

APPENDIX E NATURAL RESOURCES ASSESSMENT REPORT

NATURAL RESOURCE ASSESSMENT REPORT

Wabash Hydrogen Energy Center Project
Vigo and Vermillion Counties, Indiana



Wabash Valley Resources LLC
444 W Sandford Ave
West Terre Haute, IN 47885
August 2024

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Prepared by:

The logo for AECOM, featuring the word "AECOM" in a bold, black, sans-serif font. The letter "E" is stylized with three horizontal bars.

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TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	METHODOLOGY	1
3.0	DESKTOP REVIEW FINDINGS – PHYSICAL RESOURCES	3
3.1	Study Area Setting	3
3.2	Soils	3
3.3	Aquatic Resources	4
3.4	Floodplains	4
4.0	SITE DESCRIPTION – BIOTIC RESOURCES	4
4.1	Terrestrial Land Cover Types	4
4.2	Aquatic Land Cover Types	5
5.0	REGULATORY ISSUES	5
5.1	Clean Water Act Waters of the U.S.	5
5.1.1	Wetlands	6
5.1.2	Streams	6
5.2	Non-Waters of the United States	7
5.2.1	Isolated Wetlands	7
5.2.2	Ephemeral Streams	9
5.2.3	Upland Drainage Features	9
5.3	Rivers and Harbors Act Section 10 Navigable Waters	9
5.4	Federally Listed and Protected Species	9
5.4.1	Indiana Bat	10
5.4.2	Northern Long-Eared Bat	10
5.4.3	Tricolored bat	11
5.5	Federal Species At Risk/Candidate Species/Experimental Populations	11
5.5.1	Monarch	12
5.5.2	Whooping Crane	12
5.6	Bald Eagle and Golden Eagle Protection Act	12
5.7	State-Listed Species, Natural and Managed Areas	13
6.0	CONCLUSION AND RECOMMENDATIONS	13
7.0	REFERENCES	14

Appendix A. Figures

Figure 1. Site Location USGS Topographic Map with FEMA/HUC Overlay

Figure 2A-F. Project Area Map

Figure 3A-F. Soils and Mine Map

Figure 4A-F. NWI and NHD Map

Figure 5A-F. Flood Zone Map

Figure 6A-F. Land Cover Map

Figure 7A-F. Delineated Features Map

Appendix B. USACE Data Forms and OEPA ORAM Forms**Appendix C. OEPA Stream Forms****Appendix D. Representative Photograph Logs**

Wetland Photograph Log

Stream Photograph Log

UDF Photograph Log

Appendix E. Threatened and Endangered Species Information**LIST OF TABLES**

Table 1. Soils in the Project Area	3
Table 2. Land Cover Types within the Project Area	4
Table 3. Delineated Wetlands within the Project Area	6
Table 4. Delineated Streams within the Project Area	7
Table 5. Delineated Isolated Wetlands within the Project Area	7
Table 6. Delineated Ephemeral Streams within the Project Area	8
Table 7. Upland Drainage Features within the Project Area	9
Table 8. IPaC List of Federally Protected Species for the Project Area	10

1.0 INTRODUCTION

Wabash Valley Resources LLC (WVR), in coordination with Gas Technology Institute (GTI), proposes to redevelop the existing WVR's Coal Gasification site into a prototype of the 21st Century Power Plant for gasification-based carbon-negative power and hydrogen co-production. This project is part of the Department of Energy's (DOE), 21st Century Power Plant initiative, which seeks to advance power generation along with hydrogen production beyond today's state-of-the-art to make power plants more adaptive to the electrical grid with net zero carbon emission by 2035. Project limits of disturbance, herein defined as the "Project Area", which totals approximately 143.22-acres, includes: an ammonia synthesis site, a hydrogen production and CO₂ capture site, one laydown/parking area, two injection well sites and two formation monitoring well sites (Appendix A, Figure 1).

AECOM Technical Services, Inc. (AECOM) was retained by WVR to provide a Natural Resource Assessment Report for the Project. The scope of work includes the following services:

- A delineation of Waters of the United States and isolated waters.
- Collection of data using sub-meter accuracy Global Positioning System (GPS) equipment.
- A habitat evaluation for federal and state-listed protected species.
- A report documenting the natural resources within the Project Area.

This Natural Resource Assessment Report has been prepared to assist WVR in their preliminary planning, so that construction activities may attempt to avoid or minimize impacts to environmental resources identified within the Project Area.

2.0 METHODOLOGY

AECOM performed background research prior to commencing fieldwork with additional research conducted following completion of fieldwork. Research included publicly available information on soils, water resources, geology, mapped wetlands, and rare species. Sources included, but were not limited to:

- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps (USFWS 2024a)
- U.S. Geological Survey (USGS) National Hydrography Dataset (NHD) for the state of Indiana (USGS 2022a)
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database for Vigo and Vermillion Counties, Indiana (USDA NRCS 2023a and 2023b)
- USGS 7.5-minute topographic quadrangles for Clinton (USGS 2022b) and New Goshen (USGS 2022c), Indiana
- Federal Emergency Management Agency (FEMA) floodplain mapping (FEMA 2011 and 2014)
- Indiana Department of Natural Resources (IDNR) Indiana Best Available Floodplain Mapping (IDNR 2017a and 2017b)
- USFWS Information for Planning and Consultation (IPaC) Official Species List (USFWS 2024b; Appendix D)
- Indiana Department of Natural Resources (IDNR) Heritage Data Center Request (Appendix E)
- Indiana Geographic Information Office Indiana Map Viewer (IGIO 2024)
- IDNR Coal Mine Information System (IDNR 2024a)

AECOM biologists surveyed the Project Area for potential jurisdiction wetlands and waterways, including isolated waters. AECOM identified habitat types, wetlands, waterbodies, and other regulated special aquatic sites. Wetlands were identified using the U.S. Army Corps of Engineers (USACE) 1987 Manual

(Environmental Laboratory 1987) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (USACE 2010), utilizing the routine on-site method for wetland delineation. As per the USACE guidance, trees and woody vines were evaluated in an approximate 30-foot radius plot; saplings and shrubs were evaluated in a 15-foot radius plot; and herbs were evaluated in a 5-foot radius plot. The wetland indicator status of these species was determined using the National Wetland Plant List (USACE 2023). At each sample plot, a spade shovel or a one-piece hand-auger was used to excavate the soil for inspection of the soil profile. Soil horizon depths were measured and recorded. Each distinct horizon in the soil profile was also examined for hue, value, and chroma using a Munsell Soil color chart (Kollmorgen Corporation 2010). In addition, the texture, physical characteristics, and redoximorphic features if present, of each horizon were noted. Sample plots were evaluated by visual inspection for the presence of wetland hydrologic indicators, including but not limited to inundation, observed saturation, water marks, drift lines, sediment deposits, water-stained leaves, surface scour, drainage patterns, and/or morphological plant adaptations. AECOM documented, using the most current USACE wetland determination data form, sample plots for each identified wetland and at least one corresponding upland plot. Indiana does not have a state-mandated wetland assessment protocol in place. Based on our experience with USACE and Indiana Department of Environmental Management, the Ohio Environmental Protection Agency (OEPA) Ohio Rapid Assessment Method (ORAM) version 5.0 (Mack 2001) qualitative wetland assessment would be acceptable as a qualitative wetland assessment by regulatory agencies. For the Project, the 10-page version of the ORAM form was utilized. AECOM classified each wetland according to the USFWS Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et. al. 1979). Identified wetlands were photographed from the datapoint at the four cardinal directions as well as the soil profile.

Streams were identified by the presence of a defined bed and bank and evidence of an ordinary high-water mark (OHWM). The USACE defines OHWM as “that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” (USACE 2005). Each identified stream was assessed using either the OEPA Headwater Habitat Evaluation Index (HHEI; OEPA 2020) or the OEPA Qualitative Habitat Evaluation Index (QHEI) data form (Rankin 2006), depending upon stream watershed size. Additionally, AECOM collected specific information about width, depth, and bank characteristics for all identified stream features. Identified streams were photographed showing upstream, downstream, and substrate images.

An upland drainage feature (UDF) is a non-jurisdictional drainage that does not meet the criteria of either a jurisdictional stream or a wetland. A UDF generally lacks an OHWM (USACE 2005) and is equivalent to a swale or an erosional feature as described by the USACE: “generally shallow features in the landscape that may convey water across upland areas during and following storm events. Swales usually occur on nearly flat slopes and typically have grass or other low-lying vegetation throughout the swale” (USACE 2007).

AECOM mapped the location of each field-delineated feature boundary using Global Positioning System (GPS) EOS Arrow units capable of sub-meter accuracy in conjunction with the ESRI Field Map application on Samsung tablets. The GPS data was imported into ESRI ArcMap Geographic Information System (GIS) software, where the data was reviewed, edited for quality and accuracy, and compiled in a format suitable for transfer and use by WVR. GIS analysis was performed on the field data to produce tables and maps required for a USACE Jurisdictional Determination.

Land cover observed within the Project Area were assigned a general classification based upon the principal land characteristics and vegetation cover of the location. These habitat community types were compared to the habitat preferences of known listed federal or state species.

3.0 DESKTOP REVIEW FINDINGS – PHYSICAL RESOURCES

3.1 Study Area Setting

The Project Area is geographically situated within the Wabash-Ohio Bottomlands, Wabash River Bluffs and Low Hills, and Illinois/Indiana Prairies (USEPA 2012). The Project site is located on the Clinton and New Goshen, Indiana USGS 7.5' Topographic Quadrangles (Appendix A, Figure 1; USGS 2022b and 2022c). Elevations in the Project Area range between approximately 480-feet to 630-feet above mean sea level. A desktop review of aerial imagery (ESRI 2020) indicates that land use in the Project Area is comprised primarily of development, cultivated crops, deciduous/mixed forests, grassland and shrub/scrub.

3.2 Soils

The Soil Survey for Vermillion and Vigo Counties (USDA NRCS 2023a and 2023b) identifies fifteen (15) soil mapping units within the Project Area. One (1) of these soil units, Ra, is classified as hydric, five (5) were classified as having hydric inclusions, and the remainder are classified as non-hydric soils (Table 1). Soil mapping units are shown on Appendix A, Figure 3. Hydric status was defined by NRCS Web Soil Survey (USDA NRCS 2023a and 2023b). A soil is considered hydric if the majority of its components are hydric. Non-hydric soils can have hydric components but are predominately non-hydric.

Table 1. Soils in the Project Area

Soil Map Unit	Mapping Unit Symbol	Drainage Class	Hydric Status
AlB2	Alford silt loam, 2 to 5 percent slopes, eroded	Well drained	Non-hydric
AlC3	Alford silt loam, 5 to 10 percent slopes, severely eroded	Well drained	Non-hydric
Ee	Eel silt loam	Moderately well drained	Hydric Inclusions
Fn	Fincastle silt loam, Bloomington Ridged Plain, 0 to 2 percent slopes	Somewhat poorly drained	Hydric Inclusions
HeG	Hennepin loam, 25 to 50 percent slopes	Well drained	Non-hydric
HkF	Hickory loam, 25 to 40 percent slopes	Well drained	Non-hydric
Ma	Made land	Well drained	Non-hydric
MuB2	Muren silt loam, 2 to 6 percent slopes, eroded	Moderately well drained	Hydric Inclusions
OrB	Orthents, loamy, 0 to 8 percent slopes	Well drained	Non-hydric
Ra	Ragsdale silt loam, 0 to 2 percent slopes	Poorly drained	Hydric
RuC2	Russell silt loam, Bloomington Ridged Plain, 5 to 10 percent slopes, eroded	Well drained	Non-hydric
RuD2	Russell silt loam, 12 to 18 percent slopes, eroded	Well drained	Non-hydric
Sh	Shoals silt loam, 0 to 2 percent slopes, frequently flooded, brief duration	Somewhat poorly drained	Hydric Inclusions
W	Water	-	-
XeB2	Xenia silt loam, 2 to 6 percent slopes, eroded	Moderately well drained	Hydric Inclusions

3.3 Aquatic Resources

The Project Area is located within the Gin Creek-Brouillets Creek [USGS Hydrologic Unit Code (HUC): 051201110303], North Coal Creek-Coal Creek [HUC: 051201110602], and South Salt Creek-Wabash River [HUC: 051201110604] watersheds (Appendix A, Figure 4). Review of USFWS NWI data indicates that five (5) PEM1Cx (Palustrine, Emergent, Persistent, Seasonally, Flooded, Excavated) and one R2UBH (Riverine, Lower Perennial, Unconsolidated Bottom, Permanently Flooded) wetlands are mapped within the Project Area (Appendix A, Figure 4). Four (4) of the PEM1Cx features were field verified as present and discussed in detail in Section 5.1, while the overlay for the R2UBH feature (Wabash River) falls within the Project Area. Aerial imagery shows the river actually does not.

Based on review of the USGS NHD, eleven (11) mapped streams were identified within the Project Area (Appendix A, Figure 4).

3.4 Floodplains

Approximately 0.42-acres of the Project Area is within a FEMA designated 100-year floodplain (FEMA 2011 and 2014). No IDNR Approximate Floodway/Fringe within the Project Area (IDNR 2017a and 2017b) (Appendix A, Figures 5).

4.0 SITE DESCRIPTION – BIOTIC RESOURCES

4.1 Terrestrial Land Cover Types

The National Land Cover Database has documented thirteen (13) national land cover types within the 143.22-acres of Project Area, (Table 2; Appendix A, Figure 6): Barren Land (Rock/Sand/Clay), Cultivated Crops, Deciduous Forest, Developed High Intensity, Developed, Low Intensity, Developed, Medium Intensity, Developed, Open Space, Emergent Herbaceous Wetlands, Grassland/Herbaceous, Mixed Forest, Open Water, Pasture/Hay and Shrub/Scrub.

Table 2. Land Cover Types within the Project Area

Vegetation Community Type	Description	Approximate Acreage Within the Project Area	Percentage of Project Area
Barren Land (Rock/Sand/Clay)	Areas with bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits, and other accumulations of earthen material.	10.92	7.6
Cultivated Crops	Areas used to produce annual crops, perennial woody crops, and actively tilled land.	20.44	14.3
Deciduous Forest	Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover.	40.50	28.4
Developed High Intensity	Areas with a high density of people living or working.	14.62	10.2
Developed, Low Intensity	Areas that have a mix of vegetation and constructed materials, with impervious surfaces making up 20–49% of the total cover.	3.77	2.6

Vegetation Community Type	Description	Approximate Acreage Within the Project Area	Percentage of Project Area
Developed, Medium Intensity	Areas as those with 50–79% impervious surfaces and a mix of vegetation and constructed materials.	12.16	8.5
Developed, Open Space	Areas with a mix of constructed materials and vegetation, but mostly vegetation like lawn grasses.	5.72	4.0
Wetlands	Areas where perennial vegetation covers more than 80% of the vegetative cover and the soil or substrate is periodically covered with or saturated with water.	3.51	2.5
Grassland/Herbaceous	Areas where more than 80% of the total vegetation is made up of graminoid or herbaceous vegetation.	23.77	16.5
Mixed Forest	Areas where trees make up more than 20% of the total vegetation cover and are generally over 5 meters tall.	4.22	2.9
Open Water	Areas with less than 25% vegetation or soil cover.	2.40	1.7
Pasture/Hay	Areas of grasses, legumes, or grass-legume mixtures that are planted for livestock grazing, hay crops, or seed production.	0.64	0.4
Shrub/Scrub	Areas where shrubs are the dominant vegetation, and are typically less than 5 meters tall.	0.55	0.4
Totals		143.22	100%

4.2 Aquatic Land Cover Types

The National Wetlands Inventory (NWI), identified approximately 5.98-acres classified as either Riverine or PEM consisting of one (1) perennial stream (Wabash River), and five (5) PEM wetlands within workspace located throughout the Project Area (Appendix A, Figure 4).

5.0 REGULATORY ISSUES

5.1 Clean Water Act Waters of the U.S

Jurisdictional waters of the United States (WOTUS), including wetlands, are protected under Section 404 of the Clean Water Act (CWA). The USACE and U.S. Environmental Protection Agency jointly define wetlands as “those areas that are inundated or saturated by surface or groundwater 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. Wetlands generally include swamps, marshes, bogs, and similar areas” (Wetlands Definitions. Code of Federal Regulations, Title 40, Pt. 230.3, Revised 2019.) The USACE’s 1987 Wetlands Delineation Manual, as supplemented by the 2010 Midwest regional supplement, requires evidence of hydric soils, positive hydrological indicators, and a prevalence of hydrophytic vegetation for determination that an area is a wetland. Section 404 jurisdictional waters other than wetlands include streams, rivers, and lakes. Presence of an OHWM and a continuous bed and bank are used to identify streams and tributaries.

The State of Indiana is currently under the regulatory regime governed by Pre-2015 (Rapanos) Consistent with Sackett decision. Below are wetlands or waterbodies provisionally classified as jurisdictional by the USACE under the CWA. Final jurisdictional determination of WOTUS can only be established by the USACE.

5.1.1 Wetlands

AECOM conducted a survey of the approximately 143.22-acres of Project Area on June 11th-13th, and July 10th-11th, and found four (4) wetlands totaling 0.26-acre. Two (2) palustrine emergent wetlands (W-CMS-007 and W-CMS-008), one (1) forested wetland (W-CMS-006), and one (1) palustrine emergent/shrub-scrub/ forested wetland (W-CMS-001), are within the Project Area. Impacts to wetlands will be minimized to the greatest extent possible (photos in Appendix D; data forms in Appendix B; Table 3).

Table 3. Delineated Wetlands within the Project Area

Waters Name ¹	Cowardin	NWI Mapped Feature	Jurisdictional Connectivity ³	Local Waterway	Lat/Long	OEPA ORAM Score ⁴	OEPA ORAM Classification ⁴	Amount (acres) ²
W-CMS-001	PEM/PSS/PFO	No	Yes	Wabash River	39.534327°, -87.424367°	57	2	0.05
W-CMS-006	PFO	No	Yes	Wabash River	39.539358°, -87.436173°	46	2	0.14
W-CMS-007	PEM	No	Yes	Wabash River	39.539358°, -87.436173°	37	Modified 2	0.03
W-CMS-008	PEM	No	Yes	Wabash River	39.539358°, -87.436173°	37	Modified 2	0.04
Total								0.26

1. Field ID

2. Total Acres delineated; areas within the Project Area

3. Waters Type***: WOTUS definition based upon the Pre-2015 Regulatory Regime consistent with Sackett Ruling:

1. Commerce- includes those waters with tides (streams and wetlands).

2. Interstate- wetlands and streams.

3. All other waters that could impact interstate or foreign commerce – wetlands and streams.

a) Used for recreation or other purposes

b) Fish or shellfish are taken and sold in interstate or foreign commerce

c) Industrial purposes by industries in interstate commerce.

4. Impoundments – wetlands and streams

5. Tributaries to water types 1-4

6. Territorial sea

7. Adjacent wetlands- wetlands adjacent to waters identified in water types 1-6.

***All waters not meeting these definitions are presumed to be isolated and therefore, federally non-jurisdictional. The table identifies wetlands as either likely jurisdictional or likely isolated with a final determination made by the USACE. Likely jurisdictional wetlands were designated to have a physical surface connection as Water Type 7 – “Adjacent wetland.”

4. ORAM – Ohio Rapid Assessment Method for Wetlands (Mack, 2001)

5.1.2 Streams

One (1) intermittent stream totaling 292-linear feet were identified within the Project area (photos in Appendix D; data forms in Appendix C; Table 4).

Table 4. Delineated Streams within the Project Area

Waters Name ¹	Type/Code	NWI/NHD Mapped Feature	Classification ⁴	Jurisdictional Connectivity ³	OHWM Width x Depth (ft)	Lat/Long	Local Waterway	OEPA HHEI Score	Amount (feet) ²
S-CMS-043	Intermittent	Yes	Class III PHW	Tributary to Wabash River	10'x0.4'	39.53897, -87.43622	Wabash River	60	292
Total									292

1. Field ID

2. Total length delineated

3. Waters Type^{***}: WOTUS definition based upon the Pre-2015 Regulatory Regime consistent with Sackett Ruling:

1. Commerce- includes those waters with tides (streams and wetlands).
2. Interstate- wetlands and streams.
3. All other waters- those that could impact interstate or foreign commerce (wetlands and streams)
 - a) Used for recreation or other purposes
 - b) Fish or shellfish are taken and sold in interstate or foreign commerce
 - c) industrial purposes by industries in interstate commerce.
4. Impoundments – wetlands and streams
5. Tributaries to water types 1-4
6. Territorial sea

7. Adjacent wetlands- wetlands adjacent to waters identified in water types 1-6.

*****All waters not meeting these definitions are presumed to be isolated and therefore, federally non-jurisdictional. The table identifies streams as either likely jurisdictional or likely isolated with a final determination made by the USACE. Likely jurisdictional streams are denoted with the water type as defined in current WOTUS regulations. Likely isolated streams are denoted in the table as "isolated." Ephemeral streams are considered non-federally jurisdictional and are therefore isolated.**

⁴QHEI – Qualitative Habitat Evaluation Index (Ohio EPA) Provisional Aquatic Life Use Classification follows:

EWH- Exceptional Warm Water Habitat
 WWH- Warm Water Habitat
 MWH- Modified Warm Water Habitat
 LRW- Limited Resource Waters

5.2 Non-Waters of the United States

Non-Waters of the United States (WOTUS) waters include bodies of water that are not protected by the Clean Water Act (CWA):

- Wetlands: Wetlands that are isolated or don't have a continuous surface connection to WOTUS are likely not considered WOTUS. This includes vernal pools and prairie potholes. Seasonal wetlands that are connected to a relatively permanent water for part of the year may be considered WOTUS, depending on agency guidance.
- Ephemeral drainages: Some rivers, streams, lakes, and ponds are no longer protected by the CWA.
- Artificial bodies of water: These include:
 - Reflecting pools, swimming pools, and other small ornamental bodies of water
 - Waterfilled depressions created during construction
 - Pits excavated for fill, sand, or gravel
 - Artificial lakes or ponds used for irrigation, stock watering, rice growing, or settling basins
- Ditches: Ditches that are excavated in dry land and don't carry a permanent flow of water, including roadside ditches
- Artificially irrigated areas: Areas that would revert to dry land if irrigation stopped

5.2.1 Isolated Wetlands

Four isolated wetlands W-CMS-002, W-CMS-003, W-CMS-004, and W-CMS-005 were observed within the Project Area appear to have no jurisdictional connectivity to Waters of the U.S. (WOTUS) (photos in Appendix D; data forms in Appendix B; Table 5).

Table 5. Delineated Isolated Wetlands within the Project Area

Waters Name ¹	Cowardin	NWI Mapped Feature	Jurisdictional Connectivity ³	Local Waterway	Lat/Long	OEPA ORAM Score ⁴	OEPA ORAM Classification ⁴	Amount (acres) ²
W-CMS-002	PFO	No	No	Wabash River	39.535503°, -87.424145°	13	1	0.01

Waters Name ¹	Cowardin	NWI Mapped Feature	Jurisdictional Connectivity ³	Local Waterway	Lat/Long	OEPA ORAM Score ⁴	OEPA ORAM Classification ⁴	Amount (acres) ²
W-CMS-003	PEM	Yes	No	Brouilletts Creek	39.622484°, -87.488098°	21	1	2.96
W-CMS-004	PEM	Yes	No	Brouilletts Creek	39.623252°, -87.487345°	9	1	0.14
W-CMS-005	PEM	Yes	No	Brouilletts Creek	39.623781°, -87.486961°	7	1	0.14
Total								3.25

5.2.2 Ephemeral Streams

Thirteen (13) ephemeral streams (S-CMS-001, S-CMS-002, S-CMS-003, S-CMS-005, S-CMS-006, S-CMS-007, S-CMS-021, S-CMS-022, S-CMS-023, S-CMS-035, S-CMS-042, S-CMS-044 and S-CMS-045), totaling 2,849-linear feet were identified within the Project area (photos in Appendix D; data forms in Appendix C; Table 6).

Table 6. Ephemeral Streams within the Project Area

Waters Name ¹	Type/Code	NWI/NHD Mapped Feature	Classification ⁴	Jurisdictional Connectivity ³	OHWL Width x Depth (ft)	Lat/Long	Local Waterway	Amount (feet) ²
S-CMS-001	Ephemeral	No	Class II PHW	NA	2.25'x0.5'	39.53384, -87.42707	Wabash River	42
S-CMS-002	Ephemeral	No	Class I PHW	NA	1x0.25'	39.53383, -87.42725	Wabash River	55
S-CMS-003	Ephemeral	No	Class I PHW	NA	1x0.25'	39.53385, -87.42739	Wabash River	68
S-CMS-005	Ephemeral	No	Class I PHW	NA	2'x0.25'	39.53479, -87.42407	Wabash River	22
S-CMS-006	Ephemeral	No	Class I PHW	NA	2'x0.25'	39.53570, -87.42578	Wabash River	901
S-CMS-007	Ephemeral	No	Class I PHW	NA	2'x0.1'	39.53667, -87.42577	Wabash River	202
S-CMS-021	Ephemeral	No	Modified Class I PHW	NA	2'x0.25'	39.54015, -87.42549	Wabash River	510
S-CMS-022	Ephemeral	No	Class I PHW	NA	2'x0.2'	39.53977, -87.42490	Wabash River	493
S-CMS-023	Ephemeral	No	Class I PHW	NA	1'x0.1'	39.53913, -87.42492	Wabash River	31
S-CMS-035	Ephemeral	No	Class I PHW	NA	3'x0.2'	39.53925, -87.43230	Wabash River	105

Waters Name ¹	Type/Code	NWI/NHD Mapped Feature	Classification ⁴	Jurisdictional Connectivity ³	OHWM Width x Depth (ft)	Lat/Long	Local Waterway	Amount (feet) ²
S-CMS-042	Ephemeral	No	Class I PHW	NA	2'x0.2'	39.53880, -87.43588	Wabash River	168
S-CMS-044	Ephemeral	No	Class I PHW	NA	1.5'x0.2'	39.53977, -87.43602	Wabash River	210
S-CMS-045	Ephemeral	No	Class I PHW	NA	0.75'x0.1'	39.53983, -87.43607	Wabash River	42
Total								2849

5.2.3 Upland Drainage Features

Two (2) non-jurisdictional manmade Upland Drainage Features (UDFs) were identified within the Project Area (Table 7; Appendix A, Figure 7 with photographs in Appendix D).

Table 7. Upland Drainage Features within the Project Area

Waters Name ¹	Length (feet)	Lat/Long	Description	Length (feet)
UDF-CMS-001	449	39.531135, -87.427953	Manmade ditch and drains into a UNT to the Wabash River	449
UDF-CMS-002	94	39.532370, -87.428029	Manmade ditch that flows into UDF-CMS-001	94
Total				543

1. Field ID

2. Will have no area of potential disturbance.

5.3 Rivers and Harbors Act Section 10 Navigable Waters

Section 10 of the Rivers and Harbors Act protects navigable waters of the US. Navigable waters are defined as “those waters that are subject to the ebb/flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.” The Project Area and the adjacent properties do not contain any navigable waters that meet the Section 10 of the Rivers and Harbors Act criteria.

5.4 Federally Listed and Protected Species

Species with the federal listing of Threatened or Endangered are protected under the Endangered Species Act (ESA) of 1976, as amended (16 U.S.C. 1531 et seq.). AECOM obtained federally listed endangered and threatened species data from the USFWS IPaC which generates a list of species and other resources that are known or expected to be within or near the Project Area (Table 8). The IPaC includes considerations for species range and potential indirect impacts. The IPaC Official Species List, generated on June 3, 2024, for the Project indicated that no critical habitat was identified within the vicinity of the Project (Appendix E).

Based on the IPaC review, three (3) mammals, one (1) bird, and one (1) insect species were identified as having the potential occur within the Project Area (USFWS 2024b). All federally listed species are discussed further within this section.

Table 8. IPaC List of Federally Protected Species for the Project Area

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion
Mammals:				
<i>Myotis sodalis</i>	Indiana bat	E	No	May Effect
<i>Myotis septentrionalis</i>	northern long-eared bat	E	No	May Effect
<i>Perimyotis subflavus</i>	tricolored bat	PE	No	May Effect
Insects:				
<i>Danaus plexippus</i>	monarch butterfly	C	No	May Effect
Avian:				
<i>Grus americana</i>	whooping crane	EP	No	Not Likely to Effect

C – Candidate

E – Endangered

EP – Experimental Population, Non-Essential

PE – Proposed Endangered

5.4.1 Indiana Bat

The Indiana bat (*Myotis sodalis*) is a medium-sized bat with chestnut brown to dark gray fur. The Indiana Bat is listed as endangered under the ESA. They are found over most of the eastern United States, with some states supporting populations of over 40,000 individuals including Indiana, Missouri, Kentucky, Illinois, and New York (USFWS 2006). From mid-autumn to early spring, Indiana bats hibernate in fissure caves in felsic rocks, or occasionally in abandoned mines, called hibernacula. In summer, they typically live in wooded or semi-wooded areas. Pregnant females will group together to form maternity colonies in crevices of trees or under loose, peeling bark of live trees. Typically, large (>9 inches in diameter at breast height [DBH]) dead and/or dying trees, exposed to direct sunlight throughout the day are preferred roosting sites for female Indiana bats (USFWS 2008). Male Indiana bats may utilize much smaller trees. A wide variety of tree species, including maple (*Acer* spp.), hickory (*Carya* spp.), ash (*Fraxinus* spp.), oak (*Quercus* spp.), elm (*Ulmus* spp.), pine (*Pinus* spp.), hemlock (*Tsuga canadensis*) and others, may be used for roosting. Indiana Bats are also known to roost in human-made structures such as bridges, sheds, houses, and abandoned churches (USFWS 2004).

To determine the likelihood of potential hibernacula present within 0.25-mile of the Project Area, a desktop assessment was conducted. Based on the Indiana Geographic Information Office IndianaMap Viewer (IGIO 2024) and IDNR Coal Mine Information System (IDNR 2024a) there are recorded underground mines within the 0.25-mile buffer of the Project Area. Suitable roost habitat with foraging opportunities was present within the deciduous and mixed forests within the Project Area. AECOM provisionally determined that Indiana bats are likely to occur within the Project Area do the presence of suitable summer habitat and proximity of the Wabash River. Due to the potential bat roost trees located within the Project Area, AECOM opines a preliminary determination of may affect.

5.4.2 Northern Long-Eared Bat

The northern long-eared bat (NLEB; *M. septentrionalis*) is a medium sized bat, around 3 – 3.7 inches in length and a wingspan of 9 to 10 inches, that is distinguished by its long ears. Although the fur color is variable, these bats are typically medium brown on the upperparts with lighter belly fur (USFWS 2022d). On November 29, 2022, the USFWS published a final rule to reclassify the northern long-eared bat as

endangered under the ESA which become effective on March 31, 2023 (USFWS 2022b). This species of bat can be found through much of the eastern United States, as well as eight Canadian provinces (USFWS 2022d). The NLEB spends winters hibernating in caves and mines with constant temperatures, high-humidity, and no air currents. During the summer, the NLEB roosts, singly or in colonies, underneath sloughing bark, in cavities or crevices of both live and dead trees. NLEB tend to be more flexible in selecting roosts, choosing trees based on suitability to retain bark or provide cavities or crevices. These species are also rarely found roosting in structures such as barns or sheds.

To determine the likelihood of potential hibernacula present within 0.25-mile of the Project Area, a desktop assessment was conducted. Based on the Indiana Geographic Information Office IndianaMap Viewer (IGIO 2024) and IDNR Coal Mine Information System (IDNR 2024a) there are recorded underground mines within the 0.25-mile buffer of the Project Area. Suitable roost habitat with foraging opportunities was present within the deciduous and mixed forests within the Project Area. AECOM provisionally determined that Indiana bats are likely to occur within the Project Area do the presence of suitable summer habitat and proximity of the Wabash River. Due to the potential bat roost trees located within the Project Area, AECOM opines a preliminary determination of may affect.

5.4.3 Tricolored bat

Tricolored bat (*Perimyotis subflavus*) is one of the smallest native bats in North America, their body measuring only 3-3.5 inches long. Tricolored bats are distinguished by their unique tricolored fur that appears dark at the base, lighter in the middle and dark at the tip (USFWS 2022e). On September 14, 2022, the USFWS announced the proposed rule to list the tricolored bat as an endangered species under the ESA (USFWS 2022c). The tricolored bat spends the winter hibernating in caves, mines, or other underground structures that provide cool, humid areas with stable temperatures. During the summer, the tricolored bat predominately roost in trees, primarily among leaves of live or recently dead deciduous hardwood trees, in open woods near the edges of water (Fugita 1984). They rarely roost in structures, including bridges.

To determine the likelihood of potential hibernacula present within 0.25-mile of the Project Area, a desktop assessment was conducted. Based on the Indiana Geographic Information Office IndianaMap Viewer (IGIO 2024) and IDNR Coal Mine Information System (IDNR 2024a) there are recorded underground mines within the 0.25-mile buffer of the Project Area. Suitable roost habitat with foraging opportunities was present within the deciduous and mixed forests within the Project Area. AECOM provisionally determined that Indiana bats are likely to occur within the Project Area do the presence of suitable summer habitat and proximity of the Wabash River. Due to the potential bat roost trees located within the Project Area, AECOM opines a preliminary determination of may affect.

5.5 Federal Species At Risk/Candidate Species/Experimental Populations

Monarch butterfly is a candidate to the ESA with the potential to occur within the Project Area. However, there is no current regulatory framework to protect the species or its habitat for projects that lack a federal nexus.

Whooping Crane is designated as an Experimental Population, Non-Essential to the ESA and has the potential to occur within the Project Area. By definition, the experimental population is not essential to the continued existence of the species. Therefore, any effects to the species as a result of the Project activities are not considered to risk jeopardizing the species population.

5.5.1 Monarch

Monarch butterfly (*Danaus plexippus*) is a large and conspicuous orange and black butterfly species of the Nymphalidae family. It's well known for having a generation that annually makes a large migration south across the United States and winters in Mexico. During spring migration, important nectar sources typically include tickseed, arrowwood and phlox species. Although adult monarch butterflies forage for nectar on a wide variety of flowering plants through migration and breeding, they only breed and lay eggs on their host plant, the milkweed (*Asclepias* spp.; USFWS 2022a). Monarch butterfly larvae, or caterpillars, are completely dependent on milkweed host plants. This species is dependent on approximately 25 different species of milkweed in eastern North America. Milkweed decline in both agricultural and urban landscapes is one of the primary reasons that monarchs are in trouble today (National Wildlife Federation 2022).

In December 2020, the USFWS determined that the monarch butterfly was warranted for listing but excluded because of other priorities. It was added to the candidate list, meaning it has no regulatory requirements; however, some federal agencies place special conditions on candidate species for projects with a federal nexus (e.g., located on federal lands, requiring federal permits).

Flowering plants, such as goldenrod, milkweeds and aster species, were observed within the Project study area. Therefore, AECOMs opines a preliminary determination of may affect.

5.5.2 Whooping Crane

The Whooping Crane (*Grus americana*) population continues to use ancestral breeding areas, migration routes, and wintering grounds. The Whooping Crane Recovery Team, an international coalition of governmental agencies and private organizations, taught captive-bred Whooping Cranes a migration route from central Wisconsin to the Gulf Coast of Florida to establish a migratory population of Whooping Cranes in the eastern United States (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2005). Most of the Eastern flock spends the summer nesting season on or around Necedah National Wildlife Refuge in central Wisconsin. Nests are typically situated within poorly drained, interspersed with numerous shallow-water wetlands, most with soft marl bottoms, that vary in size, shape, and depth (Urbanek and Lewis 2020). Currently, the birds occasionally stop during the fall and spring migrations in Indiana to rest and feed in wet meadows, sloughs and crop fields. In Indiana, whooping cranes are listed as state endangered (IDNR 2024b).

While Whooping Cranes may be observed in Indiana during fall and spring migration, nesting does not occur within the state. Further, the Project Area does not have any wet meadows, sloughs. Large amount of crop lands that would provide suitable stopover habitat were present. Therefore, AECOM opines a preliminary determination of not likely to affect.

5.6 Bald Eagle and Golden Eagle Protection Act

Habitat for the Bald Eagle (*Haliaeetus leucocephalus*) primarily consists of mature forest in proximity to large bodies of open water for foraging. Large, dominant trees are utilized for nesting sites, typically within one-mile of open water. The closest open water feature is the Wabash River. Based on eBird records; there are a number of Bald Eagle observations along the River during typical nesting/post-breeding months (March-July). Deciduous/mixed forest for potential Bald Eagle nest sites is within the Project Area, however no nest were identified during the survey.

5.7 State-Listed Species, Natural and Managed Areas

AECOM requested information from the Indiana Department of Natural Resources (IDNR) for threatened and endangered (T&E) species, natural areas, and exemplary natural communities within the general vicinity of the Project. AECOM is currently awaiting a response from the IDNR.

6.0 CONCLUSION AND RECOMMENDATIONS

AECOM conducted a survey of the approximately 143.22-acres of Project Area on June 11th-13th, and July 10th-11th, and this report has determined the following:

- It was determined that W-CMS-001, W-CMS-006, W-CMS-007, and W-CMS-008 within the Project Area appear to have jurisdictional connectivity to Waters of the U.S. (WOTUS) therefor making them WOTUS.
- It was determined that W-CMS-002, W-CMS-003, W-CMS-004, and W-CMS-005 within the Project Area appear to have no jurisdictional connectivity to Waters of the U.S. therefor making them Non-Waters of the U.S.
- It was determined that the intermittent stream S-CMS-043 within the Project Area appear to have jurisdictional connectivity to Waters of the U.S. (WOTUS) therefor making it WOTUS.
- Thirteen (13) ephemeral streams S-CMS-001, S-CMS-002, S-CMS-003, S-CMS-005, S-CMS-006, S-CMS-007, S-CMS-021, S-CMS-022, S-CMS-023, S-CMS-035, S-CMS-042, S-CMS-044 and S-CMS-045 appear to not have permanent, standing, or continuously flowing bodies of water therefor making them Non-Waters of the U.S.
- Approximately 0.42-acres of FEMA 100-year Floodplain is mapped within the Project Area.
- Summer (roosting) habitat for the two (2) federally endangered and one (1) proposed endangered bat species was identified within the Project Area or vicinity. The Project has provisionally been determined to have a may affect upon federally listed species. No critical habitat was identified within the vicinity of the Project.
- Flowering plants, such as goldenrod, milkweeds and aster species, were observed within the Project study area. Therefore, AECOM opines a preliminary determination for the monarch butterfly of may affect.
- Large amount of crop lands that would provide suitable stopover habitat were present for whooping crane. Therefore, AECOM opines a preliminary determination of not likely to affect.
- Based on eBird records; there are a number of Bald Eagle observations along the River during typical nesting/post-breeding months (March-July). Deciduous/mixed forest for potential Bald Eagle nest sites is within the Project Area, however no nest were identified during the survey.
- Coordination with IDNR is pending.

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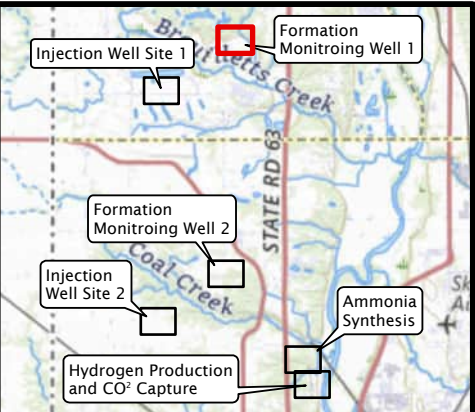
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APPENDIX A
Figures

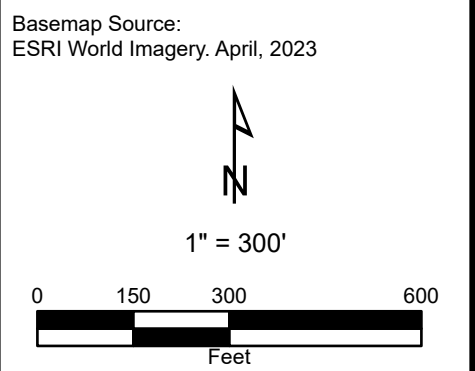
Figure 1. Site Location USGS Topographic Map with FEMA/HUC Overlay


Figure 2A-F. Project Area Map

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- LEGEND:**
- Project Area
 - 10 Foot Contour (USGS)
 - Well Type**
 - Monitoring Well





WABASH VALLEY
RESOURCES

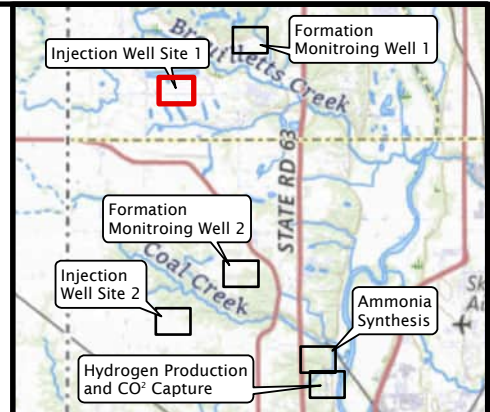
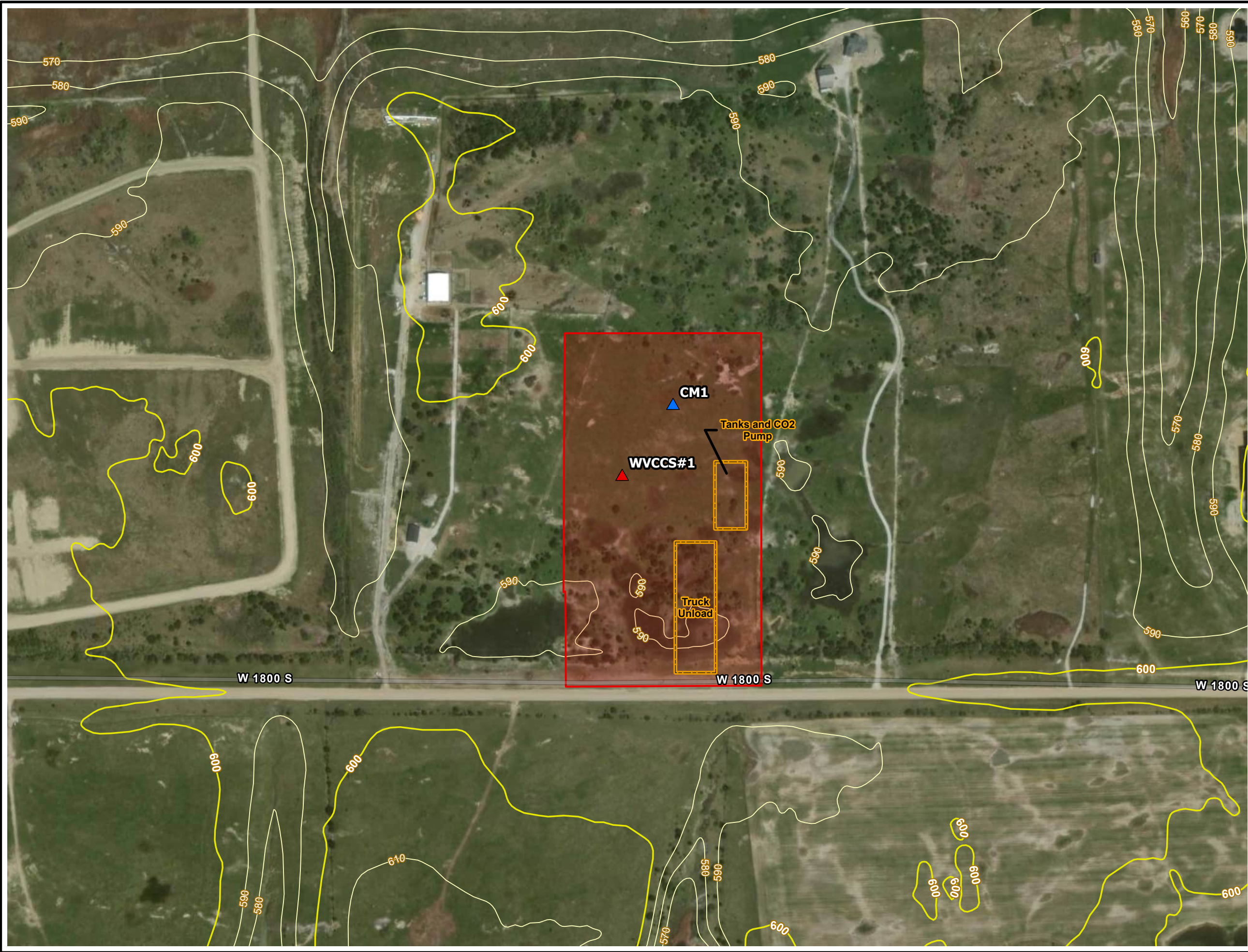
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Center Project

**FIGURE 2-A
PROJECT AREA MAP**

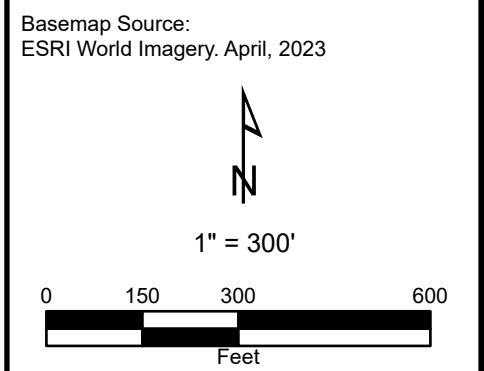
FORMATION MONITORING WELL #1




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- LEGEND:**
- Project Area
 - Proposed Project Component
 - 10 Foot Contour (USGS)
- Well Type**
- Injection Well
 - Monitoring Well






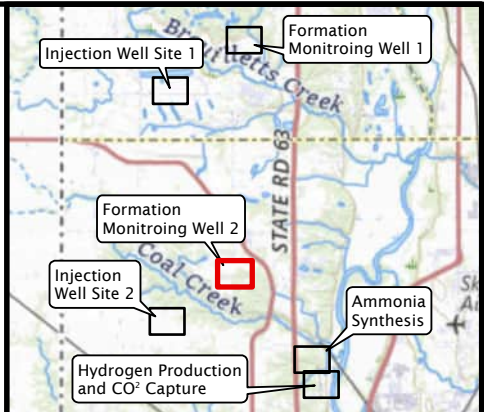
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**FIGURE 2-B
PROJECT AREA MAP**

INJECTION WELL SITE #1



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LEGEND:
Project Area
10 Foot Contour (USGS)
Well Type
Monitoring Well

Basemap Source:
ESRI World Imagery. April, 2023

1" = 300'

0 150 300 600
Feet

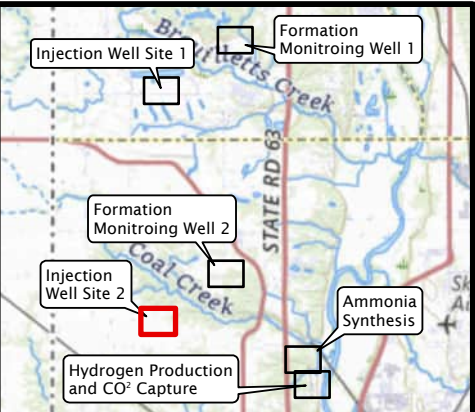
WV
WABASH VALLEY
RESOURCES

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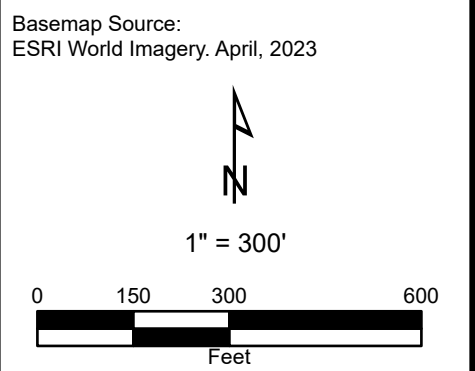
**FIGURE 2-C
PROJECT AREA MAP**
FORMATION MONITORING WELL #2


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- LEGEND:**
- Project Area
 - Proposed Project Component
 - 10 Foot Contour (USGS)
- Well Type**
- Injection Well
 - Monitoring Well



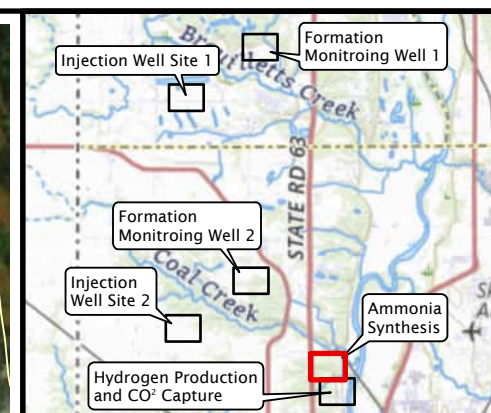
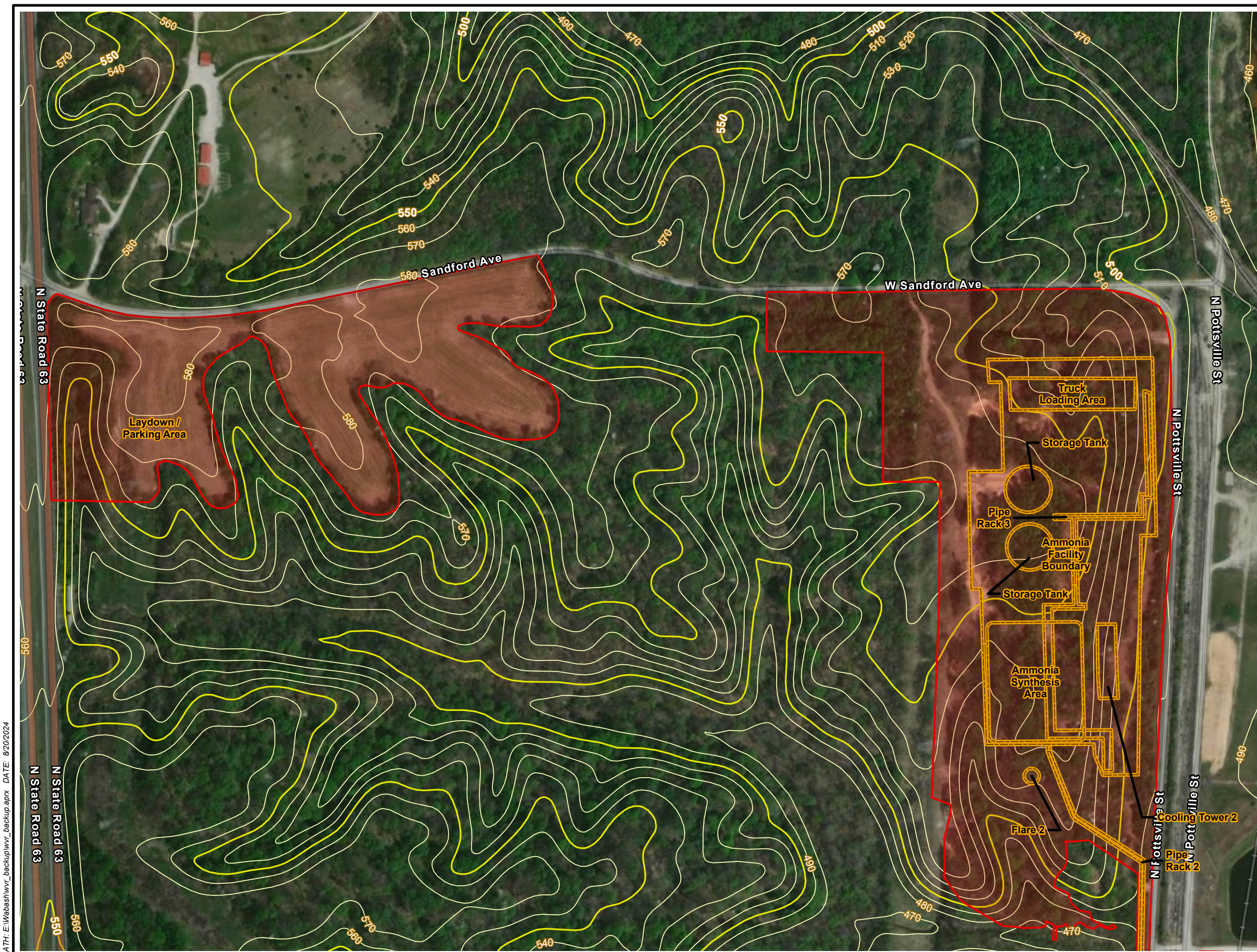


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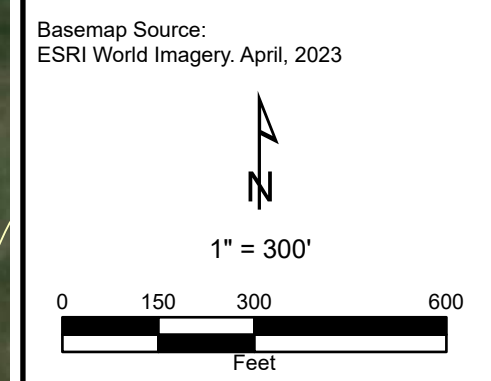
**FIGURE 2-D
PROJECT AREA MAP**


INJECTION WELL SITE #2

AECOM



- LEGEND:**
- Project Area
 - Proposed Project Component
 - 10 Foot Contour (USGS)





WV
WABASH VALLEY
RESOURCES

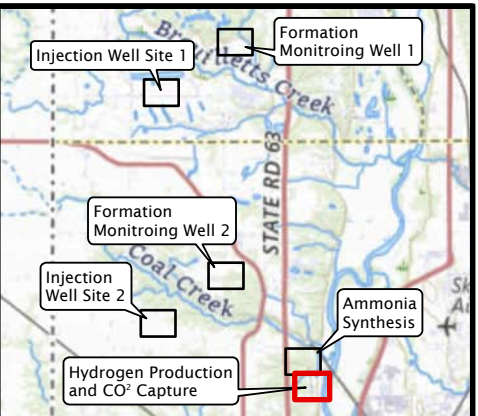
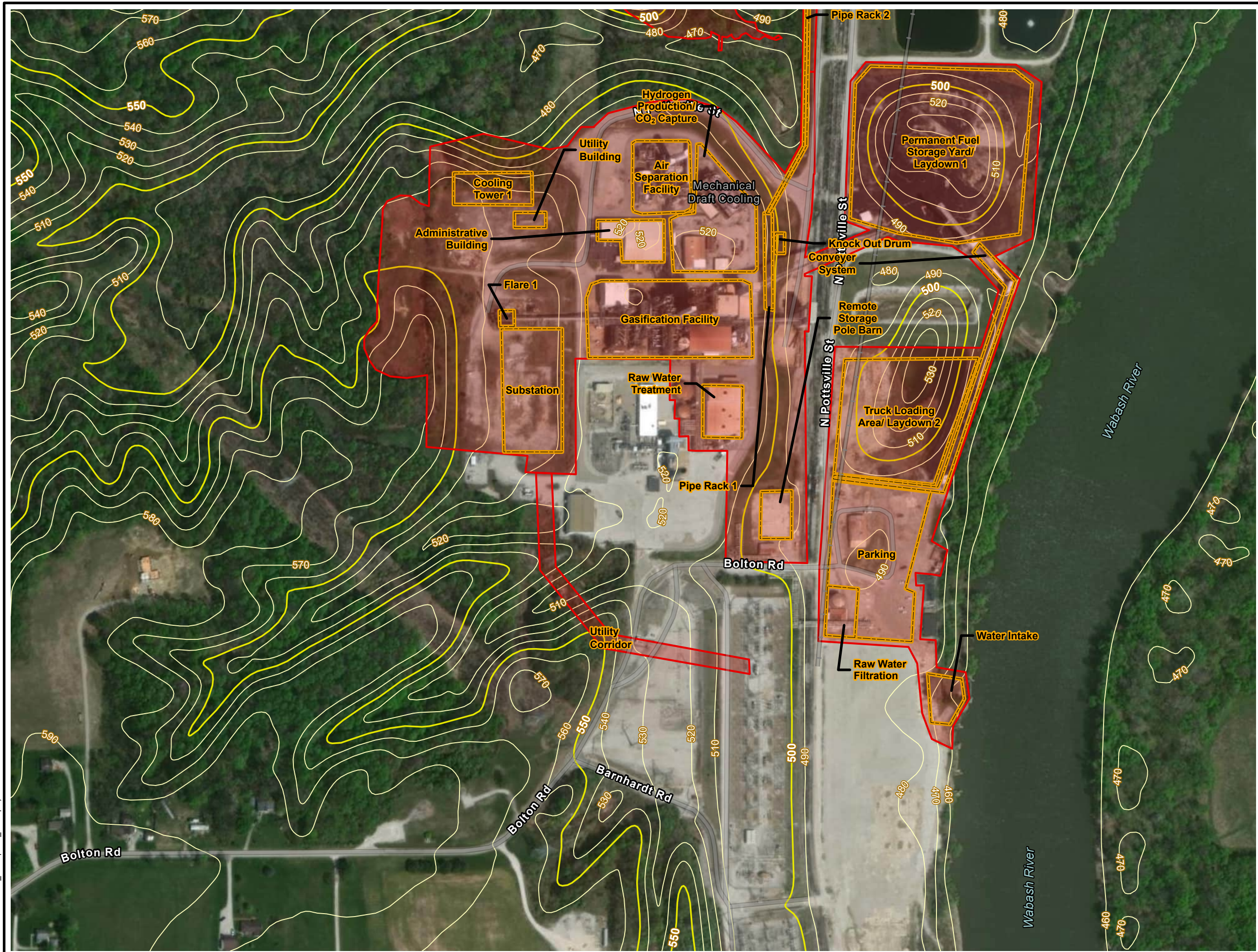
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**FIGURE 2-E
PROJECT AREA MAP**

AMMONIA SYNTHESIS AND
LAYDOWN / PARKING AREA

AECOM

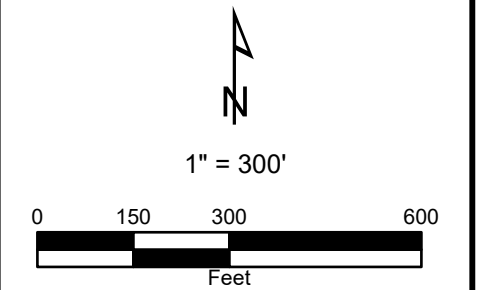
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LEGEND:

- Project Area
- Proposed Project Component
- 10 Foot Contour (USGS)

Basemap Source:
ESRI World Imagery, April, 2023



WV
WABASH VALLEY
RESOURCES

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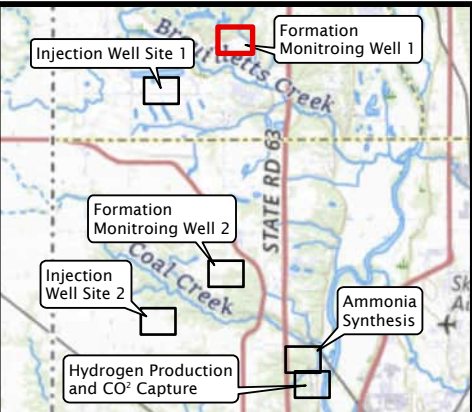
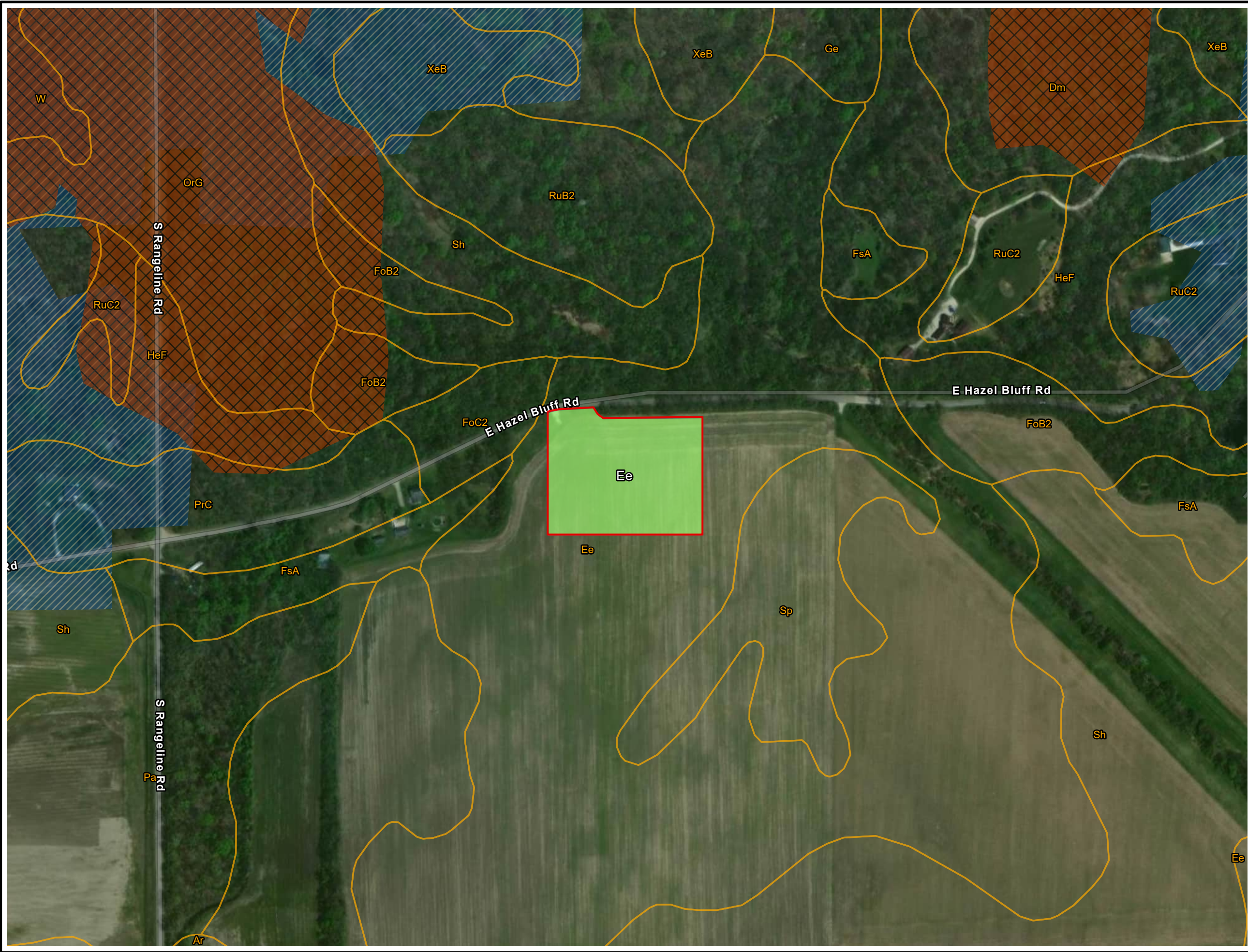
**FIGURE 2-F
PROJECT AREA MAP**

HYDROGEN PRODUCTION AND CO₂
CAPTURE

AECOM

Figure 3A-F. Soils and Mine Map

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LEGEND:

- Project Area
- SSURGO Soil Type (Outside Project Area)

SSURGO Soil Type (Inside Project Area)

- Ee

Mines (Indiana Department of Natural Resources, Division of Reclamation)

- Underground Mine
- Surface Mine

Basemap Source:
ESRI World Imagery. April, 2023

1" = 300'

0 150 300 600
Feet

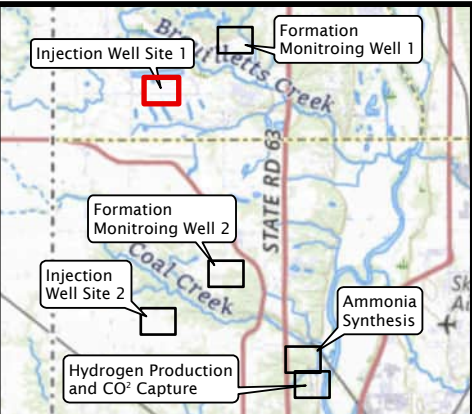
WABASH VALLEY
RESOURCES

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Center Project

**FIGURE 3-A SOILS
AND MINE MAP**

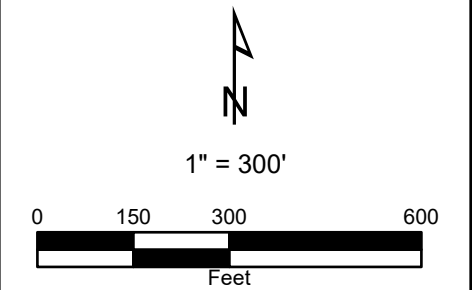
FORMATION MONITORING WELL #1

PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/28/2024



- LEGEND:**
- Project Area
 - SSURGO Soil Type (Outside Project Area)
 - SSURGO Soil Type (Inside Project Area)**
 - OrB
 - Mines (Indiana Department of Natural Resources, Division of Reclamation)**
 - Underground Mine
 - Surface Mine

Basemap Source:
ESRI World Imagery. April, 2023



WV
WABASH VALLEY
RESOURCES

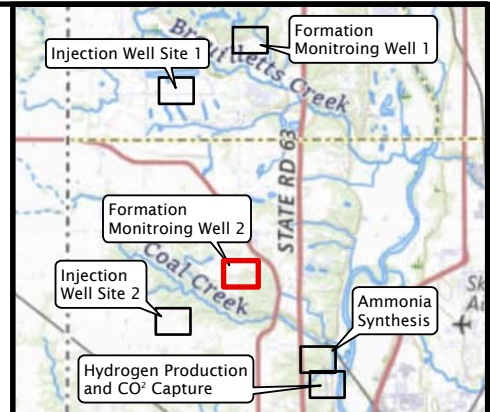
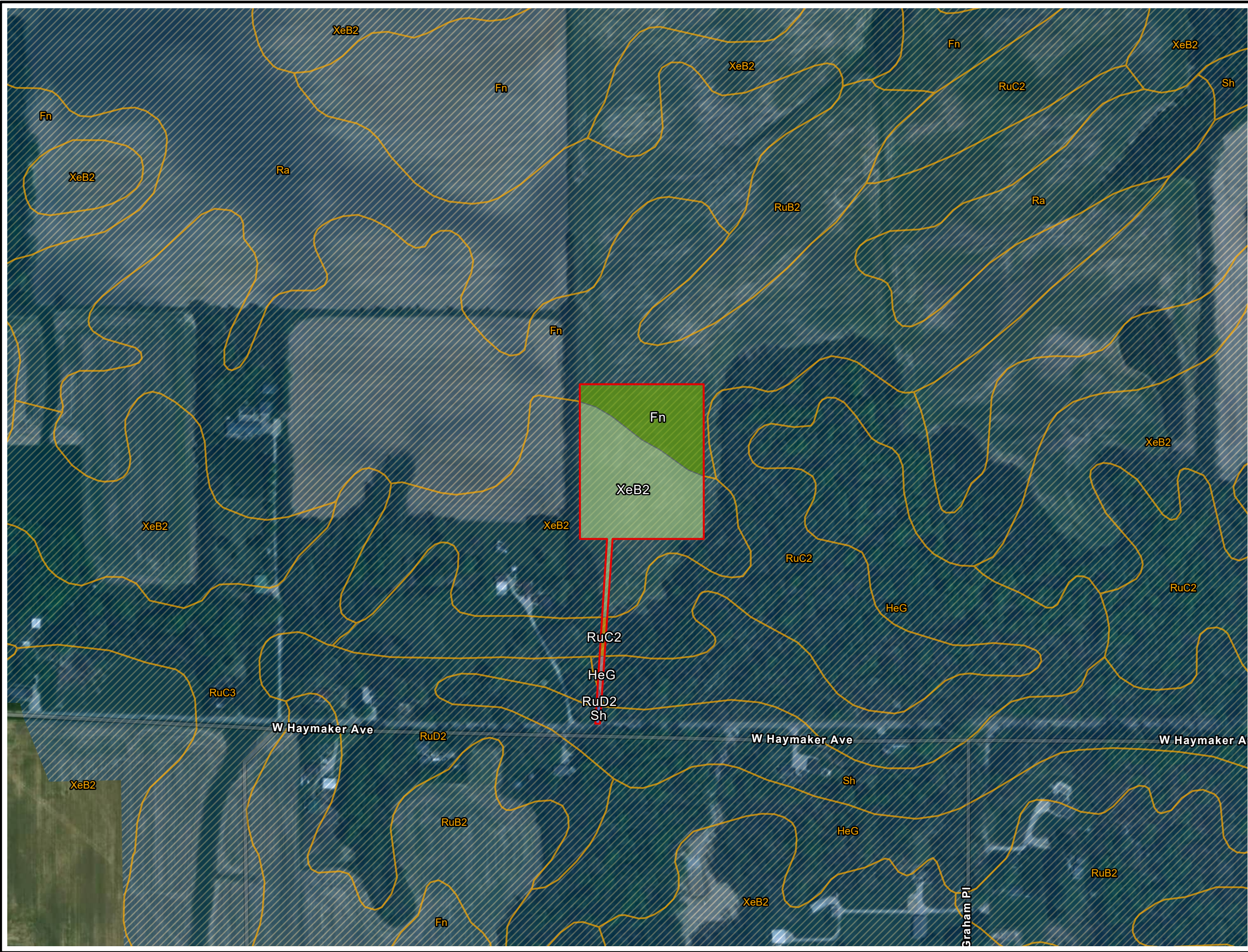
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Wabash Hydrogen Energy
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**FIGURE 3-B SOILS
AND MINE MAP**

INJECTION WELL SITE #1

AECOM

PATH: E:\Wabash\wvr_backup\wvr_backup.aprx DATE: 8/28/2024



LEGEND:

- Project Area
- SSURGO Soil Type (Outside Project Area)

SSURGO Soil Type (Inside Project Area)

- Fn
- HeG
- RuC2
- RuD2
- Sh
- XeB2

Mines (Indiana Department of Natural Resources, Division of Reclamation)

- Underground Mine

Basemap Source:
ESRI World Imagery. April, 2023

1" = 300'

0 150 300 600
Feet

WV
WABASH VALLEY
RESOURCES

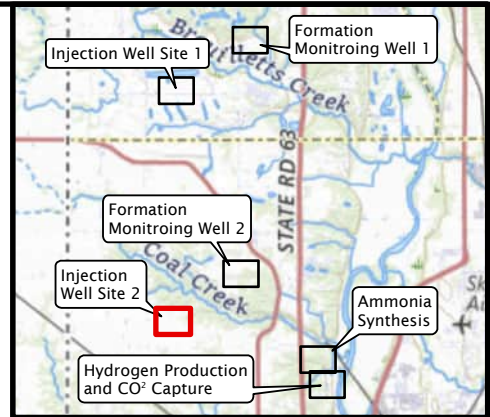
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**FIGURE 3-C SOILS
AND MINE MAP**

FORMATION MONITORING WELL #2

AECOM

PATH: E:\Wabash\wvr_backup\wvr_backup.aprx DATE: 8/28/2024



LEGEND:

- Project Area
- SSURGO Soil Type (Outside Project Area)

SSURGO Soil Type (Inside Project Area)

- Fn
- Ra
- XeB2

Basemap Source:
ESRI World Imagery, April, 2023

1" = 300'

0 150 300 600
Feet

WV
WABASH VALLEY
RESOURCES

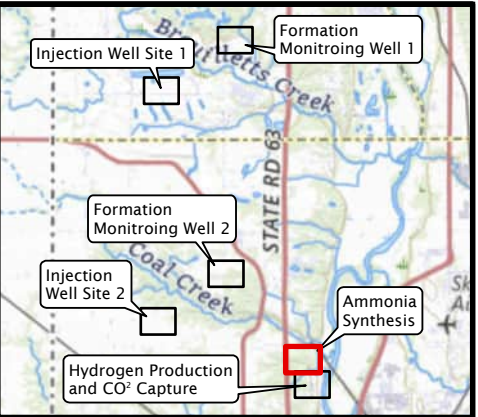
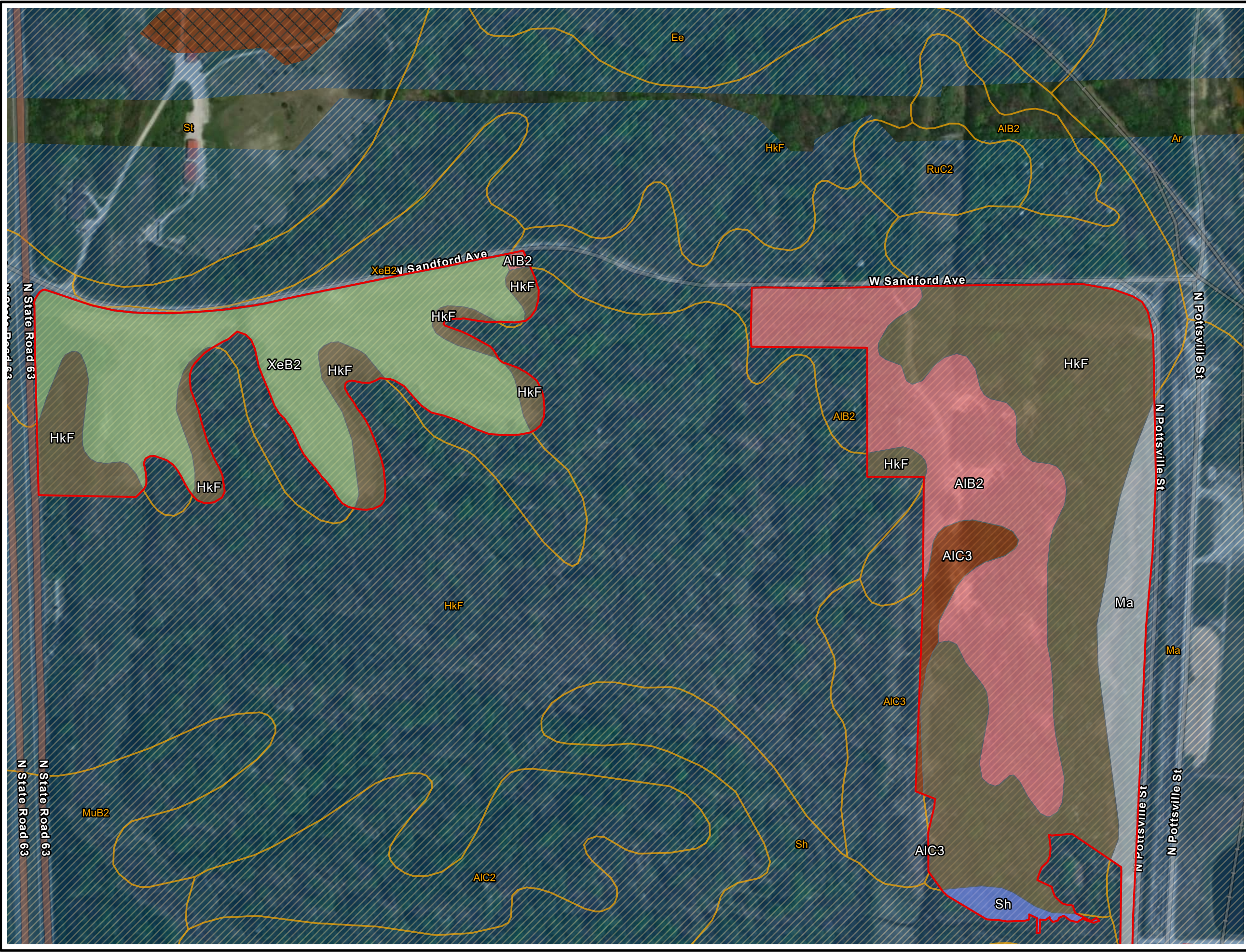
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**FIGURE 3-D SOILS
AND MINE MAP**

INJECTION WELL SITE #2

AECOM

PATH: E:\Wabash\wvr_backup\wvr_backup.aprx DATE: 8/28/2024



LEGEND:

- Project Area
- SSURGO Soil Type (Outside Project Area)

SSURGO Soil Type (Inside Project Area)

- AIB2
- AIC3
- HkF
- Ma
- Sh
- XeB2

Mines (Indiana Department of Natural Resources, Division of Reclamation)

- Underground Mine
- Surface Mine

Basemap Source:
ESRI World Imagery. April, 2023

North Arrow

1" = 300'

0 150 300 600
Feet

WV
WABASH VALLEY
RESOURCES

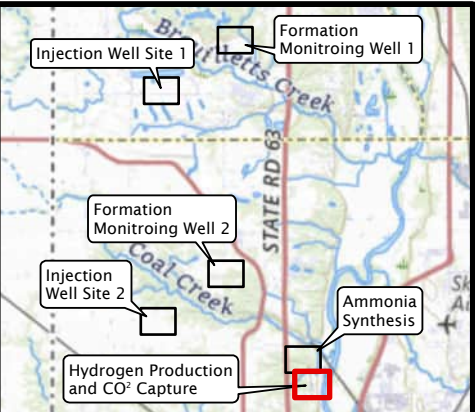
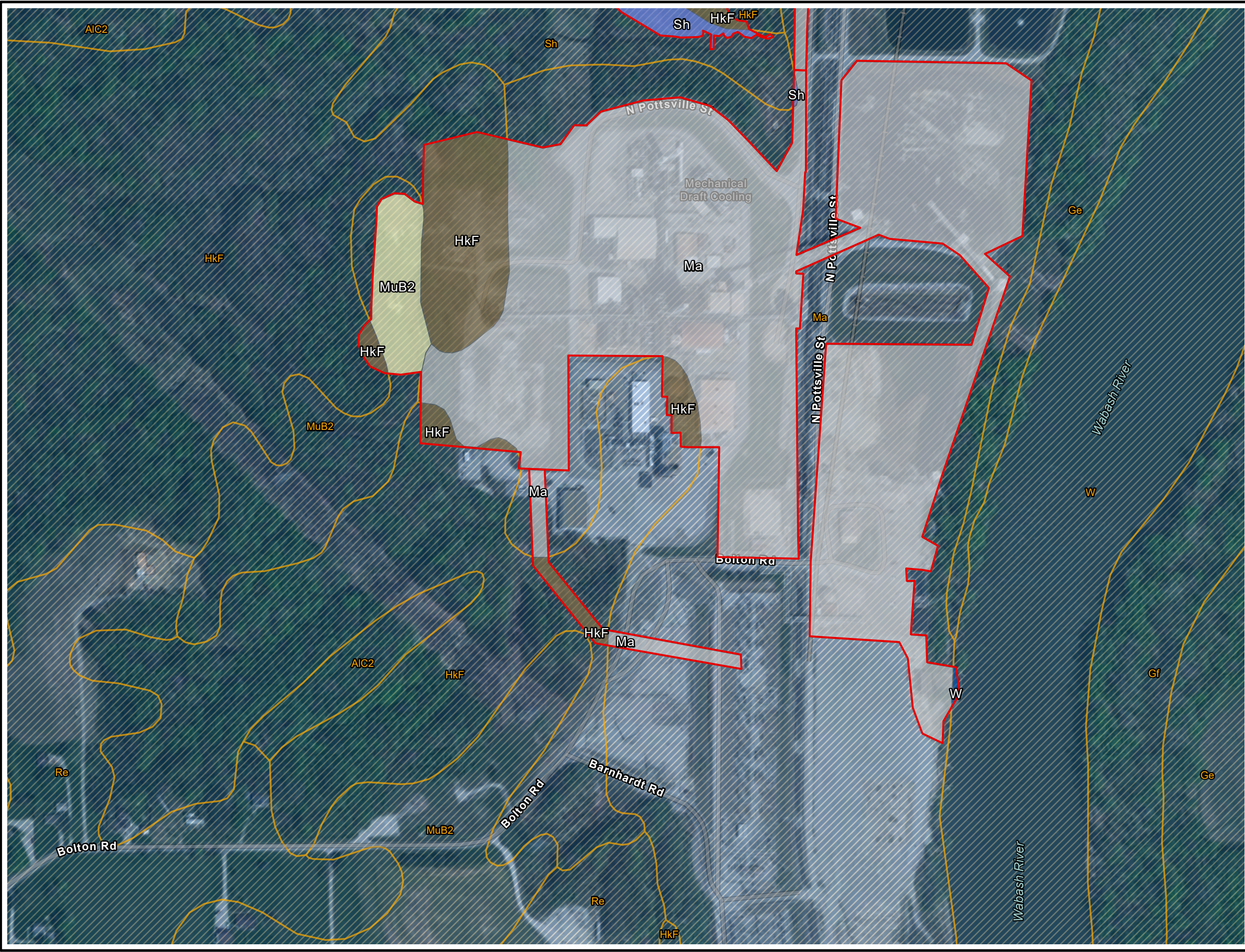
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**FIGURE 3-E SOILS
AND MINE MAP**

AMMONIA SYNTHESIS AND
LAYDOWN / PARKING AREA

AECOM

PATH: E:\Wabash\wvr_backup\wvr_backup.aprx DATE: 8/28/2024



LEGEND:

- Project Area
- SSURGO Soil Type (Outside Project Area)

SSURGO Soil Type (Inside Project Area)

- HKF
- Ma
- MuB2
- Sh
- W

Mines (Indiana Department of Natural Resources, Division of Reclamation)

- Underground Mine

Basemap Source:
ESRI World Imagery. April, 2023

1" = 300'

0 150 300 600
Feet

WV
WABASH VALLEY
RESOURCES

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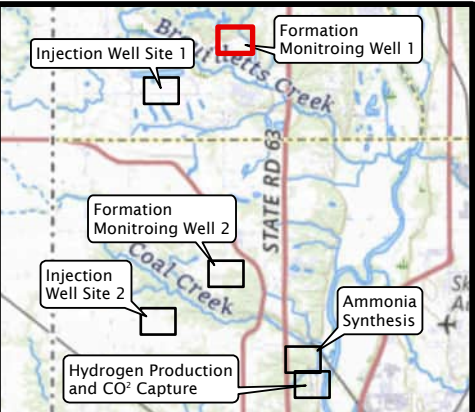
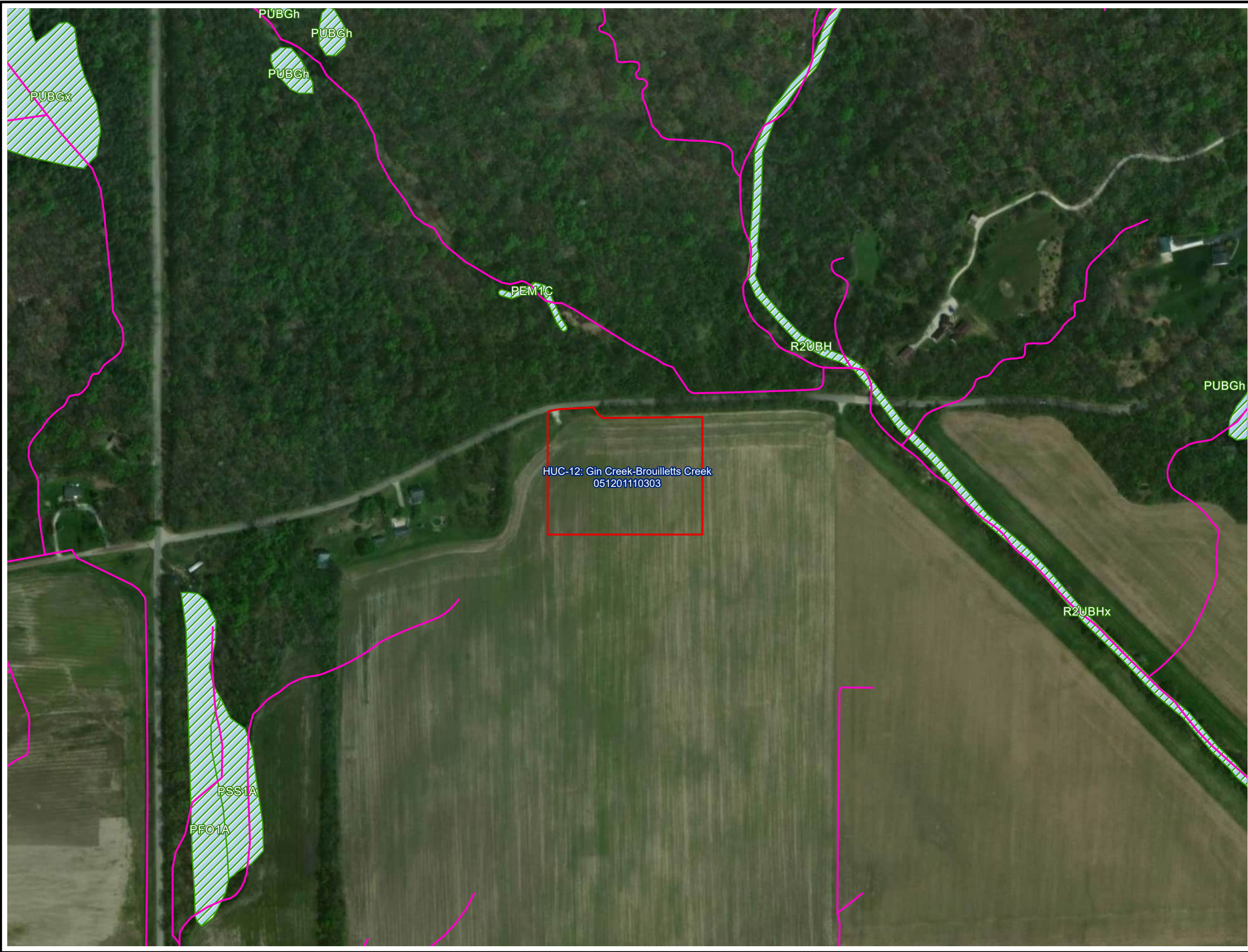
**FIGURE 3-F SOILS
AND MINE MAP**

HYDROGEN PRODUCTION AND CO₂
CAPTURE

AECOM

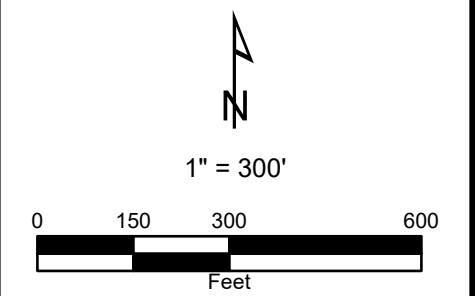
Figure 4A-F. NWI and NHD Map


PATH: E:\Wabash\wv_backup\wv_backup.aprx DATE: 8/20/2024



- LEGEND:**
- Project Area
 - HUC-12 (USGS)
 - NHD (USGS)
 - NWI (USFWS)

Basemap Source:
ESRI World Imagery. April, 2023





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RESOURCES

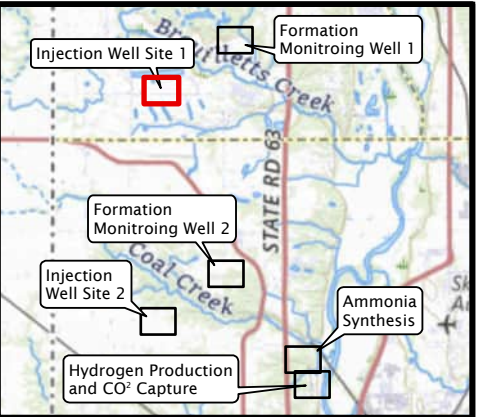
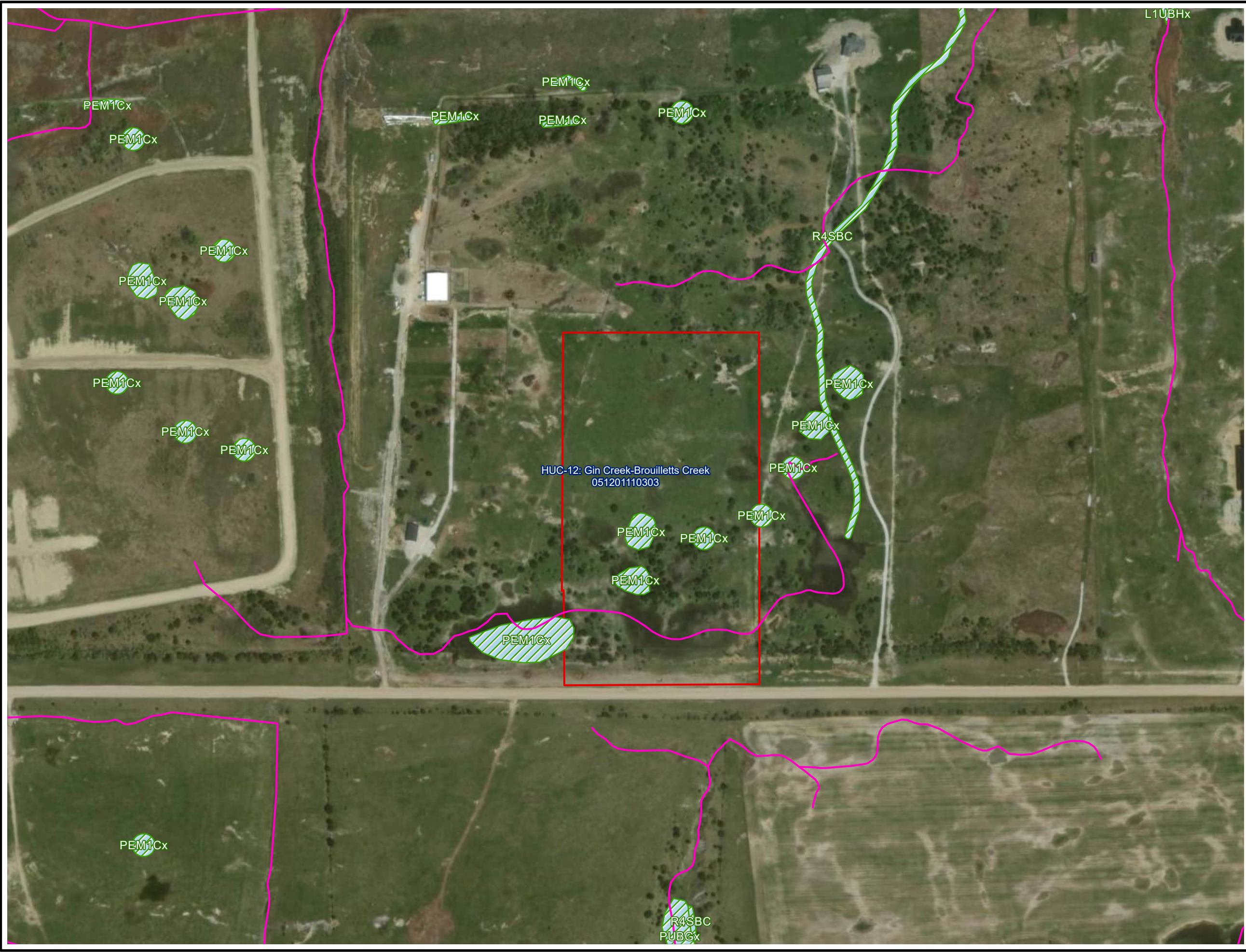
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**FIGURE 4-A
NWI AND NHD MAP**

FORMATION MONITORING WELL #1

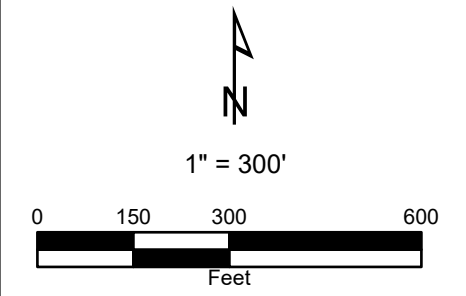


PATH: E:\Wabash\wvr_backup\wvr_backup.aprx DATE: 8/20/2024



- LEGEND:**
- Project Area
 - HUC-12 (USGS)
 - NHD (USGS)
 - NWI (USFWS)

Basemap Source:
ESRI World Imagery. April, 2023



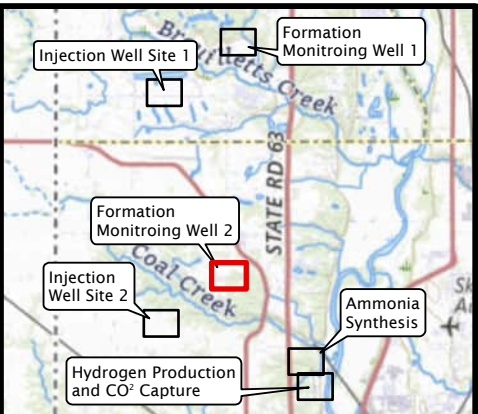
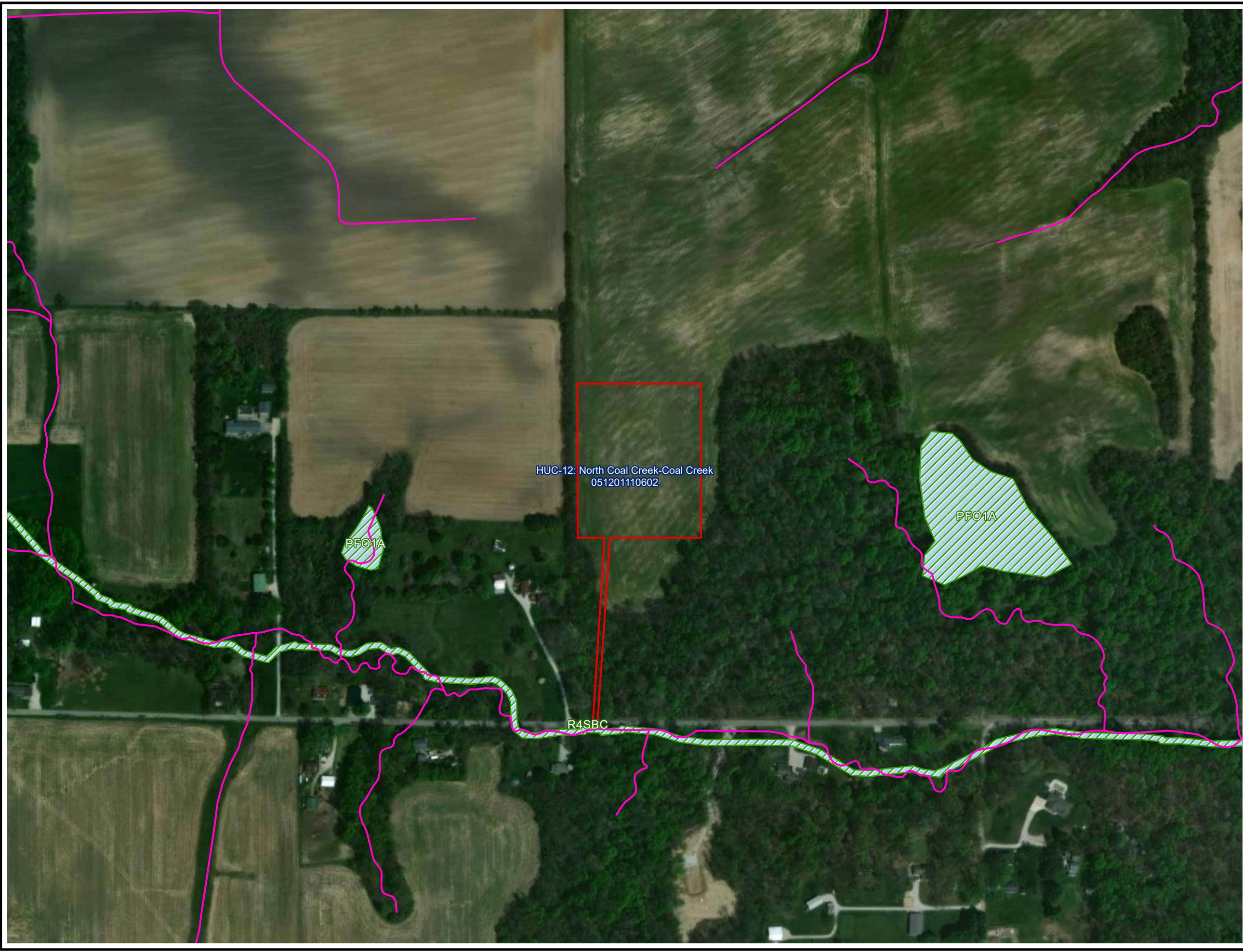
WV
WABASH VALLEY
RESOURCES

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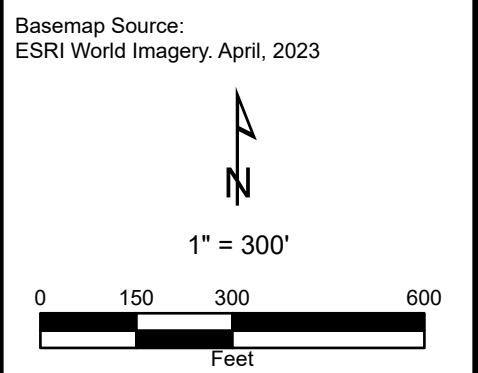
**FIGURE 4-B
NWI AND NHD MAP**
INJECTION WELL SITE #1


AECOM

PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/20/2024



- LEGEND:**
- Project Area
 - HUC-12 (USGS)
 - NHD (USGS)
 - NWI (USFWS)






WABASH VALLEY
RESOURCES

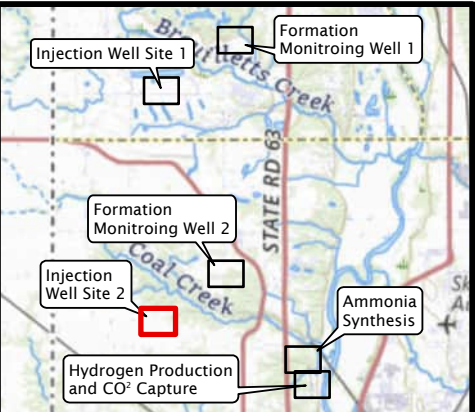
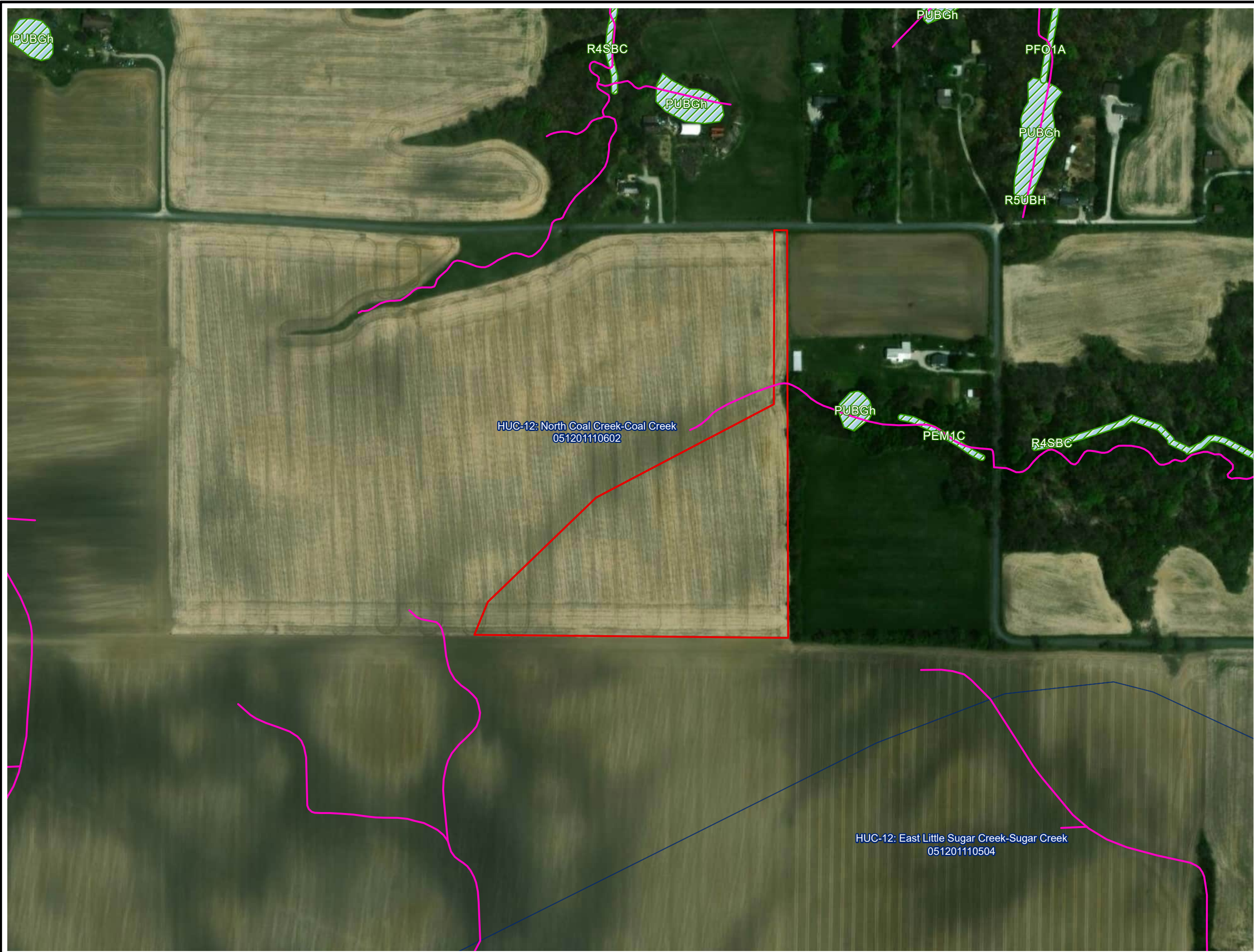
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**FIGURE 4-C
NWI AND NHD MAP**

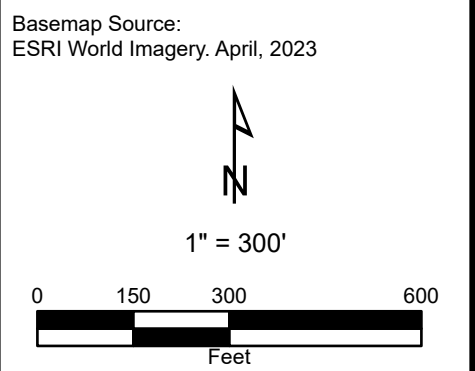
FORMATION MONITORING WELL #2



PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/20/2024



- LEGEND:**
- Project Area
 - HUC-12 (USGS)
 - NHD (USGS)
 - NWI (USFWS)



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WABASH VALLEY
RESOURCES

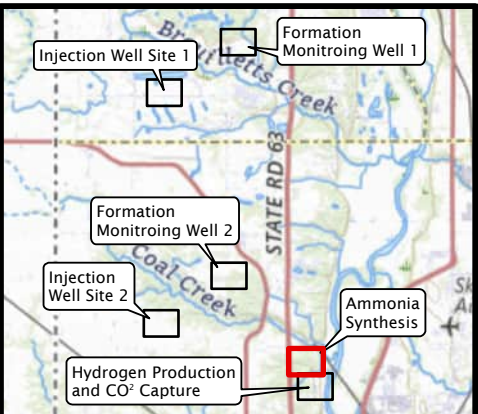
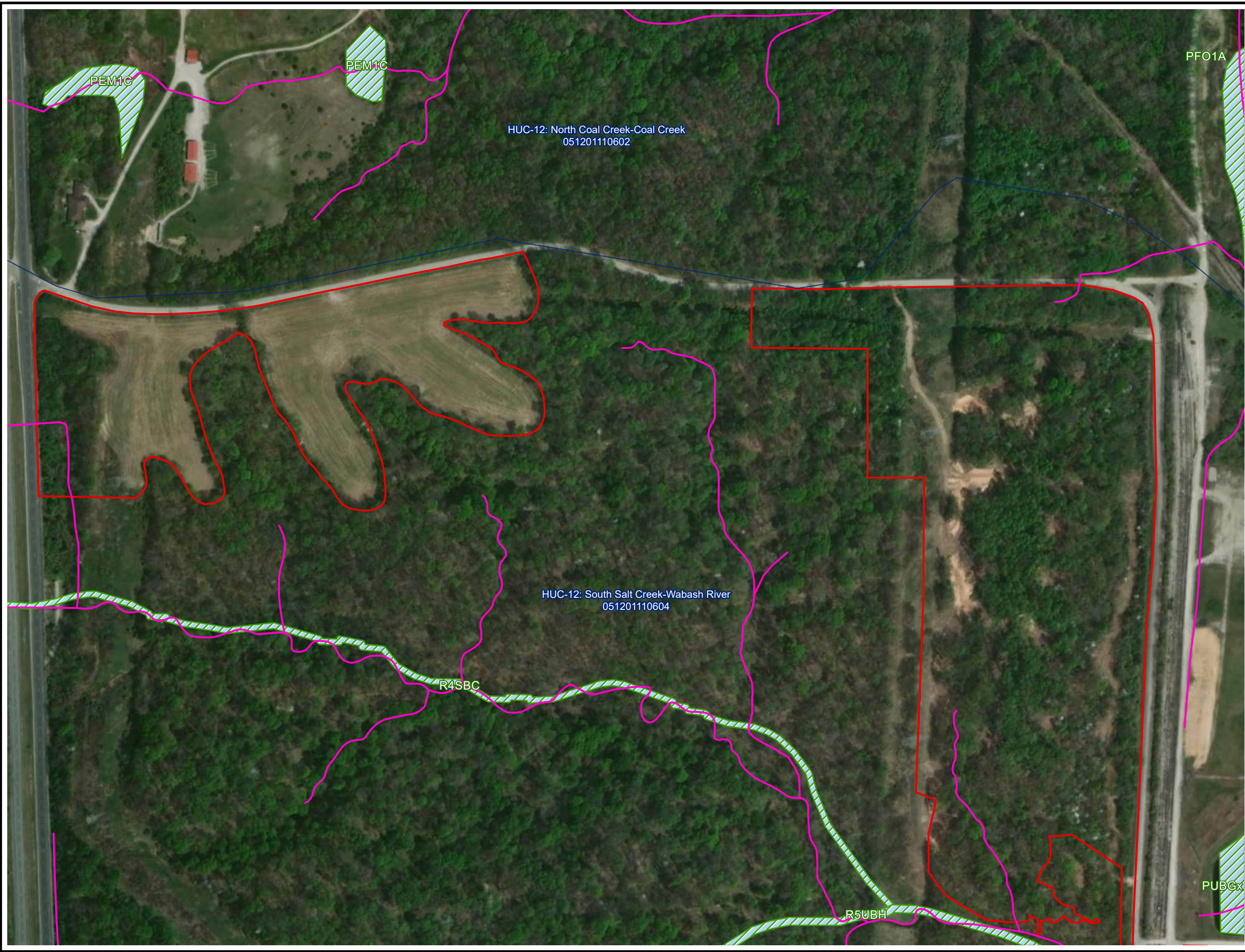
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**FIGURE 4-D
NWI AND NHD MAP**

INJECTION WELL SITE #2

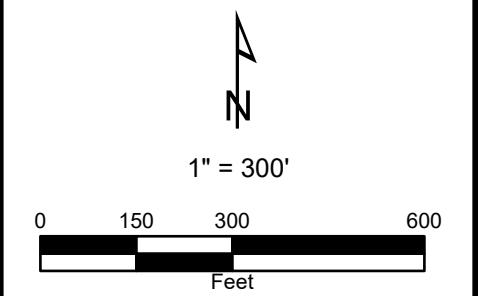
AECOM

PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/20/2024



- LEGEND:**
- Project Area
 - HUC-12 (USGS)
 - NHD (USGS)
 - NWI (USFWS)

Basemap Source:
ESRI World Imagery. April, 2023



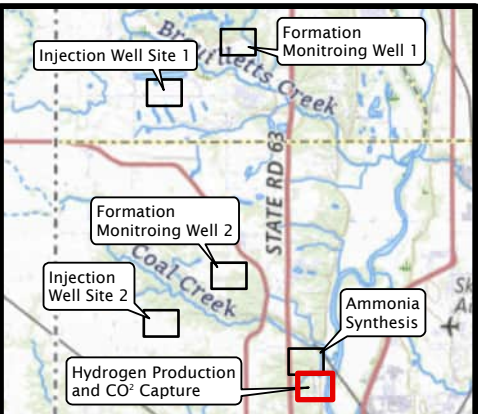
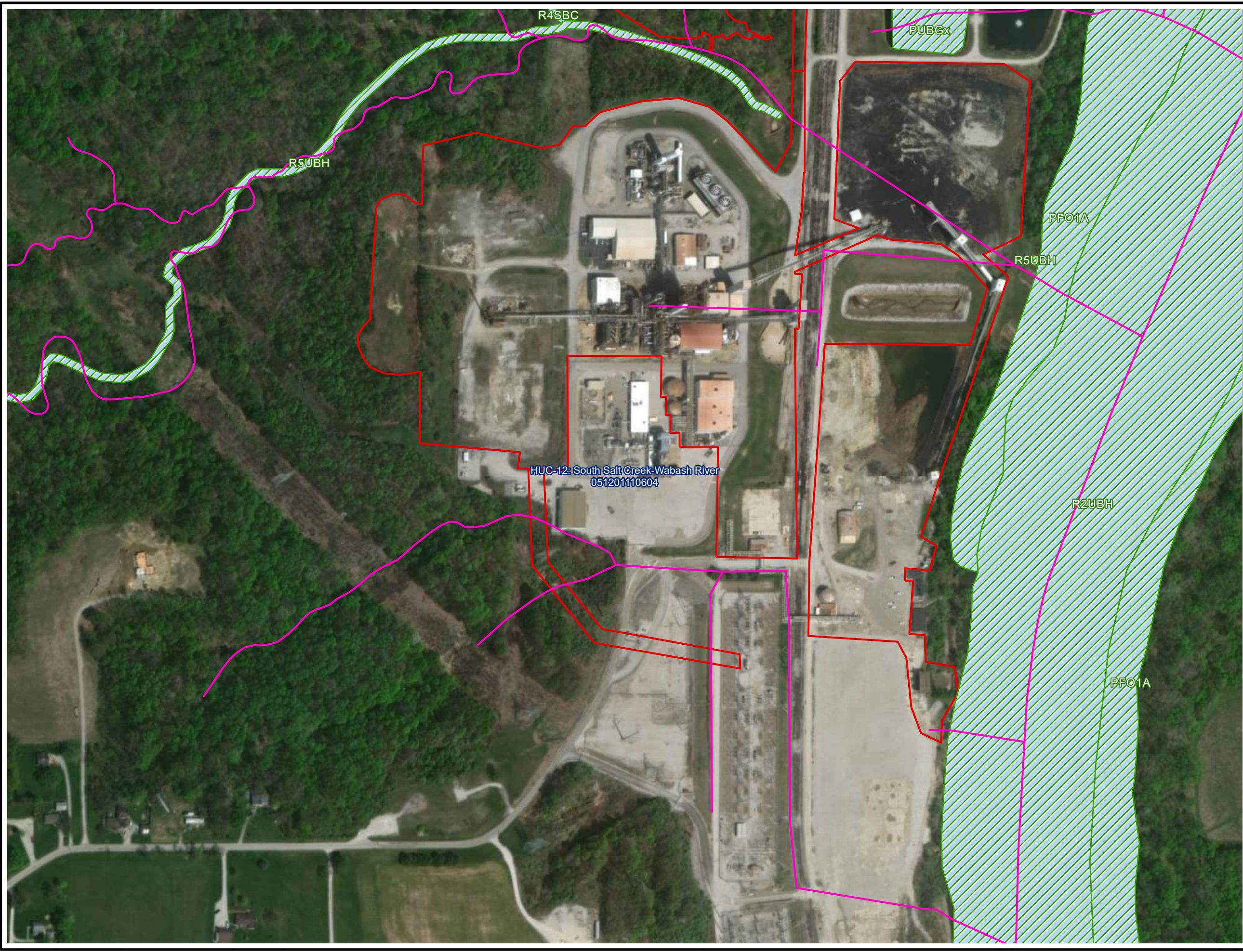
WV
WABASH VALLEY
RESOURCES

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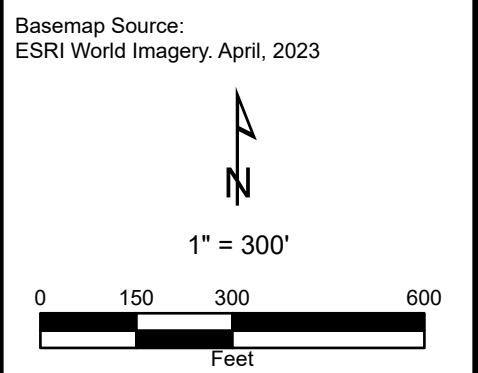
**FIGURE 4-E
NWI AND NHD MAP**


AMMONIA SYNTHESIS AND
LAYDOWN / PARKING AREA

AECOM



- LEGEND:**
- Project Area
 - HUC-12 (USGS)
 - NHD (USGS)
 - NWI (USFWS)





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**FIGURE 4-F
NWI AND NHD MAP**

HYDROGEN PRODUCTION AND CO₂
CAPTURE


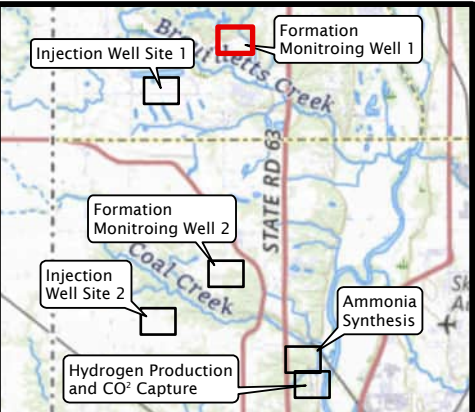
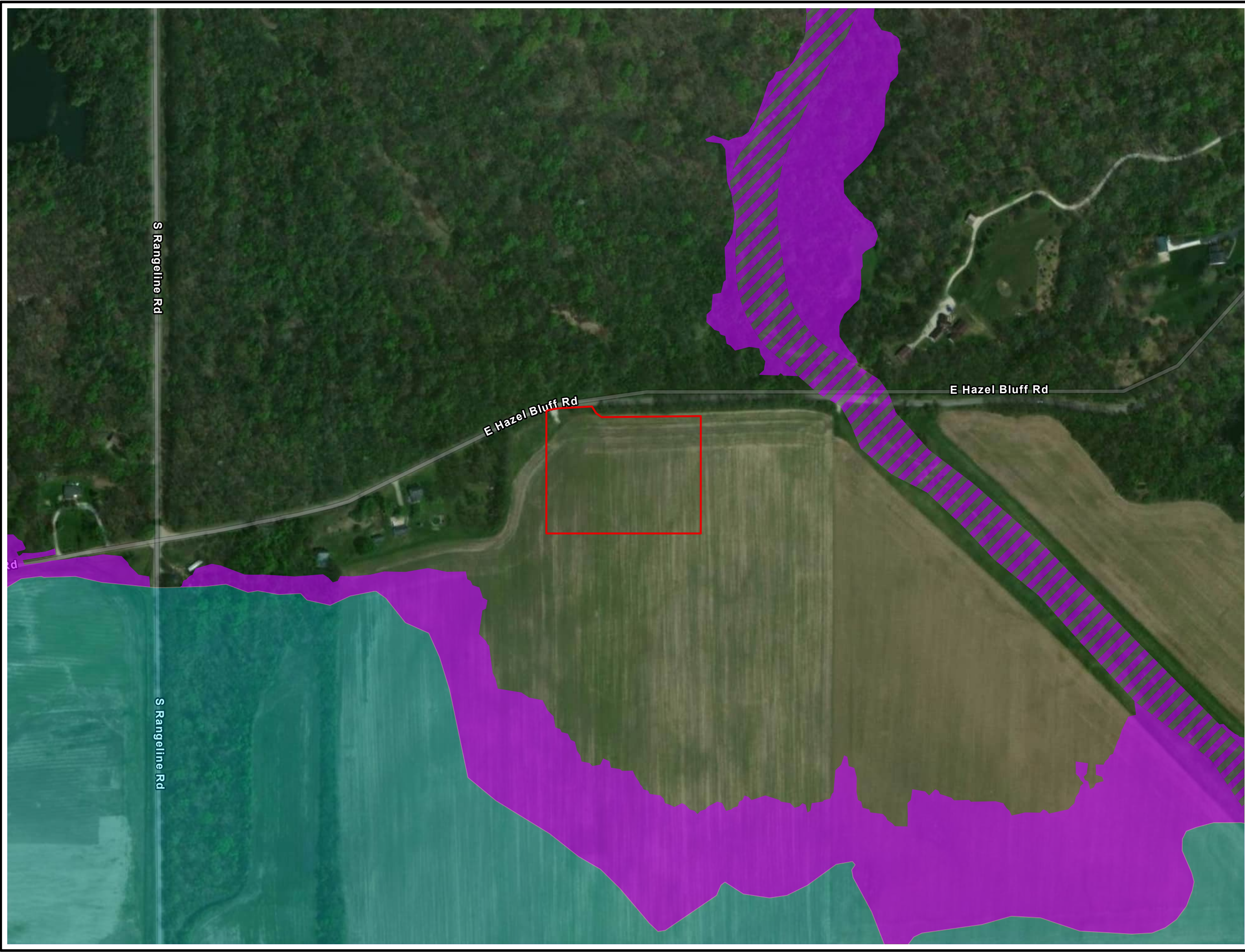
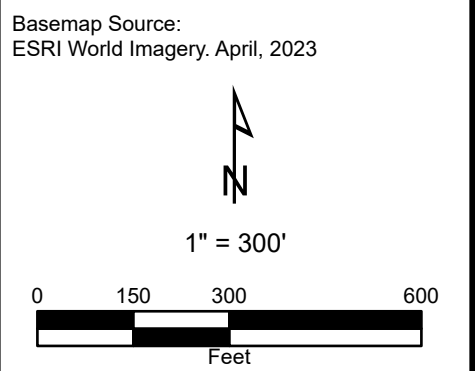


Figure 5A-F. Flood Zone Map



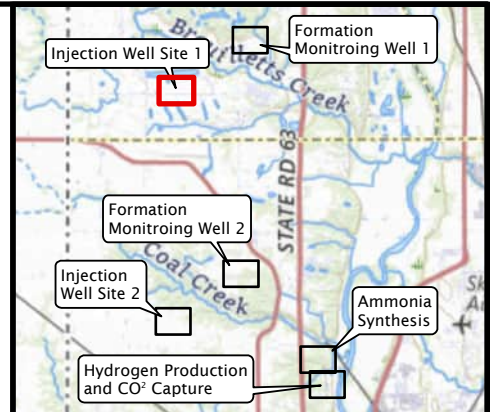
- LEGEND:**
- Project Area
 - FEMA Flood Zones**
 - 100-Year Floodplain
 - IDNR Best Available Floodplain**
 - DNR Approximate Floodway
 - DNR Approximate Fringe
- *All Unshaded Areas are Zone X, Area Of Minimal Flooding



**FIGURE 5-A
FLOOD ZONE MAP**

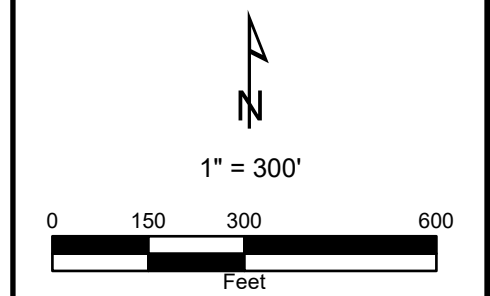
FORMATION MONITORING WELL #1

AECOM



LEGEND:
[Red Rectangle] Project Area
*All Unshaded Areas are Zone X, Area Of Minimal Flooding

Basemap Source:
ESRI World Imagery. April, 2023

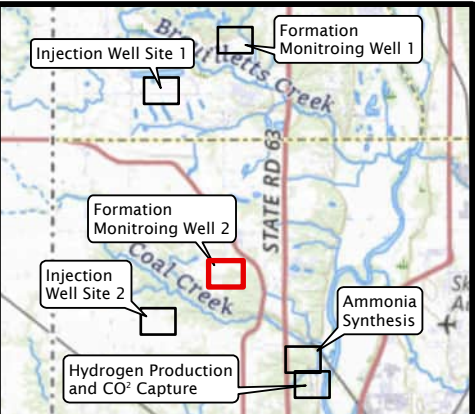


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**FIGURE 5-B
FLOOD ZONE MAP**
INJECTION WELL SITE #1

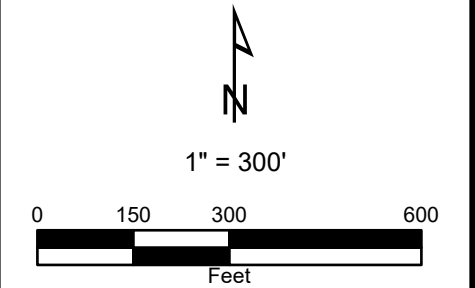
AECOM

PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/20/2024



LEGEND:
 Project Area
*All Unshaded Areas are Zone X, Area Of Minimal Flooding

Basemap Source:
ESRI World Imagery. April, 2023

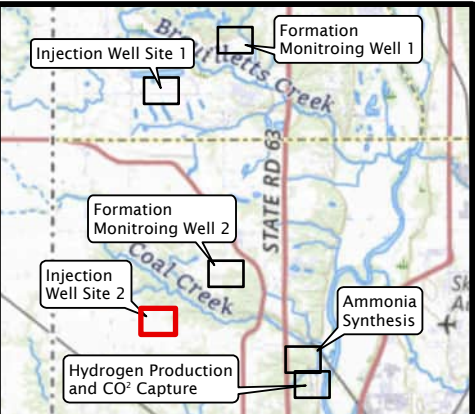


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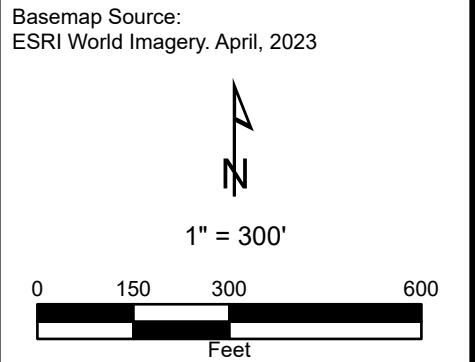
**FIGURE 5-C
FLOOD ZONE MAP**
FORMATION MONITORING WELL #2

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PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/20/2024



LEGEND:
[Red Box] Project Area
*All Unshaded Areas are Zone X, Area Of Minimal Flooding

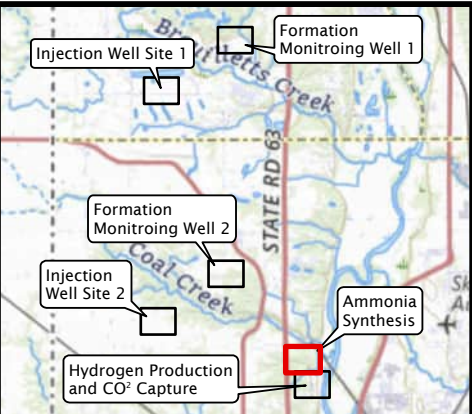
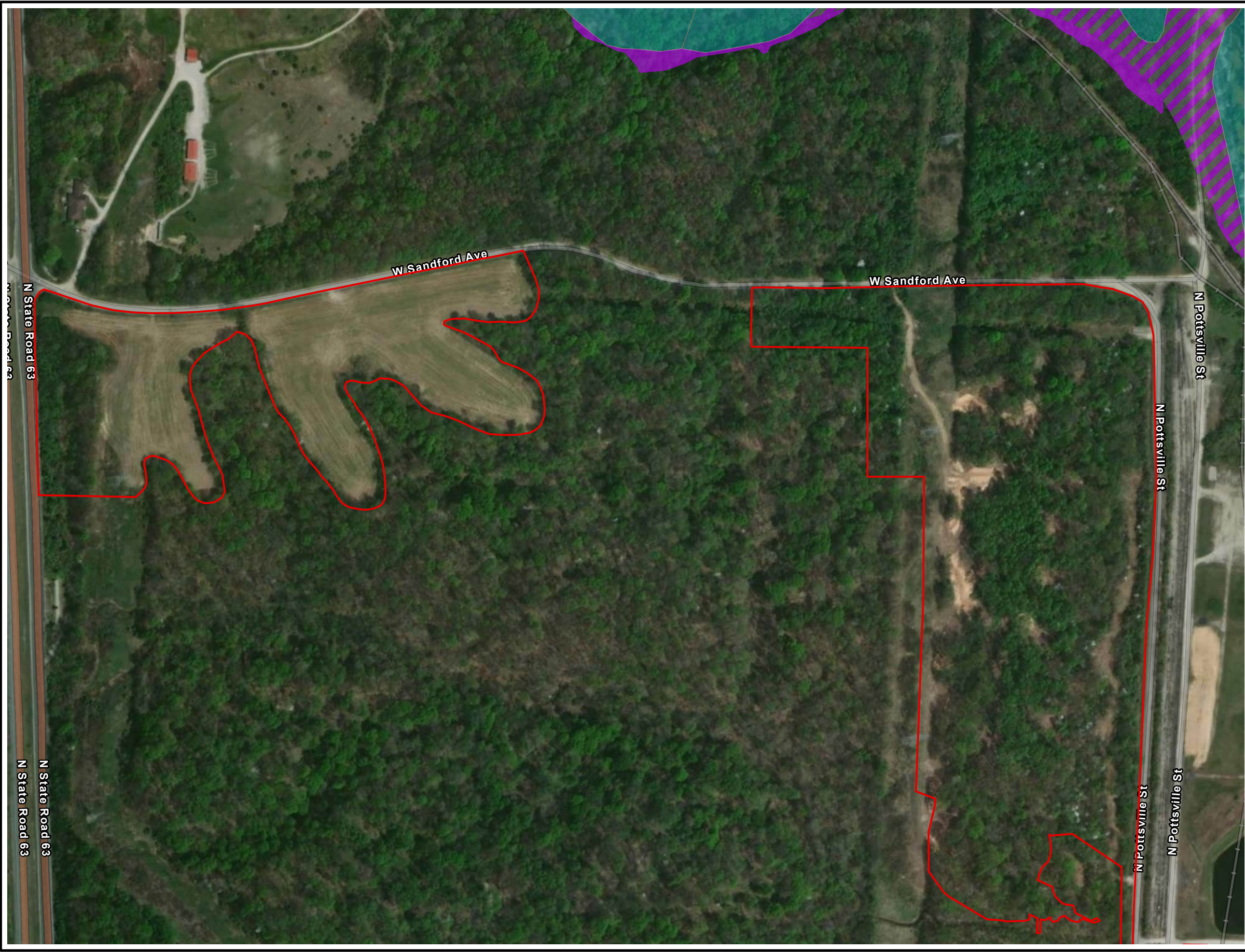


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**FIGURE 5-D
FLOOD ZONE MAP**
INJECTION WELL SITE #2

AECOM

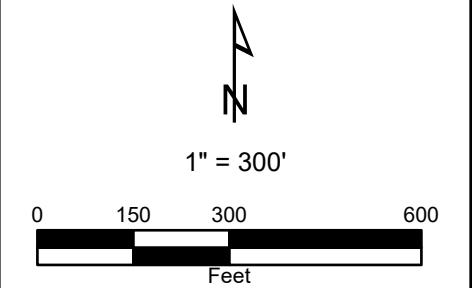


LEGEND:

- Project Area
- FEMA Flood Zones**
 - 100-Year Floodplain
- IDNR Best Available Floodplain**
 - DNR Approximate Floodway
 - DNR Approximate Fringe

*All Unshaded Areas are Zone X, Area Of Minimal Flooding

Basemap Source:
ESRI World Imagery. April, 2023



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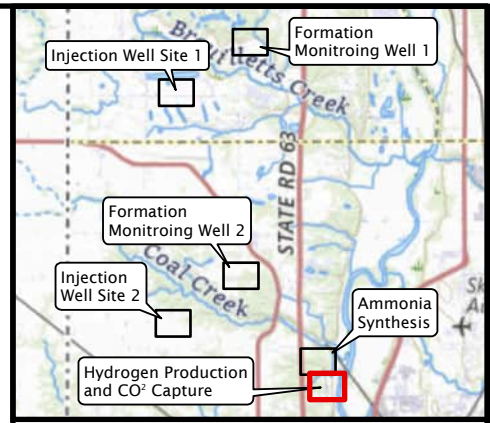
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**FIGURE 5-E
FLOOD ZONE MAP**

AMMONIA SYNTHESIS AND
LAYDOWN / PARKING AREA

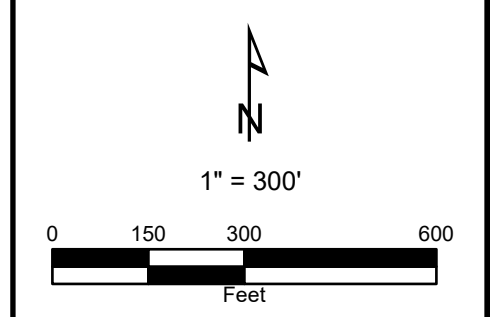
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PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/20/2024



LEGEND:
[Red Outline] Project Area
FEMA Flood Zones
[Light Blue Shading] 100-Year Floodplain
*All Unshaded Areas are Zone X, Area Of Minimal Flooding

Basemap Source:
ESRI World Imagery. April, 2023





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**FIGURE 5-F
FLOOD ZONE MAP**

HYDROGEN PRODUCTION AND CO₂
CAPTURE


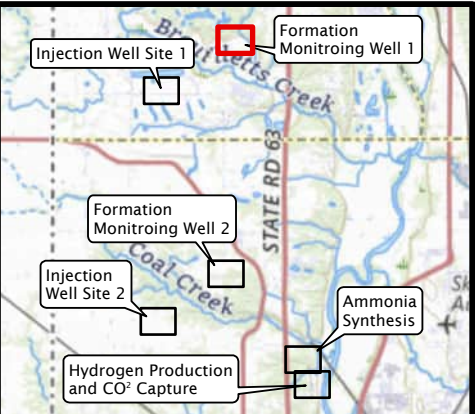






Figure 6A-F. Land Cover Map


PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/20/2024



LEGEND:
 Project Area
NLCD Class
 Developed, Open Space
 Cultivated Crops

Basemap Source:
ESRI World Imagery. April, 2023


1" = 300'


0 150 300 600
Feet


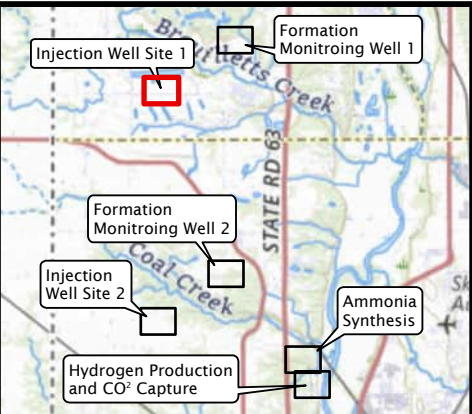
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FIGURE 6-A
LAND COVER MAP
FORMATION MONITORING WELL #1

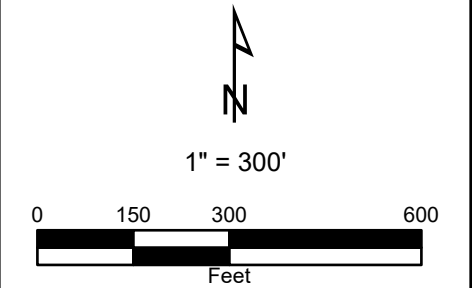
AECOM

PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/20/2024



- LEGEND:**
- Project Area
 - NLCD Class**
 - Developed, Low Intensity
 - Developed, Medium Intensity
 - Shrub/Scrub
 - Grassland/Herbaceous
 - Cultivated Crops

Basemap Source:
ESRI World Imagery. April, 2023



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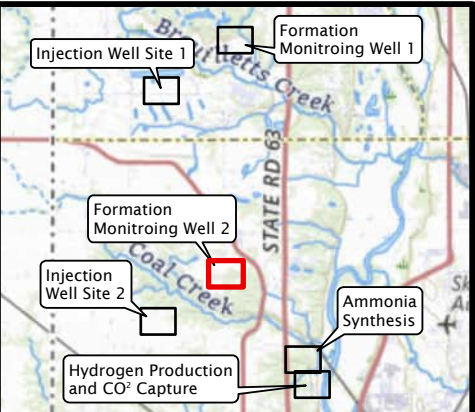
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**FIGURE 6-B
LAND COVER MAP**

INJECTION WELL SITE #1

AECOM

PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/20/2024




LEGEND:

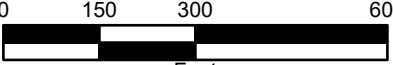
Project Area


NLCD Class

- Developed, Open Space
- Deciduous Forest
- Cultivated Crops

Basemap Source:
ESRI World Imagery. April, 2023


1" = 300'


0 150 300 600
Feet


WABASH VALLEY
RESOURCES

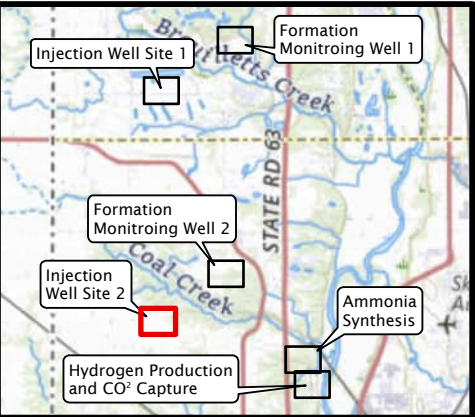
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FIGURE 6-C
LAND COVER MAP

FORMATION MONITORING WELL #2



PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/20/2024




LEGEND:

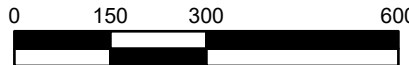
Project Area


NLCD Class

- Developed, Open Space
- Developed, Low Intensity
- Pasture/Hay
- Cultivated Crops

Basemap Source:
ESRI World Imagery. April, 2023


1" = 300'


0 150 300 600
Feet



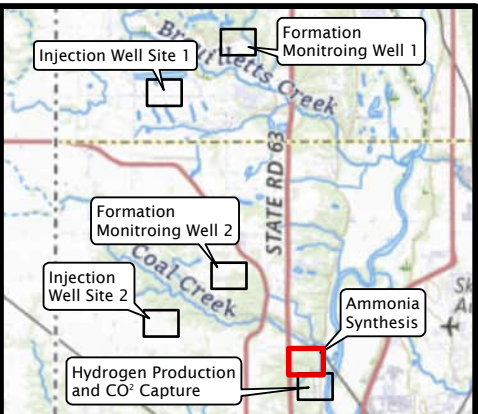
**WABASH VALLEY
RESOURCES**

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**FIGURE 6-D
LAND COVER MAP**

INJECTION WELL SITE #2






LEGEND:


Project Area

NLCD Class

- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Deciduous Forest
- Mixed Forest
- Grassland/Herbaceous
- Pasture/Hay

Basemap Source:
ESRI World Imagery. April, 2023


1" = 300'


Feet



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RESOURCES

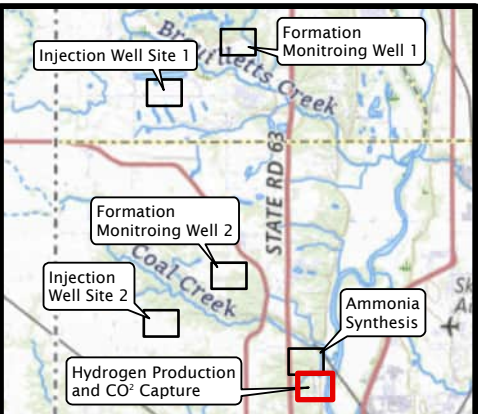
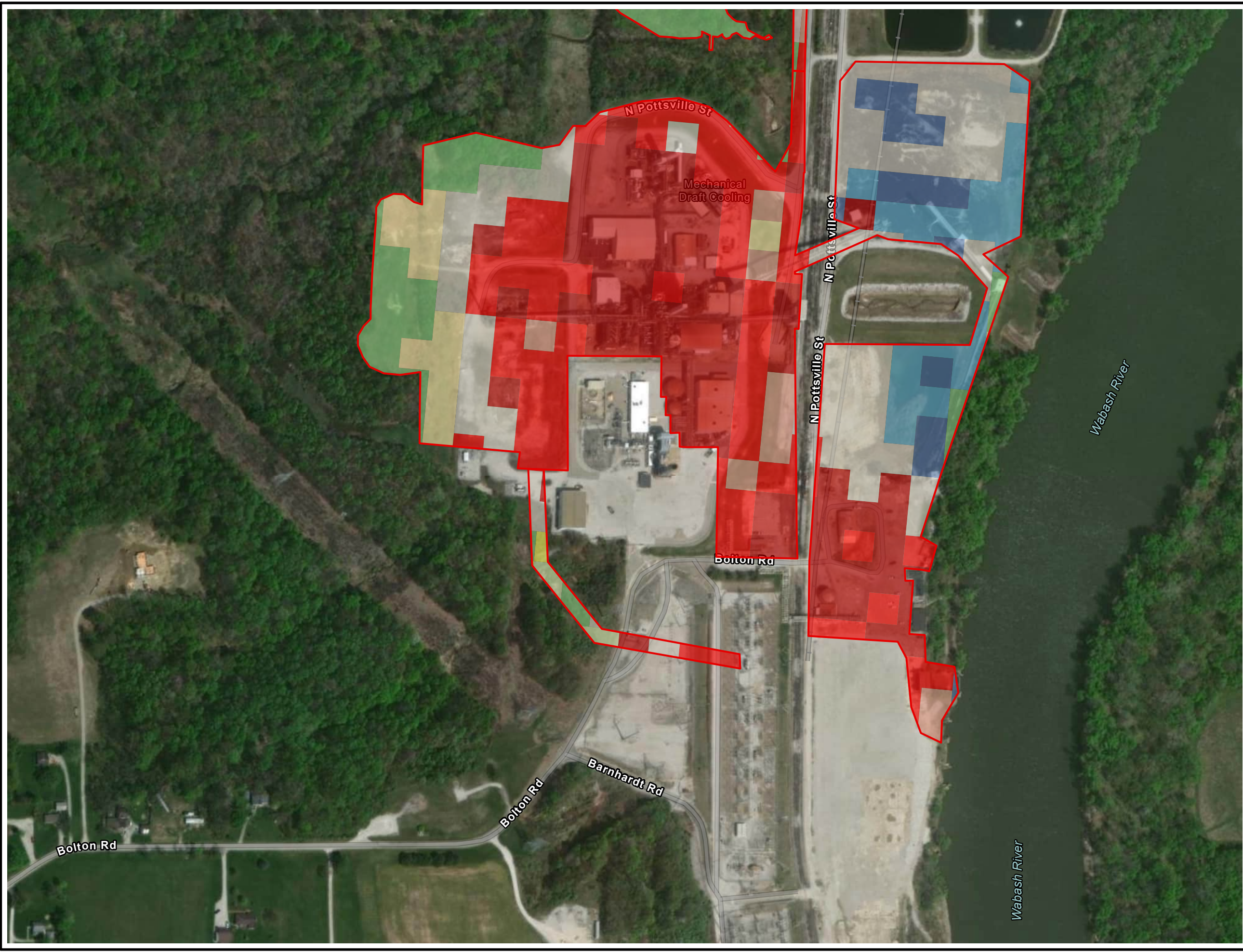
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**FIGURE 6-E
LAND COVER MAP**

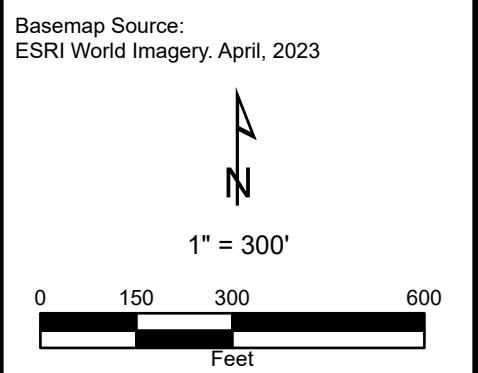
AMMONIA SYNTHESIS AND
LAYDOWN / PARKING AREA




PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/20/2024



- LEGEND:**
- Project Area
 - NLCD Class**
 - Open Water
 - Developed, Open Space
 - Developed, Low Intensity
 - Developed, Medium Intensity
 - Developed High Intensity
 - Barren Land (Rock/Sand/Clay)
 - Deciduous Forest
 - Mixed Forest
 - Grassland/Herbaceous
 - Pasture/Hay
 - Emergent Herbaceous Wetlands





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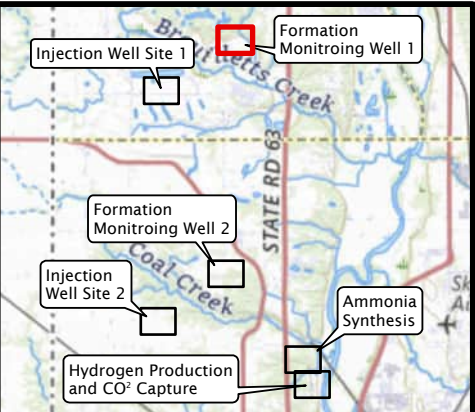
**FIGURE 6-F
LAND COVER MAP**

HYDROGEN PRODUCTION AND CO₂
CAPTURE

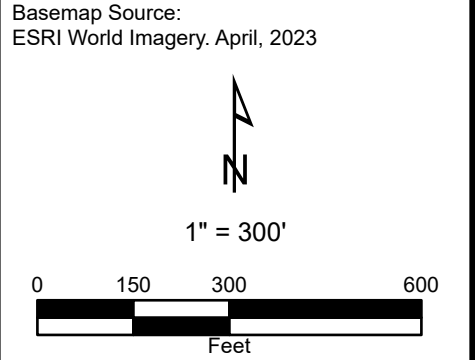
AECOM


Figure 7A-F. Delineated Features Map

PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/21/2024



LEGEND:
[Red Outline] Project Area
[Yellow Line] 10 Foot Contour (USGS)

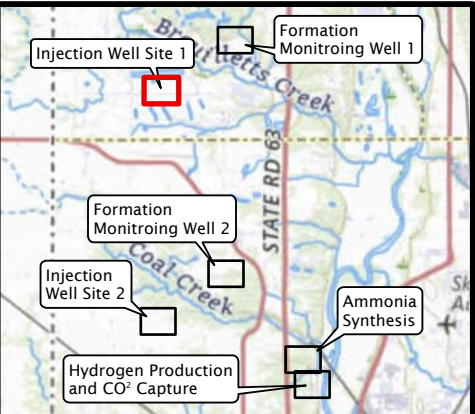


 **WABASH VALLEY RESOURCES** 60727429
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**FIGURE 7-A
DELINEATED FEATURES MAP**
FORMATION MONITORING WELL #1

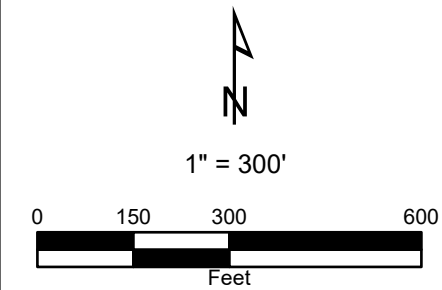


PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/21/2024



- LEGEND:**
- Project Area
 - 10 Foot Contour (USGS)
 - Culvert
 - Wetland Data Point
 - Upland Data Point
 - Delineated Wetland

Basemap Source:
ESRI World Imagery. April, 2023



WV
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RESOURCES

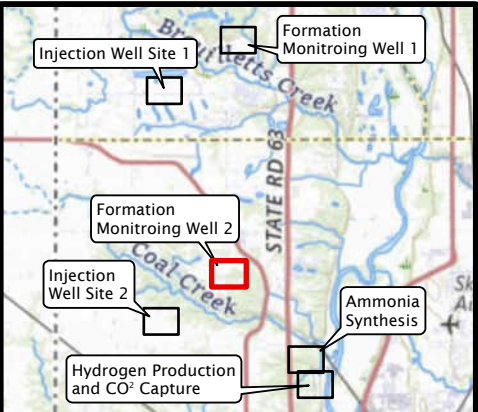
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**FIGURE 7-B
DELINEATED FEATURES MAP**

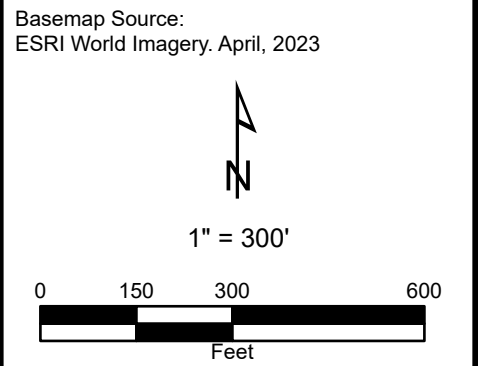
INJECTION WELL SITE #1


AECOM

PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/21/2024



- LEGEND:**
- Project Area
 - 10 Foot Contour (USGS)
 - ▲ Upland Data Point





**WABASH VALLEY
RESOURCES**

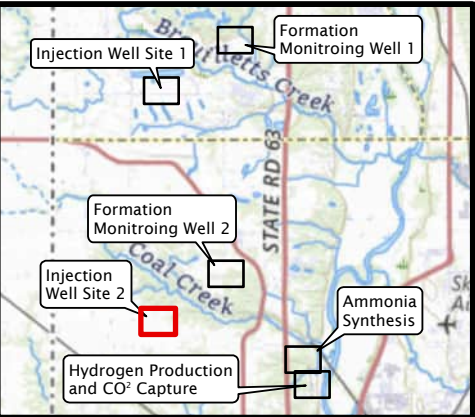
60727429
Wabash Hydrogen Energy
Center Project

**FIGURE 7-C
DELINEATED FEATURES MAP**

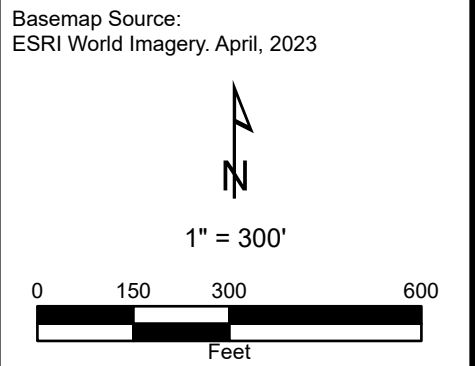
FORMATION MONITORING WELL #2


AECOM

PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/21/2024



- LEGEND:**
- Project Area
 - 10 Foot Contour (USGS)
 - Culvert





**WABASH VALLEY
RESOURCES**

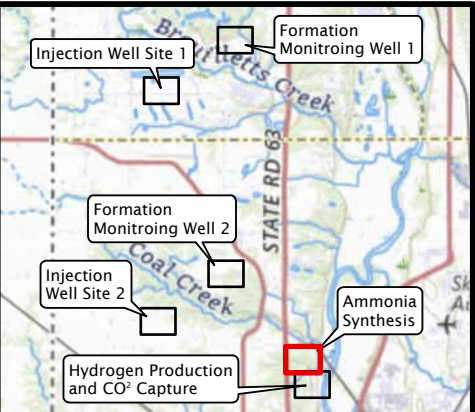
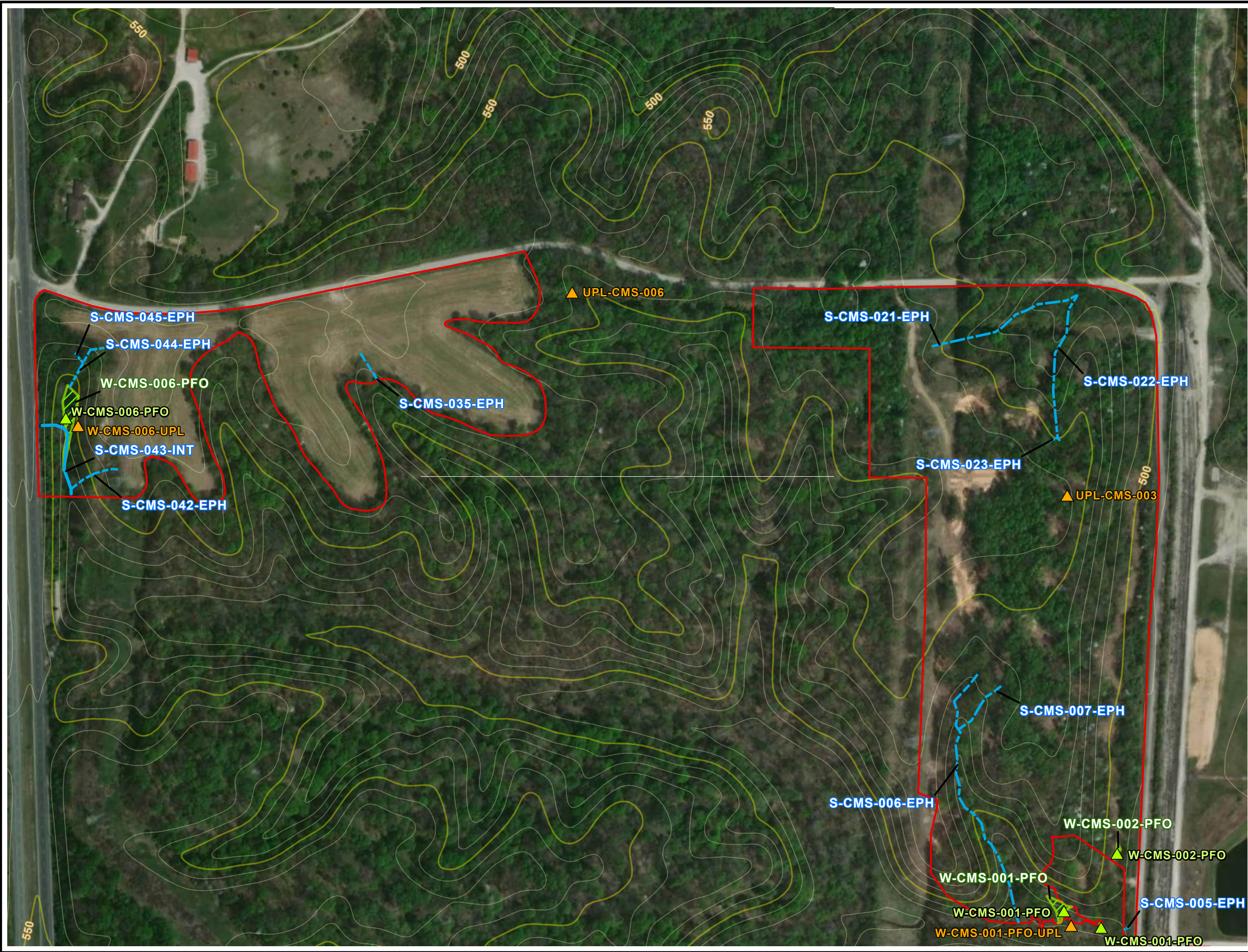
60727429
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Center Project

**FIGURE 7-D
DELINEATED FEATURES MAP**

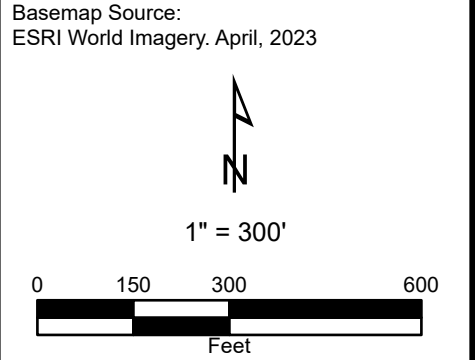
INJECTION WELL SITE #2


AECOM

PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/21/2024



- LEGEND:**
- Project Area
 - 10 Foot Contour (USGS)
 - Wetland Data Point
 - Upland Data Point
 - Delineated Ephemeral Stream
 - Delineated Intermittent Stream
 - Delineated Wetland






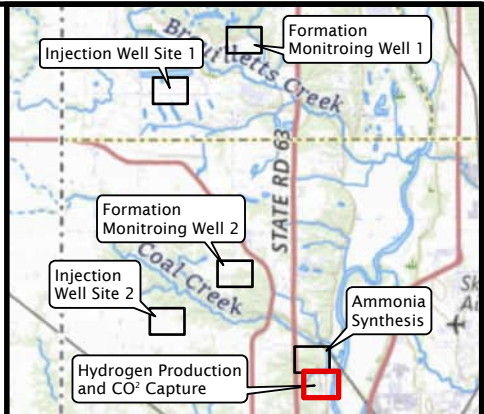
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Wabash Hydrogen Energy
Center Project

**FIGURE 7-E
DELINEATED FEATURES MAP**

AMMONIA SYNTHESIS AND
LAYDOWN / PARKING AREA

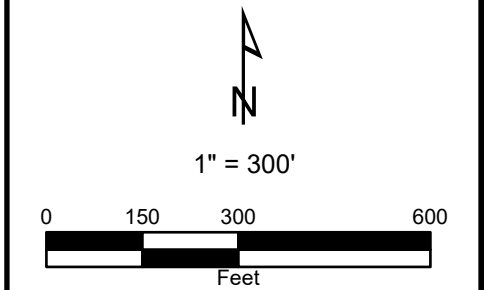


PATH: E:\Wabashwvr_backup\wvr_backup.aprx DATE: 8/21/2024



- LEGEND:**
- Project Area
 - 10 Foot Contour (USGS)
 - Culvert
 - Wetland Data Point
 - Upland Data Point
 - UDF
 - Delineated Ephemeral Stream
 - Delineated Wetland

Basemap Source:
ESRI World Imagery. April, 2023



WV
WABASH VALLEY
RESOURCES

60727429
Wabash Hydrogen Energy
Center Project

**FIGURE 7-F
DELINEATED FEATURES MAP**

HYDROGEN PRODUCTION AND CO₂
CAPTURE

AECOM

APPENDIX B
USACE Data Forms and OEPA ORAM Forms

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: <u>Wabash Hydrogen Energy Center</u>	City/County: <u>Vigo</u>	Sampling Date: <u>6/13/2024</u>
Applicant/Owner: <u>Wabash Valley Resources LLC</u>	State: <u>IN</u>	Sampling Point: <u>W-CMS-001 PEM</u>
Investigator(s): <u>CMS, KB</u>	Section, Township, Range: <u>S28 T13N R9W</u>	
Landform (hillside, terrace, etc.): <u>Floodplain</u>	Local relief (concave, convex, none): <u>Concave</u>	
Slope (%): <u>7</u>	Lat: <u>39.534397°</u>	Long: <u>-87.424188°</u> Datum: <u>DDNAD 83</u>
Soil Map Unit Name: <u>Sh: Shoals silt loam, 0 to 2 percent slopes, frequently flooded, brief duration</u>		NWI classification: <u>NA</u>

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

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

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
--	---

Remarks:
 PEM portion of a PEM/PSS/PFO complex. This portion of the wetland was historically disturbed when stream erosion measures were installed.
 Antecedent Precipitation Tool Drought Index as mild drought.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
1.																					
2.																					
3.																					
4.																					
5.																					
=Total Cover																					
Sapling/Shrub Stratum	(Plot size: <u>15'</u>)				Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <th style="width:40%;">Total % Cover of:</th> <th style="width:60%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>60</u></td> <td>x 1 = <u>60</u></td> </tr> <tr> <td>FACW species <u>28</u></td> <td>x 2 = <u>56</u></td> </tr> <tr> <td>FAC species <u>7</u></td> <td>x 3 = <u>21</u></td> </tr> <tr> <td>FACU species <u>1</u></td> <td>x 4 = <u>4</u></td> </tr> <tr> <td>UPL species <u>4</u></td> <td>x 5 = <u>20</u></td> </tr> <tr> <td>Column Totals: <u>100</u> (A)</td> <td><u>161</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>1.61</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>60</u>	x 1 = <u>60</u>	FACW species <u>28</u>	x 2 = <u>56</u>	FAC species <u>7</u>	x 3 = <u>21</u>	FACU species <u>1</u>	x 4 = <u>4</u>	UPL species <u>4</u>	x 5 = <u>20</u>	Column Totals: <u>100</u> (A)	<u>161</u> (B)	Prevalence Index = B/A = <u>1.61</u>	
Total % Cover of:	Multiply by:																				
OBL species <u>60</u>	x 1 = <u>60</u>																				
FACW species <u>28</u>	x 2 = <u>56</u>																				
FAC species <u>7</u>	x 3 = <u>21</u>																				
FACU species <u>1</u>	x 4 = <u>4</u>																				
UPL species <u>4</u>	x 5 = <u>20</u>																				
Column Totals: <u>100</u> (A)	<u>161</u> (B)																				
Prevalence Index = B/A = <u>1.61</u>																					
1. <u>Platanus occidentalis</u>		<u>4</u>	<u>Yes</u>	<u>FACW</u>																	
2. <u>Ulmus americana</u>		<u>2</u>	<u>Yes</u>	<u>FACW</u>																	
3. <u>Acer negundo</u>		<u>2</u>	<u>Yes</u>	<u>FAC</u>																	
4.																					
5.																					
<u>8</u> =Total Cover																					
Herb Stratum	(Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> <u>2</u> - Dominance Test is >50% <u>X</u> <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u>Problematic Hydrophytic Vegetation¹ (Explain)</u> ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
1. <u>Carex lurida</u>		<u>50</u>	<u>Yes</u>	<u>OBL</u>																	
2. <u>Phalaris arundinacea</u>		<u>10</u>	<u>No</u>	<u>FACW</u>																	
3. <u>Cinna arundinacea</u>		<u>5</u>	<u>No</u>	<u>FACW</u>																	
4. <u>Scirpus atrovirens</u>		<u>5</u>	<u>No</u>	<u>OBL</u>																	
5. <u>Lysimachia nummularia</u>		<u>5</u>	<u>No</u>	<u>FACW</u>																	
6. <u>Salix nigra</u>		<u>5</u>	<u>No</u>	<u>OBL</u>																	
7. <u>Populus deltoides</u>		<u>5</u>	<u>No</u>	<u>FAC</u>																	
8. <u>Daucus carota</u>		<u>4</u>	<u>No</u>	<u>UPL</u>																	
9. <u>Verbena hastata</u>		<u>2</u>	<u>No</u>	<u>FACW</u>																	
10. <u>Lonicera japonica</u>		<u>1</u>	<u>No</u>	<u>FACU</u>																	
<u>92</u> =Total Cover																					
Woody Vine Stratum	(Plot size: <u>30'</u>)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																
1.																					
2.																					
=Total Cover																					

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

SOIL

Sampling Point: W-CMS-001 PEM

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input checked="" type="checkbox"/> Other (Explain in Remarks)		
Field Observations:			
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	<input type="text"/>
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	<input type="text"/>
Saturation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	<input type="text"/>
(includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			
Cracked soils. Hydrology criteria met.			

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R				OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)	
Project/Site: Wabash Hydrogen Energy Center		City/County: Vigo		Sampling Date: 6/12/2024	
Applicant/Owner: Wabash Valley Resources LLC		State: IN		Sampling Point: W-CMS-001 PFO	
Investigator(s): CMS, KB		Section, Township, Range: S28 T13N R9W			
Landform (hillside, terrace, etc.): Depression		Local relief (concave, convex, none): Concave			
Slope (%): 1		Lat: 39.892072		Long: -77.673083	
				Datum: DDNAD 83	
Soil Map Unit Name: HkF: Hickory loam, 25 to 40 percent slopes		NW1 classification: NA			
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)					
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No					
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)					
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.					
Hydrophytic Vegetation Present? Yes X No			Is the Sampled Area within a Wetland? Yes X No		
Hydric Soil Present? Yes X No					
Wetland Hydrology Present? Yes X No					
Remarks: PFO portion of a PEM/PSS/PFO complex. Antecedent Precipitation Tool Drought Index as mild drought.					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 30')		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A) Total Number of Dominant Species Across All Strata: 7 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
1.					
2. Acer negundo		33	Yes	FAC	
3. Populus occidentalis		33	Yes	FAC	
4. Ulmus americana		33	Yes	FACW	
5.					
		99	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')					Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0 x 1 = 0 FACW species 143 x 2 = 286 FAC species 66 x 3 = 198 FACU species 0 x 4 = 0 UPL species 0 x 5 = 0 Column Totals: 209 (A) 484 (B) Prevalence Index = B/A = 2.32
1. Ulmus americana		15	Yes	FACW	
2.					
3.					
4.					
5.					
		15	=Total Cover		
Herb Stratum (Plot size: 5')					Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% X 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. Pilea pumila		50	Yes	FACW	
2. Geum aleppicum		20	Yes	FACW	
3. Laportea canadensis		20	Yes	FACW	
4. Cinna arundinacea		5	No	FACW	
5.					
6.					
7.					
8.					
9.					
10.					
		95	=Total Cover		
Woody Vine Stratum (Plot size: 30')					Hydrophytic Vegetation Present? Yes X No
1.					
2.					
			=Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)					

SOIL

Sampling Point: W-CMS-001 PFO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 3/1	60	10YR 4/1	35	C	M	Loamy/Clayey	
			10YR 4/6	5	C	M		
6-10	10YR 4/1	95	10YR 4/6	5	C	M	Loamy/Clayey	
10-18	10YR 5/1	95	5YR 3/4	5	C	M	Loamy/Clayey	

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

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Red Parent Material (F21)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Very Shallow Dark Surface (F22)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Mucky Mineral (F1)		
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input checked="" type="checkbox"/> Redox Depressions (F8)		

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

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

Remarks:
Multiple hydric indicators present

HYDROLOGY

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

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

(includes capillary fringe)

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

Remarks:
Cracked soils. Hydrology criteria met.

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: <u>Wabash Hydrogen Energy Center</u>	City/County: <u>Vigo</u>	Sampling Date: <u>6/11/2024</u>
Applicant/Owner: <u>Wabash Valley Resources LLC</u>	State: <u>IN</u>	Sampling Point: <u>W-CMS-001-PSS</u>
Investigator(s): <u>CMS, KB</u>	Section, Township, Range: <u>S33 T13N R9W</u>	
Landform (hillside, terrace, etc.): <u>floodplain</u>	Local relief (concave, convex, none): <u>Concave</u>	
Slope (%): <u>5</u>	Lat: <u>39.622484</u>	Long: <u>-87.488098</u> Datum: <u>DDNAD 83</u>
Soil Map Unit Name: <u>Sh: Shoals silt loam, 0 to 2 percent slopes, frequently flooded, brief duration</u>		NWI classification: <u>R5UBH</u>

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

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

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

Remarks:
 PSS portion of a PEM/PSS/PFO complex. This portion of the wetland was historically disturbed when stream erosion measures were installed.
 Antecedent Precipitation Tool Drought Index as mild drought.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
			=Total Cover	
Sapling/Shrub Stratum	(Plot size: <u>15';</u>)			
1. <u>Platanus occidentalis</u>		65	Yes	FACW
2. <u>Salix nigra</u>		10	No	OBL
3. <u>Salix bebbiana</u>		10	No	FACW
4. _____				
5. _____				
		85	=Total Cover	
Herb Stratum	(Plot size: <u>5'</u>)			
1. <u>Solidago gigantea</u>		20	Yes	FACW
2. <u>Leersia virginica</u>		20	Yes	FACW
3. <u>Leersia oryzoides</u>		20	Yes	OBL
4. <u>Phalaris arundinacea</u>		20	Yes	FACW
5. <u>Cinna arundinacea</u>		5	No	FACW
6. <u>Dichanthelium clandestinum</u>		5	No	FACW
7. <u>Desmodium canadense</u>		4	No	FACU
8. <u>Hordeum jubatum</u>		2	No	FAC
9. <u>Galium aparine</u>		2	No	FACU
10. _____				
		98	=Total Cover	
Woody Vine Stratum	(Plot size: <u>30'</u>)			
1. _____				
2. _____				
			=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>30</u>	x 1 = <u>30</u>
FACW species <u>145</u>	x 2 = <u>290</u>
FAC species <u>2</u>	x 3 = <u>6</u>
FACU species <u>6</u>	x 4 = <u>24</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>183</u> (A)	<u>350</u> (B)
Prevalence Index = B/A = <u>1.91</u>	

Hydrophytic Vegetation Indicators:

 1 - Rapid Test for Hydrophytic Vegetation

 X 2 - Dominance Test is >50%

 X 3 - Prevalence Index is ≤3.0¹

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

 Problematic Hydrophytic Vegetation¹ (Explain)

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

Hydrophytic Vegetation Present? Yes X No

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

SOIL

Sampling Point: W-CMS-001-PSS

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 6/1	60	10YR 6/8	40	C	M	Loamy/Clayey	
8-16	10YR 7/1	70	10YR 6/8	30	C	M	Loamy/Clayey	

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

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) <input type="checkbox"/> Redox Depressions (F8)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Red Parent Material (F21) <input type="checkbox"/> Very Shallow Dark Surface (F22) <input type="checkbox"/> Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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Restrictive Layer (if observed): Type: _____ Rock _____ Depth (inches): _____ 16 _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____
Remarks: Hydric soil indicators met. Rock encountered at 16 inches.	

HYDROLOGY

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

Field Observations: Surface Water Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes _____ No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No _____ Depth (inches): 0 _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: Multiple hydric indicators present.	

SOIL

Sampling Point: W-CMS-001 PFO-UPL

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

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

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Red Parent Material (F21) <input type="checkbox"/> Very Shallow Dark Surface (F22) <input type="checkbox"/> Other (Explain in Remarks)
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³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ rock Depth (inches): _____ 8	Hydric Soil Present? Yes _____ No <u>X</u>
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Remarks:
No indicators present

HYDROLOGY

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

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Hydrology criteria not met.

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Wabash Hydrogen Energy Center
 Applicant/Owner: Wabash Valley Resources LLC
 Investigator(s): CMS, KB
 Landform (hillside, terrace, etc.): Hillside
 Slope (%): 10 Lat: 39.534256°
 Soil Map Unit Name: Ma: Made land

City/County: Vigo
 State: IN
 Section, Township, Range: S33 T13N R9W
 Local relief (concave, convex, none): Convex
 Long: -87.424532° Datum: DDNAD 83
 NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)
 Are Vegetation X , Soil X , or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes No X
 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 <u> </u> No <u> X </u> Hydric Soil Present? Yes <u> </u> No <u> X </u> Wetland Hydrology Present? Yes <u> </u> No <u> X </u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u> X </u>
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Remarks:
 Upland old field historically disturbed when stream erosion measures were installed.. Antecedent Precipitation Tool Drought Index as mild drought.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
5.				
=Total Cover				
Sapling/Shrub Stratum	(Plot size: <u>15'</u>)			
1.	<u>Cornus racemosa</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>
2.	<u>Elaeagnus umbellata</u>	<u>10</u>	<u>Yes</u>	<u>UPL</u>
3.				
4.				
5.				
<u>20</u> =Total Cover				
Herb Stratum	(Plot size: <u>5'</u>)			
1.	<u>Securigera varia</u>	<u>50</u>	<u>Yes</u>	<u>UPL</u>
2.	<u>Medicago lupulina</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>
3.	<u>Trifolium pratense</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>
4.	<u>Daucus carota</u>	<u>5</u>	<u>No</u>	<u>UPL</u>
5.	<u>Trifolium repens</u>	<u>5</u>	<u>No</u>	<u>FACU</u>
6.	<u>Erigeron canadensis</u>	<u>5</u>	<u>No</u>	<u>FACU</u>
7.	<u>Leucanthemum vulgare</u>	<u>3</u>	<u>No</u>	<u>UPL</u>
8.	<u>Lonicera japonica</u>	<u>2</u>	<u>No</u>	<u>FACU</u>
9.	<u>Melilotus officinalis</u>	<u>1</u>	<u>No</u>	<u>FACU</u>
10.				
<u>111</u> =Total Cover				
Woody Vine Stratum	(Plot size: <u>30'</u>)			
1.				
2.				
=Total Cover				

Dominance Test worksheet:			
Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)			
Total Number of Dominant Species Across All Strata: <u>5</u> (B)			
Percent of Dominant Species That Are OBL, FACW, or FAC: <u>20.0%</u> (A/B)			

Prevalence Index worksheet:			
Total % Cover of:	Multiply by:		
OBL species <u>0</u>	x 1 =	<u>0</u>	
FACW species <u>0</u>	x 2 =	<u>0</u>	
FAC species <u>10</u>	x 3 =	<u>30</u>	
FACU species <u>53</u>	x 4 =	<u>212</u>	
UPL species <u>68</u>	x 5 =	<u>340</u>	
Column Totals: <u>131</u> (A)		<u>582</u> (B)	
Prevalence Index = B/A = <u>4.44</u>			

Hydrophytic Vegetation Indicators:	
<u> </u> 1 - Rapid Test for Hydrophytic Vegetation	
<u> </u> 2 - Dominance Test is >50%	
<u> </u> 3 - Prevalence Index is ≤3.0 ¹	
<u> </u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
<u> </u> Problematic Hydrophytic Vegetation ¹ (Explain)	
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	

Hydrophytic Vegetation Present?	
Yes <u> </u>	No <u> X </u>

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

SOIL

Sampling Point: W-CMS-001 PSS-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features					
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-2	10YR 6/3	70	10YR 5/3	30			Loamy/Clayey	

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

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Dark Surface (S7)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Mucky Mineral (F1)
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

☐ Iron-Manganese Masses (F12)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (F22)
☐ Other (Explain in Remarks) _____

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

Restrictive Layer (if observed): Type: gravel Depth (inches): 2	Hydric Soil Present? Yes ____ No <u>X</u>
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Remarks:
 No indicators present. Gravel fill encountered at 2 inches.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> (includes capillary fringe)			
		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: Hydrology criteria not met.			

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R		OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)	
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Project/Site: <u>Wabash Hydrogen Energy Center</u>	City/County: <u>Vigo</u>	Sampling Date: <u>6/13/2024</u>
Applicant/Owner: <u>Wabash Valley Resources LLC</u>	State: <u>IN</u>	Sampling Point: <u>W-CMS-002-PFO</u>
Investigator(s): <u>CMS, KB</u>	Section, Township, Range: <u>S28 T13N R9W</u>	
Landform (hillside, terrace, etc.): <u>hillside</u>	Local relief (concave, convex, none): <u>concave</u>	
Slope (%): <u>1</u> Lat: <u>39.535476°</u>	Long: <u>-87.424167°</u>	Datum: <u>DDNAD 83</u>
Soil Map Unit Name: <u>HkF: Hickory loam, 25 to 40 percent slopes</u>	NW1 classification: <u>NA</u>	

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

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

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 <u> X </u> No <u> </u> Hydric Soil Present? Yes <u> X </u> No <u> </u> Wetland Hydrology Present? Yes <u> X </u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> X </u> No <u> </u>
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Remarks:
 Site was historically disturbed in 2023 by the construction of an access road for geotechnical surveys. Soils, vegetation and hydrology were disturbed by the removal of vegetation and the compaction of soils. Site dominated by pin oak, dark-green bulrush, narrow leaf cattail and shallow sedge.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Quercus palustris</u>		25	Yes	FACW
2. _____				
3. _____				
4. _____				
5. _____				
		25	=Total Cover	
Sapling/Shrub Stratum	(Plot size: <u>15'</u>)			
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
			=Total Cover	
Herb Stratum	(Plot size: <u>5'</u>)			
1. <u>Scirpus atrovirens</u>		20	Yes	OBL
2. <u>Typha angustifolia</u>		20	Yes	OBL
3. <u>Carex lurida</u>		15	Yes	OBL
4. <u>Verbena urticifolia</u>		10	No	FAC
5. <u>Carex normalis</u>		5	No	FACW
6. <u>Triodanis perfoliata</u>		5	No	FAC
7. <u>Melilotus albus</u>		5	No	FACU
8. <u>Phragmites australis</u>		5	No	FACW
9. _____				
10. _____				
		85	=Total Cover	
Woody Vine Stratum	(Plot size: <u>30'</u>)			
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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>55</u>	x 1 = <u>55</u>
FACW species <u>35</u>	x 2 = <u>70</u>
FAC species <u>15</u>	x 3 = <u>45</u>
FACU species <u>5</u>	x 4 = <u>20</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>110</u> (A)	<u>190</u> (B)
Prevalence Index = B/A = <u>1.73</u>	

Hydrophytic Vegetation Indicators:

 1 - Rapid Test for Hydrophytic Vegetation

 X 2 - Dominance Test is >50%

 X 3 - Prevalence Index is ≤3.0¹

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

 Problematic Hydrophytic Vegetation¹ (Explain)

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

Hydrophytic Vegetation Present? Yes X No

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

SOIL

Sampling Point: W-CMS-002-PFO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10YR 4/1	70	10YR 6/1	15	D	M	Loamy/Clayey	
			10YR 6/8	15	C	M		Prominent redox concentrations

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

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input checked="" type="checkbox"/> Redox Depressions (F8)
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Restrictive Layer (if observed):
 Type: _____ rock
 Depth (inches): _____ 16

Hydric Soil Present? Yes ☒ No ☐

Remarks:
 Hydric indicator met.

HYDROLOGY

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

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>1</u> Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0</u> Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
 Hydrology indicators met.

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R		OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)	
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Project/Site: Wabash Hydrogen Energy Center
 Applicant/Owner: Wabash Valley Resources LLC
 Investigator(s): CMS, KB

City/County: Vermillion
 State: IN
 Section, Township, Range: S26 T14N R10W

Sampling Date: 6/13/2024
 Sampling Point: W-CMS-003-PEM

Landform (hillside, terrace, etc.): plains
 Slope (%): 0 Lat: 39.622335°
 Soil Map Unit Name: OrB: Orthents, loamy, 0 to 8 percent slopes

Local relief (concave, convex, none): concave
 Long: -87.489021° Datum: DDNAD 83
 NWI classification: PEM1Cx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Yes No X
 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 <u>X</u> No <u> </u> Hydric Soil Present? Yes <u>X</u> No <u> </u> Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
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Remarks:
 Site was historically disturbed by strip mining and currently by cattle. Soils, vegetation and hydrology were disturbed by the removal of vegetation and the compaction of soils. Site dominated by cottonwood, red cedar, and spotted ladythumb. APT indicates mild drought for this time of year.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u> </u>				
2. <u>Populus deltoides</u>	10	Yes	FAC	
3. <u> </u>				
4. <u> </u>				
5. <u> </u>				
10 =Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Juniperus virginiana</u>	5	Yes	FACU	
2. <u>Salix nigra</u>	5	Yes	OBL	
3. <u> </u>				
4. <u> </u>				
5. <u> </u>				
10 =Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Polygonum persicaria</u>	10	Yes	FACW	
2. <u>Eleocharis palustris</u>	10	Yes	OBL	
3. <u> </u>				
4. <u> </u>				
5. <u> </u>				
6. <u> </u>				
7. <u> </u>				
8. <u> </u>				
9. <u> </u>				
10. <u> </u>				
20 =Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. <u> </u>				
2. <u> </u>				
=Total Cover				

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

SOIL

Sampling Point: W-CMS-003-PEM

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input checked="" type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input checked="" type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		
Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u> 3 </u> Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u> 0 </u> Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u> 0 </u> (includes capillary fringe)			
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: Hydrologic indicators met.			

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Wabash Hydrogen Energy Center
 Applicant/Owner: Wabash Valley Resources LLC
 Investigator(s): CMS, KB

City/County: Vermillion
 State: IN
 Section, Township, Range: S26 T14N R10W

Sampling Date: 6/13/2024
 Sampling Point: W-CMS-003-UPL

Landform (hillside, terrace, etc.): plains
 Slope (%): 0 Lat: 39.622746°
 Soil Map Unit Name: OrB: Orthents, loamy, 0 to 8 percent slopes

Local relief (concave, convex, none): concave
 Long: -87.487905° Datum: DDNAD 83
 NWI classification: NA

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

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

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks:
 Site was historically disturbed by strip mining and currently by cattle. Soils, vegetation and hydrology were disturbed by the removal of vegetation and the compaction of soils. Site dominated by red cedar. APT indicates mild drought for this time of year.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				
2. <u>Juniperus virginiana</u>	90	Yes	FACU	
3. _____				
4. _____				
5. _____				
90 =Total Cover				
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Elaeagnus umbellata</u>	2	No	UPL	
2. _____				
3. _____				
4. _____				
5. _____				
2 =Total Cover				
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Digitaria ciliaris</u>	2	No	FACU	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
2 =Total Cover				
Woody Vine Stratum (Plot size: <u>30'</u>)				
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: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species <u>0</u>	x 1 =	<u>0</u>
FACW species <u>0</u>	x 2 =	<u>0</u>
FAC species <u>0</u>	x 3 =	<u>0</u>
FACU species <u>92</u>	x 4 =	<u>368</u>
UPL species <u>2</u>	x 5 =	<u>10</u>
Column Totals: <u>94</u> (A)		<u>378</u> (B)
Prevalence Index = B/A =		<u>4.02</u>

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: W-CMS-003-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 5/1	90	10YR 5/6	10	C	M	Loamy/Clayey	Prominent redox concentrations

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

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☒ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☒ Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

☐ Iron-Manganese Masses (F12)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (F22)
☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed): Type: rock _____ Depth (inches): 6 _____	Hydric Soil Present? Yes <u> X </u> No _____
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Remarks:
 Hydric indicators met. Cattle have hummocked and compacted soils.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> (includes capillary fringe)			
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: Hydrologic indicators not met.			

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R				OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)	
Project/Site: Wabash Hydrogen Energy Center		City/County: Vermillion		Sampling Date: 6/13/2024	
Applicant/Owner: Wabash Valley Resources LLC		State: IN		Sampling Point: W-CMS-004-PEM	
Investigator(s): CMS, KB		Section, Township, Range: S26 T14N R10W			
Landform (hillside, terrace, etc.): plains		Local relief (concave, convex, none): concave			
Slope (%): 2		Lat: 39.623260°		Long: -87.487250°	
Datum: DDNAD 83		Soil Map Unit Name: OrB: Orthents, loamy, 0 to 8 percent slopes			
NW1 classification: PEM1Cx		Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)			
Are Vegetation X, Soil X, or Hydrology X significantly disturbed?		Are "Normal Circumstances" present? Yes No X			
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		Wetland Hydrology Present? Yes X No	
Is the Sampled Area within a Wetland? Yes X No					
Remarks: Site was historically disturbed by strip mining and currently by cattle. Soils, vegetation and hydrology were disturbed by the removal of vegetation and the compaction of soils. Site dominated by creeping rush and common purslane. APT indicates mild drought for this time of year.					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 30')		Absolute % Cover		Dominant Species?	
Indicator Status					
1.					
2.					
3.					
4.					
5.					
		=Total Cover			
Sapling/Shrub Stratum (Plot size: 15')		Absolute % Cover		Dominant Species?	
Indicator Status					
1.					
2.					
3.					
4.					
5.					
		=Total Cover			
Herb Stratum (Plot size: 5')		Absolute % Cover		Dominant Species?	
Indicator Status					
1. Eleocharis palustris		60		Yes OBL	
2. Portulaca oleracea		20		Yes FACU	
3. Sagittaria latifolia		1		No OBL	
4.					
5.					
6.					
7.					
8.					
9.					
10.					
		81 =Total Cover			
Woody Vine Stratum (Plot size: 30')		Absolute % Cover		Dominant Species?	
Indicator Status					
1.					
2.					
		=Total Cover			
Remarks: (Include photo numbers here or on a separate sheet.)					
Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A) Total Number of Dominant Species Across All Strata: 2 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)					
Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 61 x 1 = 61 FACW species 0 x 2 = 0 FAC species 0 x 3 = 0 FACU species 20 x 4 = 80 UPL species 0 x 5 = 0 Column Totals: 81 (A) 141 (B) Prevalence Index = B/A = 1.74					
Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% X 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.					
Hydrophytic Vegetation Present? Yes X No					

SOIL

Sampling Point: W-CMS-004-PEM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 5/1	60	7.5YR 6/8	40	C	M	Loamy/Clayey	Prominent redox concentrations

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

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1) ☐ Sandy Gleyed Matrix (S4)
- ☐ Histic Epipedon (A2) ☐ Sandy Redox (S5)
- ☐ Black Histic (A3) ☐ Stripped Matrix (S6)
- ☐ Hydrogen Sulfide (A4) ☐ Dark Surface (S7)
- ☐ Stratified Layers (A5) ☐ Loamy Mucky Mineral (F1)
- ☐ 2 cm Muck (A10) ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Below Dark Surface (A11) ☒ Depleted Matrix (F3)
- ☐ Thick Dark Surface (A12) ☐ Redox Dark Surface (F6)
- ☐ Sandy Mucky Mineral (S1) ☐ Depleted Dark Surface (F7)
- ☐ 5 cm Mucky Peat or Peat (S3) ☒ Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

- ☐ Iron-Manganese Masses (F12)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (F22)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed): Type: _____ rock Depth (inches): _____ 6	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:
Hydric indicators met. Cattle have hummocked and compacted soils.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input checked="" type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		
Field Observations:			
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	<input type="text"/>
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	<input type="text"/>
Saturation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches):	<input type="text"/>
(includes capillary fringe)		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			
Hydrologic indicators met.			

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R				OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)	
Project/Site: Wabash Hydrogen Energy Center		City/County: Vermillion		Sampling Date: 6/13/2024	
Applicant/Owner: Wabash Valley Resources LLC		State: IN		Sampling Point: W-CMS-005-PEM	
Investigator(s): CMS, KB		Section, Township, Range: S26 T14N R10W			
Landform (hillside, terrace, etc.): plains		Local relief (concave, convex, none): concave			
Slope (%): 2		Lat: 39.623726°		Long: -87.486852°	
Datum: DDNAD 83		Soil Map Unit Name: OrB: Orthents, loamy, 0 to 8 percent slopes			
NW1 classification: PEM1Cx		Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)			
Are Vegetation X, Soil X, or Hydrology X significantly disturbed?		Are "Normal Circumstances" present? Yes No X			
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		Wetland Hydrology Present? Yes X No	
Is the Sampled Area within a Wetland? Yes X No					
Remarks: Site was historically disturbed by strip mining and currently by cattle. Soils, vegetation and hydrology were disturbed by the removal of vegetation and the compaction of soils. Site dominated by indian strawberry, creeping rush and reed canary grass. APT indicates mild drought for this time of year.					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 30')		Absolute % Cover		Dominant Species?	
Indicator Status					
1.					
2.					
3.					
4.					
5.					
		=Total Cover			
Sapling/Shrub Stratum (Plot size: 15')		Absolute % Cover		Dominant Species?	
Indicator Status					
1.					
2.					
3.					
4.					
5.					
		=Total Cover			
Herb Stratum (Plot size: 5')		Absolute % Cover		Dominant Species?	
Indicator Status					
1. Potentilla indica		40		Yes FACU	
2. Eleocharis palustris		25		Yes OBL	
3. Phalaris arundinacea		20		Yes FACW	
4. Polygonum persicaria		10		No FACW	
5. Ambrosia artemisiifolia		2		No FACU	
6.					
7.					
8.					
9.					
10.					
		97 =Total Cover			
Woody Vine Stratum (Plot size: 30')		Absolute % Cover		Dominant Species?	
Indicator Status					
1.					
2.					
		=Total Cover			
Remarks: (Include photo numbers here or on a separate sheet.)					
Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A) Total Number of Dominant Species Across All Strata: 3 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)					
Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 25 x 1 = 25 FACW species 30 x 2 = 60 FAC species 0 x 3 = 0 FACU species 42 x 4 = 168 UPL species 0 x 5 = 0 Column Totals: 97 (A) 253 (B) Prevalence Index = B/A = 2.61					
Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% X 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.					
Hydrophytic Vegetation Present? Yes X No					

SOIL

Sampling Point: W-CMS-005-PEM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 5/1	60	7.5YR 5/6	40	C	M	Loamy/Clayey	Prominent redox concentrations

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

²Location: PL=Pore Lining, M=Matrix.

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

☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Dark Surface (S7)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☒ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☒ Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:
☐ Iron-Manganese Masses (F12)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (F22)
☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):
 Type: _____ rock _____
 Depth (inches): _____ 8 _____

Hydric Soil Present? Yes ☒ No _____

Remarks:
Hydric indicators met. Cattle have hummocked and compacted soils.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input checked="" type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> (includes capillary fringe)			
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			
Hydrologic indicators met.			

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R				OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)	
Project/Site: Wabash Hydrogen Energy Center		City/County: Vermillion		Sampling Date: 6/13/2024	
Applicant/Owner: Wabash Valley Resources LLC		State: IN		Sampling Point: W-CMS-004/5-UPL	
Investigator(s): CMS, KB		Section, Township, Range: S26 T14N R10W			
Landform (hillside, terrace, etc.): plains		Local relief (concave, convex, none): concave			
Slope (%): 0		Lat: 39.624547°		Long: -87.487396°	
Datum: DDNAD 83		Soil Map Unit Name: OrB: Orthents, loamy, 0 to 8 percent slopes			
NW1 classification: NA		Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)			
Are Vegetation X, Soil X, or Hydrology X significantly disturbed?		Are "Normal Circumstances" present? Yes No X			
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		Hydic Soil Present? Yes X No		Wetland Hydrology Present? Yes No X	
Is the Sampled Area within a Wetland? Yes No X					
Remarks: Site was historically disturbed by strip mining and currently by cattle. Soils, vegetation and hydrology were disturbed by the removal of vegetation and the compaction of soils. Site dominated by annual bluegrass and red clover. APT indicates mild drought for this time of year.					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 30')		Absolute % Cover		Dominant Species?	
Indicator Status					
1.					
2.					
3.					
4.					
5.					
		=Total Cover			
Sapling/Shrub Stratum (Plot size: 15')		Absolute % Cover		Dominant Species?	
Indicator Status					
1.					
2.					
3.					
4.					
5.					
		=Total Cover			
Herb Stratum (Plot size: 5')		Absolute % Cover		Dominant Species?	
Indicator Status					
1. Poa annua		60		Yes FACU	
2. Trifolium pratense		20		No FACU	
3. Plantago lanceolata		10		No FACU	
4. Dactylis glomerata		10		No FACU	
5. Ambrosia artemisiifolia		5		No FACU	
6.					
7.					
8.					
9.					
10.					
		105 =Total Cover			
Woody Vine Stratum (Plot size: 30')		Absolute % Cover		Dominant Species?	
Indicator Status					
1.					
2.					
		=Total Cover			
Remarks: (Include photo numbers here or on a separate sheet.)					
Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A) Total Number of Dominant Species Across All Strata: 1 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)					
Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0 x 1 = 0 FACW species 0 x 2 = 0 FAC species 0 x 3 = 0 FACU species 105 x 4 = 420 UPL species 0 x 5 = 0 Column Totals: 105 (A) 420 (B) Prevalence Index = B/A = 4.00					
Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.					
Hydrophytic Vegetation Present? Yes No X					

SOIL

Sampling Point: W-CMS-004/5-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	10YR 4/1	60	10YR 5/6	5	C	M	Loamy/Clayey	Prominent redox concentrations
			10YR 5/1	35	D	M		

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

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Red Parent Material (F21)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Very Shallow Dark Surface (F22)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Mucky Mineral (F1)		
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input checked="" type="checkbox"/> Redox Depressions (F8)		

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

Restrictive Layer (if observed):		Hydric Soil Present?	
Type: _____ rock		Yes	No
Depth (inches): _____ 5		<input checked="" type="checkbox"/>	<input type="checkbox"/>

Remarks:
Hydric indicators met. Cattle have hummocked and compacted soils.

HYDROLOGY

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

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

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

Remarks:
Hydrologic indicators not met.

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Wabash Hydrogen Energy Center
 Applicant/Owner: Wabash Valley Resources LLC
 Investigator(s): CMS, CB

City/County: Vigo
 State: IN
 Section, Township, Range: S29 T13N R9W

Sampling Date: 7/10/2024
 Sampling Point: W-CMS-006-PFO

Landform (hillside, terrace, etc.): valley
 Slope (%): 2 Lat: 39.539358°
 Soil Map Unit Name: HkF: Hickory loam, 25 to 40 percent slopes

Local relief (concave, convex, none): concave
 Long: -87.436173° Datum: DDNAD 83
 NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? 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 <u>X</u> No <u> </u> Hydric Soil Present? Yes <u>X</u> No <u> </u> Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
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Remarks:
 Wetland located in a valley receiving water from intermittent and ephemeral streams. Site dominated by sycamore, cottonwood, American elm, American fly honeysuckle, and fowl manna grass. APT indicates mild drought for this time of year.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u> </u>				
2. <u>Platanus occidentalis</u>	40	Yes	FACW	
3. <u>Populus deltoides</u>	20	Yes	FAC	
4. <u>Quercus alba</u>	10	No	FACU	
5. <u>Fraxinus pennsylvanica</u>	5	No	FACW	
	75 =Total Cover			
Sapling/Shrub Stratum (Plot size: <u>15'</u>)				
1. <u>Ulmus americana</u>	10	Yes	FACW	
2. <u>Lonicera canadensis</u>	5	Yes	FACU	
3. <u> </u>				
4. <u> </u>				
5. <u> </u>				
	15 =Total Cover			
Herb Stratum (Plot size: <u>5'</u>)				
1. <u>Glyceria striata</u>	20	Yes	OBL	
2. <u>Impatiens capensis</u>	5	No	FACW	
3. <u>Phragmites australis</u>	5	No	FACW	
4. <u>Geum aleppicum</u>	5	No	FACW	
5. <u> </u>				
6. <u> </u>				
7. <u> </u>				
8. <u> </u>				
9. <u> </u>				
10. <u> </u>				
	35 =Total Cover			
Woody Vine Stratum (Plot size: <u>30'</u>)				
1. <u> </u>				
2. <u> </u>				
	=Total Cover			

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
 Total Number of Dominant Species Across All Strata: 5 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species <u>20</u>		x 1 =	<u>20</u>
FACW species <u>70</u>		x 2 =	<u>140</u>
FAC species <u>20</u>		x 3 =	<u>60</u>
FACU species <u>15</u>		x 4 =	<u>60</u>
UPL species <u>0</u>		x 5 =	<u>0</u>
Column Totals: <u>125</u> (A)			<u>280</u> (B)
Prevalence Index = B/A = <u>2.24</u>			

Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Remarks: (Include photo numbers here or on a separate sheet.)	Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>
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SOIL

Sampling Point: W-CMS-006-PFO

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 3/2	95	10YR 4/6	5	C	M	Loamy/Clayey	Prominent redox concentrations
8-12	10YR 5/2	70	7.5YR 4/6	30	C	M	Loamy/Clayey	Prominent redox concentrations

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

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10)	
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input checked="" type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input checked="" type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if observed):	Hydric Soil Present?
Type: <u> </u> rock	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Depth (inches): <u> </u> 12	

Remarks:
Hydric indicators met.

HYDROLOGY

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

Field Observations:				Wetland Hydrology Present?
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): <u> </u> 0		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u> </u> 0		
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u> </u> 0		
(includes capillary fringe)				
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:				
Remarks: Hydrologic indicators met.				

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R			OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)		
Project/Site: Wabash Hydrogen Energy Center		City/County: Vigo		Sampling Date: 7/10/2024	
Applicant/Owner: Wabash Valley Resources LLC		State: IN		Sampling Point: W-CMS-006-UPL	
Investigator(s): CMS, CB		Section, Township, Range: S29 T13N R9W			
Landform (hillside, terrace, etc.): hillside		Local relief (concave, convex, none): convex			
Slope (%): 30		Lat: 39.539234°		Long: -87.436087°	
		Datum: DDNAD 83			
Soil Map Unit Name: HkF: Hickory loam, 25 to 40 percent slopes		NW1 classification: NA			
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)					
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "X 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 pX					
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: Upland woods. Site dominated by sugar maple, cottonwood, American fly honeysuckle and wild Canadain ginger. APT indicates mild drought for this time of year.					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 30')		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A) Total Number of Dominant Species Across All Strata: 6 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 16.7% (A/B)
1.					
2. Acer saccharum		40	Yes	FACU	
3. Populus deltoides		30	Yes	FAC	
4.					
5.					
		70	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')					Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0 x 1 = 0 FACW species 0 x 2 = 0 FAC species 30 x 3 = 90 FACU species 115 x 4 = 460 UPL species 10 x 5 = 50 Column Totals: 155 (A) 600 (B) Prevalence Index = B/A = 3.87
1. Lonicera canadensis		10	Yes	FACU	
2.					
3.					
4.					
5.					
		10	=Total Cover		
Herb Stratum (Plot size: 5')					Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. Asarum canadense		50	Yes	FACU	
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
		50	=Total Cover		
Woody Vine Stratum (Plot size: 30')					Hydrophytic Vegetation Present? Yes No X
1. Parthenocissus quinquefolia		15	Yes	FACU	
2. Hedera helix		10	Yes	UPL	
		25	=Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)					

SOIL

Sampling Point: W-CMS-006-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10YR 5/4	70	5YR 3/4	30	C	M	Sandy	Prominent redox concentrations

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

²Location: PL=Pore Lining, M=Matrix.

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

_____ Sandy Gleyed Matrix (S4)
 _____ Sandy Redox (S5)
 _____ Stripped Matrix (S6)
 _____ Dark Surface (S7)
 _____ Loamy Mucky Mineral (F1)
 _____ Loamy Gleyed Matrix (F2)
 _____ Depleted Matrix (F3)
 _____ Redox Dark Surface (F6)
 _____ Depleted Dark Surface (F7)
 _____ Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:
☐ Iron-Manganese Masses (F12)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (F22)
☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

 Type: rock
 Depth (inches): 16

Hydric Soil Present? Yes ____ No X

Remarks:
 Hydric indicators not met.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		
Field Observations:			
Surface Water Present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	<input type="text"/>
Water Table Present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	<input type="text"/>
Saturation Present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	<input type="text"/>
(includes capillary fringe)		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks:			
Hydrologic indicators not met.			

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R			OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)		
Project/Site: Wabash Hydrogen Energy Center		City/County: Vigo		Sampling Date: 7/11/2024	
Applicant/Owner: Wabash Valley Resources LLC		State: IN		Sampling Point: W-CMS-007-PEM	
Investigator(s): CMS, CB		Section, Township, Range: S32 T13N R9W			
Landform (hillside, terrace, etc.): valley		Local relief (concave, convex, none): concave			
Slope (%): 1		Lat: 39.530588°		Long: -87.427182°	
Datum: DDNAD 83		Soil Map Unit Name: Ma: Made land			
NW1 classification: NA		Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)			
Are Vegetation X, Soil X, or Hydrology X significantly disturbed?		Are "Normal Circumstances" present? Yes No X			
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: Site was historically disturbed by the construction of transmission line ROW. Soils, vegetation and hydrology were disturbed by the removal of vegetation and compaction of soils. Site dominated by boxelder, pin cherry, and American elm.. APT indicates mild drought for this time of year.					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 30')		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A) Total Number of Dominant Species Across All Strata: 6 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)
1. Acer negundo		10	Yes	FAC	
2. Prunus pensylvanica		5	Yes	FACU	
3.					
4.					
5.					
		15	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')					Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 50 x 1 = 50 FACW species 39 x 2 = 78 FAC species 17 x 3 = 51 FACU species 15 x 4 = 60 UPL species 0 x 5 = 0 Column Totals: 121 (A) 239 (B) Prevalence Index = B/A = 1.98
1. Ulmus americana		10	Yes	FACW	
2. Gleditsia triacanthos		5	Yes	FACU	
3.					
4.					
5.					
		15	=Total Cover		
Herb Stratum (Plot size: 5')					Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation X 2 - Dominance Test is >50% X 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. Leersia oryzoides		40	Yes	OBL	
2. Phalaris arundinacea		20	Yes	FACW	
3. Carex lurida		5	No	OBL	
4. Phragmites australis		5	No	FACW	
5. Elymus hystrix		5	No	FACU	
6. Toxicodendron radicans		5	No	FAC	
7. Glyceria striata		5	No	OBL	
8. Dichanthelium clandestinum		2	No	FACW	
9. Urtica dioica		2	No	FACW	
10. Rumex crispus		2	No	FAC	
		91	=Total Cover		
Woody Vine Stratum (Plot size: 30')					Hydrophytic Vegetation Present? Yes X No
1.					
2.					
			=Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)					

SOIL

Sampling Point: W-CMS-007-PEM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	2.5Y 4/2	100					Sandy	
5-18	10YR 6/2	70	7.5YR 4/6	30	C	M	Sandy	Prominent redox concentrations

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

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Iron-Manganese Masses (F12)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> Histic Epipedon (A2)	<input checked="" type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Red Parent Material (F21)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Very Shallow Dark Surface (F22)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Mucky Mineral (F1)		
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Redox Depressions (F8)		

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

HYDROLOGY

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

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 5 Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0 (includes capillary fringe)				Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:				
Remarks: Hydrologic indicators met.				

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Wabash Hydrogen Energy Center
 Applicant/Owner: Wabash Valley Resources LLC
 Investigator(s): CMS, CB
 Landform (hillside, terrace, etc.): hill side
 Slope (%): 7 Lat: 39.530487°
 Soil Map Unit Name: Ma: Made land

City/County: Vigo
 State: IN
 Section, Township, Range: S32 T13N R9W
 Local relief (concave, convex, none): concave
 Long: -87.427100° Datum: DDNAD 83
 NWI classification: NA

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

Are "Normal Circumstances" present? Yes ☐ No ☒

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

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks:
 Site was historically disturbed by the construction of transmission line ROW. Soils, vegetation and hydrology were disturbed by the removal of vegetation and the compaction of soils. Site dominated by crown vetch. APT indicates mild drought for this time of year.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
5.				
		=Total Cover		
Sapling/Shrub Stratum	(Plot size: <u>15'</u>)			
1.				
2.				
3.				
4.				
5.				
		=Total Cover		
Herb Stratum	(Plot size: <u>5'</u>)			
1.	<u>Securigera varia</u>	<u>80</u>	<u>Yes</u>	<u>UPL</u>
2.	<u>Solanum carolinense</u>	<u>5</u>	<u>No</u>	<u>FACU</u>
3.	<u>Rubus occidentalis</u>	<u>5</u>	<u>No</u>	<u>UPL</u>
4.	<u>Phragmites australis</u>	<u>5</u>	<u>No</u>	<u>FACW</u>
5.	<u>Urtica dioica</u>	<u>5</u>	<u>No</u>	<u>FACW</u>
6.				
7.				
8.				
9.				
10.				
		<u>100</u>	=Total Cover	
Woody Vine Stratum	(Plot size: <u>30'</u>)			
1.				
2.				
			=Total Cover	

Dominance Test worksheet:			
Number of Dominant Species That Are OBL, FACW, or FAC:	<u>0</u>	(A)	
Total Number of Dominant Species Across All Strata:	<u>1</u>	(B)	
Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>0.0%</u>	(A/B)	

Prevalence Index worksheet:			
Total % Cover of:		Multiply by:	
OBL species	<u>0</u>	x 1 =	<u>0</u>
FACW species	<u>10</u>	x 2 =	<u>20</u>
FAC species	<u>0</u>	x 3 =	<u>0</u>
FACU species	<u>5</u>	x 4 =	<u>20</u>
UPL species	<u>85</u>	x 5 =	<u>425</u>
Column Totals:	<u>100</u>	(A)	<u>465</u> (B)
Prevalence Index = B/A =		<u>4.65</u>	

Hydrophytic Vegetation Indicators:	
<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation	
<input type="checkbox"/> 2 - Dominance Test is >50%	
<input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹	
<input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
<input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain)	
¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	

Hydrophytic Vegetation Present?	
Yes	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>

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

SOIL

Sampling Point: W-CMS-007-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-13	5YR 3/4	95	10YR 6/3	5	C	M	Loamy/Clayey	
13-18	10YR 5/8	80	10YR 3/3	20				Dual matrix

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

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Stratified Layers (A5)	
<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <u>X</u>
Remarks: Hydric indicators not met.	

HYDROLOGY

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

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: Hydrologic indicators not met.	

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: <u>Wabash Hydrogen Energy Center</u>	City/County: <u>Vigo</u>	Sampling Date: <u>7/11/2024</u>
Applicant/Owner: <u>Wabash Valley Resources LLC</u>	State: <u>IN</u>	Sampling Point: <u>W-CMS-008-PEM</u>
Investigator(s): <u>CMS, KB</u>	Section, Township, Range: <u>S32 T13N R9W</u>	
Landform (hillside, terrace, etc.): <u>valley</u>	Local relief (concave, convex, none): <u>concave</u>	
Slope (%): <u>2</u>	Lat: <u>39.529985°</u>	Long: <u>-87.426760°</u>
Datum: <u>DDNAD 83</u>		
Soil Map Unit Name: <u>HkF: Hickory loam, 25 to 40 percent slopes</u>	NW1 classification: <u>NA</u>	

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

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

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 <u> X </u> No <u> </u> Hydric Soil Present? Yes <u> X </u> No <u> </u> Wetland Hydrology Present? Yes <u> X </u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u> X </u> No <u> </u>
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Remarks:
 Site was historically disturbed by the construction of transmission line ROW. Soils, vegetation and hydrology were disturbed by the removal of vegetation and the compaction of soils. Site dominated by phragmites and reed canary grass. APT indicates mild drought for this time of year.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
5.				
			=Total Cover	
Sapling/Shrub Stratum	(Plot size: <u>15'</u>)			
1.				
2.				
3.				
4.				
5.				
			=Total Cover	
Herb Stratum	(Plot size: <u>5'</u>)			
1.	<u>Phragmites australis</u>	<u>60</u>	<u>Yes</u>	<u>FACW</u>
2.	<u>Phalaris arundinacea</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>
3.	<u>Glyceria striata</u>	<u>10</u>	<u>No</u>	<u>OBL</u>
4.	<u>Toxicodendron radicans</u>	<u>10</u>	<u>No</u>	<u>FAC</u>
5.				
6.				
7.				
8.				
9.				
10.				
		<u>110</u>	=Total Cover	
Woody Vine Stratum	(Plot size: <u>30'</u>)			
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: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>10</u>	x 1 = <u>10</u>
FACW species <u>90</u>	x 2 = <u>180</u>
FAC species <u>10</u>	x 3 = <u>30</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>110</u> (A)	<u>220</u> (B)
Prevalence Index = B/A = <u>2.00</u>	

Hydrophytic Vegetation Indicators:

 1 - Rapid Test for Hydrophytic Vegetation

 X 2 - Dominance Test is >50%

 X 3 - Prevalence Index is ≤3.0¹

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

 Problematic Hydrophytic Vegetation¹ (Explain)

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

Hydrophytic Vegetation Present? Yes X No

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

SOIL

Sampling Point: W-CMS-008-PEM

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-5	2.5Y 4/2	100					Sandy	
5-18	10YR 6/2	80	7.5YR 4/6	20	C	M	Sandy	Prominent redox concentrations

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

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Histic Epipedon (A2) <input checked="" type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) <input type="checkbox"/> Redox Depressions (F8)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Iron-Manganese Masses (F12) <input type="checkbox"/> Red Parent Material (F21) <input type="checkbox"/> Very Shallow Dark Surface (F22) <input type="checkbox"/> Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Hydric indicators met.	

HYDROLOGY

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

Field Observations: Surface Water Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u> 3 </u> Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u> 0 </u> Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u> 0 </u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: Hydrologic indicators met.	

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R				OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)	
Project/Site: Wabash Hydrogen Energy Center		City/County: Vigo		Sampling Date: 6/12/2024	
Applicant/Owner: Wabash Valley Resources LLC		State: IN		Sampling Point: UPL-CMS-001	
Investigator(s): CMS, KB		Section, Township, Range: S33 T13N R9W			
Landform (hillside, terrace, etc.): Hillside		Local relief (concave, convex, none): concave			
Slope (%): 4		Lat: 39.532855		Long: -87.428524	
		Datum: DDNAD 83			
Soil Map Unit Name: MuB2: Muren silt loam, 2 to 6 percent slopes, eroded		NW1 classification: NA			
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)					
Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes No X					
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 X No					
Wetland Hydrology Present? Yes No X					
Remarks: Upland old field. Site was historically stripped of 20' feet soils. Soils, hydrology and vegetation are significantly disturbed. Antecedent Precipitation Tool Drought Index as mild drought.					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 30')		Absolute % Cover	Dominant Species?	Indicator Status	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: 0.0% (A/B)
1.					
2.					
3.					
4.					
5.					
		=Total Cover			
Sapling/Shrub Stratum (Plot size: 15')					Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0 x 1 = 0 FACW species 10 x 2 = 20 FAC species 5 x 3 = 15 FACU species 100 x 4 = 400 UPL species 0 x 5 = 0 Column Totals: 115 (A) 435 (B) Prevalence Index = B/A = 3.78
1.					
2.					
3.					
4.					
5.					
		=Total Cover			
Herb Stratum (Plot size: 5')					Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <i>Erigeron canadensis</i>		60	Yes	FACU	
2. <i>Poa annua</i>		20	No	FACU	
3. <i>Melilotus albus</i>		10	No	FACU	
4. <i>Carex vulpinoidea</i>		10	No	FACW	
5. <i>Solidago rugosa</i>		5	No	FAC	
6. <i>Solidago canadensis</i>		5	No	FACU	
7. <i>Dactylis glomerata</i>		5	No	FACU	
8.					
9.					
10.					
		115 =Total Cover			
Woody Vine Stratum (Plot size: 30')					Hydrophytic Vegetation Present? Yes No X
1.					
2.					
		=Total Cover			
Remarks: (Include photo numbers here or on a separate sheet.)					

SOIL

Sampling Point: UPL-CMS-001

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> (includes capillary fringe)			
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: No hydric indicators met.			

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Wabash Hydrogen Energy Center City/County: Vigo Sampling Date: 6/12/2024
Applicant/Owner: Wabash Valley Resources LLC State: IN Sampling Point: UPL-CMS-002
Investigator(s): CMS, KB Section, Township, Range: S33 T13N R9W
Landform (hillside, terrace, etc.): Hilltop Local relief (concave, convex, none): convex
Slope (%): 8 Lat: 39.532098 Long: -87.428285 Datum: DDNAD 83
Soil Map Unit Name: MuB2: Muren silt loam, 2 to 6 percent slopes, eroded NWI classification: NA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling points

Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u> Hydric Soil Present? Yes <u>X</u> No <u> </u> Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Remarks: Upland woodlands. Antecedent Precipitation Tool Drought Index as mild drought.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>) 1. <u>Fraxinus americana</u> Absolute % Cover <u>60</u> Dominant Species? <u>Yes</u> Indicator Status <u>FACU</u> 2. <u>Juniperus virginiana</u> Absolute % Cover <u>10</u> Dominant Species? <u>No</u> Indicator Status <u>FACU</u> 3. <u>Ulmus americana</u> Absolute % Cover <u>5</u> Dominant Species? <u>No</u> Indicator Status <u>FACW</u> 4. <u> </u> Absolute % Cover <u> </u> Dominant Species? <u> </u> Indicator Status <u> </u> 5. <u> </u> Absolute % Cover <u> </u> Dominant Species? <u> </u> Indicator Status <u> </u> <u>75</u> =Total Cover	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>16.7%</u> (A/B)
Sapling/Shrub Stratum (Plot size: <u>15'</u>) 1. <u>Fraxinus pennsylvanica</u> Absolute % Cover <u>10</u> Dominant Species? <u>Yes</u> Indicator Status <u>FACW</u> 2. <u>Elaeagnus umbellata</u> Absolute % Cover <u>10</u> Dominant Species? <u>Yes</u> Indicator Status <u>UPL</u> 3. <u>Sassafras albidum</u> Absolute % Cover <u>5</u> Dominant Species? <u>No</u> Indicator Status <u>FACU</u> 4. <u>Liriodendron tulipifera</u> Absolute % Cover <u>5</u> Dominant Species? <u>No</u> Indicator Status <u>FACU</u> 5. <u>Lonicera tatarica</u> Absolute % Cover <u>5</u> Dominant Species? <u>No</u> Indicator Status <u>FACU</u> <u>35</u> =Total Cover	
Herb Stratum (Plot size: <u>5'</u>) 1. <u>Poa annua</u> Absolute % Cover <u>40</u> Dominant Species? <u>Yes</u> Indicator Status <u>FACU</u> 2. <u>Solidago canadensis</u> Absolute % Cover <u>7</u> Dominant Species? <u>No</u> Indicator Status <u>FACU</u> 3. <u>Erigeron canadensis</u> Absolute % Cover <u>7</u> Dominant Species? <u>No</u> Indicator Status <u>FACU</u> 4. <u>Galium aparine</u> Absolute % Cover <u>5</u> Dominant Species? <u>No</u> Indicator Status <u>FACU</u> 5. <u>Securigera varia</u> Absolute % Cover <u>3</u> Dominant Species? <u>No</u> Indicator Status <u>UPL</u> 6. <u>Cirsium vulgare</u> Absolute % Cover <u>2</u> Dominant Species? <u>No</u> Indicator Status <u>FACU</u> 7. <u>Erigeron philadelphicus</u> Absolute % Cover <u>1</u> Dominant Species? <u>No</u> Indicator Status <u>FACW</u> 8. <u> </u> Absolute % Cover <u> </u> Dominant Species? <u> </u> Indicator Status <u> </u> 9. <u> </u> Absolute % Cover <u> </u> Dominant Species? <u> </u> Indicator Status <u> </u> 10. <u> </u> Absolute % Cover <u> </u> Dominant Species? <u> </u> Indicator Status <u> </u> <u>65</u> =Total Cover	Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>16</u> x 2 = <u>32</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>153</u> x 4 = <u>612</u> UPL species <u>13</u> x 5 = <u>65</u> Column Totals: <u>182</u> (A) <u>709</u> (B) Prevalence Index = B/A = <u>3.90</u>
Woody Vine Stratum (Plot size: <u>15'</u>) 1. <u>Parthenocissus quinquefolia</u> Absolute % Cover <u>5</u> Dominant Species? <u>Yes</u> Indicator Status <u>FACU</u> 2. <u>Smilax glauca</u> Absolute % Cover <u>2</u> Dominant Species? <u>Yes</u> Indicator Status <u>FACU</u> <u>7</u> =Total Cover	
Remarks: (Include photo numbers here or on a separate sheet.)	

SOIL

Sampling Point: UPL-CMS-002

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 4/2	80	10YR 4/3	20	C	M	Loamy/Clayey	Faint redox concentrations
4-14	10YR 4/3	75	10YR 4/4	25	C	M	Loamy/Clayey	Faint redox concentrations

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

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Iron-Manganese Masses (F12)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Red Parent Material (F21)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Very Shallow Dark Surface (F22)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Stratified Layers (A5)	
<input type="checkbox"/> 2 cm Muck (A10)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Loamy Mucky Mineral (F1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

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

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

HYDROLOGY

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

Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: No hydrology indicators present	

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R				OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)	
Project/Site: Wabash Hydrogen Energy Center		City/County: Vigo		Sampling Date: 6/13/2024	
Applicant/Owner: Wabash Valley Resources LLC		State: IN		Sampling Point: UPL-CMS-003	
Investigator(s): CMS, KB		Section, Township, Range: S28 T13N R9W			
Landform (hillside, terrace, etc.): Hilltop		Local relief (concave, convex, none): convex			
Slope (%): 4		Lat: 39.538644°		Long: -87.424755°	
		Datum: DDNAD 83			
Soil Map Unit Name: AIB2: Alford silt loam, 2 to 5 percent slopes, eroded		NW1 classification: NA			
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)					
Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes No X					
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: Site was historistacly disturbed in 2023 by the construction of an access road for geotechnical surveys. Soils, vegetation and hydrology were disturbed by the removal of vegetation and the compaction of soils. Site is dominated by American elm, pignut hickory, grey dogwood, yellow avens and white					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 30')		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A) Total Number of Dominant Species Across All Strata: 8 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)
1.					
2. Ulmus americana		40	Yes	FACW	
3. Carya glabra		20	Yes	FACU	
4. Liriodendron tulipifera		15	No	FACU	
5. Fraxinus americana		5	No	FACU	
		80	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')					Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0 x 1 = 0 FACW species 60 x 2 = 120 FAC species 15 x 3 = 45 FACU species 93 x 4 = 372 UPL species 0 x 5 = 0 Column Totals: 168 (A) 537 (B) Prevalence Index = B/A = 3.20
1. Cornus racemosa		10	Yes	FAC	
2. Asimina triloba		5	Yes	FAC	
3. Lonicera tatarica		3	No	FACU	
4.					
5.					
		18	=Total Cover		
Herb Stratum (Plot size: 5')					Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. Geum aleppicum		20	Yes	FACW	
2. Ageratina altissima		20	Yes	FACU	
3. Elymus villosus		15	Yes	FACU	
4. Milium effusum		5	No	FACU	
5.					
6.					
7.					
8.					
9.					
10.					
		60	=Total Cover		
Woody Vine Stratum (Plot size: 30')					Hydrophytic Vegetation Present? Yes No X
1. Parthenocissus quinquefolia		10	Yes	FACU	
2.					
		10	=Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)					

SOIL

Sampling Point: UPL-CMS-003

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-7	10YR 5/3	100					Loamy/Clayey	
7-18	10YR 5/4	100					Loamy/Clayey	

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

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)
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Indicators for Problematic Hydric Soils³:
☐ Iron-Manganese Masses (F12)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (F22)
☐ Other (Explain in Remarks)

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

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

HYDROLOGY

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

Field Observations: Surface Water Present? Yes _____ No <u> X </u> Depth (inches): _____ Water Table Present? Yes _____ No <u> X </u> Depth (inches): _____ Saturation Present? Yes _____ No <u> X </u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u> X </u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: No hydrology indicators present.	

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Wabash Hydrogen Energy Center
 Applicant/Owner: Wabash Valley Resources LLC
 Investigator(s): CMS, KB

City/County: Vigo
 State: IN
 Section, Township, Range: S32 T13N R9W

Sampling Date: 6/13/2024
 Sampling Point: UPL-CMS-004

Landform (hillside, terrace, etc.): Hilltop
 Slope (%): 4 Lat: 39.529613°
 Soil Map Unit Name: HkF: Hickory loam, 25 to 40 percent slopes

Local relief (concave, convex, none): convex
 Long: -87.426567° Datum: DDNAD 83
 NWI classification: NA

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

Are "Normal Circumstances" present? Yes ☐ No ☒

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

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks:
 Maintained transmission line ROW.. Soils, vegetation and hydrology disturbed by the removal of vegetation and the compaction of soils. Site is dominated by autumn olive, callery pear, crownvetch, Japanese honeysuckle. APT indicates mild drought for this time of year.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1.					
2.					
3.					
4.					
5.					
					=Total Cover
Sapling/Shrub Stratum	(Plot size: <u>15'</u>)				
1.	<u>Elaeagnus umbellata</u>	<u>20</u>	<u>Yes</u>	<u>UPL</u>	
2.	<u>Pyrus calleryana</u>	<u>15</u>	<u>Yes</u>	<u>UPL</u>	
3.	<u>Lonicera tatarica</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	
4.	<u>Morus rubra</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
5.					
					=Total Cover
Herb Stratum	(Plot size: <u>5'</u>)				
1.	<u>Securigera varia</u>	<u>20</u>	<u>Yes</u>	<u>UPL</u>	
2.	<u>Lonicera japonica</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	
3.	<u>Cinna arundinacea</u>	<u>8</u>	<u>No</u>	<u>FACW</u>	
4.	<u>Rubus idaeus</u>	<u>5</u>	<u>No</u>	<u>FACU</u>	
5.	<u>Leucanthemum vulgare</u>	<u>5</u>	<u>No</u>	<u>UPL</u>	
6.	<u>Solidago canadensis</u>	<u>2</u>	<u>No</u>	<u>FACU</u>	
7.					
8.					
9.					
10.					
					=Total Cover
Woody Vine Stratum	(Plot size: <u>30'</u>)				
1.					
2.					
					=Total Cover

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

SOIL

Sampling Point: UPL-CMS-004

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 5/2	100					Loamy/Clayey	

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

Hydric Soil Indicators: <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)
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Indicators for Problematic Hydric Soils³:
☐ Iron-Manganese Masses (F12)
☐ Red Parent Material (F21)
☐ Very Shallow Dark Surface (F22)
☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed): Type: _____ Hardpan Depth (inches): _____ 10	Hydric Soil Present? Yes _____ No <u>X</u>
Remarks: No hydric indicators present.	

HYDROLOGY

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

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: No hydrology indicators present.	

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R				OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)	
Project/Site: Wabash Hydrogen Energy Center		City/County: Vigo		Sampling Date: 6/13/2024	
Applicant/Owner: Wabash Valley Resources LLC		State: IN		Sampling Point: UPL-CMS-005	
Investigator(s): CMS, KB		Section, Township, Range: S18 T13N R9W			
Landform (hillside, terrace, etc.): hillside		Local relief (concave, convex, none): convex			
Slope (%): 7		Lat: 39.564574°		Long: -87.461678°	
				Datum: DDNAD 83	
Soil Map Unit Name: RuC2: Russell silt loam, Bloomington Ridged Plain, 5 to 10 percent slopes, eroded					
NW1 classification: NA					
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)					
Are Vegetation, Soil, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No					
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)					
SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.					
Hydrophytic Vegetation Present? Yes No X			Is the Sampled Area within a Wetland? Yes No X		
Hydric Soil Present? Yes No X					
Wetland Hydrology Present? Yes No X					
Remarks: Upland woods. Site dominated by American elm, tulip tree, pignut hickory, grey dogwood, pawpaw, yellow avens and white snakeroot. APT indicates mild drought for this time of year.					
VEGETATION – Use scientific names of plants.					
Tree Stratum (Plot size: 30')		Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A) Total Number of Dominant Species Across All Strata: 8 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)
1.					
2. Ulmus americana		40	Yes	FACW	
3. Liriodendron tulipifera		20	Yes	FACU	
4. Carya glabra		20	Yes	FACU	
5. Fraxinus pennsylvanica		5	No	FACW	
		85	=Total Cover		
Sapling/Shrub Stratum (Plot size: 15')					Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species 0 x 1 = 0 FACW species 65 x 2 = 130 FAC species 15 x 3 = 45 FACU species 83 x 4 = 332 UPL species 0 x 5 = 0 Column Totals: 163 (A) 507 (B) Prevalence Index = B/A = 3.11
1. Cornus racemosa		10	Yes	FAC	
2. Asimina triloba		5	Yes	FAC	
3. Lonicera canadensis		3	No	FACU	
4.					
5.					
		18	=Total Cover		
Herb Stratum (Plot size: 5')					Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation 2 - Dominance Test is >50% 3 - Prevalence Index is ≤3.0 ¹ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. Geum aleppicum		20	Yes	FACW	
2. Ageratina altissima		20	Yes	FACU	
3. Milium effusum		5	No	FACU	
4. Elymus villosus		5	No	FACU	
5.					
6.					
7.					
8.					
9.					
10.					
		50	=Total Cover		
Woody Vine Stratum (Plot size: 30')					Hydrophytic Vegetation Present? Yes No X
1. Parthenocissus quinquefolia		10	Yes	FACU	
2.		10	=Total Cover		
Remarks: (Include photo numbers here or on a separate sheet.)					

SOIL

Sampling Point: UPL-CMS-005

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-7	10YR 5/3	100					Loamy/Clayey	
7-18	10YR 5/4	100					Loamy/Clayey	

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

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils ³ :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Iron-Manganese Masses (F12)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Red Parent Material (F21)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Very Shallow Dark Surface (F22)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Mucky Mineral (F1)		
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Redox Depressions (F8)		

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

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <u>X</u>
Remarks: Hydric indicators not met.	

HYDROLOGY

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

Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks: Hydrologic indicators not met.	

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Wabash Hydrogen Energy Center
 Applicant/Owner: Wabash Valley Resources LLC
 Investigator(s): CMS, CB

City/County: Vigo
 State: IN
 Section, Township, Range: S29 T13N R9W

Sampling Date: 7/10/2024
 Sampling Point: UPL-CMS-006

Landform (hillside, terrace, etc.): Hilltop
 Slope (%): 7 Lat: 39.540435°
 Soil Map Unit Name: HkF: Hickory loam, 25 to 40 percent slopes

Local relief (concave, convex, none): convex
 Long: -87.430434° Datum: DDNAD 83
 NWI classification: NA

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

Are "Normal Circumstances" present? Yes ☐ No ☒

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

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks:
 Upland woods. Site is dominated by pignut hickory, sugar maple, grey dogwood, sassafras, Canadian wild ginger, yellow avens and bottlebrush grass . APT indicates mild drought for this time of year.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status																									
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>42.9%</u> (A/B)																								
2. <u>Carya glabra</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>																									
3. <u>Acer saccharum</u>	<u>25</u>	<u>Yes</u>	<u>FACU</u>																									
4. _____	_____	_____	_____																									
5. _____	_____	_____	_____																									
<u>65</u> =Total Cover																												
Sapling/Shrub Stratum (Plot size: <u>15'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet: <table style="width:100%; border-collapse: collapse;"> <tr> <th style="width: 40%;">Total % Cover of:</th> <th style="width: 10%;">Multiply by:</th> <th style="width: 50%;"></th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 =</td> <td><u>0</u></td> </tr> <tr> <td>FACW species <u>33</u></td> <td>x 2 =</td> <td><u>66</u></td> </tr> <tr> <td>FAC species <u>47</u></td> <td>x 3 =</td> <td><u>141</u></td> </tr> <tr> <td>FACU species <u>137</u></td> <td>x 4 =</td> <td><u>548</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 =</td> <td><u>0</u></td> </tr> <tr> <td>Column Totals: <u>217</u> (A)</td> <td></td> <td><u>755</u> (B)</td> </tr> <tr> <td colspan="3">Prevalence Index = B/A = <u>3.48</u></td> </tr> </table>	Total % Cover of:	Multiply by:		OBL species <u>0</u>	x 1 =	<u>0</u>	FACW species <u>33</u>	x 2 =	<u>66</u>	FAC species <u>47</u>	x 3 =	<u>141</u>	FACU species <u>137</u>	x 4 =	<u>548</u>	UPL species <u>0</u>	x 5 =	<u>0</u>	Column Totals: <u>217</u> (A)		<u>755</u> (B)	Prevalence Index = B/A = <u>3.48</u>		
Total % Cover of:	Multiply by:																											
OBL species <u>0</u>	x 1 =	<u>0</u>																										
FACW species <u>33</u>	x 2 =	<u>66</u>																										
FAC species <u>47</u>	x 3 =	<u>141</u>																										
FACU species <u>137</u>	x 4 =	<u>548</u>																										
UPL species <u>0</u>	x 5 =	<u>0</u>																										
Column Totals: <u>217</u> (A)		<u>755</u> (B)																										
Prevalence Index = B/A = <u>3.48</u>																												
1. <u>Cornus racemosa</u>	<u>25</u>	<u>Yes</u>	<u>FAC</u>																									
2. <u>Sassafras albidum</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>																									
3. <u>Acer saccharum</u>	<u>10</u>	<u>No</u>	<u>FACU</u>																									
4. <u>Fraxinus pennsylvanica</u>	<u>7</u>	<u>No</u>	<u>FACW</u>																									
5. <u>Lonicera canadensis</u>	<u>5</u>	<u>No</u>	<u>FACU</u>																									
<u>62</u> =Total Cover																												
Herb Stratum (Plot size: <u>5'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																								
1. <u>Asarum canadense</u>	<u>40</u>	<u>Yes</u>	<u>FACU</u>																									
2. <u>Geum aleppicum</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																									
3. <u>Carex radiata</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>																									
4. <u>Elymus hystrix</u>	<u>2</u>	<u>No</u>	<u>FACU</u>																									
5. <u>Verbesina alternifolia</u>	<u>2</u>	<u>No</u>	<u>FACW</u>																									
6. <u>Euthamia graminifolia</u>	<u>2</u>	<u>No</u>	<u>FACW</u>																									
7. <u>Persicaria virginiana</u>	<u>2</u>	<u>No</u>	<u>FAC</u>																									
8. <u>Laportea canadensis</u>	<u>2</u>	<u>No</u>	<u>FACW</u>																									
9. _____	_____	_____	_____																									
10. _____	_____	_____	_____																									
<u>90</u> =Total Cover																												
Woody Vine Stratum (Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>																								
1. _____	_____	_____	_____																									
2. _____	_____	_____	_____																									
_____ =Total Cover																												

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

SOIL

Sampling Point: UPL-CMS-006

[illegible]

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Surface Soil Cracks (B6)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Crayfish Burrows (C8)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Stunted or Stressed Plants (D1)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Gauge or Well Data (D9)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Other (Explain in Remarks)		
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <input type="text"/> (includes capillary fringe)			
		Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: No hydrology indicators present.			

Background Information	
Name:	CMS
Date:	6/11/2024
Affiliation:	AECOM
Address:	564 White Pond Drive, Akron, OH 44320
Phone Number:	717-617-7738
e-mail address:	charlotte.stallone@aecom.com
Name of Wetland:	W-CMS-001 PEM/PSS/PFO
Vegetation Communit(ies):	PEM/PSS/PFO
HGM Class(es):	Floodplain
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	
<p>See Figures 1, 2, and 3 of Wetland Delineation and Stream Assessment Report.</p>	
Lat/Long or UTM Coordinate:	39.534327°, -87.424367°
USGS Quad Name:	New Goshen, IN
County:	Vigo
Township:	West Terre Haute
Section and Subsection:	NA
Hydrologic Unit Code:	051201110604 South Salt Creek-Wabash River
Site Visit:	6/11/2024
National Wetland Inventory Map:	See Figure 2
Ohio Wetland Inventory Map:	N/A
Soil Survey:	See Figure 2
Delineation report/map:	See Figure 3

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human- induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Wetland ID: W-CMS-001 PEM/PSS/PFO

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	*NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	*NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	*NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	*NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	*NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	*NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	*NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	*NO Go to Question 8b

Wetland ID: W-CMS-001 PEM/PSS/PFO

<p>8b Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?</p>	<p>*YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a</p>	<p>Go to Question 9a</p>
<p>9a Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?</p>	<p>YES Go to Question 9b</p>	<p>*NO Go to Question 10</p>
<p>9b Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 9c</p>
<p>9c Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.</p>	<p>YES Go to Question 9d</p>	<p>*NO Go to Question 10</p>
<p>9d Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?</p>	<p>YES Wetland is a Category 3 wetland Go to Question 10</p>	<p>*NO Go to Question 9e</p>
<p>9e Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 10</p>
<p>10 Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.</p>	<p>YES Wetland is a Category 3 wetland. Go to Question 11</p>	<p>*NO Go to Question 11</p>
<p>11 Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).</p>	<p>YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating</p>	<p>*NO Complete Quantitative Rating</p>

Wetland ID:	W-CMS-001 PEM/PSS/PFO
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Table 1. Characteristic plant species.				
invasive/exotic spp	fen species	bog species	oak opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Wetland ID: W-CMS-001 PEM/PSS/PFO

Site: Wabash Hydrogen Energy Center Project Rater(s): CMS Date: 6/11/2024

2.0 2.0
max 6 pts subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

Field ID:

W-CMS-001 PEM/PSS/PFO

Delineated acres:	0.05
Estimated Total acres	0.56

8.0 10.0
max 14 pts. subtotal

Metric 2. Upland buffers and surrounding land use.

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

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

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

- ☒ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

19.0 29.0
max 30 pts. subtotal

Metric 3. Hydrology.

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

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

3c. Maximum water depth. Select one.

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

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

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

3b. Connectivity. Score all that apply.

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

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

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

Check all disturbances observed

- ☐ ditch ☐ point source (nonstormwater)
☐ tile ☒ filling/grading
☐ dike ☒ road bed/RR track
☐ weir ☐ dredging
☐ stormwater input ☐ Other:

10.0 39.0
max 20 pts. subtotal

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

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

39.0
subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland ID: W-CMS-001 PEM/PSS/PFO

Site: Wabash Hydrogen Energy Center Project Rater(s): CMS Date: 6/11/2024

39.0
subtotal this page

Field ID:
W-CMS-001 PEM/PSS/PFO

5.0 44.0
max 10 pts. subtotal

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

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

13.0 57.0
max 20pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ Aquatic bed
☐ 1 Emergent
☐ 2 Shrub
☐ 3 Forest
☐ Mudflats
☐ 1 Open water
☐ Other

6b. horizontal (plan view) Interspersion.

Select only one.

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

6c. Coverage of invasive plants. Refer

Table 1 ORAM long form for list. Add or deduct points for coverage

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

6d. Microtopography.

Score all present using 0 to 3 scale.

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species

Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp to

A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

57.0 TOTAL (Max 100 pts)
2 Category

Wetland ID:	W-CMS-001 PEM/PSS/PFO
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ORAM Summary Worksheet

		Circle answer or insert score		Result
Narrative Rating	Question 1. Critical Habitat	YES	*NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES	*NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES	*NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES	*NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES	*NO	If yes, Category 1.
	Question 6. Bogs	YES	*NO	If yes, Category 3.
	Question 7. Fens	YES	*NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES	*NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	*YES	0	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES	*NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES	*NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	2		
	Metric 2. Buffers and surrounding land use	8		
	Metric 3. Hydrology	19		
	Metric 4. Habitat	10		
	Metric 5. Special Wetland Communities	5		
	Metric 6. Plant communities, interspersed, microtopography	13		
	TOTAL SCORE	57		Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland ID:	W-CMS-001 PEM/PSS/PFO
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Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	*NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over- categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	*YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	*NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	*YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	*NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1- 54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	*NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	*Category 2	Category 3
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End of Ohio Rapid Assessment Method for Wetlands.

Background Information	
Name:	CMS
Date:	6/12/2024
Affiliation:	AECOM
Address:	564 White Pond Drive, Akron, OH 44320
Phone Number:	717-617-7738
e-mail address:	charlotte.stallone@aecom.com
Name of Wetland:	W-CMS-002 PFO
Vegetation Communit(ies):	PFO
HGM Class(es):	Slope
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	
<p>See Figures 1, 2, and 3 of Wetland Delineation and Stream Assessment Report.</p>	
Lat/Long or UTM Coordinate:	39.535503°, -87.424145°
USGS Quad Name:	New Goshen, IN
County:	Vigo
Township:	West Terre Haute
Section and Subsection:	NA
Hydrologic Unit Code:	051201110604 South Salt Creek-Wabash River
Site Visit:	6/12/2024
National Wetland Inventory Map:	See Figure 2
Ohio Wetland Inventory Map:	N/A
Soil Survey:	See Figure 2
Delineation report/map:	See Figure 3

Name of Wetland:	W-CMS-002 PFO		
Wetland Size (delineated acres):	0.01	Wetland Size (Estimated total acres):	0.01
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.			
<div> <div>N</div> </div>			
Comments, Narrative Discussion, Justification of Category Changes: PFO wetland dominated by <i>Carex lurida</i> , <i>Populus deltoides</i> , <i>Quercus palustris</i> , <i>Scirpus atrovirens</i> , <i>Typha angustifolia</i> . Recieves hydrology from precipitation. The wetland developed on an abandoned temporary access road. Compacted soil ruts hold water and wetland vegetation has developed over time.			
Final score:	13	Category:	1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human- induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Wetland ID: W-CMS-002 PFO

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	*NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	*NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	*NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	*NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	*YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	*NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	*NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	*NO Go to Question 8b

Wetland ID: W-CMS-002 PFO

<p>8b Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?</p>	<p>Yes Wetland should be evaluated for possible Category 3 status. Go to Question 9a</p>	<p>*NO Go to Question 9a</p>
<p>9a Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?</p>	<p>YES Go to Question 9b</p>	<p>*NO Go to Question 10</p>
<p>9b Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 9c</p>
<p>9c Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.</p>	<p>YES Go to Question 9d</p>	<p>*NO Go to Question 10</p>
<p>9d Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?</p>	<p>YES Wetland is a Category 3 wetland Go to Question 10</p>	<p>*NO Go to Question 9e</p>
<p>9e Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 10</p>
<p>10 Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.</p>	<p>YES Wetland is a Category 3 wetland. Go to Question 11</p>	<p>*NO Go to Question 11</p>
<p>11 Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).</p>	<p>YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating</p>	<p>*NO Complete Quantitative Rating</p>

Wetland ID:	W-CMS-002 PFO
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Table 1. Characteristic plant species.				
invasive/exotic spp	fen species	bog species	oak opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Wetland ID:	W-CMS-002 PFO
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Site:	Wabash Hydrogen Energy Center Project	Rater(s):	CMS	Date:	6/12/2024
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0.0	0.0
max 6 pts	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

Field ID:

W-CMS-002 PFO

Delineated acres:	0.01
Estimated Total acres	0.01

8.0	8.0
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

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

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

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

- ☒ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
☐ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
☒ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

8.0	16.0
max 30 pts.	subtotal

Metric 3. Hydrology.

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

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

3c. Maximum water depth. Select one.

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

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

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

3b. Connectivity. Score all that apply.

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

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

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

Check all disturbances observed

- | | |
|---|---|
| <input type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile | <input checked="" type="checkbox"/> filling/grading |
| <input type="checkbox"/> dike | <input checked="" type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir | <input type="checkbox"/> dredging |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other: |

6.0	22.0
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

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

22.0
subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland ID: W-CMS-002 PFO

Site: Wabash Hydrogen Energy Center Project Rater(s): CMS Date: 6/12/2024

22.0
subtotal this page

Field ID:
W-CMS-002 PFO

-10.0 12.0
max 10 pts. subtotal

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

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

1.0 13.0
max 20pts. subtotal

Metric 6. Plant communities, interspersed, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ Aquatic bed
☐ Emergent
☐ Shrub
☒ Forest
☐ Mudflats
☐ Open water
☐ Other

6b. horizontal (plan view) Interspersion.

Select only one.

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

6c. Coverage of invasive plants. Refer

Table 1 ORAM long form for list. Add
or deduct points for coverage

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

6d. Microtopography.

Score all present using 0 to 3 scale.

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

Low spp diversity and/or predominance of nonnative or low
disturbance tolerant native species

Native spp are dominant component of the vegetation, mod
although nonnative and/or disturbance tolerant native spp
can also be present, and species diversity moderate to
moderately high, but generally w/o presence of rare
threatened or endangered spp to

A predominance of native species, with nonnative spp high
and/or disturbance tolerant native spp absent or virtually
absent, and high spp diversity and often, but not always,
the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

13.0 TOTAL (Max 100 pts)
1 Category

Wetland ID:	W-CMS-002 PFO
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ORAM Summary Worksheet

		Circle answer or insert score		Result
Narrative Rating	Question 1. Critical Habitat	YES	*NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES	*NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES	*NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES	*NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	*YES	NO	If yes, Category 1.
	Question 6. Bogs	YES	*NO	If yes, Category 3.
	Question 7. Fens	YES	*NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES	*NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	Yes	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES	*NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES	*NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	0		
	Metric 2. Buffers and surrounding land use	8		
	Metric 3. Hydrology	8		
	Metric 4. Habitat	6		
	Metric 5. Special Wetland Communities	-10		
	Metric 6. Plant communities, interspersions, microtopography	1		
	TOTAL SCORE	13		Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland ID:	W-CMS-002 PFO
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Wetland Categorization Worksheet

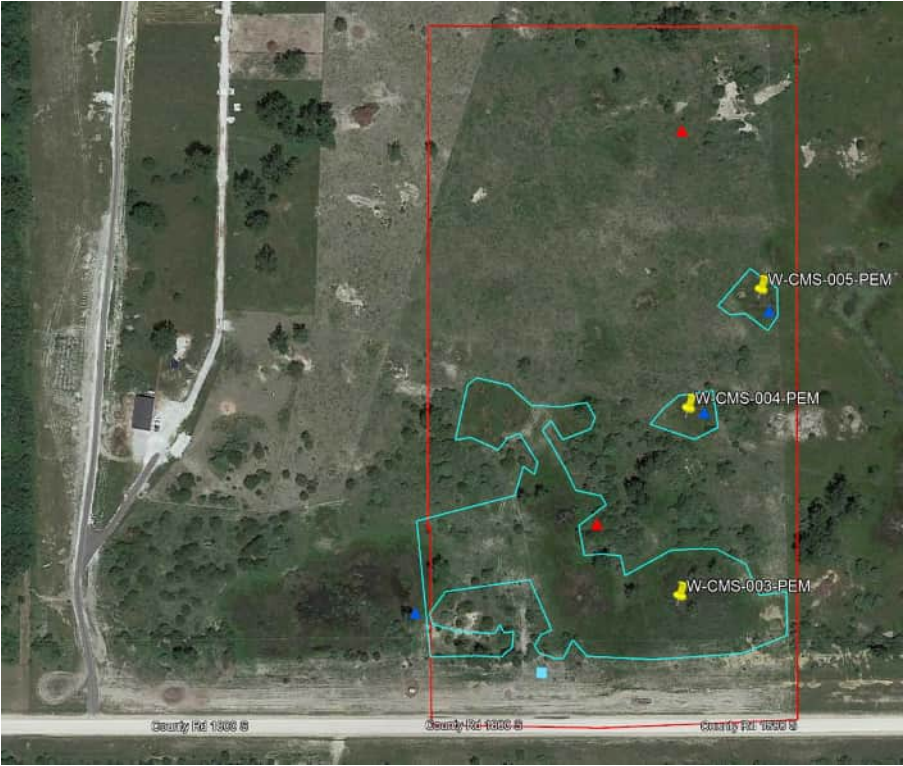
Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	*NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over- categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	*NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	*YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	*YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	*NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1- 54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	*NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	*Category 1	Category 2	Category 3	
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End of Ohio Rapid Assessment Method for Wetlands.

Background Information	
Name:	CMS
Date:	6/12/2024
Affiliation:	AECOM
Address:	564 White Pond Drive, Akron, OH 44320
Phone Number:	717-617-7738
e-mail address:	charlotte.stallone@aecom.com
Name of Wetland:	W-CMS-003 PEM
Vegetation Communit(ies):	PEM
HGM Class(es):	Depression
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	
<p>See Figures 1, 2, and 3 of Wetland Delineation and Stream Assessment Report.</p>	
Lat/Long or UTM Coordinate:	39.622484°, -87.488098°
USGS Quad Name:	New Goshen, IN
County:	Vermillion
Township:	Clinton
Section and Subsection:	NA
Hydrologic Unit Code:	051201110303 Gin Creek-Brouilletts Creek
Site Visit:	6/12/2024
National Wetland Inventory Map:	See Figure 2
Ohio Wetland Inventory Map:	N/A
Soil Survey:	See Figure 2
Delineation report/map:	See Figure 3

Name of Wetland:	W-CMS-003 PEM		
Wetland Size (delineated acres):	2.96	Wetland Size (Estimated total acres):	8.36
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.			
<div><div>N</div><div></div></div>			
Comments, Narrative Discussion, Justification of Category Changes:			
PEM wetland dominated by <i>Eleocharis palustris</i> , and <i>Portulaca oleracea</i> . Recieves hydrology from precipitation. Historic strip mine. Shallow clay soils bedrock at 6 inches. Heavily disturbed by cattle grazing and compacted soils around the wetland fringe creating hummocks.			
Final score:	21	Category:	1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human- induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Wetland ID: W-CMS-003 PEM

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	*NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	*NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	*NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	*NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	*NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	*NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	*NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	*NO Go to Question 8b

Wetland ID: W-CMS-003 PEM

<p>8b Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?</p>	<p>Yes Wetland should be evaluated for possible Category 3 status. Go to Question 9a</p>	<p>*NO Go to Question 9a</p>
<p>9a Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?</p>	<p>YES Go to Question 9b</p>	<p>*NO Go to Question 10</p>
<p>9b Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 9c</p>
<p>9c Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.</p>	<p>YES Go to Question 9d</p>	<p>*NO Go to Question 10</p>
<p>9d Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?</p>	<p>YES Wetland is a Category 3 wetland Go to Question 10</p>	<p>*NO Go to Question 9e</p>
<p>9e Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 10</p>
<p>10 Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.</p>	<p>YES Wetland is a Category 3 wetland. Go to Question 11</p>	<p>*NO Go to Question 11</p>
<p>11 Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).</p>	<p>YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating</p>	<p>*NO Complete Quantitative Rating</p>

Wetland ID:	W-CMS-003 PEM
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Table 1. Characteristic plant species.				
invasive/exotic spp	fen species	bog species	oak opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Wetland ID: W-CMS-003 PEM

Site: Wabash Hydrogen Energy Center Project Rater(s): CMS Date: 6/12/2024

3.0 3.0
max 6 pts subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

Field ID:

W-CMS-003 PEM

Delineated acres:	2.96
Estimated Total acres	8.36

3.0 6.0
max 14 pts. subtotal

Metric 2. Upland buffers and surrounding land use.

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

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

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

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

7.0 13.0
max 30 pts. subtotal

Metric 3. Hydrology.

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

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

3c. Maximum water depth. Select one.

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

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

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

3b. Connectivity. Score all that apply.

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

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

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

Check all disturbances observed

- | | |
|---|---|
| <input type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading |
| <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir | <input type="checkbox"/> dredging |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other: cattle have disturbed and compacted soils around the wetland fringe creating hummocks |

3.0 16.0
max 20 pts. subtotal

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

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

16.0
subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland ID: W-CMS-003 PEM

Site: Wabash Hydrogen Energy Center Project Rater(s): CMS Date: 6/12/2024

16.0
subtotal this page

Field ID:
W-CMS-003 PEM

0.0 16.0
max 10 pts. subtotal

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

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

5.0 21.0
max 20pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

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

6b. horizontal (plan view) Interspersion.

Select only one.

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

6c. Coverage of invasive plants. Refer

Table 1 ORAM long form for list. Add
or deduct points for coverage

- ☐ Extensive >75% cover (-5)
☐ Moderate 25-75% cover (-: Typha angustifolia
☐ Sparse 5-25% cover (-1) Phragmites australis
☐ Nearly absent <5% cover (0)
☒ x Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

Low spp diversity and/or predominance of nonnative or low
disturbance tolerant native species

Native spp are dominant component of the vegetation, mod
although nonnative and/or disturbance tolerant native spp
can also be present, and species diversity moderate to
moderately high, but generally w/o presence of rare
threatened or endangered spp to

A predominance of native species, with nonnative spp high
and/or disturbance tolerant native spp absent or virtually
absent, and high spp diversity and often, but not always,
the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

21.0 TOTAL (Max 100 pts)
1 Category

Wetland ID:	W-CMS-003 PEM
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ORAM Summary Worksheet

		Circle answer or insert score		Result
Narrative Rating	Question 1. Critical Habitat	YES	*NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES	*NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES	*NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES	*NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES	*NO	If yes, Category 1.
	Question 6. Bogs	YES	*NO	If yes, Category 3.
	Question 7. Fens	YES	*NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES	*NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	Yes	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES	*NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES	*NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	3		
	Metric 2. Buffers and surrounding land use	3		
	Metric 3. Hydrology	7		
	Metric 4. Habitat	3		
	Metric 5. Special Wetland Communities	0		
	Metric 6. Plant communities, interspersions, microtopography	5		
	TOTAL SCORE	21		Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland ID:	W-CMS-003 PEM
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Wetland Categorization Worksheet

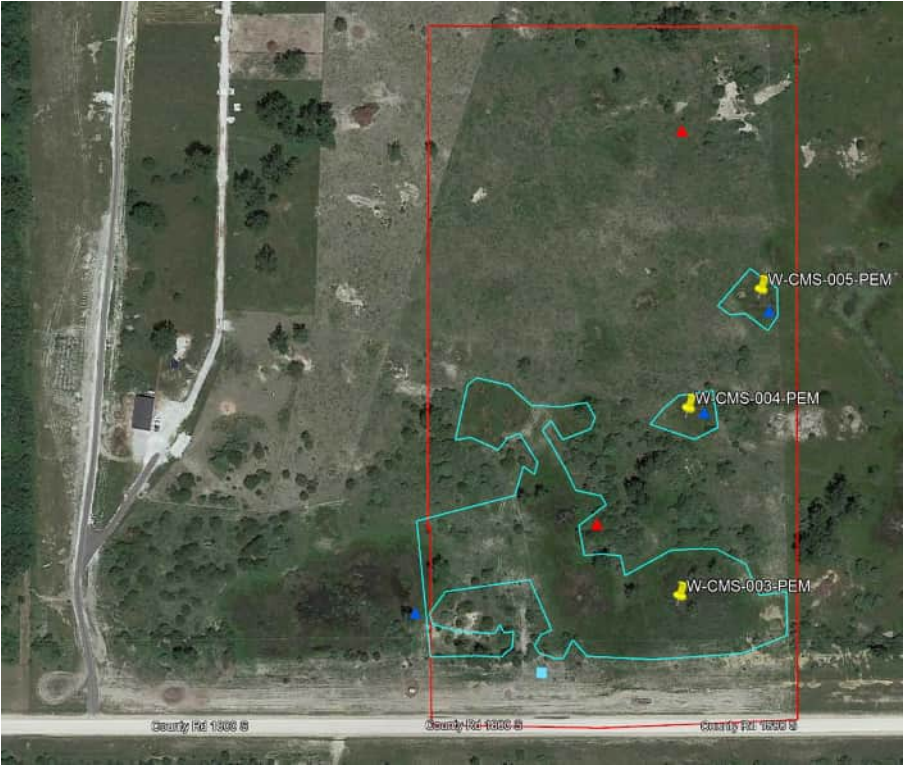
Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	*NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over- categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	*NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	*NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	*YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	*NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1- 54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	*NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	*Category 1	Category 2	Category 3	
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End of Ohio Rapid Assessment Method for Wetlands.

Background Information	
Name:	CMS
Date:	6/12/2024
Affiliation:	AECOM
Address:	564 White Pond Drive, Akron, OH 44320
Phone Number:	717-617-7738
e-mail address:	charlotte.stallone@aecom.com
Name of Wetland:	W-CMS-004 PEM
Vegetation Communit(ies):	PEM
HGM Class(es):	Depression
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	
<p>See Figures 1, 2, and 3 of Wetland Delineation and Stream Assessment Report.</p>	
Lat/Long or UTM Coordinate:	39.623252°, -87.487345°
USGS Quad Name:	New Goshen, IN
County:	Vermillion
Township:	Clinton
Section and Subsection:	NA
Hydrologic Unit Code:	051201110303 Gin Creek-Brouilletts Creek
Site Visit:	6/12/2024
National Wetland Inventory Map:	See Figure 2
Ohio Wetland Inventory Map:	N/A
Soil Survey:	See Figure 2
Delineation report/map:	See Figure 3

Name of Wetland:	W-CMS-004 PEM		
Wetland Size (delineated acres):	0.14	Wetland Size (Estimated total acres):	0.14
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.			
<div><div>N↑</div></div>			
Comments, Narrative Discussion, Justification of Category Changes:			
<p>PEM wetland dominated by <i>Eleocharis palustris</i>, and <i>Portulaca oleracea</i>. Recieves hydrology from precipitation. Historic strip mine. Shallow clay soils bedrock at 6 inches. Heavily disturbed by cattle grazing and compacted soils around the wetland fringe creating hummocks.</p>			
Final score:	9	Category:	1

Wetland ID:	W-CMS-004 PEM
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Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human- induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Wetland ID: W-CMS-004 PEM

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	*NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	*NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	*NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	*NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	*YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	*NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	*NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	*NO Go to Question 8b

Wetland ID: W-CMS-004 PEM

<p>8b Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?</p>	<p>Yes Wetland should be evaluated for possible Category 3 status. Go to Question 9a</p>	<p>*NO Go to Question 9a</p>
<p>9a Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?</p>	<p>YES Go to Question 9b</p>	<p>*NO Go to Question 10</p>
<p>9b Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 9c</p>
<p>9c Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.</p>	<p>YES Go to Question 9d</p>	<p>*NO Go to Question 10</p>
<p>9d Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?</p>	<p>YES Wetland is a Category 3 wetland Go to Question 10</p>	<p>*NO Go to Question 9e</p>
<p>9e Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 10</p>
<p>10 Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.</p>	<p>YES Wetland is a Category 3 wetland. Go to Question 11</p>	<p>*NO Go to Question 11</p>
<p>11 Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).</p>	<p>YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating</p>	<p>*NO Complete Quantitative Rating</p>

Wetland ID:	W-CMS-004 PEM
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Table 1. Characteristic plant species.				
invasive/exotic spp	fen species	bog species	oak opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Wetland ID: W-CMS-004 PEM

Site: Wabash Hydrogen Energy Center Project Rater(s): CMS Date: 6/12/2024

1.0 1.0
max 6 pts subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

Field ID:

W-CMS-004 PEM

Delineated acres:	0.14
Estimated Total acres	0.14

3.0 4.0
max 14 pts. subtotal

Metric 2. Upland buffers and surrounding land use.

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

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

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

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

7.0 11.0
max 30 pts. subtotal

Metric 3. Hydrology.

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

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

3c. Maximum water depth. Select one.

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

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

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

3b. Connectivity. Score all that apply.

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

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

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

Check all disturbances observed

- | | |
|---|---|
| <input type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading |
| <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir | <input type="checkbox"/> dredging |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other: cattle have disturbed and compacted soils around the wetland fringe creating hummocks |

3.0 14.0
max 20 pts. subtotal

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

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

14.0
subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland ID: W-CMS-004 PEM

Site: Wabash Hydrogen Energy Center Project Rater(s): CMS Date: 6/12/2024

14.0
subtotal this page

Field ID:
W-CMS-004 PEM

-10.0 4.0
max 10 pts. subtotal

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

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

5.0 9.0
max 20pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

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

6b. horizontal (plan view) Interspersion.

Select only one.

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

6c. Coverage of invasive plants. Refer

Table 1 ORAM long form for list. Add or deduct points for coverage

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

6d. Microtopography.

Score all present using 0 to 3 scale.

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species

Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp to

A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

9.0 TOTAL (Max 100 pts)
1 Category

Wetland ID:	W-CMS-004 PEM
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ORAM Summary Worksheet

		Circle answer or insert score		Result
Narrative Rating	Question 1. Critical Habitat	YES	*NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES	*NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES	*NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES	*NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	*YES	NO	If yes, Category 1.
	Question 6. Bogs	YES	*NO	If yes, Category 3.
	Question 7. Fens	YES	*NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES	*NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	Yes	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES	*NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES	*NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	1		
	Metric 2. Buffers and surrounding land use	3		
	Metric 3. Hydrology	7		
	Metric 4. Habitat	3		
	Metric 5. Special Wetland Communities	-10		
	Metric 6. Plant communities, interspersion, microtopography	5		
	TOTAL SCORE	9		Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland ID:	W-CMS-004 PEM
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Wetland Categorization Worksheet

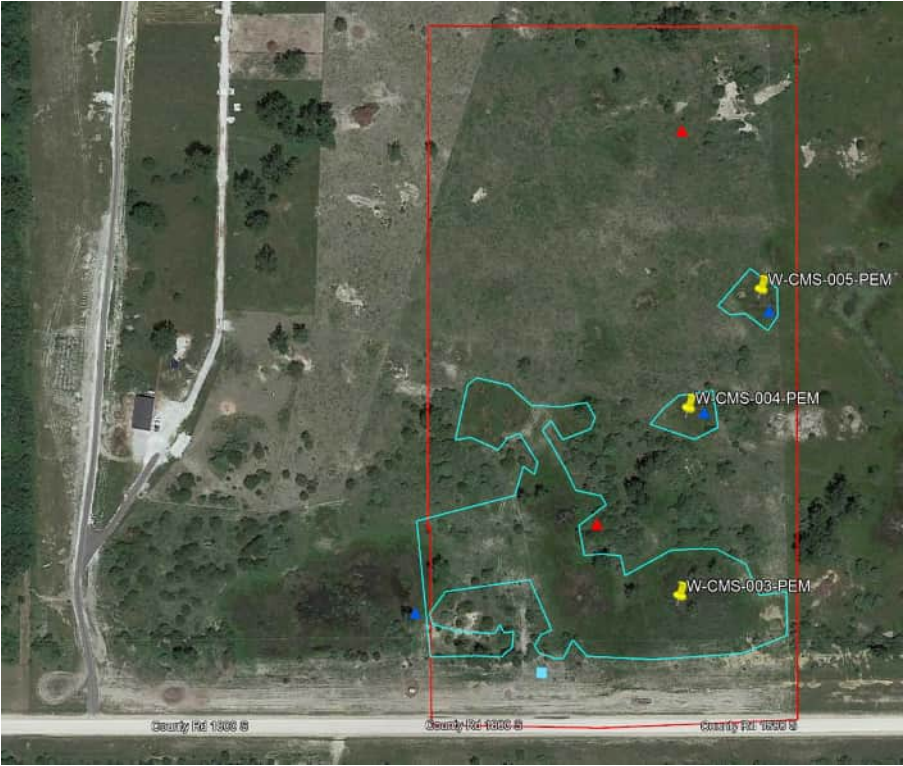
Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	*NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over- categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	*NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	*YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	*YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	*NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1- 54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	*NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	*Category 1	Category 2	Category 3	
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End of Ohio Rapid Assessment Method for Wetlands.

Background Information	
Name:	CMS
Date:	6/12/2024
Affiliation:	AECOM
Address:	564 White Pond Drive, Akron, OH 44320
Phone Number:	717-617-7738
e-mail address:	charlotte.stallone@aecom.com
Name of Wetland:	W-CMS-005 PEM
Vegetation Communit(ies):	PEM
HGM Class(es):	Depression
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	
<p>See Figures 1, 2, and 3 of Wetland Delineation and Stream Assessment Report.</p>	
Lat/Long or UTM Coordinate:	39.623781°, -87.486961°
USGS Quad Name:	New Goshen, IN
County:	Vermillion
Township:	Clinton
Section and Subsection:	NA
Hydrologic Unit Code:	051201110303 Gin Creek-Brouilletts Creek
Site Visit:	6/12/2024
National Wetland Inventory Map:	See Figure 2
Ohio Wetland Inventory Map:	N/A
Soil Survey:	See Figure 2
Delineation report/map:	See Figure 3

Name of Wetland:		W-CMS-005 PEM	
Wetland Size (delineated acres):		0.14	Wetland Size (Estimated total acres): 0.14
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.			
<div><div>N ↑</div></div>			
Comments, Narrative Discussion, Justification of Category Changes:			
PEM wetland dominated by <i>Potentilla indica</i> , <i>Eleocharis palustris</i> and <i>Phalaris arundinacea</i> . Recieves hydrology from precipitation. Historic strip mine. Shallow clay soils bedrock at 8 inches. Heavily disturbed by cattle grazing and compacted soils around the wetland fringe creating hummocks.			
Final score:		7	Category: 1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human- induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Wetland ID: W-CMS-005 PEM

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	*NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	*NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	*NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	*NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	*YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	*NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	*NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	*NO Go to Question 8b

Wetland ID: W-CMS-005 PEM

<p>8b Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?</p>	<p>Yes Wetland should be evaluated for possible Category 3 status. Go to Question 9a</p>	<p>*NO Go to Question 9a</p>
<p>9a Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?</p>	<p>YES Go to Question 9b</p>	<p>*NO Go to Question 10</p>
<p>9b Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 9c</p>
<p>9c Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.</p>	<p>YES Go to Question 9d</p>	<p>*NO Go to Question 10</p>
<p>9d Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?</p>	<p>YES Wetland is a Category 3 wetland Go to Question 10</p>	<p>*NO Go to Question 9e</p>
<p>9e Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 10</p>
<p>10 Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.</p>	<p>YES Wetland is a Category 3 wetland. Go to Question 11</p>	<p>*NO Go to Question 11</p>
<p>11 Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).</p>	<p>YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating</p>	<p>*NO Complete Quantitative Rating</p>

Wetland ID:	W-CMS-005 PEM
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Table 1. Characteristic plant species.				
invasive/exotic spp	fen species	bog species	oak opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Wetland ID: W-CMS-005 PEM

Site: Wabash Hydrogen Energy Center Project Rater(s): CMS Date: 6/12/2024

1.0 1.0
max 6 pts subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

Field ID:

W-CMS-005 PEM

Delineated acres:	0.14
Estimated Total acres	0.14

3.0 4.0
max 14 pts. subtotal

Metric 2. Upland buffers and surrounding land use.

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

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

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

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

7.0 11.0
max 30 pts. subtotal

Metric 3. Hydrology.

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

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

3c. Maximum water depth. Select one.

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

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

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

3b. Connectivity. Score all that apply.

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

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

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

Check all disturbances observed

- | | |
|---|---|
| <input type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading |
| <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir | <input type="checkbox"/> dredging |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other: cattle have disturbed and compacted soils around the wetland fringe creating hummocks |

3.0 14.0
max 20 pts. subtotal

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

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

14.0
subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland ID: W-CMS-005 PEM

Site: Wabash Hydrogen Energy Center Project Rater(s): CMS Date: 6/12/2024

14.0
subtotal this page

Field ID:
W-CMS-005 PEM

-10.0 4.0
max 10 pts. subtotal

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

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

3.0 7.0
max 20pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

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

6b. horizontal (plan view) Interspersion.

Select only one.

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

6c. Coverage of invasive plants. Refer

Table 1 ORAM long form for list. Add
or deduct points for coverage

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

6d. Microtopography.

Score all present using 0 to 3 scale.

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

Low spp diversity and/or predominance of nonnative or low
disturbance tolerant native species

Native spp are dominant component of the vegetation, mod
although nonnative and/or disturbance tolerant native spp
can also be present, and species diversity moderate to
moderately high, but generally w/o presence of rare
threatened or endangered spp to

A predominance of native species, with nonnative spp high
and/or disturbance tolerant native spp absent or virtually
absent, and high spp diversity and often, but not always,
the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

7.0 TOTAL (Max 100 pts)
1 Category

Wetland ID:	W-CMS-005 PEM
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ORAM Summary Worksheet

		Circle answer or insert score		Result
Narrative Rating	Question 1. Critical Habitat	YES	*NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES	*NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES	*NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES	*NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	*YES	NO	If yes, Category 1.
	Question 6. Bogs	YES	*NO	If yes, Category 3.
	Question 7. Fens	YES	*NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES	*NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	Yes	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES	*NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES	*NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	1		
	Metric 2. Buffers and surrounding land use	3		
	Metric 3. Hydrology	7		
	Metric 4. Habitat	3		
	Metric 5. Special Wetland Communities	-10		
	Metric 6. Plant communities, interspersion, microtopography	3		
	TOTAL SCORE	7		Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland ID:	W-CMS-005 PEM
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Wetland Categorization Worksheet


Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	*NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over- categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	*NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	*YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	*YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	*NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1- 54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	*NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	*Category 1	Category 2	Category 3
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End of Ohio Rapid Assessment Method for Wetlands.

Background Information	
Name:	CMS
Date:	7/10/2024
Affiliation:	AECOM
Address:	564 White Pond Drive, Akron, OH 44320
Phone Number:	717-617-7738
e-mail address:	charlotte.stallone@aecom.com
Name of Wetland:	W-CMS-006 PFO
Vegetation Communit(ies):	PFO
HGM Class(es):	Riverine
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	
<p>See Figures 1, 2, and 3 of Wetland Delineation and Stream Assessment Report.</p>	
Lat/Long or UTM Coordinate:	39.539358°, -87.436173°
USGS Quad Name:	New Goshen, IN
County:	Vigo
Township:	West Terre Haute
Section and Subsection:	NA
Hydrologic Unit Code:	051201110604 South Salt Creek-Wabash River
Site Visit:	7/10/2024
National Wetland Inventory Map:	See Figure 2
Ohio Wetland Inventory Map:	N/A
Soil Survey:	See Figure 2
Delineation report/map:	See Figure 3

Name of Wetland:		W-CMS-006 PFO	
Wetland Size (delineated acres):		0.14	Wetland Size (Estimated total acres):
			0.14
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.			
			
Comments, Narrative Discussion, Justification of Category Changes:			
<p>PFO wetland dominated by <i>Platanus occidentalis</i>, <i>Populus deltoides</i>, <i>Ulmus americana</i>, <i>Lonicera canadensis</i>, and <i>Glyceria striata</i>. Receives hydrology from precipitation and stream S-CMS-043-INT. APT indicates mild drought for this time of year.</p>			
Final score:		46	Category:
			2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human- induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Wetland ID: W-CMS-006 PFO

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	*NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	*NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	*NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	*NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	*NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	*NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	*NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	*NO Go to Question 8b

Wetland ID: W-CMS-006 PFO

<p>8b Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?</p>	<p>Yes Wetland should be evaluated for possible Category 3 status. Go to Question 9a</p>	<p>*NO Go to Question 9a</p>
<p>9a Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?</p>	<p>YES Go to Question 9b</p>	<p>*NO Go to Question 10</p>
<p>9b Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 9c</p>
<p>9c Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.</p>	<p>YES Go to Question 9d</p>	<p>*NO Go to Question 10</p>
<p>9d Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?</p>	<p>YES Wetland is a Category 3 wetland Go to Question 10</p>	<p>*NO Go to Question 9e</p>
<p>9e Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 10</p>
<p>10 Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.</p>	<p>YES Wetland is a Category 3 wetland. Go to Question 11</p>	<p>*NO Go to Question 11</p>
<p>11 Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).</p>	<p>YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating</p>	<p>*NO Complete Quantitative Rating</p>

Wetland ID:	W-CMS-006 PFO
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Table 1. Characteristic plant species.				
invasive/exotic spp	fen species	bog species	oak opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia elauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Wetland ID:	W-CMS-006 PFO
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Site:	Wabash Hydrogen Energy Center Project	Rater(s):	CMS	Date:	7/10/2024
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1.0	1.0
max 6 pts	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

Field ID:

W-CMS-006 PFO

Delineated acres:	0.14
Estimated Total acres	0.14

3.0	4.0
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

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

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

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

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

18.0	22.0
max 30 pts.	subtotal

Metric 3. Hydrology.

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

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

3c. Maximum water depth. Select one.

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

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

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

3b. Connectivity. Score all that apply.

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

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

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

Check all disturbances observed

- | | |
|---|--|
| <input type="checkbox"/> ditch | <input checked="" type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading |
| <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir | <input type="checkbox"/> dredging |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other: |

18.0	40.0
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

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

40.0
subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland ID: W-CMS-006 PFO

Site: Wabash Hydrogen Energy Center Project Rater(s): CMS Date: 7/10/2024

40.0
subtotal this page

Field ID:
W-CMS-006 PFO

0.0 40.0
max 10 pts. subtotal

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

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

6.0 46.0
max 20pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- ☐ Aquatic bed
☒ 1 Emergent
☐ Shrub
☒ 2 Forest
☐ Mudflats
☐ Open water
☐ Other

6b. horizontal (plan view) Interspersion.

Select only one.

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

6c. Coverage of invasive plants. Refer

Table 1 ORAM long form for list. Add
or deduct points for coverage

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

6d. Microtopography.

Score all present using 0 to 3 scale.

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

Low spp diversity and/or predominance of nonnative or low
disturbance tolerant native species

Native spp are dominant component of the vegetation, mod
although nonnative and/or disturbance tolerant native spp
can also be present, and species diversity moderate to
moderately high, but generally w/o presence of rare
threatened or endangered spp to

A predominance of native species, with nonnative spp high
and/or disturbance tolerant native spp absent or virtually
absent, and high spp diversity and often, but not always,
the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

46.0 TOTAL (Max 100 pts)
2 Category

Wetland ID:	W-CMS-006 PFO
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ORAM Summary Worksheet

		Circle answer or insert score		Result
Narrative Rating	Question 1. Critical Habitat	YES	*NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES	*NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES	*NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES	*NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES	*NO	If yes, Category 1.
	Question 6. Bogs	YES	*NO	If yes, Category 3.
	Question 7. Fens	YES	*NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES	*NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	Yes	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES	*NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES	*NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	1		
	Metric 2. Buffers and surrounding land use	3		
	Metric 3. Hydrology	18		
	Metric 4. Habitat	18		
	Metric 5. Special Wetland Communities	0		
	Metric 6. Plant communities, interspersed, microtopography	6		
	TOTAL SCORE	46		Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland ID:	W-CMS-006 PFO
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Wetland Categorization Worksheet

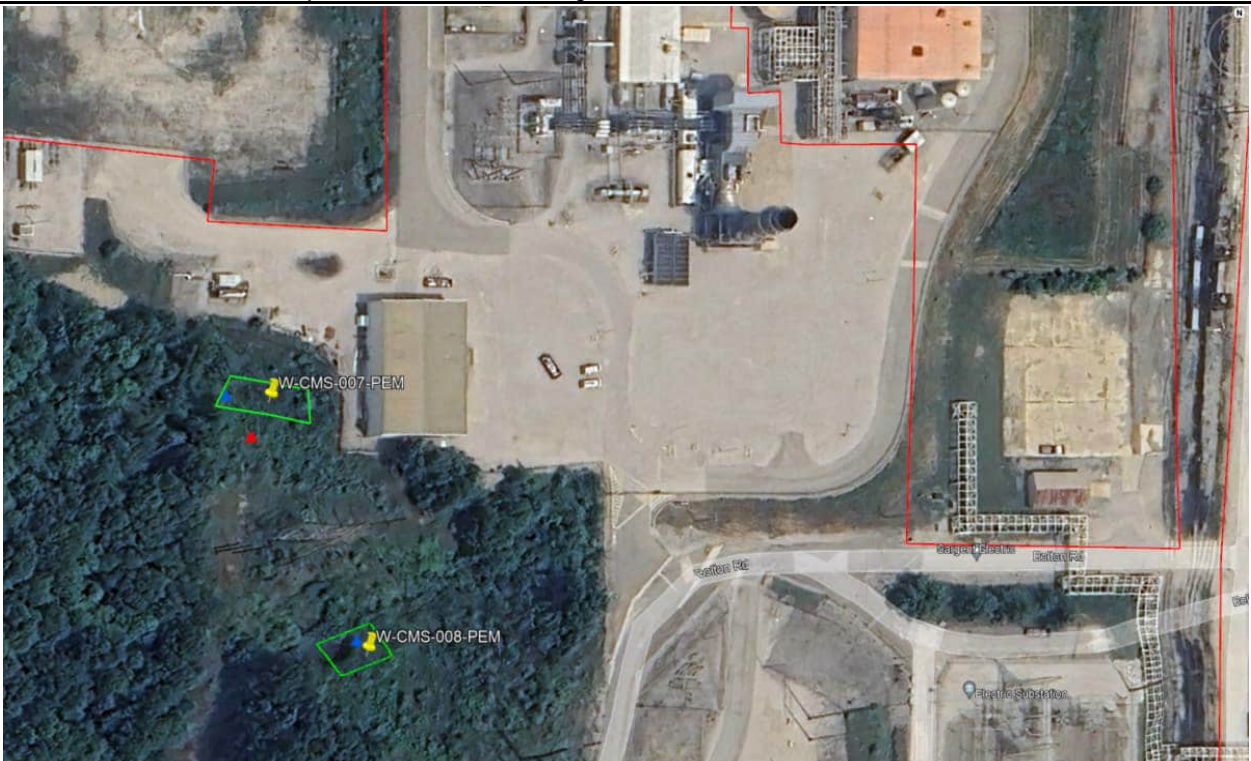
Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	*NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over- categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	*NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	*NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	*YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	*NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1- 54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	*NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	*Category 2	Category 3
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End of Ohio Rapid Assessment Method for Wetlands.

Background Information	
Name:	CMS
Date:	7/11/2024
Affiliation:	AECOM
Address:	564 White Pond Drive, Akron, OH 44320
Phone Number:	717-617-7738
e-mail address:	charlotte.stallone@aecom.com
Name of Wetland:	W-CMS-007 PEM
Vegetation Communit(ies):	PEM
HGM Class(es):	Riverine
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	
<p>See Figures 1, 2, and 3 of Wetland Delineation and Stream Assessment Report.</p>	
Lat/Long or UTM Coordinate:	39.539358°, -87.436173°
USGS Quad Name:	New Goshen, IN
County:	Vigo
Township:	West Terre Haute
Section and Subsection:	NA
Hydrologic Unit Code:	051201110604 South Salt Creek-Wabash River
Site Visit:	7/11/2024
National Wetland Inventory Map:	See Figure 2
Ohio Wetland Inventory Map:	N/A
Soil Survey:	See Figure 2
Delineation report/map:	See Figure 3

Name of Wetland:	W-CMS-007 PEM		
Wetland Size (delineated acres):	0.10	Wetland Size (Estimated total acres):	0.30
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.			
<div><div>N</div></div>			
Comments, Narrative Discussion, Justification of Category Changes:			
PEM wetland dominated by <i>Acer negundo</i> , <i>Prunus pensylvanica</i> , <i>Ulmus americana</i> , <i>Gleditsia triacanthos</i> , <i>Leersia oryzoides</i> and <i>Phalaris arundinacea</i> . Recieves hydrology from precipitation and off-site stream. APT indicates mild drought for this time of year.			
Final score:	37	Category:	Modified 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human- induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Wetland ID: W-CMS-007 PEM

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	*NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	*NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	*NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	*NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	*NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	*NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	*NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	*NO Go to Question 8b

Wetland ID: W-CMS-007 PEM

<p>8b Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?</p>	<p>Yes Wetland should be evaluated for possible Category 3 status. Go to Question 9a</p>	<p>*NO Go to Question 9a</p>
<p>9a Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?</p>	<p>YES Go to Question 9b</p>	<p>*NO Go to Question 10</p>
<p>9b Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 9c</p>
<p>9c Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.</p>	<p>YES Go to Question 9d</p>	<p>*NO Go to Question 10</p>
<p>9d Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?</p>	<p>YES Wetland is a Category 3 wetland Go to Question 10</p>	<p>*NO Go to Question 9e</p>
<p>9e Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 10</p>
<p>10 Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.</p>	<p>YES Wetland is a Category 3 wetland. Go to Question 11</p>	<p>*NO Go to Question 11</p>
<p>11 Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).</p>	<p>YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating</p>	<p>*NO Complete Quantitative Rating</p>

Wetland ID:	W-CMS-007 PEM
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Table 1. Characteristic plant species.				
invasive/exotic spp	fen species	bog species	oak opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Wetland ID:	W-CMS-007 PEM
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Site:	Wabash Hydrogen Energy Center Project	Rater(s):	CMS	Date:	7/11/2024
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1.0	1.0
max 6 pts	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

Field ID:

W-CMS-007 PEM

Delineated acres:	0.10
Estimated Total acres	0.30

3.0	4.0
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

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

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

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

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

23.0	27.0
max 30 pts.	subtotal

Metric 3. Hydrology.

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

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

3c. Maximum water depth. Select one.

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

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

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

3b. Connectivity. Score all that apply.

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

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

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

Check all disturbances observed

- | | |
|---|---|
| <input type="checkbox"/> ditch | <input type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile | <input type="checkbox"/> filling/grading |
| <input type="checkbox"/> dike | <input type="checkbox"/> road bed/RR track |
| <input type="checkbox"/> weir | <input type="checkbox"/> dredging |
| <input type="checkbox"/> stormwater input | <input type="checkbox"/> Other: |

8.0	35.0
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

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

35.0
subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland ID: W-CMS-007 PEM

Site: Wabash Hydrogen Energy Center Project Rater(s): CMS Date: 7/11/2024

35.0
subtotal this page

Field ID:
W-CMS-007 PEM

0.0 35.0
max 10 pts. subtotal

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

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

2.0 37.0
max 20pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

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

6b. horizontal (plan view) Interspersion.

Select only one.

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

6c. Coverage of invasive plants. Refer

Table 1 ORAM long form for list. Add
or deduct points for coverage

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

6d. Microtopography.

Score all present using 0 to 3 scale.

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

Low spp diversity and/or predominance of nonnative or low
disturbance tolerant native species

Native spp are dominant component of the vegetation, mod
although nonnative and/or disturbance tolerant native spp
can also be present, and species diversity moderate to
moderately high, but generally w/o presence of rare
threatened or endangered spp to

A predominance of native species, with nonnative spp high
and/or disturbance tolerant native spp absent or virtually
absent, and high spp diversity and often, but not always,
the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

37.0 TOTAL (Max 100 pts)
Modified 2 Category

Wetland ID:	W-CMS-007 PEM
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ORAM Summary Worksheet

		Circle answer or insert score		Result
Narrative Rating	Question 1. Critical Habitat	YES	*NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES	*NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES	*NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES	*NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES	*NO	If yes, Category 1.
	Question 6. Bogs	YES	*NO	If yes, Category 3.
	Question 7. Fens	YES	*NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES	*NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	Yes	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES	*NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES	*NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	1		
	Metric 2. Buffers and surrounding land use	3		
	Metric 3. Hydrology	23		
	Metric 4. Habitat	8		
	Metric 5. Special Wetland Communities	0		
	Metric 6. Plant communities, interspersion, microtopography	2		
	TOTAL SCORE	37		Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland ID: W-CMS-007 PEM

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	*NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over- categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	*NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	*NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	*NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall within the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	*YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1- 54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	*NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	*Category 2	Category 3
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End of Ohio Rapid Assessment Method for Wetlands.

Background Information	
Name:	CMS
Date:	7/11/2024
Affiliation:	AECOM
Address:	564 White Pond Drive, Akron, OH 44320
Phone Number:	717-617-7738
e-mail address:	charlotte.stallone@aecom.com
Name of Wetland:	W-CMS-008 PEM
Vegetation Communit(ies):	PEM
HGM Class(es):	Riverine
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	
<p>See Figures 1, 2, and 3 of Wetland Delineation and Stream Assessment Report.</p>	
Lat/Long or UTM Coordinate:	39.539358°, -87.436173°
USGS Quad Name:	New Goshen, IN
County:	Vigo
Township:	West Terre Haute
Section and Subsection:	NA
Hydrologic Unit Code:	051201110604 South Salt Creek-Wabash River
Site Visit:	7/11/2024
National Wetland Inventory Map:	See Figure 2
Ohio Wetland Inventory Map:	N/A
Soil Survey:	See Figure 2
Delineation report/map:	See Figure 3

Name of Wetland:	W-CMS-008 PEM		
Wetland Size (delineated acres):	0.10	Wetland Size (Estimated total acres):	0.30
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.			
<div><div>N</div></div>			
Comments, Narrative Discussion, Justification of Category Changes: PEM wetland dominated by <i>Phragmites australis</i> , and <i>Phalaris arundinacea</i> . Recieves hydrology from precipitation and off-site stream. APT indicates mild drought for this time of year.			
Final score:	37	Category:	Modified 2

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. Areas with a high degree of hydrologic interaction should be scored as a single wetland. In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human- induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		X
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Wetland ID: W-CMS-008 PEM

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature and by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	*NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	*NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	*NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	*NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	*NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	*NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	*NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	*NO Go to Question 8b

Wetland ID: W-CMS-008 PEM

<p>8b Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?</p>	<p>Yes Wetland should be evaluated for possible Category 3 status. Go to Question 9a</p>	<p>*NO Go to Question 9a</p>
<p>9a Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?</p>	<p>YES Go to Question 9b</p>	<p>*NO Go to Question 10</p>
<p>9b Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 9c</p>
<p>9c Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.</p>	<p>YES Go to Question 9d</p>	<p>*NO Go to Question 10</p>
<p>9d Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?</p>	<p>YES Wetland is a Category 3 wetland Go to Question 10</p>	<p>*NO Go to Question 9e</p>
<p>9e Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?</p>	<p>YES Wetland should be evaluated for possible Category 3 status Go to Question 10</p>	<p>*NO Go to Question 10</p>
<p>10 Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.</p>	<p>YES Wetland is a Category 3 wetland. Go to Question 11</p>	<p>*NO Go to Question 11</p>
<p>11 Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).</p>	<p>YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating</p>	<p>*NO Complete Quantitative Rating</p>

Wetland ID:	W-CMS-008 PEM
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Table 1. Characteristic plant species.				
invasive/exotic spp	fen species	bog species	oak opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Wetland ID:	W-CMS-008 PEM
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Site:	Wabash Hydrogen Energy Center Project	Rater(s):	CMS	Date:	7/11/2024
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1.0	1.0
max 6 pts	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

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

Field ID:

W-CMS-008 PEM

Delineated acres:	0.10
Estimated Total acres	0.30

3.0	4.0
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

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

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

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

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

23.0	27.0
max 30 pts.	subtotal

Metric 3. Hydrology.

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

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

3c. Maximum water depth. Select one.

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

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

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

3b. Connectivity. Score all that apply.

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

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

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

Check all disturbances observed

- ☐ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☐ stormwater input
- ☐ point source (nonstormwater)
- ☐ filling/grading
- ☐ road bed/RR track
- ☐ dredging
- ☐ Other:

8.0	35.0
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

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

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

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

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

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

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

Check all disturbances observed

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

35.0
subtotal this page

ORAM v. 5.0 Field Form Quantitative Rating

Wetland ID: W-CMS-008 PEM

Site: Wabash Hydrogen Energy Center Project Rater(s): CMS Date: 7/11/2024

35.0
subtotal this page

Field ID:
W-CMS-008 PEM

0.0 35.0
max 10 pts. subtotal

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

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

2.0 37.0
max 20pts. subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

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

6b. horizontal (plan view) Interspersion.

Select only one.

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

6c. Coverage of invasive plants. Refer

Table 1 ORAM long form for list. Add
or deduct points for coverage

- ☐ Extensive >75% cover (-5)
☐ Moderate 25-75% cover (-3)
☒ x Sparse 5-25% cover (-1) Phragmites australis
☐ Nearly absent <5% cover (Phalaris arundinacea)
☐ Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

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

Vegetation Community Cover Scale

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

Narrative Description of Vegetation Quality

Low spp diversity and/or predominance of nonnative or low
disturbance tolerant native species

Native spp are dominant component of the vegetation, mod
although nonnative and/or disturbance tolerant native spp
can also be present, and species diversity moderate to
moderately high, but generally w/o presence of rare
threatened or endangered spp to

A predominance of native species, with nonnative spp high
and/or disturbance tolerant native spp absent or virtually
absent, and high spp diversity and often, but not always,
the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

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

Microtopography Cover Scale

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

37.0 TOTAL (Max 100 pts)
Modified 2 Category

Wetland ID:	W-CMS-008 PEM
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ORAM Summary Worksheet

		Circle answer or insert score		Result
Narrative Rating	Question 1. Critical Habitat	YES	*NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES	*NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES	*NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES	*NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES	*NO	If yes, Category 1.
	Question 6. Bogs	YES	*NO	If yes, Category 3.
	Question 7. Fens	YES	*NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES	*NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	Yes	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES	*NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES	*NO	If yes, Category 3
	Question 11. Relict Wet Prairies	YES	*NO	If yes, evaluate for Category 3; may also be 1 or 2.
Quantitative Rating	Metric 1. Size	1		
	Metric 2. Buffers and surrounding land use	3		
	Metric 3. Hydrology	23		
	Metric 4. Habitat	8		
	Metric 5. Special Wetland Communities	0		
	Metric 6. Plant communities, interspersion, microtopography	2		
	TOTAL SCORE	37		Category based on score breakpoints

Complete Wetland Categorization Worksheet.

Wetland ID:	W-CMS-008 PEM
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Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	*NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over- categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	*NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	*NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	*NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall within the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	*YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc., and a consideration of the narrative criteria in OAC rule 3745-1- 54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	*NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	*Category 2	Category 3
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End of Ohio Rapid Assessment Method for Wetlands.

APPENDIX C
OEPA Stream Forms



Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

38

SITE NAME/LOCATION S-CMS-001 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-001 RIVER BASIN Wabash River RIVER CODE N/A DRAINAGE AREA (mi²) 0.01

LENGTH OF STREAM REACH (ft) 41.94 LAT 39.53384 LONG -87.42707 RIVER MILE N/A

DATE 6/11/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points Substrate Max = 40
TYPE	PERCENT	TYPE	PERCENT	
<input type="checkbox"/> BLDG SLABS [16 pts]	10%	<input type="checkbox"/> SILT [3 pts]	0%	<div>23</div> <div>A + B</div>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	15%	
<input type="checkbox"/> BEDROCK [16 pts]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%	
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	50%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	10%	<input type="checkbox"/> MUCK [0 pts]	0%	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	15%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%	
Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock 60.00%		Substrate Percentage Check 100%		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 18		TOTAL NUMBER OF SUBSTRATE TYPES: 5		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box).				Pool Depth Max = 30
<input type="checkbox"/> > 30 centimeters [20 pts] <input type="checkbox"/> 5 cm - 10 cm [15 pts] <input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> < 5 cm [5 pts] <input type="checkbox"/> > 10 - 22.5 cm [25 pts] <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]				
COMMENTS OHWM = 2.25'w x 0.5'd MAXIMUM POOL DEPTH (centimeters): 0.00				0
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				Bankfull Width Max=30
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]				
COMMENTS BF = 4.0'w x 1.0'd AVERAGE BANKFULL WIDTH (meters): 1.22				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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input checked="" type="checkbox"/>	<input type="checkbox"/> Wide >10m	<input checked="" type="checkbox"/>	<input type="checkbox"/> Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/>	<input type="checkbox"/> Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input checked="" type="checkbox"/> Narrow <5m	<input type="checkbox"/>	<input type="checkbox"/> Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/> None	<input type="checkbox"/>	<input type="checkbox"/> Fenced Pasture
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Mining or Construction

COMMENTS

FLOW REGIME (At Time of Evaluation) (Check ONLY one box)	
<input type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box)			
<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input checked="" type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 m/100 ft)	<input type="checkbox"/> Moderate to Severe	<input checked="" type="checkbox"/> Severe (4.0 m/100 ft)
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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: Wabash River Distance from Evaluated Stream 1,786'
☐ 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: S32 T13N R9W NRCS Soil Map Page: Ma NRCS Soil Map Stream Order: n/a
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: June 10, 2024 Quantity: 1.2 in

Photo-documentation Notes: _____

Elevated Turbidity? (Y/N): ☐ N Canopy (% open): 5

Were samples collected for water chemistry? (Y/N): ☐ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☐ Unstable ☒

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☐ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☐ N Species observed (if known): _____

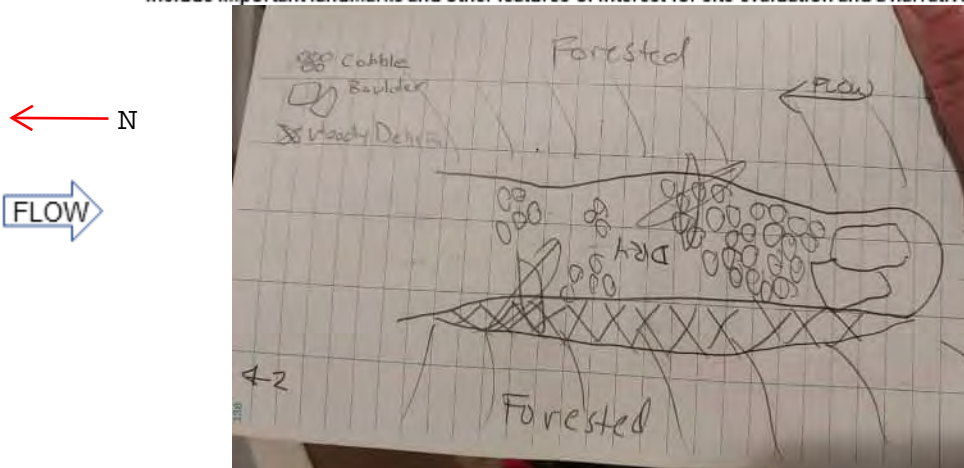
Salamanders Observed? (Y/N) ☐ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☒ Y Species observed (if known): _____

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





Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

16

SITE NAME/LOCATION S-CMS-002 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-002 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) .01

LENGTH OF STREAM REACH (ft) 55.24 LAT 39.53383 LONG -87.42725 RIVER MILE n/a

DATE 6/11/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points
TYPE	PERCENT	TYPE	PERCENT	
<input type="checkbox"/> BLDG SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pts]	0%	Substrate Max = 40 11 A + B
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	70%	
<input type="checkbox"/> BEDROCK [16 pts]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pts]	0%	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> MUCK [0 pts]	0%	
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	30%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%	
Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock 0.00%		Substrate Percentage Check 100%		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9		TOTAL NUMBER OF SUBSTRATE TYPES: 2		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box).				Pool Depth Max = 30
<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> 5 cm - 10 cm [15 pts]			0
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]			
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]			
COMMENTS OHWM = 1.0'w x 0.25'd		MAXIMUM POOL DEPTH (centimeters): 0.00		
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				Bankfull Width Max=30
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]			5
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]			
<input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]				
COMMENTS BF = 1.5'w x 1.0'd		AVERAGE BANKFULL WIDTH (meters): 0.30		

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

FLOW REGIME (At Time of Evaluation) (Check ONLY one box)	
<input type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box)			
<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input checked="" type="checkbox"/> 0.5	<input checked="" type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> ≥ 3

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 m/100 ft)	<input type="checkbox"/> Moderate to Severe	<input checked="" type="checkbox"/> Severe (4.0 m/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: Wabash River Distance from Evaluated Stream 1,913'
☐ 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: S32 T13N R9W NRCS Soil Map Page: Ma NRCS Soil Map Stream Order: n/a
 County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: June 10, 2024 Quantity: 1.2 in

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☐ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☐ Unstable ☒

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☐ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☐ N Species observed (if known): _____

Salamanders Observed? (Y/N) ☐ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☒ Y Species observed (if known): crawfish

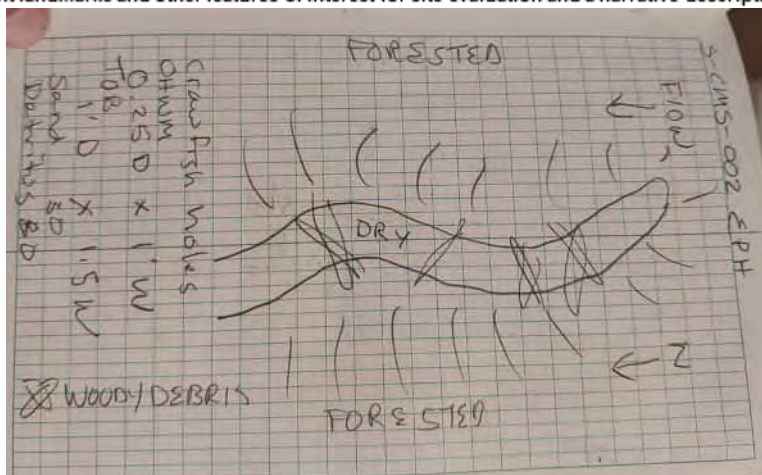
Comments Regarding Biology: crawfish holes

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

→ FLOW





Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

11

SITE NAME/LOCATION S-CMS-003 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-003 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) 0.01

LENGTH OF STREAM REACH (ft) 67.64 LAT 39.533855 LONG -87.427397 RIVER MILE n/a

DATE 6/11/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points
TYPE	PERCENT	TYPE	PERCENT	
<input type="checkbox"/> BLDG SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pts]	0%	Substrate Max = 40 6 A + B
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	60%	
<input type="checkbox"/> BEDROCK [16 pts]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	30%	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> MUCK [0 pts]	0%	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	10%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%	
Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock 0.00%		Substrate Percentage Check 100%		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 3		TOTAL NUMBER OF SUBSTRATE TYPES: 3		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box).				Pool Depth Max = 30 0
<input type="checkbox"/> > 30 centimeters [20 pts] <input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> > 10 - 22.5 cm [25 pts] <input type="checkbox"/> 5 cm - 10 cm [15 pts] <input type="checkbox"/> < 5 cm [5 pts] <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]				
COMMENTS OHWM = 1.0'w x 0.25'd MAXIMUM POOL DEPTH (centimeters): 0.00				
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				Bankfull Width Max=30 5
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]				
COMMENTS BF = 1.5'w x 0.5'd AVERAGE BANKFULL WIDTH (meters): 0.46				

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

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

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 m/100 ft)	<input type="checkbox"/> Moderate to Severe	<input checked="" type="checkbox"/> Severe (4.0 m/100 ft)
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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: Wabash River Distance from Evaluated Stream 2,046
☐ 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: S32 T13N R9W NRCS Soil Map Page: Ma NRCS Soil Map Stream Order: _____
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: June 10, 2024 Quantity: 1.2 in

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☐ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☐ Unstable ☒

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☐ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☐ N Species observed (if known): _____

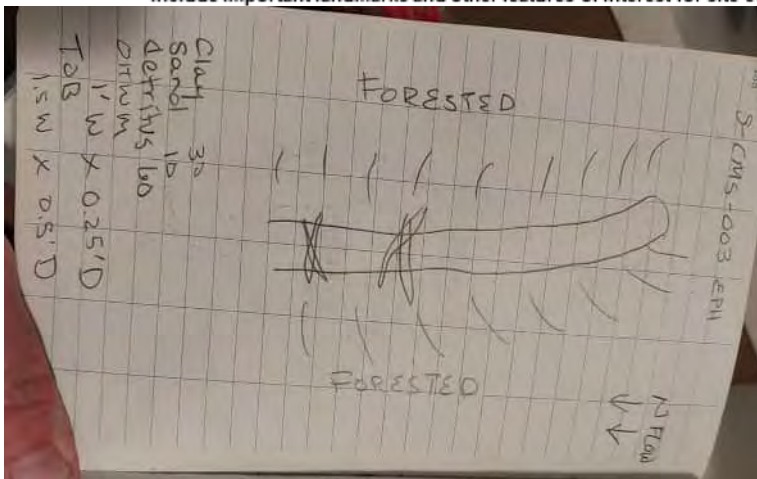
Salamanders Observed? (Y/N) ☐ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☐ N Species observed (if known): _____

Comments Regarding Biology: none observed

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





Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

21

SITE NAME/LOCATION S-CMS-005 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-005 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) 0.00

LENGTH OF STREAM REACH (ft) 22.12 LAT 39.534795 LONG -87.424072 RIVER MILE n/a

DATE 6/12/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points Substrate Max = 40
TYPE	PERCENT	TYPE	PERCENT	
<input type="checkbox"/> BLDG SLABS [16 pts]	0%	<input type="checkbox"/> SILT [3 pts]	0%	<div style="border: 1px solid black; padding: 5px; text-align: center;">16</div> A + B
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	20%	
<input type="checkbox"/> BEDROCK [16 pts]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%	
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	20%	<input type="checkbox"/> MUCK [0 pts]	0%	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	10%	<input checked="" type="checkbox"/> ARTIFICIAL [3 pts]	50%	
Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock 0.00%		Substrate Percentage Check 100%		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12		TOTAL NUMBER OF SUBSTRATE TYPES: 4		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box).				Pool Depth Max = 30
<input type="checkbox"/> > 30 centimeters [20 pts] <input type="checkbox"/> 5 cm - 10 cm [15 pts] <input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> < 5 cm [5 pts] <input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]				
COMMENTS OHWM = 2.0'w x 0.25'd MAXIMUM POOL DEPTH (centimeters): 0.00				Bankfull Width Max=30
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input checked="" type="checkbox"/> < 1.0 m (< 3' 3") [5 pts] <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]				
COMMENTS BF = 3.0'w x 1.25'd AVERAGE BANKFULL WIDTH (meters): 0.91				

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

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

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 m/100 ft)	<input checked="" type="checkbox"/> Moderate to Severe	<input type="checkbox"/> Severe (4.0 m/100 ft)
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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: Wabash River Distance from Evaluated Stream 1,284
☐ 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: S28 T13N R9W NRCS Soil Map Page: Sh NRCS Soil Map Stream Order: _____
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: June 10, 2024 Quantity: 1.2 in

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☐ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☐ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☐ N Species observed (if known): _____

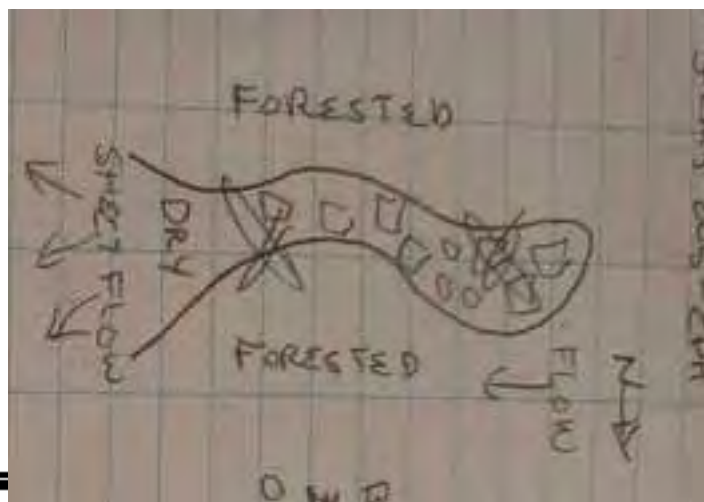
Salamanders Observed? (Y/N) ☐ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☐ N Species observed (if known): _____

Comments Regarding Biology: none observed

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





Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

28

SITE NAME/LOCATION S-CMS-006 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-006 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) 0.57

LENGTH OF STREAM REACH (ft) 901.34 LAT 39.53570 LONG -87.42578 RIVER MILE n/a

DATE 6/12/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points
TYPE	PERCENT	TYPE	PERCENT	Substrate Max = 40 13 A + B
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input type="checkbox"/> SILT [3 pts]	0%	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	35%	
<input type="checkbox"/> BEDROCK [16 pts]	5%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	20%	<input type="checkbox"/> MUCK [0 pts]	0%	
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	40%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%	
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock		5.00%		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9		TOTAL NUMBER OF SUBSTRATE TYPES: 4		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box)				
<input type="checkbox"/> > 30 centimeters [20 pts] <input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> > 10 - 22.5 cm [25 pts]				0.00
<input type="checkbox"/> 5 cm - 10 cm [15 pts] <input type="checkbox"/> < 5 cm [5 pts] <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]				
COMMENTS OHWM = 2.0'w x 0.25'd				
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				Bankfull Width Max=30 15
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]				1.37
<input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]				
COMMENTS TOB = 4.5'w x 2.5'd				

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

FLOW REGIME (At Time of Evaluation) (Check ONLY one box)	
<input type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box)			
<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input checked="" type="checkbox"/> ≥ 3

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 m/100 ft)	<input type="checkbox"/> Moderate to Severe	<input checked="" type="checkbox"/> Severe (4.0 m/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: Wabash River Distance from Evaluated Stream 1,741
☐ 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: S28 T13N R9W NRCS Soil Map Page: HkF NRCS Soil Map Stream Order: n/a
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: June 10, 2024 Quantity: 1.2 IN

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☐ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☒ Moderately Stable ☒ Unstable ☐

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☐ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☐ N Species observed (if known): _____

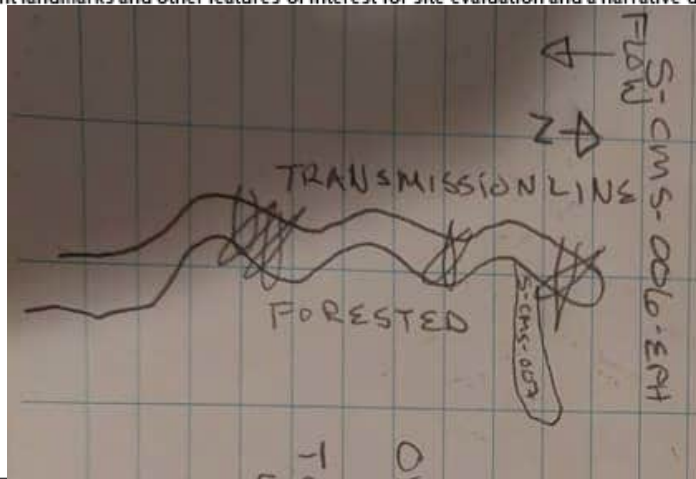
Salamanders Observed? (Y/N) ☐ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☐ N Species observed (if known): _____

Comments Regarding Biology: none observed

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





Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

22

SITE NAME/LOCATION S-CMS-007 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-007 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) .05

LENGTH OF STREAM REACH (ft) 201.87 LAT 39.53667 LONG -87.42577 RIVER MILE n/a

DATE 6/12/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points Substrate Max = 40
TYPE	PERCENT	TYPE	PERCENT	
<input type="checkbox"/> BLDG SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pts]	0%	<div style="border: 1px solid black; padding: 5px; text-align: center;"> 7 A + B </div>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	100%	
<input type="checkbox"/> BEDROCK [16 pts]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pts]	0%	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> MUCK [0 pts]	0%	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%	
Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock		0.00%		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6		TOTAL NUMBER OF SUBSTRATE TYPES: 1		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box)				Pool Depth Max = 30
<input type="checkbox"/> > 30 centimeters [20 pts] <input type="checkbox"/> 5 cm - 10 cm [15 pts] <input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> < 5 cm [5 pts] <input type="checkbox"/> > 10 - 22.5 cm [25 pts] <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]				
COMMENTS OHWM = 2.0'w x 0.1'd MAXIMUM POOL DEPTH (centimeters): 0.00				<div style="border: 1px solid black; padding: 5px; text-align: center;"> 0 </div>
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input checked="" type="checkbox"/> = 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]				<div style="border: 1px solid black; padding: 5px; text-align: center;"> 15 </div>
COMMENTS BF = 4.5'w x 1.5'd AVERAGE BANKFULL WIDTH (meters): 1.37				

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

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

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 m/100 ft)	<input type="checkbox"/> Moderate to Severe	<input checked="" type="checkbox"/> Severe (4.0 m/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: Wabash River Distance from Evaluated Stream 2,077'
☐ 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: S28 T13N R9W NRCS Soil Map Page: A1B2 NRCS Soil Map Stream Order: n/a
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: June 10, 2024 Quantity: 1.2 in

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☐ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☐ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☐ N Species observed (if known): _____

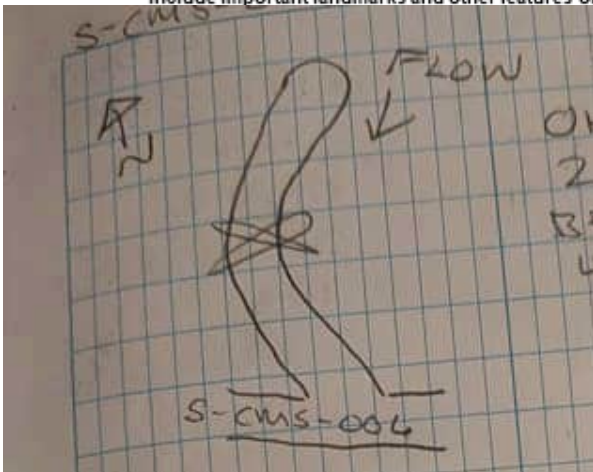
Salamanders Observed? (Y/N) ☐ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☐ N Species observed (if known): _____

Comments Regarding Biology: none observed

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





Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

24

SITE NAME/LOCATION S-CMS-021 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-021 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) .05

LENGTH OF STREAM REACH (ft) 509.85 LAT 39.540154 LONG -87.425496 RIVER MILE n/a

DATE 6/12/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points Substrate Max = 40
TYPE	PERCENT	TYPE	PERCENT	
<input type="checkbox"/> BLDG SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pts]	0%	<div style="border: 1px solid black; padding: 5px; text-align: center;"> 9 A + B </div>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	60%	
<input type="checkbox"/> BEDROCK [16 pts]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	20%	<input type="checkbox"/> MUCK [0 pts]	0%	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	20%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%	
Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock		0.00%		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6		TOTAL NUMBER OF SUBSTRATE TYPES: 3		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box)				Pool Depth Max = 30
<input type="checkbox"/> > 30 centimeters [20 pts] <input type="checkbox"/> 5 cm - 10 cm [15 pts] <input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> < 5 cm [5 pts] <input type="checkbox"/> > 10 - 22.5 cm [25 pts] <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]				
COMMENTS OHWM = 2.0'w x 0.25'd MAXIMUM POOL DEPTH (centimeters): 0.00				
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				Bankfull Width Max=30
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]				
COMMENTS TOB = 4.5'w x 2.5'd AVERAGE BANKFULL WIDTH (meters): 1.37				

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

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

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 m/100 ft)	<input type="checkbox"/> Moderate to Severe	<input checked="" type="checkbox"/> Severe (4.0 m/100 ft)
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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: Wabash River Distance from Evaluated Stream 2,212'
☐ 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: S28 T13N R9W NRCS Soil Map Page: HkF NRCS Soil Map Stream Order: n/a
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: June 10, 2024 Quantity: 1.2 in

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☐ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☐ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☐ N Species observed (if known): _____

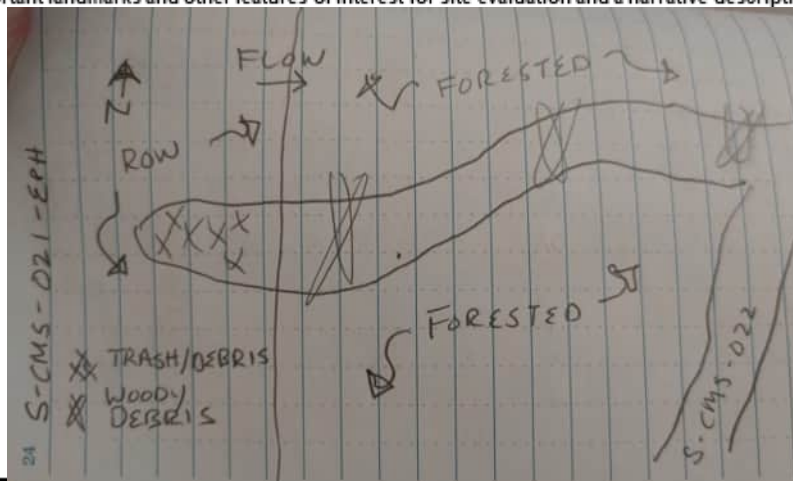
Salamanders Observed? (Y/N) ☐ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☐ N Species observed (if known): _____

Comments Regarding Biology: none observed

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





Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

13

SITE NAME/LOCATION S-CMS-022 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-022 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) .05

LENGTH OF STREAM REACH (ft) 492.90 LAT 39.539775 LONG -87.424901 RIVER MILE n/a

DATE 6/12/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points
TYPE	PERCENT	TYPE	PERCENT	
<input type="checkbox"/> BLDG SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pts]	0%	Substrate Max = 40 8 A + B
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	80%	
<input type="checkbox"/> BEDROCK [16 pts]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pts]	0%	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> MUCK [0 pts]	0%	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	20%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%	
Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock 0.00%		Substrate Percentage Check 100%		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6		TOTAL NUMBER OF SUBSTRATE TYPES: 2		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box).				Pool Depth Max = 30 0
<input type="checkbox"/> > 30 centimeters [20 pts] <input type="checkbox"/> 5 cm - 10 cm [15 pts] <input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> < 5 cm [5 pts] <input type="checkbox"/> > 10 - 22.5 cm [25 pts] <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]				
COMMENTS OHWM = 2.0'w x 0.2'd		MAXIMUM POOL DEPTH (centimeters): 0.00		
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				Bankfull Width Max=30 5
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input type="checkbox"/> = 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]				
COMMENTS TOB = 3'w x 1.5'd		AVERAGE BANKFULL WIDTH (meters): 0.91		

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

FLOW REGIME (At Time of Evaluation) (Check ONLY one box)	
<input type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box)			
<input type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input checked="" type="checkbox"/> 2.5	<input type="checkbox"/> ≥ 3

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 m/100 ft)	<input type="checkbox"/> Moderate to Severe	<input checked="" type="checkbox"/> Severe (4.0 m/100 ft)
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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: Wabash River Distance from Evaluated Stream 2,212'
☐ 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: S28 T13N R9W NRCS Soil Map Page: HkF NRCS Soil Map Stream Order: n/a
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: June 10, 2024 Quantity: 1.2 in

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☒ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☒ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☒ N Species observed (if known): _____

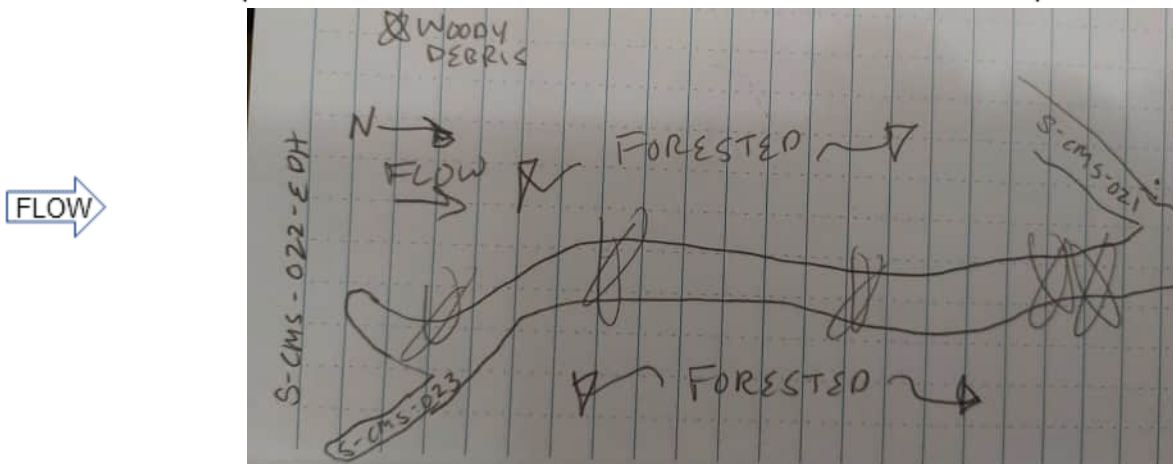
Salamanders Observed? (Y/N) ☒ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☒ N Species observed (if known): _____

Comments Regarding Biology: none observed

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





Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

12

SITE NAME/LOCATION S-CMS-023 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-023 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) .01

LENGTH OF STREAM REACH (ft) 31.05 LAT 39.539130 LONG -87.424926 RIVER MILE n/a

DATE 6/12/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points
TYPE	PERCENT	TYPE	PERCENT	Substrate Max = 40 <div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 10px auto;">7</div> A + B
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input type="checkbox"/> <input type="checkbox"/> SILT [3 pts]	0%	
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	100%	
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pts]	0%	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	0%	
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%	
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	0%	
<input type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3 pts]	0%	
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00%		Substrate Percentage Check 100%		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 6		TOTAL NUMBER OF SUBSTRATE TYPES: 1		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box)				
<input type="checkbox"/> > 30 centimeters [20 pts] <input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> > 10 - 22.5 cm [25 pts]				<div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 10px auto;">0.00</div>
<input type="checkbox"/> 5 cm - 10 cm [15 pts] <input type="checkbox"/> < 5 cm [5 pts] <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]				
COMMENTS OHWM = 1.0'w x 0.1'd				
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				Bankfull Width Max=30 <div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 10px auto;">5</div>
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]				<div style="border: 1px solid black; padding: 5px; width: 40px; text-align: center; margin: 10px auto;">0.46</div>
<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]				
COMMENTS TOB = 1.5'w x 0.5'd				

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

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

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 m/100 ft)	<input type="checkbox"/> Moderate to Severe	<input checked="" type="checkbox"/> Severe (4.0 m/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: Wabash River Distance from Evaluated Stream 2,212'
☐ 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: S28 T13N R9W NRCS Soil Map Page: HkF NRCS Soil Map Stream Order: n/a
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: June 10, 2024 Quantity: 1.2 in

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☐ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☐ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☐ N Species observed (if known): _____

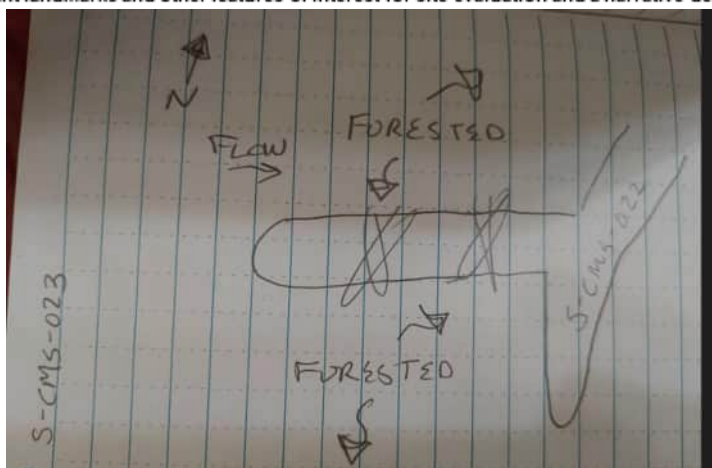
Salamanders Observed? (Y/N) ☐ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☐ N Species observed (if known): _____

Comments Regarding Biology: none observed

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





Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

25

SITE NAME/LOCATION S-CMS-035 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-035 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) 0.05

LENGTH OF STREAM REACH (ft) 105.23 LAT 39.53925 LONG -87.43230 RIVER MILE n/a

DATE 7/10/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points
TYPE	PERCENT	TYPE	PERCENT	
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input type="checkbox"/> SILT [3 pts]	0%	Substrate Max = 40 5 A + B
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	80%	
<input type="checkbox"/> BEDROCK [16 pts]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	20%	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> MUCK [0 pts]	0%	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%	
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0.00%		Substrate Percentage Check 100%		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 3		TOTAL NUMBER OF SUBSTRATE TYPES: 2		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box).				Pool Depth Max = 30 0
<input type="checkbox"/> > 30 centimeters [20 pts] <input type="checkbox"/> 5 cm - 10 cm [15 pts] <input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> < 5 cm [5 pts] <input type="checkbox"/> > 10 - 22.5 cm [25 pts] <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]				
COMMENTS OHWM = 3'w x 0.2'd MAXIMUM POOL DEPTH (centimeters): 0.00				
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				Bankfull Width Max=30 20
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input type="checkbox"/> = 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]				
COMMENTS BF = 6.5'w x 0.8'd AVERAGE BANKFULL WIDTH (meters): 1.98				

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

COMMENTS

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

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

COMMENTS Heavy rains in the morning caused moist channel no flow or pools present

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

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

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 m/100 ft)	<input type="checkbox"/> Moderate to Severe	<input checked="" type="checkbox"/> Severe (4 m/100 ft)
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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: Wabash Distance from Evaluated Stream 4,424
☐ 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: S29 T13N R9W NRCS Soil Map Page: HkF NRCS Soil Map Stream Order: n/a
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: July 10, 2024 Quantity: 1.0 in

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☐ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☐ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☐ N Species observed (if known): _____

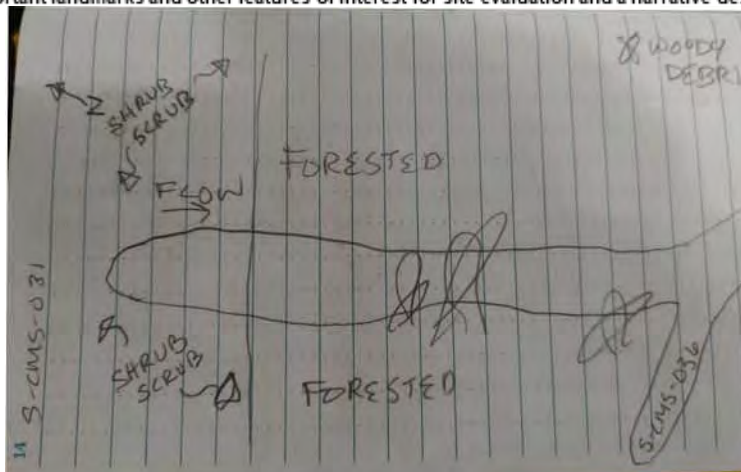
Salamanders Observed? (Y/N) ☐ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☐ N Species observed (if known): _____

Comments Regarding Biology: none observed

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





Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

25

SITE NAME/LOCATION S-CMS-042 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-042 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) 0.02

LENGTH OF STREAM REACH (ft) 168.48 LAT 39.538803 LONG -87.435883 RIVER MILE n/a

DATE 7/10/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points
TYPE	PERCENT	TYPE	PERCENT	
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input type="checkbox"/> SILT [3 pts]	0%	Substrate Max = 40 5 A + B
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	70%	
<input type="checkbox"/> BEDROCK [16 pts]	0%	<input checked="" type="checkbox"/> FINE DETRITUS [3 pts]	0%	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	30%	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> MUCK [0 pts]	0%	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%	
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock		0.00%		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 3		TOTAL NUMBER OF SUBSTRATE TYPES: 2		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box).				Pool Depth Max = 30 0
<input type="checkbox"/> > 30 centimeters [20 pts] <input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> > 10 - 22.5 cm [25 pts] <input type="checkbox"/> 5 cm - 10 cm [15 pts] <input type="checkbox"/> < 5 cm [5 pts] <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]				
COMMENTS OHWM = 2.0'w x 0.2'd MAXIMUM POOL DEPTH (centimeters): 0.00				
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				Bankfull Width Max=30 20
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts] <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]				
COMMENTS BF = 6.0'w x 0.4'd AVERAGE BANKFULL WIDTH (meters): 1.83				

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

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

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

<input type="checkbox"/>	Flat (0.5 m/100 ft)	<input type="checkbox"/>	Flat to Moderate	<input type="checkbox"/>	Moderate (2 m/100 ft)	<input type="checkbox"/>	Moderate to Severe	<input checked="" type="checkbox"/>	Severe (4.0 m/100 ft)
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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: Wabash River Distance from Evaluated Stream 5,204
☐ 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: S29 T13N R9W NRCS Soil Map Page: HkF NRCS Soil Map Stream Order: n/a
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: July 10, 2024 Quantity: 1.0 in

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☐ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☒

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☐ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☐ N Species observed (if known): _____

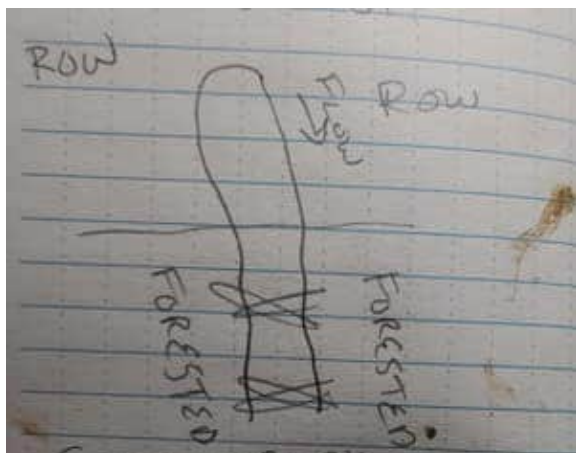
Salamanders Observed? (Y/N) ☐ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☐ N Species observed (if known): _____

Comments Regarding Biology: none observed

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



Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

60

SITE NAME/LOCATION S-CMS-043 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-043 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) 0.1

LENGTH OF STREAM REACH (ft) 292.21 LAT 39.538977 LONG -87.436226 RIVER MILE n/a

DATE 7/10/24 SCORER CMS COMMENTS Intermittent

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points	
TYPE	PERCENT	TYPE	PERCENT		
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input type="checkbox"/> SILT [3 pts]	0%	25 Substrate Max = 40 A + B	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%		
<input type="checkbox"/> BEDROCK [16 pts]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%		
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	50%	<input type="checkbox"/> CLAY or HARDPAN [0 pts]	10%		
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	20%	<input type="checkbox"/> MUCK [0 pts]	0%		
<input type="checkbox"/> SAND (<2 mm) [6 pts]	20%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%		
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock		50.00%			21 SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:
(A)		(B)			
TOTAL NUMBER OF SUBSTRATE TYPES: 4					
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box).					Pool Depth Max = 30
<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> 5 cm - 10 cm [15 pts]			5	
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input checked="" type="checkbox"/> < 5 cm [5 pts]				
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]				
COMMENTS OHWM = 10.0'w x 0.4'd MAXIMUM POOL DEPTH (centimeters): 2.54					
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				Bankfull Width Max = 30	
<input checked="" type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]			30	
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]				
<input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]					
COMMENTS BF = 20.0'w x 0.75'd AVERAGE BANKFULL WIDTH (meters): 6.10					

This information must also be completed

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

RIPARIAN WIDTH (Per Bank)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

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

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input checked="" type="checkbox"/> Moderate (2 m/100 ft)	<input type="checkbox"/> Moderate to Severe	<input type="checkbox"/> Severe (4 m/100 ft)
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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: Wabash River Distance from Evaluated Stream 5,327'
☐ 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: S29 T13N R9W NRCS Soil Map Page: HkF NRCS Soil Map Stream Order: n/a
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☐ N Date of last precipitation: July 10, 2024 Quantity: 1.0 in

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☐ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☐ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☐ N Species observed (if known): _____

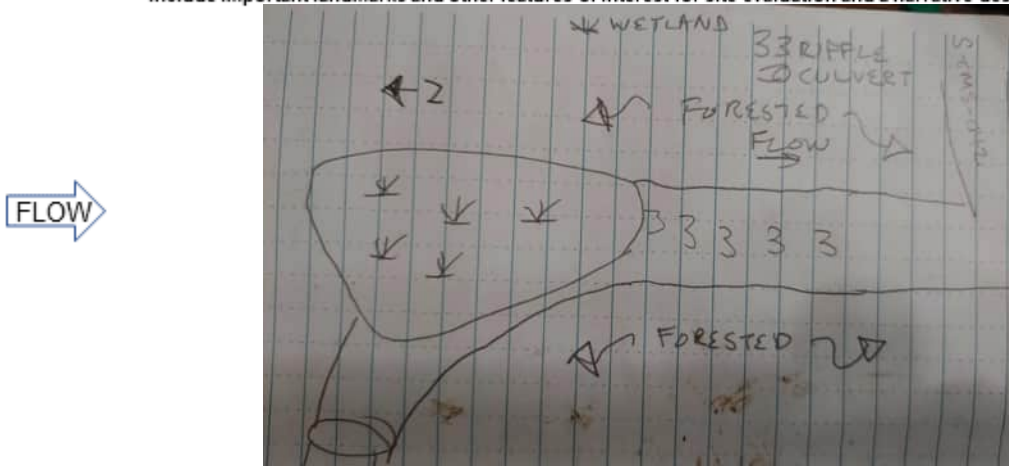
Salamanders Observed? (Y/N) ☐ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☐ N Species observed (if known): _____

Comments Regarding Biology: none observed

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





Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

27

SITE NAME/LOCATION S-CMS-044 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-044 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) 0.1

LENGTH OF STREAM REACH (ft) 210.24 LAT 39.539774 LONG -87.436024 RIVER MILE n/a

DATE 7/10/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points Substrate Max = 40
TYPE	PERCENT	TYPE	PERCENT	
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pts]	0%	<div style="border: 1px solid black; padding: 5px; text-align: center;"> 12 A + B </div>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	75%	
<input type="checkbox"/> BEDROCK [16 pts]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	10%	
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> MUCK [0 pts]	0%	
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	15%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%	
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock		0.00%		
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9		TOTAL NUMBER OF SUBSTRATE TYPES: 3		
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box)				Pool Depth Max = 30 <div style="border: 1px solid black; padding: 5px; text-align: center;"> 0 </div>
<input type="checkbox"/> > 30 centimeters [20 pts] <input type="checkbox"/> 5 cm - 10 cm [15 pts] <input type="checkbox"/> > 22.5 - 30 cm [30 pts] <input type="checkbox"/> < 5 cm [5 pts] <input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts] <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0pts]				
COMMENTS OHWM = 1.5'w x 0.2'd MAXIMUM POOL DEPTH (centimeters): 0.00				
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):				Bankfull Width Max=30 <div style="border: 1px solid black; padding: 5px; text-align: center;"> 15 </div>
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts] <input checked="" type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] <input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts] <input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]				
COMMENTS BF = 2.5.0'w x 0.5'd AVERAGE BANKFULL WIDTH (meters): 1.50				

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

FLOW REGIME (At Time of Evaluation) (Check ONLY one box)	
<input type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box)			
<input type="checkbox"/> None	<input checked="" type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 m/100 ft)	<input type="checkbox"/> Moderate to Severe	<input checked="" type="checkbox"/> Severe (4.0 m/100 ft)
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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: Wabash River Distance from Evaluated Stream 5,327'
☐ 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: S29 T13N R9W NRCS Soil Map Page: HkF NRCS Soil Map Stream Order: n/a
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☒ N Date of last precipitation: July 10, 2024 Quantity: 1.0 in

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☒ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☒ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☒ N Species observed (if known): _____

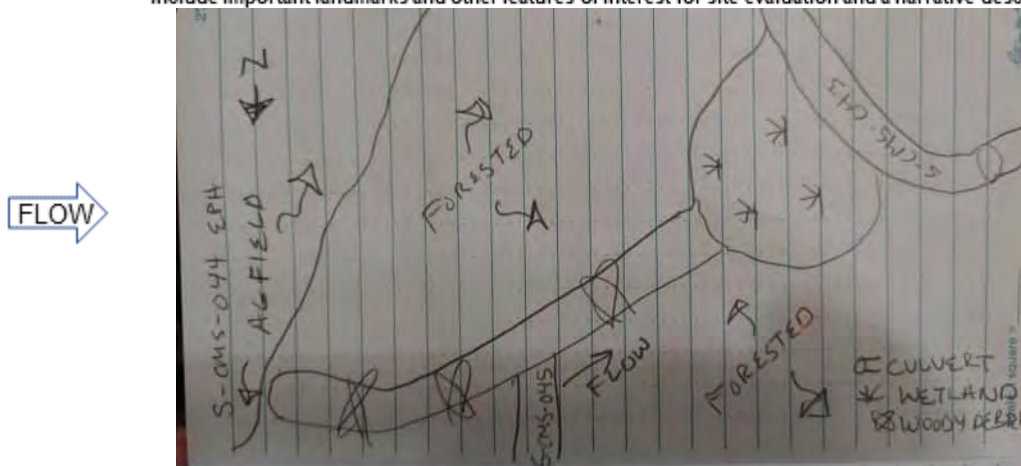
Salamanders Observed? (Y/N) ☒ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☒ N Species observed (if known): _____

Comments Regarding Biology: none observed

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





Headwater Habitat Evaluation Index Field Form

HHEI Score (sum of metrics 1+2+3)

15

SITE NAME/LOCATION S-CMS-045 / Wabash Valley Resources, LLC

SITE NUMBER S-CMS-045 RIVER BASIN Wabash River RIVER CODE n/a DRAINAGE AREA (mi²) 0.01

LENGTH OF STREAM REACH (ft) 41.49 LAT 39.539831 LONG -87.436074 RIVER MILE n/a

DATE 7/10/24 SCORER CMS COMMENTS Ephemeral

NOTE: Complete All Items On This Form - Refer to "Headwater Habitat Evaluation Index Field Manual" for Instructions

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

1. SUBSTRATE (Estimate percent of every type present). Check ONLY two predominant substrate TYPE boxes. (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.				HHEI Metric Points	
TYPE	PERCENT	TYPE	PERCENT		
<input type="checkbox"/> BLDG SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pts]	0%	Substrate Metric Points Substrate Max = 40 <div style="border: 1px solid black; padding: 5px; display: inline-block;">10</div> A + B	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	100%		
<input type="checkbox"/> BEDROCK [16 pts]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%		
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%		
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	0%	<input type="checkbox"/> MUCK [0 pts]	0%		
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	0%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%		
Total of Percentages of Bldg Slabs, Boulder, Cobble, Bedrock		0.00%			
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 9		TOTAL NUMBER OF SUBSTRATE TYPES: 1			
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 feet) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes). (Check ONLY one box)					Pool Depth Max = 30 <div style="border: 1px solid black; padding: 5px; display: inline-block;">0</div>
3. BANK FULL WIDTH (Measured as the average of 3 - 4 measurements). (Check ONLY one box):					Bankfull Width Max=30 <div style="border: 1px solid black; padding: 5px; display: inline-block;">5</div>

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)	
L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COMMENTS

FLOW REGIME (At Time of Evaluation) (Check ONLY one box)	
<input type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (interstitial)	<input checked="" type="checkbox"/> Dry channel, no water (ephemeral)

COMMENTS

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box)			
<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

<input type="checkbox"/> Flat (0.5 m/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 m/100 ft)	<input type="checkbox"/> Moderate to Severe	<input checked="" type="checkbox"/> Severe (4.0 m/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: Wabash River Distance from Evaluated Stream 5,327'
☐ 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: S29 T13N R9W NRCS Soil Map Page: HkF NRCS Soil Map Stream Order: n/a
County: Vigo Township/City: Fayette, IL

MISCELLANEOUS

Base Flow Conditions? (Y/N): ☐ N Date of last precipitation: July 10, 2024 Quantity: 1.0 in

Photo-documentation Notes: _____

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

Were samples collected for water chemistry? (Y/N): ☐ N Lab Sample # or ID (attach results): n/a

Field Measures: Temp (°C) n/a Dissolved Oxygen (mg/l) n/a pH (S.U.) n/a Conductivity (umhos/cm) n/a

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

Additional comments/description of pollution impacts: _____

Overall Stability of BOTH Stream Banks (check one): Stable ☐ Moderately Stable ☒ Unstable ☐

BIOLOGICAL OBSERVATIONS

(Record all observations below)

Fish Observed? (Y/N) ☐ N Species observed (if known): _____

Frogs or Tadpoles Observed? (Y/N) ☐ N Species observed (if known): _____

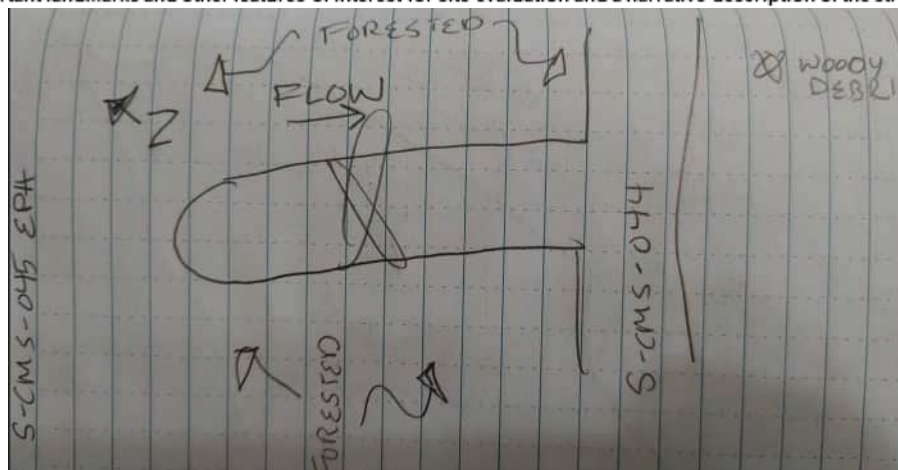
Salamanders Observed? (Y/N) ☐ N Species observed (if known): _____

Aquatic Macroinvertebrates Observed? (Y/N) ☐ N Species observed (if known): _____

Comments Regarding Biology: none observed

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



APPENDIX D
Representative Photograph Log

Wetland Photograph Log



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 1	Date 06/11/24	
Description: UPL-CMS-001 39.532863, -87.428517 Facing North		

Photo Location 2	Date 06/11/24	
Description: UPL-CMS-001 39.532863, -87.428517 Facing East		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo	Date
Location 3	06/11/24
Description: UPL-CMS-001 39.532863, -87.428517 Facing South	




Photo	Date
Location 4	06/11/24
Description: UPL-CMS-001 39.532863, -87.428517 Facing West	



Client Name:
Wabash Hydrogen Energy Center**Site Location:**
Vigo & Vermillion Counties, Indiana**Project No.**
60727429

Photo Location 5	Date 06/11/24
Description: UPL-CMS-001 39.532863, -87.428517 Facing Soils	



Photo Location 6	Date 06/11/24
Description: UDF-CMS-002 39.532122, -87.428288 Facing North	





REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 7	Date 06/11/24	
Description: UDF-CMS-002 39.532122, -87.428288 Facing East		

Photo Location 8	Date 06/11/24	
Description: UDF-CMS-002 39.532122, -87.428288 Facing South		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 9	Date 06/11/24	
Description: UDF-CMS-002 39.532122, -87.428288 Facing West		

Photo Location 10	Date 06/11/24	
Description: UDF-CMS-002 39.532122, -87.428288 Facing Soils		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------


Photo Location 11	Date 06/11/24	
Description: W-CMS-001-PSS 39.534383, -87.424509 Facing North		

Photo Location 12	Date 06/11/24	
Description: W-CMS-001-PSS 39.534383, -87.424509 Facing East		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 13	Date 06/11/24	
Description: W-CMS-001-PSS 39.534383, -87.424509 Facing South		

Photo Location 14	Date 06/11/24	
Description: W-CMS-001-PSS 39.534383, -87.424509 Facing West		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name:
Wabash Hydrogen Energy Center

Site Location:
Vigo & Vermillion Counties, Indiana

Project No.
60727429

Photo Location 15	Date 06/11/24
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Description:

W-CMS-001-PSS

39.534383, -87.424509

Facing Soils



Photo Location 16	Date 06/11/24
----------------------	------------------

Description:

W-CMS-001-PFO

39.534802, -87.4274357

Facing North





REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 17	Date 06/11/24	
Description: W-CMS-001-PFO 39.534802, -87.4274357 Facing East		

Photo Location 18	Date 06/11/24	
Description: W-CMS-001-PFO 39.534802, -87.4274357 Facing South		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 19	Date 06/11/24	
Description: W-CMS-001-PFO 39.534802, -87.4274357 Facing West		


Photo Location 20	Date 06/11/24	
Description:		
W-CMS-001-PFO		
39.534802, -87.4274357		
Facing Soils		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 21	Date 06/11/24	
Description: W-CMS-001-PEM 39.534403, -87.424186 Facing North		

Photo Location 22	Date 06/11/24	
Description: W-CMS-001-PEM 39.534403, -87.424186 Facing East		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 23	Date 06/11/24	
Description: W-CMS-001-PEM 39.534403, -87.424186 Facing South		

Photo Location 24	Date 06/11/24	
Description: W-CMS-001-PEM 39.534403, -87.424186 Facing West		




REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 25	Date 06/11/24
Description: W-CMS-001-PEM 39.534403, -87.424186 Facing Soils	

A photograph showing a soil sample being collected in a wetland area. A blue shovel is digging into the soil, and a color calibration chart is visible in the foreground. The chart is a Munsell Color Services chart with a grid of color patches and a ruler. The soil is dark brown and moist. The background is filled with green grass and some small plants.

Photo Location 26	Date 06/12/24
Description: W-CMS-001-UPL 39.534834, -87.424692 Facing North	





REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 27	Date 06/12/24	
Description: W-CMS-001-UPL 39.534834, -87.424692 Facing East		

Photo Location 28	Date 06/12/24	
Description: W-CMS-001-UPL 39.534834, -87.424692 Facing South		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 29	Date 06/12/24	
Description: W-CMS-001-UPL 39.534834, -87.424692 Facing West		


Photo Location 30	Date 06/12/24	
Description:		
W-CMS-001-UPL 39.534834, -87.424692 Facing Soils		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 31	Date 06/12/24	
Description: W-CMS-002-PFO 39.535476, -87.424167 Facing North		

Photo Location 32	Date 06/12/24	
Description: W-CMS-002-PFO 39.535476, -87.424167 Facing East		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 33	Date 06/12/24	
Description: W-CMS-002-PFO 39.535476, -87.424167 Facing South		

Photo Location 34	Date 06/12/24	
Description: W-CMS-002-PFO 39.535476, -87.424167 Facing West		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name:
Wabash Hydrogen Energy Center

Site Location:
Vigo & Vermillion Counties, Indiana

Project No.
60727429

Photo Location 35	Date 06/12/24
Description: W-CMS-002-PFO 39.535476, -87.424167 Facing Soils	



Photo Location 36	Date 06/13/24
Description: W-CMS-003-PEM 39.622335, -87.489021 Facing North	





REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 37	Date 06/13/24	
Description: W-CMS-003-PEM 39.622335, -87.489021 Facing East		

Photo Location 38	Date 06/13/24	
Description: W-CMS-003-PEM 39.622335, -87.489021 Facing South		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name:
Wabash Hydrogen Energy Center

Site Location:
Vigo & Vermillion Counties, Indiana

Project No.
60727429

Photo Location 39	Date 06/13/24
Description: W-CMS-003-PEM 39.622335, -87.489021 Facing West	



Photo Location 40	Date 06/13/24
Description: W-CMS-003-PEM 39.622335, -87.489021 Facing Soils	





REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 41	Date 06/13/24	
Description: W-CMS-003-UPL 39.622746, -87.487905 Facing North		

Photo Location 42	Date 06/13/24	
Description: W-CMS-003-UPL 39.622746, -87.487905 Facing East		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 43	Date 06/13/24	
Description: W-CMS-003-UPL 39.622746, -87.487905 Facing South		

Photo Location 44	Date 06/13/24	
Description: W-CMS-003-UPL 39.622746, -87.487905 Facing West		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 45	Date 06/13/24	
Description: W-CMS-003-UPL 39.622746, -87.487905 Facing Soils		

Photo Location 46	Date 06/13/24
Description: W-CMS-004 39.623243, -87.487244 Facing North	

A wide-angle photograph of a grassy field under a clear blue sky. A large, dark green tree stands prominently on the right side of the field. In the background, there is a line of trees and a fence. The foreground is filled with tall, yellowish-green grass. A single, dark, horizontal object, possibly a branch or stick, lies on the grass in the lower-left foreground. The sky is a uniform, clear blue.



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 47	Date 06/13/24	
Description: W-CMS-004 39.623243, -87.487244 Facing East		

Photo Location 48	Date 06/13/24	
Description: W-CMS-004 39.623243, -87.487244 Facing South		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name:
Wabash Hydrogen Energy Center

Site Location:
Vigo & Vermillion Counties, Indiana

Project No.
60727429

Photo Location 49	Date 06/13/24	
Description: W-CMS-004 39.623243, -87.487244 Facing West		

Photo Location 50	Date 06/13/24	
Description: W-CMS-004 39.623243, -87.487244 Facing Soils		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 51	Date 06/13/24	
Description: W-CMS-005 39.623701, -87.486886 Facing North		 A wide-angle photograph of a grassy field under a clear blue sky. The field is covered in green and yellow grass with some bare patches. In the background, there is a line of trees and a fence line.

Photo Location 52	Date 06/13/24	
Description: W-CMS-005 39.623701, -87.486886 Facing East		 A wide-angle photograph of a grassy field under a clear blue sky. The field is covered in green and yellow grass with some bare patches. In the background, there is a line of trees and a fence line.



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 53	Date 06/13/24	
Description: W-CMS-005 39.623701, -87.486886 Facing South		

Photo Location 54	Date 06/13/24	
Description: W-CMS-005 39.623701, -87.486886 Facing West		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name:
Wabash Hydrogen Energy Center


Site Location:
Vigo & Vermillion Counties, Indiana

Project No.
60727429

Photo Location 55	Date 06/13/24	
Description:		
W-CMS-005		
39.623701, -87.486886		
Facing Soils		

Photo Location 56	Date 06/13/24	
Description:		
W-CMS-004/005-UPL		
39.624547, -87.487396		
Facing North		

<div> <div> <div>Photo</div> <div>Location 57</div> <div>Date</div> </div> <div> <div>06/11/24</div> </div> </div>	<div> <div> <div>Description:</div> <div>W-CMS-004/005-UPL</div> <div>39.624547, -87.487396</div> <div>Facing East</div> </div> </div>	
--	--	--

<div> <div> <div>Photo</div> <div>Location 58</div> <div>Date</div> </div> <div> <div>06/13/24</div> </div> </div>	<div> <div> <div>Description:</div> <div>W-CMS-004/005-UPL</div> <div>39.624547, -87.487396</div> <div>Facing South</div> </div> </div>	
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REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 59	Date 06/11/24	
Description: W-CMS-004/005-UPL 39.624547, -87.487396 Facing West		

Photo Location 60	Date 06/13/24	
Description: W-CMS-004/005-UPL 39.624547, -87.487396 Facing South		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 61	Date 07/10/24	
Description: W-CMS-006 39.539303, -87.436227 Facing North		

Photo Location 62	Date 07/10/24	
Description: W-CMS-006 39.539303, -87.436227 Facing East		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------


Photo Location 63	Date 07/10/24	
Description: W-CMS-006 39.539303, -87.436227 Facing South		

Photo Location 64	Date 07/10/24	
Description: W-CMS-006 39.539303, -87.436227 Facing West		

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 65	Date 07/10/24
Description:	
W-CMS-006	
39.539303, -87.436227	
Facing Soil	



Photo Location 66	Date 07/10/24	
Description:		
W-CMS-006-UPL		
39.539234, -87.436087		
Facing North		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------



Photo Location 67	Date 07/10/24	
Description: W-CMS-006-UPL 39.539234, -87.436087 Facing East		

Photo Location 68	Date 07/10/24
Description: W-CMS-006-UPL 39.539234, -87.436087 Facing South	

A photograph of a forest scene. Two prominent tree trunks are visible in the foreground, one slightly to the left and one to the right, both with light-colored, textured bark. The background is filled with dense green foliage and branches, creating a lush, sun-dappled environment. The forest floor is covered with fallen leaves and low-lying green plants. The lighting suggests a bright day with sunlight filtering through the canopy.

Client Name:
Wabash Hydrogen Energy Center

Site Location:
Vigo & Vermillion Counties, Indiana

Project No.
60727429

Photo Location 69	Date 07/10/24	
Description:		
W-CMS-006-UPL		
39.539234, -87.436087		
Facing West		

Photo Location 70	Date 07/10/24	
Description:		
W-CMS-006-UPL		
39.539234, -87.436087		
Facing Soils		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------

Photo Location 71	Date 07/11/24	
Description: W-CMS-007 39.530588, -87.427182 Facing North		

Photo Location 72	Date 07/11/24	
Description: W-CMS-007 39.530588, -87.427182 Facing East		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
--	--	--------------------------------


Photo Location 73	Date 07/11/24	
Description: W-CMS-007 39.530588, -87.427182 Facing North		

Photo Location 74	Date 07/11/24	
Description: W-CMS-007 39.530588, -87.427182 Facing West		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name:
Wabash Hydrogen Energy Center

Site Location:
Vigo & Vermillion Counties, Indiana

Project No.
60727429

Photo Location 75	Date 07/11/24
Description: W-CMS-007 39.530588, -87.427182 Facing Soils	



Photo Location 76	Date 07/11/24
Description: W-CMS-008 39.529985, 87.426760 Facing North	





REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 77	Date 07/11/24
Description: W-CMS-008 39.529985, 87.426760 Facing East	

A photograph of a dense field of tall, green plants with yellow flowers, likely a wetland or marsh area. The plants are growing in a field with some taller, dry grasses in the background. The image shows a variety of plant species, including tall, thin stalks and clusters of yellow flowers. The overall scene is a lush, green landscape with a mix of different plant heights and colors.

Photo Location 78	Date 07/11/24
Description: W-CMS-008 39.529985, 87.426760 Facing South	

A photograph of a dense field of tall, thin, brownish stalks, likely dried grass or reeds, with green foliage and yellow flowers visible in the background and foreground. The stalks are the primary focus, standing vertically and creating a textured, somewhat chaotic appearance. The background shows more greenery and a clear blue sky, suggesting an outdoor, natural setting. The overall scene is a lush, wild landscape.



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 79	Date 07/11/24	
Description: W-CMS-008 39.529985, 87.426760 Facing West		

Photo Location 80	Date 07/11/24	
Description: W-CMS-007/008-UPL 39.530487°, -87.427100° Facing North		



REPRESENTATIVE WETLAND PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 81	Date 07/11/24	
Description: W-CMS-007/008-UPL 39.530487°, -87.427100° Facing East		

Photo Location 82	Date 07/11/24	
Description: W-CMS-007/008-UPL 39.530487°, -87.427100° Facing South		

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 81	Date 07/11/24	
Description: W-CMS-007/008-UPL 39.530487°, -87.427100° Facing West		

Photo Location 82	Date 07/11/24	
Description: W-CMS-007/008-UPL 39.530487°, -87.427100° Facing Soils		

Stream Photograph Log



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 1	Date 6/11/2024	
Description: S-CMS-001-EPH 39.53384, -87.42707 Facing Upstream		

Photo Location 2	Date 06/11/24	
Description: S-CMS-001-EPH 39.53384, -87.42707 Facing Downstream		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 3	Date 06/11/24	
Description: S-CMS-001-EPH 39.53384, -87.42707 Facing Substrate		

Photo Location 4	Date 06/11/24	
Description: S-CMS-002-EPH 39.53383, -87.42725 Facing Upstream		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 5	Date 06/11/24	
Description: S-CMS-002-EPH 39.53383, -87.42725 Facing Downstream		

Photo Location 6	Date 06/11/24	
Description: S-CMS-002-EPH 39.53383, -87.42725 Facing Substrate		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 7	Date 06/11/24	
Description: S-CMS-003-EPH 39.533855, -87.427397 Facing Upstream		

Photo Location 8	Date 06/11/24	
Description: S-CMS-003-EPH 39.533855, -87.427397 Facing Downstream		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 9	Date 06/11/24	
Description: S-CMS-003-EPH 39.533855, -87.427397 Facing Substrate		

Photo Location 10	Date 06/11/24
Description:	
S-CMS-005-EPH	
39.534795, -87.424072	
Facing Upstream	





REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 11	Date 06/12/24	
Description:		
S-CMS-005-EPH		
39.534795, -87.424072		
Facing Downstream		

Photo Location 12	Date 06/12/24	
Description:		
S-CMS-005-EPH		
39.534795, -87.424072		
Facing Substrate		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 13	Date 06/12/24	
Description: S-CMS-006-EPH 39.53570, -87.42578 Facing Upstream		

Photo Location 14	Date 06/12/24	
Description: S-CMS-006-EPH 39.53570, -87.42578 Facing Downstream		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 15	Date 06/12/24	
Description: S-CMS-006-EPH 39.53570, -87.42578 Facing Substrate		

Photo Location 16	Date 06/12/24	
Description: S-CMS-007-EPH 39.53667, -87.42577 Facing Upstream		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 17	Date 06/12/24	
Description: S-CMS-007-EPH 39.53667, -87.42577 Facing Downstream		

Photo Location 18	Date 06/12/24	
Description: S-CMS-007-EPH 39.53667, -87.42577 Facing Substrate		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 19	Date 06/12/24		
Description: S-CMS-021-EPH 39.540154, -87.425496 Facing Upstream			

Photo Location 20	Date 06/12/24		
Description: S-CMS-021-EPH 39.540154, -87.425496 Facing Downstream			



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 21	Date 06/12/24		
Description: S-CMS-021-EPH 39.540154, -87.425496 Facing Substrate			

Photo Location 22	Date 06/12/24		
Description: S-CMS-022-EPH 39.539775, -87.424901 Facing Upstream			



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 23	Date 06/12/24		
Description: S-CMS-022-EPH 39.539775, -87.424901 Facing Downstream			

Photo Location 24	Date 06/12/24		
Description: S-CMS-022-EPH 39.539775, -87.424901 Facing Substrate			



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 25	Date 06/12/24		
Description: S-CMS-023-EPH 39.539130, -87.424926 Facing Upstream			

Photo Location 26	Date 06/12/24		
Description: S-CMS-023-EPH 39.539130, -87.424926 Facing Downstream			



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 27	Date 06/12/24	
Description: S-CMS-023-EPH 39.539130, -87.424926 Facing Substrate		

Photo Location 28	Date 07/10/24	
Description: S-CMS-035-EPH 39.53925, -87.43230 Facing Upstream		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 29	Date 07/10/24	
Description: S-CMS-035-EPH 39.53925, -87.43230 Facing Downstream		

Photo Location 30	Date 07/10/24
Description: S-CMS-035-EPH 39.53925, -87.43230 Facing Substrate	

A photograph of a forest floor. On the left, a large, light-colored tree trunk leans diagonally. The ground is covered with dense green foliage, including many ferns. Sunlight filters through the canopy, creating dappled light and shadows on the forest floor. The overall scene is a lush, green woodland environment.



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name:
Wabash Hydrogen Energy Center

Site Location:
Vigo & Vermillion Counties, Indiana

Project No.
60727429

Photo Location 31	Date 07/10/24	
Description: S-CMS-042-EPH 39.538803, -87.435883 Facing Upstream		

Photo Location 32	Date 07/10/24	
Description: S-CMS-042-EPH 39.538803, -87.435883 Facing Downstream		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 33	Date 07/10/24	
Description:		
S-CMS-042-EPH		
39.538803, -87.435883		
Facing Substrate		

Photo Location 34	Date 07/10/24
Description: S-CMS-043-EPH 39.538977, -87.436226 Facing Upstream	





REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name:
Wabash Hydrogen Energy Center

Site Location:
Vigo & Vermillion Counties, Indiana

Project No.
60727429

Photo Location 35	Date 07/10/24	
Description: S-CMS-043-EPH 39.538977, -87.436226 Facing Downstream		

Photo Location 36	Date 07/10/24	
Description: S-CMS-043-EPH 39.538977, -87.436226 Facing Substrate		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 37	Date 07/10/24	
Description: S-CMS-044-EPH 39.539774, -87.436024 Facing Upstream		

Photo Location 38	Date 07/10/24	
Description: S-CMS-044-EPH 39.539774, -87.436024 Facing Downstream		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name:
Wabash Hydrogen Energy Center

Site Location:
Vigo & Vermillion Counties, Indiana

Project No.
60727429

Photo Location 39	Date 07/10/24	
Description: S-CMS-044-EPH 39.539774, -87.436024 Facing Substrate		

Photo Location 40	Date 07/10/24	
Description: S-CMS-045-EPH 39.539831, -87.436074 Facing Upstream		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 41	Date 07/10/24
Description: S-CMS-045-EPH 39.539831, -87.436074 Facing Downstream	

A photograph of a stream flowing through a dense forest. The water is partially obscured by fallen branches and dense green foliage. The stream bed is covered with fallen leaves and twigs. The image shows a narrow stream with a rocky and leafy bed, surrounded by lush green trees and bushes. Sunlight filters through the canopy, creating dappled light on the water and the forest floor.

Photo Location 42	Date 07/10/24	
Description: S-CMS-045-EPH 39.539831, -87.436074 Facing Substrate		

UDF Photograph Log



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 1	Date 6/11/2024	
Description: UDF-CMS-001 39.531135, -87.427953 Facing Upstream		

Photo Location 2	Date 06/11/24	
Description: UDF-CMS-001 39.531135, -87.427953 Facing Downstream		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name:
Wabash Hydrogen Energy Center

Site Location:
Vigo & Vermillion Counties, Indiana

Project No.
60727429

Photo Location 3	Date 06/11/24	
Description: UDF-CMS-001 39.531135, -87.427953 Facing Substrate		

Photo Location 4	Date 06/11/24	
Description: UDF-CMS-002 39.532370, -87.428029 Facing Upstream		



REPRESENTATIVE STREAM PHOTOGRAPH LOG

Client Name: Wabash Hydrogen Energy Center	Site Location: Vigo & Vermillion Counties, Indiana	Project No. 60727429
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Photo Location 5	Date 06/11/24	
Description:		
UDF-CMS-002		
39.532370, -87.428029		
Facing Downstream		

Photo Location 6	Date 06/11/24	
Description:		
UDF-CMS-002		
39.532370, -87.428029		
Facing Substrate		

APPENDIX E
Threatened and Endangered Species Information



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Indiana Ecological Services Field Office
620 South Walker Street
Bloomington, IN 47403-2121
Phone: (812) 334-4261 Fax: (812) 334-4273



In Reply Refer To:

06/03/2024 22:28:52 UTC

Project Code: 2024-0098919

Project Name: Wabash Hydrogen Energy Center

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website at - <http://www.fws.gov/midwest/endangered/section7/s7process/index.html>. This website contains step-by-step instructions which will help you

determine if your project will have an adverse effect on listed species and will help lead you through the Section 7 process. For all **wind energy projects and projects that include installing towers that use guy wires or are over 200 feet in height**, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project or may be affected by your proposed project.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see <https://www.fws.gov/program/migratory-bird-permit/what-we-do>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of

Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. **Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.**

Attachment(s):

- Official Species List
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Indiana Ecological Services Field Office

620 South Walker Street
Bloomington, IN 47403-2121
(812) 334-4261

PROJECT SUMMARY

Project Code: 2024-0098919

Project Name: Wabash Hydrogen Energy Center

Project Type: Mixed-Use Construction

Project Description: The Project will construct a new carbon capture, hydrogen purification, and ammonia synthesis facility, and associated infrastructure activities adjacent to an existing gasification facility. In addition, there will be equipment development for CO2 transport injection and monitoring as part of the carbon sequestration portion of the Project.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@39.6234193,-87.48781509781753,14z>



Counties: Vermillion and Vigo counties, Indiana

ENDANGERED SPECIES ACT SPECIES

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> This species only needs to be considered if the project includes wind turbine operations. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Whooping Crane <i>Grus americana</i> Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non- Essential

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act¹ and the Migratory Bird Treaty Act².

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats³, should follow appropriate regulations and consider

implementing appropriate conservation measures, as described in the links below. Specifically, please review the ["Supplemental Information on Migratory Birds and Eagles"](#).

1. The [Bald and Golden Eagle Protection Act](#) of 1940.
2. The [Migratory Birds Treaty Act](#) of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to [Bald Eagle Nesting and Sensitivity to Human Activity](#)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31
Golden Eagle <i>Aquila chrysaetos</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read ["Supplemental Information on Migratory Birds and Eagles"](#), specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

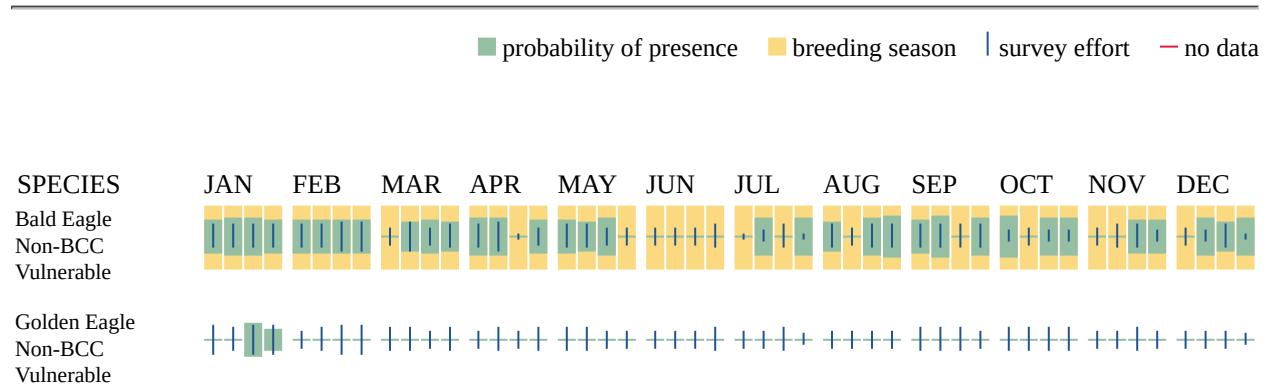
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (—)

A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats³ should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the ["Supplemental Information on Migratory Birds and Eagles"](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Golden-plover <i>Pluvialis dominica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10561	Breeds elsewhere
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Aug 31
Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink <i>Dolichonyx oryzivorus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9454	Breeds May 20 to Jul 31
Cerulean Warbler <i>Setophaga cerulea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 21 to Jul 20
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will <i>Antrostomus vociferus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10678	Breeds May 1 to Aug 20
Field Sparrow <i>Spizella pusilla</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9446	Breeds Mar 1 to Aug 15
Golden Eagle <i>Aquila chrysaetos</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere

NAME	BREEDING SEASON
Grasshopper Sparrow <i>Ammodramus savannarum perpallidus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Henslow's Sparrow <i>Centronyx henslowii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3941	Breeds May 1 to Aug 31
Kentucky Warbler <i>Geothlypis formosa</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9443	Breeds Apr 20 to Aug 20
Le Conte's Sparrow <i>Ammospiza leconteii</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9469	Breeds elsewhere
Lesser Yellowlegs <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Pectoral Sandpiper <i>Calidris melanotos</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Prairie Warbler <i>Setophaga discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9513	Breeds May 1 to Jul 31
Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478	Breeds elsewhere

NAME	BREEDING SEASON
Semipalmated Sandpiper <i>Calidris pusilla</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9603	Breeds elsewhere
Short-billed Dowitcher <i>Limnodromus griseus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Upland Sandpiper <i>Bartramia longicauda</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9294	Breeds May 1 to Aug 31
Wood Thrush <i>Hylocichla mustelina</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "[Supplemental Information on Migratory Birds and Eagles](#)", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

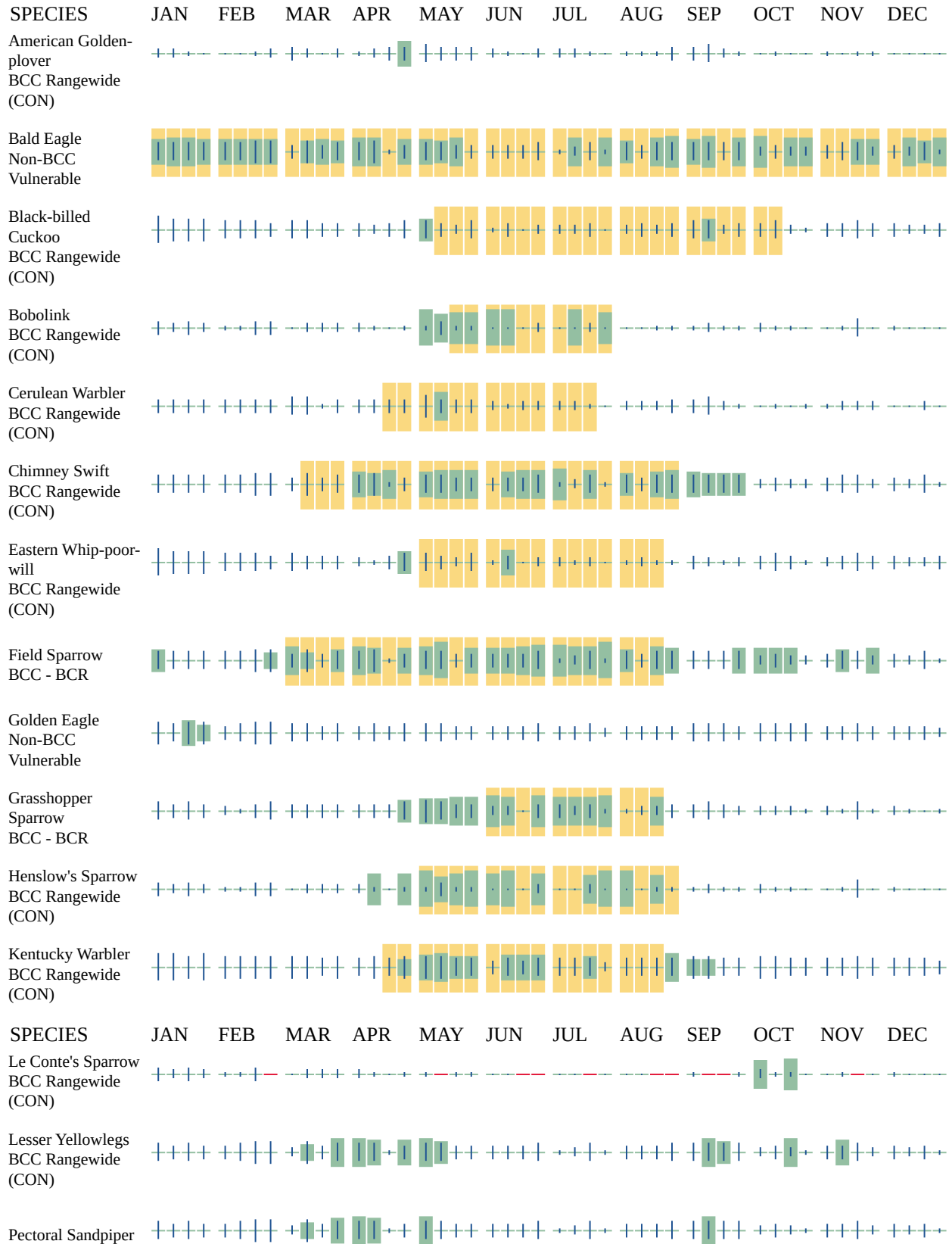
Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (—)

A week is marked as having no data if there were no survey events for that week.

■ probability of presence ■ breeding season | survey effort — no data



BCC Rangewide
(CON)

Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

WETLANDS

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1Cx

RIVERINE

- R2UBH

IPAC USER CONTACT INFORMATION

Agency: AECOM

Name: Christy Anderson

Address: 625 West Ridge Pike

City: Conshohocken

State: PA

Zip: 19428

Email: christy.anderson@aecom.com

Phone: 4849426089

You have indicated that your project falls under or receives funding through the following special project authorities:

- BIPARTISAN INFRASTRUCTURE LAW (BIL) (OTHER)

APPENDIX F TRANSPORTATION REPORTS

Attachment 1: Transportation Reports

1. "Carbon Capture Project Traffic Analysis" Thrive West Central, July 2024
2. "Haul Vehicle Route Turning Analysis" Banning Engineering, Inc., September 2024
3. "Level of Service Analysis" Traffic Engineering, Inc., October 2024
4. "Traffic Engineering Analysis" Traffic Engineering, Inc., October 2024
5. "Traffic Signal Warrant Analysis" Traffic Engineering, Inc., October 2024

Carbon Capture Project Traffic Analysis

Thrive West Central

2800 Poplar Street, Suite 9A
Terre Haute, IN 47803

July 2024

Page 1

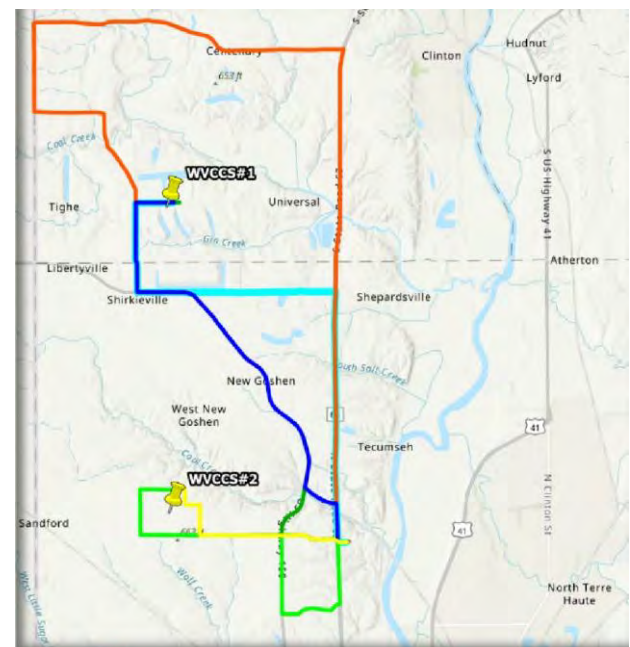
Study Understanding

Thrive West Central, the Rural Planning Organization based in Terre Haute, Indiana, was uniquely tasked with examining the existing transportation infrastructure, operations, and maintenance and determining what would be required to sustain long-term, repeated trucking operations for a specific business.

Assumptions:

- As noted on Map 1, operations will utilize pre-determined travel routes from one loading site to two off-loading sites. The loading site is in Vigo County, and the off-load locations are in Vermillion County, Indiana.
- All loads originate at 444 West Sandford Ave, West Terre Haute.
- Off-Load Site #1 is situated at 39.624378, -87.488673, adjacent to Vermillion County Road 1800 South in Vermillion County.
- Off-Load Site #2 is positioned at 39.551603, -87.488378, near Reiter Place and West 72nd Ave/West Wright Ave in Vigo County.
- For calculations, the proposed haul schedule is expected to be 5 loads each hour, 24 hours a day, 365 days per year for 12 years. This equates to 240 daily trips (one out/one return) and 87,600 one-way trips annually.
- The trips are distributed equally among the six routes for calculation purposes, or 26.7 trips.
- Hauling trucks are calculated to be 4-axle trailers with a single-axle cab.
- For calculations, each truck weighs 80,000 pounds per trip.

Map 1- Wabash Valley Resources Routes & Sites



Existing Conditions & Data:

Land Uses

Growth is not a term commonly associated with West Central Indiana. The region has experienced a steady population decline over the past several decades. For instance, Vermillion County's population decreased from 18,229 in 1980 to 15,439 in the 2020 US Census, marking a 15.3% decline (Indiana, n.d.). The land uses near the Load and Off-Load sites and along the designated travel routes have remained consistent over the same timeframe. Vermillion County comprises 166,400 acres or 260 square miles of land, 74% of which is deemed agricultural use (US Census, 2017). Considering the region's population and housing trends, the farming and sporadic housing

surrounding the proposed routes is anticipated to remain unchanged. The closest town of any size is Clinton, with a population of 4,821, according to Stats Indiana.

Average Annual Daily Traffic

Indiana measures traffic using Average Annual Daily Traffic (AADT), which represents the average number of vehicles that pass a specific point on the road in 24 hours over a one-year period. Most locations are physically counted once every three years, with growth factors applied during years two and three. AADT tracks long-term travel changes on roadways (Editorial Team, 2024). Portions of the designated routes have a solid history of AADT through the Indiana Department of Transportation.

A benefit of today's traffic counting technology is the ability to collect fleet information. Automobiles, motorcycles, and freight trucks all have distinct weight, axle, and wheelbase patterns that are captured. Knowing the number of trucks on a roadway helps engineers determine future maintenance needs based on today's wear and tear. The higher the percentage of trucks on a roadway, the more frequent the maintenance needs. Larger and slower trucks can also impact traffic flow when encountering stop/start situations. This analysis only examines load/off-load trips.

Roadways

As mentioned earlier regarding land use, the Vermillion and Vigo Counties' roadways are expected to remain unchanged. Rural county roads typically consist of narrow, two-lane routes that connect small towns and farms to regional centers. Rural state roads vary in width from two to four lanes, depending on their intended function. Due to sporadic housing and widespread agriculture, rural roads are the norm throughout the area. Historical records suggest that these roadways were initially constructed during the 1960s and 1970s and have seen minimal changes since their original design and construction.

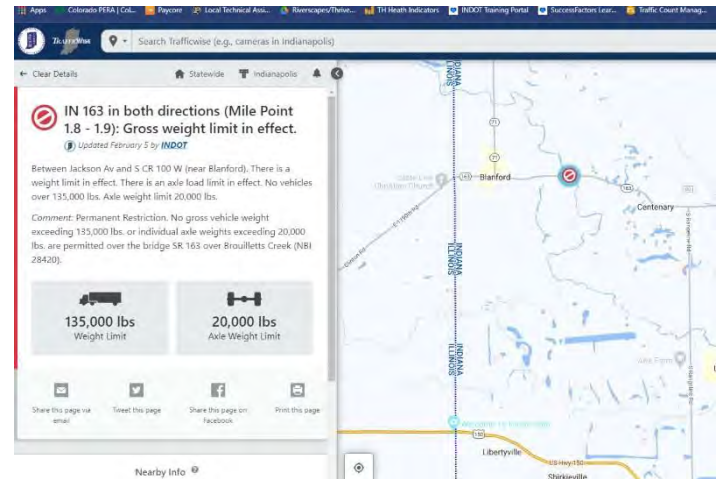
Indiana Route 63 (IN-63) is an exception. This INDOT-controlled four-lane, high-speed divided highway is a critical link for local, regional, and interstate traffic in western Indiana. This roadway spans significant distances and facilitates the movement of people and goods across the region, such as Terre Haute to Chicago.

Additionally, IN-63 and IN-163 near the City of Clinton are equipped with traffic signals to control traffic flow in each direction. These signals provide predictable and timely traffic regulation, reducing driver frustration and minimizing conflicts at these intersections. The predictable traffic signal prevents drivers from taking chances

INDOT Area Restrictions/Closures

The Indiana Department of Transportation (INDOT) maintains a real-time traveler's information page that identifies road closures, construction, or load restrictions. Figure 2 on IN-163 shows that one location identifies a permanent bridge load restriction of 135,000 pounds or 20,000 axle weight limit for the Blanford bridge over Bouillottes Creek. Due to financial and engineering challenges, INDOT has not scheduled this bridge replacement.

Figure 2- INDOT 511 Post



Proposed Operations

Average Annual Daly Traffic

As previously mentioned, the hauling schedule is estimated at five loads per hour, operating 24 hours a day, 365 days a year, for 12 years. This equates to at least half of the 240 one-way trips (120) per day using trucks at or near the 80,000-pound limit. To perform operations analysis, 26.7 daily trips were added to each designated route to evenly spread the use. Since AADT is a one-day snapshot of vehicles passing a certain point, adding these trips does not significantly change roadway daily traffic. The only notable future change noted is a 1.5% increase in truck traffic at Intersection #3 at IN-163 and State Line Road.

Roadways

Equivalent Single Axle Loads (ESALs)

Engineers utilize Equivalent single-axle loads, commonly called ESALs, as a standardized measure to express the damage caused by heavy loads on pavement. This standardization is significant for projecting the long-term maintenance costs based on today, or in this case, anticipated traffic. By predicting pavement performance, ESALs help minimize maintenance costs and extend the lifespan of pavements, thereby contributing to safer and more efficient transportation networks.

The calculations for a 4,000-pound automobile would give an estimated ESAL of 0.0004. Calculating the per 5-axle 80,000-pound tractor semi-trailer ESAL is 2.45.

*365 operating days per year*120 loaded trips per day*2.45 ESALs per truck= 107,310 ESALs*

Future Safety Considerations

Looking ahead, changes in traffic levels due to this project should trigger periodic safety reviews for the designated routes. It is prudent to assess roadway conditions and opportunities for improvement. For instance, conducting regular assessments of traffic flow

at various times along IN-63 can provide valuable insights into potential delays and safety risks. Uncontrolled intersections along this highway present specific risks, as they only regulate movements from side roads with stop signs. Without reliable traffic control measures, such as traffic signals, drivers may encounter challenges crossing four lanes of traffic, particularly during peak travel times.

Figure 3 and Appendix B show that traffic signals are present at IN-63 and IN-163 in Clinton among the intersections investigated in this report. Monitoring IN-63 in the future

would allow for observing changing traffic patterns and potential safety hazards, thereby improving intersection safety. If congestion or safety issues arise at any intersection in the future, working with county and state transportation officials can facilitate timely investments and improvements to address these concerns effectively.

Figure3-Intersection#6

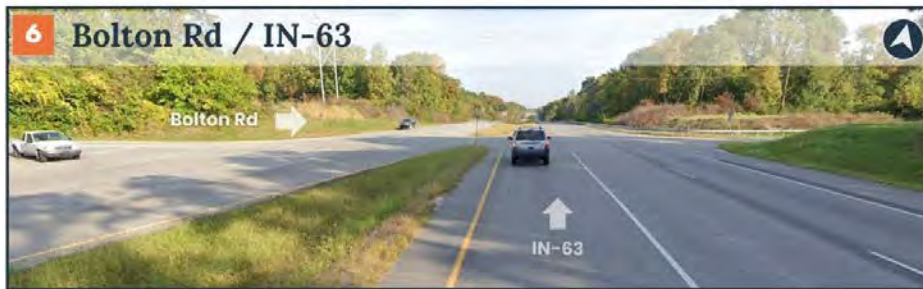


Appendix A: Acronyms

AADT	Average Annual Daily Traffic
CE	Categorical Exclusion of the National Environmental Policy Act- A class of actions that a Federal agency has determined do not individually or cumulatively have a significant effect on the human environment and for which, therefore, neither an environmental assessment nor an environmental impact statement is usually required.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act, also known as Superfunds. The program identifies and cleans up abandoned hazardous waste sites.
DOE	United States Department of Energy
EPA	Environmental Protection Agency
ESAL	Equivalent single-axle loads, commonly called ESALs, are a standardized measure used in pavement engineering to assess the impact of different loads on pavement.
ETC	USDOT Equitable Transportation Community Explorer
FHWA	The Federal Highway Administration division of the United States Department of Transportation
STORET	EPA's Storage and Retrieval (STORET) System
IN-63	State Road 63. All State highways identified as IN-63 or SR63 are operated and maintained by the Indiana Department of Transportation
INDOT	Indiana Department of Transportation, a division of the State of Indiana
MEV Rate	Million Entering Vehicles Rate is a metric used in traffic safety analysis to evaluate the frequency of traffic crashes.
NEPA	National Environmental Policy Act
RCRA	Resource Conservation & Recovery Act Information- inventory of all Hazardous Waste generators, transporters, treaters, storers, and disposers.
NPDES	The National Pollution Discharge Elimination System regulates water discharge, such as municipal or industrial wastewater treatment facilities.
SO2 1-Hour	The 2010 Standard for Sulfur Dioxide
Superfund NPL	Superfund National Priorities List
USDOT	US Department of Transportation
USGS	US Geological Survey

Appendix B: Google Earth Images of Intersections







Appendix C: Federal Functional Classification Criteria
from the Federal Highway Administration (FHWA) webpage



Road Function Classifications

The U.S. DOT's Federal Highway Administration (FHWA) classifies our Nation's urban and rural roadways by road function. Each function class is based on the type of service the road provides to the motoring public, and the designation is used for data and planning purposes. Design standards are tied to function class. Each class has a range of allowable lane widths, shoulder widths, curve radii, etc. The following photos and information illustrate the four major road function classifications: Interstates, Other Arterials, Collectors, and Local roads. The amount of mobility and land access offered by these road types differs greatly.

The Interstate System is the highest classification of roadways in the United States. These arterial roads provide the highest level of mobility and the highest speeds over the longest uninterrupted distance. Interstates nationwide usually have posted speeds between 55 and 75 mi/h.



Rural Interstate North Carolina



Urban Interstate North Carolina

Other Arterials include freeways, multilane highways, and other important roadways that supplement the Interstate System. They connect, as directly as practicable, the Nation's principal urbanized areas, cities, and industrial centers. Land access is limited. Posted speed limits on arterials usually range between 50 and 70 mi/h.



Rural Arterial Illinois



Urban Arterial California

Collectors are major and minor roads that connect local roads and streets with arterials. Collectors provide less mobility than arterials at lower speeds and for shorter distances. They balance mobility with land access. The posted speed limit on collectors is usually between 35 and 55 mi/h.



Rural Collector New York



Urban Collector

Delaware

Local roads provide limited mobility and are the primary access to residential areas, businesses, farms, and other local areas. Local roads, with posted speed limits usually between 20 and 45 mi/h, are the majority of roads in the U.S.



Rural Local

Pennsylvania



Urban Local

New York

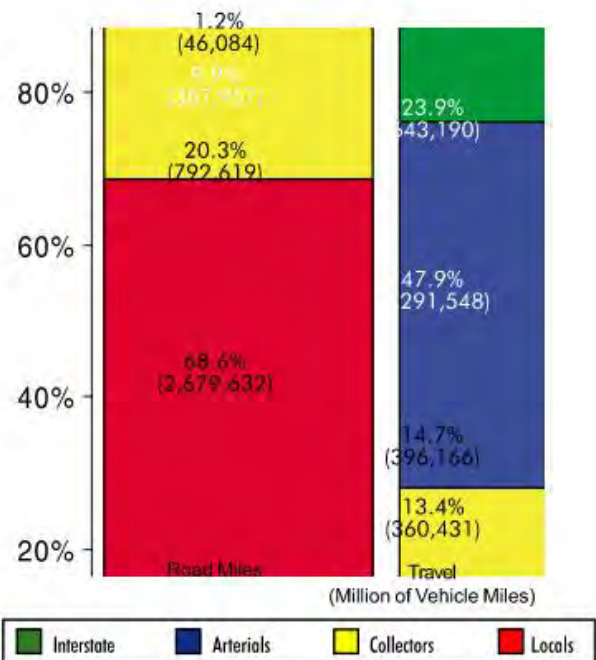


Figure 1. Total Road Mileage and Travel by Road Function (1999)

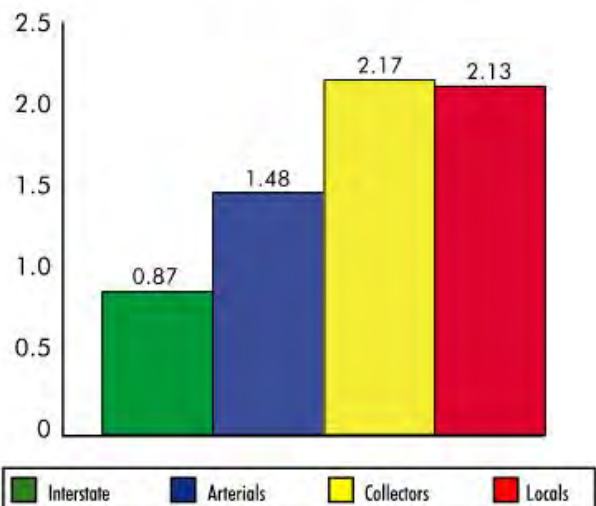
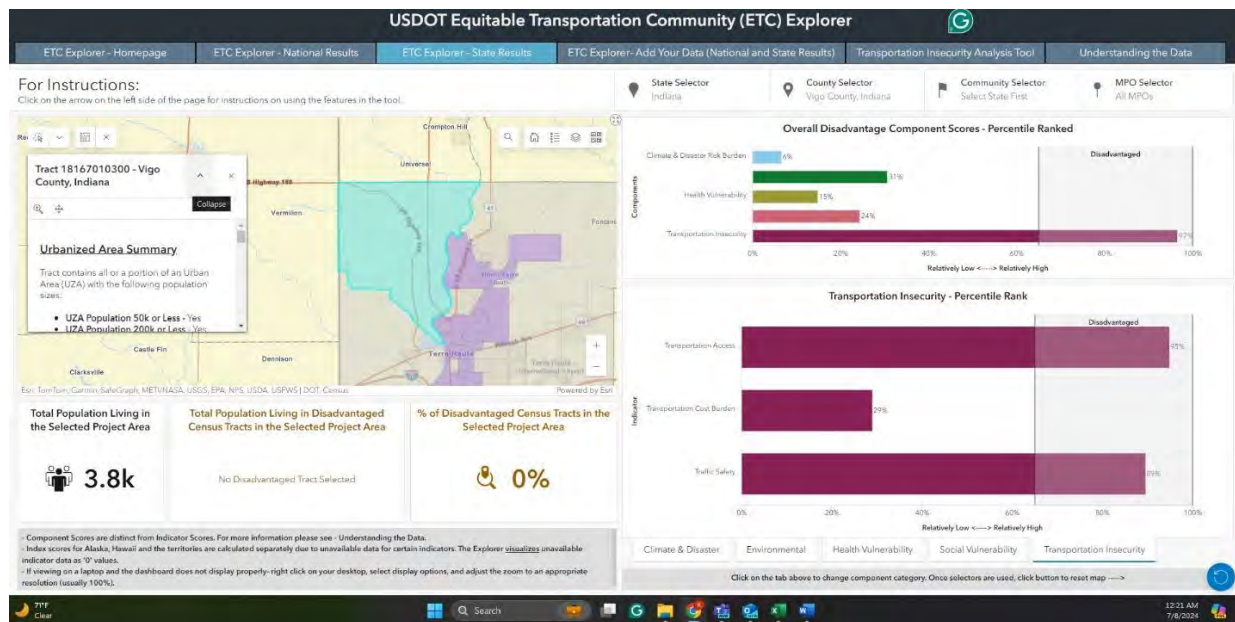
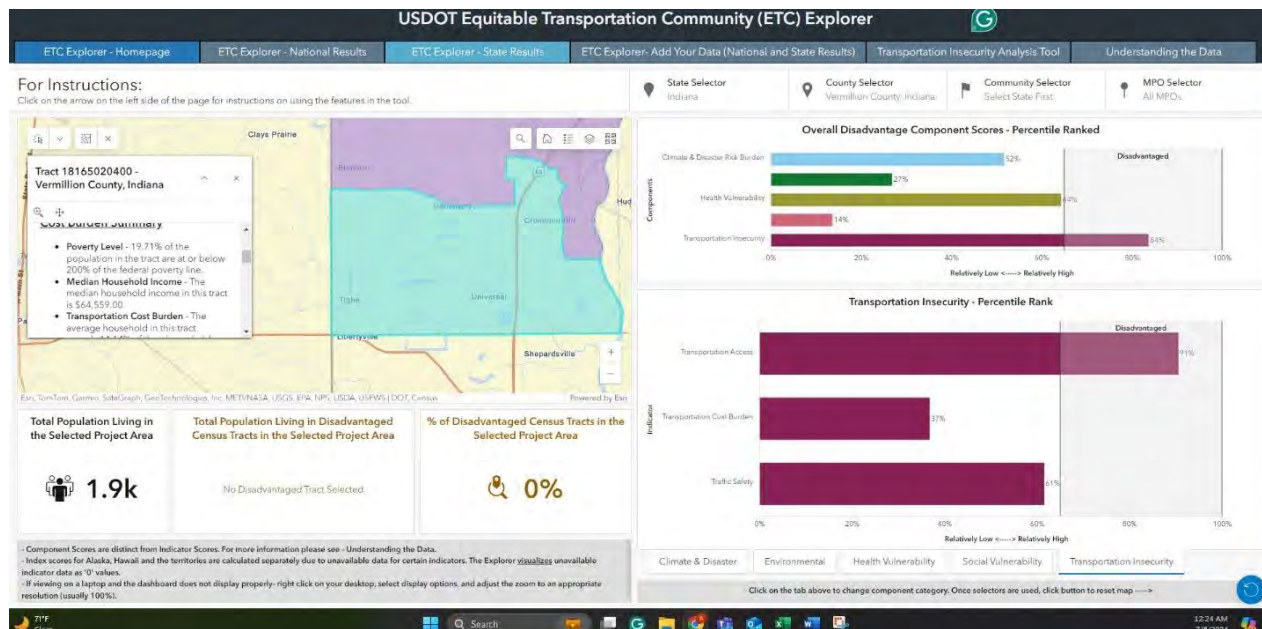


Figure 2. Overall Fatality Rates by Function Class (Fatalities per 100 M VMT, speeding-related and nonspeeding fatalities combined) (1999)

Source: Table VM-2 for VMT, and HM-20 for Public Road Miles, FHWA 1999 Highway Statistics. Fatality data come from NHTSA Fatality Analysis Reporting System.

Appendix D: EPA NEPAAssist and USDOT Equitable Transportation Community Explorer



Appendix E: References

- Code of Federal Regulations. (n.d.). Retrieved from Park 1021- National Environmental Policy Act Implementing Procedures: <https://www.ecfr.gov/current/title-10/chapter-X/part-1021#1021.410DOE>
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- US Department of Transportation. (2023). Federal Highway Administration. Retrieved from Highway Functional Classification Concepts, Criteria and Procedures 2023 Edition : <https://www.fhwa.dot.gov/planning/processes/statewide/related/hwy-functional-classification-2023.pdf>

Appendix F: General Vehicle Weight Estimates

APPROXIMATE VEHICLE WEIGHTS



AVERAGE STANDARD
CAR - 1.5 TONS

AVERAGE STANDARD
TRUCK - 3 TONS



AVERAGE AMBULANCE -
5 TONS

AVERAGE DELIVERY
TRUCK - 6 TONS



AVERAGE LOADED
SCHOOL BUS - 17 TONS

AVERAGE LOADED
CHARTER BUS - 20 TONS





AVERAGE FIRE TRUCK
19 TONS - 30 TONS

AVERAGE LOADED
GARBAGE TRUCK - 25 TONS



AVERAGE LOADED
PLOW TRUCK - 28 TONS

AVERAGE LOADED
CEMENT TRUCK - 33 TONS



AVERAGE LOADED DUMP
TRUCK - 36 TONS



AVERAGE LOADED TRACTOR
TRAILER - 40 TONS



Appendix G: Report Data

Traffic Conditions today

Location	Cross Streets	AADT	TAADT	% Truck by Leg	Intersection % truck	2019-2023 Crashes	MEV Rate	Notes
Intersection 1								
Vigo County	IN-63	11175	2533	22.7%		16	0.77	Animal/object in roadway
	Trinity Ave	272	44	16.2%	22.5%			
Intersection 2								
Vigo County	IN-63	14573	2311	15.9%		14	0.51	Animal/Object in Roadway / Failure to Yield
	Sanford Rd (estimated)	373	37.3	10.0%	15.7%			
Intersection 3							MEV Rate	
Vermillion County	IN -163	1280	156	12.2%		0	-	N/A
	State Line Rd (estimated)	250	25	10.0%	11.8%			
Intersection 4							MEV Rate	
Vigo County	IN-150	2923	418	14.3%		6	1.03	Animal/Object in Roadway / following too closely
	Trinity Ave	272	44	16.2%	14.5%			
Intersection 5							MEV Rate	
Vermillion County	IN-63	10061	1660	16.5%		10	0.39	Animal/Object in Roadway / following too closely
	IN-163	4128	146	3.5%	12.7%			
Intersection 6							MEV Rate	
Vigo County	IN-63	13523	1712	12.7%		6	0.23	Animal/Object in Roadway / following too closely
	Bolton Rd	956	70	7.3%	12.3%			
Intersection 7							MEV Rate	
Vigo County	IN-63	14573	2311	15.9%		17	0.59	Animal/Object in Roadway / Failure to Yield
	Durkees Ferry Rd	1141	28	2.5%	14.9%			
Intersection 8							MEV Rate	
Vigo County	IN-150	3070	427	13.9%		4	0.52	Animal/Object in Roadway / Failure to Yield
	Durkees Ferry Rd	1141	28	2.5%	10.8%			
Intersection 9							MEV Rate	
Vigo County	IN-150	3070	427	13.9%		2	0.32	Animal/Object in Roadway / Failure to Yield
	Sanford Rd	373	150	10.0%	12.6%			

	Traffic Conditions 2023				Future Estimations			
	2023		2023 %	2023 %truck	2035		2035 % Truck	2035 % Truck Intersection
Intersection 1	2023 AADT	2023 TAADT	Truck By Leg		2035 AADT	2035 AADT	By Leg	
Vigo County IN-63	11,175	2,533	22.67%		11,175	2,533	22.67%	0.18%
Trinity Ave	272	44	16.18%	22.51%	299	71	23.66%	22.69%
Intersection 2								
Vigo County IN-63	14,573	2,311	15.86%		14,573	2,311	15.86%	0.14%
Sanford Rd (estimated)	1,500	150	10.00%	15.31%	1,527	177	11.57%	15.45%
Intersection 3								
Vermillion County IN -163	1,280	156	12.19%		1,280	156	12.19%	1.51%
State Line Rd (estimated)	250	25	10.00%	11.83%	277	52	18.67%	13.34%
Intersection 4								
Vigo County IN-150	2,923	418	14.30%		2,923	418	14.30%	0.71%
Trinity Ave	272	44	16.18%	14.46%	299	71	23.66%	15.17%
Intersection 5								
Vermillion County IN-63	10,061	1,660	16.50%		10,061	1,660	16.50%	0.16%
IN-163	4,128	146	3.54%	12.73%	4,155	173	4.16%	12.89%
Intersection 6								
Vigo County IN-63	13,523	1,712	12.66%		13,523	1,712	12.66%	0.16%
Bolton Rd	956	70	7.32%	12.31%	983	97	9.84%	12.47%
Intersection 7								
Vigo County IN-63	14,573	2,311	15.86%		14,573	2,311	15.86%	0.14%
Durkees Ferry Rd	1,141	28	2.45%	14.88%	1,168	55	4.68%	15.03%
Intersection 8								
Vigo County IN-150	3,070	427	13.91%		3,070	427	13.91%	0.56%
Durkees Ferry Rd	1,141	28	0	10.81%	1,168	55	0	11.37%
Intersection 9								
Vigo County IN-150	3,070	427	0		3,070	427	0	0.51%
Sanford Rd	1,500	150	0	12.63%	1,527	177	0	13.13%

HAUL VEHICLE ROUTE TURNING ANALYSIS

Prepared for:



Wabash Valley Resources, LLC
444 West Sandford Avenue
West Terre Haute, IN 47885
Contact: Dan Williams

Prepared by:



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853 Columbia Road, Suite 101
Plainfield, IN 46168
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Table of Contents

Introduction	3
Data Collection.....	3
Analysis	3
Northern Haul Route.....	4
Southern Haul Route.....	5
Summary	5
Appendix A - Northern Haul Route and Intersections.....	6
Appendix B - Southern Haul Route Map and Intersections.....	17

Figure 1: Passing Vehicle for Northern Haul Route (Page 4)

Figure 2: Passing Vehicle for Southern Haul Route (Page 5)

Introduction

The following report describes the findings of Banning Engineering, Inc. for the haul route turning radius study performed for Wabash Valley Resources, LLC. Two separate hauling routes were evaluated. An array of vehicles were analyzed and the largest “passing” vehicle configuration is shown in this report.

A passing vehicle configuration is considered a turning path where all wheel paths traverse over pavement or gravel portions of the respective roadways. At times, additional linework may appear to be outside the gravel or pavement, however, this linework is actually the rear overhang on the vehicles. Every intersection analyzed and shown on the routes provide a “passing” performance for the vehicle configuration shown. Smaller vehicles than the ones shown could also be utilized on each respective route.

Data Collection

The survey information presented for this report was collected in the field between August 12 and August 16, 2024. Data was gathered using a data collector and standard surveying techniques with global positioning system (GPS) equipment. A real-time kinematic (RTK) correction service, provided by the VRS Network, was utilized to enhance accuracy. Locations at intersections of pavement and gravel limits were acquired. Additionally, items such as power poles, fence posts or other items that may interfere with turning movements were located.

Aerial imagery was obtained from the Indiana Spatial Data Portal. The downloaded images were imported into Global Mapper V24.0 and cropped to encompass the desired area. Subsequently, the images were exported as JPEG files. These JPEG files were then imported into AutoCAD and georeferenced to the appropriate coordinate system.

Analysis

The turning swept path analysis was performed within the Autocad suite of programs. The vehicle tracking module specifically was utilized. Standard vehicles within this module were operated. The analysis output provided outside locations for wheel paths and vehicle overhangs (typically in the rear of a vehicle).

The route analysis locations are within the northwest portion of Vigo County and southern portion of Vermillion County. Both routes begin at the Wabash Valley Resources, LLC (WVR) plant and provide intersection by intersection evaluation both to and from the haul destination.

Northern Haul Route

The northern haul route is approximately 28 miles in total. The route is approximately 19 miles from the plant to the haul destination for the loaded trip. The return, empty trip, is 9 miles. The northern haul route consists of the following segments and intersections. See Appendix A for a map and intersection analysis.

1. From Plant, Sandford Road (West 0.5 miles)
2. North 1 intersection (Sandford Road and SR 63) right turn
3. State Highway 63 (North 8.2 miles) (Leave Vigo Enter Vermillion)
4. North 2 intersection (SR 163 and SR 63) left turn
5. State Highway 163 (West 5.4 miles)
6. North 3 intersection (State Line Rd and SR 163) left turn
7. State Line Road (South 1.5 miles)
8. North 4 intersection (State Line Rd and Brouilletts Rd) left turn
9. Brouilletts Road (East 1.2 miles)
10. North 5 intersection (Brouilletts Rd and CR 250 W) right turn
11. CR 250 West (South 1.6 miles)
12. North 6 intersection (CR 250 W and CR 1800 S) left turn
13. CR 1800 South (East 0.5 miles), to Haul Destination
14. From Haul Destination, CR 1800 South (East 1.5 miles)
15. North 7 intersection (CR 1800 S and Rangeline Rd) right turn
16. Rangeline Road (South 1.5 miles) (Leave Vermillion Enter Vigo)
17. North 8 intersection (Rangeline Rd and Trinity Ave) left turn
18. Trinity Avenue (East 1.4 miles)
19. North 9 intersection (Trinity Ave and SR 63) right turn
20. State Highway 63 (South 4.1 miles)
21. North 10 intersection (SR 63 and Sandford Road) left turn
22. Sandford Road (East 0.5 miles), to Plant

All intersections analyzed had a passing evaluation for the northern route. A standard semi tractor with up to a 48 foot trailer navigated the route.

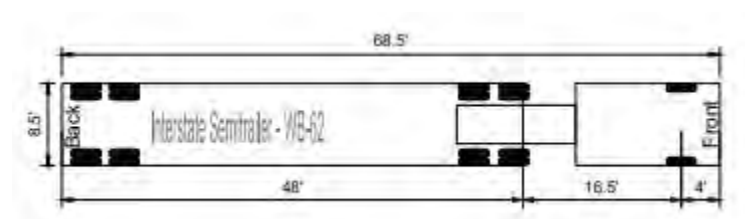


Figure 1: Passing Vehicle for Northern Haul Route

Southern Haul Route

The southern haul route is approximately 9.3 miles in total. The route is approximately 4.1 miles from the plant to the haul destination for the loaded trip. The return, empty trip, is 5.2 miles. Both the loaded and empty trip are within Vigo County. The southern haul route consists of the following segments and intersections. See Appendix B for a map and intersection analysis.

1. From Plant, Sanford Road (West 2.9 miles)
2. South 1 intersection (Sandford Rd and Regan Rd) right turn
3. Regan Road (North 0.5 miles)
4. South 2 intersection (Regan Rd and Dugger Ave) left turn
5. Dugger Road (West 0.25 miles)
6. South 3 intersection (Dugger Ave and Reiter Rd) right turn
7. Reiter Road (North 0.25 miles)
8. South 4 intersection (Reiter Rd and Wright Ave) left turn
9. Wright Ave (West 0.2 miles), to Haul Destination
10. From Haul Destination, Wright Ave (West 0.6 miles)
11. South 5 intersection (Wright Ave and Hollingsworth Pl) left turn
12. Hollingsworth Place (South 0.75 miles)
13. South 6 intersection (Hollingsworth Pl and Sanford Rd) left turn
14. Sanford Road (3.85 miles east), to Plant

All intersections analyzed had a passing evaluation for the southern route. A large truck up to 38 feet in length navigated the route with a passing evaluation.

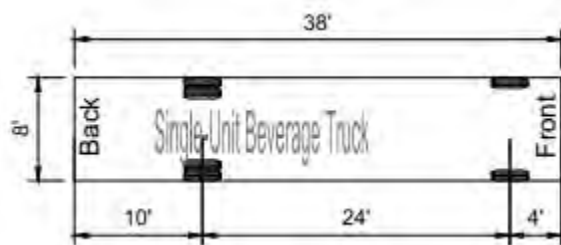
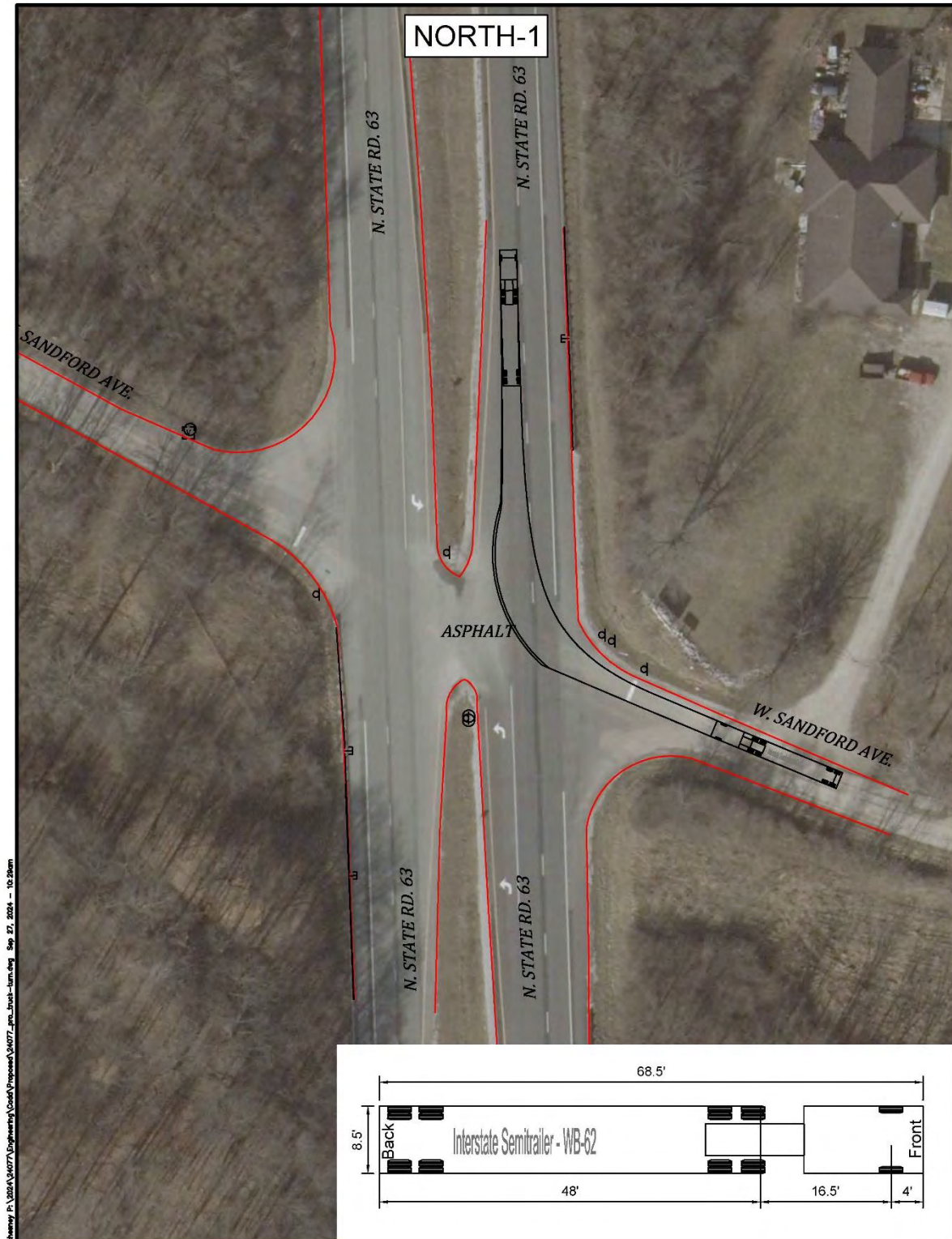


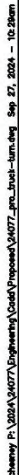
Figure 2: Passing Vehicle for Southern Haul Route

Summary

In summary, both routes analyzed provided a passing evaluation for the respective vehicles evaluated. A passing evaluation for both routes means no additional roadway pavement or gravel is needed to traverse intersections. It is our opinion, if vehicles used are the same size or smaller than the vehicles evaluated within the turning analysis program no additional pavement or gravel will be necessary at the intersections evaluated along the respective routes.

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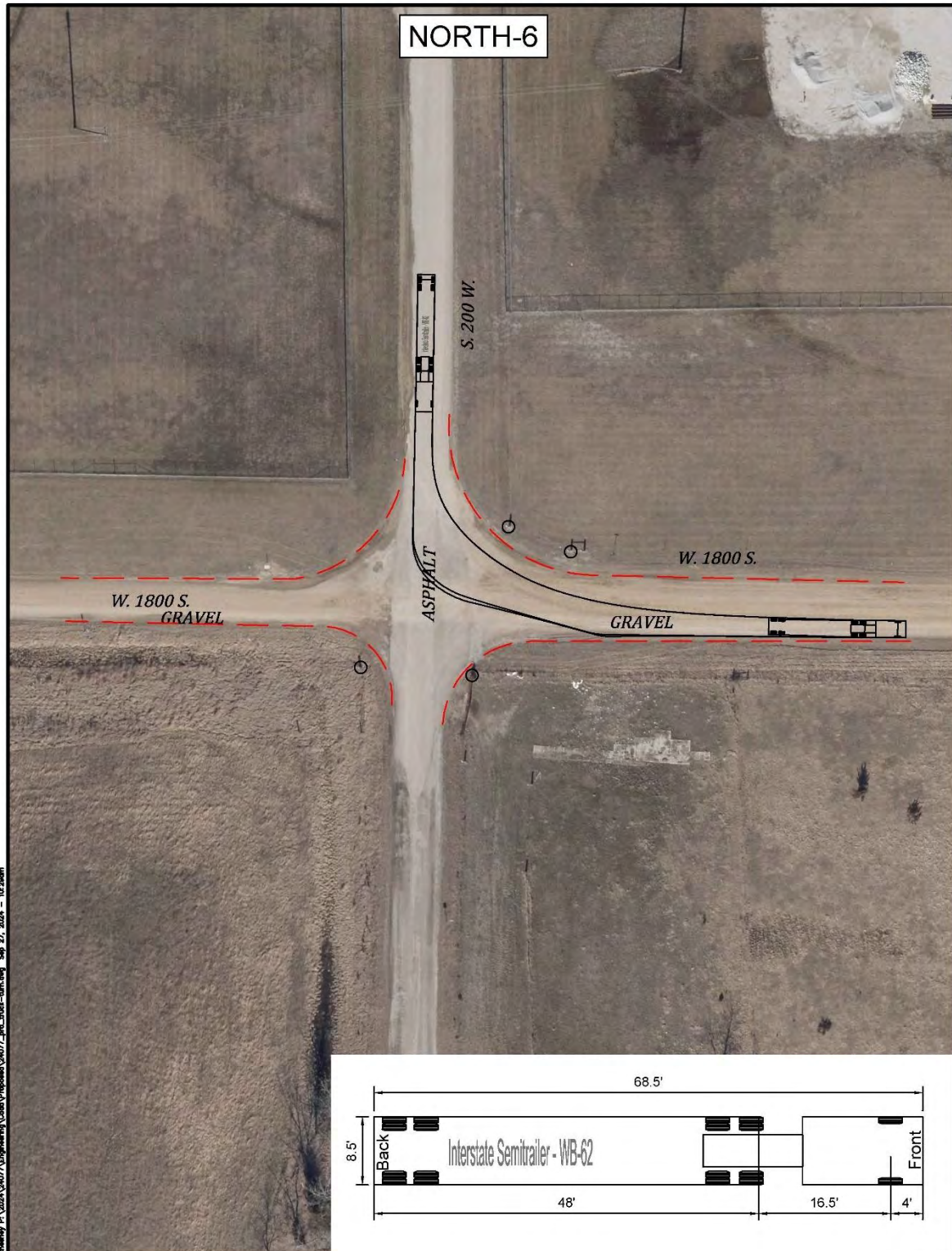








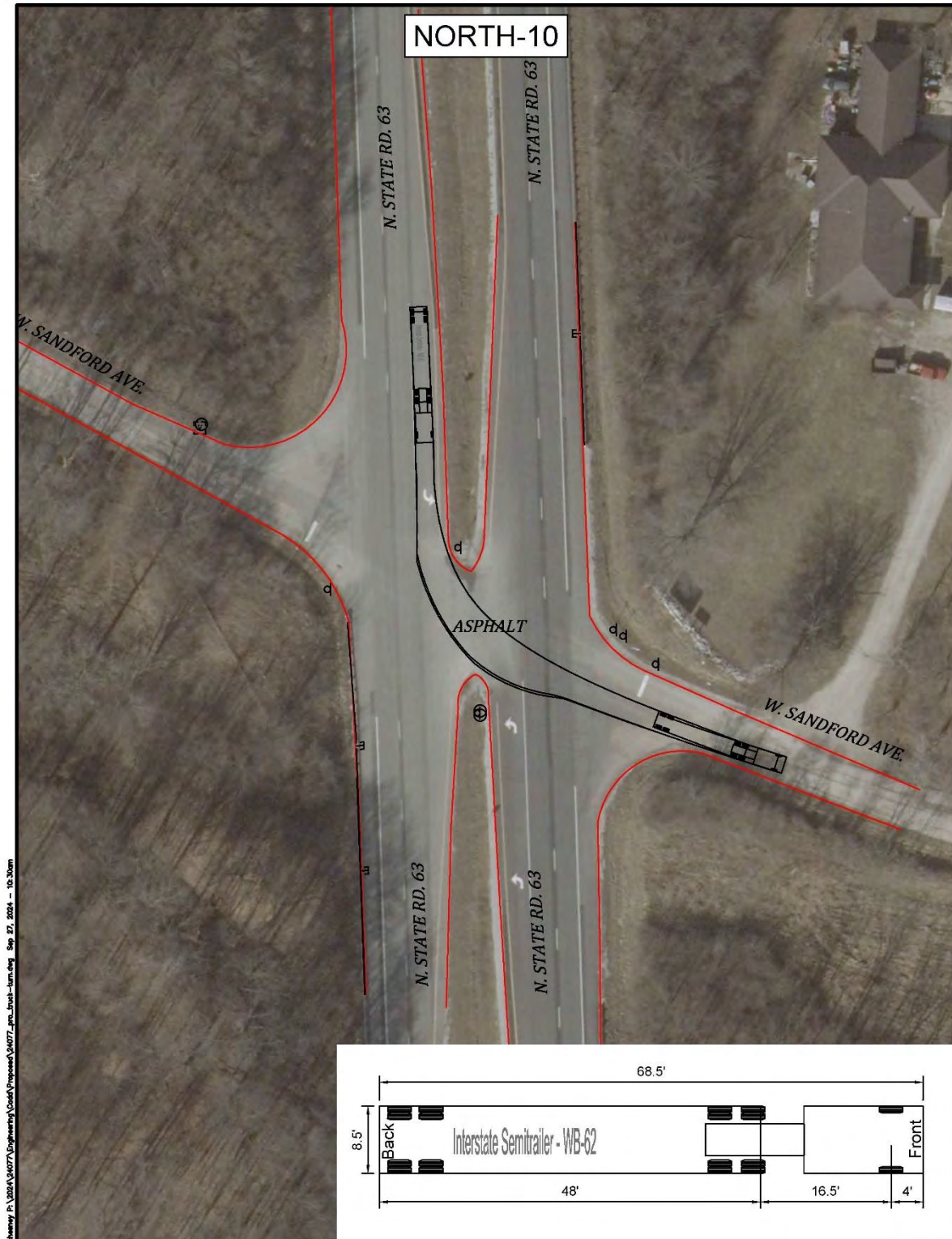




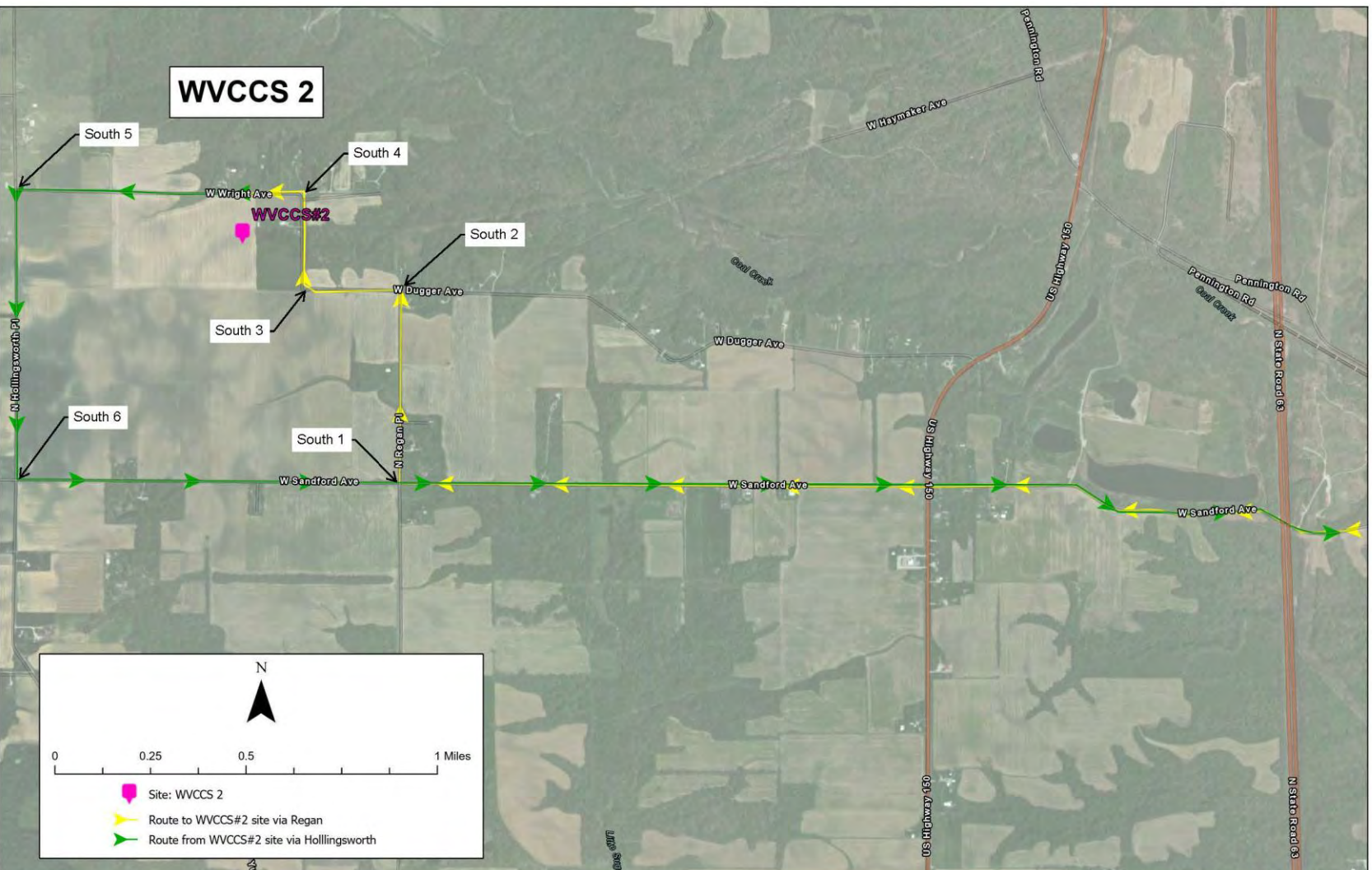


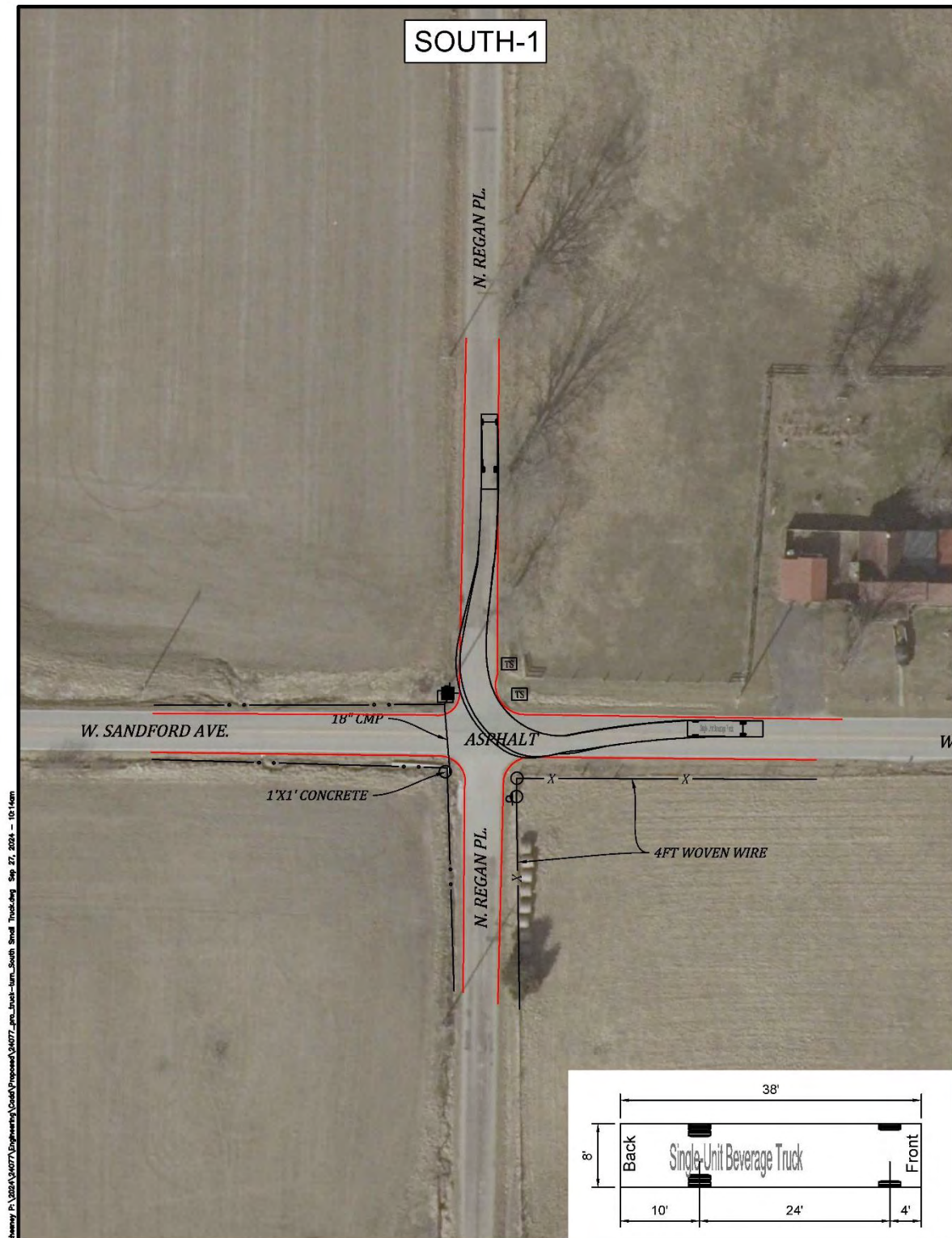


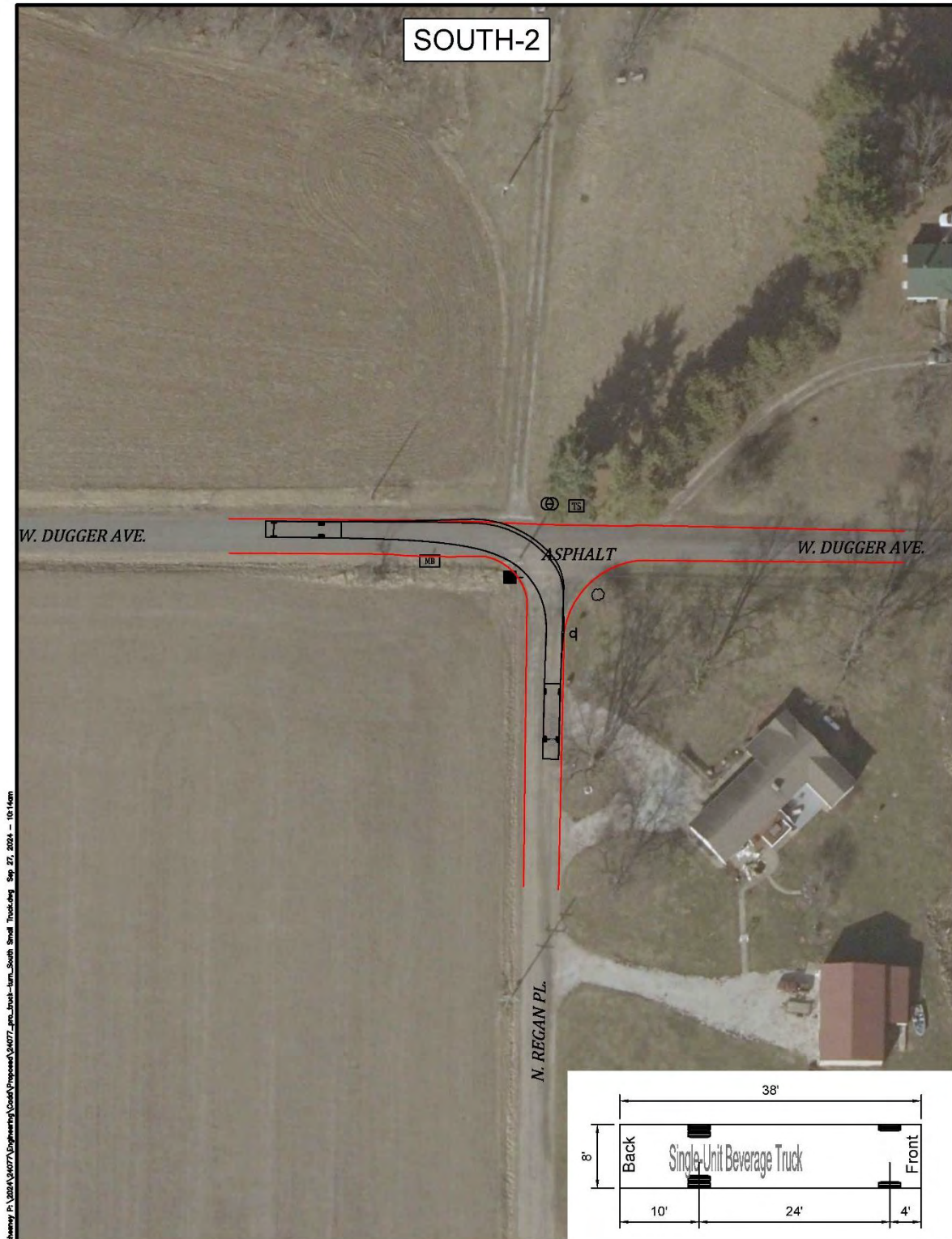




Appendix B- Southern Haul Route Map and Intersections















Traffic



TRAFFICENGINEERING.COM
BY CHET SKWARCAN

Level of Service Analysis

SR 63 at Sandford Avenue
West Terre Haute, Indiana

Wabash Valley Resources, LLC
Haul Vehicle Evaluation

Submitted by:

Chet M. Skwarcan, P.E., President
Traffic Engineering, Inc.
1965 E. Main Street, Suite 555
Danville, Indiana 46122
October 9, 2024

SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro

Scenario 1 1 AM Peak Hour - 2024 Existing

Report File: C:\...\1 LOS - AM Peak Hour - 2024 Existing -

10/9/2024





SR 63 at Sandford Avenue 10092024.pdf

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	SR 63 at Sandford Road	Two-way stop	HCM 6th Edition	EB Thru	0.007	32.7	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: SR 63 at Sandford RoadControl Type: Two-way stop
Analysis Method: HCM 6th Edition
Analysis Period: 15 minutesDelay (sec / veh): 32.7
Level Of Service: D
Volume to Capacity (v/c): 0.007**Intersection Setup**

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	120.00	100.00	100.00	120.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	60.00			60.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	4	408	4	0	770	7	8	1	20	1	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	13.00	2.00	2.00	5.00	2.00	2.00	2.00	5.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	408	4	0	770	7	8	1	20	1	0	0
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	120	1	0	226	2	2	0	6	0	0	0
Total Analysis Volume [veh/h]	5	480	5	0	906	8	9	1	24	1	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.01	0.00	0.06	0.01	0.04	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.89	0.00	0.00	8.35	0.00	0.00	30.50	32.70	13.11	22.70	31.36	9.83
Movement LOS	A	A	A	A	A	A	D	D	B	C	D	A
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.00	0.00	0.37	0.37	0.37	0.01	0.01	0.01
95th-Percentile Queue Length [ft/ln]	0.51	0.00	0.00	0.00	0.00	0.00	9.32	9.32	9.32	0.37	0.37	0.37
d_A, Approach Delay [s/veh]	0.10			0.00			18.29			22.70		
Approach LOS	A			A			C			C		
d_I, Intersection Delay [s/veh]	0.48											
Intersection LOS	D											

SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro

Scenario 1 1 AM Peak Hour - 2024 Existing

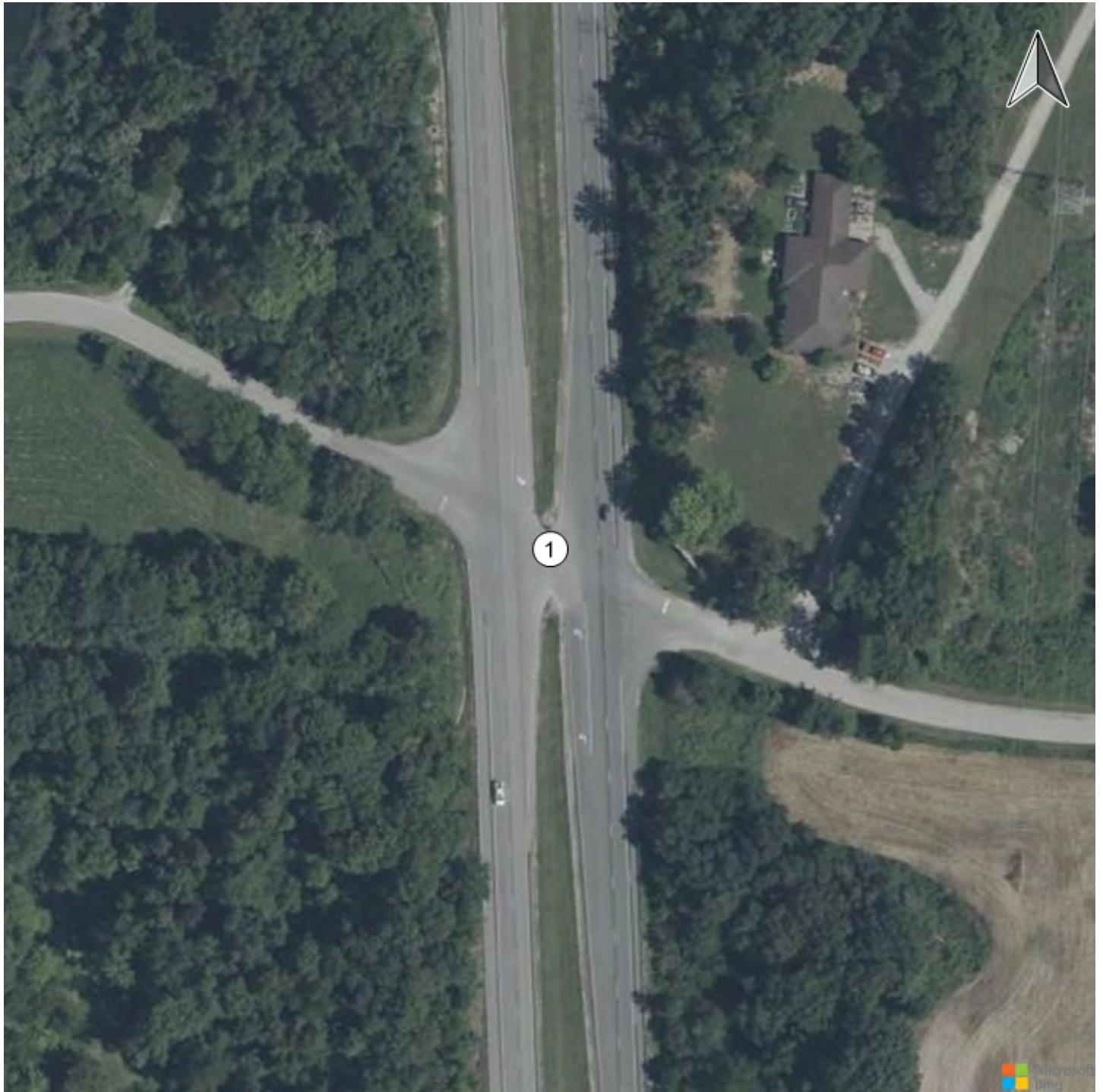
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10/9/2024

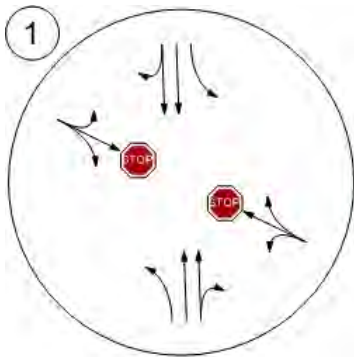
SR 63 at Sandford Avenue 10092024.pdf

Turning Movement Volume: Detail

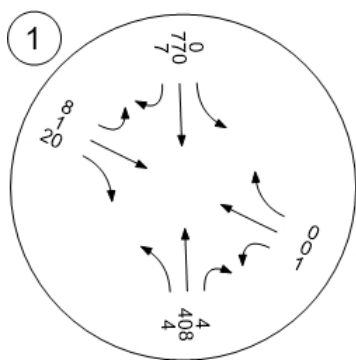
ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	SR 63 at Sandford Road	Final Base	4	408	4	0	770	7	8	1	20	1	0	0	1223
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	4	408	4	0	770	7	8	1	20	1	0	0	1223



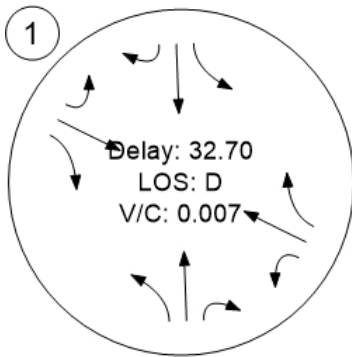
Lane Configuration and Traffic Control



Traffic Volume - Base Volume



Traffic Conditions



SR 63 at Sandford Avenue - WVR

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Scenario 4 2 PM Peak Hour - 2024 Existing

Report File: C:\...\2 LOS - PM Peak Hour - 2024 Existing -

10/9/2024





SR 63 at Sandford Avenue 10092024.pdf

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	SR 63 at Sandford Road	Two-way stop	HCM 6th Edition	EB Thru	0.018	40.0	E

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: SR 63 at Sandford RoadControl Type: Two-way stop
Analysis Method: HCM 6th Edition
Analysis Period: 15 minutesDelay (sec / veh): 40.0
Level Of Service: E
Volume to Capacity (v/c): 0.018**Intersection Setup**

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	120.00	100.00	100.00	120.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	60.00			60.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	23	807	0	0	575	12	9	2	12	4	1	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	7.00	2.00	2.00	7.00	2.00	11.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	23	807	0	0	575	12	9	2	12	4	1	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	219	0	0	156	3	2	1	3	1	0	0
Total Analysis Volume [veh/h]	25	877	0	0	625	13	10	2	13	4	1	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.00	0.00	0.01	0.00	0.07	0.02	0.02	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	8.99	0.00	0.00	9.70	0.00	0.00	31.45	40.02	12.13	35.22	39.80	12.65
Movement LOS	A	A	A	A	A	A	D	E	B	E	E	B
95th-Percentile Queue Length [veh/ln]	0.08	0.00	0.00	0.00	0.00	0.00	0.35	0.35	0.35	0.13	0.13	0.13
95th-Percentile Queue Length [ft/ln]	2.07	0.00	0.00	0.00	0.00	0.00	8.79	8.79	8.79	3.22	3.22	3.22
d_A, Approach Delay [s/veh]	0.25			0.00			22.09			36.14		
Approach LOS	A			A			C			E		
d_I, Intersection Delay [s/veh]	0.61											
Intersection LOS	E											

SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro

Scenario 4 2 PM Peak Hour - 2024 Existing

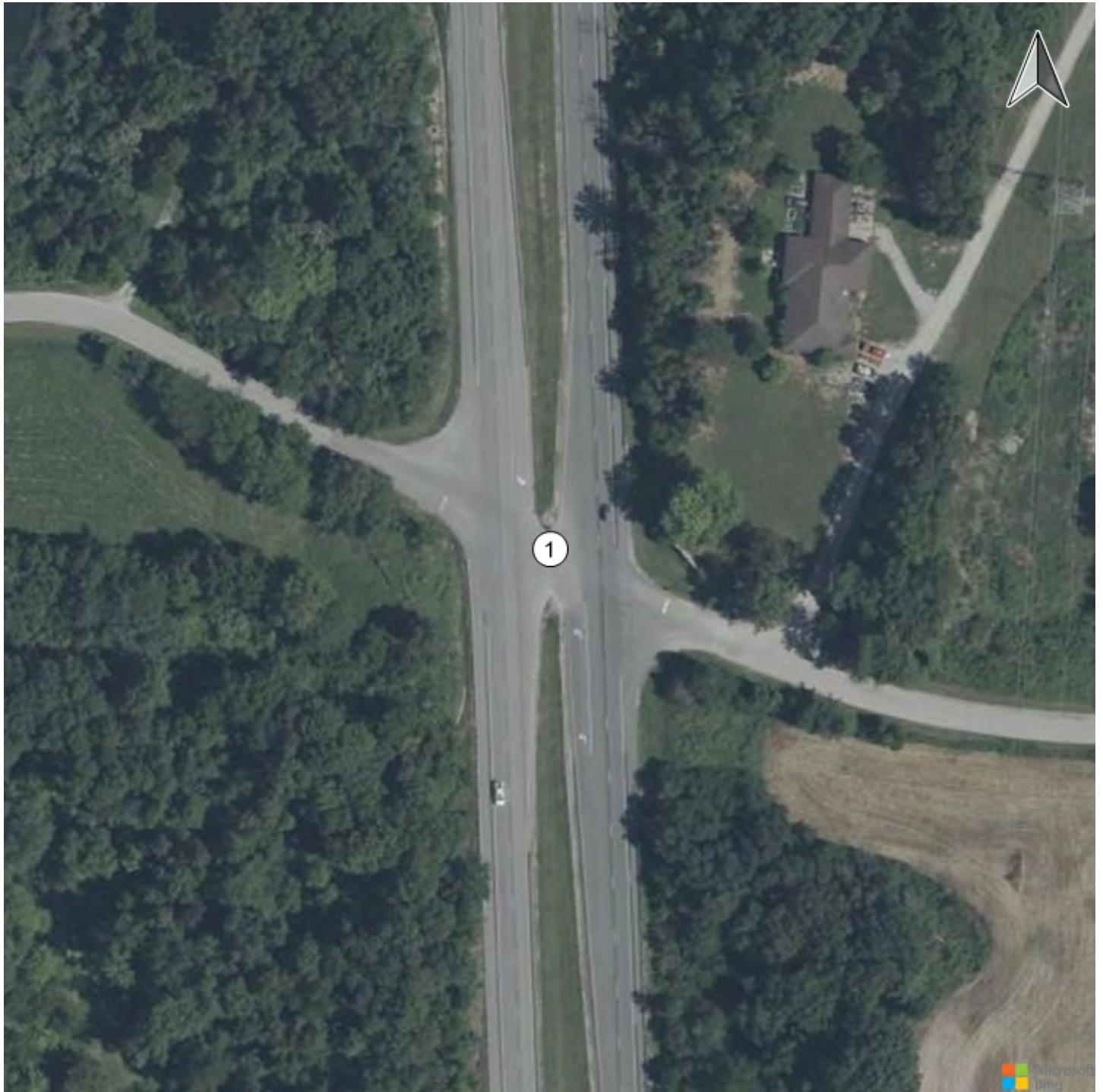
Report File: C:\...\2 LOS - PM Peak Hour - 2024 Existing -

10/9/2024

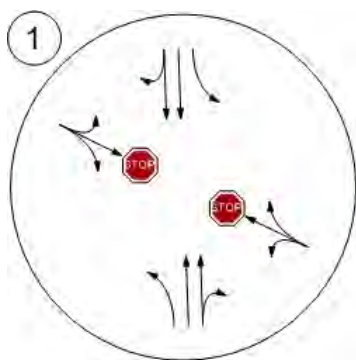
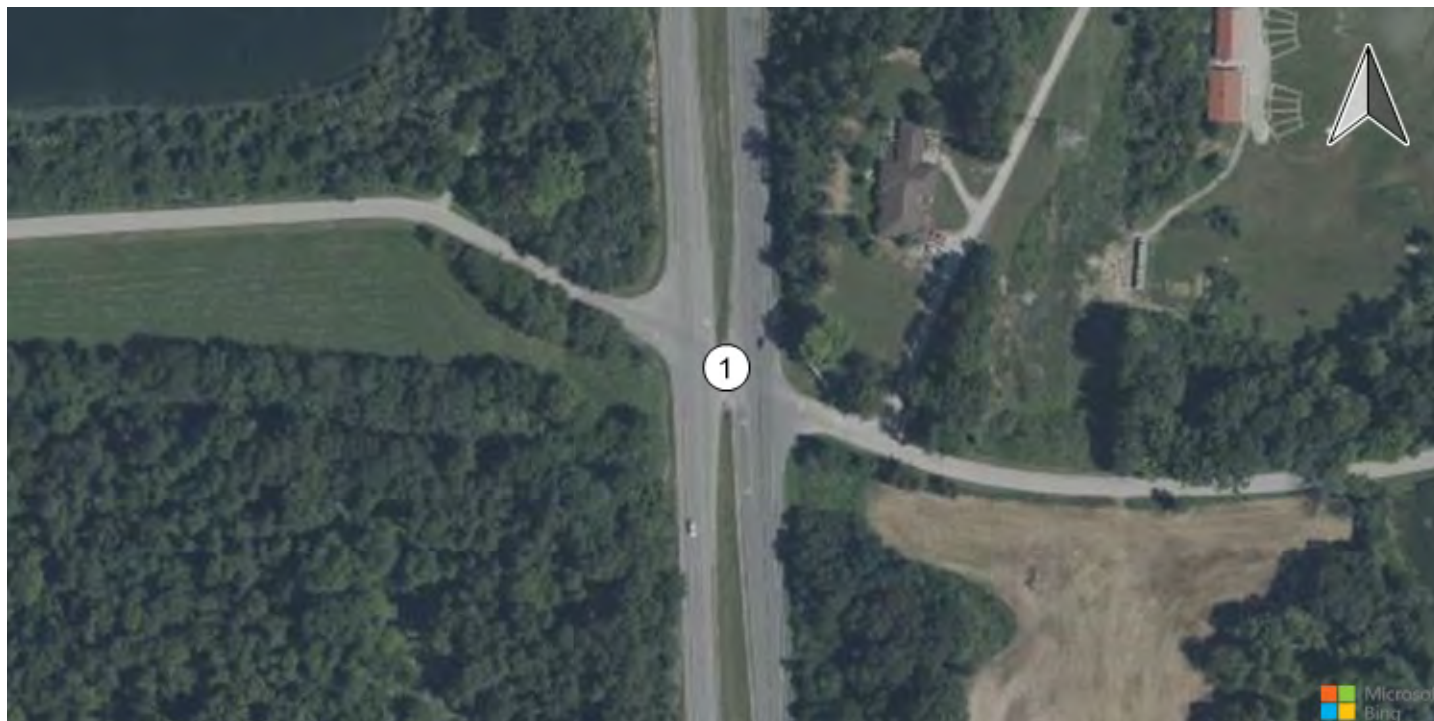
SR 63 at Sandford Avenue 10092024.pdf

Turning Movement Volume: Detail

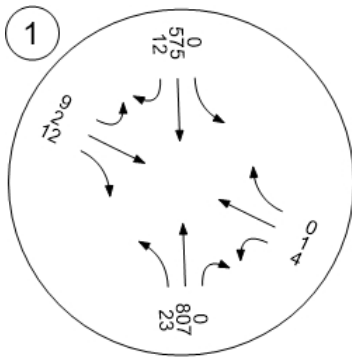
ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	SR 63 at Sandford Road	Final Base	23	807	0	0	575	12	9	2	12	4	1	0	1445
		Growth Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	23	807	0	0	575	12	9	2	12	4	1	0	1445



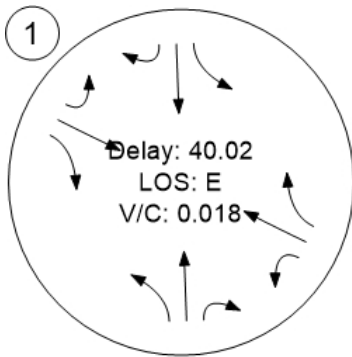
Lane Configuration and Traffic Control



Traffic Volume - Base Volume



Traffic Conditions



SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro

Scenario 2 3 AM Peak Hour - 2029 Existing + BG

Report File: C:\...\3 LOS - AM Peak Hour - 2029 Existing
plus BG - SR 63 at Sandford Avenue 10092024.pdf





10/9/2024

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	SR 63 at Sandford Road	Two-way stop	HCM 6th Edition	EB Thru	0.008	37.8	E

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: SR 63 at Sandford RoadControl Type: Two-way stop
Analysis Method: HCM 6th Edition
Analysis Period: 15 minutesDelay (sec / veh): 37.8
Level Of Service: E
Volume to Capacity (v/c): 0.008**Intersection Setup**

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	120.00	100.00	100.00	120.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	60.00			60.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	4	408	4	0	770	7	8	1	20	1	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	13.00	2.00	2.00	5.00	2.00	2.00	2.00	5.00	2.00	2.00	2.00
Growth Factor	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	440	4	0	830	8	9	1	22	1	0	0
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	129	1	0	244	2	3	0	6	0	0	0
Total Analysis Volume [veh/h]	5	518	5	0	976	9	11	1	26	1	0	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.00	0.01	0.00	0.09	0.01	0.05	0.01	0.00	0.00
d_M, Delay for Movement [s/veh]	10.20	0.00	0.00	8.46	0.00	0.00	35.28	37.85	14.30	25.19	35.75	10.00
Movement LOS	B	A	A	A	A	A	E	E	B	D	E	A
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.00	0.00	0.00	0.50	0.50	0.50	0.02	0.02	0.02
95th-Percentile Queue Length [ft/ln]	0.54	0.00	0.00	0.00	0.00	0.00	12.45	12.45	12.45	0.42	0.42	0.42
d_A, Approach Delay [s/veh]	0.10			0.00			20.99			25.19		
Approach LOS	A			A			C			D		
d_I, Intersection Delay [s/veh]	0.56											
Intersection LOS	E											

SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro

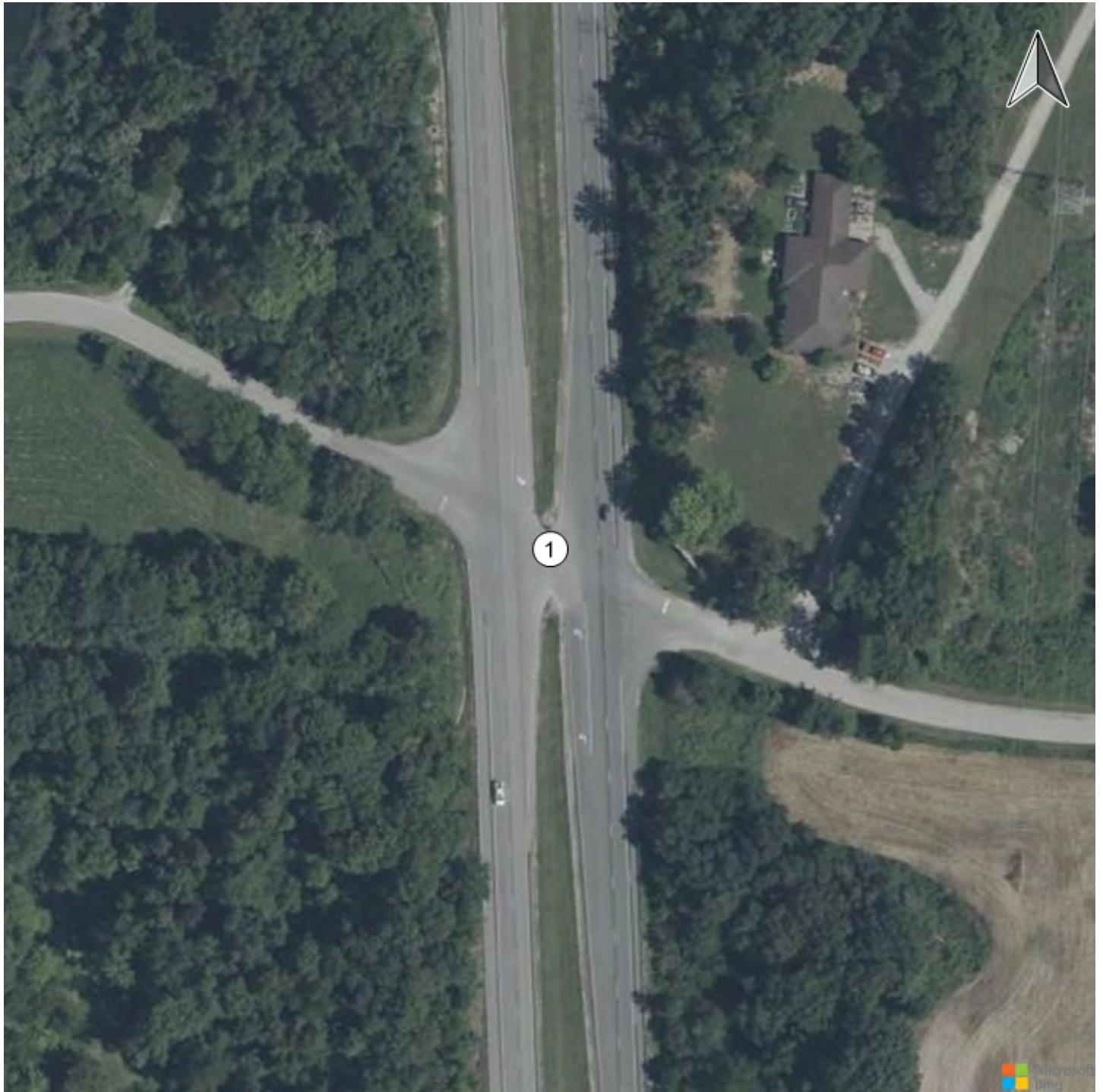
Scenario 2 3 AM Peak Hour - 2029 Existing + BG

Report File: C:\...\3 LOS - AM Peak Hour - 2029 Existing
plus BG - SR 63 at Sandford Avenue 10092024.pdf

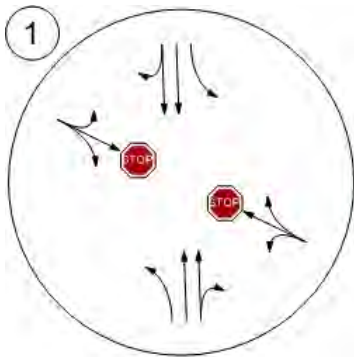
10/9/2024

Turning Movement Volume: Detail

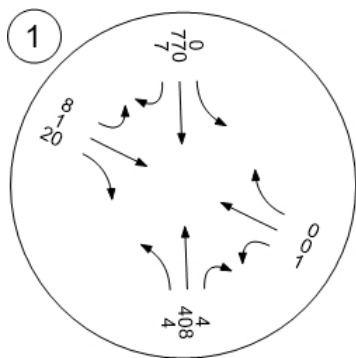
ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	SR 63 at Sandford Road	Final Base	4	408	4	0	770	7	8	1	20	1	0	0	1223
		Growth Factor	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	4	440	4	0	830	8	9	1	22	1	0	0	1319



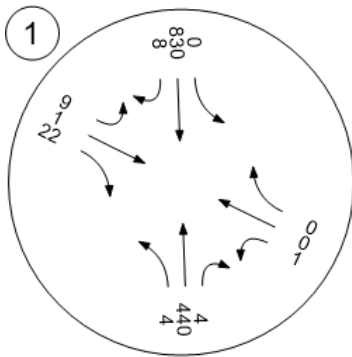
Lane Configuration and Traffic Control



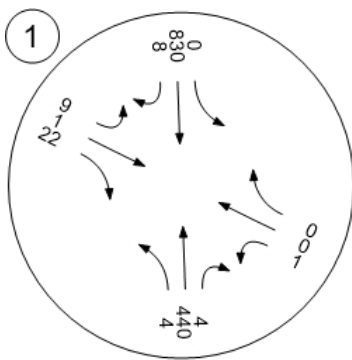
Traffic Volume - Base Volume



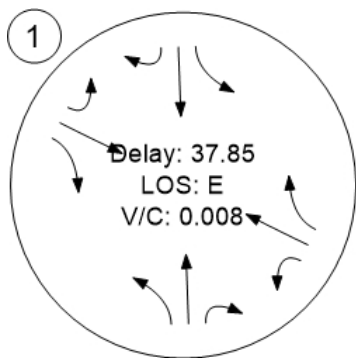
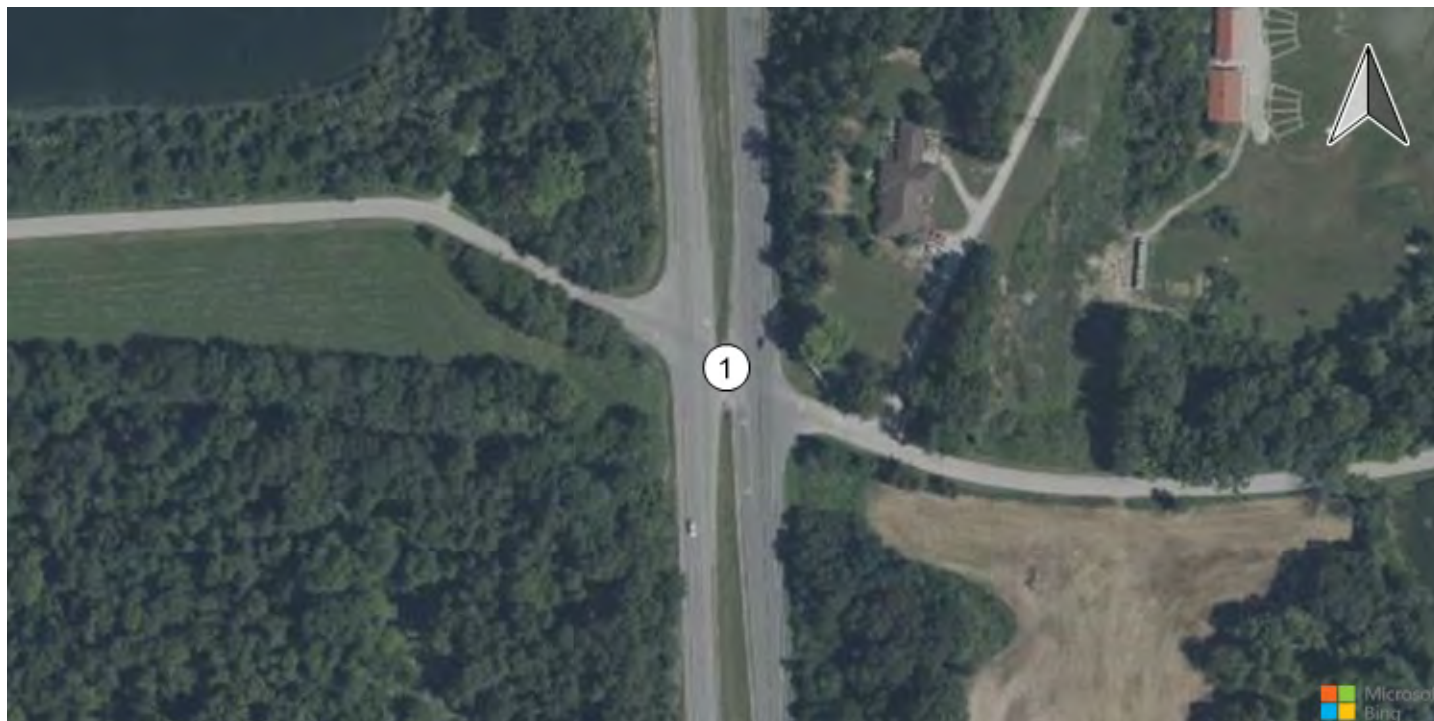
Traffic Volume - Future Background Volume



Traffic Volume - Future Total Volume



Traffic Conditions



SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro

Scenario 5 4 PM Peak Hour - 2029 Existing + BG

Report File: C:\...4 LOS - PM Peak Hour - 2029 Existing

10/9/2024





plus BG - SR 63 at Sandford Avenue 10092024.pdf

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	SR 63 at Sandford Road	Two-way stop	HCM 6th Edition	EB Thru	0.022	47.2	E

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: SR 63 at Sandford RoadControl Type: Two-way stop
Analysis Method: HCM 6th Edition
Analysis Period: 15 minutesDelay (sec / veh): 47.2
Level Of Service: E
Volume to Capacity (v/c): 0.022**Intersection Setup**

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	120.00	100.00	100.00	120.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	60.00			60.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	23	807	0	0	575	12	9	2	12	4	1	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	7.00	2.00	2.00	7.00	2.00	11.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	869	0	0	619	13	10	2	13	4	1	0
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	236	0	0	168	4	3	1	4	1	0	0
Total Analysis Volume [veh/h]	27	945	0	0	673	14	11	2	14	4	1	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.00	0.00	0.01	0.00	0.09	0.02	0.02	0.04	0.01	0.00
d_M, Delay for Movement [s/veh]	9.17	0.00	0.00	9.99	0.00	0.00	36.39	47.17	13.15	41.17	46.76	13.52
Movement LOS	A	A	A	A	A	A	E	E	B	E	E	B
95th-Percentile Queue Length [veh/ln]	0.09	0.00	0.00	0.00	0.00	0.00	0.44	0.44	0.44	0.15	0.15	0.15
95th-Percentile Queue Length [ft/ln]	2.35	0.00	0.00	0.00	0.00	0.00	11.12	11.12	11.12	3.84	3.84	3.84
d_A, Approach Delay [s/veh]	0.25			0.00			25.14			42.29		
Approach LOS	A			A			D			E		
d_I, Intersection Delay [s/veh]	0.67											
Intersection LOS	E											

SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro

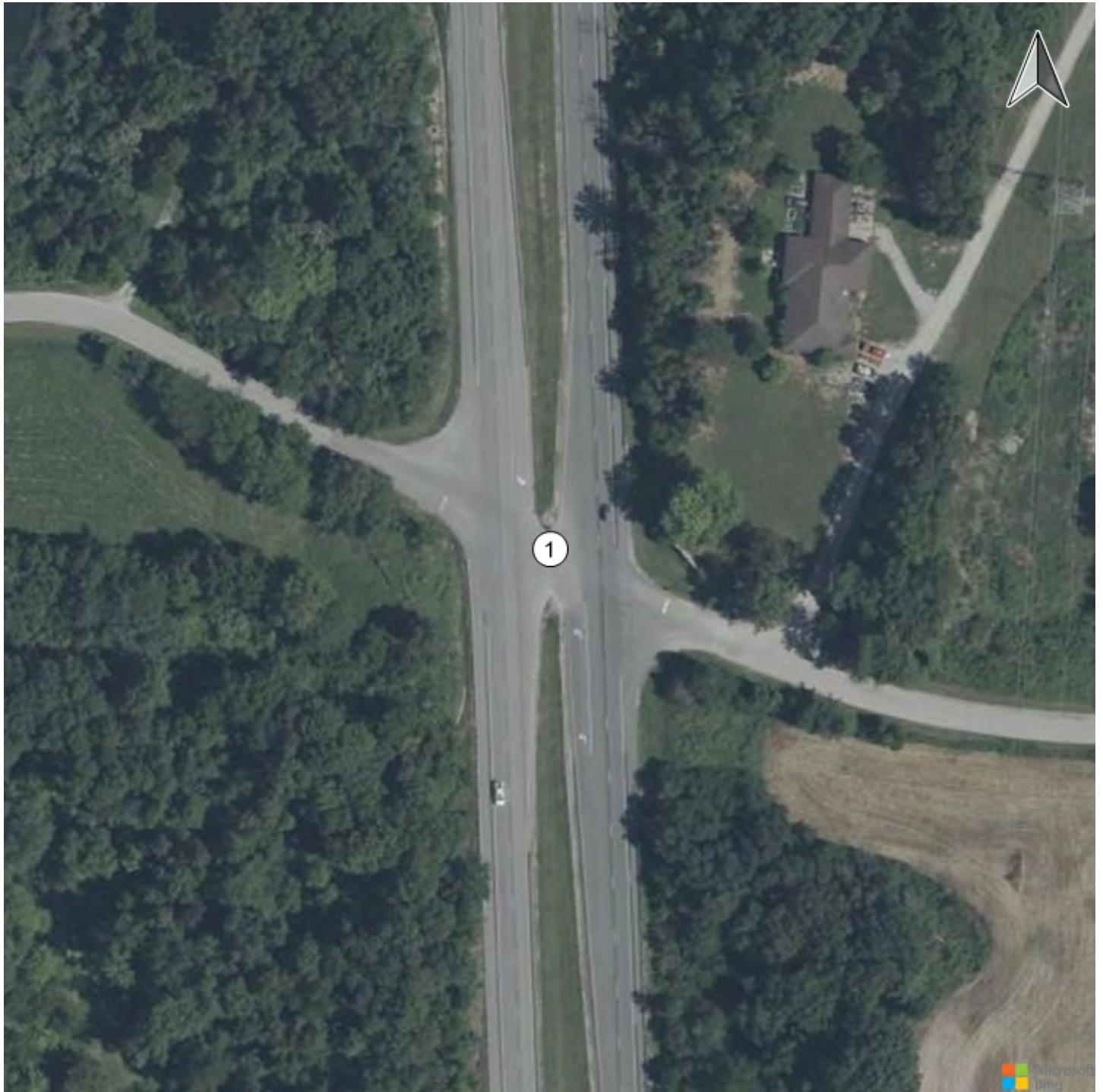
Scenario 5 4 PM Peak Hour - 2029 Existing + BG

Report File: C:\...4 LOS - PM Peak Hour - 2029 Existing
plus BG - SR 63 at Sandford Avenue 10092024.pdf

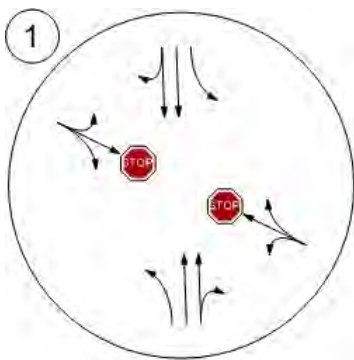
10/9/2024

Turning Movement Volume: Detail

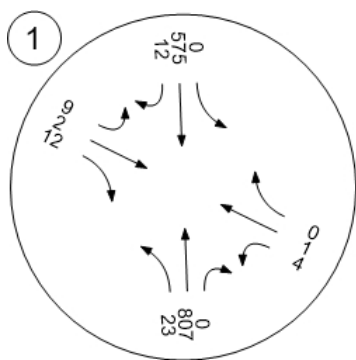
ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	SR 63 at Sandford Road	Final Base	23	807	0	0	575	12	9	2	12	4	1	0	1445
		Growth Factor	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	0	0	0	0	0	0	0	0	0	0	0
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	25	869	0	0	619	13	10	2	13	4	1	0	1556



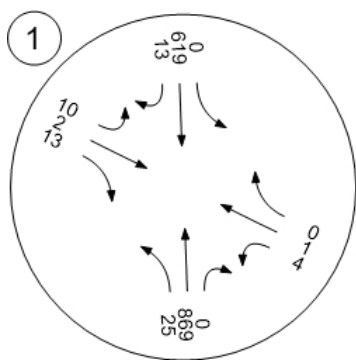
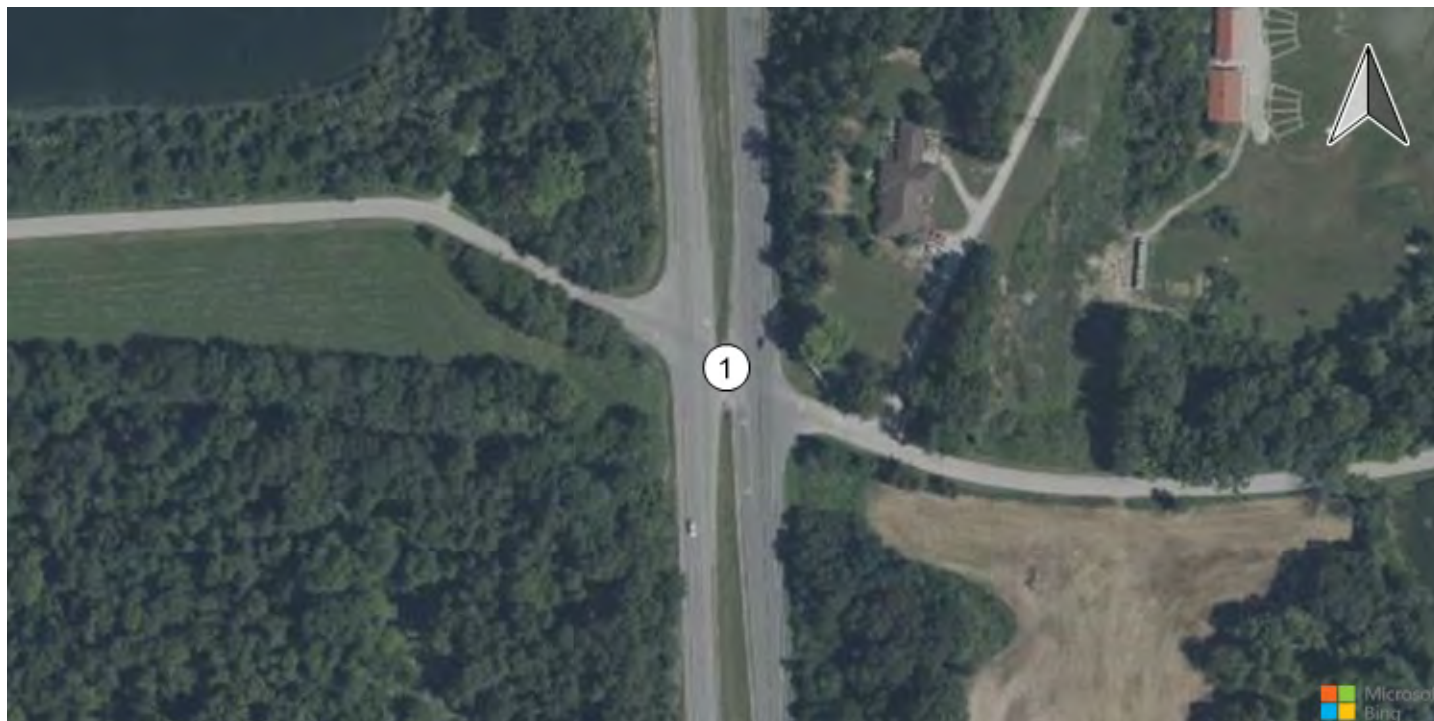
Lane Configuration and Traffic Control



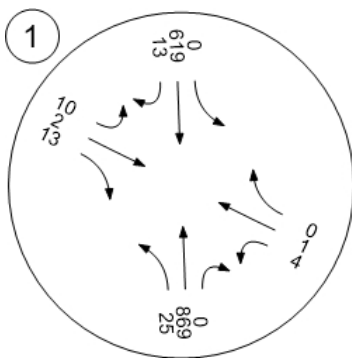
Traffic Volume - Base Volume



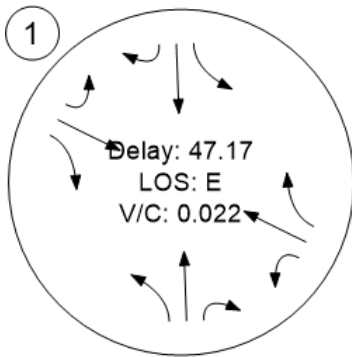
Traffic Volume - Future Background Volume



Traffic Volume - Future Total Volume



Traffic Conditions



SR 63 at Sandford Avenue - WVR





Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro Scenario 3 5 AM Peak Hour - 2029 Existing + BG + Site

Report File: C:\...\5 LOS - AM Peak Hour - 2029 Existing 10/9/2024
plus BG plus Site - SR 63 at Sandford Avenue 10092024.pdf**Intersection Analysis Summary**

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	SR 63 at Sandford Road	Two-way stop	HCM 6th Edition	WB Thru	0.131	93.3	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: SR 63 at Sandford RoadControl Type: Two-way stop
Analysis Method: HCM 6th Edition
Analysis Period: 15 minutesDelay (sec / veh): 93.3
Level Of Service: F
Volume to Capacity (v/c): 0.131**Intersection Setup**

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	120.00	100.00	100.00	120.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	60.00			60.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	4	408	4	0	770	7	8	1	20	1	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	13.00	43.00	100.00	5.00	2.00	2.00	83.00	5.00	75.00	100.00	100.00
Growth Factor	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	3	7	0	0	0	5	0	3	5	7
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	440	7	7	830	8	9	6	22	4	5	7
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	129	2	2	244	2	3	2	6	1	1	2
Total Analysis Volume [veh/h]	5	518	8	8	976	9	11	7	26	5	6	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.01	0.01	0.00	0.10	0.13	0.05	0.05	0.13	0.02
d_M, Delay for Movement [s/veh]	10.20	0.00	0.00	11.32	0.00	0.00	46.85	81.35	20.87	53.56	93.27	21.46
Movement LOS	B	A	A	B	A	A	E	F	C	F	F	C
95th-Percentile Queue Length [veh/ln]	0.02	0.00	0.00	0.04	0.00	0.00	1.10	1.10	1.10	0.70	0.70	0.70
95th-Percentile Queue Length [ft/ln]	0.54	0.00	0.00	1.05	0.00	0.00	27.39	27.39	27.39	17.61	17.61	17.61
d_A, Approach Delay [s/veh]	0.10			0.09			36.99			52.58		
Approach LOS	A			A			E			F		
d_I, Intersection Delay [s/veh]	1.74											
Intersection LOS	F											

SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro Scenario 3 5 AM Peak Hour - 2029 Existing + BG + Site

Report File: C:\...\5 LOS - AM Peak Hour - 2029 Existing 10/9/2024
plus BG plus Site - SR 63 at Sandford Avenue 10092024.pdf**Turning Movement Volume: Detail**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	SR 63 at Sandford Road	Final Base	4	408	4	0	770	7	8	1	20	1	0	0	1223
		Growth Factor	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	3	7	0	0	0	5	0	3	5	7	30
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	4	440	7	7	830	8	9	6	22	4	5	7	1349

SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro Scenario 3 5 AM Peak Hour - 2029 Existing + BG + Site

Report File: C:\...\5 LOS - AM Peak Hour - 2029 Existing 10/9/2024
plus BG plus Site - SR 63 at Sandford Avenue 10092024.pdf**Trip Generation summary****Added Trips**

Zone ID: Name	Land Use variables	Code	Ind. Var.	Rate	Quantity	% In	% Out	Trips In	Trips Out	Total Trips	% of Total Trips
1: Industrial Development	---			1.000	0.000	50.00	50.00	15	15	30	100.00
Added Trips Total								15	15	30	100.00

SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro

Scenario 3 5 AM Peak Hour - 2029 Existing + BG + Site

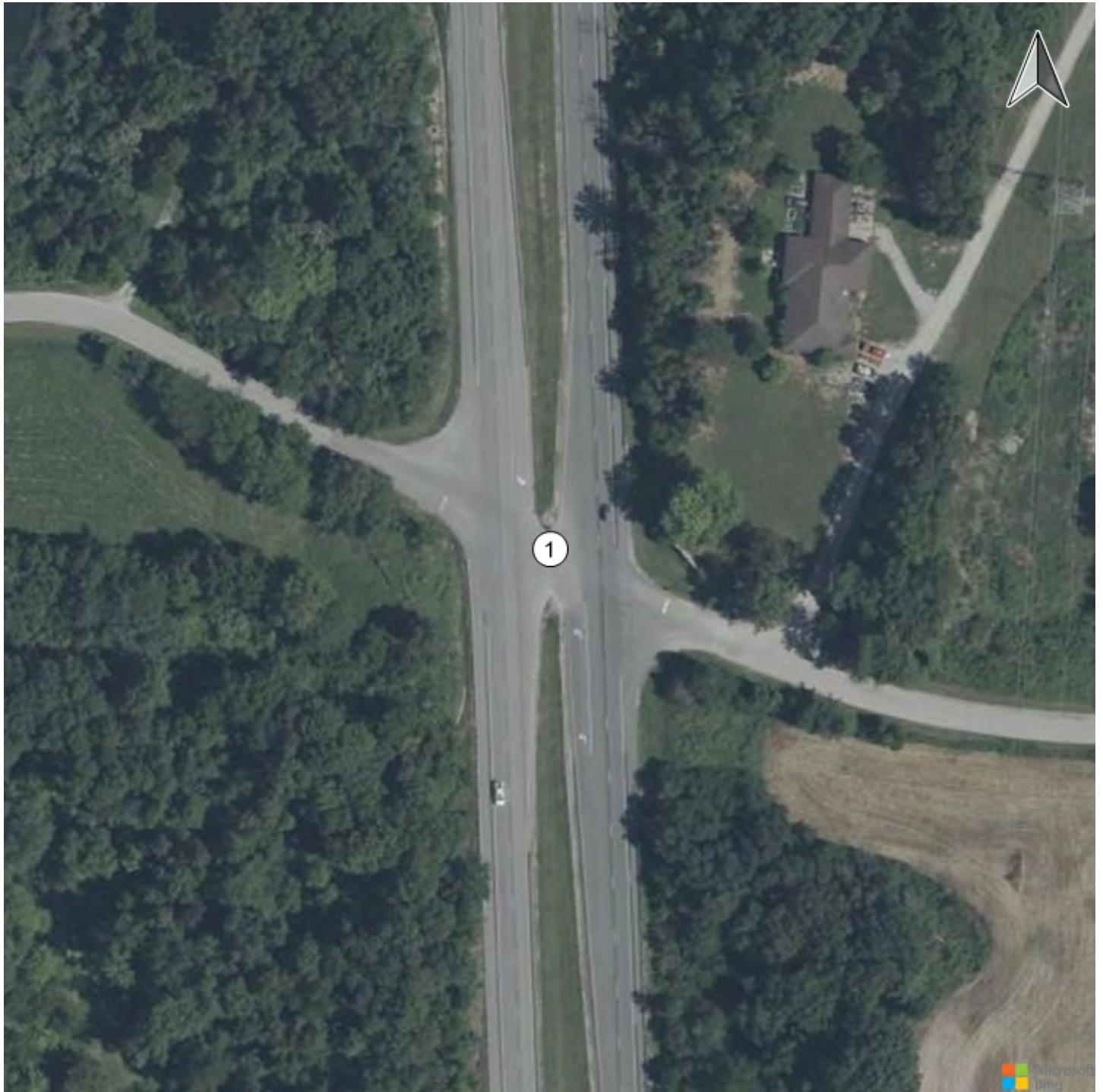
Report File: C:\...\5 LOS - AM Peak Hour - 2029 Existing

10/9/2024

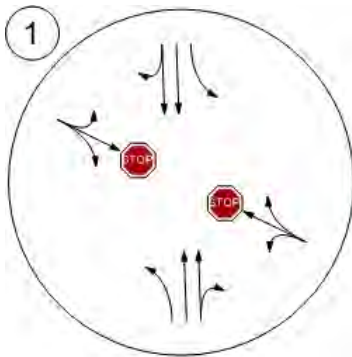
plus BG plus Site - SR 63 at Sandford Avenue 10092024.pdf

Trip Distribution summary

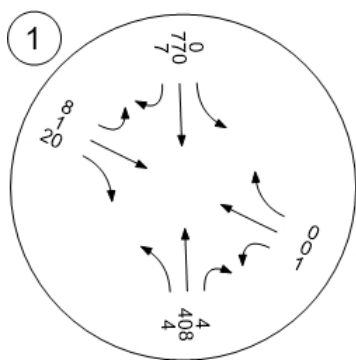
Zone / Gate	Zone 1: Industrial Development			
	To Industrial Development:		From Industrial Development:	
	Share %	Trips	Share %	Trips
2: Gate	47.00	7	47.00	7
3: Gate	20.00	3	20.00	3
4: Gate	33.00	5	33.00	5
Total	100.00	15	100.00	15



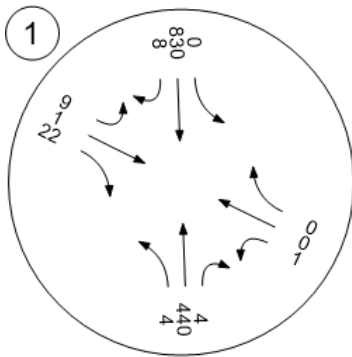
Lane Configuration and Traffic Control



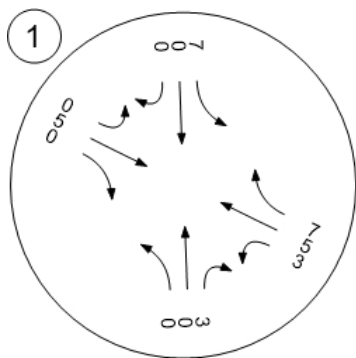
Traffic Volume - Base Volume



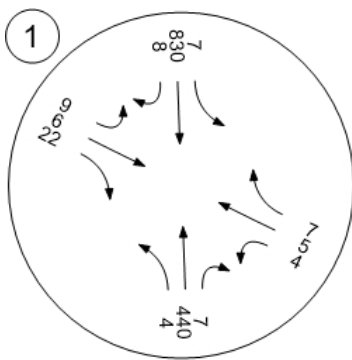
Traffic Volume - Future Background Volume



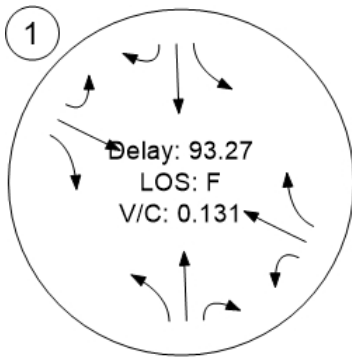
Traffic Volume - Net New Site Trips



Traffic Volume - Future Total Volume



Traffic Conditions



SR 63 at Sandford Avenue - WVR





Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro Scenario 6 6 PM Peak Hour - 2029 Existing + BG + Site

Report File: C:\...\6 LOS - PM Peak Hour - 2029 Existing 10/9/2024
plus BG plus Site - SR 63 at Sandford Avenue 10092024.pdf**Intersection Analysis Summary**

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	SR 63 at Sandford Road	Two-way stop	HCM 6th Edition	WB Thru	0.185	125.8	F

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: SR 63 at Sandford RoadControl Type: Two-way stop
Analysis Method: HCM 6th Edition
Analysis Period: 15 minutesDelay (sec / veh): 125.8
Level Of Service: F
Volume to Capacity (v/c): 0.185**Intersection Setup**

Name												
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	120.00	100.00	100.00	120.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	60.00			60.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			No			No		

Volumes

Name												
Base Volume Input [veh/h]	23	807	0	0	575	12	9	2	12	4	1	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	4.00	7.00	100.00	100.00	7.00	2.00	11.00	71.00	2.00	43.00	83.00	100.00
Growth Factor	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773	1.0773
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	3	7	0	0	0	5	0	3	5	7
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	869	3	7	619	13	10	7	13	7	6	7
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	236	1	2	168	4	3	2	4	2	2	2
Total Analysis Volume [veh/h]	27	945	3	8	673	14	11	8	14	8	7	8
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Priority Scheme	Free	Free	Stop	Stop
Flared Lane			No	No
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance			No	No
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.00	0.02	0.01	0.00	0.11	0.19	0.02	0.13	0.19	0.02
d_M, Delay for Movement [s/veh]	9.17	0.00	0.00	16.04	0.00	0.00	56.09	103.99	25.80	89.92	125.77	41.05
Movement LOS	A	A	A	C	A	A	F	F	D	F	F	E
95th-Percentile Queue Length [veh/ln]	0.09	0.00	0.00	0.07	0.00	0.00	1.22	1.22	1.22	1.26	1.26	1.26
95th-Percentile Queue Length [ft/ln]	2.35	0.00	0.00	1.84	0.00	0.00	30.59	30.59	30.59	31.62	31.62	31.62
d_A, Approach Delay [s/veh]	0.25			0.18			54.85			83.83		
Approach LOS	A			A			F			F		
d_I, Intersection Delay [s/veh]	2.38											
Intersection LOS	F											

SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro Scenario 6 6 PM Peak Hour - 2029 Existing + BG + Site

Report File: C:\...\6 LOS - PM Peak Hour - 2029 Existing 10/9/2024
plus BG plus Site - SR 63 at Sandford Avenue 10092024.pdf**Turning Movement Volume: Detail**

ID	Intersection Name	Volume Type	Northbound			Southbound			Eastbound			Westbound			Total Volume
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
1	SR 63 at Sandford Road	Final Base	23	807	0	0	575	12	9	2	12	4	1	0	1445
		Growth Factor	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	-
		In Process	0	0	0	0	0	0	0	0	0	0	0	0	0
		Net New Trips	0	0	3	7	0	0	0	5	0	3	5	7	30
		Other	0	0	0	0	0	0	0	0	0	0	0	0	0
		Future Total	25	869	3	7	619	13	10	7	13	7	6	7	1586

SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro Scenario 6 6 PM Peak Hour - 2029 Existing + BG + Site

Report File: C:\...\6 LOS - PM Peak Hour - 2029 Existing 10/9/2024
plus BG plus Site - SR 63 at Sandford Avenue 10092024.pdf**Trip Generation summary****Added Trips**

Zone ID: Name	Land Use variables	Code	Ind. Var.	Rate	Quantity	% In	% Out	Trips In	Trips Out	Total Trips	% of Total Trips
1: Industrial Development	---			1.000	0.000	50.00	50.00	15	15	30	100.00
Added Trips Total								15	15	30	100.00

SR 63 at Sandford Avenue - WVR

Vistro File: C:\...\SR 63 at Sandford Avenue 10092024.vistro

Scenario 6 6 PM Peak Hour - 2029 Existing + BG + Site

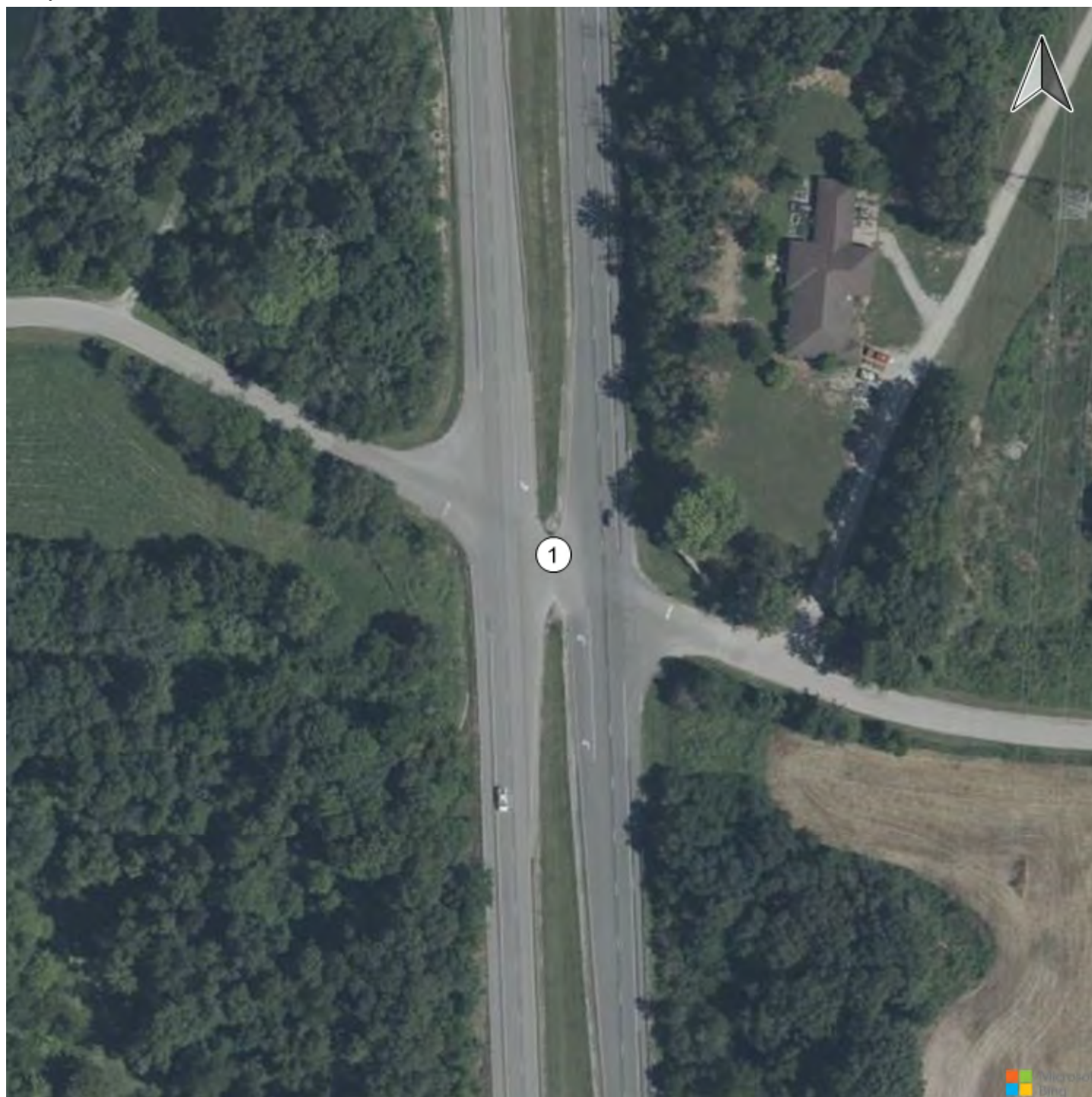
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10/9/2024

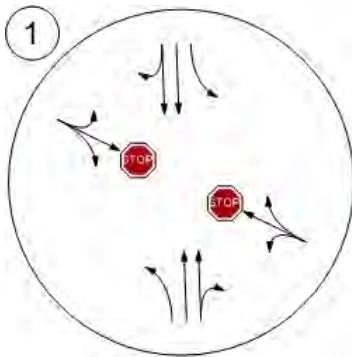
plus BG plus Site - SR 63 at Sandford Avenue 10092024.pdf

Trip Distribution summary

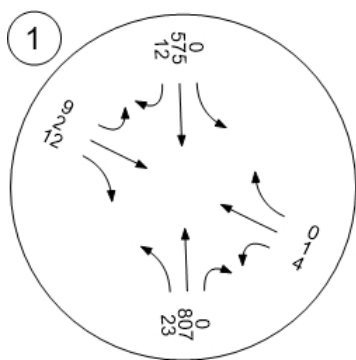
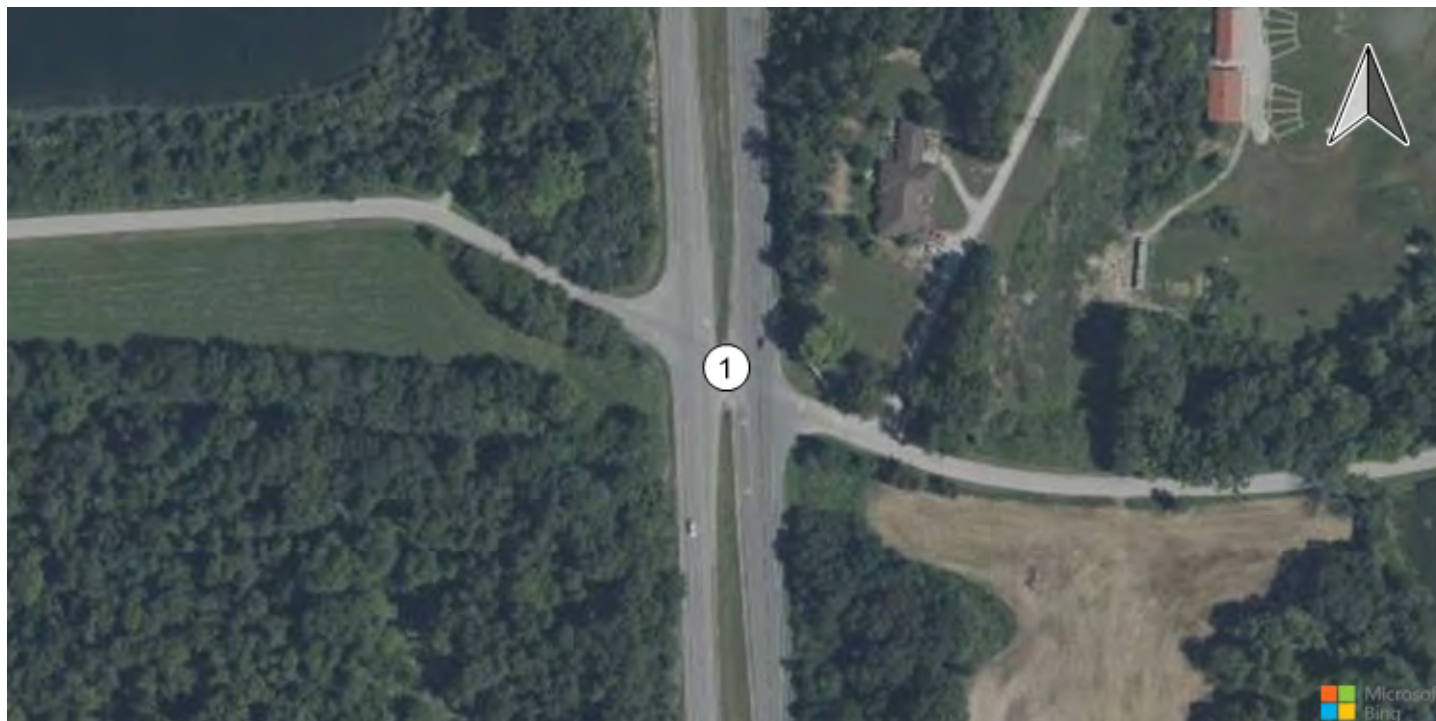
Zone / Gate	Zone 1: Industrial Development			
	To Industrial Development:		From Industrial Development:	
	Share %	Trips	Share %	Trips
2: Gate	47.00	7	47.00	7
3: Gate	20.00	3	20.00	3
4: Gate	33.00	5	33.00	5
Total	100.00	15	100.00	15



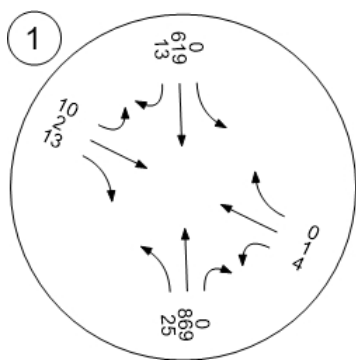
Lane Configuration and Traffic Control



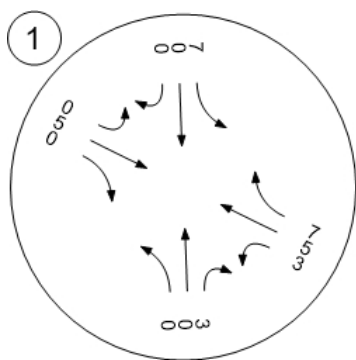
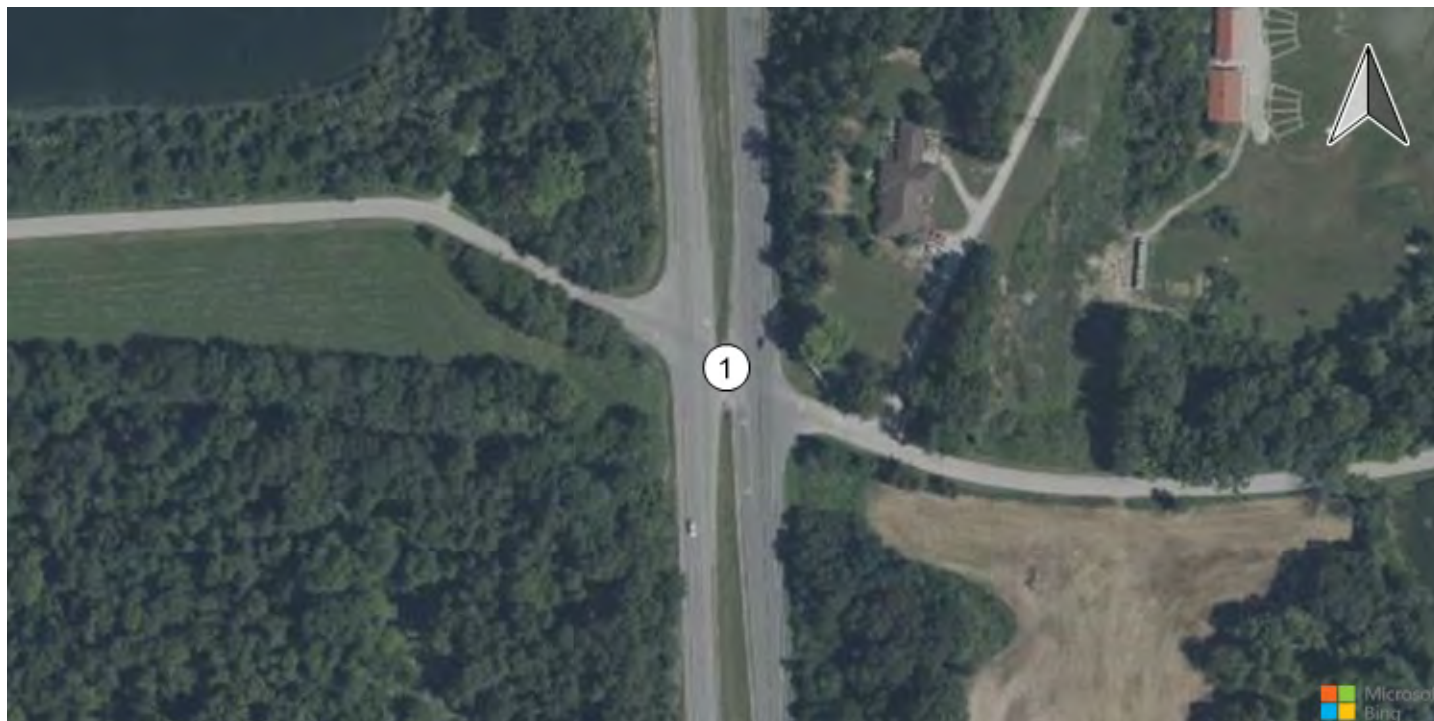
Traffic Volume - Base Volume



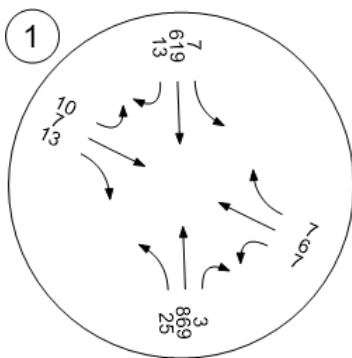
Traffic Volume - Future Background Volume



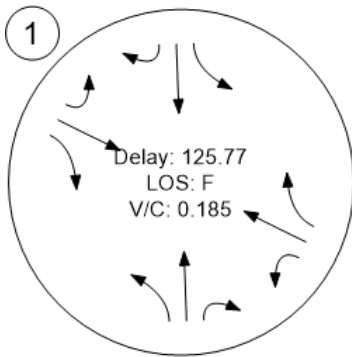
Traffic Volume - Net New Site Trips



Traffic Volume - Future Total Volume



Traffic Conditions



Traffic



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BY CHET SKWARCAN

Traffic Engineering Analysis

SR 63 at Sandford Avenue
West Terre Haute, Indiana

Wabash Valley Resources, LLC
Haul Vehicle Evaluation

Chet M. Skwarczan, P.E., President
Traffic Engineering, Inc.
1965 E. Main Street, Suite 555
Danville, Indiana 46122
October 9, 2024

Certification

I certify this Traffic Analysis has been prepared by me or under my immediate supervision and that I have experience and training in the field of traffic and transportation engineering.



Chet M. Skwarczan, P.E., President
Traffic Engineering, Inc.
10/09/2024



Table of Contents

Executive Summary	4
Existing Traffic Information.....	5
Peak Hour Turning Movements for All Vehicles (Non-trucks plus Trucks)	5
Development Information	6
Trip Generation Details	6
Distribution of New Site Traffic	6
Projected Turning Movements – SR 63 at Sandford Avenue	7
Sight Distance Evaluation – SR 63 at Sandford Avenue	8
Traffic Signal Warrant Summary – SR 63 at Sandford Avenue	9
Level of Service Summary – SR 63 at Sandford Avenue	10
Traffic Signal Warrant Analysis – SR 63 at Sandford Avenue	11
Level of Service Analysis – SR 63 at Sandford Avenue	12
Haul Vehicle Route Turning Analysis	13

Executive Summary

The Wabash Valley Resources facility is located on the east side of SR 63¹, between Sandford Avenue and Bolton Road in West Terre Haute, Indiana. The development forecasts new site truck traffic to access their site via Sandford Avenue at SR 63.

Study scenarios for the AM and PM peak hours:

1. Existing Traffic (2024)
2. Existing Traffic plus Background Growth² (2029)
3. Existing Traffic plus Background Growth (2029) plus Projected Site Truck Traffic (see page 6)

Key Findings:

- **Traffic Signal Warrant Analysis:**

A traffic signal is not warranted for the intersection of SR 63 at Sandford Avenue based on projected traffic volumes³ (see pages 9 & 11).

- **Sight Distance Evaluation:**

Field measurements at the east approach of the intersection of SR 63 and Sandford Avenue indicate that the available intersection sight distance (ISD) may not meet the current design criteria for combination trucks (see page 8). These criteria are established by the American Association of State Highway and Transportation Officials (AASHTO) in *"A Policy on Geometric Design of Highways and Streets, 7th Edition (2018)"*.

Ensuring safety for all road users is essential, especially with the proposed increase in combination truck traffic from the development. Therefore, we recommend that a certified survey be conducted. This survey will accurately determine whether the ISD meets the necessary standards for the specific conditions and expected vehicle types at this location.

Although this intersection is a public facility on a state route—where adequate sight distance is generally presumed—it is prudent to verify compliance with AASHTO guidelines to address any potential safety concerns.

- **Level of Service (LOS) and Vehicle Queuing:**

Both SR 63 approaches at the proposed intersection are projected to operate at an acceptable LOS, with individual turning movements anticipated to perform at LOS "C" or better during both AM and PM peak hours. While multiple Sandford Avenue turning movements are projected to operate below acceptable levels, the maximum queue length is projected to be two vehicles, which is considered acceptable (see pages 10 & 12).

¹ Note: the posted speed limit along SR 63 is 60 mph

² 5 years of background growth at an average annual rate of 1.5%

³ Using projected 2029 turning movements (existing traffic + background growth + projected truck traffic)

Existing Traffic Information

Peak Hour Turning Movements for All Vehicles (Non-trucks plus Trucks)

This analysis focuses on the AM and PM peak hours of a typical weekday:

Weekday Turning Movement Volumes (Peak Hours) SR 63 at Sandford Avenue <i>Week of September 9, 2024</i>													
AM Peak Hour													
Time	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	Total
0715 - 0730	0	166	0	0	0	1	0	103	0	5	1	2	278
0730 - 0745	2	224	0	0	0	0	2	122	1	5	0	2	358
0745 - 0800	4	249	0	0	0	0	2	92	0	5	0	2	354
0800 - 0815	1	131	0	0	0	0	0	91	3	5	0	2	233
Totals	7	770	0	0	0	1	4	408	4	20	1	8	1223
PHF	0.44	0.77	0.00	0.00	0.00	0.25	0.50	0.84	0.33	1.00	0.25	1.00	0.85
% Trucks	0%	5%	0%	0%	0%	0%	0%	13%	0%	5%	0%	0%	8%
PM Peak Hour													
Time	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	Total
1630 - 1645	4	141	0	0	1	1	0	189	3	7	0	0	346
1645 - 1700	3	135	0	0	0	0	0	204	11	1	0	2	356
1700 - 1715	2	138	0	0	0	1	0	199	2	2	2	4	350
1715 - 1730	3	161	0	0	0	2	0	215	7	2	0	3	393
Totals	12	575	0	0	1	4	0	807	23	12	2	9	1445
PHF	0.75	0.89	0.00	0.00	0.25	0.50	0.00	0.94	0.52	0.43	0.25	0.56	0.92
% Trucks	0%	7%	0%	0%	0%	0%	0%	7%	4%	0%	0%	11%	7%



Development Information

Trip Generation Details

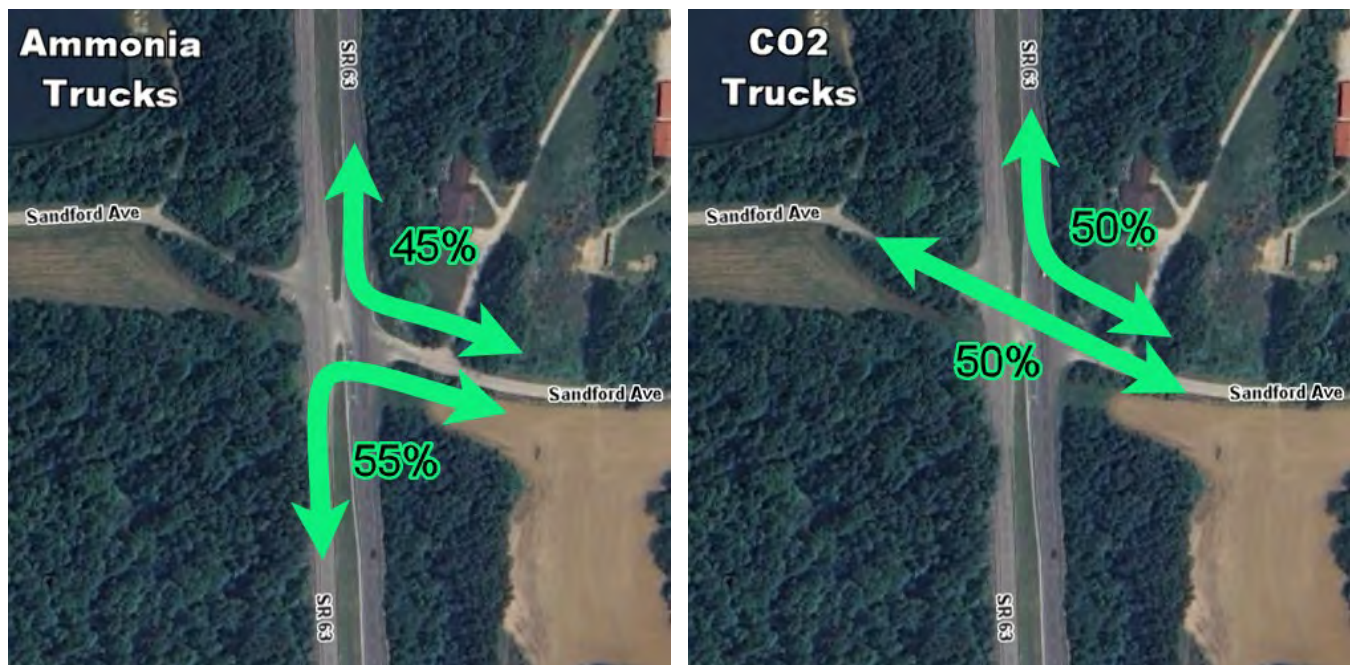
The expected traffic generated by the proposed development is detailed below:

Truck Type	AM Peak Hour		PM Peak Hour	
	Entry	Exit	Entry	Exit
Ammonia	5	5	5	5
CO2	10	10	10	10
Total Trucks	15	15	15	15

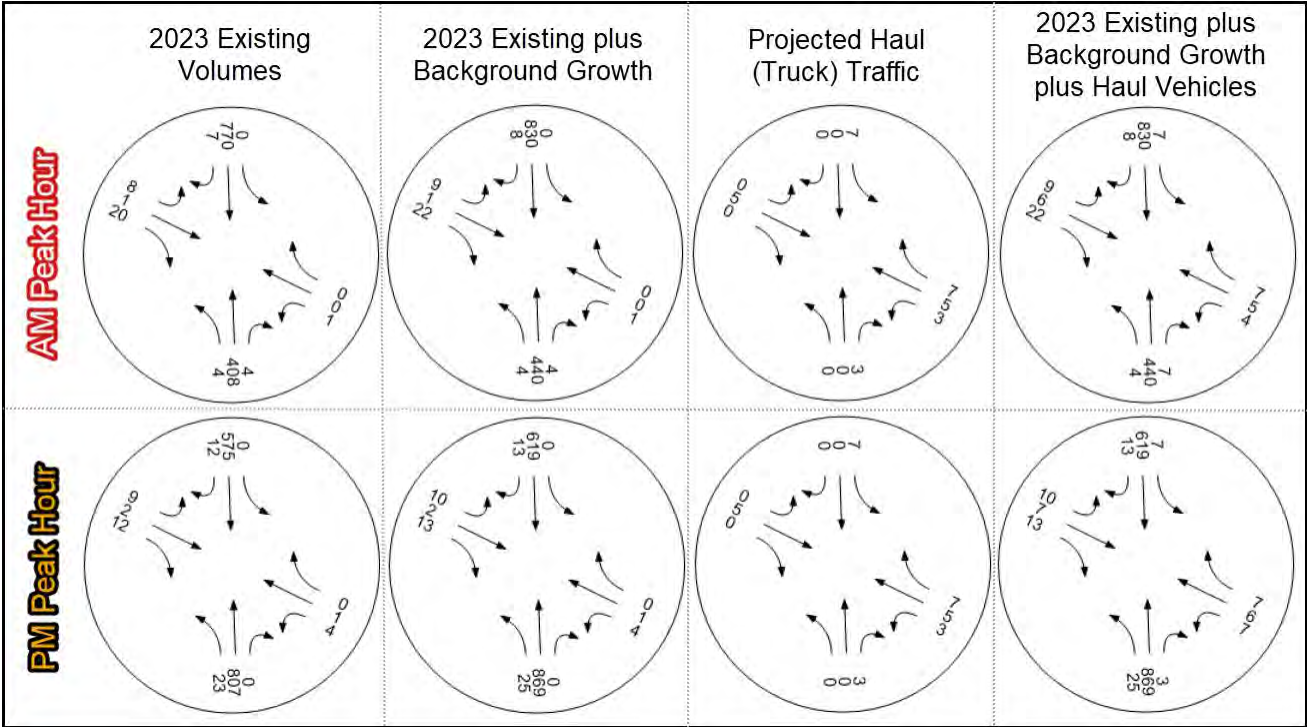
For the ammonia trucking operations, approximately 72 trucks will be loaded per day over a 16-hour period. This equates to an average of 9 trucks per hour turning into and out of Sanford Avenue for ammonia purposes, with 4.5 (rounded up to 5) empty trucks arriving and 4.5 (rounded up to 5) loaded trucks departing each hour. In the CO2 trucking operation, approximately 240 trucks will be loaded per day over a 24-hour period, averaging 10 trucks per hour. Since these trucks are operating in a loop (loaded and unloaded), the total traffic through Sanford Avenue will be 20 trucks per hour.

Distribution of New Site Traffic

The distribution of haul traffic is based on the nature of the proposed development, existing traffic patterns in this area, and projected haul routes (CO2 Trucks). This graphic depicts the overall distribution of haul traffic entering and exiting the proposed development:



Projected Turning Movements – SR 63 at Sandford Avenue



Sight Distance Evaluation – SR 63 at Sandford Avenue

Intersection Sight Distance (ISD) was measured along the major roadway beginning at a point that coincides with the intersection of Sandford Avenue. In this case, the major roadway is SR 63, a divided, two-way, four-lane roadway with dedicated left-turn lanes and a posted speed limit of 60 mph.

In this scenario, the ISD required for a westbound combination truck turning left, right, or crossing straight over SR 63 is calculated as follows:

Maneuver Type	Base Gap Time (seconds)	Northbound Through Lane* (seconds)	Northbound Left-turn Lane (seconds)	Time for Median (seconds)	Southbound Left-turn Lane (seconds)	Southbound Through Lane* (seconds)	Total Time Gap (seconds)	ISD Formula ¹ (ft)
Left-Turn (into near lane)	11.5	0.7	0.7	1.4	0.7	--	15	1323
Left-Turn (into far lane)	11.5	0.7	0.7	1.4	0.7	0.7	15.7	1385
Right-Turn (into near lane)	10.5	--	--	--	--	--	10.5	926
Right-Turn (into far lane)	10.5	0.7	--	--	--	--	11.2	988
Crossing	10.5	0.7	0.7	1.4	0.7	0.7	14.7	1297

¹ ISD=1.47 X 60 X Total Time Gap

*Applicable when more than one through lane.

Based on the average eye height of a combination truck driver (7.6 feet) at the east approach of Sandford Avenue, the ISD looking south exceeds 1,500 feet and looking north is approximately 1,000 feet, along SR 63.

Looking south along SR 63:



Looking north along SR 63:



Traffic Signal Warrant Summary – SR 63 at Sanford Avenue

A traffic signal *is not warranted* for the SR 63 at Sanford Avenue intersection based on projected traffic volumes⁴.

Based on Table 4C-1 of the MUTCD⁵, posted speed limit⁶ > 40 mph, two lanes on the major street approaches, and one lane on each minor street approach, the projected volumes did not warrant consideration of a future traffic signal for any hour of a typical day (eight hours required).

Table 4C-1. Warrant 1, Eight-Hour Vehicular Volume									
Condition A—Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	500	400	350	280	150	120	105	84
2 or more	1	600	480	420	336	150	120	105	84
2 or more	2 or more	600	480	420	336	200	160	140	112
1	2 or more	500	400	350	280	200	160	140	112

Condition B—Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1	1	750	600	525	420	75	60	53	42
2 or more	1	900	720	630	504	75	60	53	42
2 or more	2 or more	900	720	630	504	100	80	70	56
1	2 or more	750	600	525	420	100	80	70	56

^a Basic minimum hourly volume
^b Used for combination of Conditions A and B after adequate trial of other remedial measures
^c May be used when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000
^d May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 40 mph or in an isolated community with a population of less than 10,000

1. Table 4C-1, Condition “A” – a signal is considered warranted when SR 63 exceeds 420 vehicles and either Sanford Avenue approach exceeds 105 vehicles per hour for the same eight (8) hours of a typical day – this threshold was not satisfied for any hours of a projected typical day.
2. Table 4C-1, Condition “B” – a signal is considered warranted when SR 63 exceeds 630 vehicles and either Sanford Avenue approach exceeds 53 vehicles per hour for the same eight (8) hours of a typical day – this threshold was not satisfied for any hours of a projected typical day.

⁴ Using projected 2029 turning movements (existing traffic + background growth + projected truck traffic)

⁵ Manual on Uniform Traffic Control Devices (MUTCD)

⁶ Posted speed limit along SR 63 is 60 mph

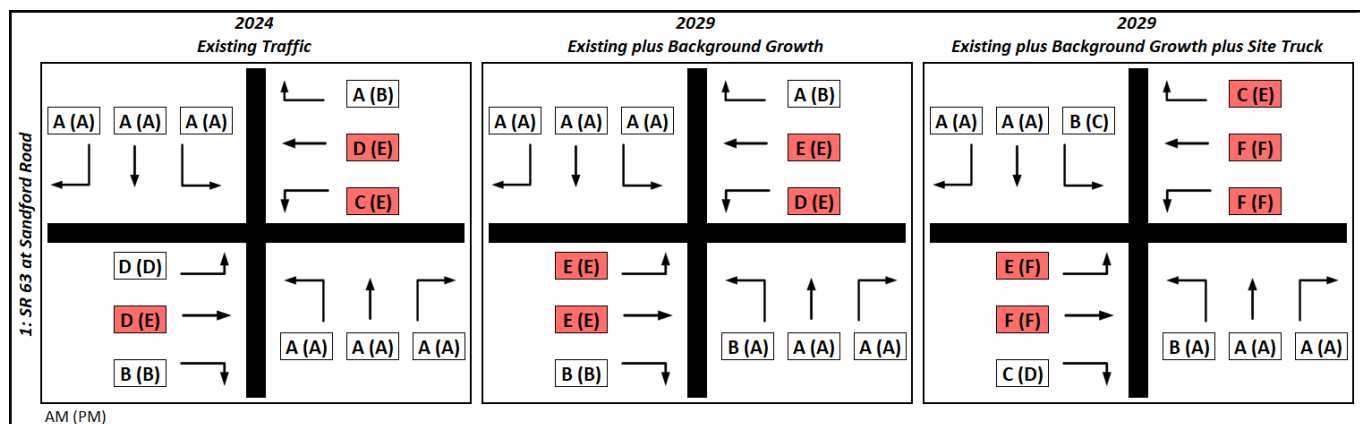
Level of Service Summary – SR 63 at Sandford Avenue

The individual turning movements are provided in terms of Level of Service (LOS). In general, LOS “D” or better is considered acceptable while LOS “E” or “F” suggest volume exceeding the capacity of the intersection, approach, or turning movement:

LOS vs. Delay	
LOS	Unsignalized Intersection
A	<10 seconds
B	10-15 seconds
C	15-25 seconds
D	25-35 seconds
E	35-50 seconds
F	>50 seconds

Source: Federal Highway Administration (FHWA)

All turning movements along SR 63 are projected to operate at an acceptable level of service (LOS) during the peak hours. However, multiple turning movements at both Sandford Avenue approaches are currently operating below acceptable levels, with additional movements expected to degrade further due to background growth and the forecasted increase in site truck traffic.



As shown in the attached LOS analysis, the projected vehicle queuing for all analyzed turning movements during the AM and PM peak hours is not expected to exceed two vehicles.

Traffic Signal Warrant Analysis – SR 63 at Sandford Avenue

[submitted as separate document]

Level of Service Analysis – SR 63 at Sanford Avenue

[submitted as separate document]

Haul Vehicle Route Turning Analysis

[submitted by client as separate document]

Traffic



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BY CHET SKWARCAN

Traffic Signal Warrant Analysis

SR 63 at Sandford Avenue
West Terre Haute, Indiana

Wabash Valley Resources, LLC
Haul Vehicle Evaluation

Chet M. Skwarczan, P.E., President
Traffic Engineering, Inc.
1965 E. Main Street, Suite 555
Danville, Indiana 46122
October 9, 2024

Traffic Signal Warrant Results

Signal Warrant Analysis - Condition "A"										
Time	Major-street (SR 63)				Minor-street (Sandford Avenue)				BOTH Major-street & Minor-street Thresholds Met	Total Vehicles
	Northbound	Southbound	Total	Threshold 420 Vehicles (70%)	Eastbound	Westbound	Greatest Hourly Minor Approach Total	Threshold 105 Vehicles (70%)		
0 - 1	48	50	98	Unsatisfied	5	10	10	Unsatisfied	Unsatisfied	113
1 - 2	30	43	73	Unsatisfied	5	10	10	Unsatisfied	Unsatisfied	88
2 - 3	34	48	82	Unsatisfied	6	10	10	Unsatisfied	Unsatisfied	98
3 - 4	54	66	120	Unsatisfied	6	10	10	Unsatisfied	Unsatisfied	136
4 - 5	100	115	215	Unsatisfied	8	15	15	Unsatisfied	Unsatisfied	238
5 - 6	164	262	426	SATISFIED	19	15	19	Unsatisfied	Unsatisfied	460
6 - 7	305	539	844	SATISFIED	24	15	24	Unsatisfied	Unsatisfied	883
7 - 8	442	833	1275	SATISFIED	39	16	39	Unsatisfied	Unsatisfied	1330
8 - 9	407	594	1001	SATISFIED	29	16	29	Unsatisfied	Unsatisfied	1046
9 - 10	327	482	809	SATISFIED	24	17	24	Unsatisfied	Unsatisfied	850
10 - 11	386	472	858	SATISFIED	13	18	18	Unsatisfied	Unsatisfied	889
11 - 12	408	453	861	SATISFIED	27	19	27	Unsatisfied	Unsatisfied	907
12 - 13	468	448	916	SATISFIED	21	18	21	Unsatisfied	Unsatisfied	955
13 - 14	489	450	939	SATISFIED	29	22	29	Unsatisfied	Unsatisfied	990
14 - 15	549	427	976	SATISFIED	23	20	23	Unsatisfied	Unsatisfied	1019
15 - 16	797	544	1341	SATISFIED	22	20	22	Unsatisfied	Unsatisfied	1383
16 - 17	857	544	1401	SATISFIED	21	21	21	Unsatisfied	Unsatisfied	1443
17 - 18	785	606	1391	SATISFIED	31	20	31	Unsatisfied	Unsatisfied	1442
18 - 19	471	414	885	SATISFIED	19	21	21	Unsatisfied	Unsatisfied	925
19 - 20	429	279	708	SATISFIED	15	17	17	Unsatisfied	Unsatisfied	740
20 - 21	309	271	580	SATISFIED	10	11	11	Unsatisfied	Unsatisfied	601
21 - 22	266	136	402	Unsatisfied	13	11	13	Unsatisfied	Unsatisfied	426
22 - 23	183	136	319	Unsatisfied	7	11	11	Unsatisfied	Unsatisfied	337
23 - 24	97	74	171	Unsatisfied	5	10	10	Unsatisfied	Unsatisfied	186
Totals	8405	8286	16691	16	421	373	465	0	0	17485

Signal Warrant Analysis - Condition "B"										
Time	Major-street (SR 63)				Minor-street (Sandford Avenue)				BOTH Major-street & Minor-street Thresholds Met	Total Vehicles
	Northbound	Southbound	Total	Threshold 630 Vehicles (70%)	Eastbound	Westbound	Greatest Hourly Minor Approach Total	Threshold 53 Vehicles (70%)		
0 - 1	48	50	98	Unsatisfied	5	10	10	Unsatisfied	Unsatisfied	113
1 - 2	30	43	73	Unsatisfied	5	10	10	Unsatisfied	Unsatisfied	88
2 - 3	34	48	82	Unsatisfied	6	10	10	Unsatisfied	Unsatisfied	98
3 - 4	54	66	120	Unsatisfied	6	10	10	Unsatisfied	Unsatisfied	136
4 - 5	100	115	215	Unsatisfied	8	15	15	Unsatisfied	Unsatisfied	238
5 - 6	164	262	426	Unsatisfied	19	15	19	Unsatisfied	Unsatisfied	460
6 - 7	305	539	844	SATISFIED	24	15	24	Unsatisfied	Unsatisfied	883
7 - 8	442	833	1275	SATISFIED	39	16	39	Unsatisfied	Unsatisfied	1330
8 - 9	407	594	1001	SATISFIED	29	16	29	Unsatisfied	Unsatisfied	1046
9 - 10	327	482	809	SATISFIED	24	17	24	Unsatisfied	Unsatisfied	850
10 - 11	386	472	858	SATISFIED	13	18	18	Unsatisfied	Unsatisfied	889
11 - 12	408	453	861	SATISFIED	27	19	27	Unsatisfied	Unsatisfied	907
12 - 13	468	448	916	SATISFIED	21	18	21	Unsatisfied	Unsatisfied	955
13 - 14	489	450	939	SATISFIED	29	22	29	Unsatisfied	Unsatisfied	990
14 - 15	549	427	976	SATISFIED	23	20	23	Unsatisfied	Unsatisfied	1019
15 - 16	797	544	1341	SATISFIED	22	20	22	Unsatisfied	Unsatisfied	1383
16 - 17	857	544	1401	SATISFIED	21	21	21	Unsatisfied	Unsatisfied	1443
17 - 18	785	606	1391	SATISFIED	31	20	31	Unsatisfied	Unsatisfied	1442
18 - 19	471	414	885	SATISFIED	19	21	21	Unsatisfied	Unsatisfied	925
19 - 20	429	279	708	SATISFIED	15	17	17	Unsatisfied	Unsatisfied	740
20 - 21	309	271	580	Unsatisfied	10	11	11	Unsatisfied	Unsatisfied	601
21 - 22	266	136	402	Unsatisfied	13	11	13	Unsatisfied	Unsatisfied	426
22 - 23	183	136	319	Unsatisfied	7	11	11	Unsatisfied	Unsatisfied	337
23 - 24	97	74	171	Unsatisfied	5	10	10	Unsatisfied	Unsatisfied	186
Totals	8405	8286	16691	14	421	373	465	0	0	17485

Note: the posted speed limit along SR 63 is 60 mph

Entering and Exiting Site Traffic Breakdown

Projected Truck Traffic Hourly Volumes		
Time	Entering	Exiting
0 - 1	10	10
1 - 2	10	10
2 - 3	10	10
3 - 4	10	10
4 - 5	15	15
5 - 6	15	15
6 - 7	15	15
7 - 8	15	15
8 - 9	15	15
9 - 10	15	15
10 - 11	15	15
11 - 12	15	15
12 - 13	15	15
13 - 14	15	15
14 - 15	15	15
15 - 16	15	15
16 - 17	15	15
17 - 18	15	15
18 - 19	15	15
19 - 20	15	15
20 - 21	10	10
21 - 22	10	10
22 - 23	10	10
23 - 24	10	10
Totals	320	320

24-Hour Turning Movement Volumes

Existing Traffic

24 Hour Traffic Data - Existing Week of September 9, 2024													
Time	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	Total
0 - 1	0	42	0	0	0	0	0	44	1	0	0	0	87
1 - 2	1	34	0	0	0	0	0	28	0	0	0	0	63
2 - 3	0	40	0	0	0	0	0	31	1	1	0	0	73
3 - 4	0	57	0	0	0	0	0	50	0	1	0	0	108
4 - 5	1	99	0	0	0	0	0	90	0	3	0	0	193
5 - 6	0	236	1	0	0	0	2	147	1	10	0	3	400
6 - 7	0	494	0	0	0	0	1	278	2	14	1	3	793
7 - 8	6	761	0	0	0	1	4	402	2	21	2	8	1207
8 - 9	4	541	0	0	0	1	1	362	12	15	0	7	943
9 - 10	2	438	1	1	0	1	3	289	9	16	0	2	762
10 - 11	0	430	2	1	1	1	2	346	7	4	0	4	798
11 - 12	3	408	3	1	0	3	4	369	3	16	0	5	815
12 - 13	4	406	0	2	1	0	2	422	7	10	3	2	859
13 - 14	2	409	0	4	1	2	4	433	15	17	0	6	893
14 - 15	6	384	0	1	2	2	3	488	16	13	1	3	919
15 - 16	5	493	1	1	1	3	4	705	29	7	1	7	1257
16 - 17	12	486	0	0	1	5	1	773	19	11	0	4	1312
17 - 18	8	548	0	0	1	4	1	707	18	10	2	12	1311
18 - 19	3	375	0	0	1	5	2	418	15	10	0	3	832
19 - 20	5	248	0	0	1	1	0	379	17	6	0	4	661
20 - 21	3	244	0	0	0	1	0	282	5	3	0	2	540
21 - 22	1	121	0	0	1	0	0	242	5	5	0	3	378
22 - 23	0	122	0	0	0	1	0	164	6	1	1	0	295
23 - 24	0	64	0	0	0	0	0	85	5	0	0	0	154
Totals	66	7480	8	11	11	31	34	7534	195	194	11	78	15653

24-Hour Turning Movement Volumes

Existing Traffic plus Background Growth

24 Hour Traffic Data - Existing plus Background Growth													
Time	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	Total
0 - 1	0	45	0	0	0	0	0	47	1	0	0	0	93
1 - 2	1	37	0	0	0	0	0	30	0	0	0	0	68
2 - 3	0	43	0	0	0	0	0	33	1	1	0	0	78
3 - 4	0	61	0	0	0	0	0	54	0	1	0	0	116
4 - 5	1	107	0	0	0	0	0	97	0	3	0	0	208
5 - 6	0	254	1	0	0	0	2	158	1	11	0	3	430
6 - 7	0	532	0	0	0	0	1	299	2	15	1	3	853
7 - 8	6	820	0	0	0	1	4	433	2	23	2	9	1300
8 - 9	4	583	0	0	0	1	1	390	13	16	0	8	1016
9 - 10	2	472	1	1	0	1	3	311	10	17	0	2	820
10 - 11	0	463	2	1	1	1	2	373	8	4	0	4	859
11 - 12	3	440	3	1	0	3	4	398	3	17	0	5	877
12 - 13	4	437	0	2	1	0	2	455	8	11	3	2	925
13 - 14	2	441	0	4	1	2	4	466	16	18	0	6	960
14 - 15	6	414	0	1	2	2	3	526	17	14	1	3	989
15 - 16	5	531	1	1	1	3	4	759	31	8	1	8	1353
16 - 17	13	524	0	0	1	5	1	833	20	12	0	4	1413
17 - 18	9	590	0	0	1	4	1	762	19	11	2	13	1412
18 - 19	3	404	0	0	1	5	2	450	16	11	0	3	895
19 - 20	5	267	0	0	1	1	0	408	18	6	0	4	710
20 - 21	3	263	0	0	0	1	0	304	5	3	0	2	581
21 - 22	1	130	0	0	1	0	0	261	5	5	0	3	406
22 - 23	0	131	0	0	0	1	0	177	6	1	1	0	317
23 - 24	0	69	0	0	0	0	0	92	5	0	0	0	166
Totals	68	8058	8	11	11	31	34	8116	207	208	11	82	16845

Note: 5 years of background traffic growth at an annual rate of 1%

24-Hour Turning Movement Volumes

Projected Truck Traffic

24 Hour Traffic Data - Projected Truck Traffic													
Time	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	Total
0 - 1	0	0	5	5	5	0	0	0	0	0	5	0	20
1 - 2	0	0	5	5	5	0	0	0	0	0	5	0	20
2 - 3	0	0	5	5	5	0	0	0	0	0	5	0	20
3 - 4	0	0	5	5	5	0	0	0	0	0	5	0	20
4 - 5	0	0	7	7	5	3	3	0	0	0	5	0	30
5 - 6	0	0	7	7	5	3	3	0	0	0	5	0	30
6 - 7	0	0	7	7	5	3	3	0	0	0	5	0	30
7 - 8	0	0	7	7	5	3	3	0	0	0	5	0	30
8 - 9	0	0	7	7	5	3	3	0	0	0	5	0	30
9 - 10	0	0	7	7	5	3	3	0	0	0	5	0	30
10 - 11	0	0	7	7	5	3	3	0	0	0	5	0	30
11 - 12	0	0	7	7	5	3	3	0	0	0	5	0	30
12 - 13	0	0	7	7	5	3	3	0	0	0	5	0	30
13 - 14	0	0	7	7	5	3	3	0	0	0	5	0	30
14 - 15	0	0	7	7	5	3	3	0	0	0	5	0	30
15 - 16	0	0	7	7	5	3	3	0	0	0	5	0	30
16 - 17	0	0	7	7	5	3	3	0	0	0	5	0	30
17 - 18	0	0	7	7	5	3	3	0	0	0	5	0	30
18 - 19	0	0	7	7	5	3	3	0	0	0	5	0	30
19 - 20	0	0	7	7	5	3	3	0	0	0	5	0	30
20 - 21	0	0	5	5	5	0	0	0	0	0	5	0	20
21 - 22	0	0	5	5	5	0	0	0	0	0	5	0	20
22 - 23	0	0	5	5	5	0	0	0	0	0	5	0	20
23 - 24	0	0	5	5	5	0	0	0	0	0	5	0	20
Totals	0	0	152	152	120	48	48	0	0	0	120	0	640

24-Hour Turning Movement Volumes

Existing Traffic plus Background Growth plus Projected Truck Traffic

24 Hour Traffic Data													
Existing plus Background Growth plus Projected Truck Traffic													
Time	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL	Total
0 - 1	0	45	5	5	5	0	0	47	1	0	5	0	113
1 - 2	1	37	5	5	5	0	0	30	0	0	5	0	88
2 - 3	0	43	5	5	5	0	0	33	1	1	5	0	98
3 - 4	0	61	5	5	5	0	0	54	0	1	5	0	136
4 - 5	1	107	7	7	5	3	3	97	0	3	5	0	238
5 - 6	0	254	8	7	5	3	5	158	1	11	5	3	460
6 - 7	0	532	7	7	5	3	4	299	2	15	6	3	883
7 - 8	6	820	7	7	5	4	7	433	2	23	7	9	1330
8 - 9	4	583	7	7	5	4	4	390	13	16	5	8	1046
9 - 10	2	472	8	8	5	4	6	311	10	17	5	2	850
10 - 11	0	463	9	8	6	4	5	373	8	4	5	4	889
11 - 12	3	440	10	8	5	6	7	398	3	17	5	5	907
12 - 13	4	437	7	9	6	3	5	455	8	11	8	2	955
13 - 14	2	441	7	11	6	5	7	466	16	18	5	6	990
14 - 15	6	414	7	8	7	5	6	526	17	14	6	3	1019
15 - 16	5	531	8	8	6	6	7	759	31	8	6	8	1383
16 - 17	13	524	7	7	6	8	4	833	20	12	5	4	1443
17 - 18	9	590	7	7	6	7	4	762	19	11	7	13	1442
18 - 19	3	404	7	7	6	8	5	450	16	11	5	3	925
19 - 20	5	267	7	7	6	4	3	408	18	6	5	4	740
20 - 21	3	263	5	5	5	1	0	304	5	3	5	2	601
21 - 22	1	130	5	5	6	0	0	261	5	5	5	3	426
22 - 23	0	131	5	5	5	1	0	177	6	1	6	0	337
23 - 24	0	69	5	5	5	0	0	92	5	0	5	0	186
Totals	68	8058	160	163	131	79	82	8116	207	208	131	82	17485

Note: 5 years of background traffic growth at an annual rate of 1.5%

APPENDIX G MITIGATON ACTION PLAN

This Mitigation Action Plan identifies mitigation measures applicable to the Project, for the construction and operation of the Project for the production of ammonia and hydrogen, and the capture, transport, and sequestration of CO₂. This Mitigation Action Plan for the Proposed Action (as defined in Chapter 2 of this EA) includes integral elements and commitments made in the EA to mitigate potential adverse environmental impacts. The Proposed Action includes commitments by Wabash Valley Resources, LLC (WVR) to refine and implement the Project Transportation Plan and develop and implement a Noise Plan. The Transportation Plan will cover both the construction and operation of the Project, accounting for both construction and operational workforce transportation as well as the shipments of supplies, raw materials, products, wastes, and CO₂. The Transportation Plan and Noise Plan will be incorporated into the construction and operation of the Project to mitigate potential safety, noise, road maintenance, and traffic impacts associated with the Project.

As part of the Transportation Plan, WVR has allocated up to \$5,000,000 for implementation of future transportation-related measures to mitigate any adverse impacts.

As part of the consultations with Indiana State and County officials, WVR will provide the following to such State and County officials:

- Updated traffic analyses and level-of-service analyses that address the construction and operational phases of the Project accounting for various operational conditions (e.g., all CO₂ shipments directed to a single Injection Well Site). The traffic analyses and level-of-service analyses will account for the deliveries of materials and shipment of products and CO₂ from the Wabash Facility as well as the construction and operational workforce associated with the Project.
- Updated equivalent single-axle loads (ESALs) evaluations and annual values associated with the truck traffic supporting Project operations, including CO₂ transport trucks and product (ammonia) transport trucks.
- A review of the access road to the Wabash Facility (West Sanford Avenue) to ensure that the access road can adequately support the construction and operation of the Project.
- A review of the paved and unpaved Vigo County and Vermillion County roads to ensure that they can adequately and safely support the construction and operation of the Project, as well as prepare an applicable ESAL analyses for the paved and gravel county roads to identify any applicable upgrade and/or maintenance measures.
- In coordination with local emergency responders, WVR will develop response, coordination, and training plans for potential trucking incidents involving both CO₂ and ammonia.

The Noise Plan will cover both the construction and operation of the Project to include shipments of supplies, raw materials, products, waste, and CO₂. The Noise Plan will be incorporated into the construction and operation of the Project to mitigate potential noise impacts associated with the Project. As part of the consultations with Indiana State and County officials, WVR will provide the following to such State and County officials:

- Review of applicability of Indiana Code Title 13. Environment Article 17. Air Pollution Control Chapter 3. Powers and Duties Concerning Air Pollution Control 13-17-3-15. Rules and Standards Limiting Noise Emission (IN Code §13-17-3-15 (2024)) and other potentially applicable State noise related ordinances.
- Review of applicability of County noise ordinances (e.g., Vigo County Chapter 53, Excessive Noise, Disturbance Prohibited; Chapter 20 Road Crossings - Temporary Road Closing; and Vermillion County Unified Development Ordinance, Article 5.23 G. Noise Pollution), that may be applicable to the noise associated with the construction and operation of the Project.

- Identification of potential noise reduction measures that WVR could implement to address any potential adverse impacts.
- A Final Noise Plan that addresses applicable noise-related authorizations, ordinances, agreements, and/or approvals associated with the construction and operation of the Project.

WVR will provide LPO with an initial approach and schedule for the development of any additional studies and information regarding the Transportation Plan and the Noise Plan.

WVR will provide LPO with updates on the development of any additional studies and information and will include LPO on correspondence to and from the State and County officials to include any reports and information submitted.

WVR will notify and invite LPO to participate in discussions with State and County officials regarding the Transportation Plan and the Noise Plan.

WVR will provide LPO with summaries of the outcomes of consultations conducted with State and County officials regarding the Transportation Plan and the Noise Plan.

WVR will provide LPO with any final concurrence, approvals, and/or resolutions reached between WVR and the State and County officials.

WVR will provide Mitigation Action Plan status reports within 3 months after closure of DOE's loan guarantee and continue at a frequency to be established between LPO and WVR

If you have questions about this Mitigation Action Plan, contact the LPO NEPA document manager for the environmental review, Whitney Donoghue (LPO_environmental@hq.doe.gov). LPO may amend this Mitigation Action Plan if revisions are necessary due to new information or Project adjustments.