennial flow and dashed lines to indicate intermittent flow. Ephemeral drainages are not identified on these maps.

All streams, regardless of potential connectivity to other "waters," were delineated. Assumptions were made as to whether or not the stream eventually drained into another "water of the U.S." as the limit of study did not allow for a full investigation of connectivity. Aerial photography and topographic maps were utilized as aides in supporting decisions regarding connectivity with other "waters."

Function and Value Assessment for Streams

Two different function and value assessment methodologies were used, depending on the size of the stream's immediate watershed (drainage area). These methodologies include the Qualitative Habitat Evaluation Index (QHEI) for larger streams and the Headwater Habitat Evaluation Index (HHEI) for smaller streams. Each of these assessment methodologies are described in more detail below.

HHEI

As described in detail in the Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams (State of Ohio Environmental Protection Agency [OEPA], 2009), a primary headwater habitat stream is a "surface water of the state, having a defined bed and bank, with either continuous or periodical flowing water, with watershed areas less than or equal to 1.0 square mile, and a maximum depth of water pools less than or equal to 40cm." Primary headwater habitat streams are defined based on substrate type, quality, maximum pool depth and bank full width.

QHEI

The QHEI was developed by the OEPA to assess available habitat for fish communities, invertebrates and other aquatic organisms by visually assessing the bed, bank and riparian areas of free-flowing streams. The QHEI is similar to the HHEI in that a score is given to a particular stream segment based on the sum of metrics. The six metrics that comprise the composite score are substrate, in-stream cover, channel morphology, bank erosion and riparian zone, pool/glide and riffle/run quality, and gradient (OEPA, 2006). Each of these categories is subdivided into specific attributes that are assigned a point value reflective of the attribute's impact on the aquatic life. Highest scores are assigned to the attributes correlated to streams with high biological diversity and integrity and lower scores are progressively assigned to less desirable habitat features. The QHEI is typically utilized for streams with either continuous or periodic flowing water, with a watershed area greater than 1 square mile.

3.0 Results

3.1 Wetlands

Five wetlands were delineated within the Study Area. The largest wetland (Wetland 101) is classified as a palustrine forested wetland (PFO), while the other four are palustrine emergent (PEM) wetlands. The total area of the wetlands within the study area is 16.36 acres. None of these wetlands appear to be isolated. All five of these wetlands should be considered jurisdictional waters of the U.S. Two of these wetlands (Wetlands 101 and 104) extend beyond the Study area, and therefore their full boundaries were not surveyed. Table 2 summarizes the wetlands located within the Study Area. Figure 6 shows the wetland boundaries and the locations of the data points (wetland determination forms are located in Appendix B).

Table 2: Wetlands within the Study Area

Wetland ID	Photo Number	Lat. / Long.	Type	Delineated Area (acres)	Acres within Study Area [2]	Isolated?
101	1-2	39.030400 N 85.620400 W	PFO	58.7 [1]	6.85	No
102	3-4	39.030400 N 85.622000 W	PEM	45.0	9.23	No
104	5-6	39.033000 N 85.626180 W	PEM	0.24 [1]	0.20	No
209	7-8	39.011300 N 85.599300 W	PEM	0.02	0.02	No
304	9-10	39.027400 N 85.618800 W	PEM	0.06	0.06	No
			Total Acres	**104**	**16.36**	

[1] Portions of these wetlands extend beyond the survey area, so not all boundaries were delineated. The actual sizes of these wetlands are larger than what is stated here.

[2] Study Area is defined as a 300 ft wide corridor (proposed right-of-way) as shown on the included figures.

Wetland 101

This wetland is located in a wooded parcel east of CR 75 W and west of CR 20 W (see Figure 6, Sheet 2). It has a Cowardin classification of PFO and occurs in the hydric soil series Cobbsfork silt loam (ClfA, see Figure 5, Sheet 2). Its western border is contiguous with Wetland 102 (PEM, described below), which appears to drain westward via ditches towards tributaries of Sixmile Creek. The soil in this wetland was observed to contain a low chroma with a depleted matrix, which met hydric soil field indicator F3. The tree canopy is dominated by red maple (*Acer rubrum*, FAC) and pin oak (*Quercus palustris*, FACW), which was also dominant in the shrub/sapling and herbaceous layers. Spicebush (*Lindera benzoin*, FACW) was a dominant species in the shrub/sapling stratum and sweet wood reed (*Cinna arundinacea*, FACW) was a dominant component in the herbaceous layer. Two secondary indicators of wetland hydrology, crayfish burrows and a FAC-neutral test, were recorded during an October 2012 field visit. During a subsequent field visit in May 2013, a pair of primary indicators, surface water and saturation, were observed.

This wetland polygon scored more "good" and "valuable" rankings based on the In-WRAP Summary Sheet (see Appendix C) than any other wetland described in this report. Wetland 101 could be categorized as a mesic flatwoods, which is included on the Indiana Department of Natural Resouce's list of High Quality Natural Communities of Indiana (http://www.in.gov/dnr/naturepreserve/4743.htm). Although present on this list, it is not given a state or global ranking in Indiana. The Michigan Natural Features Inventory provides an excellent description of a Wet-Mesic Flatwoods at its website (http://mnfi.anr.msu.edu/abstracts/ecology/wet-mesic_flatwoods.pdf). Although design changes were made to lessen the amount of impact (down from 10.3 acres), the proposed corridor will still impact approximately 6.85 acres of this high-quality wetland and divide the forested wetland into two tracts.

Wetland 102

This emergent wetland (PEM) is located in a field east of CR 75 W and is west of Wetland 101 (see Figure 6, Sheets 1-2). Wetland 102 shares nearly a half mile of its border with Wetland 101, and is also underlain by the hydric soil unit Cobbsfork silt loam (see Figure 5, Sheets 1-2). The soil profile met the same field indicator (F3, depleted matrix) and the wetland was characterized by the same primary and secondary indicators of hydrology as Wetland 101. Wetland 102 (emergent) was once a part of Wetland 101 (forested) but has been cleared of its native woody vegetation to make way for an industrial park.

Several lots along the south end of Wetland 102 have already been filled (note the UfdA – Urban Land soil unit shown in Figure 5, Sheets 1-2) and developed. Wetland 102, which is probably maintained by occasional mowing (the mowing apprears to be less frequent than yearly), is dominated by soft-stem club-rush (*Schoenoplectus tabernaemontani*, OBL), rice button aster (*Symphyotricum dumosum*, FAC) and cottongrass bulrush (*Scirpus cyperinus*, OBL). Along the border with Wetland 101, there are saplings and shrubs (mostly pin oak and red maple), which rapidly decrease in coverage with increased distance from the forested wetland.

This wetland also scores many "good" and "valuable" ratings on the In-WRAP Summary, but because it has been cleared of its original tree cover, it does not rate as highly as Wetland 101. Wetland 102 received low marks on the In-WRAP Summary in categories such as "dead woody material as indicator of animal habitat," "number of dominant plant taxa observed," "mature trees as indicator of animal habitat," and "number of indicator taxa." Like Wetland 101, Wetland 102 will be divided in half by the proposed bypass. However, it appears that portions of the wetland (north and south of the existing wetland boundary) have already been developed, and the City of North Vernon is marketing the majority of Wetland 102 as an industrial park. Even without the bypass project, Wetland 102 would likely be filled and developed by the continued urban expansion of North Vernon.

Wetland 104

This emergent wetland (PEM) is in a drainage ditch that parallels the west side of CR 75 W (Figure 6, Sheet 1). It is dominated by broad-leaf cattail (*Typha latifolia*, OBL) and soft-stem club-rush. According to the soil map (Figure 5, Sheet 1), Wetland 104 is on urban fill (map symbol UfdA). The soil profile revealed gray soils (10YR 5/1) with yellowish brown mottles (10YR 5/8), which meets hydric soil field indicator F3, depleted matrix. Despite the drought conditions during much of summer 2012, primary indicators of hydrology (surface water and soil saturation) were observed during the October field visit.

The In-WRAP Summary gives this wetland low ratings in most categories, except for those involving water quality, wetland connectivity and lack of invasive species. Even though this wetland is in a roadside ditch through an upland area, it is adjacent to a mapped hydric soil unit (see Figure 5 Sheet 1) and likely receives water from a wetland that lies beyond the extent of the area surveyed for this project. This ditch supports a hydrophytic plant community and was observed to have flowing water at the surface even after an exceptionally dry summer. After leaving the roadside ditch, water in this wetland flows west through another ditch and enters a retention pond. Overflow from this pond flows north under CR 350 N and enters an ephemeral tributary to Sixmile Creek. For these reasons, Wetland 104 should be considered a jurisdictional water of the U.S.

Wetland 209

Wetland 209 is one of several small emergent wetlands (PEM) that occupy shallow depressions in a hay field near the project's east end (Figure 6, Sheet 4). This wetland is dominated by lamp rush (*Juncus effuses*, OBL) and dark green bulrush (*Scirpus atrovirens*, OBL). The mapped soil unit under this wetland is Avonburg silt loam (AddA, see Figure 5, Sheet 4). A soil profile with low chroma and a depleted matrix satisfies the hydric soil criterion. Wetland 209 contained standing water and saturated soils during the May 2013 field visit.

Wetland 209 received "good" rankings on the In-WRAP Summary in the categories of "water quality protection" and "exotic species rating," but scored low on most other rating criteria. This depressional wetland may be an isolatated wetland, or, like several of the streams at the east end of the U.S. North Vernon Bypass – East project, it may feed into an underground waterway. Due to its small size and the

abundance of karst features in the immediate vicinity, this wetland should be considered a jurisdictional water of the U.S.

Wetland 304

Wetland 304 is an emergent wetland (PEM) within a shallow drainage swale surrounded by a row-crop agricultural field (Figure 6, Sheet 2). The mapped soil types (see Figure 5, Sheet 2) are Cobbsfork silt loam (ClfA, hydric) and Avonburg silt loam (AddA, not hydric). Within the wetland, the soil profile had a low chroma and prominent redox features, which satisfies the hydric soil criterion. Lamp rush was the dominant herbaceous species and three primary indicators of hydrology were observed: saturation, sediment deposits, and drift deposits.

On the In-WRAP Summary, Wetland 304 scored highly in "wetland size and connectivity" and "exotic species rating," but scored low on most other metrics. Wetland 304 drains southeast into ephemeral Stream 303, which in turn, flows to Woods Branch.

3.2 Ponds

Three ponds were delineated within the Study Area. Pond 205 (Figure 6, Sheet 4) drains southwest into a closed basin with several sinkholes. Ponds 306 and 307 (Figure 6, Sheet 2) appear to outlet towards the south. There are several sinkholes south of Ponds 306 and 307, so water from these ponds probably reaches the Vernon Fork via underground channels. These three ponds should not be considered isolated, but should be considered jurisdictional waters of the U.S. Table 3 summarizes the ponds located within the Study Area.

Table 3: Ponds within the Study Area

Pond ID	Photos	Lat. / Long.	Total Area of Pond (acres)	Acres within Study Area*	Waters of the US?
205	35-36	39.011400 N 85.602100 W	0.19	0.19	Yes
306	37-38	39.022000 N 85.617700 W	0.56	0.56	Yes
307	39-40	39.021300 N 85.618800 W	0.26	0.26	Yes
		Total	1.01	1.01	

*All of these ponds extend beyond the proposed right-of-way limits shown in Figure 6, Sheets 2 and 4. Temporary right-of-way will be acquired at the pond locations and these ponds will be completely filled in as a result of this project.

3.3 Streams

Twelve streams were identified in the Study Area. Eleven of these streams are classified as ephemeral, while the remaining stream, the Vernon Fork of the Muscatatuck River, is classified as a perennial stream. The total length for streams located within the Study Area is 3,186 feet and the total area of these streams is approximately 1.378 acres. Table 4 on page 15 lists the streams that were delineated within the Study Area. HHEI/QHEI forms were completed for each stream and are located in Appendix D.

Table 4: Streams within the Study Area

Stream ID	Photo Nos.	Waterbody Name	Stream Type	Rapanos Type	Avg. Width at OHW (ft.)	Avg. Depth at OHW (ft.)	Linear feet within Study Area	Acres within Study Area	QHEI/ HHEI	Jurisdic-tional ?
101	11-12	Tributary to Sixmile Creek	EPH	Non-RPW	4	0.25	230[(1)]	0.021	48	Yes
214	13-14	Tributary to Vernon Fork	EPH	Non-RPW	3	0.17	349	0.024	22	Yes
217	15-16	Tributary to Deer Creek	EPH	Non-RPW	1.5	0.08	32	0.001	21	Yes
219	17-18	Tributary to Deer Creek	EPH	Non-RPW	1.5	0.08	46	0.002	21	Yes
220	19-20	Tributary to Vernon Fork	EPH	Non-RPW	4	0.25	304	0.028	48	Yes
221	21-22	Tributary to Vernon Fork	EPH	Non-RPW	1	0.08	108	0.002	21	Yes
222	23-24	Tributary to Vernon Fork	EPH	Non-RPW	4	0.17	359	0.033	31	Yes
223	25-26	Tributary to Vernon Fork	EPH	Non-RPW	1	0.08	140	0.003	14	Yes
301	27-28	Tributary to Woods Branch	EPH	Non-RPW	2	0.08	316	0.015	21	Yes
303	29-30	Tributary to Woods Branch	EPH	Non-RPW	2	0.17	270	0.012	15	Yes
311	31-32	Tributary to Vernon Fork	EPH	Non-RPW	4	0.17	622	0.057	45	Yes
Vernon Fork	33-34	Vernon Fork of Muscatatuck River	PER	RPW	125	15	410	1.18	57	Yes
						Total	3,186 [(2)]	1.378[(2)]		

[(1)] A small part of Stream 101 is within the Study Area (see Figure 6, Sheet 1), but during the design phase, it was determined that this stream will be beyond the construction limits and therefore, not impacted.
[(2)] This total includes Stream 101, even though it will not be impacted by construction of this project.

4.0 Summary

A total of 5 wetlands with two classification types totaling 16.36 acres, 3 ponds totaling 1.01 acres, and 12 jurisdictional streams totaling 3,186 linear feet were delineated within the Study Area. The USACE has the authority to determine that this report is accurate and meets the requirements for a wetland delineation.

5.0 Bibliography

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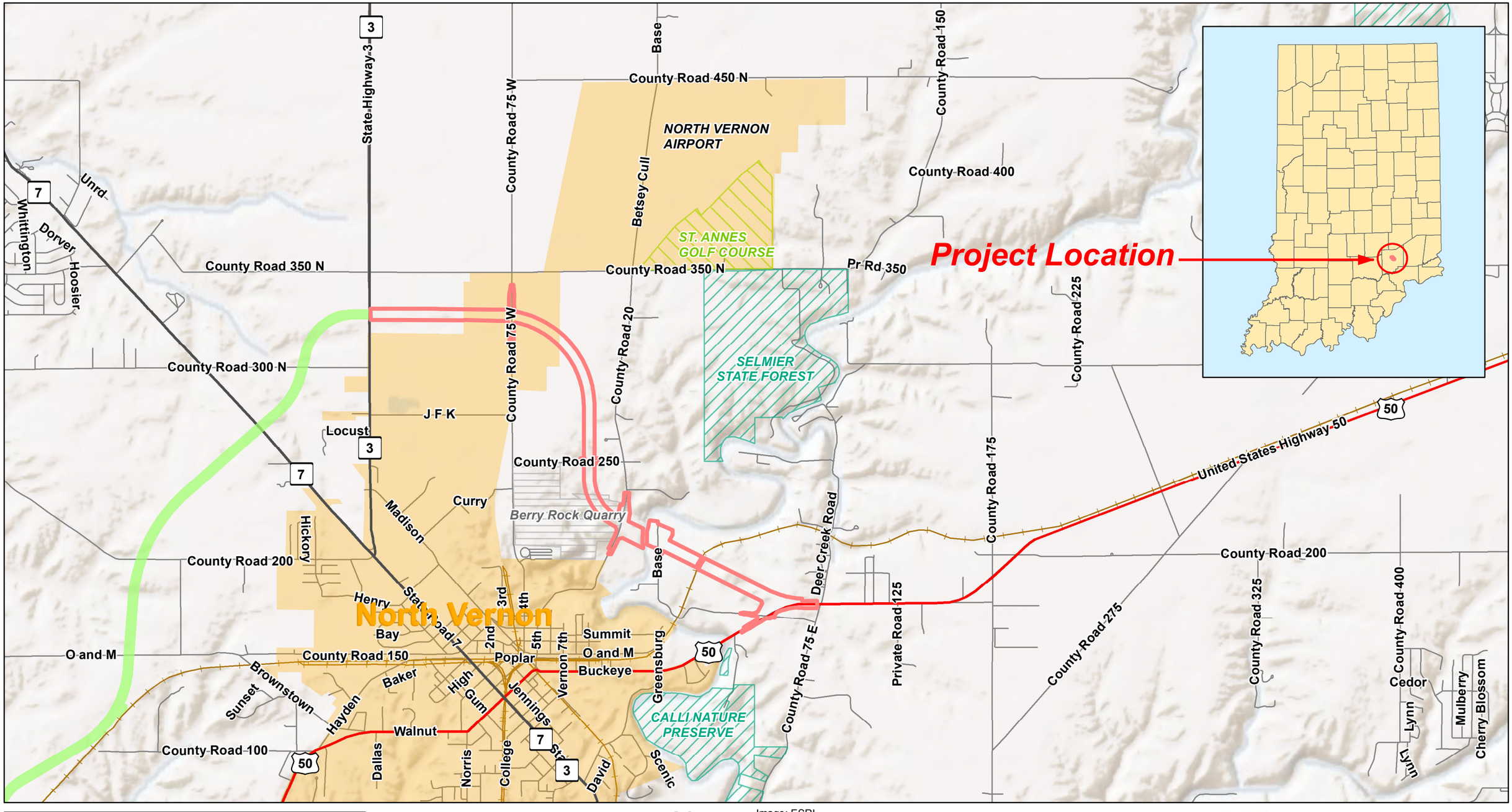
List of Figures



Legend

- US 50 Bypass - East proposed R/W
- US 50 Bypass - West

Image: ESRI

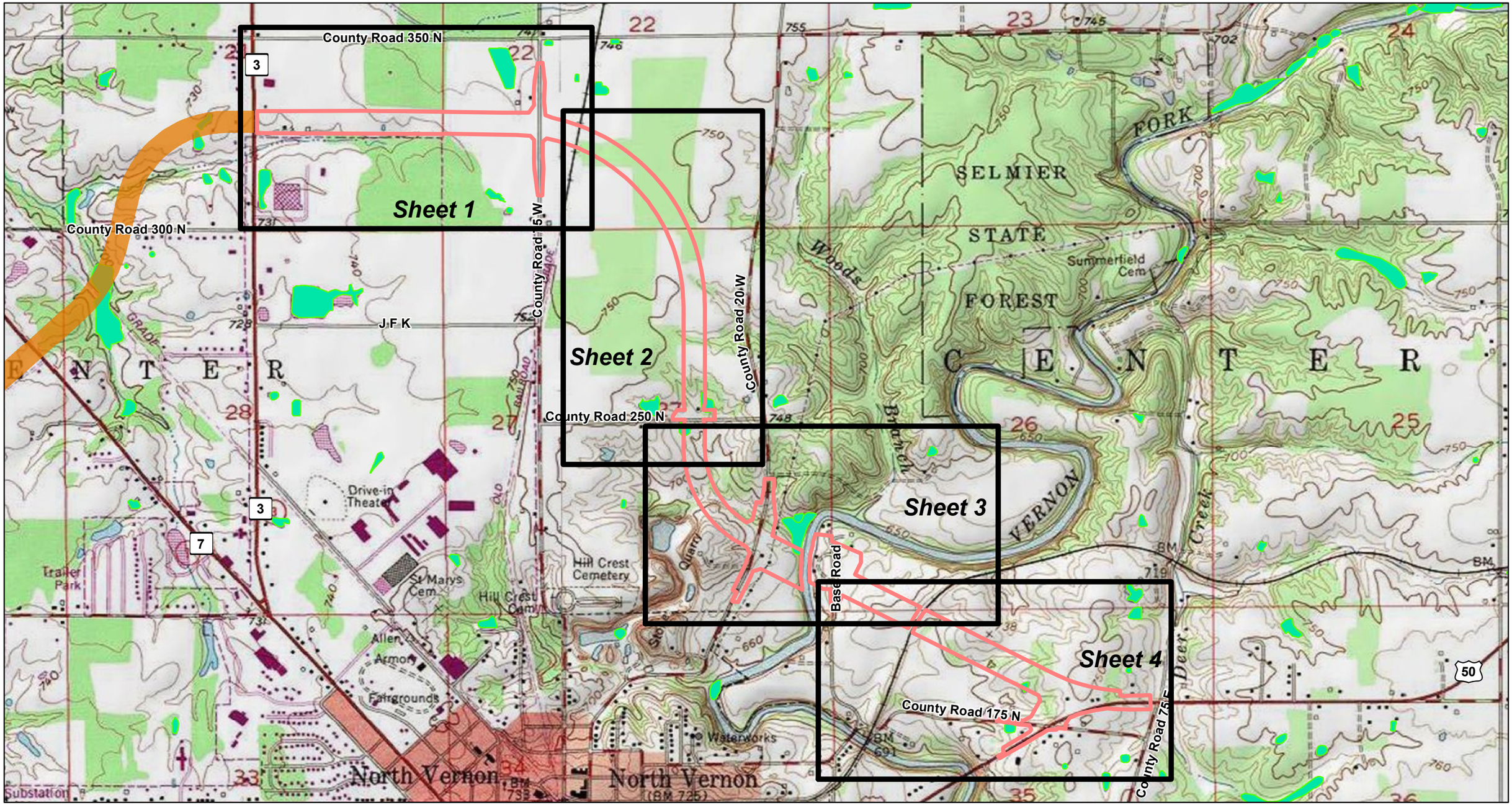
N

0 0.25 0.5 1 1.5 2 Miles

PARSONS

Project Location

FIGURE 1



Legend

- US 50 Bypass - East proposed R/W
- US 50 Bypass - West
- NWI polygons

N

Image: USGS, North Vernon and Bultlerville quads
Data: USFWS, National Wetlands Inventory

0 0.125 0.25 0.5 0.75 1 Mile

PARSONS

USGS Topographic & NWI Maps

FIGURE 2: Index

Legend

- US 50 Bypass - East proposed R/W
- US 50 Bypass - West
- Ephemeral Stream
- Emergent Wetland
- NWI polygons

N

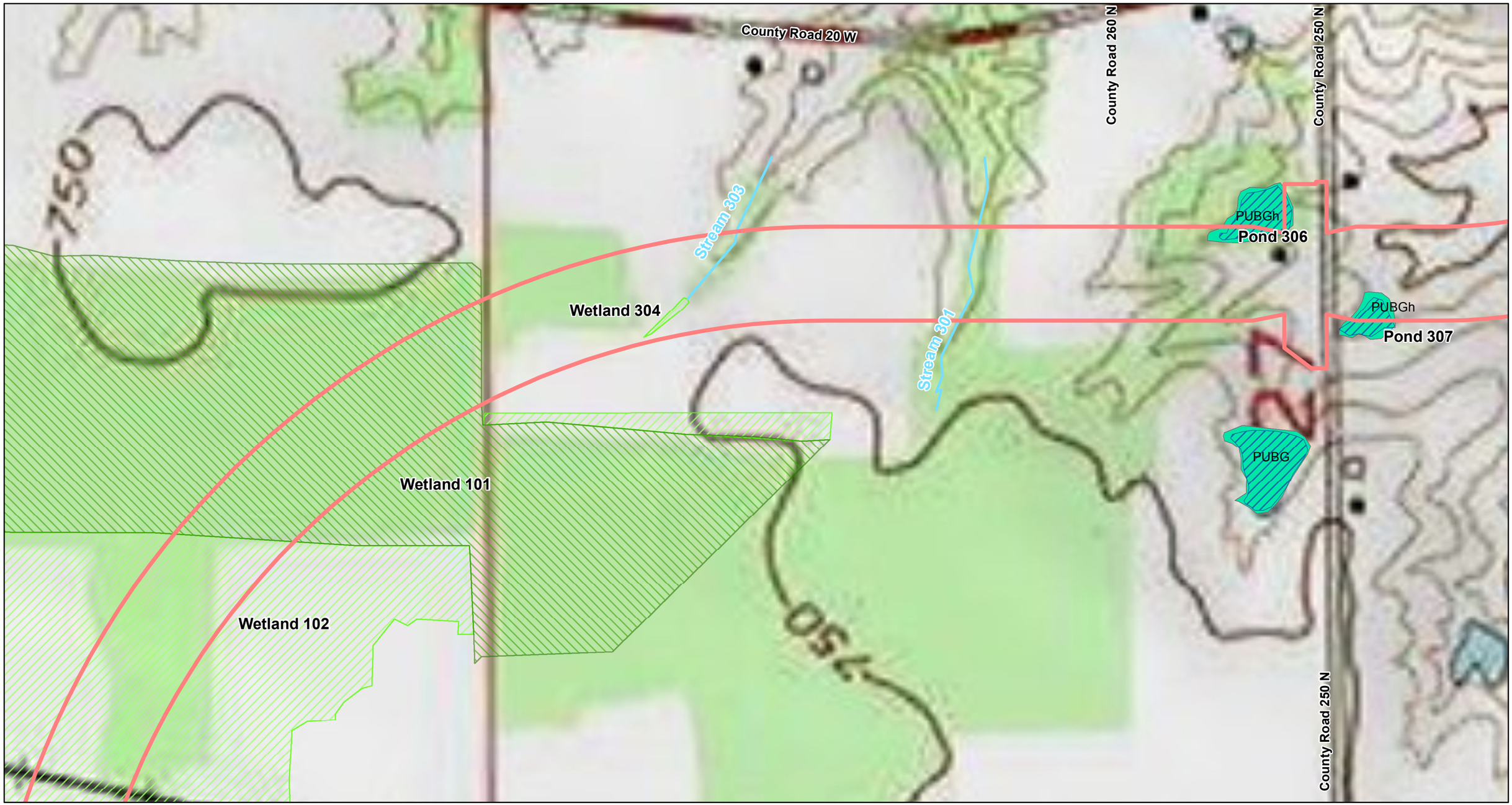
Image: USGS, North Vernon quad
Data: USFWS, National Wetlands Inventory

0 150 300 600 900 1,200 Feet

PARSONS

USGS Topographic & NWI Maps

FIGURE 2: SHEET 1



Legend

- US 50 Bypass - East proposed R/W
- Ephemeral Stream
- Pond/Open Water
- Emergent Wetland
- Forested Wetland
- NWI polygons

Image: USGS, Butlerville quad
Data: USFWS, National Wetlands Inventory

N

0 150 300 600 900 1,200 Feet

PARSONS

USGS Topographic & NWI Maps

FIGURE 2: SHEET 2

Legend

- US 50 Bypass - East proposed R/W
- NWI polygons
- Ephemeral Stream
- Perennial Stream

N

Image: USGS, Butlerville quad
Data: USFWS, National Wetlands Inventory

0 150 300 600 900 1,200 Feet

PARSONS

USGS Topographic & NWI Maps

FIGURE 2: SHEET 3

Legend

- US 50 Bypass - East proposed R/W
- Ephemeral Stream
- Pond/Open Water
- Emergent Wetland
- NWI polygons

N

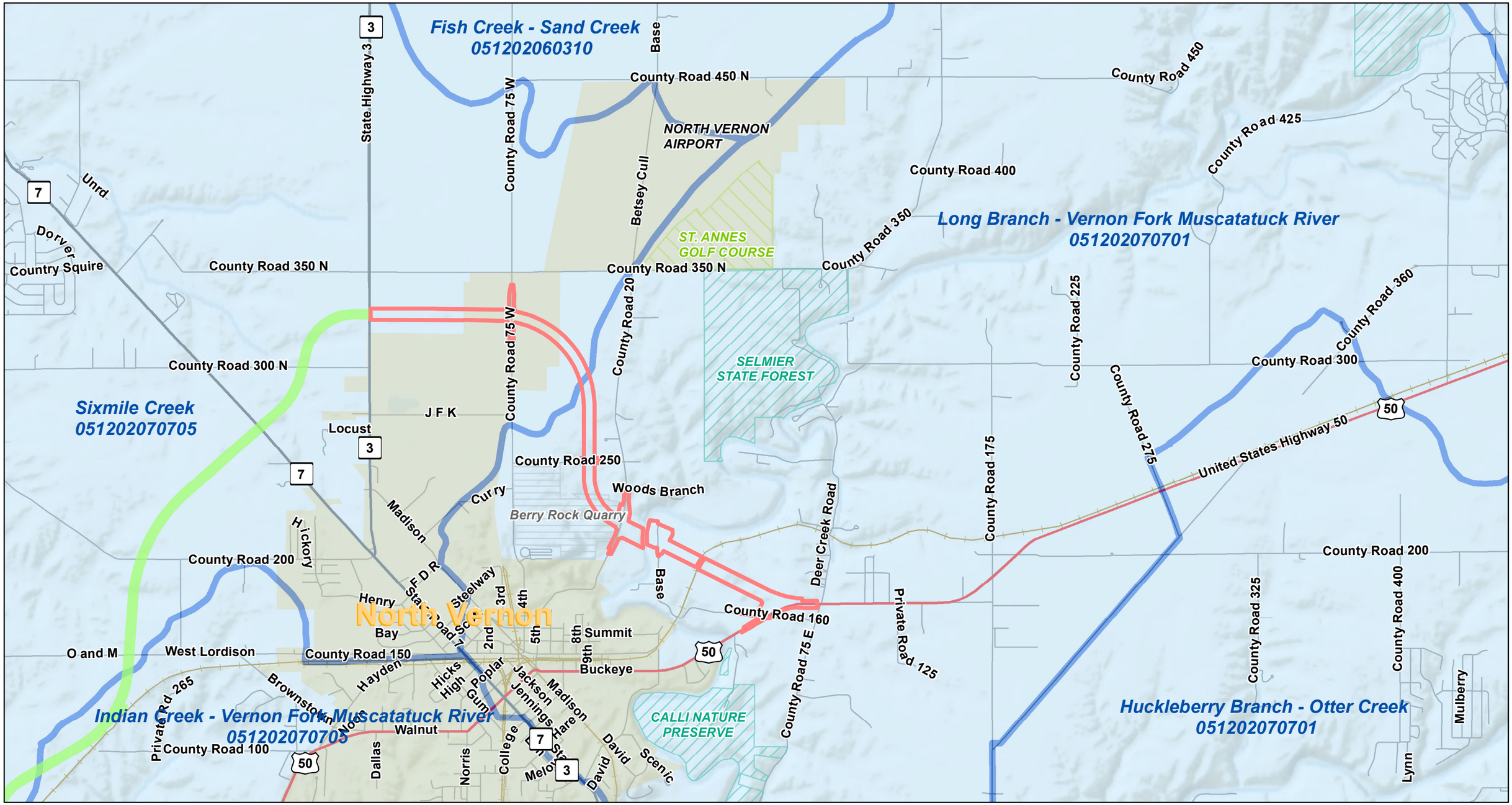
Image: USGS, Butlerville quad
Data: USFWS, National Wetlands Inventory

0 150 300 600 900 1,200 Feet

PARSONS

USGS Topographic & NWI Maps

FIGURE 2: SHEET 4



Legend

- US 50 Bypass - East proposed R/W
- US 50 Bypass - West

N

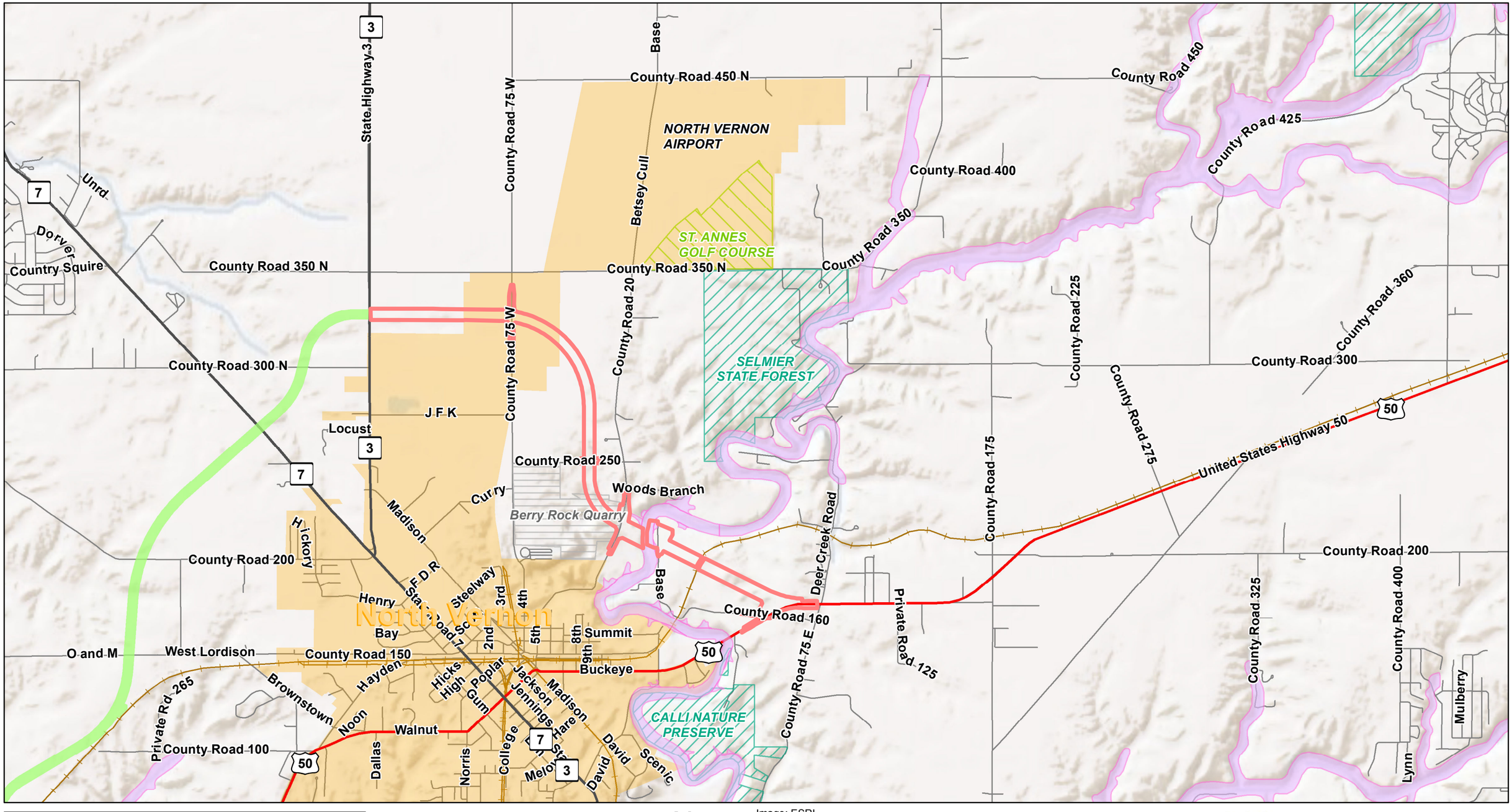
Image: ESRI
Data: Indiana Geological Survey

0 0.25 0.5 1 1.5 2 Miles

PARSONS

Watershed Map (12-Digit Hydrologic Unit Code)

FIGURE 3



Legend

- US 50 Bypass - East proposed R/W
- US 50 Bypass - West
- Floodplains

N

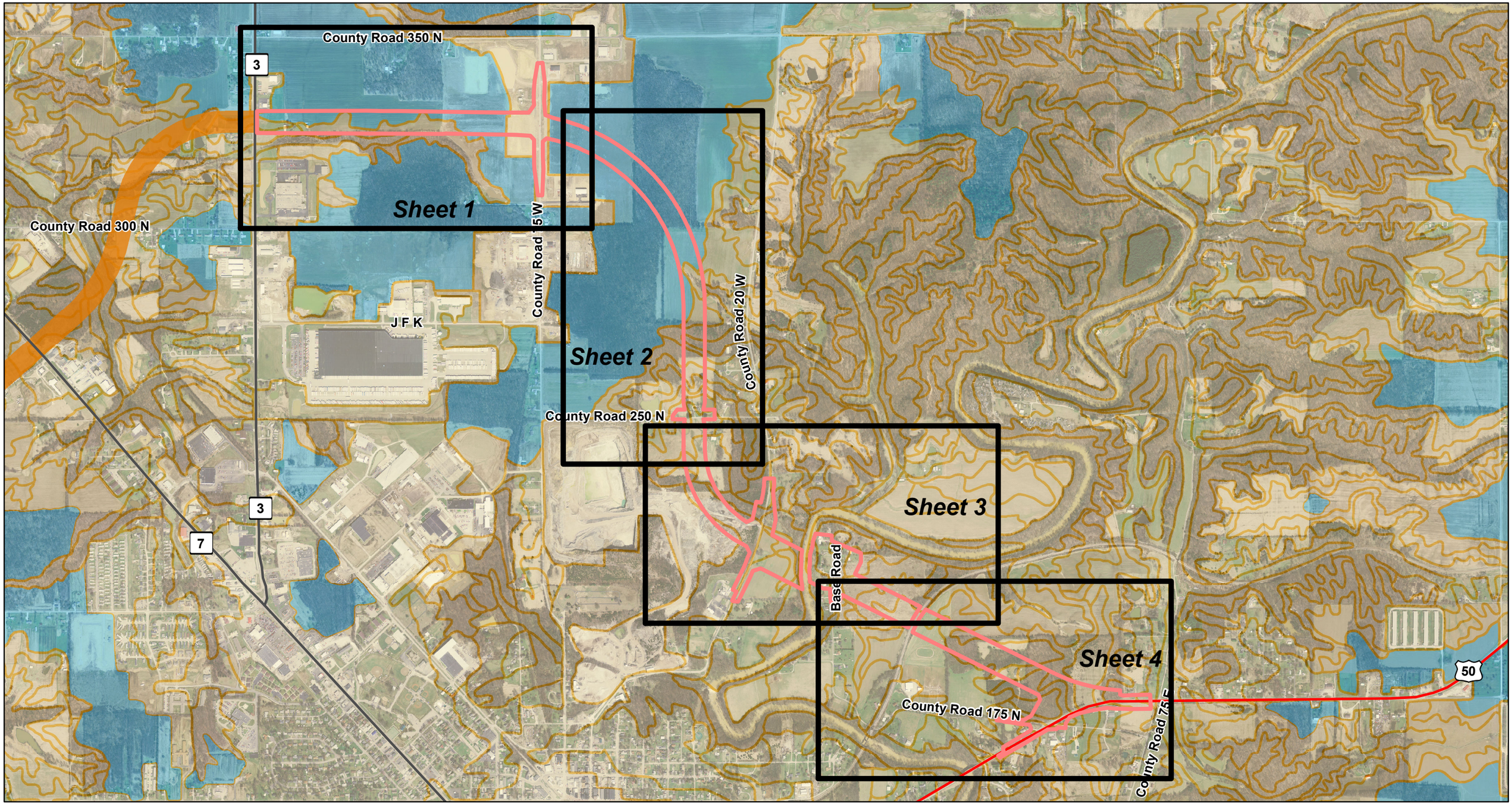
Image: ESRI
Data: Indiana DNR

0 0.25 0.5 1 1.5 2 Miles

PARSONS

FEMA Floodplain Map

FIGURE 4



Legend

- US 50 Bypass - East proposed R/W
- US 50 Bypass - West
- Non-hydric Soil
- Hydric Soil - ClfA

N

Image: ESRI
Data: USDA, NRCS

0 0.125 0.25 0.5 0.75 1 Mile

PARSONS

Soils Map

FIGURE 5: Index

Legend

- US 50 Bypass - East proposed R/W
- US 50 Bypass - West
- Ephemeral Stream
- Emergent Wetland
- Non-hydric Soil
- Hydric Soil - ClfA

N

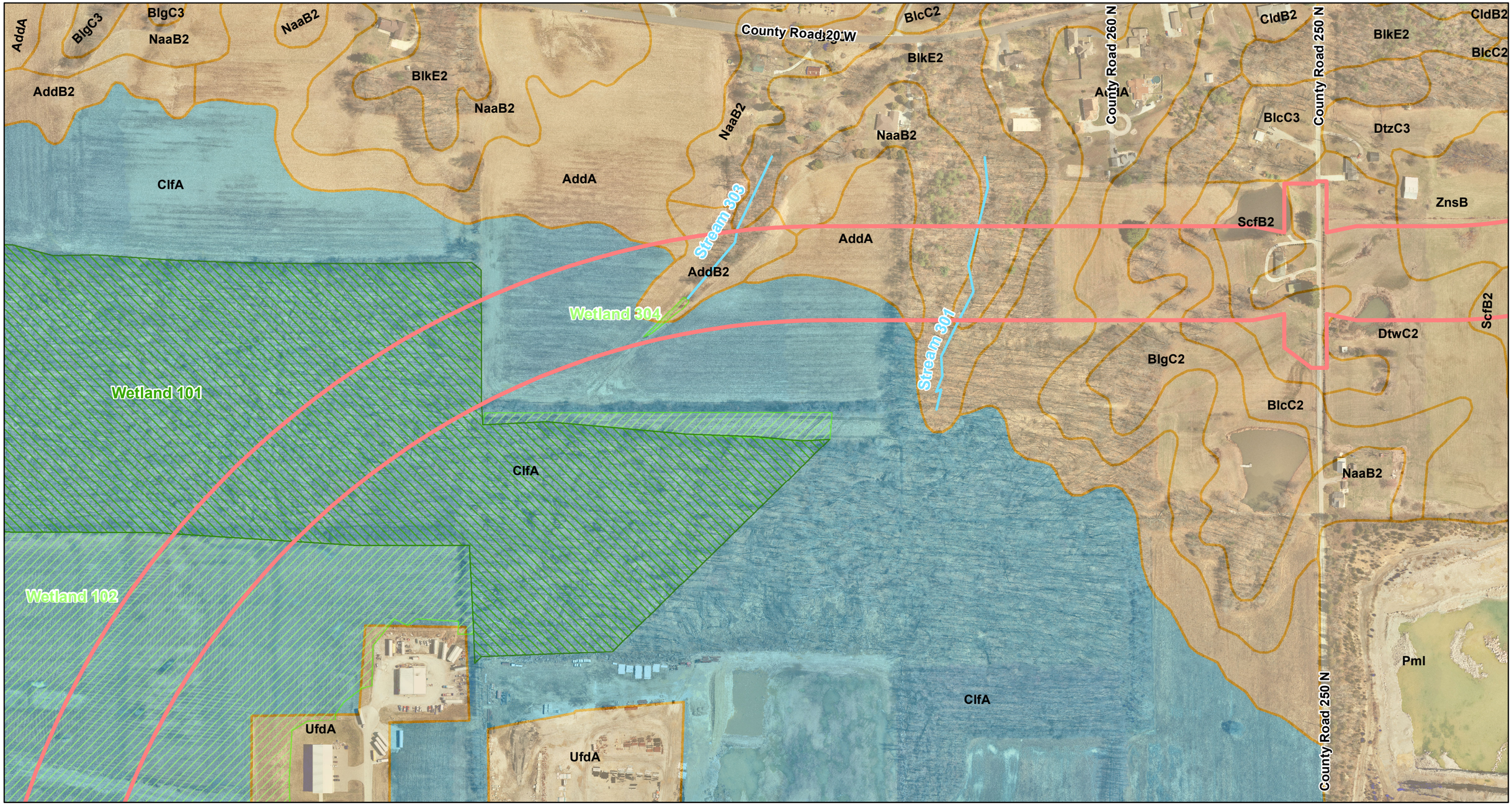
Image: ESRI
Data: USDA, NRCS

0 150 300 600 900 1,200 Feet

PARSONS

Soils Map

FIGURE 5: SHEET 1



Legend

- US 50 Bypass - East proposed R/W
- Ephemeral Stream
- Emergent Wetland
- Forested Wetland
- Non-hydric Soil
- Hydric Soil - ClfA

Image: ESRI
Data: USDA, NRCS

N

0 150 300 600 900 1,200 Feet

PARSONS

Soils Map

FIGURE 5: SHEET 2

NaaB2
BlcC2
BlcC3
DtwC2
BlkE2
CldB2
IcC2
County Road 20 W
BlgC2
CldB2
CcaG
HizE2
NaaB2
BlcC2
CcbC2
CcaG
ScfB2
ZnsB
DtzC3
Woods Branch Road
DtwC2
ZnsB
DtzC3
DtzC3
BlkE2
CcaG
RzfA
Stream 311
DtwC2
RzhC3
OfaAW
RzfB2
WokAW
CcgD3
Pml
CcaG
EesB2
Pml
CcbC2
RzfA
ZnsB
RzgC2
Vernon Fork Muscatatuck River
CcaG
RzfB2
WprAW
Uby
WnmA
CcaG
Base Road
ScfB2
CcgD2
DtwC2
Uby
RzfB2
DtzC3
CSX Railroad
County Road 20 W
EesB2
RzgC2
ScfB2
DtwC2
RzfB2
CcaG
RzgC2
ZnsB

Legend

- US 50 Bypass - East proposed R/W
- Non-hydric Soil
- Ephemeral Stream

N

Image: ESRI
Data: USDA, NRCS

0 150 300 600 900 1,200 Feet

PARSONS

Soils Map

FIGURE 5: SHEET 3

Legend

- US 50 Bypass - East proposed R/W
- Non-hydric Soil
- Ephemeral Stream
- Emergent Wetland

N

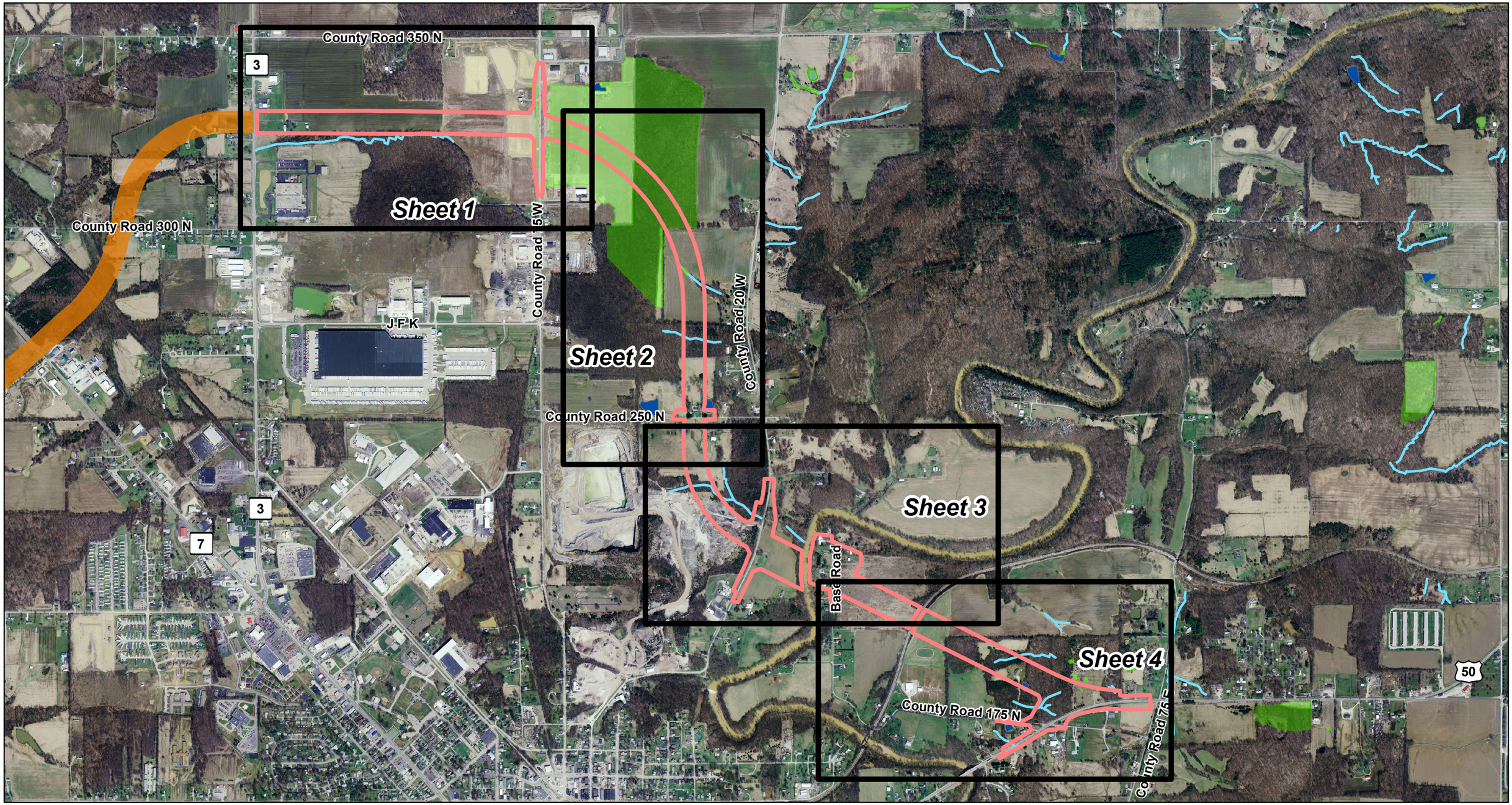
Image: ESRI
Data: USDA, NRCS

0 150 300 600 900 1,200 Feet

PARSONS

Soils Map

FIGURE 5: SHEET 4



Legend

- US 50 Bypass - East proposed R/W
- US 50 Bypass - West
- Ephemeral Stream
- Emergent Wetland
- Forested Wetland
- Pond/Open Water

Image: Indiana Geographic Information Council, 2005

N

0 0.125 0.25 0.5 0.75 1 Mile

PARSONS

Delineated Wetland & Water Features

FIGURE 6: Index

Legend

- US 50 Bypass - East proposed R/W
- US 50 Bypass - West
- Ephemeral Stream
- Emergent Wetland
- Wetland Data Point

Image: INDOT, 2011

N

0 150 300 600 900 1,200 Feet

PARSONS

Delineated Wetland & Water Features

FIGURE 6: SHEET 1

Image: INDOT, 2011

Legend

- US 50 Bypass - East proposed R/W
- Ephemeral Stream
- Pond/Open Water
- Emergent Wetland
- Forested Wetland
- Wetland Data Point

N

0 150 300 600 900 1,200 Feet

PARSONS

Delineated Wetland & Water Features

FIGURE 6: SHEET 2

Image: INDOT, 2011

Legend

- US 50 Bypass - East proposed R/W
- Ephemeral Stream
- Perennial Stream

N

0 150 300 600 900 1,200 Feet

US 50 | INDIANA DEPARTMENT OF TRANSPORTATION | PARSONS

Delineated Wetland & Water Features

FIGURE 6: SHEET 3

Image: INDOT, 2011

Legend

- US 50 Bypass - East proposed R/W
- Ephemeral Stream
- Pond/Open Water
- Emergent Wetland
- Wetland Data Point

N

0 150 300 600 900 1,200 Feet

PARSONS

Delineated Wetland & Water Features

FIGURE 6: SHEET 4

Appendix A

Photograph Log

Legend

- US 50 Bypass - East proposed R/W
- US 50 Bypass - West
- Ephemeral Stream
- Emergent Wetland
- Wetland Data Point

Image: INDOT, 2011

N

0 150 300 600 900 1,200 Feet

PARSONS

Photo Location Key

SHEET 1

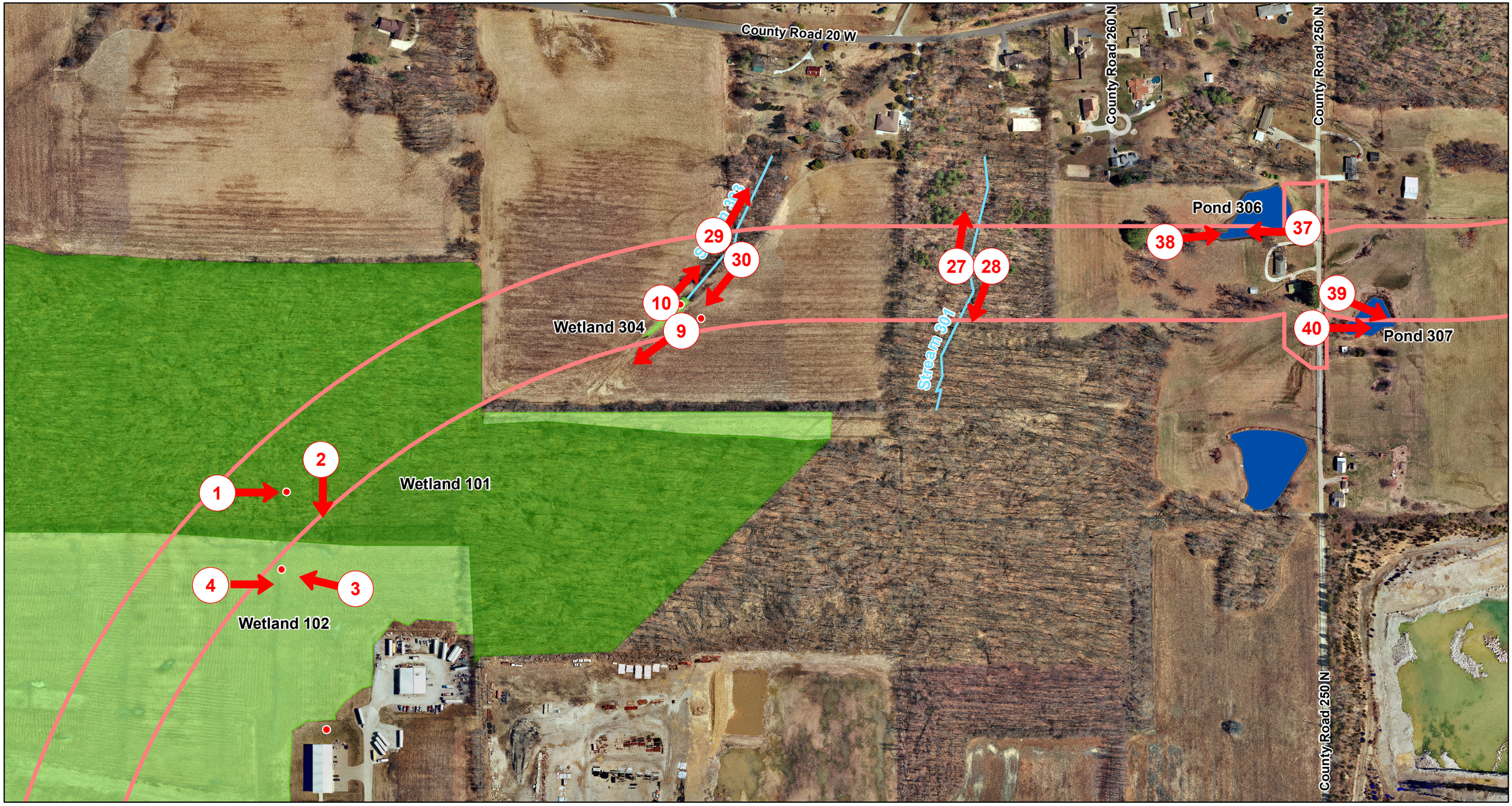


Image: INDOT, 2011

Legend

- US 50 Bypass - East proposed R/W
- Ephemeral Stream
- Pond/Open Water
- Emergent Wetland
- Forested Wetland
- Wetland Data Point

N

0 150 300 600 900 1,200 Feet

PARSONS

Photo Location Key

SHEET 2

Image: INDOT, 2011

Legend

- US 50 Bypass - East proposed R/W
- Ephemeral Stream
- Perennial Stream

N

0 150 300 600 900 1,200 Feet

PARSONS

Photo Location Key

SHEET 3

Image: INDOT, 2011

Legend

- US 50 Bypass - East proposed R/W
- Ephemeral Stream
- Pond/Open Water
- Emergent Wetland
- Wetland Data Point

N

0 75 150 300 450 600 Feet

PARSONS

Photo Location Key

SHEET 4

May 14, 2013

Photo 1: Wetland 101

May 14, 2013

Photo 2: Wetland 101

May 14, 2013

Photo 3: Wetland 102

May 14, 2013

Photo 4: Wetland 102

Oct. 23, 2012

Photo 5: Wetland 104

Oct. 23, 2012

Photo 6: Wetland 104

May 14, 2013

Photo 7: Wetland 209

May 14, 2013

Photo 8: Wetland 209

May 14, 2013

Photo 9: Wetland 304

May 14, 2013

Photo 10: Wetland 304

Oct. 22, 2012

Photo 11: Stream 101 downstream

Oct. 22, 2012

Photo 12: Stream 101 upstream

May 14, 2013

Photo 13: Stream 214 downstream

May 14, 2013

Photo 14: Stream 214 upstream

May 14, 2013

Photo 15: Stream 217 downstream

May 14, 2013

Photo 16: Stream 217 upstream

May 14, 2013

Photo 17: Stream 219 downstream

May 14, 2013

Photo 18: Stream 219 upstream

May 14, 2013

Photo 19: Stream 220 downstream

May 14, 2013

Photo 20: Stream 220 upstream

May 14, 2013

Photo 21: Stream 221 downstream

May 14, 2013

Photo 22: Stream 221 upstream

May 14, 2013

Photo 23: Stream 222 downstream

May 14, 2013

Photo 24: Stream 222 upstream

May 14, 2013

Photo 25: Stream 223 downstream

May 14, 2013

Photo 26: Stream 223 upstream

May 14, 2013

Photo 27: Stream 301 downstream

May 14, 2013

Photo 28: Stream 301 upstream

May 14, 2013

Photo 29: Stream 303 downstream

May 14, 2013

Photo 30: Stream 303 upstream

May 14, 2013

Photo 31: Stream 311 downstream

May 14, 2013

Photo 32: Stream 311 upstream

Oct. 23, 2012

Photo 33: Muscatatuck River downstream

Oct. 23, 2012

Photo 34: Muscatatuck River upstream

May 14, 2013

Photo 35: Open Water 205, looking east

May 14, 2013

Photo 36: Open Water 205, looking south

May 14, 2013

Photo 37: Open Water 306, looking north

May 14, 2013

Photo 38: Open Water 306, looking south

May 14, 2013

Photo 39: Open Water 307, looking southwest

May 14, 2013

Photo 40: Open Water 307, looking south

Appendix B

Wetland Determination Forms

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: US 50 North Vernon Bypass - East City/County: Jennings Sampling Date: October 22, 2012

Applicant/Owner: INDOT State: IN Sampling Point: Wetland 101

Investigator(s): Alan Ball, Darren Mitchell of Parsons Transportation Group Section, Township, Range:

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

Slope (%): Lat: 39.030400 Long: -85.620400 Datum: WGS84

Soil Map Unit Name: Cobbsfork silt loam, 0 - 1 percent slopes (ClfA) NWI classification: N/A

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 X, 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

Hydric Soil Present? Yes X No

Wetland Hydrology Present? Yes X No

Is the Sampled Area within a Wetland? Yes X No

Remarks: This is a mesic flatwoods, and it is dominated by facultative canopy trees, with an understory of more hydrophytic species.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	60	X	FAC
2. Quercus palustris	20	X	FACW
3. Fagus grandifolia	10		FACU
4. Fraxinus pennsylvanica	5		FACW
5. Liquidambar styraciflua	5		FACW
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Lindera benzoin	40	X	FACW
2. Quercus palustris	40	X	FACW
3. Fagus grandifolia	5		FACU
4. Ulmus americana	5		FACW
5.			
	90	= Total Cover	
Herb Stratum (Plot size: 5' radius)			
1. Quercus palustris	20	X	FACW
2. Cinna arundinacea	10	X	FACW
3. Carex grayi	5		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	35	= Total Cover	
Woody Vine Stratum (Plot size:)			
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	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
- X 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 X No

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

Hydrophytic vegetation is present. This is a forested wetland, with standing water in many spots and saturated soils throughout in the spring. This woods has little to no topographical relief and underlain by a hydric soil unit. This wetland closely matches the description of a Wet-Mesic Flatwoods as provided by the Michigan Natural Features Inventory in an abstract at the following web address: http://mnfi.anr.msu.edu/abstracts/ecology/wet-mesic_flatwoods.pdf. The Indiana DNR maintains a list of High Quality Natural Communities of Indiana (http://www.in.gov/dnr/naturepreserve/4743.htm) which includes an entry for "Forest - Flatwoods Mesic," but the global and state ranks for this community type are unclear from the information listed on the website.

SOIL

Sampling Point: Wetland 101

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
0-1	10YR 3/3							organics, duff layer
1-8	10YR 5/1	75	10YR 5/8	25				silt loam
8-16	10YR 7/1	75	10YR 5/6	25				silt loam

[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: This soil profile meets field indicator F3. Hydric soils are present.

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)
- X 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)
- X Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 0-1

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

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

Wetland Hydrology Present? Yes X No _____

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

Remarks: Wetland hydrology is present. This data point meets all three wetland criteria.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: US 50 North Vernon Bypass - East City/County: Jennings Sampling Date: October 22, 2012

Applicant/Owner: INDOT State: IN Sampling Point: Wetland 102

Investigator(s): Alan Ball, Darren Mitchell of Parsons Transportation Group Section, Township, Range:

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

Slope (%): Lat: 39.030400 Long: -85.622000 Datum: WGS84

Soil Map Unit Name: Cobbsfork silt loam, 0 - 1 percent slopes (ClfA) NWI classification: N/A

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

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

Remarks: This emergent wetland most likely was a mesic flatwoods, like the forested wetland immediately adjacent to the east. It would appear that this wetland (a former mesic flatwoods) has been cleared to allow for development of this land as an industrial park. The vegetation appears to be disturbed by occasional mowing.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Acer rubrum	15	X	FAC
2. Quercus palustris	2		FACW
3. Liquidambar styraciflua	2		FACW
4. Ulmus americana	1		FACW
5.			
	20 = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Schoenoplectus tabernaemontani	40	X	OBL
2. Symphyotricum dumosum	30	X	FAC
3. Scirpus cyperinus	20	X	OBL
4. Andropogon virginicus	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size:)			
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: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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
- X 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 X No

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

Hydrophytic vegetation is present. This field was likely a forested wetland, like the adjacent Wetland 101. Both areas are underlain by the same hydric soil unit and share similar hydrology and species composition. This wetland has been cleared of trees and is maintained by occasional mowing and is being marketed as development land for an industrial park. If this site is not mown over the next year or two, natural succession will cause this wetland to become a shrub/scrub wetland.

SOIL

Sampling Point: Wetland 102

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
0-6	10YR 6/2	75	10YR 5/8	25				silt loam
6-16	10YR 6/1	75	10YR 5/8	25				silt loam

[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: This soil profile meets field indicator F3. Hydric soils are present.

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

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 0-2

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

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

Wetland Hydrology Present? Yes X No _____

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

Remarks: Wetland hydrology is present. This data point meets all three wetland criteria.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: US 50 North Vernon Bypass - East City/County: Jennings Sampling Date: October 22, 2012

Applicant/Owner: INDOT State: IN Sampling Point: Upland 101 / 102

Investigator(s): Alan Ball, Darren Mitchell of Parsons Transportation Group Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Fill placed to allow for parcel development Local relief (concave, convex, none): None

Slope (%): _____ Lat: 39.030400 Long: -85.623600 Datum: WGS84

Soil Map Unit Name: Urban land - Cobbsfork-Avonburg complex, 0 - 2 percent slopes (UfdA) NWI classification: N/A

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

Are Vegetation _____, Soil X, 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: This point is part of an industrial park development. This site was likely a wet-mesic flatwoods like Wetland 101. This point, like the open field to the north and east, was cleared of trees, which resulted in the emergent wetland delineated as Wetland 102. This particular point has been further disturbed by bring in fill dirt to allow for the development of parcels as an industrial park.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Bromus inermis	50	X	NI
2. Festuca arundinacea	50	X	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
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 _____	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 X

Remarks: (Include photo numbers here or on a separate sheet.)
Upland vegetation is present. This lawn area is maintained by mowing. This data point appears to be on soils that have been brought in to the site to allow the parcel to be developed.

SOIL

Sampling Point: Upland 101 / 102

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 4/2	100						loam

[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: This soil profile does not meets a field indicator of hydric soils. Hydric soils are not present.

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:

Remarks: Wetland hydrology is neither present nor indicated. This data point does not meet any wetland criteria.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: US 50 North Vernon Bypass - East City/County: Jennings Sampling Date: October 23, 2012

Applicant/Owner: INDOT State: IN Sampling Point: Wetland 104

Investigator(s): Alan Ball, Darren Mitchell of Parsons Transportation Group Section, Township, Range: _____

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

Slope (%): _____ Lat: 39.033000 Long: -85.626180 Datum: WGS84

Soil Map Unit Name: Urban Land - Cobbsfork-Avonburg complex, 0 - 2 percent slopes (UfdA) NWI classification: N/A

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

Are Vegetation X, Soil _____, or Hydrology X 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: The vegetation occurs to be disturbed by occasional mowing. Hydrology is altered by the deliberate collection/concentration of runoff from surrounding areas into this roadside ditch. The flows in this ditch appear to run to the north, where they turn west and flow into a retention pond in the SW quad of the CR 75W / CR 350N intersection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Typha latifolia	60	X	OBL
2. Schoenoplectus tabernaemontani	30	X	OBL
3. Carex vulpinoidea	10		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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

X 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 X No _____

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

Hydrophytic vegetation is present. The wetland is about 4 feet wide, at the bottom of a roadside ditch.

SOIL

Sampling Point: Wetland 104

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
0-3	10YR 5/2	90	10YR 5/8	10				silt loam
3-16	10YR 5/1	85	10YR 5/8	15				clay loam

[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: This soil profile meets field indicator F3. Hydric soils are present.

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)
- ___ 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): 0-1

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

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

Wetland Hydrology Present? Yes X No _____

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

Remarks: Wetland hydrology is present. This data point meets all three wetland criteria.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: US 50 North Vernon Bypass - East City/County: Jennings Sampling Date: October 23, 2012

Applicant/Owner: INDOT State: IN Sampling Point: Upland 104

Investigator(s): Alan Ball, Darren Mitchell of Parsons Transportation Group Section, Township, Range:

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

Slope (%): Lat: 39.033000 Long: -85.626180 Datum: WGS84

Soil Map Unit Name: Urban Land - Cobbsfork-Avonburg complex, 0 - 2 percent slopes (UfdA) NWI classification: N/A

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 X 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: The vegetation occurs to be disturbed by occasional mowing. Hydrology is altered by the deliberate collection/concentration of runoff from surrounding areas into this roadside ditch. The flows in this ditch appear to run to the north, where they turn west and flow into a retention pond in the SW quad of the CR 75W / CR 350N intersection.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Festuca arundinacea	60	X	FACU
2. Trifolium pratense	20	X	FACU
3. Plantago rugelii	10		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
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	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 X

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

Upland vegetation is present. Portions of the wetland ditch and the surrounding uplands are maintained by mowing. This data point is on the flat field above and to the west of the ditch (Wetland 104).

SOIL

Sampling Point: Upland 104

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 3/3	100						loam

[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: This soil profile does not meet a field indicator of hydric soils. Hydric soils are not present.

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:

Remarks: Wetland hydrology is neither present nor indicated. This data point does not meet any wetland criteria.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: US 50 North Vernon Bypass - East City/County: Jennings Sampling Date: October 24, 2012

Applicant/Owner: INDOT State: IN Sampling Point: Wetland 209

Investigator(s): Richard Connolly of Parsons Transportation Group Section, Township, Range: _____

Landform (hillslope, terrace, etc.): flat field, mown pasture Local relief (concave, convex, none): none

Slope (%): _____ Lat: 39.011300 Long: -85.599300 Datum: WGS84

Soil Map Unit Name: Avonburg silt loam, 0 - 2 percent slopes (AddA) NWI classification: N/A

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

Are Vegetation X, 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: The vegetation appears to be disturbed by occasional mowing for hay production.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Juncus effusus	70	X	OBL
2. Scirpus atrovirens	30	X	OBL
3. Festuca pratensis	10		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	110 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (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
- X 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 X No _____

Remarks: (Include photo numbers here or on a separate sheet.)
Wetland vegetation is present. This wetland is a shallow depression in an old field. This field may be maintained by mowing.

SOIL

Sampling Point: Wetland 209

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
0-3	10YR 5/2	95	10YR 5/7	5			clay loam	
3-16	10YR 6/2	95	10YR 6/8	5			clay loam	

[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: This soil profile meets field indicator F3. Hydric soils are present.

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)
- ___ 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)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 0-1"

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

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

Wetland Hydrology Present? Yes X No _____

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

Remarks: Wetland hydrology is present. All three wetland criteria are satisfied at this data point. During a subsequent visit to the site in May 2013, this wetland was saturated at the surface with shallow (1-2") pockets of standing water.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: US 50 North Vernon Bypass - East City/County: Jennings Sampling Date: October 24, 2012

Applicant/Owner: INDOT State: IN Sampling Point: Upland 209

Investigator(s): Richard Connolly of Parsons Transportation Group Section, Township, Range: _____

Landform (hillslope, terrace, etc.): flat field, mown pasture Local relief (concave, convex, none): none

Slope (%): _____ Lat: 39.011300 Long: -85.599300 Datum: WGS84

Soil Map Unit Name: Avonburg silt loam, 0 - 2 percent slopes (AddA) NWI classification: N/A

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

Are Vegetation X, 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: The vegetation appears to be disturbed by occasional mowing for hay production.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Lonicera japonica	50	X	FACU
2. Rubus allegheniensis	20	X	FACU
3. Poa pratensis	15		FAC
4. Toxicodendron radicans	5		FAC
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
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	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 X

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

Upland vegetation is present. This data point is along the edge of an old field. This field may be maintained by mowing.

SOIL

Sampling Point: Upland 209

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 4/3	100					loam	

[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: This soil profile does not meet a field indicator of hydric soils. Hydric soils are not present.

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:

Remarks: Wetland hydrology is neither present nor indicated. None of the three wetland criteria are satisfied at this data point.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: US 50 North Vernon Bypass - East City/County: Jennings Sampling Date: October 22, 2012

Applicant/Owner: INDOT State: IN Sampling Point: Wetland 304

Investigator(s): Luke Eggering, Katie Astroth of Parsons Transportation Group Section, Township, Range: _____

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

Slope (%): _____ Lat: 39.027400 Long: -85.618800 Datum: WGS84

Soil Map Unit Name: Cobbsfork silt loam, 0 - 1 percent slopes (ClfA) NWI classification: N/A

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: This emergent wetland is in a swale in a corn field. The swale drains SE and turns into Stream 303.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Juncus effusus	80	X	OBL
2. Echinochloa crus-galli	15		FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	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:

X 1 - Rapid Test for Hydrophytic Vegetation

X 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 X No _____

Remarks: (Include photo numbers here or on a separate sheet.)
Hydrophytic vegetation is present.

SOIL

Sampling Point: Wetland 304

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 - 2	2.5YR 3/1						silty clay loam	
2-16	2.5YR 5/2	90	7.5YR 5/8	10			silty clay loam	

[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: This soil profile meets field indicator F3. Hydric soils are present.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X 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)
- X Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- X 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 X No _____ Depth (inches): 10"

Wetland Hydrology Present? Yes X No _____

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

Remarks: Soil is saturated at about 10 inches. Wetland hydrology is present and indicated. During a subsequent visit to the site in May 2013, this wetland was saturated at the surface, with shallow (1-2") pockets of standing water. All three wetland criteria are satisfied at this data point.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: US 50 North Vernon Bypass - East City/County: Jennings Sampling Date: October 22, 2012

Applicant/Owner: INDOT State: IN Sampling Point: Upland 304

Investigator(s): Luke Eggering, Katie Astroth of Parsons Transportation Group Section, Township, Range: _____

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

Slope (%): _____ Lat: 39.027400 Long: -85.618800 Datum: WGS84

Soil Map Unit Name: Cobbsfork silt loam, 0 - 1 percent slopes (ClfA) NWI classification: N/A

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

Are Vegetation X, Soil X, 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

Wetland Hydrology Present? Yes _____ No X

Is the Sampled Area within a Wetland? Yes _____ No X

Remarks: This data point is in the row-crop agricultural field adjacent to Wetland 304. The soils have been disturbed in the past by plowing, and the vegetation is disturbed by monoculture row-crop agricultural practices.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Zea mays	90	X	NI
2. Setaria faberi	10		FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
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: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (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 X

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

Upland vegetation is present. Vegetation is disturbed by row-crop farming practices. The hydrology may be altered by subsurface drainage, as a large part of this farm field is a mapped hydric soil unit (ClfA).

SOIL

Sampling Point: Upland 304

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 5/3	95	2.5Y 6/2	5			loam	very faint light gray mottles, may be soil mixing due to plowing

[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: This soil profile does not meet a field indicator of hydric soils. Hydric soils are not present.

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:

Remarks: Hydrology is neither present nor indicated. None of the wetland criteria are satisfied at this data point.

Appendix C

In-WRAP Summary Forms

In-WRAP Summary Sheet

Date Report Generated: May 24, 2013
Wetland site name: US 50 North Vernon Bypass - East
Data Reference # Wetland 101
Date of Site Visit: 10/22/12 and 05/14/13
NWI polygons in Site (quadrangle and NWI id. numbers): N/A

TIER 1 SUMMARY:

a. Total wetland area (acres): 58+ acres

b. Wetland size and connectivity - contribution to animal habitat:

☒ Valuable ☐ More Favorable ☐ Favorable ☐ Neutral

c. Surrounding land use - numerical rank (max. = 1): 0.45

d. Value surrounding area adds to animal habitat: ☐ Valuable ☒ Favorable ☐ Low

TIER 2 SUMMARY *NWI Polygon Id.* N/A

a. Indiana Wetland community type: Swamp Forest

b. Standing water - contribution to animal habitat: ☐ Valuable ☒ Favorable ☐ Neutral

c. Disturbances to site: none

d. Exotic species rating: ☒ Good ☐ Medium ☐ Poor

e. Special Hydrologic Conditions Observed: none

f. Special Community Type: none

g. Rare-Threatened-Endangered Species: none

h. Polygon QualityDescriptor: ☒ Good ☐Medium ☐Poor

TIER 3A SUMMARY

a. Dead woody material as indicator of animal habitat: ☒ Valuable ☐ Favorable ☐ Neutral

b. Water quality protection - numerical rank (6 max.): 6 Rating: ☒Good ☐Medium ☐Poor

c. Flood and storm water storage - numerical rank (5 max.): 3 Rating: ☐Good ☒Medium ☐Poor

TIER 3B SUMMARY

a. Zonation and interspersion as indicator of animal habitat: ☒ Valuable ☐ Favorable ☐ Neutral

b. Stratification as indicator of animal habitat: ☒ Valuable ☐ Neutral

c. Number of dominant plant taxa observed: 6 Rating: ☐ Good ☒ Medium ☐ Poor

d. Average coefficient of conservatism: 4.5 Rating: ☐ Good ☒ Medium ☐ Poor

e. Tree canopy as indicator of animal habitat: ☒ Valuable ☐ Neutral

f. Mature trees as indicator of animal habitat: ☒ Valuable ☐ Favorable ☐ Neutral

g. Total hydrophytic taxa observed: 16 Rating: ☐ Good ☒ Medium ☐ Poor

h. Number of indicator taxa: 0 Rating: ☐ Good ☐ Medium ☒ Poor

In-WRAP Summary Sheet

Date Report Generated: May 24, 2013
Wetland site name: US 50 North Vernon Bypass - East
Data Reference # Wetland 102
Date of Site Visit: 10/22/12 and 05/14/13
NWI polygons in Site (quadrangle and NWI id. numbers): N/A

TIER 1 SUMMARY:

a. Total wetland area (acres): 45 acres

b. Wetland size and connectivity - contribution to animal habitat:

☒ Valuable ☐ More Favorable ☐ Favorable ☐ Neutral

c. Surrounding land use - numerical rank (max. = 1): 0.56

d. Value surrounding area adds to animal habitat: ☐ Valuable ☒ Favorable ☐ Low

TIER 2 SUMMARY *NWI Polygon Id.* N/A

a. Indiana Wetland community type: Sedge Meadow

b. Standing water - contribution to animal habitat: ☐ Valuable ☒ Favorable ☐ Neutral

c. Disturbances to site: may be artificially drained as part of a future industrial park

d. Exotic species rating: ☒ Good ☐ Medium ☐ Poor

e. Special Hydrologic Conditions Observed: none

f. Special Community Type: none

g. Rare-Threatened-Endangered Species: none

h. Polygon QualityDescriptor: ☒ Good ☐Medium ☐Poor

TIER 3A SUMMARY

a. Dead woody material as indicator of animal habitat: ☐ Valuable ☐ Favorable ☒ Neutral

b. Water quality protection - numerical rank (6 max.): 6 Rating: ☒Good ☐Medium ☐Poor

c. Flood and storm water storage - numerical rank (5 max.): 3 Rating: ☐Good ☒Medium ☐Poor

TIER 3B SUMMARY

a. Zonation and interspersion as indicator of animal habitat: ☒ Valuable ☐ Favorable ☐ Neutral

b. Stratification as indicator of animal habitat: ☒ Valuable ☐ Neutral

c. Number of dominant plant taxa observed: 4 Rating: ☐ Good ☐ Medium ☒ Poor

d. Average coefficient of conservatism: 4.5 Rating: ☐ Good ☒ Medium ☐ Poor

e. Tree canopy as indicator of animal habitat: ☐ Valuable ☒ Neutral

f. Mature trees as indicator of animal habitat: ☐ Valuable ☐ Favorable ☒ Neutral

g. Total hydrophytic taxa observed: 15 Rating: ☐ Good ☒ Medium ☐ Poor

h. Number of indicator taxa: 1 Rating: ☐ Good ☐ Medium ☒ Poor

In-WRAP Summary Sheet

Date Report Generated: May 24, 2013
Wetland site name: US 50 North Vernon Bypass - East
Data Reference # Wetland 104
Date of Site Visit: 10/23/12 and 05/14/13
NWI polygons in Site (quadrangle and NWI id. numbers): N/A

TIER 1 SUMMARY:

a. Total wetland area (acres): 0.25 acre

b. Wetland size and connectivity - contribution to animal habitat:

☐ Valuable ☒ More Favorable ☐ Favorable ☐ Neutral

c. Surrounding land use - numerical rank (max. = 1): 0.35

d. Value surrounding area adds to animal habitat: ☐ Valuable ☒ Favorable ☐ Low

TIER 2 SUMMARY *NWI Polygon Id.* N/A

a. Indiana Wetland community type: Sedge Meadow

b. Standing water - contribution to animal habitat: ☐ Valuable ☒ Favorable ☐ Neutral

c. Disturbances to site: this wetland is in the bottom of a roadside ditch, which collects and conveys runoff from surrounding areas

d. Exotic species rating: ☒ Good ☐ Medium ☐ Poor

e. Special Hydrologic Conditions Observed: none

f. Special Community Type: none

g. Rare-Threatened-Endangered Species: none

h. Polygon QualityDescriptor: ☐ Good ☒Medium ☐Poor

TIER 3A SUMMARY

a. Dead woody material as indicator of animal habitat: ☐ Valuable ☐ Favorable ☒ Neutral

b. Water quality protection - numerical rank (6 max.): 3 Rating: ☐Good ☒Medium ☐Poor

c. Flood and storm water storage - numerical rank (5 max.): 2 Rating: ☐Good ☒Medium ☐Poor

TIER 3B SUMMARY

a. Zonation and interspersion as indicator of animal habitat: ☐ Valuable ☐ Favorable ☒ Neutral

b. Stratification as indicator of animal habitat: ☐ Valuable ☒ Neutral

c. Number of dominant plant taxa observed: 2 Rating: ☐ Good ☐ Medium ☒ Poor

d. Average coefficient of conservatism: 3 Rating: ☐ Good ☒ Medium ☐ Poor

e. Tree canopy as indicator of animal habitat: ☐ Valuable ☒ Neutral

f. Mature trees as indicator of animal habitat: ☐ Valuable ☐ Favorable ☒ Neutral

g. Total hydrophytic taxa observed: 5 Rating: ☐ Good ☐ Medium ☒ Poor

h. Number of indicator taxa: 0 Rating: ☐ Good ☐ Medium ☒ Poor

In-WRAP Summary Sheet

Date Report Generated: May 24, 2013
Wetland site name: US 50 North Vernon Bypass - East
Data Reference # Wetland 209
Date of Site Visit: 10/24/12 and 05/14/13
NWI polygons in Site (quadrangle and NWI id. numbers): N/A

TIER 1 SUMMARY:

a. Total wetland area (acres): 0.02 acre

b. Wetland size and connectivity - contribution to animal habitat:

☐ Valuable ☐ More Favorable ☒ Favorable ☐ Neutral

c. Surrounding land use - numerical rank (max. = 1): 0.40

d. Value surrounding area adds to animal habitat: ☐ Valuable ☒ Favorable ☐ Low

TIER 2 SUMMARY *NWI Polygon Id.* N/A

a. Indiana Wetland community type: Sedge Meadow

b. Standing water - contribution to animal habitat: ☐ Valuable ☒ Favorable ☐ Neutral

c. Disturbances to site: this field may be artificially drained to allow the site to be maintained as pasture land

d. Exotic species rating: ☒ Good ☐ Medium ☐ Poor

e. Special Hydrologic Conditions Observed: none

f. Special Community Type: none

g. Rare-Threatened-Endangered Species: none

h. Polygon QualityDescriptor: ☐ Good ☒Medium ☐Poor

TIER 3A SUMMARY

a. Dead woody material as indicator of animal habitat: ☐ Valuable ☐ Favorable ☒ Neutral

b. Water quality protection - numerical rank (6 max.): 6 Rating: ☒Good ☐Medium ☐Poor

c. Flood and storm water storage - numerical rank (5 max.): 3 Rating: ☐Good ☒Medium ☐Poor

TIER 3B SUMMARY

a. Zonation and interspersion as indicator of animal habitat: ☐ Valuable ☐ Favorable ☒ Neutral

b. Stratification as indicator of animal habitat: ☐ Valuable ☒ Neutral

c. Number of dominant plant taxa observed: 2 Rating: ☐ Good ☐ Medium ☒ Poor

d. Average coefficient of conservatism: 4.5 Rating: ☐ Good ☒ Medium ☐ Poor

e. Tree canopy as indicator of animal habitat: ☐ Valuable ☒ Neutral

f. Mature trees as indicator of animal habitat: ☐ Valuable ☐ Favorable ☒ Neutral

g. Total hydrophytic taxa observed: 5 Rating: ☐ Good ☐ Medium ☒ Poor

h. Number of indicator taxa: 0 Rating: ☐ Good ☐ Medium ☒ Poor

In-WRAP Summary Sheet

Date Report Generated: May 24, 2013
Wetland site name: US 50 North Vernon Bypass - East
Data Reference # Wetland 304
Date of Site Visit: 10/22/12 and 05/14/13
NWI polygons in Site (quadrangle and NWI id. numbers): N/A

TIER 1 SUMMARY:

a. Total wetland area (acres): 0.06 acre

b. Wetland size and connectivity - contribution to animal habitat:

☐ Valuable ☒ More Favorable ☐ Favorable ☐ Neutral

c. Surrounding land use - numerical rank (max. = 1): 0.20

d. Value surrounding area adds to animal habitat: ☐ Valuable ☐ Favorable ☒ Low

TIER 2 SUMMARY *NWI Polygon Id.* N/A

a. Indiana Wetland community type: Sedge Meadow

b. Standing water - contribution to animal habitat: ☐ Valuable ☒ Favorable ☐ Neutral

c. Disturbances to site: this wetland is in a drainage swale in a row-crop ag field and may be influenced by artificial drainage

d. Exotic species rating: ☒ Good ☐ Medium ☐ Poor

e. Special Hydrologic Conditions Observed: none

f. Special Community Type: none

g. Rare-Threatened-Endangered Species: none

h. Polygon QualityDescriptor: ☐ Good ☒Medium ☐Poor

TIER 3A SUMMARY

a. Dead woody material as indicator of animal habitat: ☐ Valuable ☐ Favorable ☒ Neutral

b. Water quality protection - numerical rank (6 max.): 4 Rating: ☐Good ☒Medium ☐Poor

c. Flood and storm water storage - numerical rank (5 max.): 3 Rating: ☐Good ☒Medium ☐Poor

TIER 3B SUMMARY

a. Zonation and interspersion as indicator of animal habitat: ☐ Valuable ☒ Favorable ☐ Neutral

b. Stratification as indicator of animal habitat: ☐ Valuable ☒ Neutral

c. Number of dominant plant taxa observed: 1 Rating: ☐ Good ☐ Medium ☒ Poor

d. Average coefficient of conservatism: 4 Rating: ☐ Good ☒ Medium ☐ Poor

e. Tree canopy as indicator of animal habitat: ☐ Valuable ☒ Neutral

f. Mature trees as indicator of animal habitat: ☐ Valuable ☐ Favorable ☒ Neutral

g. Total hydrophytic taxa observed: 5 Rating: ☐ Good ☐ Medium ☒ Poor

h. Number of indicator taxa: 0 Rating: ☐ Good ☐ Medium ☒ Poor

Appendix D

HHEI / QHEI Froms

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 48

SITE NAME/LOCATION Stream 101

SITE NUMBER 101 RIVER BASIN Muscatatuck DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. 39.0328 LONG. -85.6317 RIVER CODE _____ RIVER MILE _____

DATE 5/14/13 SCORER A. Ball COMMENTS _____

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		☐	SILT [3 pt]	
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	10	☐	CLAY or HARDPAN [0 pt]	
☑	GRAVEL (2-64 mm) [9 pts]	60	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]	30	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 10 (A) 15

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES: (B) 3

HHEI Metric Points

Substrate Max = 40: 18

A + B

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

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☑ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (~~centimeters~~ inches): 3"

Pool Depth Max = 30: 15

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☑ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ AVERAGE BANKFULL WIDTH (~~meters~~ feet): 4

Bankfull Width Max=30: 15

This information must also be completed

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

RIPARIAN WIDTH L	R (Per Bank)	FLOODPLAIN QUALITY L	R (Most Predominant per Bank)	L	R	
☐	☑ Wide >10m	☑	☑ Mature Forest, Wetland	☐	☐	Conservation Tillage
☑	☐ Moderate 5-10m	☐	☐ Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐ Narrow <5m	☐	☐ Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐ None	☐	☐ Fenced Pasture	☐	☐	Mining or Construction

COMMENTS _____

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

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☑ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

- ☐ None
- ☐ 0.5
- ☐ 1.0
- ☐ 1.5
- ☐ 2.0
- ☐ 2.5
- ☑ 3.0
- ☐ >3

STREAM GRADIENT ESTIMATE

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

June 20, 2008 Revision

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)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Yes Date of last precipitation: 5/12/13 Quantity: 0.2"

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): 20 %

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Yes If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____

Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

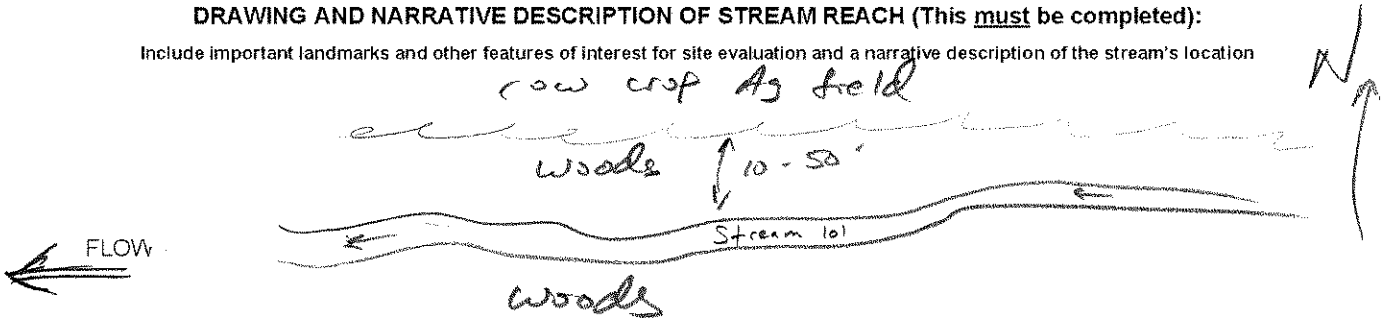
Comments Regarding Biology:_____

_____

_____

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

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



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 22

SITE NAME/LOCATION Stream 214

SITE NUMBER 214 RIVER BASIN Muscatatuck DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. 39.0126 LONG. -85.6024 RIVER CODE _____ RIVER MILE _____

DATE 5/14/13 SCORER A. Ball COMMENTS _____

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		☑	SILT [3 pt]	70
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	10
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]		☐	MUCK [0 pts]	
☑	SAND (<2 mm) [6 pts]	20	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 9 (B) 3

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40: 12

A + B

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

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☑ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (~~centimeters~~ inches): 2

Pool Depth Max = 30: 5

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☑ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ AVERAGE BANKFULL WIDTH (~~meters~~ feet): 3

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 (Per Bank) L	R	FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☑	☑	Wide >10m	☑	☑	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS _____

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

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☑ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

- ☐ None
- ☐ 0.5
- ☐ 1.0
- ☐ 1.5
- ☐ 2.0
- ☐ 2.5
- ☐ 3.0
- ☑ >3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Yes Date of last precipitation: 5/12/13 Quantity: 0.2"

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): 10 %

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Yes If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

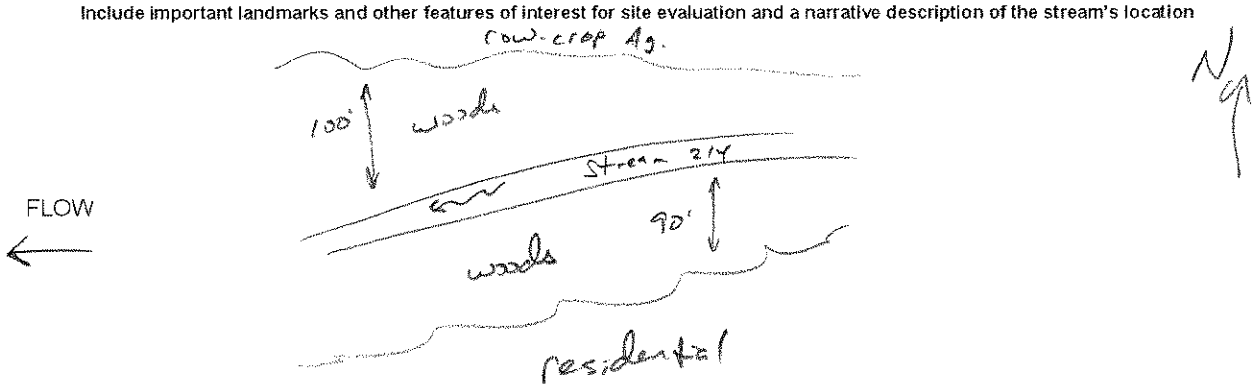
Comments Regarding Biology:_____

_____

_____

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

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



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 21

SITE NAME/LOCATION Stream 217

SITE NUMBER 217 RIVER BASIN Muscatatuck DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. 39.61125 LONG. 85.59765 RIVER CODE _____ RIVER MILE _____

DATE 5/14/13 SCORER A. Ball COMMENTS _____

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		☑	SILT [3 pt]	90
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]		☐	MUCK [0 pts]	
☑	SAND (<2 mm) [6 pts]	10	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 9 (B) 2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **TOTAL NUMBER OF SUBSTRATE TYPES:**

HHEI Metric Points

Substrate Max = 40: 11

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):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ 5 cm - 10 cm [15 pts]
- ☑ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ **MAXIMUM POOL DEPTH (~~centimeters~~ inches):** 1"

Pool Depth Max = 30: 5

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☑ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ **AVERAGE BANKFULL WIDTH (~~meters~~ feet):** 1.5

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 (Per Bank) L	R	FLOODPLAIN QUALITY (Most Predominant per Bank) L	R	L	R
☑	☑ Wide >10m	☐	☐ Mature Forest, Wetland	☐	☐ Conservation Tillage
☐	☐ Moderate 5-10m	☑	☑ Immature Forest, Shrub or Old Field	☐	☐ Urban or Industrial
☐	☐ Narrow <5m	☐	☐ Residential, Park, New Field	☐	☐ Open Pasture, Row Crop
☐	☐ None	☐	☐ Fenced Pasture	☐	☐ Mining or Construction

COMMENTS _____

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

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☑ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

☐ None	☐ 1.0	☑ 2.0	☐ 3.0
☐ 0.5	☐ 1.5	☐ 2.5	☐ >3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N):Yes Date of last precipitation: 5/12/13 Quantity: 0.2"

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): 20

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Yes If not, please explain:_____

_____

Additional comments/description of pollution impacts:_____

_____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

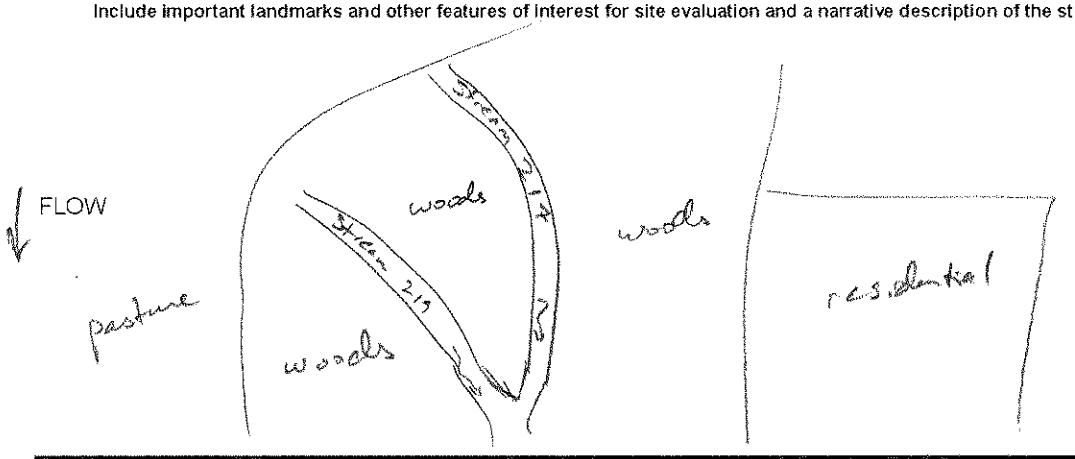
Comments Regarding Biology:_____

_____

_____

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

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



OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 21

SITE NAME/LOCATION Stream 219

SITE NUMBER 219 RIVER BASIN Muscatatuck DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. 39.01125 LONG. 85.5997 RIVER CODE _____ RIVER MILE _____

DATE 5/14/13 SCORER A.Ball COMMENTS _____

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		☑	SILT [3 pt]	90
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]		☐	MUCK [0 pts]	
☑	SAND (<2 mm) [6 pts]	10	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ (A) 9 (B) 2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **TOTAL NUMBER OF SUBSTRATE TYPES:**

HHEI Metric Points

Substrate Max = 40: 11

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):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☑ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ **MAXIMUM POOL DEPTH (~~centimeters~~ inches):** 1"

Pool Depth Max = 30: 5

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☑ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ **AVERAGE BANKFULL WIDTH (~~meters~~ feet):** 1.5

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 (Per Bank) L	R	FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☑	☑	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☑	☑	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS _____

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

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☑ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

☐ None	☐ 1.0	☑ 2.0	☐ 3.0
☐ 0.5	☐ 1.5	☐ 2.5	☐ >3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Yes Date of last precipitation: 5/12/13 Quantity: 0.2"

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): 20

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Yes If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

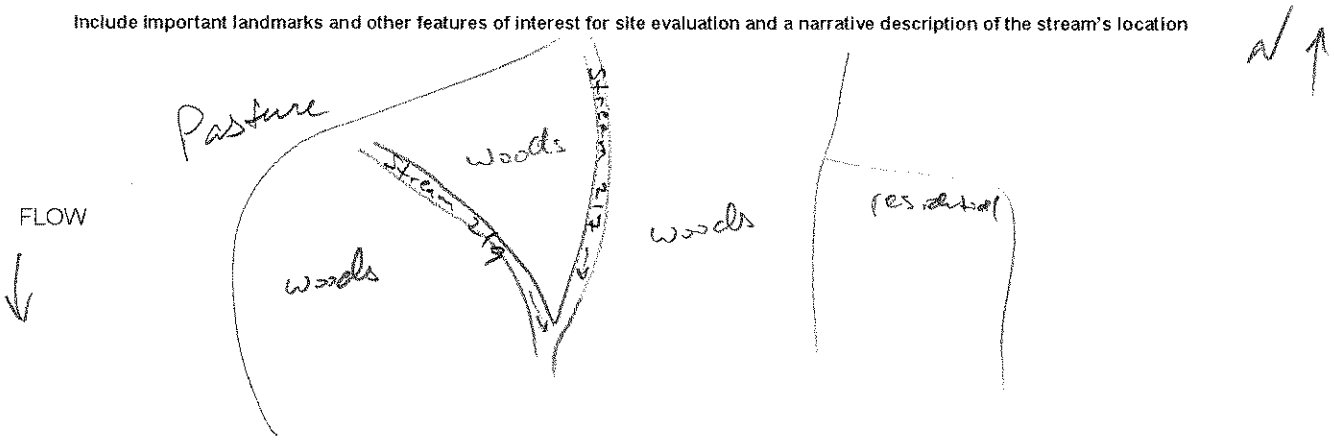
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

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

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



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 48

SITE NAME/LOCATION Stream 220

SITE NUMBER 220 RIVER BASIN Muscatatuck DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. 39.0104 LONG. 85.6008 RIVER CODE _____ RIVER MILE _____

DATE 5/14/13 SCORER A. Ball COMMENTS _____

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		☐	SILT [3 pt]	10
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☑	GRAVEL (2-64 mm) [9 pts]	60	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]	30	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 60 (A) 15

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES: (B) 3

HHEI Metric Points

Substrate Max = 40: 18

A + B

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

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☑ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (~~centimeters~~ inches): 3"

Pool Depth Max = 30: 15

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☑ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ AVERAGE BANKFULL WIDTH (~~meters~~ feet): 4

Bankfull Width Max=30: 15

This information must also be completed

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

RIPARIAN WIDTH L	R	(Per Bank)	FLOODPLAIN QUALITY L	R	(Most Predominant per Bank)	L	R	
☑	☑	Wide >10m	☑	☑	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS _____

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

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☑ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

- ☐ None
- ☐ 0.5
- ☐ 1.0
- ☐ 1.5
- ☐ 2.0
- ☐ 2.5
- ☑ 3.0
- ☐ >3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Yes Date of last precipitation: 5/12/13 Quantity: 0.2"

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): 20

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Yes If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

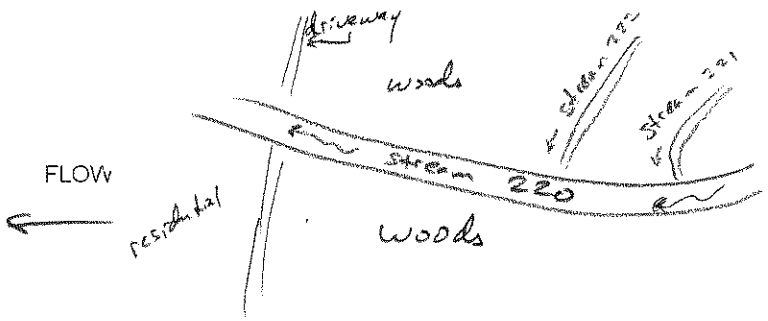
Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

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

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

NA



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 21

SITE NAME/LOCATION Stream 221

SITE NUMBER 221 RIVER BASIN Muscatatuck DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. 39.0107 LONG. 85.6010 RIVER CODE _____ RIVER MILE _____

DATE 5/14/13 SCORER A. Ball COMMENTS _____

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		☑	SILT [3 pt]	20
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]		☐	MUCK [0 pts]	
☑	SAND (<2 mm) [6 pts]	20	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 9 (B) 2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **TOTAL NUMBER OF SUBSTRATE TYPES:**

HHEI Metric Points

Substrate Max = 40: 11

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):

☐	> 30 centimeters [20 pts]	☐	5 cm - 10 cm [15 pts]
☐	> 22.5 - 30 cm [30 pts]	☑	< 5 cm [5 pts]
☐	> 10 - 22.5 cm [25 pts]	☐	NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (~~centimeters~~ inches): 1"

Pool Depth Max = 30: 5

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

☐	> 4.0 meters (> 13') [30 pts]	☐	> 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐	> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	☑	≤ 1.0 m (≤ 3' 3") [5 pts]
☐	> 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]		

COMMENTS _____ AVERAGE BANKFULL WIDTH (~~meters~~ feet): 1'

Bankfull Width Max=30: 5

This information must also be completed

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

RIPARIAN WIDTH L	R (Per Bank)	FLOODPLAIN QUALITY L	R (Most Predominant per Bank)	L	R	
☑	☑ Wide >10m	☑	☑ Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐ Moderate 5-10m	☐	☐ Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐ Narrow <5m	☐	☐ Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐ None	☐	☐ Fenced Pasture	☐	☐	Mining or Construction

COMMENTS _____

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

☐	Stream Flowing	☑	Moist Channel, isolated pools, no flow (Intermittent)
☐	Subsurface flow with isolated pools (Interstitial)	☐	Dry channel, no water (Ephemeral)

COMMENTS _____

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

☐	None	☐	1.0	☑	2.0	☐	3.0
☐	0.5	☐	1.5	☐	2.5	☐	>3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Yes Date of last precipitation: 5/12/13 Quantity: 0.2"

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): 30

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Yes If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

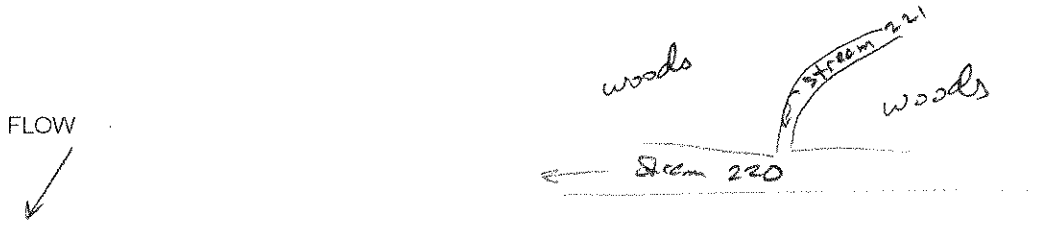
Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

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

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

N



OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 31

SITE NAME/LOCATION Stream 222

SITE NUMBER 222 RIVER BASIN Muscatatuck DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. 39.0109 LONG. 85.6011 RIVER CODE _____ RIVER MILE _____

DATE 5/14/13 SCORER A. Ball COMMENTS _____

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		☑	SILT [3 pts]	60
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]		☐	MUCK [0 pts]	
☑	SAND (<2 mm) [6 pts]	<1%	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 9 (B) 2

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points — Substrate Max = 40: 11 (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):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☑ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (~~centimeters~~ inches): 2"

Pool Depth Max = 30: 5

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☑ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ AVERAGE BANKFULL WIDTH (~~meters~~ feet): 4

Bankfull Width Max=30: 15

This information must also be completed

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

RIPARIAN WIDTH (Per Bank) L	R	FLOODPLAIN QUALITY (Most Predominant per Bank) L	R	L	R	
☑	☑	Wide >10m	☑ ☑	Mature Forest, Wetland	☐ ☐	Conservation Tillage
☐	☐	Moderate 5-10m	☐ ☐	Immature Forest, Shrub or Old Field	☐ ☐	Urban or Industrial
☐	☐	Narrow <5m	☐ ☐	Residential, Park, New Field	☐ ☐	Open Pasture, Row Crop
☐	☐	None	☐ ☐	Fenced Pasture	☐ ☐	Mining or Construction

COMMENTS _____

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

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☑ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

- ☐ None
- ☐ 0.5
- ☐ 1.0
- ☐ 1.5
- ☑ 2.0
- ☐ 2.5
- ☐ 3.0
- ☐ >3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Yes Date of last precipitation: 5/12/13 Quantity: 0.2"

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): 10

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Yes If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

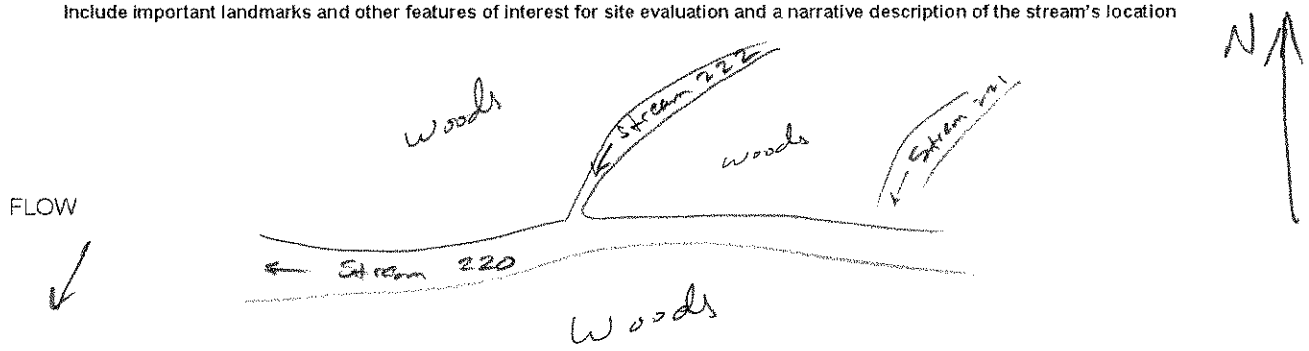
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)_____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

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

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



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 14

SITE NAME/LOCATION Stream 223

SITE NUMBER 223 RIVER BASIN Muscatatuck DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. 39.009726 LONG. 85.6028 RIVER CODE _____ RIVER MILE _____

DATE 5/14/13 SCORER A. Ball COMMENTS _____

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		☑	SILT [3 pts]	1215
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]		☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ (A) 3

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

(B) 1

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40: 4

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):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☑ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (~~centimeters~~ inches): 1"

Pool Depth Max = 30: 5

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☑ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ AVERAGE BANKFULL WIDTH (~~meters~~ feet): 1'

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☆

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
☐	☐	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☑	☑	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	Mining or Construction

COMMENTS _____

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

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☑ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

☑ None	☐ 1.0	☐ 2.0	☐ 3.0
☐ 0.5	☐ 1.5	☐ 2.5	☐ >3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____
☐ CWH Name: _____ Distance from Evaluated Stream _____
☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Yes Date of last precipitation: 5/12/13 Quantity: 0.2"

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): 90

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Yes If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

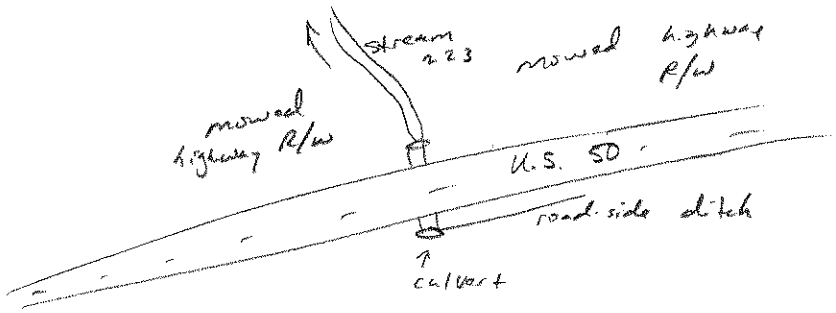
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)_____ Voucher? (Y/N)_____ Aquatic Macroinvertebrates Observed? (Y/N)_____ Voucher? (Y/N)_____

Comments Regarding Biology: _____

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

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



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 21

SITE NAME/LOCATION Stream 301

SITE NUMBER 301 RIVER BASIN Muscatatuck DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. 39.02482 LONG. 85.6181 RIVER CODE _____ RIVER MILE _____

DATE 5/14/13 SCORER A. Ball COMMENTS _____

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		☑	SILT [3 pt]	80
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]		☐	CLAY or HARDPAN [0 pt]	
☐	GRAVEL (2-64 mm) [9 pts]		☐	MUCK [0 pts]	
☑	SAND (<2 mm) [6 pts]	20	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 9

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

(B) 2

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40

11

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):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☑ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ **MAXIMUM POOL DEPTH (~~centimeters~~ inches):** 1"

Pool Depth Max = 30

5

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☑ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ **AVERAGE BANKFULL WIDTH (~~meters~~ feet):** 2'

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 (Per Bank) L	R	FLOODPLAIN QUALITY (Most Predominant per Bank) L	R	L	R
☑	☑ Wide >10m	☑	☑ Mature Forest, Wetland	☐	☐ Conservation Tillage
☐	☐ Moderate 5-10m	☐	☐ Immature Forest, Shrub or Old Field	☐	☐ Urban or Industrial
☐	☐ Narrow <5m	☐	☐ Residential, Park, New Field	☐	☐ Open Pasture, Row Crop
☐	☐ None	☐	☐ Fenced Pasture	☐	☐ Mining or Construction

COMMENTS _____

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

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☑ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

- ☐ None
- ☐ 0.5
- ☐ 1.0
- ☐ 1.5
- ☑ 2.0
- ☐ 2.5
- ☐ 3.0
- ☐ >3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☐ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____
☐ CWH Name: _____ Distance from Evaluated Stream _____
☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Yes Date of last precipitation: 5/12/13 Quantity: 0.2"

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): 20

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Yes If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

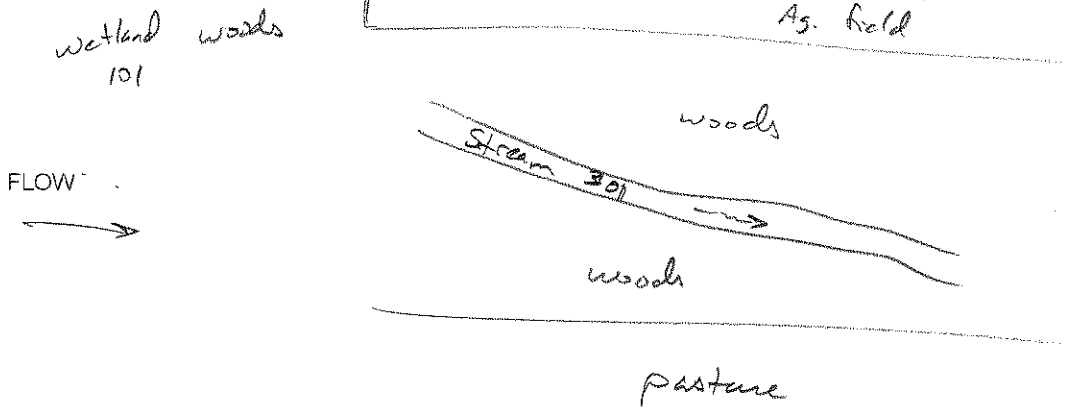
Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

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

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

N/A



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 15

SITE NAME/LOCATION Stream 303

SITE NUMBER 303 RIVER BASIN Muscatatuck DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. 39.0270 LONG. 85.6822 RIVER CODE _____ RIVER MILE _____

DATE 5/14/13 SCORER A. Ball COMMENTS _____

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		☑	SILT [3 pt]	60
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]		☑	CLAY or HARDPAN [0 pt]	40
☐	GRAVEL (2-64 mm) [9 pts]		☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ (A) 3

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

(B) 2

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40: 5

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):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☑ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (~~centimeters~~ inches): 2"

Pool Depth Max = 30: 5

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ ≥ 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☑ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ AVERAGE BANKFULL WIDTH (~~meters~~ feet): 2'

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 (Per Bank) L	R	FLOODPLAIN QUALITY (Most Predominant per Bank) L	R	L	R
☐	☐ Wide >10m	☐	☐ Mature Forest, Wetland	☐	☐ Conservation Tillage
☐	☐ Moderate 5-10m	☑	☑ Immature Forest, Shrub or Old Field	☐	☐ Urban or Industrial
☑	☑ Narrow <5m	☐	☐ Residential, Park, New Field	☐	☐ Open Pasture, Row Crop
☐	☐ None	☐	☐ Fenced Pasture	☐	☐ Mining or Construction

COMMENTS _____

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

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☑ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

- ☐ None
- ☐ 0.5
- ☐ 1.0
- ☐ 1.5
- ☑ 2.0
- ☐ 2.5
- ☐ 3.0
- ☐ >3

STREAM GRADIENT ESTIMATE

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

June 20, 2008 Revision

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)

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Yes Date of last precipitation: 5/12/13 Quantity: 0.2"

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): 30

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Yes If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)_____ Voucher? (Y/N)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____

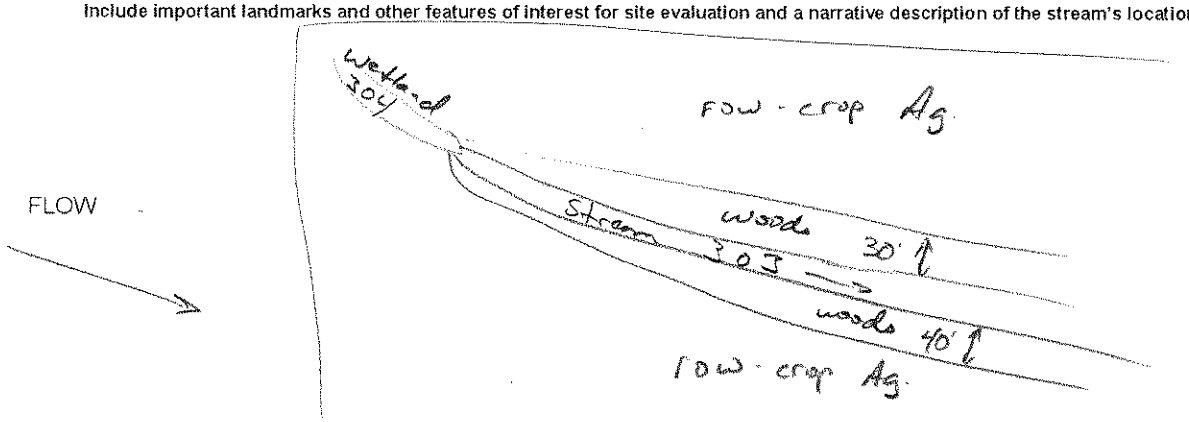
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology: _____

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

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

N



Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 45

SITE NAME/LOCATION Stream 311

SITE NUMBER 311 RIVER BASIN Muscatatuck DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. 39.0192 LONG. -85.6915 RIVER CODE _____ RIVER MILE _____

DATE 5/14/13 SCORER A-Ball COMMENTS _____

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

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

1. SUBSTRATE (Estimate percent of every type of substrate present. Check *ONLY* two predominant substrate *TYPE* boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE		PERCENT	TYPE		PERCENT
☐	BLDR SLABS [16 pts]		☐	SILT [3 pts]	10
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	
☐	BEDROCK [16 pts]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	20	☐	CLAY or HARDPAN [0 pt]	
☑	GRAVEL (2-64 mm) [9 pts]	40	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]	30	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 20% (A) 21 (B) 4

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40: 25

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):

- ☐ > 30 centimeters [20 pts]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☑ < 5 cm [5 pts]
- ☐ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (~~centimeters~~ inches): 2"

Pool Depth Max = 30: 5

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☑ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ AVERAGE BANKFULL WIDTH (~~meters~~ feet): 4'

Bankfull Width Max=30: 15

This information must also be completed

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

RIPARIAN WIDTH L	R (Per Bank)	FLOODPLAIN QUALITY L	R (Most Predominant per Bank)	L	R	
☑	☑ Wide >10m	☑	☑ Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐ Moderate 5-10m	☐	☐ Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐ Narrow <5m	☐	☐ Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐ None	☐	☐ Fenced Pasture	☐	☐	Mining or Construction

COMMENTS _____

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

- ☐ Stream Flowing
- ☐ Subsurface flow with isolated pools (Interstitial)
- ☑ Moist Channel, isolated pools, no flow (Intermittent)
- ☐ Dry channel, no water (Ephemeral)

COMMENTS _____

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

- ☐ None
- ☐ 0.5
- ☐ 1.0
- ☐ 1.5
- ☑ 2.0
- ☐ 2.5
- ☐ 3.0
- ☐ >3

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - ☐ Yes ☑ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: _____ Distance from Evaluated Stream _____
☐ CWH Name: _____ Distance from Evaluated Stream _____
☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name:_____ NRCS Soil Map Page:_____ NRCS Soil Map Stream Order _____

County: _____ Township / City:_____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Yes Date of last precipitation: 5/12/13 Quantity: 0.2"

Photograph Information: _____

Elevated Turbidity? (Y/N): _____ Canopy (% open): 30

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:_____

Field Measures: Temp (°C)_____ Dissolved Oxygen (mg/l) _____ pH (S.U.) _____ Conductivity (µmhos/cm) _____

Is the sampling reach representative of the stream (Y/N) Yes If not, please explain:_____

Additional comments/description of pollution impacts:_____

BIOTIC EVALUATION

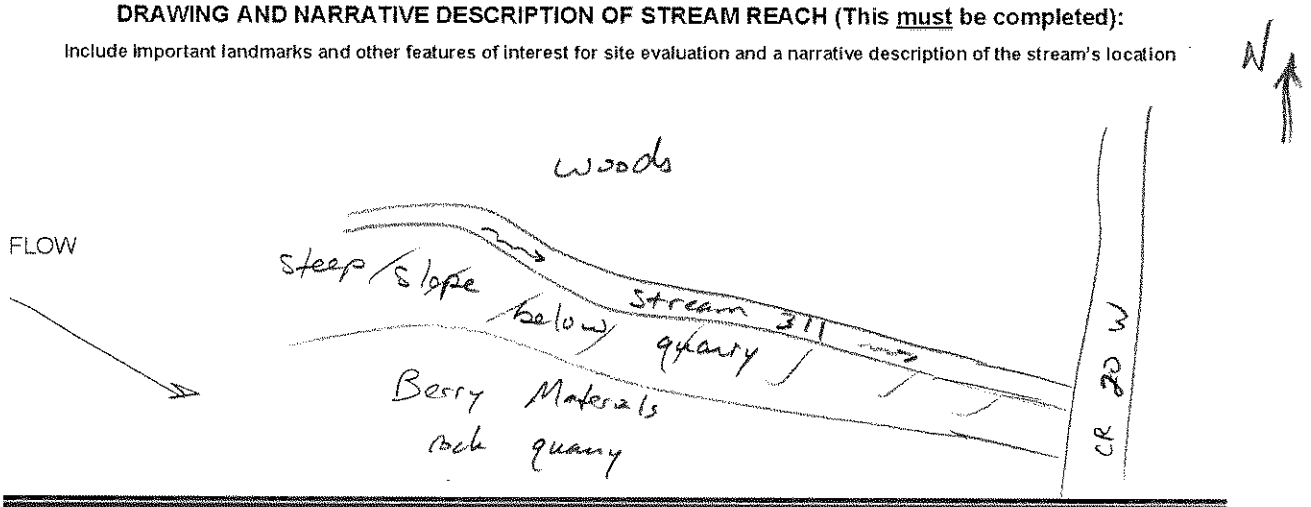
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N)____ Voucher? (Y/N)____ Salamanders Observed? (Y/N)____ Voucher? (Y/N)____
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

Comments Regarding Biology:_____

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

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



June 20, 2008 Revision

Ohio EPA — Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: 57

Stream & Location: Vernon Fork **RM:** ____ **Date:** 5/14/13

Scorers Full Name & Affiliation: A. Ball, Parsons

River Code: ___-___-___ **STORET #:** _____ **Lat./Long.:** (NAD 83 - decimal °) 39.0161 / 85.6130 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]	25	
☐ ☐ COBBLE [8]			☐ ☑ MUCK [2]	25	
☐ ☐ GRAVEL [7]			☐ ☑ SILT [2]	25	
☐ ☐ SAND [6]			☐ ☐ ARTIFICIAL [0]		
☐ ☑ BEDROCK [5]	25		(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 see Note on reverse

Substrate: 13 (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]	3 POOLS > 70cm [2]	____ OXBOWS, BACKWATERS [1]	
2 OVERHANGING VEGETATION [1]	____ ROOTWADS [1]	____ AQUATIC MACROPHYTES [1]	
____ SHALLOWS (IN SLOW WATER) [1]	____ BOULDERS [1]	____ LOGS OR WOODY DEBRIS [1]	
____ ROOTMATS [1]			

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

Comments

Cover Maximum 20: 10

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 Maximum 20: 11

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]
☐	☐	CONSERVATION TILLAGE [1]
☐	☐	URBAN OR INDUSTRIAL [0]
☐	☐	MINING / CONSTRUCTION [0]

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

Comments there is little erosion due to stable pool depth caused by nearby dam

Riparian Maximum 10: 7

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]
- ☑ SLOW [1]
- ☐ VERY FAST [1]
- ☐ INTERSTITIAL [-1]
- ☐ FAST [1]
- ☐ INTERMITTENT [-2]
- ☐ MODERATE [1]
- ☐ EDDIES [1]

Indicate for reach - pools and riffles.

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

Comments there are no Riffles/Runs in this area due to deep pool caused by dam

Pool / Current Maximum 12: 7

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 Maximum 8: 1

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

DRAINAGE AREA (108.9 mi²)

%POOL: 100 %GLIDE: — %RUN: — %RIFFLE: —

Gradient Maximum 10: 8

EPA 4520 06/16/06

A] SAMPLED REACH

Check ALL that apply

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

STAGE (1st-sample pass- 2nd)

	1st	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.

The Sampled reach of the Vernon Fork is permanently flooded by a dam approximately 1/4 mile downstream. Some observations noted on the front are from stream reaches below the dam or above the pool created by the dam.

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

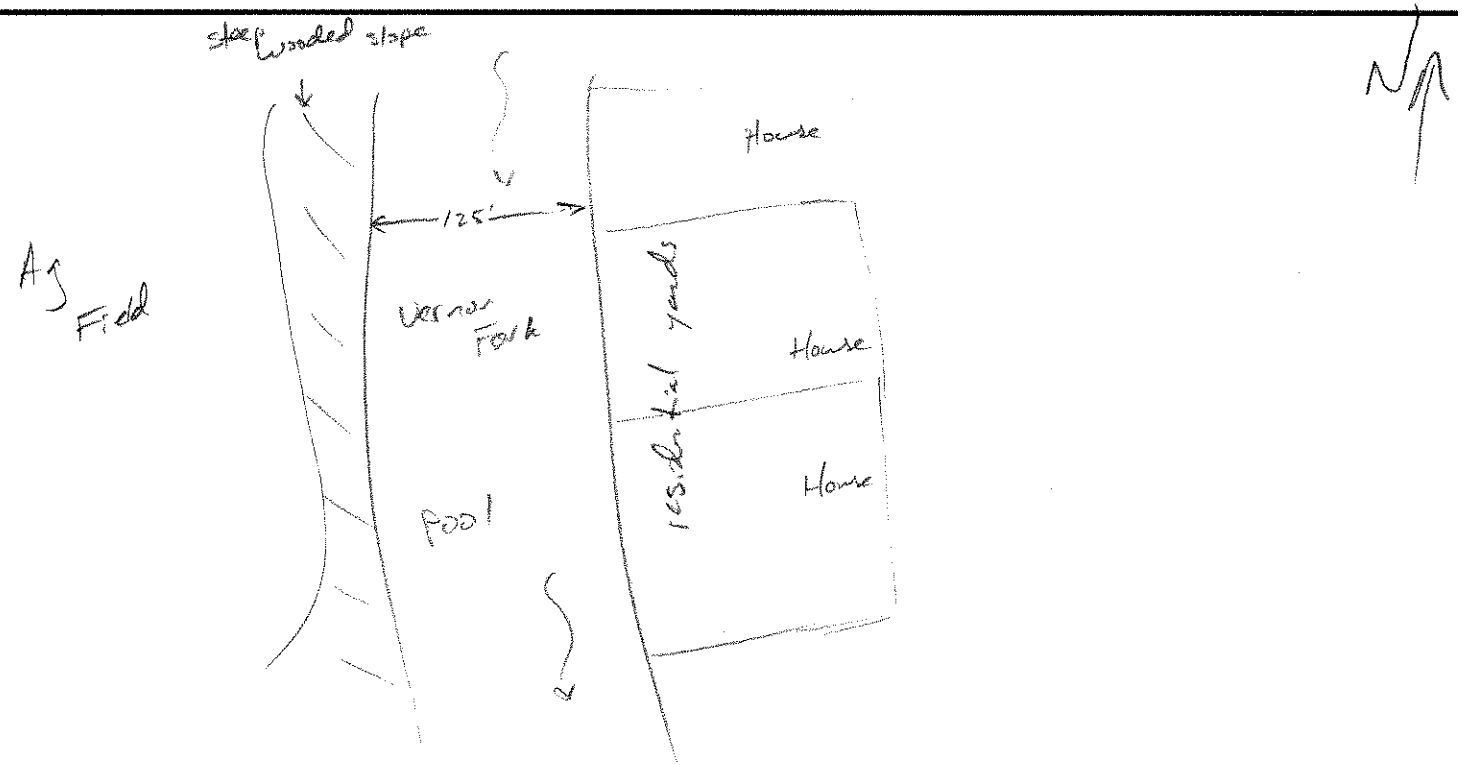
WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H_20 / TILE / H_20 TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN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



Appendix E

Pre-Jurisdictional Determination Form and Table

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): July 2013

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD: Parsons Transportation Group (Contact: Alan Ball), 101 West Ohio Street, Suite 2121, Indianapolis, IN 46204

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: **Louisville District**

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: INDOT plans to complete the US 50 Bypass of North Vernon. This new roadway project starts at SR 3 on the north side of North Vernon and continues east and then southeast to connect to existing US 50 near Jennings County Road 75 E (Deer Creek Road). INDOT Des. No. 1173374

(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)

State: IN County/parish/borough: Jennings County City: North Vernon
Center coordinates of site (lat/long in degree decimal format):
Lat. 39.021800°N, Long. -85.618400° W

Universal Transverse Mercator: Northing 4320103.76, Easting 619600.88 (Zone 16S)

Name of nearest waterbody: Vernon Fork of the Muscatatuck River

Identify (estimate) amount of waters in the review area:
Non-wetland waters: See attached table
Wetlands: 16.36 acres.
Cowardin Class: See attached table

Name of any water bodies on the site that have been identified as Section 10 waters:
Tidal: None
Non-Tidal: None

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:

☒ Field Determination. Date(s): October, 22-25, 2012 and May 14, 2013 (by Consultant)

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Various maps (See attached report).
- ☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps: .
- ☐ Corps navigable waters' study: .
- ☐ U.S. Geological Survey Hydrologic Atlas: .
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: North Vernon and Butlerville quads See Figure 2
- ☒ USDA Natural Resources Conservation Service Soil Survey. Citation: NRCS website (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm) See Figure 5
- ☒ National wetlands inventory map(s). Cite name: See Figure 2
- ☐ State/Local wetland inventory map(s): .
- ☒ FEMA/FIRM maps: See Figure 4
- ☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
- ☒ Photographs: ☒ Aerial (Name & Date): 2005, IN Geographic Information Council and 2012, INDOT.
- ☐ Previous determination(s). File no. and date of response letter: .
- ☐ Other information (please specify): .

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

July 2013

Signature and date of Regulatory Project Manager (REQUIRED)

Signature and date of person requesting preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

PJD Form Table: U.S. 50 North Vernon Bypass - East – Des. No. 1173374

Site Number	Latitude	Longitude	Cowardin Class	Estimated amount of aquatic resource in Study Area	Class of aquatic resource
Wetland 101	39.030400	-85.620400	PFO1	6.85 acres	non-section 10 - wetland
Wetland 102	39.030400	-85.622000	PEM1	9.23 acres	non-section 10 - wetland
Wetland 104	39.033000	-85.626180	PEM1	0.20 acre	non-section 10 - wetland
Wetland 209	39.011300	-85.599300	PEM1	0.02 acre	non-section 10 - wetland
Wetland 304	39.027400	-85.618800	PEM1	0.06 acre	non-section 10 - wetland
Stream 101	39.032800	-85.631700	R4SB3	230 linear feet	non-section 10
Stream 214	39.012600	-85.602400	R4SB4	349 linear feet	non-section 10
Stream 217	39.011250	-85.597650	R4SB4	32 linear feet	non-section 10
Stream 219	39.011250	-85.597700	R4SB4	46 linear feet	non-section 10
Stream 220	39.010400	-85.600800	R4SB5	304 linear feet	non-section 10
Stream 221	39.010700	-85.601000	R4SB5	108 linear feet	non-section 10
Stream 222	39.010900	-85.601100	R4SB5	359 linear feet	non-section 10
Stream 223	39.009260	-85.602800	R4SB5	140 linear feet	non-section 10
Stream 301	39.024820	-85.618100	R4SB5	316 linear feet	non-section 10
Stream 303	39.027000	-85.618220	R4SB5	270 linear feet	non-section 10
Stream 311	39.019200	-85.618150	R4SB3	622 linear feet	non-section 10
Vernon Fork	39.016100	-85.613000	R5UB	410 linear feet	non-section 10
Pond 205	39.011400	-85.602100	PUBGh	0.19 acre	non-section 10
Pond 306	39.022000	-85.617700	PUBGh	0.56 acre	non-section 10
Pond 307	39.021300	-85.618800	PUBGh	0.26 acre	non-section 10

Appendix F

Waters Upload Sheet

Appendix F: Waters Upload Sheet

Waters_Name	Cowadin_Code	HGM_Code	Area (acres)	Linear (ft)	Waters Types	Lat. (dd nad83)	Long. (dd nad83)	Local_Waterway
Wetland 101	PFO1	DEPRESS	6.85		NRPWW	39.030400	-85.620400	Tributary to Sixmile Creek
Wetland 102	PEM1	DEPRESS	9.23		NRPWW	39.030400	-85.622000	Tributary to Sixmile Creek
Wetland 104	PEM1	DEPRESS	0.20		NRPWW	39.033000	-85.626180	Tributary to Sixmile Creek
Wetland 209	PEM1	DEPRESS	0.02		NRPWW	39.011300	-85.599300	Tributary to Vernon Fork
Wetland 304	PEM1	DEPRESS	0.06		NRPWW	39.027400	-85.618800	Tributary to Woods Branch
Stream 101	R4SB3	RIVERINE		230	NRPW	39.032800	-85.631700	Tributary to Sixmile Creek
Stream 214	R4SB4	RIVERINE		349	NRPW	39.012600	-85.602400	Tributary to Vernon Fork
Stream 217	R4SB4	RIVERINE		32	NRPW	39.011250	-85.597650	Tributary to Deer Creek
Stream 219	R4SB4	RIVERINE		46	NRPW	39.011250	-85.597700	Tributary to Deer Creek
Stream 220	R4SB5	RIVERINE		304	NRPW	39.010400	-85.600800	Tributary to Vernon Fork
Stream 221	R4SB5	RIVERINE		108	NRPW	39.010700	-85.601000	Tributary to Vernon Fork
Stream 222	R4SB5	RIVERINE		359	NRPW	39.010900	-85.601100	Tributary to Vernon Fork
Stream 223	R4SB5	RIVERINE		140	NRPW	39.009260	-85.602800	Tributary to Vernon Fork
Stream 301	R4SB5	RIVERINE		316	NRPW	39.024820	-85.618100	Tributary to Woods Branch
Stream 303	R4SB5	RIVERINE		270	NRPW	39.027000	-85.618220	Tributary to Woods Branch
Stream 311	R4SB3	RIVERINE		622	NRPW	39.019200	-85.618150	Tributary to Vernon Fork
Vernon Fork	R5UB	RIVERINE		410	RPW	39.016100	-85.613000	Vernon Fork Muscatatuck River
Pond 205	PUB	DEPRESS	0.19		NRPWW	39.011400	-85.602100	Tributary to Vernon Fork
Pond 306	PUB	DEPRESS	0.56		NRPWW	39.022000	-85.617700	Tributary to Vernon Fork
Pond 307	PUB	DEPRESS	0.26		NRPWW	39.021300	-85.618800	Tributary to Vernon Fork