APPENDIX E

Red Flag Investigation

DLZ
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

Date: December 23, 2019

To: Site Assessment & Management
Environmental Policy Office - Environmental Services Division
Indiana Department of Transportation
100 N Senate Avenue, Room N642
Indianapolis, IN 46204

From: DLZ Indiana, LLC
2211 E Jefferson Blvd.
South Bend, IN, 46615

Re: RED FLAG INVESTIGATION
DES 1702957, Local Project
Vernal Pike Connector Road
Monroe County, Indiana

Note: The original RFI was prepared before the study limits were expanded to include the portion of the Profile Parkway project. Re-coordination with INDOT SAM provided guidance to utilize the original RFI and discuss the expanded project limits in the CE text. As a result, the RFI graphics do not show the expanded project study limits.

PROJECT DESCRIPTION

Brief Description of Project:

The proposed project includes the extension of Sunrise Greeting Court south to Profile Parkway, connecting West Vernal Pike to Profile Parkway via a railroad overpass. The project will include road and bridge construction on a new alignment over CSX Railroad (operated by Indiana Railroad), with a total project length of approximately 0.45 miles. The typical roadway section will consist of two 12-foot lanes with 8-inch concrete curb and gutter, a 5-foot sidewalk on the west side and a 10-foot Multiuse path on the east side of the proposed roadway, along with 3-foot bike lanes adjacent to the travel lanes. Retaining walls may be incorporated at the fill slopes of the railroad overpass bridge to optimize earth embankment cost and right-of-way. The proposed road construction will tie into the existing roadway section of Sunrise Greeting Court at the existing Cul-de-Sac, approximately 830 feet south of West Vernal Pike. Construction of the 10-foot Multiuse path will continue along the east side of Sunrise Greeting Court and will extend to West Vernal Pike. An eastbound right turn lane from West Vernal Pike to Sunrise Greeting Court may also be constructed along with a new traffic signal at the intersection of West Vernal Pike and Sunrise Greeting Court.
The project area north of the railroad tracks will be connected to existing storm sewers. The project area south of the railroad tracks will be connected to the new Profile Parkway storm sewer system.

Bridge and/or Culvert Project: Yes ☐ No ☒ Structure # _____
If this is a bridge project, is the bridge Historical? Yes ☐ No ☒ , Select ☐ Non-Select ☐
(Note: If the project involves a historical bridge, please include the bridge information in the Recommendations Section of the report).

Proposed right of way: Temporary ☒ # Acres >0.5 Permanent ☒ # Acres >0.5 , Not Applicable ☐
Type of excavation: Three (3) foot deep excavation for new bridge construction, four (4) foot deep excavation for new sewer.
Maintenance of traffic: Majority of the project will be new construction. Traffic will be maintained during construction of the connections to Vernal Pike and Profile Parkway .
Work in waterway: Yes ☐ No ☒ Below ordinary high water mark: Yes ☐ No ☒
State Project: ☐ LPA: ☒
Any other factors influencing recommendations: N/A

INFRASTRUCTURE TABLE AND SUMMARY

Infrastructure Indicate the number of items of concern found within the 0.5 mile search radius. If there are no items, please indicate N/A:			
Religious Facilities	**N/A**	Recreational Facilities	**N/A**
Airports[1]	**1**	Pipelines	**5**
Cemeteries	**N/A**	Railroads	**3**
Hospitals	**N/A**	Trails	**4**
Schools	**N/A**	Managed Lands	**N/A**

[1]In order to complete the required airport review, a review of public airports within 3.8 miles (20,000 feet) is required.

Explanation:

Airports
One (1) airport is within the 3.8-mile airport search radius. Monroe Airport, located approximately 2.41 miles southwest of the project area, is a public airport. Coordination with INDOT Aviation will occur.

Pipelines
Five (5) pipeline segments are within the 0.5-mile search radius. The nearest is approximately 0.13 mile south of the project area. No impact is anticipated.

Railroads
Three (3) railroad segments are within the 0.5-mile search radius. Two of these segments, both operated by Indiana Rail Road Company, intersect the southern project area. Coordination with Indiana Rail Road Company will occur.

Trails
Four (4) trail segments are within the 0.5-mile search radius. Two (2) potential segments of the Stinesville/Elletsville Greenway, managed by the Monroe County Plan Commission, are intersected by the project area. In addition, the Vernal Pike Sidepath is located on the north side of West Vernal Pike, which is adjacent to the project area. Coordination with Monroe County Commissioners will occur.

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WATER RESOURCES TABLE AND SUMMARY

Water Resources Indicate the number of items of concern found within the 0.5 mile search radius. If there are no items, please indicate N/A:			
NWI - Points	**1**	Canal Routes - Historic	**N/A**
Karst Springs	**3**	NWI - Wetlands	**3**
Canal Structures – Historic	**N/A**	Lakes	**7**
NPS NRI Listed	**N/A**	Floodplain - DFIRM	**N/A**
NWI-Lines	**1**	Cave Entrance Density	**1**
IDEM 303d Listed Streams and Lakes (Impaired)	**N/A**	Sinkhole Areas	**2**
Rivers and Streams	**3**	Sinking-Stream Basins	**1**

Explanation:

NWI Points
One (1) NWI Point is within the 0.5-mile search radius. It is approximately 0.25 mile northeast of the project area. No impact is anticipated.

Karst Springs
Three (3) karst springs are within the 0.5-mile search radius. The nearest is approximately 0.26 mile northwest of the project area. No impact is anticipated.

NWI-Lines
One (1) NWI line is within the 0.5-mile search radius. Its nearest point is approximately 0.48 mile north of the project area. No impact is anticipated.

Rivers and Streams
Three (3) stream segments are within the 0.5-mile search radius. The nearest is approximately 0.18 mile west of the project area. No impact is anticipated.

NWI-Wetlands
Three (3) wetlands are within the 0.5-mile search radius. The nearest is approximately 0.13 mile northwest of the project area. No impact is anticipated.

Lakes
Seven (7) lake polygons are within the 0.5-mile search radius. The nearest is approximately 0.1 mile east of the project area. No impact is anticipated.

Cave Entrance Density
One (1) cave entrance density polygon is within the 0.5-mile search radius, approximately 0.31 mile west of the project area. No impact is anticipated.

Sinkhole Areas

Two (2) sinkhole area polygons are within the 0.5-mile search radius.

Sinking Stream Basins

One (1) sinking stream basin polygon is within the 0.5-mile search radius and is within the project area. The southern section of the project area is within a sinking-stream basin polygon. Coordination with the appropriate agency will occur.

URBANIZED AREA BOUNDARY SUMMARY

Explanation:

The project lies within the Monroe County MS4 UAB. Post construction Storm Water Quality Best Management Practices (BMPs) may need to be considered. An early coordination letter with topographic and aerial maps showing the project area should be sent to the Monroe County MS4 Coordinator at 501 N. Morton Street, Suite 216, Bloomington, IN, 47404.

MINING AND MINERAL EXPLORATION TABLE AND SUMMARY

Mining/Mineral Exploration Indicate the number of items of concern found within the 0.5 mile search radius. If there are no items, please indicate N/A:			
Petroleum Wells	**N/A**	Mineral Resources	**N/A**
Mines – Surface	**N/A**	Mines – Underground	**N/A**

Explanation:

No mining or mineral exploration resources were identified within the 0.5-mile search radius.

HAZARDOUS MATERIAL CONCERNS TABLE AND SUMMARY

Hazardous Material Concerns Indicate the number of items of concern found within the 0.5 mile search radius. If there are no items, please indicate N/A:			
Superfund	**N/A**	Manufactured Gas Plant Sites	**N/A**
RCRA Generator/ TSD	**7**	Open Dump Waste Sites	**N/A**
RCRA Corrective Action Sites	**N/A**	Restricted Waste Sites	**N/A**
State Cleanup Sites	**N/A**	Waste Transfer Stations	**N/A**
Septage Waste Sites	**N/A**	Tire Waste Sites	**N/A**
Underground Storage Tank (UST) Sites	**2**	Confined Feeding Operations (CFO)	**N/A**
Voluntary Remediation Program	**N/A**	Brownfields	**1**
Construction Demolition Waste	**N/A**	Institutional Controls	**1**
Solid Waste Landfill	**N/A**	NPDES Facilities	**7**
Infectious/Medical Waste Sites	**N/A**	NPDES Pipe Locations	**N/A**
Leaking Underground Storage (LUST) Sites	**3**	Notice of Contamination Sites	**N/A**

Explanation:

RCRA Generator/TSD
Seven (7) RCRA Generator/TSD Sites are within the 0.5-mile search radius. Two are in close proximity to the project area.

Sunrise Publications, located at 3963 W Vernal Pike, Agency Interest ID 12198, is located at the north end of the project area. Sunrise Greetings was listed as a Conditionally Exempt Small Quantity Generator in 2004. No reports of releases exist in the Virtual File Cabinet. No impact is anticipated.

ATR Coil Company Incorporated, located at 3895 W Vernal Pike, Agency Interest ID 40646, is approximately 0.02 mile east of the project area. This facility is no longer in business. No impact is anticipated.

Underground Storage Tanks

Two (2) underground storage tanks are within the 0.5-mile search radius. The nearest is approximately 0.38 mile southwest of the project area. No impact is anticipated.

Leaking Underground Storage Tanks
Three (3) LUST sites are within the 0.5-mile search radius. The nearest is approximately 0.33 mile east of the project area. No impact is anticipated.

Institutional Controls
A site with an Environmental Restrictive Covenant is approximately 0.38 mile southwest of the project area. No impact is anticipated.

NPDES Facilities
Seven (7) NPDES facilities are within the 0.5-mile search radius. The nearest is approximately 0.07 mile east of the project area. No impact is anticipated.

Brownfields
One (1) Brownfield site is located 0.38 mile southwest of the project area. No impact is anticipated.

ECOLOGICAL INFORMATION SUMMARY

The Monroe County listing of the Indiana Natural Heritage Data Center information on endangered, threatened, or rare (ETR) species and high-quality natural communities is attached with ETR species highlighted. A preliminary review of the Indiana Natural Heritage Database by INDOT Environmental Services did not indicate the presence of ETR species within the 0.5 mile search radius.

A review of USFWS database did not indicate the presence of endangered bat species in or within 0.5-mile of the project area. The range-wide programmatic consultation for the Indiana Bat and Northern Long-eared Bat will be completed according to the most recent "Using the USFWS's IPaC System for Listed Bat Consultation for INDOT Projects".

An inquiry using the USFWS Information for Planning and Consultation (IPaC) website did not indicate the presence of the federally endangered species, the Rusty Patched Bumble Bee, in or within 0.5-mile of the project area. No impact is anticipated.

RECOMMENDATIONS SECTION

Include recommendations from each section. If there are no recommendations, please indicate N/A.

INFRASTRUCTURE:

Airports: Monroe County Airport, located approximately 2.41 miles southwest of the project area, is a public airport. Coordination with INDOT Aviation will occur.

Railroads: Two railroad segments, both operated by Indiana Rail Road Company, intersect the southern project area. Coordination with Indiana Rail Road Company will occur.

Trails: Two (2) potential segments of the Stinesville/Elletsville Greenway, managed by the Monroe County Plan Commission, are intersected by the project area. In addition, the Vernal Pike Sidepath is located on the north side of West Vernal Pike, which is adjacent to the project area. Coordination with Monroe County Commissioners will occur.

WATER RESOURCES:

Sinking-Stream Basin: The southern section of the project area is within a sinking-stream basin polygon. Coordination with the appropriate agency will occur.

URBANIZED AREA BOUNDARY:

The project lies within the Monroe County MS4 UAB. Post construction Storm Water Quality Best Management Practices (BMPs) may need to be considered. An early coordination letter with topographic and aerial maps showing the project area should be sent to the Monroe County MS4 Coordinator at 501 N. Morton Street, Suite 216, Bloomington, IN, 47404.

MINING/MINERAL EXPLORATION: N/A

HAZMAT CONCERNS: N/A

ECOLOGICAL INFORMATION:

Coordination with USFWS and IDNR will occur. The range-wide programmatic consultation for the Indiana Bat and Northern Long-eared Bat will be completed according to the most recent "Using the USFWS's IPaC System for Listed Bat Consultation for INDOT Projects".

INDOT Environmental Services concurrence: Marlene Mathas Digitally signed by Marlene Mathas Date: 2020.01.14 14:54:54 -05'00' (Signature)

Prepared by:
Isaac Miller
Civil Engineer
DLZ Indiana, LLC

Graphics:

A map for each report section with a 0.5 mile search radius buffer around all project area(s) showing all items identified as possible items of concern is attached. If there is not a section map included, please change the YES to N/A:

SITE LOCATION: YES

INFRASTRUCTURE: YES

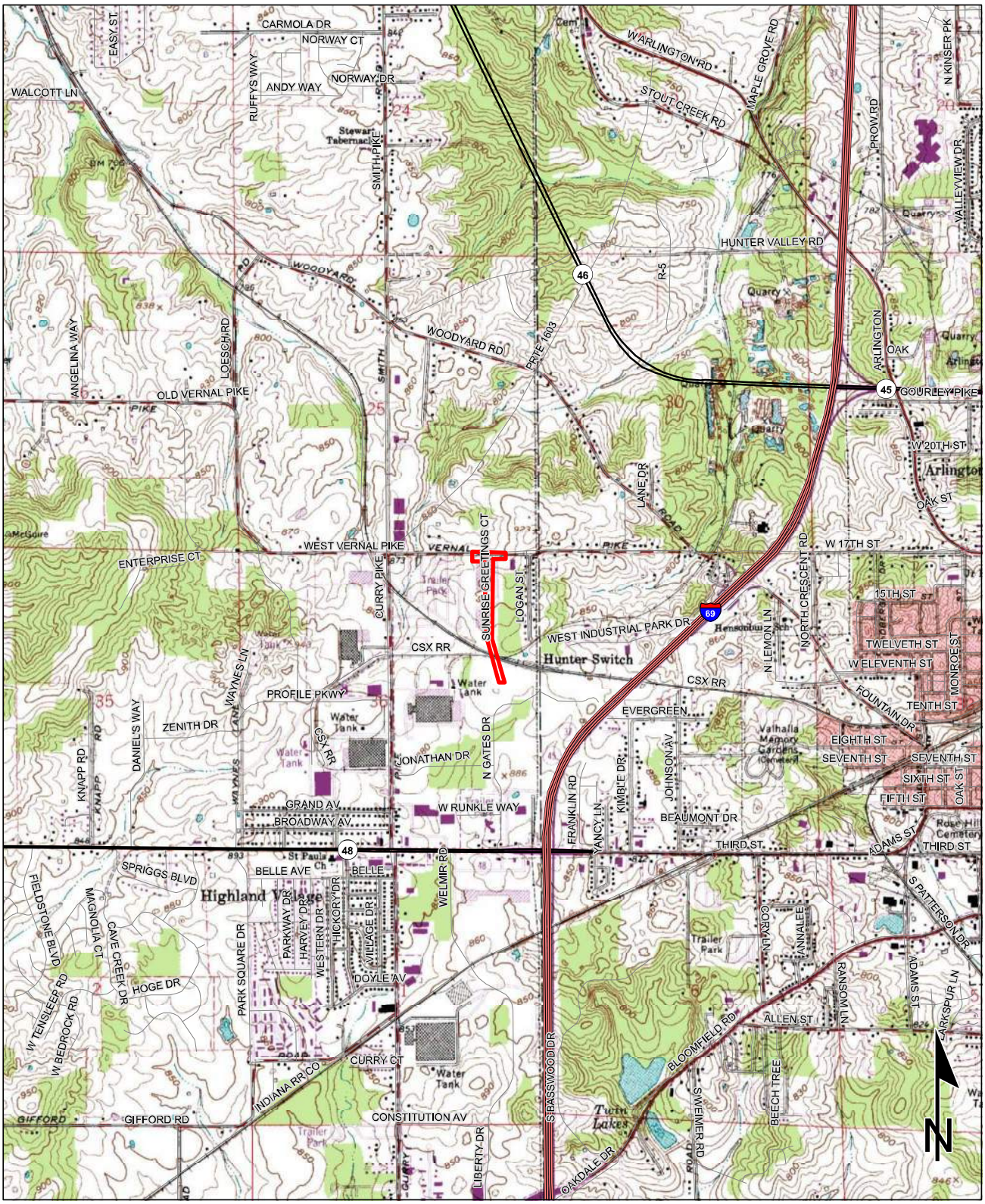
WATER RESOURCES: YES

URBANIZED AREA BOUNDARY: YES

MINING/MINERAL EXPLORATION: N/A

HAZMAT CONCERNS: YES

Red Flag Investigation - Site Location
Vernal Pike Connector Road
Des. No. 1702957 New Road Construction
Monroe County, Indiana



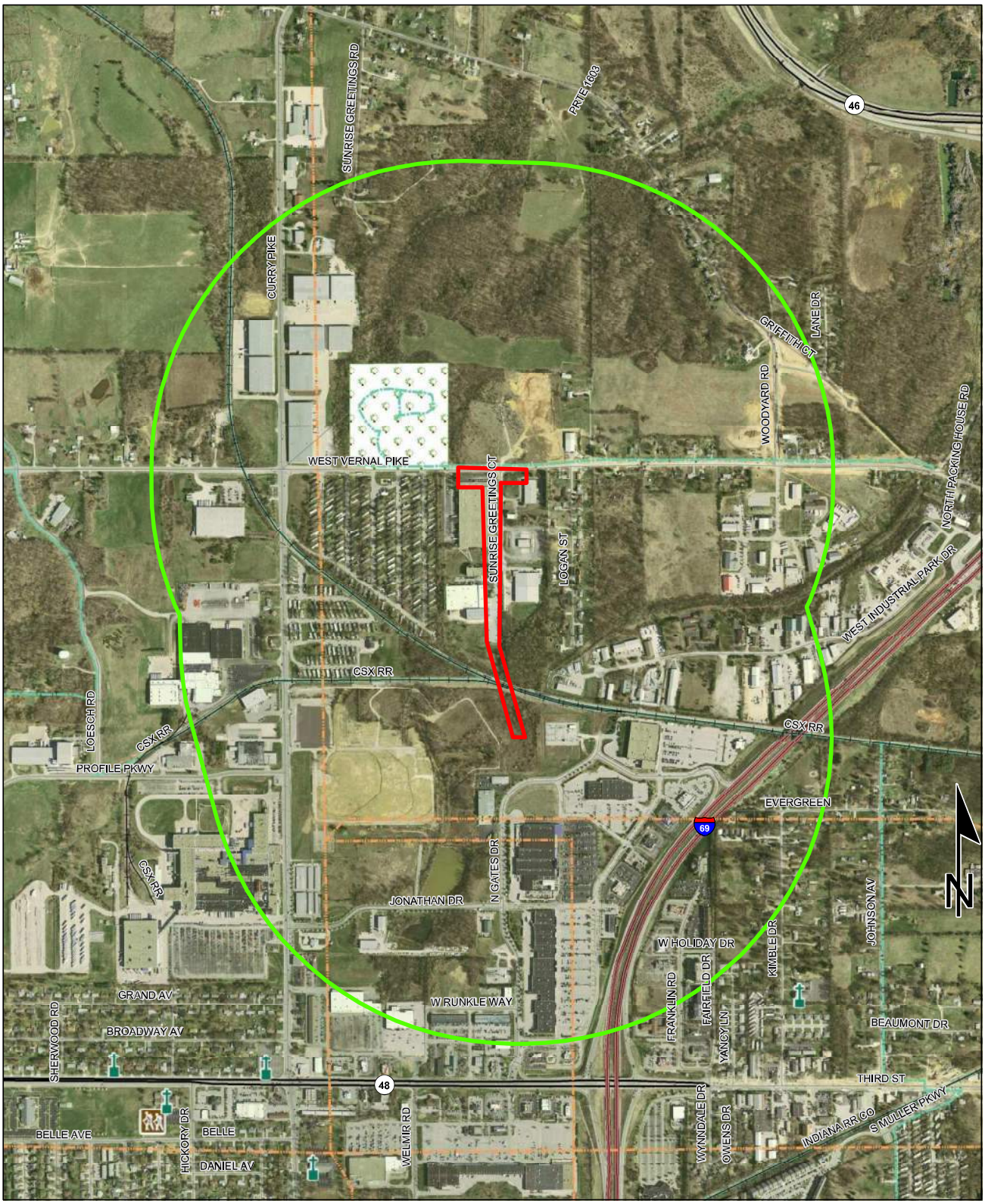
Sources:
Non Orthophotography Data - Obtained from the State of Indiana Geographical Information Office Library
Orthophotography - Obtained from Indiana Map Framework Data (www.indianamap.org)
Map Projection: UTM Zone 16 N **Map Datum:** NAD83

0.4 0.2 0 0.4 Miles

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

BLOOMINGTON QUADRANGLE
INDIANA
7.5 MINUTE SERIES
(TOPOGRAPHIC)

Red Flag Investigation - Infrastructure
Vernal Pike Connector Road
Des. No. 1702957 New Road Construction
Monroe County, Indiana



0.2 0.1 0 0.2 Miles

Sources:
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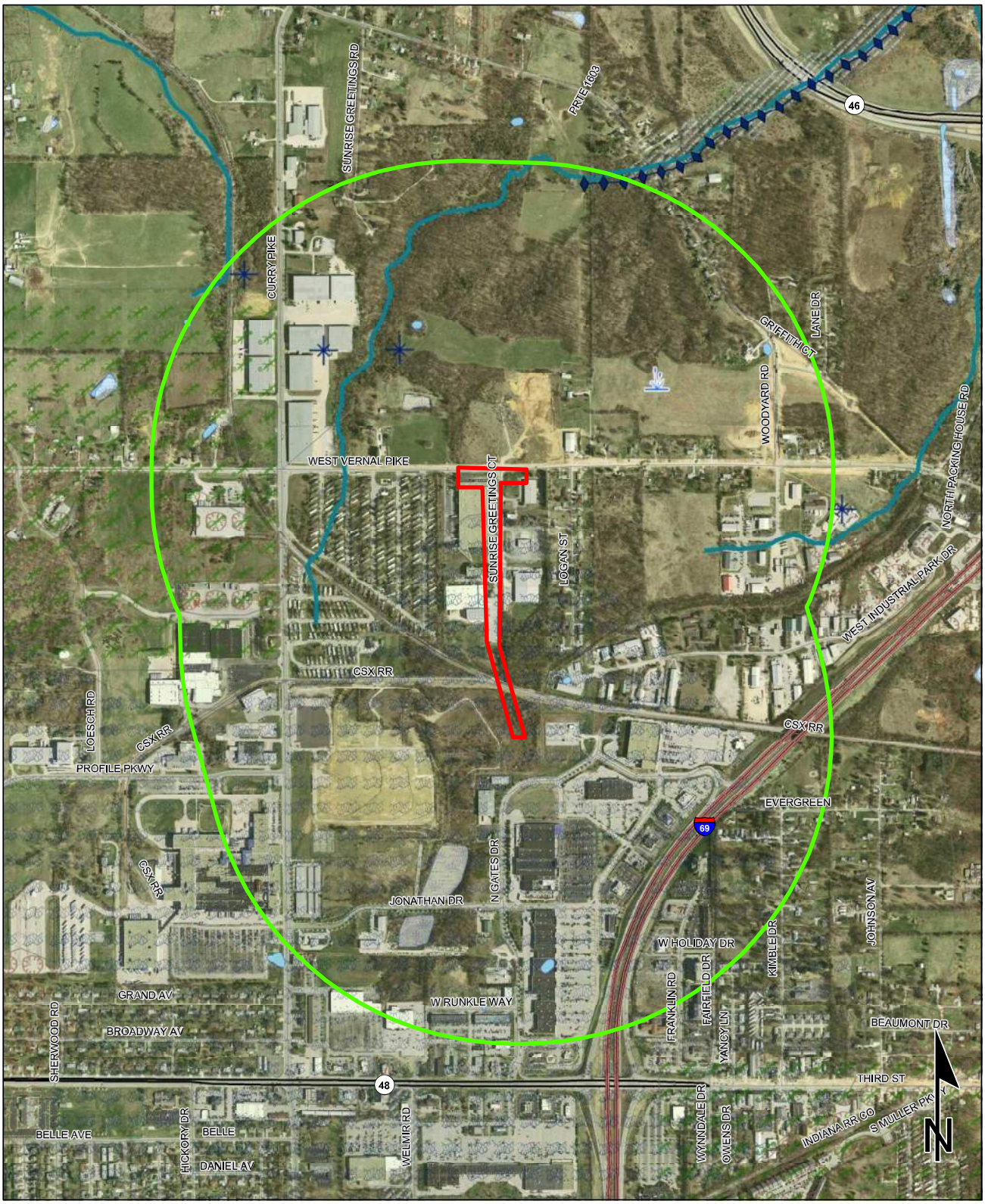
- Religious Facility
- Airport
- Cemeteries
- Hospital
- School
- Recreation Facility
- Pipeline
- Railroad
- Trails
- Managed Lands
- County Boundary
- Project Area
- Half Mile Radius
- Toll
- Interstate
- State Route
- US Route
- Local Road

Red Flag Investigation - Water Resources
Vernal Pike Connector Road
Des. No. 1702957 New Road Construction
Monroe County, Indiana



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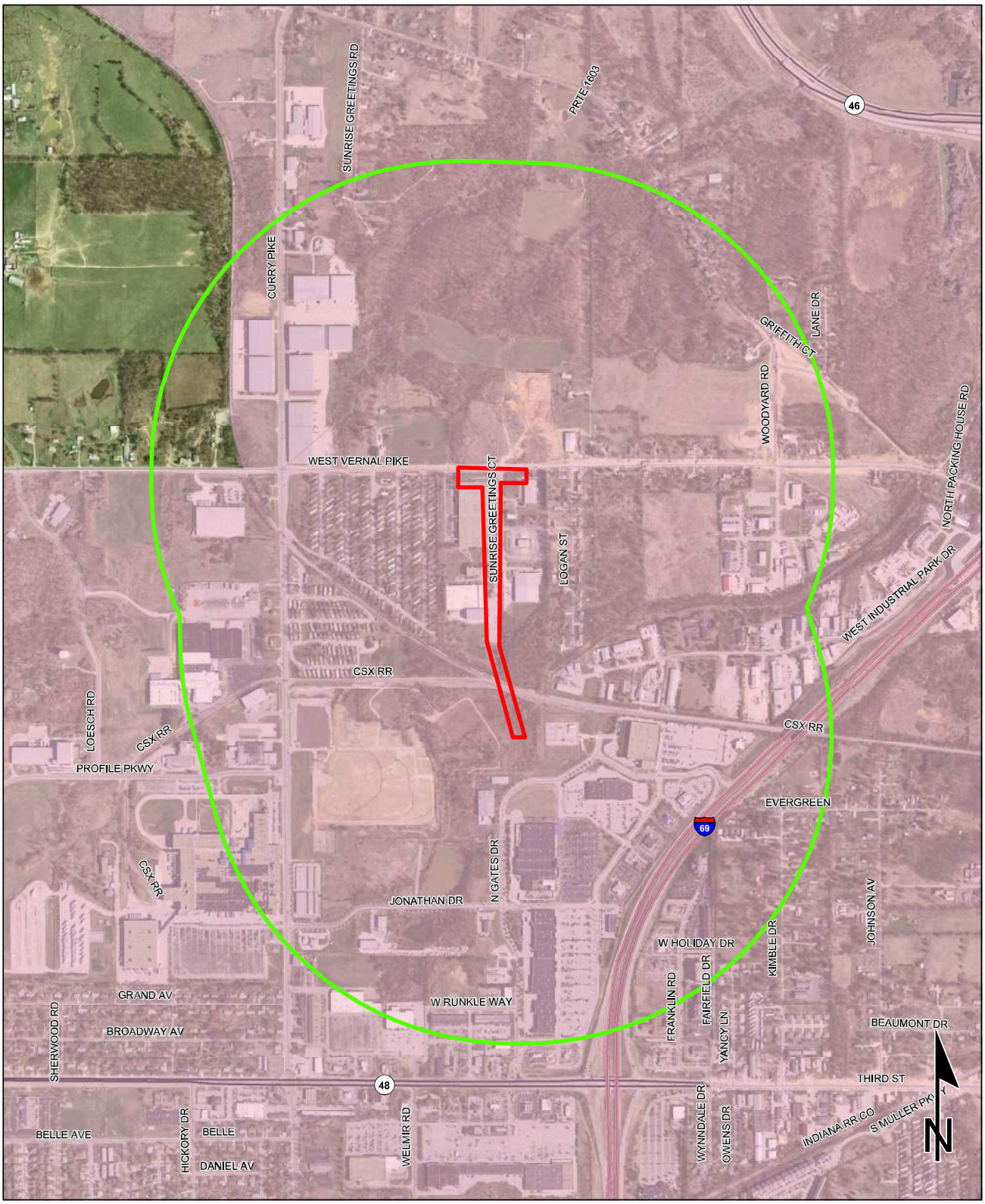
- NWI - Point
- Karst Spring
- NWI- Line
- Impaired_Stream_Lake
- NPS NRI listed
- River
- Canal Structure - Historic
- Canal Route - Historic
- Wetlands
- Lake
- Floodplain - DFIRM
- Cave Entrance Density
- Sinkhole Area
- Sinking-Stream Basin
- County Boundary
- Project Area
- Half Mile Radius
- Toll
- Interstate
- State Route
- US Route
- Local Road

Red Flag Investigation - UAB
Vernal Pike Connector Road
Des. No. 1702957 New Road Construction
Monroe County, Indiana



0.2 0.1 0 0.2 Miles

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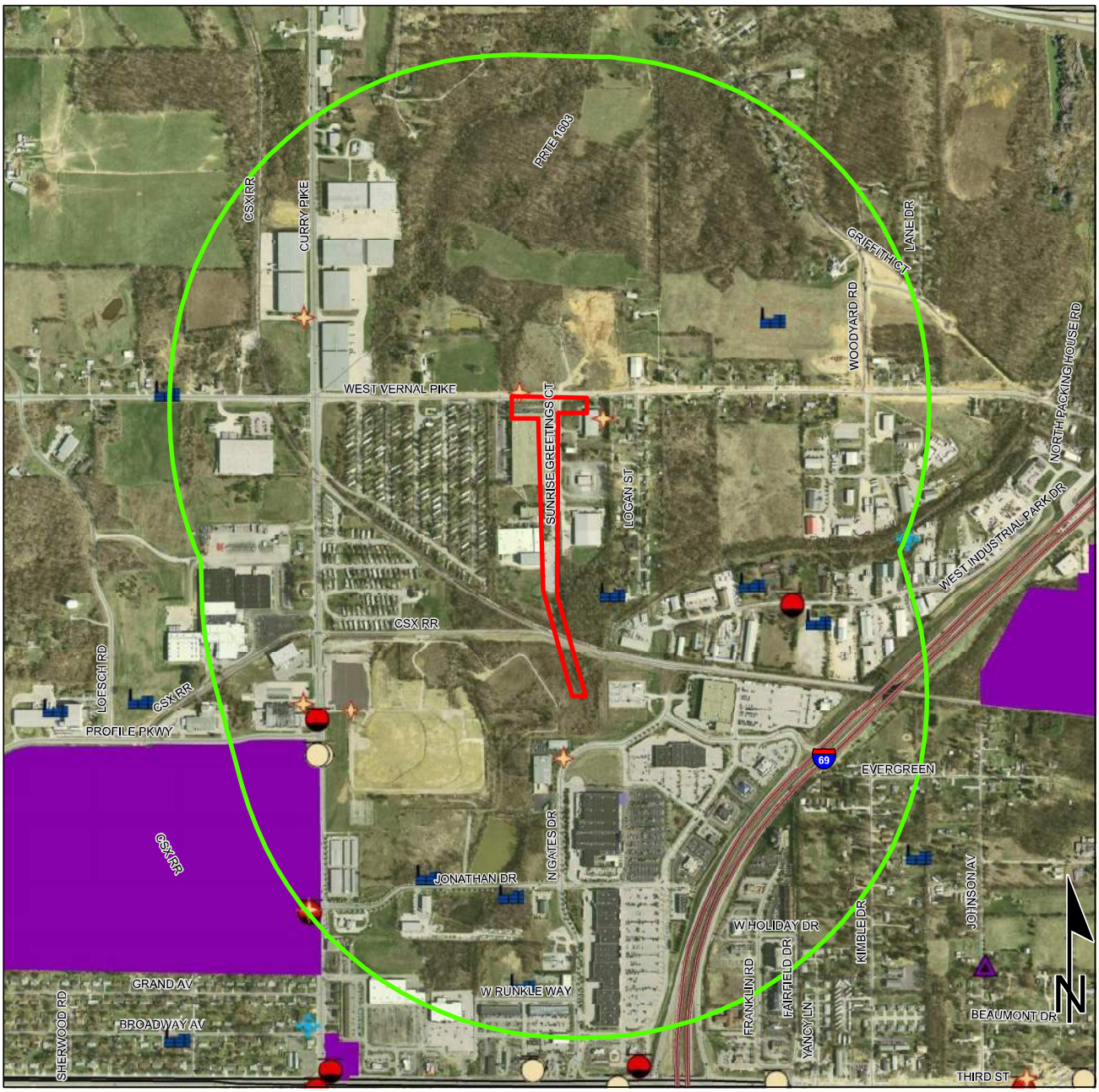
UAB
County Boundary
Project Area
Half Mile Radius
Toll
Interstate
State Route
US Route
Local Road

Red Flag Investigation - Hazardous Material Concerns
Vernal Pike Connector Road
Des. No. 1702957 New Road Construction
Monroe County, Indiana



- Brownfield
- RCRA Corrective Action Sites
- Confined Feeding Operation
- Notice_Of_Contamination
- Construction/Demolition Site
- Infectious/Medical Waste Site
- Leaking Underground Storage Tank
- Manufactured Gas Plant
- NPDES Facilites
- NPDES Pipe Locations
- Open Dump Waste Site
- RCRA Generator/TSD
- Restricted Waste Site
- Septage Waste Site
- Solid Waste Landfill
- State Cleanup Site
- Superfund
- Tire Waste Site
- Underground Storage Tank
- Voluntary Remediation Program
- Waste Transfer Station
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- Interstate
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- US Route
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0.2 0.1 0 0.2 Miles

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Map Projection: UTM Zone 16 N **Map Datum:** NAD83

Indiana County Endangered, Threatened and Rare Species List

County: Monroe

Species Name	Common Name	FED	STATE	GRANK	SRANK
Diplopoda					
Conotyla bollmani	Bollman's Cave Milliped		WL	G5	S3
Crustacean: Malacostraca					
Caecidotea jordani	Jordan's groundwater isopod		SE	G2G3	S1
Crangonyx packardi	Packard's Cave Amphipod		WL	G4	S3
Orconectes inermis testii	Troglobitic Crayfish		SR	G5T3	S3
Crustacean: Ostracoda					
Pseudocandona jeanneli	Jeannel's Cave Ostracod		SE	G2	S1
Sagittocythere barri	Barr's Commensal Cave Ostracod		WL	G5	S3S4
Mollusk: Bivalvia (Mussels)					
Cyprogenia stegaria	Eastern Fanshell Pearlymussel	LE	SE	G1Q	S1
Epioblasma torulosa torulosa	Tubercled Blossom	LE	SE	G2TX	SX
Fusconaia subrotunda	Longsolid	C	SE	G3	SX
Obovaria subrotunda	Round Hickorynut	C	SE	G4	S1
Pleurobema clava	Clubshell	LE	SE	G1G2	S1
Quadrula cylindrica cylindrica	Rabbitsfoot	LT	SE	G3G4T3	S1
Villosa lienosa	Little Spectaclecase		SSC	G5	S3
Mollusk: Gastropoda					
Fontigens cryptica	Hidden Springs Snail		SE	G1	S1
Punctum minutissimum	Small Spot			G5	S2
Ellipluran: Collembola					
Hypogastrura gibbosus	Humped Springtail		WL	GNR	SNR
Isotoma anglicana	A Springtail		WL	GNR	SNR
Pseudosinella argentea	A Springtail		SE	GNR	S1
Pseudosinella collina	Hilly Springtail		SR	GNR	S2?
Pseudosinella fonsa	Fountain Cave Springtail		ST	G3G4	S2
Sinella alata	Springtail		WL	G5	S4
Insect: Coleoptera (Beetles)					
Aleochara lucifuga	Rove beetle		WL	GNR	S4
Atheta annexa	Rove beetle		WL	G4	S4
Dynastes tityus	Unicorn Beetle		SR	GNR	S2
Nicrophorus americanus	American Burying Beetle	LE	SX	G2G3	SX
Pseudanophthalmus shilohensis mayfieldensis	Monroe cave ground beetle		SE	G1G2T1T2	S1S2
Pseudanophthalmus stricticollis	Marengo Cave Ground Beetle		WL	G4	S3
Insect: Lepidoptera (Butterflies & Moths)					
Artogeia virginiensis	West Virginia White		SR	G3?	S3
Celastrina nigra	Dusky Azure		ST	G4	S2
Insect: Odonata (Dragonflies & Damselflies)					
Rhionaeschna mutata	Spatterdock Darner		ST	G4	S2S3

Indiana Natural Heritage Data Center
Division of Nature Preserves
Indiana Department of Natural Resources
This data is not the result of comprehensive county surveys.

Fed: LE = Endangered; LT = Threatened; C = candidate; PDL = proposed for delisting

State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list

GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long term concerns; G5 = widespread and abundant globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank

SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; G4 = widespread and abundant in state but with long term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked

Indiana County Endangered, Threatened and Rare Species List

County: Monroe

Species Name	Common Name	FED	STATE	GRANK	SRANK
Tachopteryx thoreyi	Gray Petaltail		wl	G4	S3
Insect: Tricoptera (Caddisflies)					
Agapetus gelbae	An Agapetus Caddisfly		ST	G3	S2
Diplectrona metaqui	A Diplectronan Caddisfly		ST	G4G5	S2
Goera stylata	A Northern Casemaker Caddisfly		SE	G5	S1
Homoplectra doringa	A Homoplectran Caddisfly		SE	G5	S1
Arachnida					
Dolomedes scriptus	Lined Nursery Web Spider			G5	S1?
Nesticus carteri	Carter's Cave Spider			GNR	S1
Fish					
Amblyopsis hoosieri	Hoosier cavefish	C	SE	G2	S1
Amphibian					
Acris blanchardi	Northern Cricket Frog		SSC	G5	S4
Hemidactylium scutatum	Four-toed Salamander		SSC	G5	S2
Lithobates areolatus circulosus	Northern Crawfish Frog		SE	G4T4	S2
Necturus maculosus	Common mudpuppy		SSC	G5	S2
Reptile					
Clonophis kirtlandii	Kirtland's Snake	C	SE	G2	S2
Crotalus horridus	Timber Rattlesnake		SE	G4	S2
Opheodrys aestivus	Rough Green Snake		SSC	G5	S3
Terrapene carolina carolina	Eastern Box Turtle		SSC	G5T5	S3
Thamnophis proximus proximus	Western Ribbon Snake		SSC	G5T5	S3
Bird					
Accipiter striatus	Sharp-shinned Hawk		SSC	G5	S2B
Aimophila aestivalis	Bachman's Sparrow			G3	SXB
Ardea alba	Great Egret		SSC	G5	S1B
Bartramia longicauda	Upland Sandpiper		SE	G5	S3B
Buteo lineatus	Red-shouldered Hawk		SSC	G5	S3
Buteo platypterus	Broad-winged Hawk		SSC	G5	S3B
Coragyps atratus	Black Vulture			G5	S1N,S2B
Dendroica virens	Black-throated Green Warbler			G5	S2B
Haliaeetus leucocephalus	Bald Eagle		SSC	G5	S2
Helmitheros vermivorus	Worm-eating Warbler		SSC	G5	S3B
Ixobrychus exilis	Least Bittern		SE	G5	S3B
Mniotilta varia	Black-and-white Warbler		SSC	G5	S1S2B
Setophaga cerulea	Cerulean Warbler		SE	G4	S3B
Vermivora chrysoptera	Golden-winged Warbler	C	SE	G4	S1B
Wilsonia citrina	Hooded Warbler		SSC	G5	S3B
Mammal					

Indiana Natural Heritage Data Center
Division of Nature Preserves
Indiana Department of Natural Resources
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SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; G4 = widespread and abundant in state but with long term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked

Indiana County Endangered, Threatened and Rare Species List

County: Monroe

Species Name	Common Name	FED	STATE	GRANK	SRANK
Lasiurus borealis	Eastern Red Bat		SSC	G3G4	S4
Lasiurus cinereus	Hoary Bat		SSC	G3G4	S4
Mustela nivalis	Least Weasel		SSC	G5	S2?
Myotis lucifugus	Little Brown Bat	C	SSC	G3	S2
Myotis septentrionalis	Northern Long Eared Bat	LT	SSC	G1G2	S2S3
Myotis sodalis	Indiana Bat or Social Myotis	LE	SE	G2	S1
Neotoma magister	Allegheny Woodrat		SE	G3G4	S2
Perimyotis subflavus	Tricolored Bat		SSC	G2G3	S2S3
Sorex fumeus	Smoky Shrew		SSC	G5	S2
Sorex hoyi	Pygmy Shrew		SSC	G5	S2
Taxidea taxus	American Badger		SSC	G5	S2
Vascular Plant					
Acalypha deamii	Mercury		SR	G4?	S2
Armoracia aquatica	Lake Cress		SE	G4?	S1
Carex timida	Timid Sedge		SE	G2G4	S1
Castanea dentata	American Chestnut		WL	G4	S3
Catalpa speciosa	Northern Catalpa		SR	G4?	S2
Cypripedium parviflorum var. pubescens	Large Yellow Lady's-slipper		WL	G5T5	S3
Epigaea repens	Trailing Arbutus		WL	G5	S3
Hydrastis canadensis	Golden Seal		WL	G3G4	S3
Juglans cinerea	Butternut		WL	G4	S3
Linum striatum	Ridged Yellow Flax		WL	G5	S3
Liparis loeselii	Loesel's Twayblade		WL	G5	S3
Lithospermum incisum	Narrow-leaved Puccoon		SE	G5	S1
Malaxis unifolia	Green Adder's-mouth Orchid		SE	G5	S1
Oryzopsis racemosa	Black-fruit Mountain-ricegrass		SR	G5	S2
Oxalis illinoensis	Illinois Woodsorrel		WL	G4Q	S2
Panax quinquefolius	American Ginseng		WL	G3G4	S3
Platanthera flava var. herbiola	Pale Green Orchis		WL	G4?T4Q	S3
Potamogeton pusillus	Slender Pondweed		WL	G5	S2
Rubus centralis	Illinois Blackberry		SE	G2?Q	S1
Zannichellia palustris	Horned Pondweed		SR	G5	S2
Zizia aptera	Golden Alexanders		SR	G5	S2
High Quality Natural Community					
Forest - floodplain mesic	Mesic Floodplain Forest		SG	G3?	S1
Forest - upland dry Highland Rim	Highland Rim Dry Upland Forest			GNR	S3
Forest - upland dry-mesic Highland Rim	Highland Rim Dry-mesic Upland Forest			GNR	S3
Forest - upland mesic Highland Rim	Highland Rim Mesic Upland Forest			GNR	S3

Indiana Natural Heritage Data Center
Division of Nature Preserves
Indiana Department of Natural Resources
This data is not the result of comprehensive county surveys.

Fed: LE = Endangered; LT = Threatened; C = candidate; PDL = proposed for delisting

State: SE = state endangered; ST = state threatened; SR = state rare; SSC = state species of special concern; SX = state extirpated; SG = state significant; WL = watch list

GRANK: Global Heritage Rank: G1 = critically imperiled globally; G2 = imperiled globally; G3 = rare or uncommon globally; G4 = widespread and abundant globally but with long term concerns; G5 = widespread and abundant globally; G? = unranked; GX = extinct; Q = uncertain rank; T = taxonomic subunit rank

SRANK: State Heritage Rank: S1 = critically imperiled in state; S2 = imperiled in state; S3 = rare or uncommon in state; G4 = widespread and abundant in state but with long term concern; SG = state significant; SH = historical in state; SX = state extirpated; B = breeding status; S? = unranked; SNR = unranked; SNA = nonbreeding status unranked

Indiana County Endangered, Threatened and Rare Species List

County: Monroe

Species Name	Common Name	FED	STATE	GRANK	SRANK
Primary - cave aquatic	Aquatic Cave		SG	GNR	SNR
Primary - cliff limestone	Limestone Cliff		SG	GU	S1
Other Significant Feature					
Geomorphic - Nonglacial Erosional Feature - Water Fall and Cascade	Water Fall and Cascade			GNR	SNR

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SOIL MANAGEMENT PLAN

PROFILE PARKWAY EXTENSION ROADWAY PROJECT

FORMER ABB SITE
300 NORTH CURRY ST.,
BLOOMINGTON, IN.

Note: Portions of this document have been removed to only cover the area at/near this project since the SMP is for the Profile Parkway Extension Project.

PREPARED FOR:
MONROE COUNTY BOARD OF COMMISSIONERS
MONROE COUNTY COURTHOUSE
100 W. KIRKWOOD AVE.
BLOOMINGTON, IN 47404

PREPARED BY:
DLZ INDIANA, LLC
157 E. MARYLAND ST.
INDIANAPOLIS, INDIANA 46204

DLZ PROJECT NO.: 1763-1207-90

DLZ
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

AUGUST 2019

Soil Management Plan
Profile Parkway Extension Roadway Project

Former ABB Site
300 North Curry Street
Bloomington, Indiana

Prepared for

Monroe County Board of Commissioners
Monroe County Courthouse
100 West Kirkwood Avenue
Bloomington, Indiana 47404

Prepared by

DLZ Indiana, LLC
157 E. Maryland Street
Indianapolis, Indiana 46204

DLZ Project No.: 1763-1207-90

August 2019

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APPENDICES

1.0 INTRODUCTION

This Soil Management Plan has been developed by DLZ Indiana, LLC. (DLZ) to support the Profile Parkway Extension project (Project) which will extend the current alignment for Profile Parkway from Curry Pike to the east, approximately 0.50 miles to Gates Drive in Bloomington, Indiana (Project Site), **Figure 1**. The Project will include the construction of new roadway, sidewalk, a multi-use trail, sub-surface utility infra-structure. As part of this Project, the proposed alignment for the extension of Profile Parkway will cross the former ABB, Inc. (ABB) manufacturing plant located at 300 North Curry Pike in Bloomington, Indiana (ABB Site) that was part of a cleanup site subject to an Administrative Settlement Agreement and Consent EPA-V-W-08-C-890 (AOC) issued by the United States Environmental Protection Agency (EPA) and approved by the Indiana Department of Environmental Management (IDEM). The ABB Site is subject to an Environmental Protection Easement and Declaration of Restrictive Covenants (ERC) made by ABB on February 2, 2012. A copy of the ERC is enclosed in **Appendix A**.

The ERC has placed restrictions on the use of the ABB Site and the handling and disposal of contaminated soils that were left in place within the designated Affected Areas. The ERC also states that a Soil Management Plan must be prepared and implemented prior to any excavation, or other similar disturbances of soils within the Affected Areas. In response to the requirements stated in the ERC, DLZ Indiana LLC. (DLZ) has been requested to prepare an appropriate Soil Management Plan on behalf of the Monroe County Board of Commissioners that satisfies the requirements of the ERC and all local, state, and federal regulations.

1.1 PURPOSE

The purpose of this Soil Management Plan is intended to:

- Educate contractors and subcontractors on the presence of residually impacted soils at the ABB Site;
- Provide risk mitigation measures during excavation and construction activities for the direct contact and inhalation exposure pathways to control construction worker exposure;
- Provide plans for management of soil disturbed within the designated Affected Areas during construction activities and site restoration of the disturbed areas with a “clean” soil cap;
- Provide plans for the management of potentially impacted stormwater that results from the direct contact with disturbed soils within the designated Affected Areas.

- Provide plans for the management of potentially impacted groundwater, if encountered, during construction activities.

Contractors and subcontractors are responsible for the environmental health and safety of their employees during all activities performed for this project. Ultimately, each individual worker on the site is responsible for his or her own environmental health and safety.

Specific to health and safety, this document further defines the responsibility and authority with respect to implementation of the Soil Management Plan. The document does not remove, reduce, or alter any contractor responsibility to operate under their own health and safety program as required by the Occupational Safety and Health Administration (OSHA) and contracts governing this project.

2.0 ABB SITE BACKGROUND

As part of the preparation of the Soil Management Plan, DLZ reviewed publicly available documents for the ABB Site through the IDEM Virtual File Cabinet. A review of these documents confirmed that the proposed Profile Parkway Extension Project crosses the former ABB Manufacturing Plant site, which consisted of a 148-acre parcel of land that formerly contained a 450,000 square foot plant. The former plant was constructed in the late 1950's for the manufacture of capacitors and equipment associated with the transmission and distribution of electrical power. Documents indicate that prior to January 1, 1990, the facility was owned and operated by Westinghouse Electric Corporation (currently CBS Corporation) either alone or in conjunction with ABB and after January 1, 1990 ABB became the sole owner and operator of the facility.

Reports indicate that polychlorinated biphenyls (PCBs) were used in the production process at the facility until October 1977 when the capacitor products were converted to non-PCB dielectric fluids. Starting in the early 1990s, multiple sampling and cleanup activities were performed relating to the PCB impacts and other volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals.

The facility closed in 1998 and the above-grade portion of the former plant was razed in 2006-2007, however the concrete slab was left in-place. In response to the AOC with the U.S. EPA Region 5, in June of 2009 the EPA and IDEM approved the Remediation Work Plan - Soil Remediation and Removal of the Concrete Floor (Remediation Work Plan) prepared by PASARA Technologies, Inc. on behalf of CBS Corporation and ABB.

Remedial activities started in July of 2009 and were completed in the spring of 2010. The remedial activities involved the removal of all concrete slab floors, foundation walls associated with the former plant building and the removal of soils found to contain site related contaminants at concentrations greater that the site-specific cleanup criteria. Soils contaminated with VOCs above the site cleanup

criteria and/or land-ban limits were transferred to a soil vapor extraction (SVE) area for treatment of VOC content. After the VOC content was lowered, the soils were used as backfill if the PCB content was below the site cleanup criteria or disposed off-site as a Toxic Substances Control Act (TSCA) or Special Waste if the PCB content was above the site PCB Cleanup Criteria.

The cleanup criteria established in the Remediation Work Plan (Table 15) consisted of the following:

PCB Cleanup Levels:

- Soils that were less than 7 feet below the plant floor slab that were identified via delineation sampling to contain less than or equal to 25 PPM PCBs were left in-place or removed to access deeper soils.

- Soils that were more than 7 feet below the plant floor slab that were identified via delineation sampling to contain less than or equal to 35 PPM PCBs were left in-place or removed to access deeper soils.

- Soils that had a PCB concentration greater than or equal to 50 PPM were disposed of at an off-site landfill as a TSCA waste.

- Soils that exceeded the criteria for being left on-site and have a PCB concentration less than 50 ppm were disposed of at an off-site landfill as a Special Waste.

Other Constituent Cleanup Levels

- Tetrachloroethane (PCE) and Trichloroethane (TCE) in soils had a not-to-exceed cleanup criteria of 10 ppm.

- All other contaminants were compared to IDEM's RISC Industrial default migration-to-groundwater levels.

The AOC also required maximum release area averages for PCB, TCE, and PCE. The average PCB cleanup concentration per the AOC was not to exceed 10 ppm within 7 feet of the final ground surface and not to exceed 25 ppm for the interval below 7 feet from the final ground surface. The release area average for TCE was not to exceed 5 ppm, and PCE was not to exceed 7 ppm regardless of depth from ground surface. For other contaminants besides TCE and PCE, the final residual 95% upper confidence limit (UCL) within a release area for the contaminants would have to be lower than the IDEM RISC Industrial migration to groundwater closure guideline.

As part of the Remediation Work Plan, target and focused concentration verification sampling was to be performed based on the results of the extensive pre-remedial activities soil delineation investigation and established trigger levels. The trigger levels do not represent the cleanup standard but instead represent the screening criteria that would require the collection of a verification sample.

Using the results from the pre-remedial soil delineation, the limits for the soil excavation activities were defined. If the concentration of PCB or the other constituents in the soil at the proposed excavation limits were less than the established trigger levels (Remediation Work Plan, Table 18), then verification sampling was not performed. The trigger level for PCBs located 0-7 feet below ground surface was 100 ppm and the trigger level for PCBs located greater than 7 feet below ground surface was 250 ppm. The trigger level for VOCs, SVOCs, and metals was the concentration equivalent to IDEM RISC Industrial Default Direct Contact Levels

If the concentration of PCBs or the other constituents in the soil at the proposed excavation limits were greater than the established trigger levels, then verification sampling was performed. If the results of the verification sampling exceeded the Maximum Not to Exceed Limits (Cleanup Levels) then additional excavation was performed. No additional re-verification sampling was required if the additional excavation resulted in the removal of an additional 5-Ft from the sidewall or an additional 2-Ft from the bottom elevation in that designated grid. Re-verification sampling was only performed if the additional removal depths were not meet or the remaining underlying soil was visually stained or contained noticeable odors or the original verification sampling exceeded 1,000 ppm. A summary of the verification sampling results is contained in the Final Report, Completion of Removal Action for Bloomington ABB, dated March 8, 2010.

Information provided by IDEM indicated that based on the karst features in this region, it was determined that groundwater monitoring at the ABB Site would not be performed and instead groundwater samples were collected at the discharge springs located in the area. It is assumed that a certain level of impacts may exist in the groundwater at the ABB Site.

The remedial activities were completed in the Spring of 2010 and were documented in the Final Report, Completion of Removal Action for Bloomington ABB, dated March 8, 2010. The remedial activities consisted of the removal and disposal of the following:

- 3,840 tons of PCB contaminated concrete was disposed of as a TSCA waste at the Heritage Roachdale Subtitle C Landfill.

- 116 tons of PCB contaminated concrete was disposed of as a Special Waste at the South Side Subtitle D Landfill.

- 38,222 tons of PCB contaminated soil was disposed of as a TSCA waste at the Heritage Roachdale Subtitle C Landfill.

- 2,569 tons of PCB contaminated soil was disposed of as a Special Waste at the South Side Subtitle D Landfill.

- 1,355,550 gallons of stormwater, sub-slab water, and groundwater was collected and pumped to an on-site water treatment system and then discharged.

A copy of the Remediation Work Plan, Soil Remediation and Removal of the Concrete Slab Floor, Former ABB Manufacturing Plant, dated June 2009 and the Final Report, Completion of Removal Action for Bloomington ABB Report, dated March 8, 2010 are available upon request or can be reviewed on the IDEM Virtual File Cabinet.

3.0 ABB SITE ENVIRONMENTAL PROTECTION EASEMENT AND DECLARATION OF RESTRICTIVE COVENANT

Upon completion of the remedial activities, an ERC was executed by ABB on February 2, 2012. A copy of the executed ERC is enclosed in **Appendix A** and states the following:

- The ABB Site shall not be used for residential purposes, including but not limited to, daily child care facilities or educational facilities for children (e.g., daycare centers or K-12 schools).

- The use or extraction of groundwater at the ABB Site shall not be used for any purposes, including, but not limited to: human or animal consumption, gardening, industrial purposes, or agriculture, except that groundwater may be extracted in conjunction with environmental investigation and/or remediation activities.

- Soil originating from the Affected Areas (**Figure 2**) that are disturbed as a result of construction and excavation activities shall be restored in a manner such that the remaining contaminant concentrations do not present a threat to human health and the environment. Contaminated soil that is excavated from an Affected Area must be managed in accordance with all applicable state and federal laws. In addition to and in support of the above requirements, the Owner shall prepare and implement a Soil Management Plan.

- Soils excavated from an Affected Areas at depths shallower than 7 feet below grade may be returned to an Affected Area and placed any depth below grade but must be covered by at least 1 foot of clean fill to prevent storm water impacts. If the excavated soils are not returned to an Affected Area and covered with at least 1 foot of clean fill, then the excavated soils must be

removed from the ABB Site and properly disposed of in accordance with all applicable state and federal laws.

- Soils excavated from Affected Area B that originate from depths greater than 7 feet below grade must be returned to Affected Area B and placed at a depth of at least 7 feet below grade or removed from the ABB Site and properly disposed of in accordance with all applicable state and federal laws.

- A written record must be maintained that documents the quantity and survey coordinates of the location of soils excavated from an Affected Area and the quantity and survey coordinates for the soils that were excavated from an Affected Area and then returned to an Affected Area.

4.0 RESPONSIBILTY, AUTHORITY, AND QUALIFICATIONS

The following key personnel at the Project Site will have responsibility for the implementation of this Soil Management Plan and oversight of activities/operations involving hazardous substances.

4.1 RESPONSIBLE PARTY

The responsible Party is ABB, Inc. and they are identified has the Grantor and Grantee in the ERC. As Grantor/Grantee, ABB is responsible for the enforcement of the covenants identified in the ERC and verifying that no action is being taken on the ABB Site that is in violation of the ERC or any of the federal and state environmental laws or regulations.

Under the TSCA regulations contained in 40 CFR 761, ABB is considered the generator of PCB waste. ABB will have a designee on-site while construction and excavation activities are occurring within an Affected Area and will sign the Uniform Hazardous Waste Manifest Generator's/Offeror's Certification for each load of soil excavated from an Affected Area that can not be re-used within an Affected Area and will require off-site disposal.

4.2 OWNER/OPERATOR

The Owner/Operator is the County of Monroe, Indiana Board of Commissioners. The responsibility of the Owner/Operator include the following:

- Complying with the requirements set forth in the ERC, preparation of the Soil Management Plan document, and confirming that the engineering controls, as specified herein, are properly constructed with the Affected Areas at the Project Site

- Continued oversight and maintenance of the engineering controls in-place within the portions of the right-of-way (ROW) that cross an Affected Area, as a means of managing the direct-contact exposure pathway and to minimize stormwater contact with potentially contaminated soils within the Affected Areas after the construction of the Project.

- Coordination with contractors performing future construction and excavation activities within the portion of the ROW that crosses an Affected Area to educate workers on exposure risks, verify that excavated materials are appropriately handled, and confirm that work areas are either developed or restored in accordance with this Soil Management Plan and/or the ERC.

4.3 CONTRACTOR

The Contractor is the company hired by the Owner/Operator to furnish all materials and services for the overall construction of the Project and has the responsibility for the implementation of the Soil Management Plan.

The Contractor shall be responsible for notifying the Environmental Professional, Owner/Operator and the Responsible Party of any deviations from the Soil Management Plan or if soils are encountered that exhibit a discernable change in visual and/or odor characteristics that may represent a potentially hazardous condition.

4.4 CONTRACTOR SITE HEALTH AND SAFETY OFFICER

The Contractor's Site Health and Safety Officer shall be on-site during all construction and excavation activities and will have the primary responsibility for the daily implementation of the Health and Safety Plan (HASP) at the Project Site. The Contractor's Site Health and Safety Officer will oversee all health and safety issues associated with the construction and excavation activities being performed within the Affected Areas and at the Project Site, decontamination of equipment, construction machinery, and personnel, and the materials leaving the Project Site. The Contractor's Site Health and Safety Officer will verify proper training of all site personnel and will stop work authority if methods or practices are unsafe in their opinion.

The Contractor's Site Health and Safety Officer must have 40-hours of OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) training and the appropriate 8-hour refreshers in accordance with the requirements set forth in 40 CFR 1910.120.

4.5 ENVIRONMENTAL PROFESSIONAL

The Environmental Professional shall be a third-party independent representative of the Contractor, hired by the Contractor, and shall be either a licensed Professional Geologist in State of Indiana or a registered Professional Engineer in the State of Indiana. The Environmental Professional must have 40-hours of OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) training and the appropriate 8-hour refreshers in accordance with the requirements set forth in 40 CFR 1910.120.

At a minimum, the Environmental Professional or their designee shall be on-site during all construction, excavation, or land-disturbing activities being performed within the Affected Areas while existing soils located deeper than 12" below existing grade are exposed. The responsibilities of the Environmental Professional or their designee shall include but are not limited to:

- Overseeing the proper implementation of the Soil Management Plan. The Environmental Professional shall be responsible for notifying the Contractor of any deviations from the Soil Management Plan or if soil conditions are encountered that exhibit a discernable change in visual and/or odor characteristics that may represent a potentially hazardous condition.

- Document the location and depth of any discernable change in visual and/or odor characteristics of the excavated soils or remaining soils located within an Affected Area.

- Providing environmental monitoring/screening as part of the Confined Excavation/Trench Measures, as defined herein Section 5.6, if required.

- Performing real-time and perimeter air monitoring, as defined herein Section 5.8.

- Performing the required waste characterization sampling and preparation of the required waste profile and associated paperwork for the accepting landfill for excavated soils from within an Affected Area that will be taken off-site for proper disposal.

- Performing the required waste characterization sampling and preparing a waste profile, if required, for the handling and proper disposal of stormwater and/or groundwater that is collected within the construction and excavation limits for the Affected Areas.

- Proper record-keeping and documentation as required by this Soil Management Plan.

5.0 RISK MITIGATION MEASURES

5.1 APPLICABILITY

As previously discussed, elevated concentrations of PCB's and other constituents (VOCs, SVOCs, metals) may remain in the on-site soils located within the designated Affected Areas and impacted groundwater may be present under the site. The construction, excavation, and other land disturbing activities covered under this Soil Management Plan include, but are not limited to construction, grading, excavations, trenching, general soil disturbance, placement of backfill, and handling and disposal of soils located within an Affected Area while existing soils located deeper than 12" below existing grade are exposed, the collection and disposal of potentially contaminated stormwater that comes in contact with disturbed soils located within an Affected Area, and the collection and disposal of groundwater encountered at the Project Site.

Grading and utility construction operations are considered to be the primary work activities to be performed at the Project Site. While the management strategies outlined for construction and excavation activities are expected to be applicable only to the work within an Affected Area, DLZ recommends that the minimum measures outlined herein Section 5.2 be employed for all work activities across the entire Project Site.

As a common practice, if soils or stormwater and/or groundwater are encountered during the course of the project that exhibits a discernable change in visual or odor characteristics that are different than expected, the Environmental Professional shall be immediately notified for review of the conditions and the appropriate response measures. For the purposes of this Soil Management Plan, a potentially hazardous condition shall be defined as the discovery and/or occurrence of strong odors, staining, coloring, and/or unusual or unexpected conditions in association with the construction and excavation activities. In this event, workers shall be removed from the immediate area, the area secured, and activities resumed after the Environmental Professional determines that a potentially hazardous situation does not exist.

5.2 MINIMUM MEASURES

The following Minimum Measures are intended to reduce the potential for exposure to potentially contaminated soils at the Project Site and within the Affected Areas during construction, excavation, and other land disturbing activities. These Minimum Measures are intended to augment health and safety requirements that may exist under contract and statutory requirements and are specifically limited to the intended purpose. They are not intended as global or comprehensive health and safety requirements at the Project Site.

The Minimum Measures primarily consist of proper hygiene, especially with respect to limiting potential ingestion of soil particles; general worker training, the use of personal protective equipment (PPE) to limit direct skin/eye exposure, and the use of dust control.

5.2.1 Hygiene

Proper hygiene as part of a daily construction worker's routine at the project Site and while working within an Affected Area is intended to reduce the potential for ingesting contaminants (in the form of soil particles), as well as reducing the duration of direct contact. These practices primarily consist of smoking, eating, and drinking practices and cleaning/decontamination practices. These provisions include, but are not limited to, the following:

- Smoking shall be prohibited when working within an Affected Area and shall be allowed only in designated area;

- Eating, drinking, and the use of smokeless tobacco will be prohibited when working within an Affected Area and shall be allowed in designated areas.

- Construction Workers who come into contact with soil from the Project Site should clean exposed areas of skin periodically throughout the day to limit the amount of time contact is made with potentially contaminated soils.

- The potential for excessive soiling of personal clothing, boots, and/or gloves as part of activities in which these conditions may occur (i.e., hand work within trenching) should be reduced through the use of disposable or easily decontaminated personal protective equipment (PPE) (i.e., Tyvek coveralls, rubber over boots, etc.).

Each contractor and subcontractor shall make available, at no cost to the worker, gloves, hand wipes, waterless cleaning soap, or similar type of cleaning agent, and a means or cleaning dirt from skin in the form of hand washing stations.

5.2.2 Personal Protective Equipment

OSHA requires that PPE be selected based on hazard identification and assessment such that the minimum level of PPE provides adequate protection to individuals exposed to physical, chemical and/or biological hazards within the work environment. At a minimum, the PPE identified for the Site during construction and excavation activities is modified Level D: steel-toed boots, hard hat, gloves, long-sleeved shirts, full-length pants, and safety glasses in addition to whatever additional PPE is required by each contractor. As part of the development of the Health and Safety Plan, a determination shall be made if additional PPE,

above the Modified Level D PPE, is required for workers that are involved in construction, excavation, or other land-disturbing activities within the Affected Areas while existing soils located deeper than 12" below existing grade are exposed.

As noted in herein, dust control via watering is intended to be the primary engineering control to reduce the potential for exposure to dust generated as a result of construction and excavation activities, such that the use of dust masks or other respiratory protection is not anticipated. The potential for excessive soiling of personal clothing, boots, and/or gloves as part of activities in which these conditions may occur (i.e., hand work within trenching) may be reduced through the use of disposable or easily decontaminated PPE (i.e., Tyvek coveralls, rubber over boots, etc.).

The need for upgrading PPE is not anticipated at this time. However, changes in Project Site working conditions and exposures may require additional PPE. When a significant change occurs, an assessment of hazards will be made by the Contractor Health and Safety Officer to determine if additional PPE is required.

Site construction workers are responsible for the proper use, care, storage, and maintenance of PPE issued for operations/activities involving hazardous substances. The manufacturer's instructions for use, care, and maintenance of specific PPE will be followed. As with any PPE, periodic inspections should be performed to maintain condition, reliability, and effectiveness. Workers will be responsible for inspecting their PPE immediately prior to its use for any operation/activity/task on-Site. Workers should perform a visual inspection of their PPE for any obvious damages, defects, or deteriorated parts. Damaged PPE should be reported immediately to the supervisor and replaced.

5.2.3 Dust Control

The goal of dust control is to maintain exposed soil in a moist condition so as to eliminate the formation of dust generated from vehicle traffic, foot traffic and wind, thereby reducing the potential for inhalation by Site workers and surrounding area inhabitants.

To reduce the generation of dust at the Project Site during construction, excavation, and other land disturbing activities within an Affected Area while existing soils located deeper than 12" below existing grade are exposed, the Contractor shall be responsible for applying water as necessary to eliminate dust generation from the Project Site and Affected Areas. The rate and method of application should be coordinated with the Environmental Professional so as to not significantly degrade the stability and condition of the soil subgrade or cause excessive generation of water within the Affected Area that will have to be managed as defined herein.

Visual assessment of dust levels shall be performed by the Environmental Professional to determine if dust suppression activities are sufficient. If, in the opinion of the Environmental Professional, dust levels are too high, the Contractor will be directed to employ additional dust control measures.

5.3 NOTIFICATION/COMMUNICATION

All Contractor and subcontractor site personnel entering the former ABB site and conducting work at the ABB Site shall be required to review the Soil Management Plan and/or receive the appropriate awareness training prior to starting work at the Site. All Contractor and subcontractor on-site personnel will be required to sign a "Certificate of Worker Acknowledgement" form located in **Appendix B** acknowledging that they have reviewed the Soil Management Plan and/or have received the appropriate awareness training and understand the potential exposure risks, health and safety and training requirements, and the proper handling and disposal requirements for soils that are disturbed within an Affected Area. Completed Certificate of Worker's Acknowledgement forms shall be kept on file with the Soil Management Plan.

5.4 HEALTH AND SAFETY PLAN

The Contractor shall be required to develop a Health and Safety Plan (HASP) to address potential exposure to contaminants that may be encountered during construction and excavation activities within an Affected Area and the overall Project Site limits. The HASP shall be prepared in accordance with the requirements set forth in 40 CFR 1910.120 and shall establish the specific training requirements and air monitoring requirements for all personnel involved with the construction and excavation activities required for the completion of this Project based on their specific job assignments. The HASP should be prepared by a qualified Health and Safety Professional.

The HASP shall also address potential worker inhalation exposure associated with construction, excavation, and other land disturbing activities performed within an Affected Area while existing soils located deeper than 12" below existing grade are exposed or if soil or groundwater containing VOCs is encountered within a confined excavation/trench, as discussed in Section 5.6. The HASP shall also identify potential engineering controls to reduce exposure risks and the required respiratory PPE, based on personnel air monitoring results and the environmental screening discussed in Section 5.7, to protect site workers from inhalation hazards while working in the confined excavation/trench.

5.5 TRAINING

At a minimum, all site personnel shall receive awareness training with respect to exposure to potential soil and groundwater contaminants identified in this Soil Management Plan. In addition, all site personnel who will conduct construction, excavation, and land-disturbing activities within an Affected Area while existing soils located deeper than 12 inches below existing grade are exposed or are involved in the

handling of excavated soils from an Affected Area, as described in this Soil Management Plan, shall receive the appropriate training as required by law and as defined in the HASP.

5.6 SITE ACCESS AND SECURITY

Site control and access to construction and excavation areas within the Project Site are the responsibility of the Contractor and shall be limited to designated construction personnel and representatives of the Contractor, designated representatives of Owner/Operator, designated representatives of the Responsible Party, and representatives of the U.S. EPA, IDEM, or any other regulatory authority having jurisdiction over the ABB Site. The Contractor shall establish the requirements for visitors entering the Project Site.

The Contractor's Safety Officer shall establish the site access requirements for personnel entering an Affected Area or the Affected Soil Temporary Stockpile locations while construction and excavation activities are occurring.

5.7 CONFINED EXCAVATION/TRENCHES

A potential inhalation exposure risk for Site Workers within a confined excavation/trenches may exist if soil or groundwater containing VOCs is encountered. As previously indicated, there were VOC impacts in the soil and there were site-specific cleanup criteria established within the Affected Areas. However, there is limited data available on the concentration VOCs in the groundwater that was encountered during the previous remediation project. However, it is anticipated that the groundwater at the ABB Site may contain elevated concentrations of PCBs, VOCs, SVOCs, and metals. Although, based on historical information, groundwater is not likely to be encountered except where excavations are advanced to the top of bedrock. However, it has been reported that small areas were encountered during previous site remediation excavation activities where water was encountered at varying depths below grade and were thought to related to water being trapped in granular soil seams or trapped under former slabs.

A geotechnical evaluation that was completed as part of the proposed roadway design involved the installation of nine soil borings within the Project Site limits. One boring was advanced in Affected Area A (RB-4). At that location groundwater was not encountered during drilling but was encountered upon completion of the boring. Since it appeared that saturated soils were not encountered in this boring, the groundwater that was present in the boring appears to be related to a granular soil seam or fracture in the clay that allowed for the migration of water A copy of the geotechnical evaluation in enclosed in **Appendix C.**

Construction and excavation activities that are conducted at the Project Site where groundwater is encountered in a confined excavation/trench may represent a condition where inhalation hazards may exceed acceptable risk thresholds. For the purposes of evaluating the risk associated with an inhalation hazard, a confined excavation/trench is described as follows:

- The depth of the excavation is such that the breathing zone of a typical construction worker lies within the trench.

- The geometry of the excavation is such that vapors could be reasonably anticipated to accumulate and not otherwise be dissipated via normal ambient conditions/wind;

- Site workers enter/work within the confined excavation/trench or are otherwise inhaling vapors within the breathing zone of the confined excavation/trench for prolonged periods (i.e., other than incidental); and

- The groundwater table is breached within the excavation.

If groundwater is encountered, the Contractor shall notify the Environmental Professional to make a determination if a confined excavation/trench condition exists. If it is determined that a confined excavation/trench condition exists, the Environmental Professional will perform the following environmental screening:

- The potential presence of volatile vapors within the confined excavation/trench shall be evaluated by the Environmental Professional using a properly calibrated, real-time, direct reading organic vapor analyzer (OVA) with an instrument detection limit of no more than 1 part per billion (ppb) total organic vapors (i.e., Rae Systems ppb RAE 3000).
- Ambient conditions around the confined excavation/trench should also be screened using the OVA for comparison purposes prior to screening vapor conditions within the confined excavation/trench. The vapor conditions within the confined excavation/trench should be screened using the OVA with an emphasis on screening the anticipated breathing zone. Screening should be conducted once digging of the confined excavation/trench, or portion thereof, has been completed, and active use of construction equipment for digging has ceased (including an allowance for combustion vapors to dissipate).
- The results of the environmental screening should be provided to the Contractor Safety Officer so that a determination can be made on the need for engineering controls and/or respiratory PPE.

5.8 AIR MONITORING

Personnel, real-time, and perimeter air monitoring shall be performed to ensure that construction, excavation, and other material handling activities performed within an Affected Area does not result in excessive PCB or VOC emissions.

5.8.1 Personnel Air Monitoring

Personnel air monitoring shall be performed by the Contractor Health and Safety Officer during construction, excavation and other land disturbing activities performed within the Affected Areas while existing soils located deeper than 12 inches below existing grade are exposed to measure the exposure to site workers for VOCs and PCBs to ensure that this exposure does not approach the OSHA Permissible Exposure Limit (PEL).

The Contractor Health and Safety Officer shall designate one crew member from each active work area within an Affected Area to wear the sampling device. In general, samples shall be collected from those workers and site conditions representing the highest potential for exposure. Initially, daily personnel air monitoring shall be performed. Based on the results, the subsequent frequency of personnel air monitoring shall be determined by the Contractor's Health and Safety Officer.

Results of the personnel air monitoring shall be evaluated by the Contractor Health and Safety Officer. If it is determined that exposure is approaching an OSHA PEL, the Contractor Health and Safety Officer shall determine if the use of engineering controls are needed to reduce the potential exposure. If an OSHA PEL is exceeded, the Contractor Health and Safety Officer shall notify the Contractor, the Environmental Professional, the Owner, and the Responsible Party and work within the Affected Area shall be stopped until a determination on the source for the high exposure can be made and what engineering controls will be required to reduce the exposure.

All personnel air monitoring data and results shall be maintained with the project records and shall be available for review.

5.8.2 Real-Time Air Monitoring

Real-time air monitoring for organic vapors in the breathing zone shall be periodically monitored daily by the Environmental Professional during all construction, excavation, and other land-disturbing activities being performed within the Affected Areas while existing soils located deeper than 12" below existing grade are exposed. Real-time air monitoring shall also be performed around the Affected Area Temporary Stockpiles and the downwind site perimeter.

Real-time monitoring shall be performed using a properly calibrated, real-time, direct reading OVA with an instrument detection limit of no more than 1 ppb total organic vapors. Screening for organic vapors will occur at the working face of excavations areas, areas with exposed soils, the Affected Area Temporary Stockpile locations, and at the downwind site perimeter. Real-time monitoring shall also be conducted at locations selected by the Environmental Professional that are downwind of dust generating activities, where deemed appropriate and necessary to document ambient air levels. The location, date/time, wind-direction, activity and real-time readings shall be logged by the Environmental Professional. All data shall be maintained with the project records and shall be available for review.

The real-time action level for organic vapors is 5.0 ppm above background. If the real-time action level is exceeded, the Environmental Professional shall notify the Contractor, and immediate measures shall be taken to reduce the organic vapor concentrations identified. The immediate measures shall be determined by the Environmental Professional and may include, but are not limited to one or all of the following:

- Increased use of water misting at the excavation, Affected Area Temporary Stockpile locations, and along the haul roads;
- Covering stockpiles and/or inactive work areas with exposed soils;
- Reducing the area of exposed soil within an Affected Area;
- Suspending and/or altering work activities during high wind conditions.

If more than two exceedances occur, construction, excavation, and other land-disturbing activities within the Affected Area shall cease and the Owner and the Responsible Party shall be notified. A meeting/conference call shall be conducted with the Owner, Responsible Party, Contractor, and the Environmental Professional to determine what additional measures are needed to prevent a reoccurrence.

5.8.3 Perimeter Air Monitoring

Perimeter air monitoring shall be performed continually during all construction, excavation, and other land-disturbing activities being performed within the Affected Areas while existing soils located deeper than 12" below existing grade are exposed. Perimeter air samples shall be collected by the Environmental Professional and analyzed for PCBs and VOCs.

Perimeter PCB air samples shall be collected using U.S. EPA Method TO-4A. This method involves collecting a 24-hour air sample using a modified polyurethane foam (PUF) sampler. Airborne PCB concentrations shall be reported in nanograms per cubic meter (ng/m^3).

Perimeter VOC air samples shall be performed using Summa canisters in accordance with EPA Method TO-15. To collect a grab sample, a flow control regulator valve on the vacuum canister is opened and the canister is allowed to fill over an 8-hour period. At the end of the sample period, the regulator valve is closed.

Air samples will be collected at four designated air monitoring locations. The designated sample locations shall be located near the property boundaries on the north, south, east, and west sides of the Site. Exact sample locations shall be placed in clear, unobstructed areas as determined by the Environmental

Professional. The wind direction, wind speed, temperature, and rainfall shall be recorded on a daily basis and shall be maintained with the project records.

Each sample shall be identified with a unique sample number. This sample number shall provide for easy identification of the sample in the field logs, field data sheets, analytical reports, chain-of-custody, and project reports. Samples shall be submitted to the laboratory following strict chain-of-custody procedures.

Background air sampling shall be performed prior to beginning of any excavation or land-disturbing activities being performed within the Affected Areas. Air samples from all four designated sample locations shall be collected and analyzed to establish the background conditions.

Perimeter air samples collected during construction, excavation, and land disturbing activities that occur within the Affected Areas while existing soils located deeper than 12 inches below existing grade are exposed shall be overnighted to the laboratory and analyzed using at least a 3-day turnaround time. The results shall be emailed from the lab directly to the Environmental Professional for evaluation and shall be made available for review. If any result exceeds 50 percent of the established action level, the Environmental Professional shall notify the Contractor.

Perimeter Air Sample Action Levels	
Constituent	**Concentration**
PCBs	1,000 ng/mg^3
1,4-Dichlorobenzene	2.0 ppm
trans-1,2-Dichlorobenzene	0.2 ppm
Methylene chloride	0.6 ppm
Tetrachloroethene	0.2 ppm
Toluene	1.0 ppm
1,1,1-Trichloroethene	2.0 ppm
Trichloroethene	2.0 ppm
Vinyl Chloride	0.5 ppm

Any result exceeding 50 percent of the established action level will be considered “elevated” and immediate measures shall be taken to reduce perimeter PCB and VOC concentrations. The immediate measures shall be determined by the Environmental Professional may include, but are not limited to one or all of the following:

- Increased use of water misting at the excavation, temporary stockpiles, and along the haul roads;
- Covering stockpiles and/or inactive work areas with exposed soils;

- Reducing the area of soil exposed within an Affected Area;

- Suspending and/or altering work activities during high wind condition.

If PCB or VOC concentrations exceed the established action level in any perimeter sample, work shall be stopped and the Contractor, the Owner, and the Responsible Party shall be notified. A meeting/conference call shall be conducted to review the circumstances of the exceedance and to determine what additional measures are necessary to prevent a recurrence.

6.0 SOIL MANAGEMENT

The following soil management procedures are intended to provide for proper handling, re-use and/or disposal, and documentation of excavated soils from within an Affected Area, **Figure 2**, as required by the ERC.

6.1 AFFECTED AREA LAND DISTURBING ACTIVITIES

The proposed coordinates for the limits of the land-disturbing activities located within the Affected Areas and estimate of the volume of soil to be excavated from each Affected Area are depicted on **Figure 3** and the maximum depth of excavation with in the Affected Area is depicted on **Figure 4**. Prior to initiating any land-disturbing activities at the Project Site, the Contractor shall survey and stake the limits of the Affected Areas located within the ROW and clearly designate these areas so that they are not inadvertently disturbed prior to work specifically being scheduled in the Affected Areas. Contractor shall coordinate work activities to limit the duration that disturbed soils within an Affected Area are exposed.

Prior to any change in the limits for the land-disturbing activities within an Affected Area, the Environmental Professional, the Owner/Operator and the Responsible Party should be notified to verify the scope of the change and how the change will impact the requirements set forth in the Soil Management Plan and the estimated volume of excavated soil from within an Affected Area.

The following handling procedures are required for excavated soils from within an Affected Area:

- Soils excavated from within Affected Area A, regardless of depth, shall be segregated, transported, and stockpiled in the designated area depicted on **Figure 3** as the Affected Area Temporary Stockpile Area.

- Soils excavated from within Affected Area B from existing grade to 7 feet below existing grade shall be segregated, transported, and stockpiled in the designated area depicted on **Figure 3** as the Affected Area Temporary Stockpile Area.

- Soils excavated from within Affected Area B from depths greater than 7 feet below existing grade shall be segregated, transported, and stockpiled in the designated area depicted on **Figure 3** as the Affected Area B Temporary Stockpile Area.

If the limits of land-disturbing activities within an Affected Area are changed, the Contractor shall have the new limits surveyed. The Contractor shall also have the base of the excavations and/or grading limits located within the land-disturbing limits of an Affected Area surveyed. The survey shall be performed by a State of Indiana Licensed Land Surveyor.

6.2 AFFECTED AREA TEMPORARY SOIL STOCKPILES

The proposed coordinates for the limits of the Affected Area Temporary Soil Stockpile locations are depicted on **Figure 3**. Prior to initiating any land-disturbing activities at the Project Site, the Contractor shall survey and stake the limits of the Affected Area Temporary Soil Stockpile locations and clearly designate these areas so that they are not inadvertently disturbed prior to work specifically being scheduled in the Affected Areas. Contractor shall coordinate work activities to limit the duration that disturbed soils excavated from an Affected Area are stockpiled.

Excavated soils shall be properly segregated and stockpiled in the designated locations. Temporarily stockpiling of excavated soils from within the Affected Areas shall be placed on a plastic liner (30-mil minimum thickness). Prior to the placement of the liner, a one-foot berm shall be built on all sides of the stockpile area. The liner shall have a minimum 3-foot wide soil-free perimeter around the base of the stockpiles.

Stockpiles shall be sloped to minimize creeping or sloughing of the soils. Diking or other measures shall be used to prevent surface runoff from flowing onto the liners on which the soil is placed.

The stockpile shall be completely covered, if left overnight, with plastic liner (6-mil minimum thickness) anchored securely to protect against wind and precipitation, as directed by the Environmental Professional. Where several sheets of plastic are necessary to cover the stockpiles, the edges shall overlap a minimum of 2 feet and be taped. Once the stockpile has been covered, the soil-free perimeter of the liner shall be secured with concrete blocks or similar materials.

Temporary Soil Stockpile area shall be graded to divert stormwater and minimize the amount of surface water that comes in contact with the Affected Area Temporary Soil Stockpiles.

In lieu of temporarily stockpiling the excess excavated soils from Affected Area A and Affected Area B (0-7' below ground surface) and the excavated soils from Affected Area B that were removed from a depth of 7 feet or deeper below existing grade, the Contractor has the option to place the excavated soils directly into a Department of Transportation (DOT) approved roll-off containers having removable liners and covers that can be staged on-site in the designated locations and then transported off-site to the designated landfill for proper disposal.

If the limits of Affected Area Temporary Stockpile locations are changed, the Contractor shall have the new limits surveyed. The survey shall be performed by a State of Indiana Licensed Land Surveyor.

6.3 RE-USE OF AFFECTED AREA EXCAVATED SOILS

In accordance with the ERC, soils excavated from within the limits of Affected Area A (regardless of depth) or from the within the limits of Affected Area B (0-7' below ground surface) can be used as fill and/or backfill, as long as it meets the geotechnical requirements defined in the Special Provisions, at any depth below grade within an Affected Area as long as the soil is capped with a minimum of 12 inches of clean fill, as defined in Section 9.2.

Coordinates for the proposed location for the re-use of the excavated soils from Affected Areas described above and the estimated quantity are depicted on **Figure 5**. The Contractor shall be required to survey the exact location of the area and depth interval within the Affected Area that the previously excavated Affected Area soils were placed and provide an exact quantity placed. The survey shall be performed by a State of Indiana Licensed Land Surveyor.

6.4 DISPOSAL OF AFFECTED AREA EXCAVATED SOILS

Th excess excavated soils from the Affected Areas that are not able to be placed back within the limits of the Affected Area or the soils excavated from Affected Area B (7' and deeper below grade) will be required to be removed from the Site and transported to the Heritage Subtitle C Landfill located in Roachdale, IN for proper disposal. If an alternate disposal facility is desired, the Contractor shall submit a written request to the Owner/Operator and the Responsible Party for review and approval. If the request for an alternate disposal facility is approved, the Owner/Operator will provide a written authorization for the approval. Without written authorization for approval, the Contractor shall be required to dispose of the soil at the Heritage Subtitle C Landfill. An estimate of the tonnage of excess soil requiring removal and disposal at the Heritage Subtitle C Landfill is provided on **Figure 3**.

The Contractor shall be required to coordinate the transportation and disposal of the Affected Area excavated soils with Heritage, the Environmental Professional, the Owner/Operator, and the Responsible Party. The Environmental Professional will be required to perform the required waste characterization sampling and analysis and prepare the necessary waste profile paperwork for signature. The Responsible Party or their authorized designee will sign the waste profile as the Generator.

The Environmental Professional shall be required to collect three waste characterization soil samples from each Affected Area Temporary Soil Stockpile that will be removed from the site for disposal. At a minimum, each soil sample shall be analyzed for pH, Ignitability (cyanide and sulfide), TCLP Metals (RCRA 8 metals), PCBs, total VOCs, SVOCs, herbicides, and pesticides. Prior to the collection of the waste characterization samples, the Environmental Professional shall coordinate with the Heritage Subtitle C Landfill to determine if any additional analysis is required.

The transportation of the excavated soils from the Affected Areas must be transported by appropriately licensed personnel/contractors in accordance with all local, state, and federal regulations utilizing a DOT approved roll-off containers having removable liners and covers. The removal and transport of any excavated soil that contains free-liquids will not be permitted.

The transport of all excess excavated soils from the Affected Areas that are not able to be placed back within the limits of the Affected Area or the soils excavated from Affected Area B (7' and deeper below grade) will be required to be manifested using the Uniform Hazardous Waste Manifest. The Environmental Professional shall prepare the Uniform Hazardous Waste Manifest for signature by the Responsible Party or their authorized designee.

The Environmental Professional will be responsible for the management of records associated with the waste transportation and disposal on this Project (e.g., load tickets, landfill receipts, and manifests). All project records will be turned over to Owner and Responsible Party at the conclusion of the project.

6.5 SOIL MANAGEMENT PLAN RECORD KEEPING AND DOCUMENTATION

The Contractor will be responsible for the management of all records associated with the documentation of the limits of land-disturbing activities within the Affected Areas, the location of Affected Area Temporary Stockpile locations, and the quantity and limits of where excavated Affected Area soils were placed back within an Affected Area.

The Environmental Professional will be responsible for the management of records associated with air-monitoring, confined trench/excavation environmental screening, and the waste transportation and disposal on this Project (e.g., load tickets, landfill receipts, and manifests).

All project records will be turned over to Owner and the Responsible Party at the conclusion of the project.

7.0 WATER MANAGEMENT

The management of stormwater and groundwater encountered during the construction and excavation activities is divided into five components:

- Diversion of site runoff away from the exposed soils located within an Affected Area.
- Retention of any stormwater that comes in contact with potentially impacted soils within an Affected Area.
- Collection and transfer of potentially impacted stormwater or groundwater from the Affected Area.
- Sampling and analysis of potentially impacted stormwater or groundwater and on-site discharge.
- Off-site treatment of impacted stormwater and/or groundwater

The primary objective of this plan is to divert the flow of stormwater runoff from rainfall events away from the disturbed areas located within an Affected Area and to minimize the accumulation of stormwater in the disturbed areas located within an Affected Area. Stormwater that does come in contact with potentially contaminated soils located within an Affected Area (soils 1' below ground surface) will be collected and tested to determine if treatment is required before the stormwater can be discharged.

7.1 DIVERSION OF CLEAN STORMWATER

Stormwater runoff from rainfall events shall be diverted away from construction and excavation activities located within the Affected Areas to minimize the accumulation of stormwater in the excavations, stockpile areas, and other work zones. At a minimum, temporary earthen berms, or something similar in nature, should be constructed around any open excavations or stockpile areas that appear to lie in the natural drainage path in attempt to divert stormwater runoff from coming in contact with potentially contaminated soils located within an Affected Area. Any storm water that does come in contact with potentially contaminated soil located within an Affected Area shall be collected and handled as described herein.

Stormwater that is diverted away from the potentially contaminated soils located within an Affected Area will be allowed to follow the natural drainage pattern.

7.2 COLLECTION OF POTENTIALLY IMPACTED WATER

At a minimum, areas with land disturbing activities located within an Affected Area shall be temporarily graded to allow for the collection of stormwater that comes in contact with potentially contaminated soils in that Affected Area. The stormwater that accumulates in the construction and excavation limits located within an Affected Area will be collected and then pumped to the contractor's on-site frac tank for subsequent sampling and analysis. The Contractor shall provide a sufficient number of 20,000-gallon frac tanks on-site to use for the storage of collected stormwater from the portion of the Affected Areas where construction and excavation activities are occurring. Where the potential for overflow of an excavation exists to stormwater run-on, sump pumps should be installed prior to the rainfall event and connected directly to the on-site holding tank(s).

Groundwater accumulated in open soil excavations or the effluent from dewatering operations at the Project Site shall be pumped to the on-site holding tank(s) for subsequent sampling and analysis.

7.3 SAMPLING AND ANLYSIS OF POTENTIALLY IMPACTED WATER

The Environmental Professional shall collect a water sample from each frac tank, or approximately 20,000 gallons of collected stormwater and/or groundwater collected. The sample shall be submitted to qualified laboratory and analyzed for VOCs (EPA Method 8260), zinc (EPA Method 6010), PCBs (EPA Method 8082A).

7.4 DISCHARGE REQUIREMENTS

The Environmental Professional shall evaluate the analytical laboratory results from the water sampling and compare the results to the following discharge requirements:

- Less than 0.43 mg/l zinc
- Less than 0.3 ug/l total PCBs
- Ph of 6.0 to 9.0
- VOCs shall be compared against the IDEM aquatic water quality criteria.

If the analytical results are less than the above requirements, the water can be discharged to the surface at the Project Site and allowed to follow the natural drainage courses.

If the analytical results indicate that the discharge requirements have not been met, then the water shall either be treated on-site and then re-sampled or taken off-site and properly disposed of at a facility

licensed to treat this water. Additional sampling and analysis may be required by the off-site treatment facility.

7.5 WATER RECORD KEEPING REQUIREMENTS

The Environmental Professional or his designee will be responsible for maintaining a log of all water sampled and analyzed, released on-site, treated on-site, or taken off-site for treatment. The water log will record the source of the water, the date, the volume, storage tank number, batch, test results, on-site discharge location and date, off-site treatment location and date and any other relevant information. The water log and supporting information will be turned over to the Owner and the Responsible Party at the conclusion of the Project.

8.0 DECONTAMINATION PLAN

8.1 SMALL EQUIPMENT DECONTAMINATION PROCEDURE

Decontamination will be required for all equipment, such as tools, shovels, sampling devices, pumps, tubing, containers, other items that come in contact with potentially impacted soils located at depths greater than 1-foot below the ground surface in an Affected Area and/or stormwater and/or groundwater that is collected within an Affected Area so as to prevent the transport of potentially contaminated soils and/or water to uncontaminated areas.

Prior to the removal of equipment from the construction and excavation areas within an Affected Area, initial decontamination should be performed and should consist of the gross removal of soil using hand-methods (i.e, with a shovel, brush, or broom). Equipment should then be taken to the designated decontamination area and equipment should be placed on plastic liners or other appropriately lined containers.

Scrub the equipment in a large bucket, wash basin, or children's swimming pool with water and rinse. The wash and rinse solutions should be selected based on the contaminants present at the site. For the Project Site, organic solutions are preferred for the residual PCB impacts that may be encountered. Repeat the cleaning process as many times as necessary to remove any residual soil.

Any soil collected as part of the decontamination process shall be added to the Affected Area Temporary Soil Stockpile. The wash and rinse solutions utilized in the decontamination process shall be collected and shall be handled in accordance with the requirements set forth in Section 7.0.

8.2 PERSONNEL DECONTAMINATION PROCEDURE

Decontamination will be required for all workers that come in contact with potentially impacted soils located at depths greater than 1-foot below the ground surface in an Affected Area and/or stormwater and/or groundwater that is collected within an Affected Area so as to prevent the transport of potentially contaminated soils and/or water to uncontaminated areas.

Prior to the workers leaving the construction and excavation areas within an Affected Area, initial decontamination should be performed and should consist of the gross removal of soil using hand-methods (i.e., with a shovel, brush, or broom).

Workers should then proceed to the designated decontamination area and outer protective clothing exhibiting or suspected of gross impacts should be deposited on drop cloths made of plastic or other suitable material. Lined boxes or other similar lined containers can also be used for wiping or rinsing off gross solid contaminants. Any soil collected as part of the decontamination process shall be added to the Affected Area Temporary Soil Stockpile.

A children's pool, galvanized tub or other large basin is recommended for the washing and rinsing process and should be large enough to place a booted foot inside. Long-handled, soft-bristled brushes can be utilized to help remove contaminants during the washing and rinsing process. The wash and rinse solutions should be selected based on the contaminants present at the site. For the Project Site, organic solutions are preferred for the residual PCB impacts that may be encountered. All cleaning and rinse paper or cloth towels should be provided for drying of the protective clothing and other PPE cleaned or decontaminated during the above process. The wash and rinse solutions utilized in the decontamination process shall be collected and shall be handled in accordance with the requirements set forth in Section 7.0.

8.3 CONSTRUCTION MACHINARY DECONTAMINATION PROCEDURE

Decontamination will be required for all construction machinery that comes in contact with potentially impacted soils located at depths greater than 1-foot below the ground surface in an Affected Area and/or stormwater and/or groundwater that is collected within an Affected Area so as to prevent the transport of potentially contaminated soils and/or water to uncontaminated areas.

Prior to the removal of construction machinery from the construction and excavation areas within an Affected Area, initial decontamination should be performed and should consist of the gross removal of soil using hand-methods (i.e., with a shovel, brush, or broom). Construction machinery should then be taken to the designated decontamination area, which should be constructed for the purpose to allow for the accumulation of removed soil and wash water. The construction machinery should be power-washed to remove all residual soil materials, to the extent practical. Any soil collected as part of the

decontamination process shall be added to the Affected Area Temporary Soil Stockpile. The wash and rinse solutions utilized in the decontamination process shall be collected and shall be handled in accordance with the requirements set forth in Section 7.0.

9.0 INSTITUTIONAL AND ENGINEERING CONTROLS

The ERC, discussed in Section 3.0, establishes institutional controls for the Project Site that restrict the land-use type, require the implementation of a Soil Management Plan for excavation activities within an Affected Area, and also establishes engineering controls to prevent potential stormwater impacts resulting from contact with contaminated soils located within an Affected Area.

The proposed construction and grading activities associated with the Project, which are located within the limits of the Affected Areas, will result in the removal of the existing engineering controls that are in-place. The components of this Soil Management Plan that will be implemented during construction and excavation activities within the Affected Areas address the disturbance of the engineering controls during the Project. The engineering controls, as defined in Section 9.1. and 9.2, consist of barriers to prevent the direct contact of stormwater runoff with contaminated soils located within the Affected Areas. The engineering controls discussed in Section 9.3 consist of barriers to eliminate preferential pathways resulting from the construction of utility trenches that cross the Affected Areas.

9.1 HARDSCAPE CAPPING

Based on the proposed roadway design plans, portions of the construction and excavation activities located within the Affected Areas will be capped with hardscape. The proposed hardscapes (roadway pavement and sidewalk pavement) will be constructed so as to provide the required engineering controls (minimum 1-foot of clean fill over potentially contaminated soils within the Affected Areas) to prevent stormwater run-off from directly contacting potentially contaminated soils.

Roadway Pavement: Areas within the foot-print of the proposed roadway will consist of 11-inches of asphalt pavement constructed on 6-inches of aggregate sub-base material. The thickness of the roadway materials exceeds the minimum 1-foot of clean fill cover required to be placed over the potentially impacted soils within the Affected Areas.

Multi-Use Trail: Areas within the foot-print of the proposed multi-use trail will consist of 4-inches of asphalt constructed on 6-inches of aggregate sub-base material. If the proposed grade for the multi-use trail is lower than the existing grade (cut-area), then clean fill should be placed, as required, underneath the foot-print of the multi-use trail to an elevation that provides a minimum of 1-foot of material (fill required + 4" pavement and 6"aggregate base) over the potentially contaminated soils within the Affected Area.

Sidewalks: Areas within the foot-print of the proposed sidewalks will consist of 4-inches of concrete constructed on 4-inches of aggregate sub-base material. If the proposed grade for the sidewalk is lower than the existing grade (cut-area), then clean fill should be placed, as required, underneath the foot-print of the sidewalk to an elevation that provides a minimum of 1-foot of material (clean fill required + 4" concrete and 4" aggregate base) over the potentially contaminated soils within the Affected Area.

9.2 CLEAN SOIL CAPPING

In portions of the Affected Areas where the existing grade is to be lowered (cut-area) or the existing grade was disturbed, reducing the thickness of the existing 1-foot thick clean soil cap, and the Project will not include the construction of hardscape, the Contractor shall provide additional clean fill, as required to provide a minimum of one-foot of clean fill over the potentially contaminated soils within that Affected Area. In addition, a 1-foot clean soil cap shall also be placed over the areas where the Affected Area Soil Temporary Stockpiles and the Decontamination Zones were located.

Clean fill shall consist of soils obtained from an off-site borrow source that meet the geotechnical requirements, as defined in the Project Special Provisions, and contains contaminant concentrations less than the IDEM Remediation Closure Guide (RCG) current residential screening levels for PCBs, VOCs, SVOCs, and the 8-RCRA metals. An initial soil sample from the off-site borrow source shall be collected by the Environmental Professional and submitted to a qualified laboratory for analysis. Prior to import of soil from the off-site borrow source, the laboratory analytical report shall be submitted to the Owner, the Responsible Party, and the IDEM Office of Land Quality-Federal Programs Section for review and approval prior to the material being brought on-site.

An additional soil sample from the off-site borrow source shall be collected and analyzed for every 5,000 cubic yards, or as directed by the Owner, brought on-site. The laboratory analytical report shall be submitted to the Owner, the responsible Party, and the IDEM Office of Land Quality – Federal Programs Section for review and approval.

9.3 CONCRETE TRENCH DAM

This Project will involve the installation of water, sanitary sewer, and storm sewer mains, tee's, and service lateral piping. The utilities will be constructed in separate utility trenches that are located at varying depths below the ground surface within the ROW, which crosses the Affected Areas depicted in **Figure 3**. The utility trenches are to be backfilled in accordance with the requirements set forth in the Standard Specifications, which may result in the creation of preferential pathways that could allow migration of contaminants from an Affected Area. To mitigate the potential migration of contaminants from an Affected Area via a preferential pathway created by the utility trenches, the Contractor shall construct a Concrete Trench Dam in each utility trench where that utility trench bisects an Affected Area boundary. If a service lateral is installed on the water, sanitary of storm mains that terminates within an Affected

Area, then a Concrete Trench Dram is not required to be installed at the end of the service lateral trench. However, if a service lateral is installed on the water, sanitary, or storm mains that bisects the Affected Area boundary, then a Concrete Trench Dam will be required to be constructed in that service lateral trench at the Affected Area boundary.

In addition, if groundwater is encountered in a utility trench outside of the boundaries of the Affected Area, a Concrete Trench Dam will be required to be installed at the limits of where groundwater was encountered within that utility trench.

A detail for the Concrete Trench Dam is enclosed in **Appendix D.** The Contractor shall construct the concrete trench dam in accordance with the requirements set forth in the Standard Specifications, Special Provisions, and Contract Drawings.

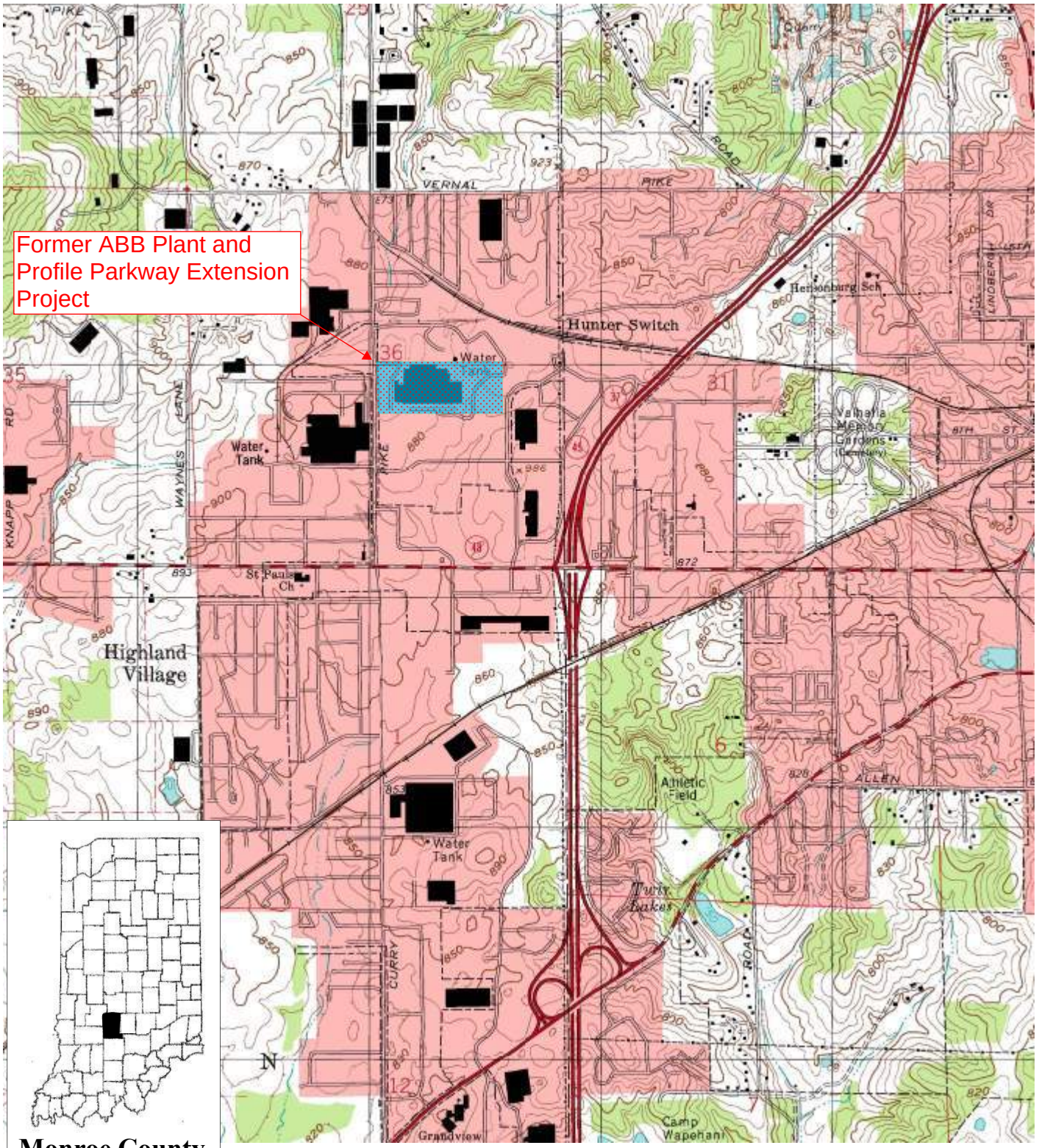
9.4 UTILITY INSTALLATION REQUIREMENTS

The installation of water, sanitary sewer, and storm mains, tee's and service lateral piping within the limits of the Project Site will require the use of approved piping and gasket materials, as specified in the Special Provisions and Contract Drawings.

I

FIGURES

USGS Quadrangle Map



USGS Bloomington Quad Maps
Scale: 1"=2000'

DLZ	**Soil Management Plan** Profile Parkway Extension Monroe County, Indiana	Scale: NTS Figure: 1

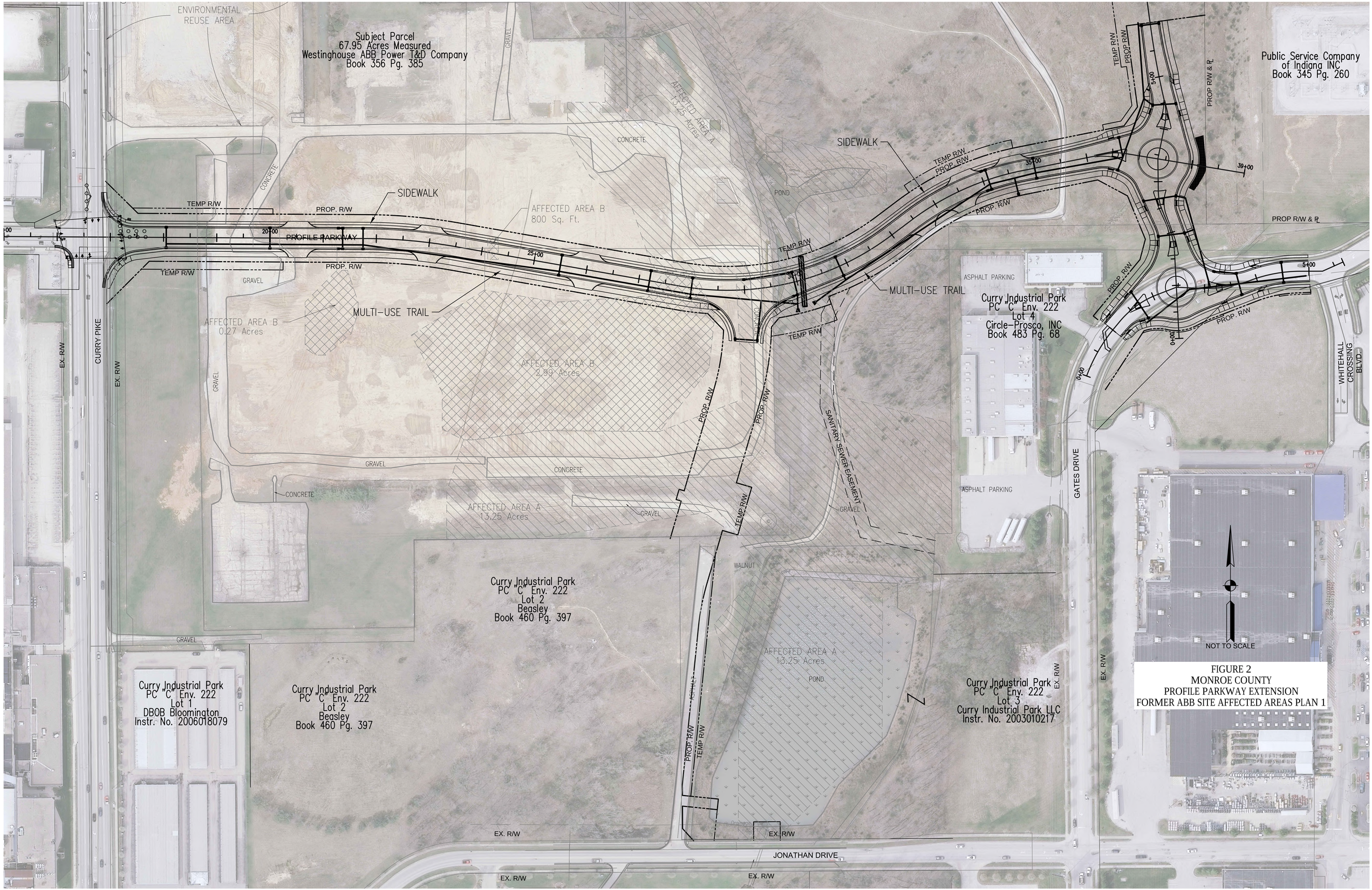


FIGURE 2
MONROE COUNTY
PROFILE PARKWAY EXTENSION
FORMER ABB SITE AFFECTED AREAS PLAN 1

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
We Protect Hoosiers and Our Environment.
100 N. Senate Avenue • Indianapolis, IN 46204
(800) 451-6027 • (317) 232-8603 • www.idem.IN.gov
Eric J. Holcomb
Governor
Bruno L. Pigott
Commissioner

August 27, 2019

Mr. Steven Winters
DLZ Indiana LLC
2211 East Jefferson Blvd.
South Bend, IN 46615

Dear Mr. Winters:

Re: Revised Soils Management Plan, Profile
Parkway Project, ABB Removal Action Site,
Bloomington, IN

IDEM staff have reviewed the above referenced document provided via email on August 26, 2019. Our comments have been addressed. The plan is approved.

IDEM staff would like to take this opportunity to reiterate that strict adherence to the Soils Management Plan is essential to ensure any residual polychlorinated biphenyl (PCB) contamination is not inadvertently brought to the surface and spread to other, clean areas of the site. Please provide at least two weeks advance notice for the start of construction activities so IDEM staff can provide oversight.

If you have any questions or wish to discuss this report further, please do not hesitate to contact me at (317) 233-2823 or jfliss@idem.in.gov.

Sincerely,

Jessica Huxhold Fliss,
Senior Environmental Manager
Federal Programs Section
Office of Land Quality

cc: Rex Osborn, IDEM
Tom Alcamo, U.S. EPA

APPENDIX F

Water Resources

WETLAND DELINEATION REPORT

Vernal Pike Connector
From West Vernal Pike to Profile Parkway
Monroe County, Indiana
Des. No.: 1702957 and 1900406

Prepared By:

DLZ Indiana, LLC
157 E. Maryland Street
Indianapolis, IN 46204

November 15, 2019

WATERS OF THE U.S. REPORT
Vernal Pike Connector
From West Vernal Pike to Profile Parkway
Monroe County, Indiana
Des. No.: 1702957 and 1900406

Report By: Dan Stevens, Environmental Scientist, DLZ Indiana, LLC
November 15, 2019

Introduction
DLZ conducted a Waters of the United States determination on September 20, 2018 and October 1, 2019 for the proposed Vernal Pike Connector project (Des No. 1702957 and 1900406) that includes the extension of Sunrise Greeting Court south to Profile Parkway, connecting West Vernal Pike to Profile Parkway via a railroad overpass. The project will include road and bridge construction on a new alignment over CSX Railroad (operated by Indiana Railroad). The study limits also include approximately 550 feet of the locally funded Profile Parkway at the project's southern terminus. This portion is being included to provide the Vernal Pike Connector project with a connection to North Gates Drive. This connection will provide independent utility in case construction of the locally funded Profile Parkway project becomes delayed. The entire Profile Parkway project is not included since the Vernal Pike Connector does not rely on the completion of the other sections of Profile Parkway to provide independent utility.

The project is located within Sections 25 and 36, Township 9 North, Range 2 West, Richland Township, USGS Bloomington Topographic Quadrangle, Monroe County, Indiana (See Figure 1). The project is located in watersheds with 12-digit Hydrologic Unit Codes (HUC) of 051202020106 (Stout Creek-Beanblossom Creek) and 051202080802 (May Creek-Clear Creek).

The Bloomington, IN Quadrangle Map does not show any blue-line streams or drainage features in the study limits (See Figures 1-1 and 1-2). A Light Detection and Ranging (LiDAR) map of the project area is attached as Figure 2.

The National Wetlands Inventory (NWI) does not show any wetland features in the study limits (See Figure 3).

The project is within the potential karst features region. However, no mapped karst features were noted in the IndianaMap data (*https:maps.indiana.edu*) within the study limits as shown on Figure 3. A separate karst report will be prepared as part of the Environmental Study for this project.

According to the Soil Survey Geographic (SSURGO) Database for Monroe County, Indiana, the following soil units are located in the project area (See Figure 4). None of these are listed as hydric soil units.

- Crider silt loam, 2 to 6 percent slopes (CrB) – not hydric (0%)
- Crider silt loam, 6 to 12 percent slopes (CrC) – not hydric (0%)
- Hosmer silt loam, 0 to 2 percent slopes (HoA) – not hydric (0%)
- Hosmer silt loam, 2 to 6 percent slopes (HoB) – not hydric (0%)
- Udorthents, loamy (Ua) – not hydric (0%)

The project is not located within the limits of the Federal Emergency Management Agency (FEMA) mapped floodplain (See Figure 5).

See Tables 1 and 2 for a summary of the waters determination. See Figures 1 to 6 for maps of the project area. See Appendix A for wetland data sheets and Appendix B for site photographs.

Field Reconnaissance

The study limits were found to contain existing roadway, industrial/manufacturing land, wooded land, undeveloped land, and three potential wetland areas. Field reconnaissance did not identify any streams in the project area. The wetlands are described below. The delineated boundaries of these wetlands are shown on Figure 6-1 and 6-2.

Wetlands

The field inspection revealed three potentially jurisdictional wetland features in the study limits. The wetland boundaries were field flagged and DGPS surveyed as shown on Figure 6-1 and 6-2. A total of 11 sample points were studied for the presence of wetlands. The delineation procedures and wetland criteria outlined in the 1987 Corps of Engineers Wetland Delineation Manual were used for this study. In addition, the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0, August 2010) was applied to the project location. Wetland data sheets are attached (See Appendix A). Following is a summary of each sample point:

<u>Wetland A (Sample Point 1)</u>

Wetland A is located in the wooded area east of the parking lot/drive. Wetland A is a slightly depressed swale feature that receives and holds storm water runoff from up-gradient parking areas. Wetland A is dominated by wetland plants consisting of eastern cottonwood (*Populus deltoides*, FAC), box elder (*Acer negundo*, FAC), Canadian wood-nettle (Laportea canadensis, FAC), beggarstick (*Bidens frondosa*, FACW), and smartweed (*Persicaria pensylvanica*, FACW). These plants meet the hydrophytic plant criteria. The plant community type is emergent/forested wetland. The quality of Wetland A is considered poor due to its small size and eroded nature. Wetland hydrology was evidenced by the presence of primary indicators of sediment deposits (B2), drift deposits (B3), and water-stained leaves (B9). The soil color in the test pit was 10YR 4/2 silt loam with 10YR 5/6 mottles (10%) from 0 to 20 inches. The presence of the hydric soil indicator of Depleted Matrix (F3) demonstrates that the site contains hydric soils. This area therefore meets the three jurisdictional wetland criteria. Wetland A is apparently an isolated wetland since it does not appear to connect to any other jurisdictional waters of the U.S. Ephemeral overland flow enters and leaves this feature during rain events but no connecting

surface drainage features were observed that displayed relatively permanent flow, an ordinary high water mark, or bed and bank characteristics.

The contrasting upland sample point (Sample Point 2) did not meet all three wetland criteria. The plants were sassafrass (*Sassafras albidum*, FACU) and honeysuckle (*Lonicera tatarica*, FACU). These plants do not meet the hydrophytic plant criteria. No hydrology indicators were observed. The soil was 10YR 4/3 silt loam from 0 to 20 inches with no mottles. No hydric soil indicators were observed. This plot does not meet the hydrophytic vegetation, wetland hydrology, or the hydric soils criteria and was therefore determined to not be within a wetland.

Wetland B (Sample Point 3)

Wetland B is located south of the railroad tracks near the east project study limits. Wetland B is a possibly man-made shallow pond feature. Wetland B is dominated by wetland plants consisting of pin oak (*Quercus palustus, FACW*), Canadian wood-nettle (*Laportea canadensis, FAC*), and beggarstick (*Bidens frondosa*, FACW). These plants meet the hydrophytic plant criteria. The plant community type is emergent/forested wetland. The quality of Wetland B is considered poor due to its small size, lack of plant diversity, and apparent man-made nature. Wetland hydrology was evidenced by the presence of primary indicators of Saturation (A3). The soil color in the test pit was 10YR 4/1 clay with 10YR 5/6 mottles (40%) from 0 to 20 inches. The presence of the hydric soil indicator of Depleted Matrix (F3) demonstrates that the site contains hydric soils. This area therefore meets the three jurisdictional wetland criteria. Wetland A is apparently an isolated wetland since it does not appear to connect to any other jurisdictional Water of the U.S.

The contrasting upland sample point (Sample Point 4) did not meet all three wetland criteria. The plants were eastern red cedar (*Juniperus virginiana*, FACU), sassafras (*Sassafras albidum*, FACU), honeysuckle (*Lonicera tatarica*, FACU), tall goldenrod (*Solidago altissima*, FACU), multiflora rose (*Rosa multiflora*, FACU), poison ivy (*Toxicodendron radicans*, FAC), and Virginia creeper (*Parthenocissus quinquefolia*, FACU). These plants do not meet the hydrophytic plant criteria. No hydrology indicators were observed. The soil was 10YR 4/3 silt loam from 0 to 20 inches with no mottles. No hydric soil indicators were observed. This plot does not meet the hydrophytic vegetation, wetland hydrology, or the hydric soils criteria and was therefore determined to not be within a wetland.

Wetland C (Sample Point 5)

Wetland C is located in the lawn area south of the parking lot. Wetland C is a man-made swale feature that receives storm water runoff from up-gradient parking areas. Wetland C is dominated by wetland plants consisting of rice cutgrass (*Leersia oryzoides*, OBL), smartweed (*Persicaria pensylvanica*, FACW), and beggarstick (*Bidens frondosa*, FACW). These plants meet the hydrophytic plant criteria. The plant community type is emergent wetland. The quality of Wetland A is considered poor due to its small size, manmade nature and since it is frequently mowed. Wetland hydrology was evidenced by the presence of secondary indicators of Drainage Patterns (B10) and FAC-Neutral Test (D5). The soil color in the test pit was 10YR 3/1 silt loam from 0 to 4 inches and 10YR 5/1 silt loam with 10YR 5/6 mottles (30%) from 4 to 20 inches. The presence of the hydric soil indicator of Depleted Matrix (F3) demonstrates that the site contains

hydric soils. This area therefore meets the three jurisdictional wetland criteria. Wetland C is apparently an isolated wetland since it does not appear to connect to any other jurisdictional waters of the U.S. Ephemeral overland flow enters and leaves this feature during rain events but no connecting surface drainage features were observed that displayed relatively permanent flow, an ordinary high water mark, or bed and bank characteristics.

The contrasting upland sample point (Sample Point 6) did not meet all three wetland criteria. The plants were tall fescue (*Schedonorus arundinaceus*, FACU), white clover (*Trifolium repens*, FACU), English plantain (*Plantago lanceolata*, UPL), foxtail (*Setaria pumila*, FAC), and crabgrass (*Digitaria sanguinalis*, FACU). These plants do not meet the hydrophytic plant criteria. No hydrology indicators were observed. The soil was 10YR 5/3 silt loam from 0 to 20 inches with no mottles. No hydric soil indicators were observed. This plot does not meet the hydrophytic vegetation, wetland hydrology, or the hydric soils criteria and was therefore determined to not be within a wetland.

Upland 1

This representative upland sample point (Sample Point 7) was collected in the wooded area north of the CSX Railroad. This point did not meet all three wetland criteria. The plants were sassafrass (*Sassafras albidum*, FACU), black cherry (*Prunus serotina*, FACU), honeysuckle (*Lonicera tatarica*, FACU), privet (*Ligustrum vulgare*, FACU), black snakeroot (*Sanicula marilandica*, FACU), Virginia creeper (*Parthenocissus quinquefolia*, FACU), and white snakeroot (*Ageratina altissima*, FACU) which do not meet the hydrophytic plant criteria. The soil in the test pit was 10YR 3/2 silt loam from 0 to 8 inches and 10 YR 4/3 silt loam from 8 to 20 inches, which is not a hydric soil profile. No wetland hydrology indicators were observed at the sample site. The upland sample point is therefore not in a wetland.

Upland 2

This representative upland sample point (Sample Point 8) was collected near the southern study limits to the north of Gates Drive. This point did not meet all three wetland criteria. The plants were tulip tree (*Liriodendron tulipifera*, FACU), black cherry (*Prunus serotina*, FACU), sassafras (*Sassafras albidum*, FACU), black walnut (*Juglans nigra*, FACU), honeysuckle (*Lonicera tatarica*, FACU), blackberry (*Rubus allegheniensis*, FACU), poison ivy (*Toxicodendron radicans*, FAC), black snakeroot (*Sanicula marilandica*, FACU), multiflora rose (*Rosa multiflora*, FACU), Virginia creeper (*Parthenocissus quinquefolia*, FACU), and sticky-willy (*Galium aparine*, FACU) which do not meet the hydrophytic plant criteria. The soil in the test pit was 10YR 6/4 silt loam from 0 to 20 inches which is not a hydric soil profile. No wetland hydrology indicators were observed at the sample site. The upland sample point is therefore not in a wetland.

Upland 3

This representative upland sample point (Sample Point 9) was collected in the wooded area north of the CSX Railroad. This point did not meet all three wetland criteria. The plants were tulip (*Liriodendron tulipifera*, FACU), sassafrass (*Sassafras albidum*, FACU), honeysuckle (*Lonicera tatarica*, FACU), white snakeroot (*Ageratina altissima*, FACU), Virginia creeper (*Parthenocissus quinquefolia*, FACU), blackberry (*Rubus allegheniensis*, FACU), poison ivy (*Toxicodendron*

radicans, FAC), and black snakeroot (*Sanicula marilandica*, FACU), which do not meet the hydrophytic plant criteria. The soil in the test pit was 10YR 5/3 silt loam from 0 to 8 inches and 10 YR 6/3 silt loam from 8 to 20 inches, which is not a hydric soil profile. No wetland hydrology indicators were observed at the sample site. The upland sample point is therefore not in a wetland.

Upland 4

This representative upland sample point (Sample Point 10) was collected south of Gates Drive. This point did not meet all three wetland criteria. The plants were white oldfield American aster (*Symphyotrichum pilosum*, FAC), tall goldenrod (*Solidago altissima*, FACU), tall fescue (*Schedonorus arundinaceus*, FACU), blackberry (*Rubus allegheniensis*, FACU), and poison ivy (*Toxicodendron radicans*, FAC), which do not meet the hydrophytic plant criteria. The soil in the test pit was 10YR 5/3 silt loam from 0 to 8 inches and 10 YR 4/4 silt loam from 8 to 20 inches, which is not a hydric soil profile. No wetland hydrology indicators were observed at the sample site. The upland sample point is therefore not in a wetland.

Upland 5

This representative upland sample point (Sample Point 11) was collected in the wooded area north of the Gates Drive. This point did not meet all three wetland criteria. The plants were tulip (*Liriodendron tulipifera*, FACU), white ash (*Fraxinus americana*, FACU), eastern redcedar (*Juniperus virginiana*, FACU), black cherry (*Prunus serotina*, FACU), honeysuckle (*Lonicera tatarica*, FACU), staghorn sumac (*Rhus typhina*, UPL), Japanese honeysuckle (*Lonicera japonica*, FACU), tall goldenrod (*Solidago altissima*, FACU), white oldfield American aster (*Symphyotrichum pilosum*, FAC), poison ivy (*Toxicodendron radicans*, FAC), tall fescue (*Schedonorus arundinaceus*, FACU), and blackberry (*Rubus allegheniensis*, FACU) which do not meet the hydrophytic plant criteria. The soil in the test pit was 10YR 5/4 silt loam from 0 to 20 inches, which is not a hydric soil profile. No wetland hydrology indicators were observed at the sample site. The upland sample point is therefore not in a wetland.

Roadside Ditch

One segment of roadside ditch was observed in the study limits. Roadside Ditch 1 is located along the north side of North Gates Drive near the southern project terminus. This ditch is an ephemeral and manmade feature. This ditch does not connect to any other upstream surface waters or tributaries. Since this feature is a manmade roadway drainage feature that was constructed in an upland area for the purpose of roadway drainage, it is not considered a jurisdictional Water of the U.S. In addition, this roadside ditch does not display an OHWM, defined bed and bank, or relatively permanent flow.

Conclusions

The Bloomington, IN Quadrangle Map does not show any blue-line streams or drainage features in the study limits. Field reconnaissance confirmed the absence of these features. Three wetland features were identified in the study limits. Since Roadside Ditch 1 is a manmade roadway drainage feature that was constructed in an upland it is not considered a jurisdictional Water of the U.S.

Every effort should be taken to avoid and minimize impacts to the waterways. If impacts are necessary, then mitigation may be required. The final determination of jurisdictional waters is ultimately made by the U.S. Army Corps of Engineers (Corps) and this report is our best judgment based on the guidelines set forth by the Corps.

Table 1: Wetland Summary

Wetland ID	Photos	Lat (N)	Lon (W)	Type	Area (acres)	Quality	Likely Water of U.S.?
Wetland A	13, 14, 15	39.175340°	86.576107°	PFO	0.027	Poor	Yes*
Wetland B	16, 17, 18	39.173317°	-86.575886°	PFO	0.049	Poor	Yes*
Wetland C	19, 20, 21	39.174971°	-86.576492°	PEM	0.019	Poor	Yes*

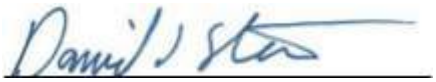
*Potentially an Isolated Wetland, Water of the State of Indiana

Table 2: Wetland Plot Summary Table

Plot				
	Hydrophytic Vegetation	**Hydric Soils**	**Wetland Hydrology**	**Within a wetland**
SP-1	Yes	Yes	Yes	Yes
SP-2	No	No	No	No
SP-3	Yes	Yes	Yes	Yes
SP-4	No	No	No	No
SP-5	Yes	Yes	Yes	Yes
SP-6	No	No	No	No
SP-7	No	No	No	No
SP-8	No	No	No	No
SP-9	No	No	No	No
SP-10	No	No	No	No
SP-11	No	No	No	No

Acknowledgement:
This waters determination has been prepared based on the best available information interpreted in the light of the investigator's training, experience, and professional judgement in

conformance with the *1987 U.S. Army Corps of Engineers* (USACE) *Wetland Delineation Manual (Technical Report Y-87-1)*, the *2010 U.S. Army Corps of Engineers Eastern Mountains and Piedmont Regional Supplement*, the USACE *Jurisdictional Determination Form Instructional Guidebook*, and other appropriate agency guidelines.



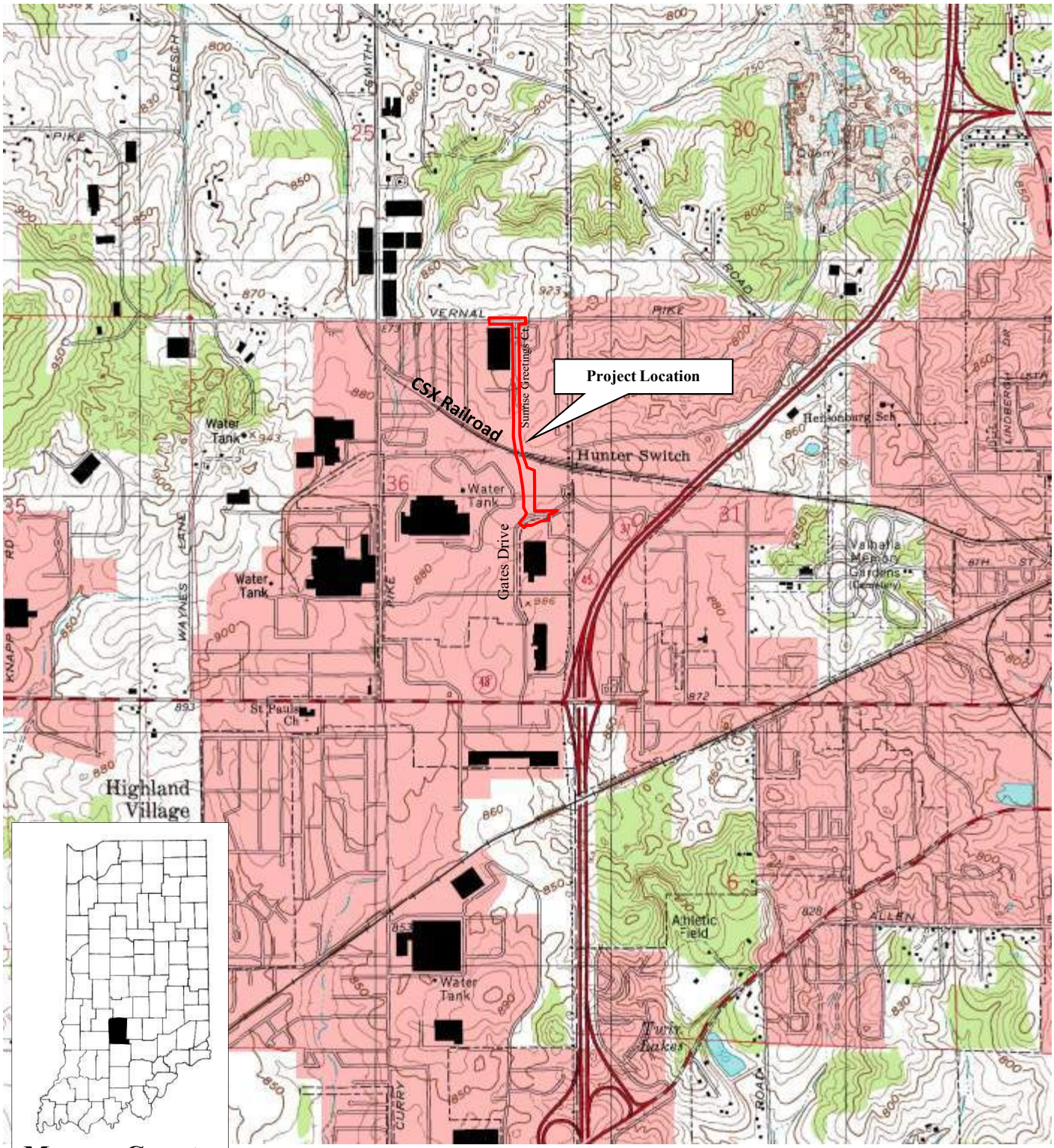
Daniel J. Stevens
Environmental Scientist
DLZ Indiana, LLC

Supporting Documentation:

- Maps:
  - Figure 1-1 and 1-2 – Topographic Maps
  - Figure 2 – LiDAR Map
  - Figure 3 – NWI Map
  - Figure 4 – Soils Map
  - Figure 5 – Floodplain Map
  - Figure 6 – Site Map and Aerial Photograph

- Appendix A - Wetland Data Sheets
- Appendix B - Photographs with Location/Orientation map
- Appendix C – Preliminary Jurisdictional Determination Form

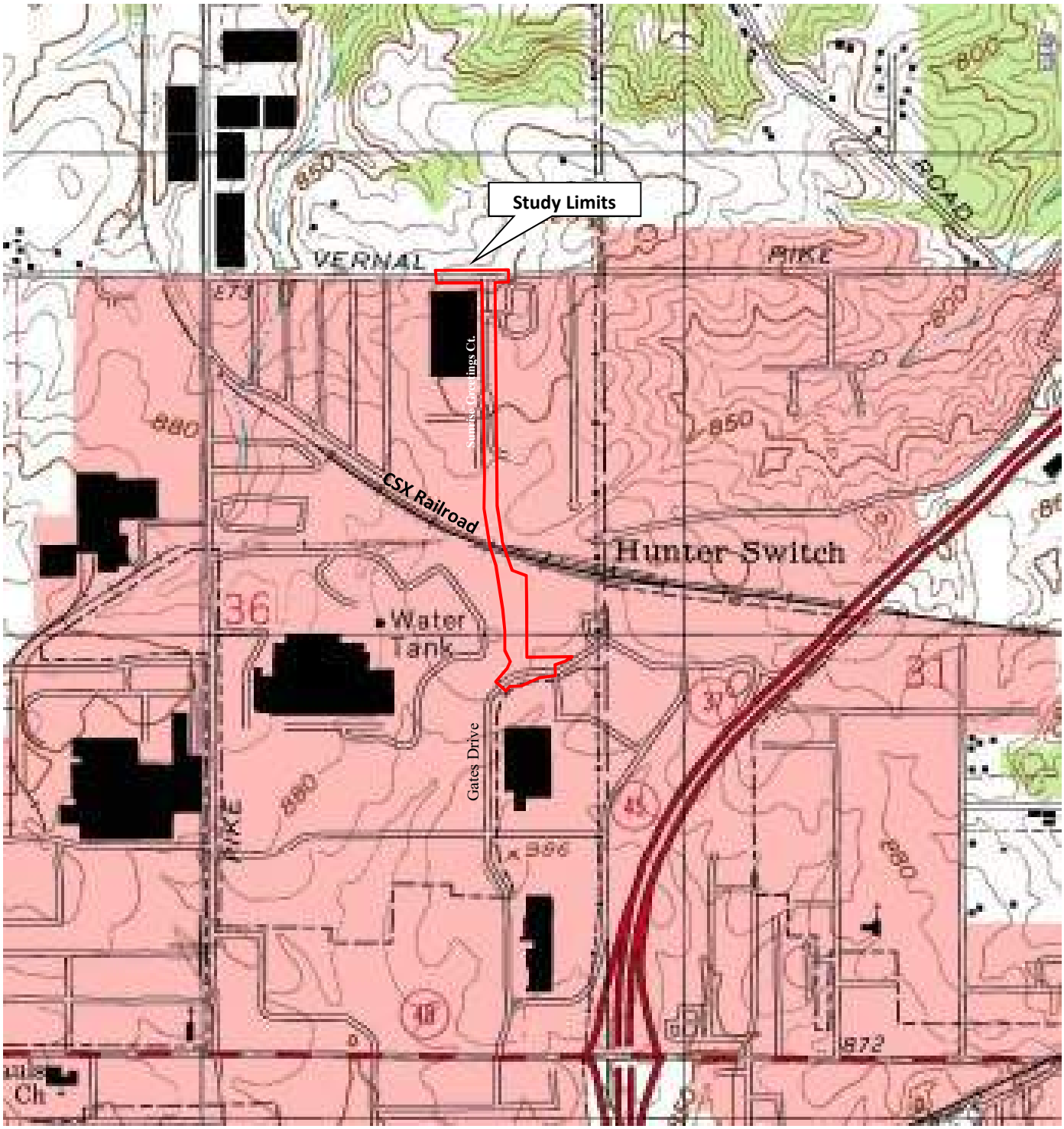
USGS Quadrangle Map



USGS Bloomington Quad Map
Scale: 1"=2000'

DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: 1"=2000' Figure: 1-1

USGS Quadrangle Map



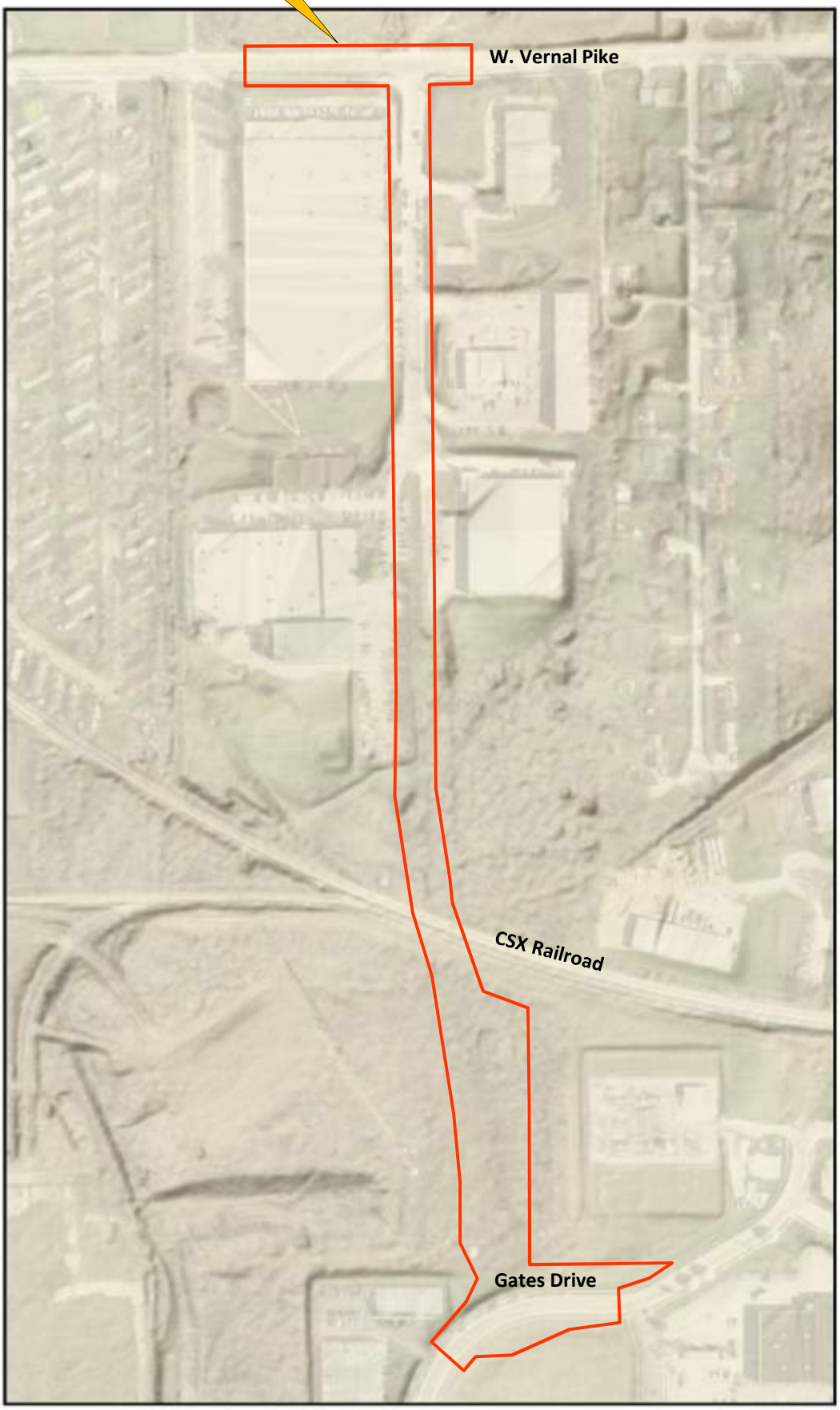
USGS Bloomington Quad Map
Scale: 1"=1000'

DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: 1"=1000' Figure: 1-2

LIDAR Map

Des. No.: 1702957 and 1900406

Date: 11/14/2019



Legend

LiDAR Color Hillshade (2011-2013

High : 1256

Low : 247

2016 Orthophotography - Placeh

NORTH

Author:

0 0.08 mi

IndianaMAP

Figure: 2

NWI Map

Des. No.: 1702957 and 1900406

Date: 11/14/2019

Legend

- Lakes (NHD)
- Streams (NHD)
- Rivers (NHD)
- Historic Wetlands NWI (USFWS
- Wetlands NWI (USFWS)
- Wetlands Project Metadata NWI
- Karst Area Dye Points
- Karst Area Dye Lines
- Karst Springs
- Sinkhole Inventory (2011)
- 2016 Orthophotography - Placeh

NORTH

Author:

0 0.08 mi

IndianaMAP

Figure: 3

Soil Survey

Des. No.: 1702957 and 1900406

Figure: 4-1

Soil Survey Legend

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
CrB	Crider silt loam, 2 to 6 percent slopes	0	32.3	41.6%
CrC	Crider silt loam, 6 to 12 percent slopes	0	8.6	11.1%
HoA	Hosmer silt loam, 0 to 2 percent slopes	0	20.7	26.6%
HoB	Hosmer silt loam, 2 to 6 percent slopes	0	14.3	18.4%
IvA	Iva silt loam, 0 to 2 percent slopes	5	0.7	0.9%
Ua	Udorthents, loamy	0	1.1	1.4%
Totals for Area of Interest			**77.5**	**100.0%**

Floodplain Map

Des. No.: 1702957 and 1900406

Date: 11/14/2019

Legend

Floodplains - FIRM (Jan 2019)

- Floodway
- 1% Annual Chance Flood Hazar
- 0.2% Annual Chance, Protected
- 0.2% Annual Chance Flood Haz
- 2016 Orthophotography - Placeh

NORTH

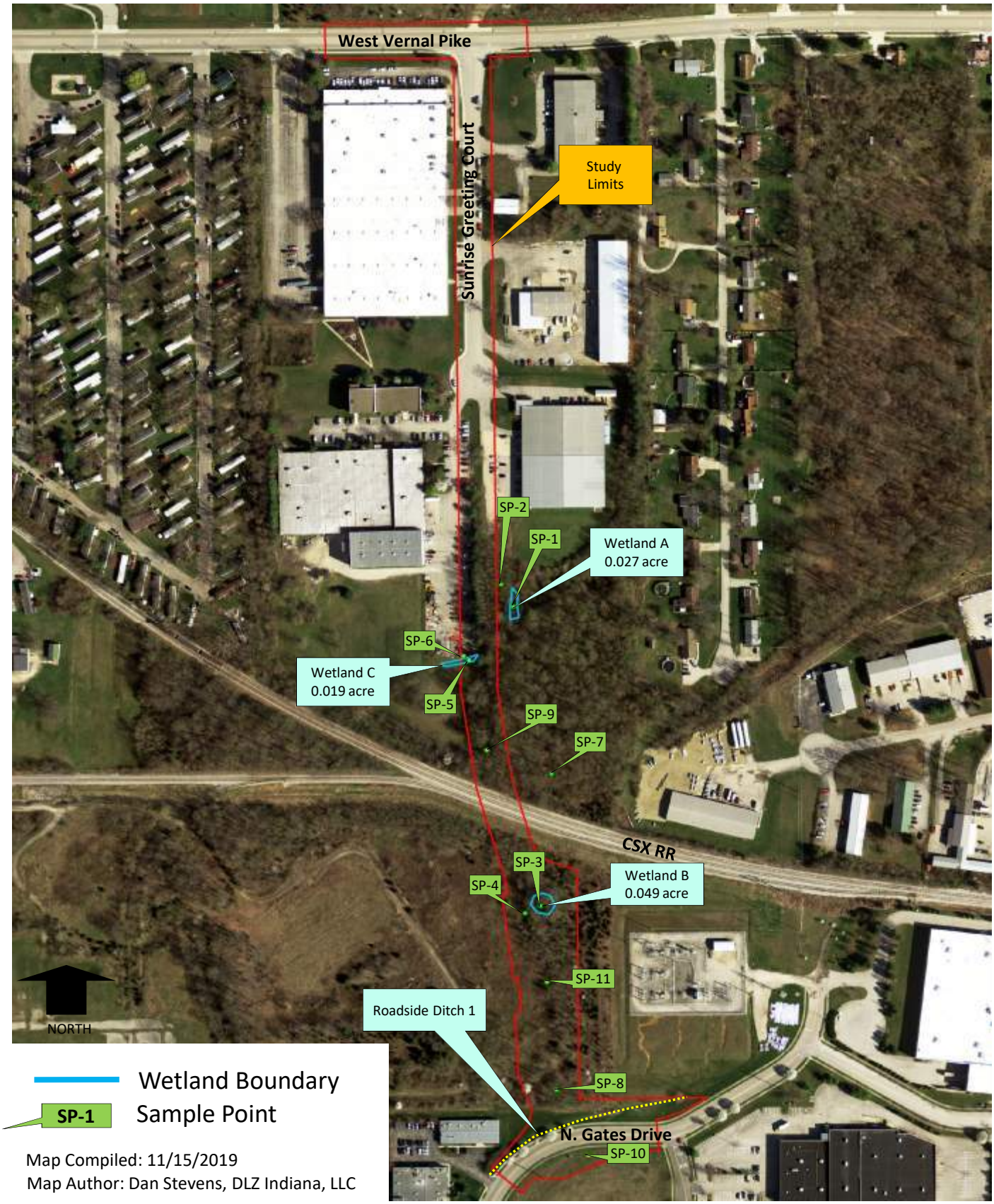
Author:

0 0.08 mi

IndianaMAP

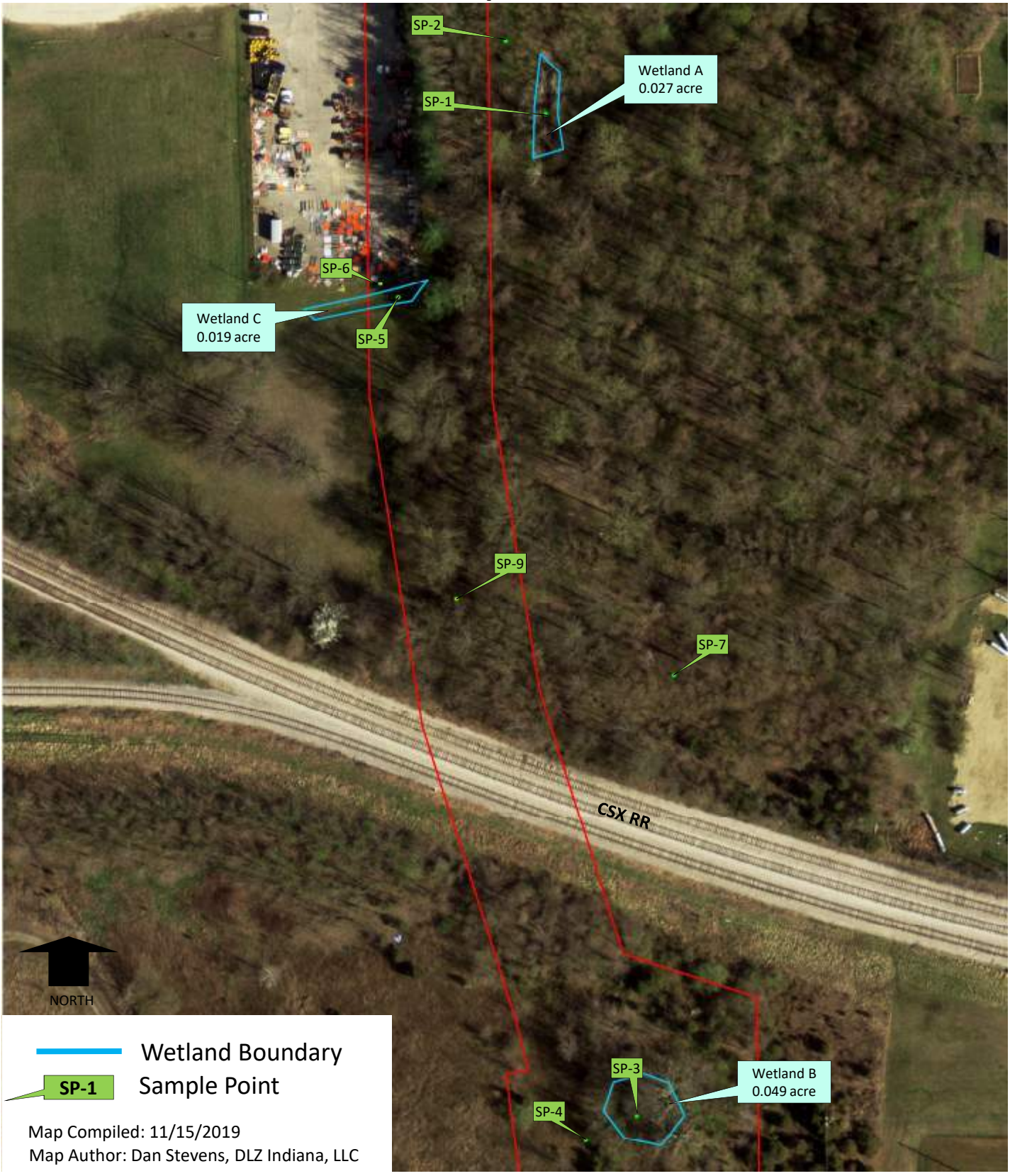
Figure: 5

Site Map - Overall



DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: 1'=333" Figure: 6-1

Site Map - Zoomed



Map Compiled: 11/15/2019
Map Author: Dan Stevens, DLZ Indiana, LLC

DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: 1”=100’ Figure: 6-2

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vernal Pike Connector City/County: Monroe County Sampling Date: 9/20/2018

Applicant/Owner: Monroe County State: IN Sampling Point: 1

Investigator(s): Dan Stevens Section, Township, Range: S36, T9N, R2W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 2%

Subregion (LRR or MLRA): LRR N Lat: 39.175340° Long: -86.576107° Datum: -

Soil Map Unit Name: Crider silt loam, 2 to 6 percent slopes (CrB) NWI classification: -

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

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

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

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

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

Remarks:

The sample point meets the three wetland criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

Wetland hydrology indicators were observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 1

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	50	yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	50 = Total Cover		
50% of total cover: 25	20% of total cover: 10		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Acer negundo	50	yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5' radius)			
1. Laportea canadensis	10	yes	FAC
2. Bidens frondosa	5	yes	FACW
3. Persicaria pensylvanica	5	yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of 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% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	110	x 3 =	330
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	120 (A)		350 (B)

Prevalence Index = B/A = 2.92

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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

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

The sample point does meet the hydrophytic plant criteria.

SOIL Sampling Point: 1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 4/2	90	10YR 5/6	10	C	M	Silt loam	

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Hydric soil indicators were observed at the sample point.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vernal Pike Connector City/County: Monroe County Sampling Date: 9/20/2018

Applicant/Owner: Monroe County State: IN Sampling Point: 2

Investigator(s): Dan Stevens Section, Township, Range: S36, T9N, R2W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 2%

Subregion (LRR or MLRA): LRR N Lat: 39.175487° Long: -86.576209° Datum: -

Soil Map Unit Name: Crider silt loam, 2 to 6 percent slopes (CrB) NWI classification: -

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

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

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

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

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

Remarks:

The sample point does not meet the three wetland criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

Wetland hydrology indicators were not observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 2

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Sassafras albidum	30	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Lonicera tatarica	90	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		
Herb Stratum (Plot size: 5' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	0 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	120	x 4 =	480
UPL species	0	x 5 =	0
Column Totals:	120 (A)		480 (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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

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

The sample point does not meet the hydrophytic plant criteria.

SOIL Sampling Point: 2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-20	10YR 4/3	100					Silt loam	

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

Hydric soil indicators were not observed at the sample point.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vernal Pike Connector City/County: Monroe County Sampling Date: 9/20/2018

Applicant/Owner: Monroe County State: IN Sampling Point: 3

Investigator(s): Dan Stevens Section, Township, Range: S36, T9N, R2W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 2%

Subregion (LRR or MLRA): LRR N Lat: 39.173317° Long: -86.575886° Datum: -

Soil Map Unit Name: Hosmer silt loam, 0 to 2 percent slopes (HoA) NWI classification: -

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

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

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

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

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

Remarks:

The sample point meets the three wetland criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- x Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No x	Depth (inches): _____
Water Table Present?	Yes _____	No x	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes x	No _____	Depth (inches): 8"

Wetland Hydrology Present? **Yes** x **No** _____

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

Remarks:

Wetland hydrology indicators were observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 3

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus palustris	20	yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5' radius)			
1. Laportea canadensis	10	yes	FAC
2. Bidens frondosa	10	yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	40 (A)		90 (B)

Prevalence Index = B/A = 2.25

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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

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

The sample point does meet the hydrophytic plant criteria.

SOIL Sampling Point: 3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 4/1	60	10YR 5/6	40	C	M	Clay	

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X **No** _____

Remarks:

Hydric soil indicators were observed at the sample point.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vernal Pike Connector City/County: Monroe County Sampling Date: 9/20/2018

Applicant/Owner: Monroe County State: IN Sampling Point: 4

Investigator(s): Dan Stevens Section, Township, Range: S36, T9N, R2W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 2%

Subregion (LRR or MLRA): LRR N Lat: 39.173269° Long: -86.576018° Datum: -

Soil Map Unit Name: Hosmer silt loam, 0 to 2 percent slopes (HoA) NWI classification: -

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

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

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

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

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

Remarks:

The sample point does not meet the three wetland criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

Wetland hydrology indicators were not observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 4

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Juniperus virginiana	60	yes	FACU
2. Sassafras albidum	40	yes	FACU
3.			
4.			
5.			
6.			
7.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Lonicera tatarica	30	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		
Herb Stratum (Plot size: 5' radius)			
1. Solidago altissima	20	yes	FACU
2. Rosa multiflora	10	yes	FACU
3. Toxicodendron radicans	10	yes	FAC
4. Parthenocissus quinquefolia	10	yes	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	50 = Total Cover		
50% of total cover: 25	20% of total cover: 10		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 14.29% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	170	x 4 =	680
UPL species	0	x 5 =	0
Column Totals:	180 (A)		710 (B)

Prevalence Index = B/A = 3.94

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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

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

The sample point does not meet the hydrophytic plant criteria.

SOIL Sampling Point: 4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-20	10YR 4/3	100					Silt loam	

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

Hydric soil indicators were not observed at the sample point.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vernal Pike Connector City/County: Monroe County Sampling Date: 10/1/2019

Applicant/Owner: Monroe County State: IN Sampling Point: 5

Investigator(s): Dan Stevens Section, Township, Range: S36, T9N, R2W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 2%

Subregion (LRR or MLRA): LRR N Lat: 39.174971° Long: -86.576492° Datum: -

Soil Map Unit Name: Hosmer silt loam, 2 to 6 percent slopes (HoB) NWI classification: -

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

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

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

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

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

Remarks:

The sample point meets the three wetland criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? **Yes** X **No** _____

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

Remarks:

Wetland hydrology indicators were observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 5

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5' radius)			
1. Leersia oryzoides	40	yes	OBL
2. Persicaria pensylvanica	30	yes	FACW
3. Bidens frondosa	20	yes	FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	50	x 2 =	100
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		140 (B)

Prevalence Index = B/A = 1.56

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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

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

The sample point does meet the hydrophytic plant criteria.

SOIL Sampling Point: 5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100					Silt loam	
4-20	10YR 5/1	70	10YR 5/6	30	C	M	Silt loam	

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Hydric soil indicators were observed at the sample point.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vernal Pike Connector City/County: Monroe County Sampling Date: 10/1/2019

Applicant/Owner: Monroe County State: IN Sampling Point: 6

Investigator(s): Dan Stevens Section, Township, Range: S36, T9N, R2W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 2%

Subregion (LRR or MLRA): LRR N Lat: 39.174998° Long: -86.576538° Datum: -

Soil Map Unit Name: Hosmer silt loam, 2 to 6 percent slopes (HoB) NWI classification: -

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

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

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

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

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

Remarks:

The sample point does not meet the three wetland criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

Wetland hydrology indicators were not observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 6

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 5' radius)			
1. Schedonorus arundinaceus	40	yes	FACU
2. Trifolium repens	30	yes	FACU
3. Plantago lanceolata	20	no	UPL
4. Setaria pumila	20	no	FAC
5. Digitaria sanguinalis	20	no	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	130 = Total Cover		

50% of total cover: 65 20% of total cover: 26

Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	100	x 4 =	400
UPL species	20	x 5 =	100
Column Totals:	120 (A)		500 (B)

Prevalence Index = B/A = 4.17

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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No X

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

The sample point does not meet the hydrophytic plant criteria.

SOIL Sampling Point: 6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-20	10YR 5/3	100					Silt loam	

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

Hydric soil indicators were not observed at the sample point.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vernal Pike Connector City/County: Monroe County Sampling Date: 9/20/2018

Applicant/Owner: Monroe County State: IN Sampling Point: 7

Investigator(s): Dan Stevens Section, Township, Range: S36, T9N, R2W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 2%

Subregion (LRR or MLRA): LRR N Lat: 39.174205° Long: -86.575783° Datum: -

Soil Map Unit Name: Hosmer silt loam, 0 to 2 percent slopes (HoA) NWI classification: -

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

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

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

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

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

Remarks:

The sample point does not meet the three wetland criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

Wetland hydrology indicators were not observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 7

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Sassafras albidum	60	yes	FACU
2. Juniperus virginiana	25	yes	FACU
3.			
4.			
5.			
6.			
7.			
	85 = Total Cover		
50% of total cover: 42.5	20% of total cover: 17		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Lonicera tatarica	50	yes	FACU
2. Ligustrum vulgare	10	yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		
Herb Stratum (Plot size: 5' radius)			
1. Parthenocissus quinquefolia	20	yes	FACU
2. Sanicula marilandica	10	yes	FACU
3. Ageratina altissima	10	yes	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	40 = Total Cover		
50% of total cover: 20	20% of total cover: 8		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of 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: 6 (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	185	x 4 =	740
UPL species	0	x 5 =	0
Column Totals:	185 (A)		740 (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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

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

The sample point does not meet the hydrophytic plant criteria.

SOIL Sampling Point: 7

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					Silt loam	
8-20	10YR 4/3	100					Silt loam	

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

Hydric soil indicators were not observed at the sample point.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vernal Pike Connector City/County: Monroe County Sampling Date: 9/20/2018

Applicant/Owner: Monroe County State: IN Sampling Point: 8

Investigator(s): Dan Stevens Section, Township, Range: S36, T9N, R2W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 2%

Subregion (LRR or MLRA): LRR N Lat: 39.172075° Long: -86.575758° Datum: -

Soil Map Unit Name: Udorthents, loamy (Ua) NWI classification: -

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

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

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

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

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

Remarks:

The sample point meets the three wetland criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? Yes _____ **No** X

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

Remarks:

Wetland hydrology indicators were not observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 8

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera	40	yes	FACU
2. Prunus serotina	30	yes	FACU
3. Sassafras albidum	30	yes	FACU
4. Juglans nigra	30	yes	FACU
5.			
6.			
7.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Lonicera tatarica	50	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	50 = Total Cover		
50% of total cover: 25	20% of total cover: 10		
Herb Stratum (Plot size: 5' radius)			
1. Rubus allegheniensis	10	yes	FACU
2. Toxicodendron radicans	10	yes	FAC
3. Sanicula marilandica	10	yes	FACU
4. Rosa multiflora	10	yes	FACU
5. Galium aparine	5	no	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	45 = Total Cover		
50% of total cover: 22.5	20% of total cover: 9		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 11.1% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species	10	x 3 =	30
FACU species	215	x 4 =	860
UPL species		x 5 =	
Column Totals:	225 (A)		890 (B)

Prevalence Index = B/A = 3.96

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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

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

The sample point does not meet the hydrophytic plant criteria.

SOIL Sampling Point: 8

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-20	10YR 6/4	100					Silt loam	

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

Hydric soil indicators were not observed at the sample point.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vernal Pike Connector City/County: Monroe County Sampling Date: 10/1/2019

Applicant/Owner: Monroe County State: IN Sampling Point: 9

Investigator(s): Dan Stevens Section, Township, Range: S36, T9N, R2W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 2%

Subregion (LRR or MLRA): LRR N Lat: 39.174364° Long: -86.576345° Datum: -

Soil Map Unit Name: Hosmer silt loam, 0 to 2 percent slopes (HoA) NWI classification: -

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

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

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

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

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

Remarks:

The sample point does not meet the three wetland criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? **Yes** _____ **No** X

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

Remarks:

Wetland hydrology indicators were not observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 9

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera	60	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Lonicera tatarica	30	yes	FACU
2. Sassafras albidum	30	yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	60 = Total Cover		
50% of total cover: 30	20% of total cover: 12		
Herb Stratum (Plot size: 5' radius)			
1. Ageratina altissima	10	yes	FACU
2. Parthenocissus quinquefolia	10	yes	FACU
3. Rubus allegheniensis	10	yes	FACU
4. Toxicodendron radicans	10	yes	FAC
5. Sanicula marilandica	10	yes	FACU
6.			
7.			
8.			
9.			
10.			
11.			
	50 = Total Cover		
50% of total cover: 25	20% of total cover: 10		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 12.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	160	x 4 =	640
UPL species	0	x 5 =	0
Column Totals:	170 (A)		670 (B)

Prevalence Index = B/A = 3.94

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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

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

The sample point does not meet the hydrophytic plant criteria.

SOIL Sampling Point: 9

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/3	100					Silt loam	
8-20	10YR 6/3	100					Silt loam	

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

Hydric soil indicators were not observed at the sample point.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vernal Pike Connector City/County: Monroe County Sampling Date: 10/1/2019

Applicant/Owner: Monroe County State: IN Sampling Point: 10

Investigator(s): Dan Stevens Section, Township, Range: S36, T9N, R2W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 2%

Subregion (LRR or MLRA): LRR N Lat: 39.171629° Long: -86.575485° Datum: -

Soil Map Unit Name: Hosmer silt loam, 2 to 6 percent slopes (HoB) NWI classification: -

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

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

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

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

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

Remarks:

The sample point does not meet the three wetland criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

Wetland hydrology indicators were not observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 10

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 5' radius)			
1. Symphyotrichum pilosum	40	yes	FAC
2. Solidago altissima	20	yes	FACU
3. Schedonorus arundinaceus	20	yes	FACU
4. Rubus allegheniensis	10	no	FACU
5. Toxicodendron radicans	10	no	FAC
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	100 (A)		350 (B)

Prevalence Index = B/A = 3.5

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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

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

The sample point does not meet the hydrophytic plant criteria.

SOIL Sampling Point: 10

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/3	100					Silt loam	
8-20	10YR 4/4	100					Silt loam	

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

Hydric soil indicators were not observed at the sample point.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vernal Pike Connector City/County: Monroe County Sampling Date: 10/1/2019

Applicant/Owner: Monroe County State: IN Sampling Point: 11

Investigator(s): Dan Stevens Section, Township, Range: S36, T9N, R2W

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 2%

Subregion (LRR or MLRA): LRR N Lat: 39.172802° Long: -86.575835° Datum: -

Soil Map Unit Name: Hosmer silt loam, 2 to 6 percent slopes (HoB) NWI classification: -

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

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

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

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

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

Remarks:

The sample point does not meet the three wetland criteria.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

Wetland hydrology indicators were not observed.

VEGETATION (Four Strata) – Use scientific names of plants. Sampling Point: 11

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron tulipifera	50	yes	FACU
2. Fraxinus americana	20	yes	FACU
3. Juniperus virginiana	20	yes	FACU
4. Prunus serotina	10	yes	FACU
5.			
6.			
7.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Lonicera tatarica	20	yes	FACU
2. Rhus typhina	10	yes	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
	30 = Total Cover		
50% of total cover: 15	20% of total cover: 6		
Herb Stratum (Plot size: 5' radius)			
1. Lonicera japonica	20	yes	FACU
2. Solidago altissima	20	yes	FACU
3. Symphyotrichum pilosum	20	yes	FACU
4. Toxicodendron radicans	10	no	FAC
5. Schedonorus arundinaceus	10	no	FACU
6. Rubus allegheniensis	10	no	FACU
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 12.5% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	160	x 4 =	640
UPL species	0	x 5 =	0
Column Totals:	170 (A)		670 (B)

Prevalence Index = B/A = 3.94

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.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

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

The sample point does not meet the hydrophytic plant criteria.

SOIL Sampling Point: 11

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/3	100						Silt loam
8-20	10YR 4/4	100						Silt loam

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

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10) **(LRR N)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ___ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ___ Umbric Surface (F13) **(MLRA 136, 122)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ___ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(MLRA 147)**
- ___ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

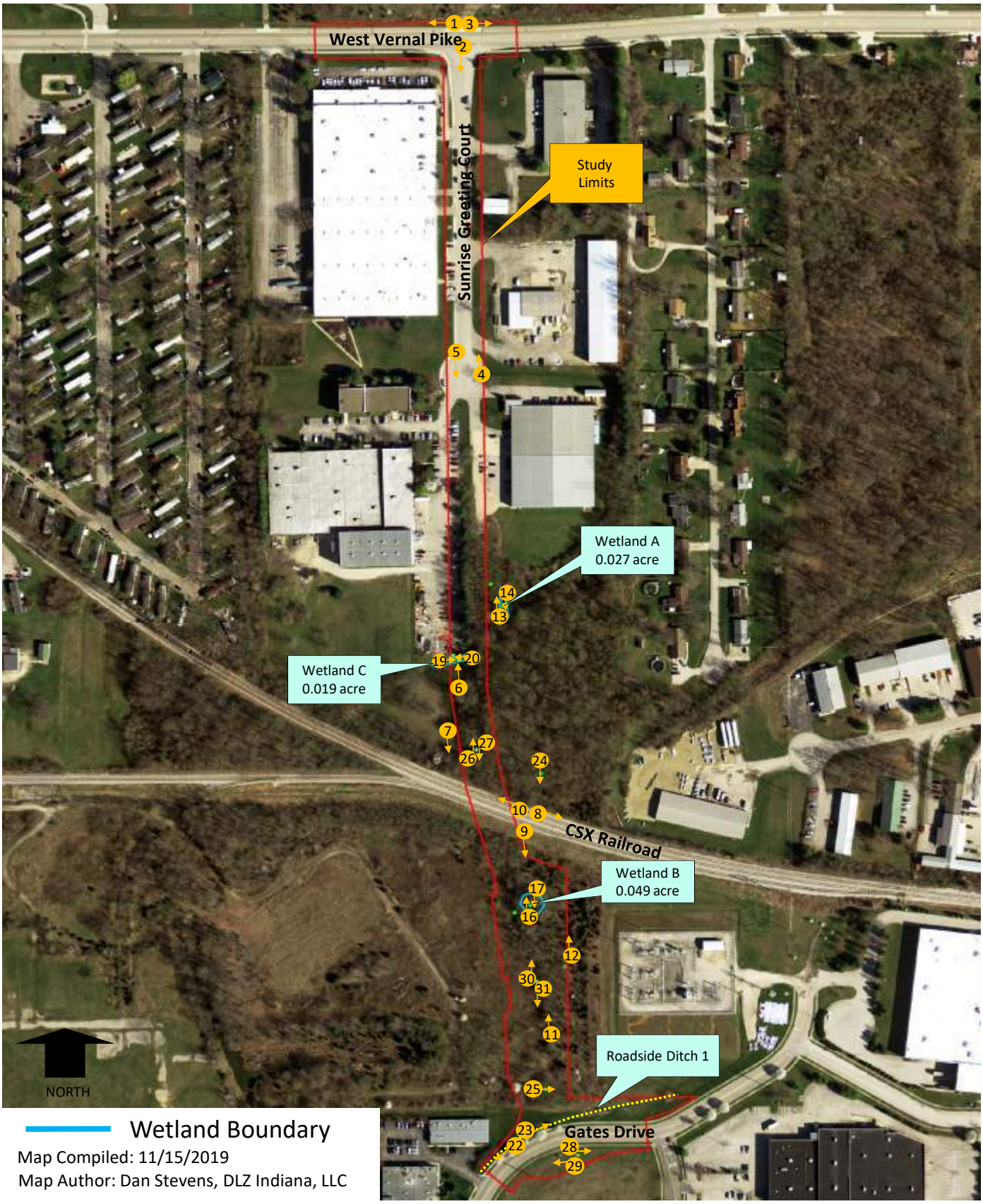
Depth (inches): _____

Hydric Soil Present? Yes _____ **No** X

Remarks:

Hydric soil indicators were not observed at the sample point.

Photo Log



Wetland Boundary

Map Compiled: 11/15/2019

Map Author: Dan Stevens, DLZ Indiana, LLC

DLZ Dan Stevens, DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: 1'=333" Appendix B-1

Photographs - 9/20/2018

Photo 1: Looking west along West Vernal Pike

Photo 2: Looking south along Sunrise Greetings Court

Photo 3: Looking east along West Vernal Pike

Photo 4: Looking north along Sunrise Greetings Court from cul-de-sac

Photographs - 9/20/2018

Photo 5: Looking north along Sunrise Greetings Court from cul-de-sac

Photo 6: Looking north along drive and wooded area.

Photo 7: Looking south at the wooded land and lawn north of the tracks

Photo 8: Looking east along the CSX Railroad tracks

DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: NTS Appendix B-3

Photographs - 9/20/2018

Photo 9: Looking south across CSX Railroad tracks

Photo 10: Looking west along the CSX Railroad tracks

Photo 11: Looking north in the old field area south of the tracks

Photo 12: Looking north from wooded area south of the tracks

DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: NTS Appendix B-4

Photographs - 9/20/2018

Photo 13: View of Wetland A looking north

Photo 14: View of Wetland A looking south

Photo 15: View of Wetland A soil pit (SP-1)

DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: NTS Appendix B-5

Photographs - 9/20/2018

Photo 16: View of Wetland B looking north

Photo 17: View of Wetland B looking south

Photo 18: View of Wetland B test pit (SP-3)

DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: NTS Appendix B-6

Photographs - 10/1/2019

Photo 19: View of Wetland C looking east

Photo 20: View of Wetland C looking west

Photo 21: View of Wetland C test pit (SP-5)

DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: NTS Appendix B-7

Photographs – 9/20/2018 and 10/1/2019

Photo 22: View of Roadside Ditch 1 looking southwest along N. Gates Drive

Photo 23: View of Roadside Ditch 1 looking northeast along N. Gates Drive

Photo 24: View south from north of CSX Railroad at SP-7

Photo 25: View east from north of N. Gates Drive at SP-8

DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: NTS Appendix B-8

Photographs - 10/1/2019

Photo 26: Looking north from north of CSX RR at SP-9

Photo 27: Looking south from north of CSX RR at SP-9

Photo 28: View east from south of North Gates Drive at SP-10

Photo 29: View west from south of North Gates Drive at SP-10

DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: NTS Appendix B-9

Photographs - 10/1/2019

Photo 30: Looking north from north of
N. Gates Drive at SP-11

Photo 31: Looking south from north of
N. Gates Drive at SP-11

DLZ	**WETLAND DELINEATION** Vernal Pike Connector From West Vernal Pike to Profile Parkway Des. No.: 1702957 and 1900406 Monroe County, Indiana	Scale: NTS Appendix B-10

PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: November 15, 2019

B. NAME AND ADDRESS OF PERSON REQUESTING PJD:

Daniel J. Stevens
DLZ Indiana, LLC
2211 E. Jefferson Blvd.
South Bend, IN 46615
Phone: 574-236-4400

C. DISTRICT OFFICE, FILE NAME, AND NUMBER:

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: (USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

DLZ conducted a Waters of the United States determination on September 20, 2018 and October 1, 2019 for the proposed Vernal Pike Connector project (Des No. 1702957 and 1900406) that includes the extension of Sunrise Greeting Court south to Profile Parkway, connecting West Vernal Pike to Profile Parkway via a railroad overpass. The project will include road and bridge construction on a new alignment over CSX Railroad (operated by Indiana Railroad). The project is located within Sections 25 and 36, Township 9 North, Range 2 West, Richland Township, USGS Bloomington Topographic Quadrangle, Monroe County, Indiana.

State: Indiana County/parish/borough: Monroe County City: n/a

Center coordinates of site (lat/long in degree decimal format):

Lat.: 38.498679 Long.: -86.576345°

Universal Transverse Mercator: 16S, 536594.89 m E, 4336211.70 m N

Name of nearest waterbody: Stout Creek

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

☐ Office (Desk) Determination. Date:

☐ Field Determination. Date(s):

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Wetland A	39.175340°	86.576107°	0.027 acre	Wetland	Section 404
Wetland B	39.173317°	-86.575886°	0.049 acre	Wetland	Section 404
Wetland C	39.174971°	-86.576492°	0.019 acre	Wetland	Section 404

1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

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

SUPPORTING DATA. Data reviewed for PJD (check all that apply)

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

- ☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
  Map: Project location, Topographic, Floodplain, Soils, NWI, Site, and LiDAR maps
- ☒ Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report. Rationale:_____
- ☐ Data sheets prepared by the Corps:_____.
- ☐ Corps navigable waters' study:_____.
- ☐ U.S. Geological Survey Hydrologic Atlas:_____.
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: Bloomington, 1:24,000 scale.
- ☒ Natural Resources Conservation Service Soil Survey. Citation:
  Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/)
- ☒ National wetlands inventory map(s). Cite name: Bloomington.
- ☐ State/local wetland inventory map(s):_____.
- ☒ FEMA/FIRM maps: IndianaMap (FIRM Floodplains and Flood Hazard Zones in Indiana, IDNR).
- ☐ 100-year Floodplain Elevation is:_____.(National Geodetic Vertical Datum of 1929)
- ☒ Photographs: ☒ Aerial (Name & Date): 2018 IndianaMap.
  or ☒ Other (Name & Date): Site photographs, 9/20/2018 and 10/1/2019.
- ☐ Previous determination(s). File no. and date of response letter:_____.
- ☐ Other information (please specify):_____.

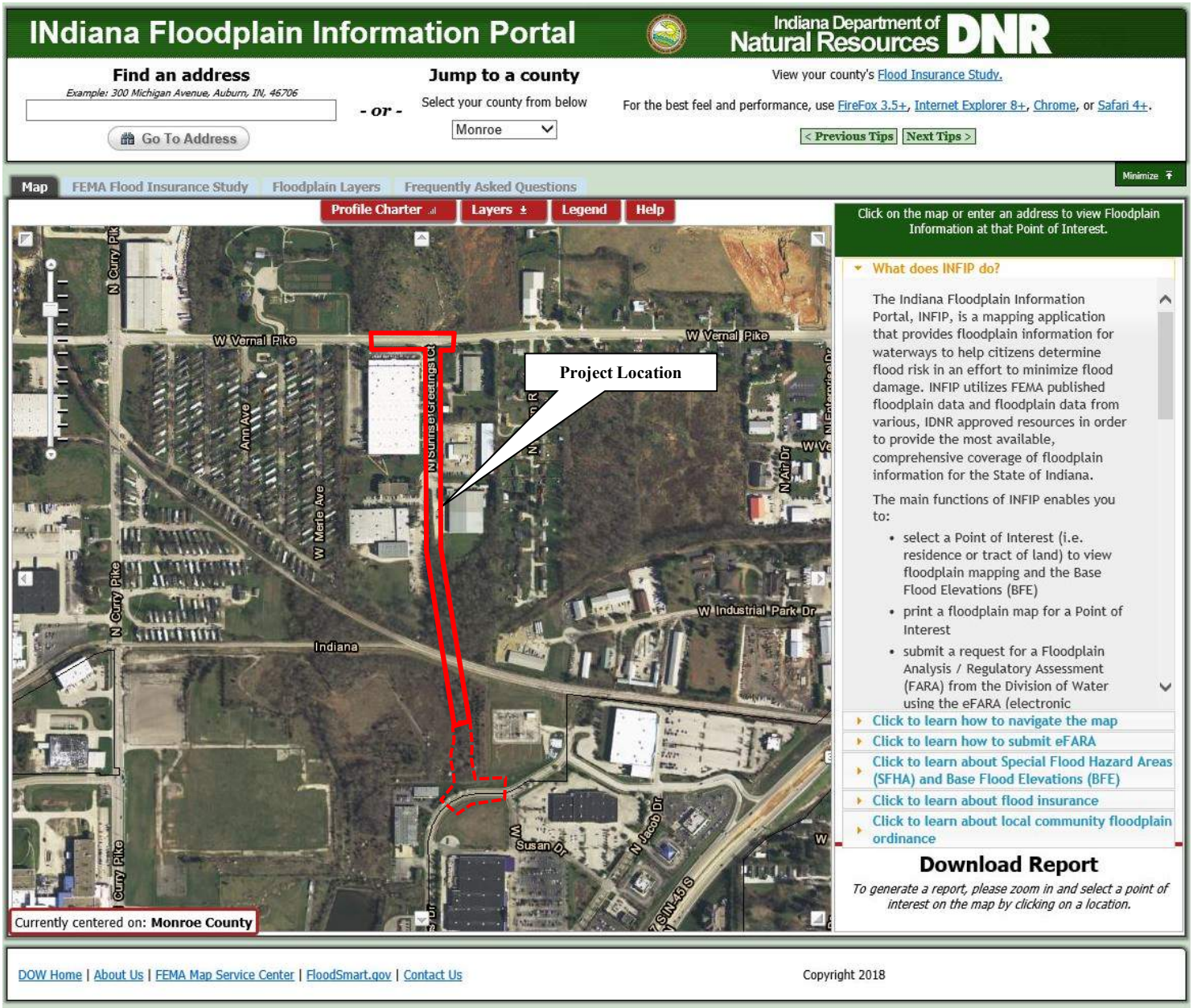
IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

David J Steve 11-15-19

Signature and date of
Regulatory staff member
completing PJD

Signature and date of
person requesting PJD
(REQUIRED, unless obtaining
the signature is impracticable)[1]

[1] Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.


INdiana Floodplain Information Portal
Indiana Department of Natural Resources DNR
Find an address
Example: 300 Michigan Avenue, Auburn, IN, 46706
Go To Address
- or -
Jump to a county
Select your county from below
Monroe
View your county's Flood Insurance Study.
For the best feel and performance, use FireFox 3.5+, Internet Explorer 8+, Chrome, or Safari 4+.
< Previous Tips
Next Tips >
Map
FEMA Flood Insurance Study
Floodplain Layers
Frequently Asked Questions
Minimize
Profile Charter
Layers
Legend
Help
Project Location
W Vernal Pike
N Curry Pike
Ann Ave
W Merle Ave
N Sunrise Greetings Ct
N Air Dr
W Industrial Park Dr
Indiana
N Jacob Dr
Susan Dr
Currently centered on: Monroe County
Click on the map or enter an address to view Floodplain Information at that Point of Interest.
What does INFIP do?
The Indiana Floodplain Information Portal, INFIP, is a mapping application that provides floodplain information for waterways to help citizens determine flood risk in an effort to minimize flood damage. INFIP utilizes FEMA published floodplain data and floodplain data from various, IDNR approved resources in order to provide the most available, comprehensive coverage of floodplain information for the State of Indiana.
The main functions of INFIP enables you to:
select a Point of Interest (i.e. residence or tract of land) to view floodplain mapping and the Base Flood Elevations (BFE)
print a floodplain map for a Point of Interest
submit a request for a Floodplain Analysis / Regulatory Assessment (FARA) from the Division of Water using the eFARA (electronic
Click to learn how to navigate the map
Click to learn how to submit eFARA
Click to learn about Special Flood Hazard Areas (SFHA) and Base Flood Elevations (BFE)
Click to learn about flood insurance
Click to learn about local community floodplain ordinance
Download Report
To generate a report, please zoom in and select a point of interest on the map by clicking on a location.
DOW Home | About Us | FEMA Map Service Center | FloodSmart.gov | Contact Us
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APPENDIX G

Public Involvement

DLZ
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

Sample Notice of Entry for Survey Letter

September 10, 2018

Heitink Properties LLC
107 Elm Street Floor 10
Stamford, CT 06902

Re: Notice of Survey for a Road Improvement Project on Vernal Pike, Bloomington, Indiana

Dear Property Owner:

Our firm has been retained by the Monroe County Board of Commissioners to prepare a survey for a road improvement project in Bloomington, IN, INDOT Des. No. 1702957.

Our information indicates that you either own or occupy property near this proposed project. Our employees will be conducting a survey of the project area in the near future. It may be necessary for them to come onto your property to complete this work. This is allowed by law pursuant to Indiana Code IC 8-23-7-26. Our employees will identify themselves, if you are available, before coming onto your property to perform their work. If you have sold this property, or it is occupied by someone else, please provide DLZ the name and address of the new owner or current occupant so that we may contact them about the survey.

At this stage we generally do not know what impact, if any, this project may eventually have on your property. If it is determined later that your property is impacted, the Monroe County Highway Department will contact you with additional information.

The survey work will include mapping the location of features such as buildings, trees, fences, drives, property evidence, ground elevations, etc. The survey is needed for the proper planning and design of

DLZ
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

this road improvement project. Please be assured of our sincere desire to cause you as little inconvenience as possible during the course of our work. If any problems do occur as a result of our survey work, please contact our field crew or myself at the address listed below.

If you have questions regarding other issues related to this proposed project please contact DLZ Project Manager in the DLZ Indianapolis office at (317) 633-4120.

In the event that damage to your property should occur as a result of our work you may request compensation for said damages. A copy of IC-8-23-7-26 thru 28 is provided to help with your understanding of the process. In accordance with IC 8-23-7-28, any request for damages shall be made in writing to the Commissioners of Monroe County, Indiana, 100 Kirkwood Avenue, Commission Office Bloomington, IN 47404.

Very truly yours,

DLZ INDIANA, LLC

Alan B. Cleveland, PS
Consultant Surveyor

Attachments: as noted

APPENDIX H

Air Quality

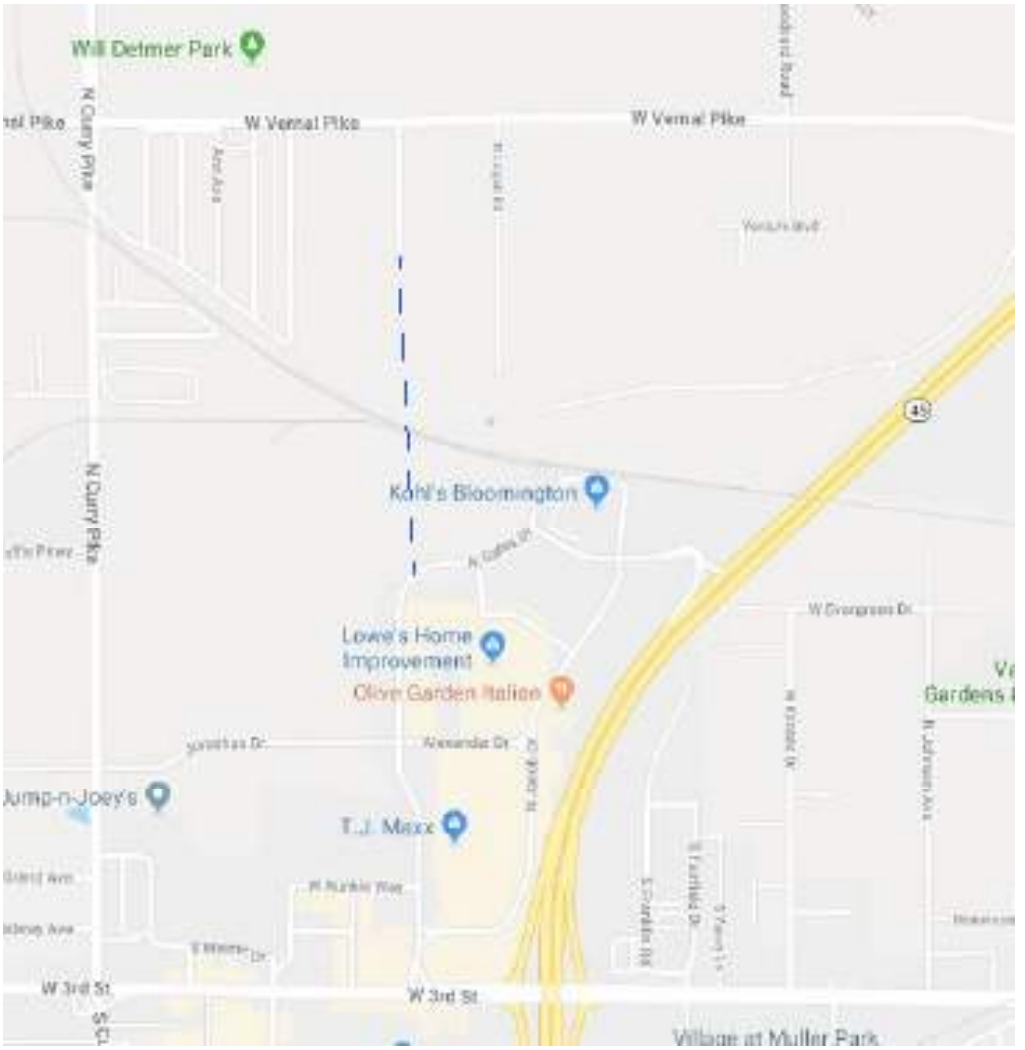
Vernal Pike Connector

DES# 1702957

Letting Date: November 17, 2021

New roadway construction from Vernal pike southward to the new segment of Profile Parkway/Gates Drive. Includes a new bridge over the Indiana Railroad tracks. The roadway will include a sidewalk and multiuse path.

Project Phase	Fiscal Year	Federal Source	Federal Funding	Local Match	TOTAL
PE	2019	Local		$1,045,000	$1,045,000
RW	2021	Group III Program	$836,000	209,000	$1,045,000
CE	2022	Group III Program	$888,000	$222,000	$1,100,000
CN	2022	Group III Program	$5,920,000	$1,48,000	$7,400,000
Railroad CN	2022	Group III Program	$200,000	$50,000	$250,000
Utilities CN	2022	Group III Program	$80,000	$20,000	$100,000
TOTAL			7,924,000	$3,076,000	$11,000,000



Indiana Department of Transportation (INDOT)

State Preservation and Local Initiated Projects FY 2020 - 2024

SPONSOR	CONTRACT # / LEAD DES	STIP NAME	ROUTE	WORK TYPE	LOCATION	DISTRICT	MILES	FEDERAL CATEGORY	Estimated Cost left to Complete Project*	PROGRAM	PHASE	FEDERAL	MATCH	2020	2021	2022	2023	2024
Bloomington	40293 / 1700735	Init.	ST 1014	Bike/Pedestrian Facilities	From existing B-Line Trail terminus at Adams Street to 17th at Crescent	Seymour	.795	STPBG		Local Funds	CN	$0.00	$287,500.00		$287,500.00			
										Local Funds	RW	$0.00	$630,000.00	$630,000.00				
Bloomington	40293 / 1700735	A 03	ST 1014	Bike/Pedestrian Facilities	From existing B-Line Trail terminus at Adams Street to 17th at Crescent	Seymour	.795	STPBG	$2,717,500.00	Local Funds	CN	$0.00	$875,000.00		$875,000.00			
Comments:Amending Local CN phase for FY 2021. BMPO-TIP Resolution dated 4-12-19																		
Bloomington	40294 / 1700736	Init.	VA 1036	Bike/Pedestrian Facilities	Multi-use Trail on Sare Road from Moores Pike to Buttonwood Lane	Seymour	.833	STPBG		Bloomington MPO	CN	$1,334,000.00	$0.00	$1,334,000.00				
										Local Funds	CN	$0.00	$333,500.00	$333,500.00				
Bloomington	40294 / 1700736	A 07	VA 1036	Bike/Pedestrian Facilities	Multi-use Trail on Sare Road from Moores Pike to Buttonwood Lane	Seymour	.833	STBG	$2,736,645.00	Bloomington MPO - PYB	CN	$182,199.00	$0.00	$182,199.00				
										Local Funds	CN	$0.00	$523,801.00	$523,801.00				
Comments:CN PYB Phase for $182,199 FY 2020, Bloomington MPO Tip Page via Administrative modification Tip Dated 5-10-19. CN Local Phase for $523,801 FY 2020, Bloomington MPO Tip Page via Administrative modification Dated 5-10-2019.																		
Bloomington	40336 / 1700974	Init.	VA 1032	Bike/Pedestrian Facilities	Systematic safety improvements expected to include approximately 25	Seymour	0	STPBG		Bloomington MPO	CN	$470,684.00	$0.00	$470,684.00				
										Local Funds	CN	$0.00	$99,316.00	$99,316.00				
Bloomington	40337 / 1700976	Init.	VA 1032	Bike/Pedestrian Facilities	Systematic safety improvements expected to include approximately 25	Seymour	0	STPBG		Bloomington MPO	CN	$470,684.00	$0.00		$470,684.00			
										Local Funds	CN	$0.00	$99,316.00		$99,316.00			
Monroe County	40890 / 1702957	Init.	IR 1059	New Road Construction	Industrial Park Drive Extension/ Vernal Pike Connector Road	Seymour	.5	STPBG		Bloomington MPO	CN	$6,808,000.00	$0.00		$6,808,000.00			
										Local Funds	CN	$0.00	$3,474,000.00		$1,702,000.00	$1,772,000.00		
										Group III Program	CN	$7,088,000.00	$0.00			$7,088,000.00		
Monroe County	40890 / 1702957	A 07	IR 1059	New Road Construction	Industrial Park Drive Extension/ Vernal Pike Connector Road	Seymour	.5	STBG	$9,289,700.00	Local Funds	RW	$0.00	$209,000.00		$209,000.00			
										Group IV Program	RW	$836,000.00	$0.00		$836,000.00			
Comments:RW Phase for $1,045,000 FY 2021. Bloomington MPO Tip page Dated 5/10/2019.																		
Monroe County	40890 / 1702957	A 10	IR 1059	New Road Construction	Industrial Park Drive Extension/ Vernal Pike Connector Road	Seymour	.5	STBG	$9,289,700.00	Local Bridge Program	CN	-$910,800.00	$0.00			($910,800.00)		

*Estimated Costs left to Complete Project column is for costs that may extend beyond the four years of a STIP. This column is not fiscally constrained and is for information purposes.

Indiana Department of Transportation (INDOT)

State Preservation and Local Initiated Projects FY 2020 - 2024

SPONSOR	CONTRACT # / LEAD DES	STIP NAME	ROUTE	WORK TYPE	LOCATION	DISTRICT	MILES	FEDERAL CATEGORY	Estimated Cost left to Complete Project*	PROGRAM	PHASE	FEDERAL	MATCH	2020	2021	2022	2023	2024
Monroe County	40890 / 1702957	A 10	IR 1059	New Road Construction	Industrial Park Drive Extension/ Vernal Pike Connector Road	Seymour	.5	STBG	$9,289,700.00	Local Funds	CN	$0.00	-$227,700.00			($227,700.00)		
										Local Funds	RW	$0.00	$209,000.00		$209,000.00			
										Group III Program	CN	-$910,800.00	$0.00			($910,800.00)		
										Local Funds	PE	$0.00	$0.00					
										Group IV Program	RW	$836,000.00	$0.00		$836,000.00			
Comments: Amending RW Phase FY 2021 $$1,045,000. Modify CN phase for ($1,138,500) FY 2022. Removing local bridge program funding FY 2022 ($910,800). No MPO																		
Monroe County	40894 / 1702958	Init.	IR 1020	Road Reconstruction (3R/4R Standards)	Hunters Creek Road - Phase II & III - from SR446 to 2.85 miles East of SR446	Seymour	.94	STPBG		Local Funds	CN	$0.00	$772,700.00				$772,700.00	
										Group IV Program	CN	$3,090,800.00	$0.00				$3,090,800.00	
Monroe County	40894 / 1702958	M 03	IR 1020	Road Reconstruction (3R/4R Standards)	Hunters Creek Road - Phase II & III - from SR446 to 2.85 miles East of SR446	Seymour	.94	STBG	$8,117,125.00	Local Funds	CN	$0.00	$805,725.00		$1,578,425.00		($772,700.00)	
										Group IV Program	CN	$3,222,900.00	$0.00		$6,313,700.00		($3,090,800.00)	
Comments:Moving CN funds from FY 2023 to FY 2021 in the amount of $7,892,125. No MPO.																		
Indiana Department of Transportation	41055 / 1800930	Init.	SR 43	Bridge Deck Overlay	Over Richland Creek, 00.12 mi S SR-48	Vincennes	0	STPBG		Bridge Construction	CN	$519,200.00	$129,800.00		$649,000.00			
Indiana Department of Transportation	41061 / 1702627	Init.	SR 37	Bridge Deck Overlay	04.05 mile S of SR 45 over Abandoned RR and Clear Creek SBL	Seymour	0	NHPP		Bridge Construction	CN	$4,655,877.60	$1,163,969.40		$5,819,847.00			
Indiana Department of Transportation	41061 / 1801171	Init.	SR 37	Bridge Thin Deck Overlay	03.65 miles S of SR 45 over Abandoned RR NBL	Seymour	0	NHPP		Bridge Construction	CN	$316,046.40	$79,011.60	$395,058.00				
Indiana Department of Transportation	41349 / 1801525	Init.	SR 46	Intersect. Improv. W/ Added Turn Lanes	Intersection of SR 46 and 14th Street in Bloomington	Seymour	0	NHPP		Mobility Construction	CN	$2,000,000.00	$500,000.00	$2,500,000.00				
										Local Funds	CN	$1,040,000.00	$260,000.00	$1,300,000.00				
Indiana Department of Transportation	41465 / 1800199	Init.	SR 45	Intersect. Improv. W/ Added Turn Lanes	At the intersection of Pete Ellis Dr	Seymour	0	STPBG		Safety ROW	RW	$80,000.00	$20,000.00		$100,000.00			
										Safety Construction	CN	$1,833,912.80	$458,478.20				$2,292,391.00	
Indiana Department of Transportation	41515 / 1800198	Init.	SR 45	Intersect. Improv. W/ Added Turn Lanes	Intersection of SR 45/West Ison Rd and SR 45/South Bunger Rd .	Seymour	.285	NHPP		Safety ROW	RW	$20,000.00	$5,000.00		$25,000.00			
										Safety Construction	CN	$654,579.20	$163,644.80				$818,224.00	

*Estimated Costs left to Complete Project column is for costs that may extend beyond the four years of a STIP. This column is not fiscally constrained and is for information purposes.

U.S. Department
of Transportation

Federal Transit Administration
Region V
200 West Adams St., Suite 320
Chicago, IL 60606-5253

Federal Highway Administration
Indiana Division
575 N. Pennsylvania St., Rm 254
Indianapolis, IN 46204-1576

July 2, 2019

Joe McGuinness
Commissioner
Indiana Department of Transportation
100 N Senate Ave. N955
Indianapolis, IN 46204

Dear Mr. McGuinness:

This letter documents the Federal Highway Administration (FHWA) and the Federal Transit Administration's (FTA) review of Indiana's State Fiscal Year 2020-2024 Statewide Transportation Improvement Program (STIP) and the Federal Planning Finding as required under 23 CFR 450.220(b).

In order to approve the STIP document, including the Metropolitan Planning Organization (MPO) Transportation Improvement Programs (TIPs) contained by reference or directly incorporated into the STIP, FHWA and FTA must determine, through a Federal Planning Finding, that each MPO TIP is based on a continuing, cooperative, and comprehensive (3-C) planning process. In addition, the Federal Planning Finding is based upon the extent that all the projects in the STIP are the result of a planning process in accordance with 23 USC 134 & 135 and 49 USC 5303 & 5304.

FHWA and FTA have identified the following strengths of the statewide and metropolitan transportation planning processes:

- The Indiana Department of Transportation (INDOT), MPOs and transit operators worked together to establish performance measures and targets. They established routine meetings between key INDOT and MPO staff on the safety, congestion, freight, bridge, pavement, and other measures. Subcommittees were formed between INDOT, the MPOs and FHWA. INDOT incorporated the performance measures into the 2045 Long-Range Statewide Transportation Plan (LRTP), STIP and Transportation Asset Management Plan (TAMP). All but one of the MPOs adopted INDOT's performance measures targets.

- The various performance measure subcommittees developed written procedures that were adopted into INDOT's Planning Roles and Responsibilities Cooperation Operation Manual (PRRCOM). The procedures addressed how to develop and share information related to the transportation performance data, the selection of performance targets, the reporting of performance targets, the reporting of performance to be used in tracking the progress toward attainment of critical outcomes for the regions of the MPOs, and the collection of data for the state asset management plan for the National Highway System.

- INDOT held regional meetings with the MPOs and Rural Planning Organizations (RPOs) in the development of its 2045 LRTP and FY 2020-2024 STIP during late fall 2017 through early 2018.

- INDOT increased its public outreach methods by hosting a virtual town hall meeting on transportation needs as part of input into the 2045 LRTP and the STIP. INDOT employed an on-line community survey that resulted in increased feedback and expanded the number of public meetings locations on the LRTP and STIP. Finally, INDOT created a QR Scanner app for the LRTP and STIP that linked these documents for interested persons to view electronically.

- The MPOs, INDOT, US Environmental Protection Agency, Indiana Department of Environmental Management, FTA and FHWA effectively collaborated to meet the requirements of the 1997 ozone standards.

FHWA and FTA also identified the following areas for improvement in the statewide and metropolitan transportation planning processes:

- INDOT needs to ensure projects selected by its Mobility Asset Management Team are provided earlier to the Transportation Management Areas (TMAs) MPOs for analysis in Congestion Management Process (CMP) and inclusion in the MPO's MTP.

- INDOT needs to ensure staff is knowledgeable of and fulfilling its responsibilities per the FHWA and INDOT Stewardship and Oversight Agreement and the PRRCOM. It is important INDOT follow these documents in conducting its oversight of the statewide and metropolitan planning processes.

FHWA and FTA will follow up with our observations leading to the above areas for improvement and work with you on how to best address them. In the meantime, we offer the following suggestions as possible approaches for improving the statewide and metropolitan transportation planning processes:

- We recommend INDOT work in coordination with FHWA and FTA to establish reoccurring staff and management level meetings to discuss state and federal policies, practices, procedures, and internal controls to ensure adequate stewardship and oversight of the transportation planning process in Indiana.

- We also encourage INDOT to explore and take advantage of opportunities for enhanced technical assistance, such as National Highway Institute and National Transit Institute courses on statewide and metropolitan planning and other related topics, peer exchanges, and other Transportation Planning Capacity Building program opportunities, which can be found at https://planning.dot.gov/.

This letter constitutes the documented Federal Planning Finding for Indiana's planning process. Based on our review of the information provided, including fiscal constraint information, air

quality determinations, public involvement, and the statewide and MPO planning certifications, FHWA and FTA approves Indiana's fiscal years 2020-2023 of the FY 2020-2024 STIP. We consider the projects in the 5th year for informational purposes as our approval is not to exceed more than four years per 23 CFR 450.218(l).

If you have any questions, please feel free to contact Joyce Newland with FHWA at (317) 226-5353 / joyce.newland@dot.gov or Cecilia Crenshaw with FTA at (312) 705-1268 / cecilia.crenshaw@dot.gov.

Sincerely,

Kelley Brookins
Regional Administrator
FTA Region V

Sincerely,

Mayela Sosa
Division Administrator
FHWA Indiana Division

cc: (transmitted by e-mail)
Brad Steckler, INDOT
Roy Nunnally, INDOT
Karen Hicks, INDOT
Jay Mitchell, INDOT

APPENDIX I

Noise Study

VERNAL PIKE CONNECTOR
TRAFFIC NOISE STUDY AND ABATEMENT ANALYSIS

DES NO.: 1702957 & 1900406

PREPARED FOR:
MONROE COUNTY BOARD OF COMMISSIONERS
100 KIRKWOOD AVE.
BLOOMINGTON, IN 467404

PREPARED BY:
DLZ INDIANA, LLC
157 E. MARYLAND STREET
INDIANAPOLIS, INDIANA 46204

DLZ PROJECT NO.: 1863-2010-90

ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

MARCH 2020

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APPENDICES

1.0 INTRODUCTION

DLZ Indiana, LLC (DLZ) was retained by the Monroe County Board of Commissioners to perform a planning level Traffic Noise Study and Abatement Analysis as part of the requirement for the Categorical Exclusion (CE) environmental document. This report evaluates traffic noise impacts and mitigation measures for the construction of the Vernal Pike Connector, which will extend from Vernal Pike to the southeast where it will connect with North Gates Drive in Monroe County, Indiana, refer to **Figure 1-2, Appendix A**. The project will include the reconstruction of Sunset Greeting Court, the construction of approximately 2,550 feet of new roadway and the reconstruction of Vernal Pike from approximately 500 feet west of Sunrise Greeting Court to approximately 100 feet east of Sunrise Greeting Court.

The major objectives of this planning level noise analysis and abatement analysis study are defined as follows:

- Identify areas of potential noise impacts associated with the Proposed Action
- Evaluate measures to mitigate noise impacts, as necessary
- Compare the various mitigation alternatives on the basis of potential noise impact and the associated mitigation costs

2.0 LEGISLATION AND NOISE FUNDAMENTALS

2.1 Regulatory Requirements

Effective control of undesirable traffic noise is focused upon three areas of responsibility. These are the control of land uses adjacent to a highway, regulation of vehicle noise emission levels, and mitigation of noise impacts resulting from certain types of highway improvement projects.

The authority to implement planning and land use control in the state of Indiana is under the jurisdiction of local governments. Both Federal Highway Administration (FHWA) and INDOT encourage local governments to regulate land uses in such a manner that noise sensitive developments are either prohibited from being located adjacent to major transportation facilities, or that developments are planned, designed, and built in such a manner that potential noise impacts can be avoided or minimized.

The National Environmental Policy Act (NEPA) of 1969 gives broad authority and responsibility to federal agencies to evaluate and mitigate adverse environmental impacts caused by federal actions. FHWA is required to comply with NEPA including mitigating adverse highway traffic noise effects. The Federal-Aid Highway Act of 1970 mandates FHWA to develop standards for mitigating highway traffic noise. It also requires FHWA to establish traffic noise level abatement criteria for various types of land uses. The act prohibits FHWA approval of federal-aid highway projects unless adequate consideration has been made for noise abatement measures to comply with the standards.

The Noise Control Act of 1972 gives the US Environmental Protection Agency (USEPA) the authority to establish noise regulations to control major noise sources, including motor vehicles and construction equipment. Furthermore, the US EPA is required to set noise emission standards for motor vehicles used for interstate commerce and the FHWA is required to enforce the USEPA noise emission standards through the office of motor carrier safety.

FHWA regulations for highway traffic noise for federal-aid highway projects are contained in 23 CFR 772. The regulations contain noise abatement criteria, which represent the maximum acceptable level of highway traffic noise for specific types of land uses. The regulations do not mandate that the abatement criteria be met in all situations, but rather require that reasonable and feasible efforts be made to provide noise mitigation when the abatement criteria are approached or exceeded.

This study was prepared in accordance with the requirement of the INDOT *Traffic Noise Analysis Procedure (2017) and 23 CFR 772*. This policy is applicable to Type I Federal-Aid Highway Projects, which involve the construction of a highway on a new location, or which involve the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment or increases the number of through traffic lanes. The policy is not applicable to Type II Federal-Aid Highway Projects for the abatement of noise on existing highways.

2.2 Traffic Noise Descriptors

Noise is generally defined as unwanted or annoying sound. Airborne sound occurs by a rapid fluctuation of air pressure above and below atmospheric pressure. Sound pressure levels are usually measured and expressed in decibels (dB). The decibel scale is logarithmic and expresses the ratio of the sound pressure unit being measured to a standard reference level.

Most sounds occurring in the environment do not consist of a single frequency, but rather a broad band of differing frequencies. The intensities of each frequency add to generate sound. Because the human ear does not respond to all frequencies equally, the method commonly used to quantify environmental noise consists of evaluating all of the frequencies of a sound according to a weighting system. It has been found that the A-weighted filter on a sound level meter, which includes circuits to differentially measure selected audible frequencies, best approximates the frequency response of the human ear.

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources, creating a relatively steady background noise in which no particular source is identifiable. To describe the time-varying character of traffic noise, a statistical noise descriptor called the equivalent hourly sound level, or L_{eq}(h), is commonly used. L_{eq}(h) describes a noise sensitive receiver's cumulative exposure from all noise-producing events over a one-hour period.

Because decibels are logarithmic units, sound levels cannot be added by ordinary arithmetic means. The following general relationships provide a basic understanding of sound generation and propagation:

- An increase or decrease of 10 dB will be perceived by a receiver to be a doubling or halving of the sound level
- Doubling the distance between a highway and receiver will produce a 3-dB sound level decrease
- A 3-dB sound level increase/decrease is barely detectable by the human ear.

3.0 IMPACT CRITERIA

3.1 Noise Abatement Criteria

The *INDOT Traffic Noise Analysis Procedure (2017)* has adopted the noise abatement criteria (NAC) that have been established by FHWA (23 CFR 772) for determining noise impacts for a variety of land uses. The Land-Use Activity Categories along with the criteria are presented in **Table 1**.

The NAC sound levels are only to be used to determine a roadway noise impact. These are the absolute values where abatement must be considered.

Table 1
INDOT Noise Abatement Criteria (NAC)
Hourly A-Weighted Sound Levels in Decibels (dBA)

Activity Category	L_{eq}(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Residential
C	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or not profit institutional structures, radio studios, recording studios, recreation areas, Section 4(F) sites, schools, television studios, trails and trail crossings
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public and not profit institutional structures, radio studios, recording studios, schools, and television studios
E	72 (Exterior)-	Hotels, motels, offices, restaurant/bars and other developed lands, properties, or activities not included in A-D or F
F	-(-)	Agriculture, airports, bus yards, emergency services, industrial logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	-(-)	Undeveloped lands that are not permitted
Source: FHWA 23 CFR Part 772		

3.2 INDOT Definition of Traffic Noise Impacts

Traffic noise impacts occur if either of the following two conditions is met:

1. The predicted traffic noise levels approach or exceed the NAC, as shown in **Table 1**. The *INDOT Highway Traffic Noise Analysis Procedure* (2017) defines "approach" as meaning that future levels

are higher than 1 dBA below the appropriate NAC activity category. For example, for a category B receiver, 66 dBA would be approaching 67 dBA and would be considered an impact.

2. The predicted traffic noise levels substantially exceed the existing noise level. The *INDOT Highway Traffic Noise Analysis Procedure* (2017) defines "substantial noise increase" as meaning when predicted traffic noise levels exceed existing noise levels by 15 dBA or more. For example, if a receiver's existing noise level is 50 dBA, and if the future noise level is 65 dBA, then it would be considered an impact.

4.0 NOISE STUDY METHODOLOGY

4.1 Ambient Noise Measurements

The existing noise level is defined in 23 CFR 772- Procedures for Abatement of Highway Traffic Noise and Construction Noise as, "The worst noise hour resulting from a combination of natural and mechanical sources and human activity usually present in a particular area." In accordance with the *INDOT Traffic Noise Analysis Procedure (2017) – Ambient Noise Measurements,* existing noise level measurements are required to be taken at a time of the day that reflects the loudest hourly highway traffic noise levels occurring on a regular basis under normal traffic conditions at each receptor or representative set of receptors. A receptor represents a point where noise levels are measured or modeled for each applicable land-use Activity Category classification located within the limits of the noise analysis. An evaluation of the topography, the level of service of the existing local roadway and highways, and the density and proximity of the receivers to the local roadways and highways was performed so as to establish groupings of receptors and the existing measurement locations that best represented these groupings. The ambient noise monitoring locations can be found on **Figure 3 (Appendix A).**

Prior to taking existing noise level measurements, an evaluation of the level of service for the roadways within the project study area was performed to determine when the anticipated loudest hourly traffic noise levels may occur under normal traffic conditions. It was determined that this condition would most likely occur along Vernal Pike during the normal peak hour traffic periods of 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, respectively. Additionally, it was determined that the other roadways within the project study area (Logan St and the mobile home park interior road) are not primary sources of traffic noise and that the ambient conditions in these areas area are mainly impacted by traffic related noise on Vernal Pike and ambient noise related to the industrial area along Sunset Greetings Court. The weekend days along with the Monday AM and Friday PM were excluded since traffic volumes during these times may have the potential to be elevated and not indicative of the normal traffic conditions. Therefore, it was decided that the existing noise level measurements should be collected during the normal AM and/or PM peak hour traffic periods between the time frames of the Monday PM peak hour through the Friday AM peak hour.

The collection of Ambient Noise Measurements was conducted in accordance with the *INDOT Traffic Noise Analysis Procedure (2017)* and the FHWA Report FHWA-PD-96-046, *"Measurement of Highway-Related Noise."* Measurement of the existing noise levels at the representative sites was conducted on June 3rd and 4th of 2019 and January 28, 2020 using a Quest SoundPro DL Type II meter. Existing noise measurements were conducted under meteorologically acceptable conditions when the pavement was dry and winds were calm or light.

The sound level meter was calibrated at 114 decibels using a Quest QC-10 Calibrator before and after each reading. Copies of the manufacturers Certificate of Calibration for both the sound level meter and the calibrator are enclosed in **Appendix B.** All of the existing noise level measurements were recorded at approximately 5 feet above grade and at locations representative of the predominant ambient noise source.

A total of six (6) existing noise level measurements were collected at representative receptor locations throughout the project area. The ambient readings were recorded for 15-minute durations, which is an acceptable time frame for collecting existing noise level readings according to the FHWA Report FHWA-PD-96-046, "*Measurement of Highway Related Noise.*" A summary of the existing noise level measurements used as part of this analysis is included in **Table 2**.

Table 2
Existing Noise Level Readings

Site I.D.	Site Description	Time		Existing Noise Level Reading (dBA)
		Start	End	L_{eq}
A-1	Wooded Area – Near RR Tracks	5:00 PM	6:15 PM	41.6
A-2	Vernal Pike (27' off road)	7:10 AM	7:25 PM	64.6
A-3	Sunset Greeting Cul-de-Sac (40' off road)	7:30 AM	7:45 AM	56.1
A-4	Mobile Home Park– Interior Road (22' off road)	7:50 AM	8:05 AM	52.5
A-5	Logan Street (15' off road)	8:40 AM	8:55 AM	51.4
A-6	North Gates Dr. (18' off road)	8:43 AM	8:58 AM	55.3

Traffic data was simultaneously recorded during the noise measurements and classified into five vehicle types— motorcycles, buses, automobiles (passenger cars, vans, trucks with two axles with four wheels), medium trucks (two-axles with six wheels), and heavy trucks (three or more axles)—for subsequent entry into the TNM 2.5 noise prediction computer model. A copy of the Existing Noise Measurement Logs is included in **Appendix C**.

4.2 Traffic Noise Model

The traffic noise analysis for the project study area was performed using the FHWA Traffic Noise Model (TNM), Version 2.5. The FHWA TNM was first released in March 1998. Version 2.5 of the model was released in April 2004 and is the latest approved version.

The TNM estimates vehicle noise emissions and resulting noise levels based on reference energy mean emission levels. The existing and proposed alignments (horizontal and vertical), as well as the traffic volumes, vehicle type, average vehicle speeds, pavement type and traffic control devices are input into the model. TNM uses its acoustic algorithms to predict noise levels at the selected receiver locations by taking into account sound propagation variables such as, atmospheric absorption, divergence, intervening ground, barriers, building rows, and heavy vegetation.

4.2.1 Traffic Data

Traffic data that was input into the existing conditions run to validate the model was based on the traffic observed during the collection of the existing noise level reading A-1 along Vernal Pike and then converted to an equivalent hourly traffic volume, **Table D-1, Appendix D.**

Peak hour traffic volumes for the predicted Year 2019 Existing Condition scenario along Vernal Pike were based on the traffic data recorded along Vernal Pike during the collection of existing noise level reading A-1, **Table D-1, Appendix D**. The projected peak hour traffic volumes for Year 2035 No-Build scenario were based on Year 2035 traffic projections provided by the Monroe County Highway Department, **Table D-2, Appendix D.** The projected peak hour traffic volumes for the Year 2035 Proposed Build scenario were based on Year 2035 traffic projections provided by the Monroe County Highway Department, **Table D-3, Appendix D.** The Year 2035 projected peak hour traffic volumes were not available for Logan Street, North Gates Drive, or the mobile home park interior roadway.

The Year 2035 projected traffic data did not differentiate between the directional lanes. Based on discussions with the Monroe County Highway Department, it was determined that the traffic data should be split evenly between the directional lanes. Available traffic data did not differentiate between medium and heavy trucks or include buses and motorcycles.

A traffic speed of 35 mph was used for all vehicle classes on Vernal Pike and the Vernal Pike Connector Road.

4.2.2 Alignment

The existing alignment for Vernal Pike was digitized using the Year 2018 color aerials that were obtained from the Indiana Spatial Data Portal (http://www.indiana.edu/~gisdata/) and the elevation data was based on the digital elevation model that was generated using the USGS 2018 LiDAR Point Cloud Data obtained from the USGS Earth Explorer website.

The proposed alignments for Vernal Pike and the Vernal Pike Connector roadways were developed by DLZ. The proposed elevation data for the areas located within the proposed Right-of-Way were based on the information provided in the project design files.

The alignments for Logan Street, North Gates Drive, and the mobile home park interior roadway were not modeled based on the low-traffic volumes observed during the collection of the existing noise levels and the lack of Year 2035 projected traffic volumes for these roadways.

In accordance with the INDOT *Traffic Noise Analysis Procedure (2017)* each lane of traffic was modeled separately. Flow control devices, such as stop signs and traffic lights were included in the modeling. Directional traffic was modeled for all roads and turning lanes.

4.2.3 Receptors

A receptor is defined as a discrete or representative location of a noise sensitive area(s) for any land uses listed in Table 1. All receptors located within 500 feet of the edge of pavement of the proposed build scenario were assessed for potential noise impacts per the *INDOT Traffic Noise Analysis Procedure (2017*),

refer to **Figure 2, Appendix A**.

DLZ reviewed the project area to identify land-uses and receptor locations. Land-uses with an Activity Category F and G were not evaluated as part of this traffic noise study. Specific receptor placement in the model is generally based on exterior areas where normal human occupation is expected to occur on the property. The ground elevation for the receptor locations was based on the digital elevation model that was generated using the USGS 2018 LiDAR Point Cloud Data. A default height of 4.9 feet above the base ground elevation was used for all receptors. The receptor input data is included in **Appendix E**.

4.2.4 Tree Zones and Surface Objects

There were no tree zones or surface objects input into the TNM runs for this project.

4.2.5 Terrain Lines

Terrain lines were used in the TNM model to represent where a significant grade differential and/or ground obstruction that should result in natural shielding is present between the receptor location and the roadway elevation. The terrain lines were based on the ground elevation data located within the Right-of-Way obtained from the design files and the digital elevation model that was generated using the USGS 2018 LiDAR Point Cloud Data.

4.2.6 Barriers

There were no existing barriers input into the TNM runs for this project.

4.3 TNM 2.5 Validation

Model validation is a process for testing a model to ensure that it produces reliable results and to confirm that traffic noise is the predominant noise source at the receptor locations. In general, validation involves comparing actual noise measurements obtained with the sound level meter to the noise levels predicted by the model for existing conditions at the same location. The model is considered to be verified if the model results are within ±3 dBA of the field measurements recorded at the site for the same conditions. Refer to **Section 6.1** in this document for the results of the validation study.

5.0 PROPOSED ACTION

5.1 Project Description

The project will consist of the construction of the Vernal Pike Connector road, which will extend from Vernal Pike to the southeast where it will connect with North Gates Drive in Monroe County, Indiana, refer to **Figure 1-2, Appendix A**. The project will include the reconstruction of Sunset Greeting Court, the construction of approximately 2,550 feet of new roadway and the reconstruction of Vernal Pike from approximately 500 feet west of Sunrise Greeting Court to approximately 100 feet east of Sunrise Greeting Court.

5.3 Proposed Alignments

The project will include road and bridge construction on a new alignment over the CSX Railroad (operated by Indiana Railroad). The typical section for the Vernal Pike Connector roadway will consist of two 12-foot lanes with 8-inch curb and gutter. The intersection of Vernal Pike and Vernal Pike Connector roadway will be improved, and a turn signal will be installed on Vernal Pike and the existing stop sign on Sunset Greetings Court will remain in-place. Minor improvements are proposed at the intersection of the Vernal Pike Connector roadway and North Gates Drive to allow for connectivity.

5.4 Receptors

Based on an evaluation of the project study area, a total of 35 receptors representing 35 dwelling units were modeled. The location of all the receptors modeled in TNM can be found on **Figure 3, Appendix A.** No multi-family dwelling units were observed within the project area.

There are 33 residential dwelling units that have an Activity Category B NAC classification, one (1) park (Will Detmer County Park) that has an Activity Category C NAC Classification, and one commercial business that has an Activity Category E NAC classification. Only one receptor was used to represent the Will Detmer County Park since the portion of the park located within the project study area is identified as a garden area.

5.5 Planned Development

In accordance with 23 CFR 772.9 and the INDOT *Traffic Noise Analysis Procedure (2017),* determination is to be made if undeveloped land within the project limits is permitted for development. INDOT considers "permitted" to mean that there is a definite commitment to develop land with an approved specific design of land use activities as evidenced by the issuance of a building permit. In areas where no building permit process is in place, land is considered undeveloped unless foundations for new buildings are in-place. If undeveloped land is determined to be "permitted", then appropriate Activity Category Classification will be assigned to that land and a predicted noise level will be developed and analyzed as part of the noise study. If undeveloped land is not "permitted" by the Date of Public Knowledge, then the predicted future noise levels will be analyzed as part of the noise compatible planning process. INDOT considers the Date of Public Knowledge as the date that the final NEPA approval is made. Participation in noise abatement measures will not be considered for lands that are not permitted by the Date of Public Knowledge.

A review of the Monroe County Assessor records provided on the Monroe County GIS website did not identify the presence of any properties that meet the definition of a Planned Development within the project study area.

6.0 EXISTING CONDITIONS NOISE LEVELS

6.1 TNM Validation

In accordance with the INDOT *Traffic Noise Analysis Procedure (2017)*, for projects that are on existing alignments, existing noise levels are determined from the TNM 2.5 output for the existing conditions model. For projects on a new alignment, existing noise levels are determined using the ambient noise

measurements. Since a portion of the receptors identified with the project study area are located along an existing roadway alignment (Vernal Pike) with a significant traffic volume and a portion of the receptors are located on a side road (Logan Street) and a private roadway (mobile home park interior road) that are set back a significant distance from the primary roadway and are subject to ambient noise associated with the manufacturing facilities located along Sunset Court, it was determined that the existing noise levels would be established based on a combination of the existing noise level readings and the predicted noise levels generated using TNM 2.5.

The use of the predicted noise levels for the existing condition requires that the TNM 2.5 existing conditions model be validated. This validation involves comparing actual noise measurements with the noise levels predicted by the model for present conditions at the same location. The model is considered to be verified if the model results are within ±3 dBA of the field measurements recorded at the site for the same conditions.

The existing noise level reading A-2 was collected along the north side of Vernal Pike and was used to validate the TNM existing conditions model for the receptor locations within the project study area that are located along Vernal Pike. The results of the noise modeling indicate that the predicted noise level generated using TNM 2.5 at the existing noise level reading A-2 (64.0 dBA) is within ±3 dBA of the existing noise level reading A-2 ambient noise measurement of 64.6 dBA. Based on the comparison of the existing measured noise level against the modeled level, the model is validated. TNM output data is enclosed in **Appendix G.**

Since the existing conditions TNM model was not used to generate predicted existing noise levels for the receptors represented by A-1, A-3, A-4, A-5, and A-6, these existing noise level readings were not included in the TNM validation analysis.

6.2 Predicted Existing Conditions Noise levels

The Year 2019 Existing Conditions predicted noise levels for the receptors located along Vernal Pike and the existing conditions measured ambient noise levels for the receptors located along Logan Street and the mobile home park interior road are summarized in **Table F-1, Appendix F**. The TNM output data for the receptors located along Vernal Pike is enclosed in **Appendix H**.

As shown in **Table F-1**, the Year 2019 Existing Conditions predicted L_{eq} noise levels and measured ambient noise levels within the study area ranged from 51.4 dBA L_{eq} to 59.3 dBA L_{eq}. None of the receptor locations have a predicted or measured ambient noise level for the Year 2019 Existing Conditions that approach or exceed the NAC for the Activity Category B, C, or E classifications.

7.0 PREDICTED YEAR 2035 NOISE RESULTS AND COMPARITIVE ANALYSIS

7.1 Predicted Year 2035 No-Build Noise Levels

The Year 2035 No-Build scenario predicted noise levels for the receptors located along Vernal Pike were generated using TNM 2.5 and are summarized in **Table F-1, Appendix F** and the TNM output data is included in **Appendix I**. A predicted noise levels for the Year 2035 No-Build scenario were not generated for the receptors located along Logan Street and the mobile park interior roadway since projected traffic data for these roadways was not available and these receptor locations are subject to ambient noise

associated with the manufacturing facilities located along Sunset Greeting Court.

As shown in **Table F-1**, the Year 2035 No-Build predicted L_{eq} noise levels for the receptors located along Vernal Pike within the study area ranged from 53.1 dBA L_{eq} to 62.5 dBA L_{eq}. These predicted noise levels represent a difference from the existing noise levels ranging from +1.3 dBA L_{eq} to + 1.5 dBA L_{eq}. None of the receptors located along Vernal Pike have a predicted noise level for the Year 2035 No-Build scenario that approach or exceed the NAC for the Activity Category B, C, or E classifications.

7.2 Predicted Design Year 2035 Build Noise Levels

The Design Year 2035 Build scenario predicted noise levels were generated using TNM 2.5 and are summarized in **Table F-1, Appendix F** and the TNM output data is included in **Appendix J**. As shown in **Table F-1,** the predicted Design Year 2035 Build L_{eq} noise levels within the study area ranged from 46.9 dBA L_{eq} to 63.0 dBA L_{eq}. These predicted noise levels represent a difference from existing measured noise levels ranging from -4.5 dBA L_{eq} to + 3.7 dBA L_{eq}. The decrease in predicted noise levels for the Design Year 2035 Build scenario when compared to the Year 2019 Existing Conditions scenario is a result of ambient noise influences recorded during the collection of the existing noise level readings that are not accounted for in the Year 2035 Build model.

None of the receptors located within the project study area a predicted noise level for the Design Year 2035 Build scenario that approach or exceed the NAC for the Activity Category B, C, or E classifications.

8.0 NOISE ABATEMENT EVALUATION

8.1 INDOT Noise Abatement Policy

In accordance with the *INDOT Traffic Noise Analysis Procedure, (2017)*, possible mitigation measures are considered for sites where noise impacts are predicted to occur. Mitigation is assessed in terms of its feasibility and reasonableness. For the purposes of assessing noise mitigation strategies, "feasible" means that it is structurally and acoustically possible to reduce noise by 5dBA at a majority (greater than 50%) of the impacted receptors. In order to determine "reasonableness", INDOT has established three criteria to be evaluated for each "feasible" form of noise abatement. If any of the three "reasonableness" criteria are not met, noise abatement measures will not be constructed. The three "reasonableness" criteria are described as follows:

INDOT Design Goal for Noise Abatement: INDOT has established a noise reduction design goal of 7 dBA for a majority (greater than 50%) of the benefited first row receptors. If the proposed noise abatement measure is unable to produce this required level of noise reduction, then the noise abatement measure will not be considered "reasonable".

Cost-Effectiveness: To determine cost effectiveness, the estimated cost of constructing a noise barrier will be divided by the number of benefited receptors. A benefited receptor includes those sites which are predicted to experience at least a 5 dBA L_{eq}(h) reduction at the noisiest hour conditions and may include benefited receptors that are not impacted. Barrier cost should be arrived at by applying a square footage cost (determined by INDOT to be $30 per square foot) to the square footage of the noise barrier. Noise abatement will be considered cost effective if the estimated cost of constructing abatement divided by the number of benefited receptors is $25,000 or less. In situations where the majority (greater than 50%)

of the receptors were in place prior to construction of the highway, the cost-effective criteria will be 20% greater (currently $30,000 per benefited receptor). Since the project involves the construction of a roadway on an existing alignment and the receptors were in place prior to this study, a cost effectiveness criterion of $25,000 per benefited receptor will be used.

Consideration and Obtaining Views of Residents and Property Owners: A survey of the benefited receptors will be performed so that they have the opportunity to express their opinion and may elect to decline such mitigation if they believe the positive benefits outweigh the potential negative impacts of noise barriers (i.e., unsightliness, shortened daylight, poor air circulation, degradation by weather, reduced safety, vandalism, and restriction of access for emergency vehicles). In addition to the survey, a fact sheet describing Highway Traffic Noise and Noise Barriers and a map identifying the location of the proposed noise barrier will be provided to the benefited receptors. If the total respondents to the survey do not total a majority (more than 50%) of the benefited receptors and affected property owners, then a second survey of those that did not respond will be performed. A third survey will not be performed regardless of the percentage of the responses.

8.2 Noise Abatement Considerations

The following strategies are to be considered for permanent noise impacts.

Traffic Management Measures: Traffic management measures were not considered reasonable and feasible for abating noise impacts for any receptor. Measures such as installation of additional traffic control devices, prohibition of vehicle types, time-use restrictions, speed limit reductions, and exclusive lane designations would be detrimental to the proposed project's ability to function as a major north-south route.

Alteration of Horizontal and Vertical Alignments: The final design of the preferred alternative may include shifting the alternative both vertically and horizontally, wherever feasible, to minimize impacts to adjacent land uses. Both vertical and horizontal alignments may be altered to minimize noise impacts where other factors are not prohibitive.

Acquisition of Property Rights or Acquisition of Property: The purchase of property and/or buildings for noise barrier construction or the creation of a "buffer zone" to reduce noise impacts was considered. The amount of property required for this option to be effective would create significant additional impacts (*e.g.*, residential displacements), which were determined to outweigh the benefits of land acquisition.

Noise Insulation of Public Use or Nonprofit Institutional Structures: This noise abatement measure option applies only to public and institutional use buildings. Since no public use or institutional structures are anticipated to have interior noise levels exceeding FHWA's interior NAC, this noise abatement option will not be applied.

Coordination Among Local Planning Authorities. The potential does exist for local officials and developers to help minimize adverse noise impacts through the use of careful land use planning for the undeveloped land within the project area. With regard to currently undeveloped land, the creation of a "buffer zone" or locating noise sensitive developments a reasonable distance away from the project would help minimize future noise impacts.

Construction of Noise Barriers: The construction of noise barriers between the shoulder and the right-of-way limits is generally one of the most feasible and/or reasonable abatement measures available. For those receptors experiencing a noise impact, the feasibility and reasonableness of noise abatement were evaluated using *INDOT's Traffic Noise Analysis Procedure, (2017).*

8.3 Noise Mitigation Assessment

In accordance with INDOT's *Highway Traffic Noise Analysis Procedure*, (2*017)* receptors that were categorized as having predicted design year (2035) traffic noise impacts are to be assessed to determine if the construction of noise barriers would be a "feasible" and "reasonable" form of noise abatement. However, since there is no Design Year 2035 Build scenario traffic noise level impacts noise mitigation assessment is not required.

9.0 NOISE COMPATIBLE PLANNING

Through advance planning and shared responsibility, local governments and developers, working cooperatively with Federal and State governments, can plan, design, and construct new development projects and roadways that minimize the adverse effects of noise from highway traffic. Noise-compatible land-use planning encourages the location of less noise-sensitive land uses near highways, promotes the use of open space separating roads from developments, and may even suggest special construction techniques that could possibly minimize the impact of noise from highway traffic. While there is no NAC set up for undeveloped lands (Category G,) as described in **Table 1**, INDOT *Traffic Noise Analysis Procedure (2017)* requires noise contours to be developed for undeveloped lands and provided to local governments and planning agencies so that future land-use planning efforts can be performed in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized.

Based on the Year 2035 Build scenario TNM analysis, the 66-dBA noise contour would not extend beyond the right-of-way along the Vernal Pike Connector roadway.

10.0 SUMMARY

A Traffic Noise Analysis was performed for the proposed construction of the Vernal Pike Connector Project to identify areas of potential noise impacts associated with the Proposed Action and to evaluate measures to mitigate noise impacts, as necessary.

There are 35 receptors located within the study area representing 35 individual dwelling units and other noise sensitive entities (parks and commercial facilities). Since a portion of the receptors identified with the project study area are located along an existing roadway alignment (Vernal Pike) with a significant traffic volume and a portion of the receptors are located on a side road (Logan Street) and a private roadway (mobile home park interior road) that are set back a significant distance from the primary roadway and are subject to ambient noise associated with the manufacturing facilities located along Sunset Court, it was determined that the existing noise levels would be established based on a combination of the existing noise level readings and the predicted noise levels generated using TNM 2.5.

The Year 2019 Existing Conditions predicted L_{eq} noise levels and measured ambient noise levels within the study area ranged from 51.4 dBA L_{eq} to 59.3 dBA L_{eq}. None of the receptor locations have a predicted or measured ambient noise level for the Year 2019 Existing Conditions that approach or exceed the NAC for the Activity Category B, C, or E classifications

The Year 2035 No-Build predicted L_{eq} noise levels for the receptors located along Vernal Pike within the study area ranged from 53.1 dBA L_{eq} to 62.5 dBA L_{eq}. These predicted noise levels represent a difference from the existing noise levels ranging from +1.3 dBA L_{eq} to + 1.5 dBA $L_{eq.}$. None of the receptors located along Vernal Pike have a predicted noise level for the Year 2035 No-Build scenario that approach or exceed the NAC for the Activity Category B, C, or E classifications.

The Design Year 2035 Build predicted L_{eq} noise levels within the study area ranged from 46.9 dBA L_{eq} to 63.0 dBA L_{eq}. These predicted noise levels represent a difference from existing measured noise levels ranging from -4.5 dBA L_{eq} to + 3.7 dBA $L_{eq.}$. The decrease in predicted noise levels for the Year 2035 Build scenario when compared to the Year 2019 Existing Conditions scenario is a result of ambient noise influences recorded during the collection of the existing noise level readings that are not accounted for in the Year 2035 Build model

Based on the studies thus far accomplished, there are no predicted Design Year 2035 Build scenario traffic noise level impacts identified. As a result, noise mitigation assessment is not required.

11.0 REFERENCES

Indiana Department of Transportation *Traffic Noise Analysis Procedure (2017)*

FHWA Policy Memorandum *Highway Traffic Noise Analysis and Abatement Guidance*, August 11, 2010.

23 CFR Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, July 13, 2011.

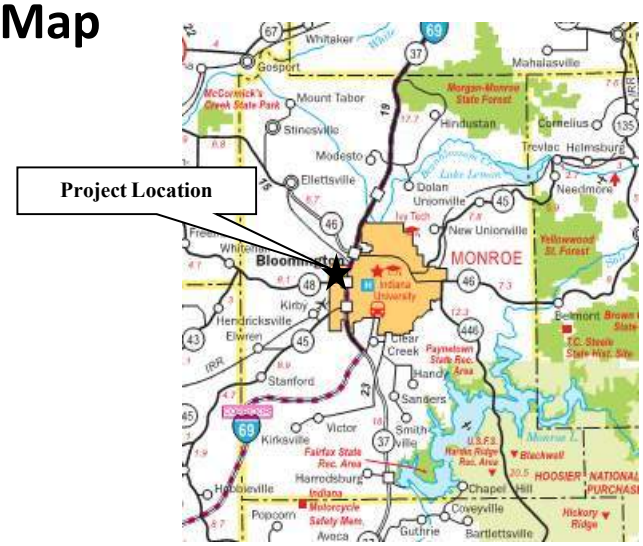
FHWA Report FHWA-HEP-06-015 *Construction Noise Handbook, August 2006*

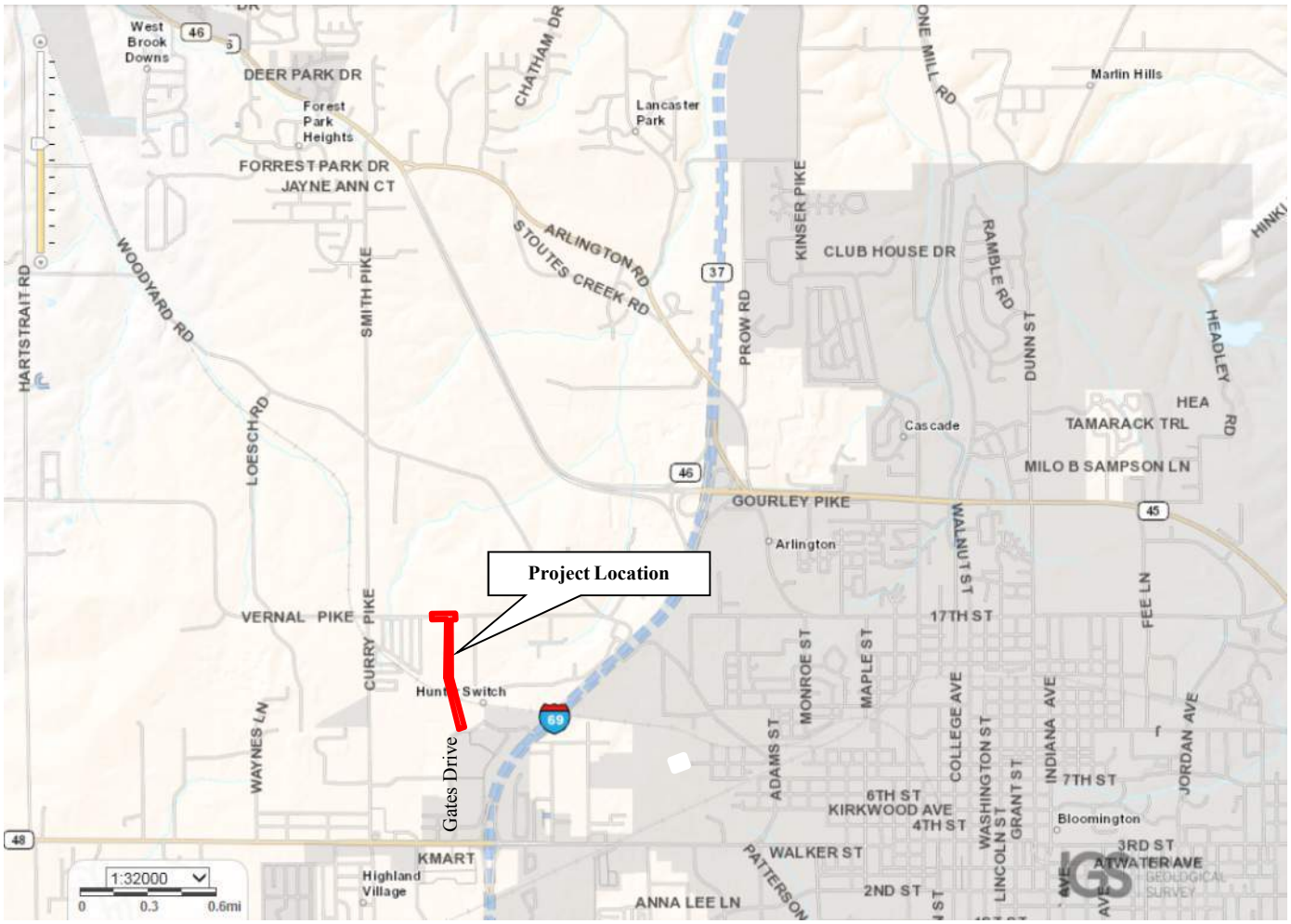
FHWA Report FHWA-PD-96-046, "*Measurement of Highway Related Noise, January 2, 1997*

APPENDIX A

FIGURES

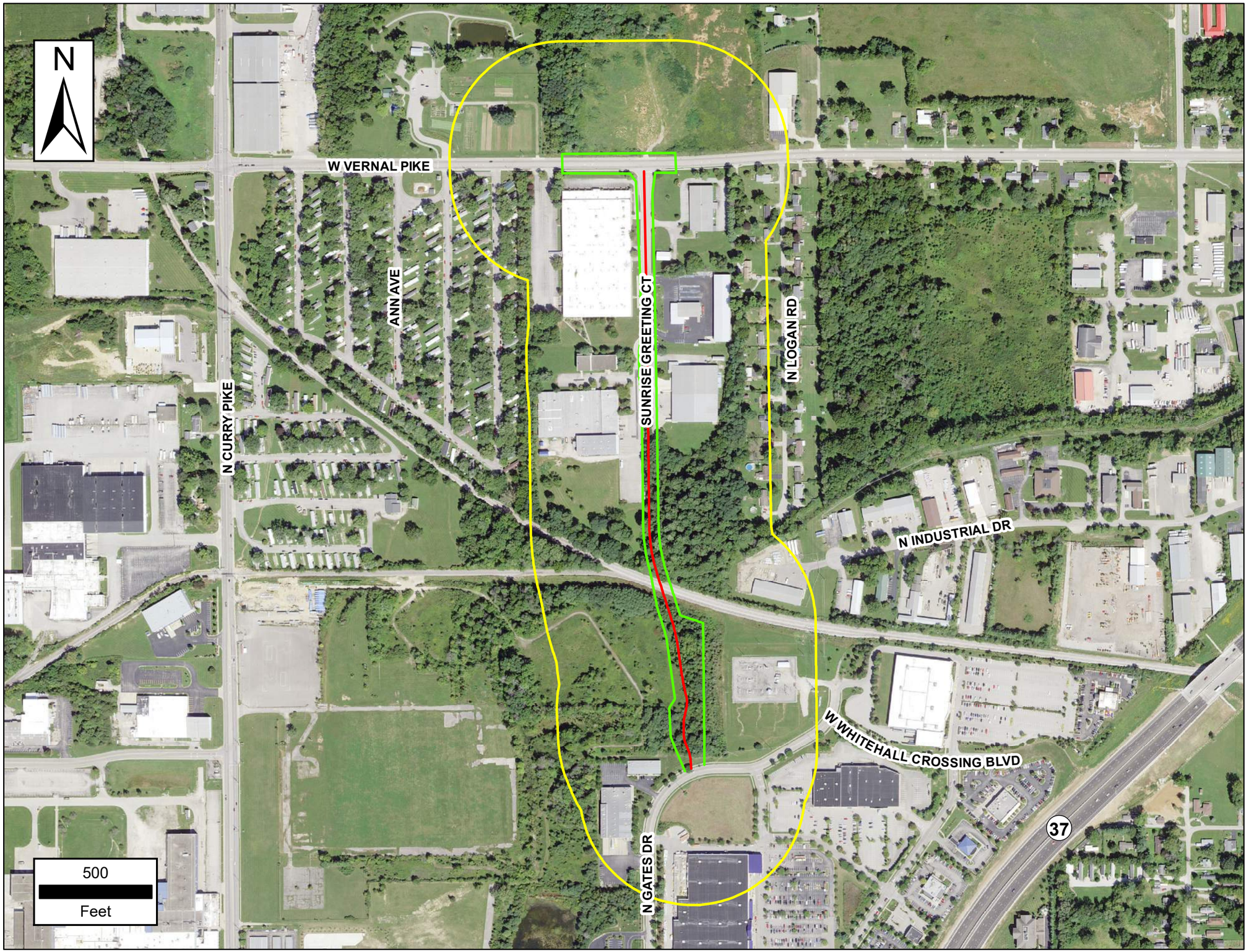
Location Map





http://maps.indiana.edu/

DLZ	Vernal Pike Connector Des. No.: 1702957 & 1900406 Monroe County, Indiana	Scale: NTS Figure: 1



Legend

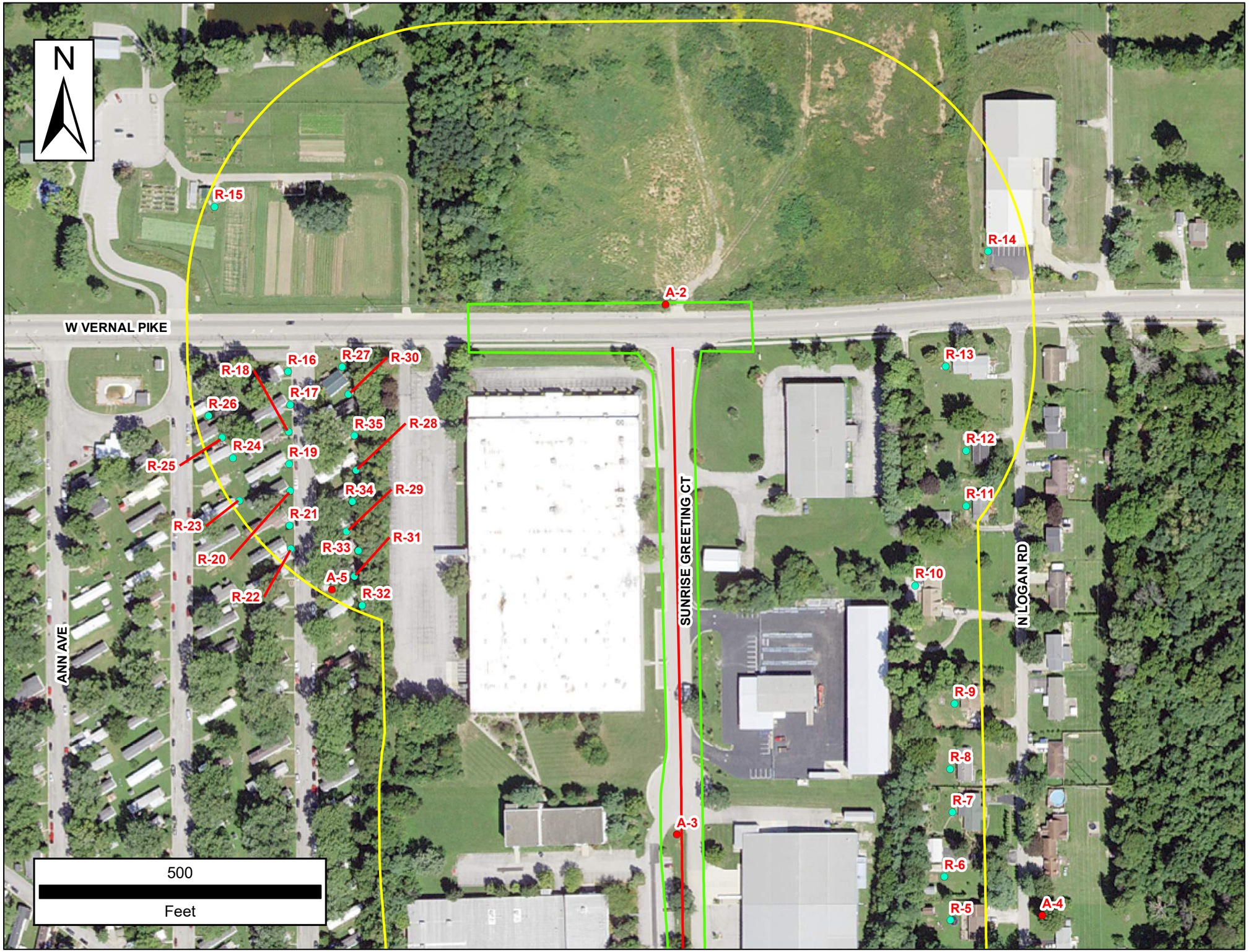
- Vernal Pike Connector
- Right-of-Way Limits
- Study Area

Figure 2
Project Location Plan

Vernal Pike Connector Traffic Noise Study
Des # 1702957 & 1900404
Monroe County, Indiana

DLZ

February 2020



Legend

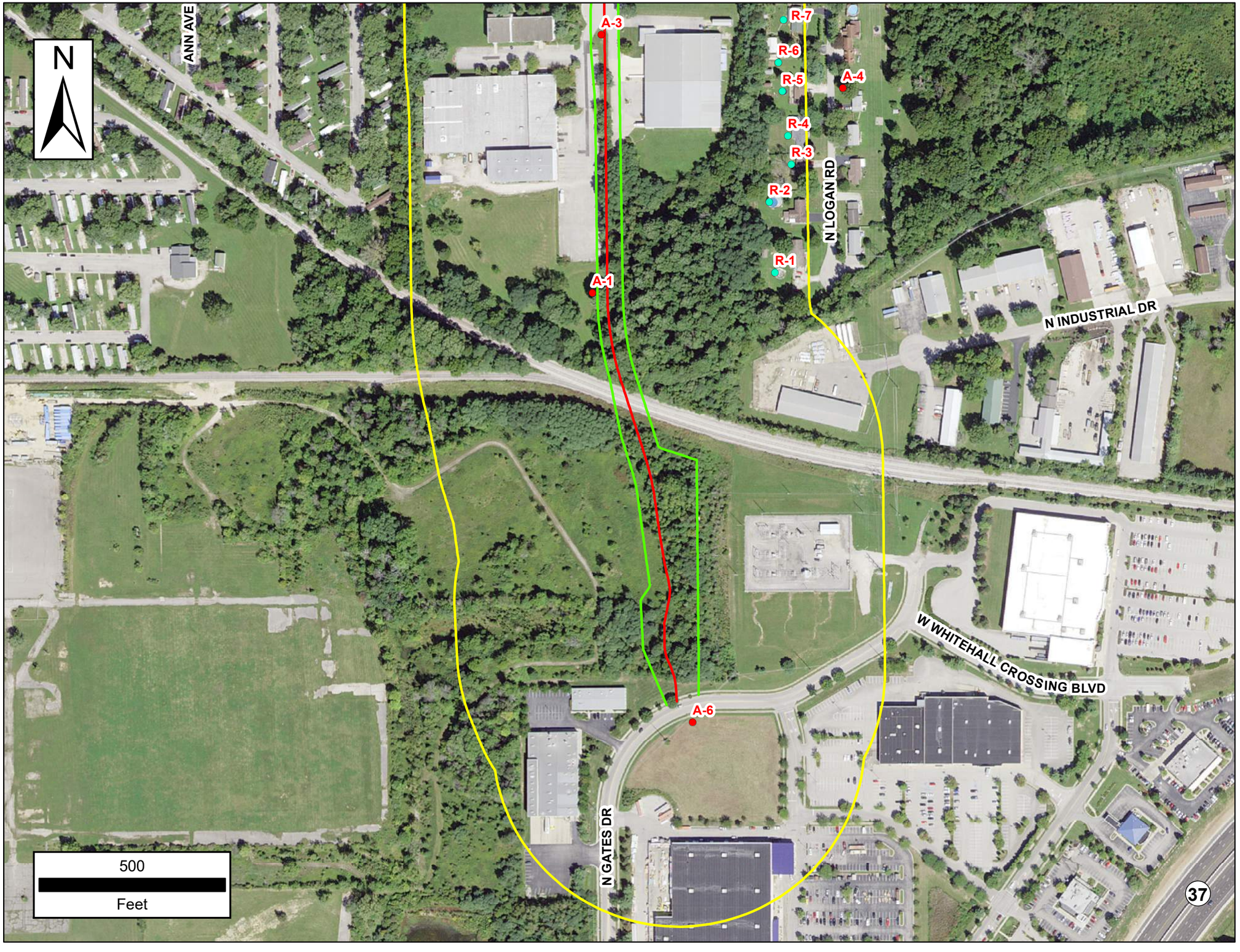
- Existing Noise Level Reading Location
- Receptor Location
- Vernal Pike Connector
- Right-of-Way Limits
- Study Area

Figure 3.1
TNM Receptor Locations Plan

Vernal Pike Connector Traffic Noise Study
Des # 1702957 & 1900404
Monroe County, Indiana

DLZ

February 2020



Legend

- Existing Noise Level Reading Location
- Receptor Location
- Vernal Pike Connector
- Right-of-Way Limits
- Study Area

Figure 3.2
TNM Receptor Locations Plan

Vernal Pike Connector Traffic Noise Study
Des # 1702957 & 1900404
Monroe County, Indiana

DLZ

February 2020

APPENDIX B

NOISE METER CALIBRATION

MONITORING INSTRUMENTS
Industrial Environmental Monitoring Instruments, Inc.

7410 Worthington-Galena Road
Worthington, Ohio 43085
Phone: (614) 436-4933
Fax: (614) 436-9144

Website: www.ierents.com

Certificate of Calibration

Submitted By: IE Monitoring Instruments
7410 Worthington-Galena Road
Worthington, Oh 43085

Serial No: QIE120114
Model: QC-10

Date Issued: 11/14/2019

Test Conditions:
Temperature 68.5 F
Humidity 27.6%
Barometric Pressure 29.217"Hg

Model Conditions:
As Received: Fully Functional and In Tolerance
Final Condition: Fully Functional and In Tolerance

Test Results:
Output: 114.0 dB Frequency: 1.00035 KHz VAC: 1.00330 v

Reference Standards:

Device	Serial Number	Last Calibration	Date Calibration Due
Quest SoundPro Type I	BKL120001	4/4/2019	4/4/2020
Quest AC-300	AC3000002327	4/4/2019	4/4/2020
Agilent 34401A	MY41002352	11/8/2019	11/8/2021

Calibrated By: Ryan Taylor, Service Technician 11/14/2019

This report certifies that all calibration equipment used in the test is traceable to the NIST, and applies only to the unit identified above. All tolerances of accuracy are within the manufactures specifications.

7410 Worthington-Galena Road
Worthington, Ohio 43085
Phone: (614) 436-4933
Fax: (614) 436-9144

Industrial Environmental Monitoring Instruments, Inc.

Website: www.ierents.com

Certificate of Calibration

Submitted By: IE Monitoring Instruments
7410 Worthington-Galena Road
Worthington, OH 43085

Serial No: BIH050001
Model: Quest SoundPro SE/DL

Date Issued: 11/13/2019

Test Conditions:
Temperature 69.1 F
Humidity 26.8 %
Barometric Pressure 29.408"Hg

Model Conditions:
As Received: Fully Functional and In Tolerance
Final Condition: Fully Functional and In Tolerance

Test Results:
A & C Weightings +/- 0.2 dB
Linearity +/- 0.1 dB

Type II Accuracy: +/- 2 dB
Linearity Accuracy: +/- 0.5dB

Octave Band Filter Check:
Bandwidth Peak 12.5hz – 20Khz meets manufacturers specifications.
Frequency output meets manufacturer's specifications.

Reference Standards:

Device	Serial Number	Last Calibration	Date Calibration Due
Quest SoundPro Type I	BKL120001	4/4/2019	4/4/2020
Quest AC-300	AC300002327	4/4/2019	4/4/2020
Druck DPI740	74004430	4/24/2019	4/24/2020

Calibrated By: Ryan Taylor, Service Technician **11/13/2019**

This report certifies that all calibration equipment used in the test is traceable to the NIST, and applies only to the unit identified above. All tolerances of accuracy are within the manufactures specifications.

APPENDIX C

EXISTING NOISE MEASUREMENT LOGS

Noise Analysis Field Log

DLZ

Date:	June 3, 2019	**Technician:**	SJW + DJS
Project Name:	Vernal Pike	**Temp. and Cloud Cover:**	partly cloudy / 63°
Project Number:		**Wind Speed/Dir:**	0-5 mph / west

Measurement Number	Datalog Measurement ID	Run Time	Time Start	Time Stop	Distance to Roadway
1		15:00	6:00	6:15	N/A

Site Diagram

Noise Meter Readings

$L_{eq(A)}$	$L_{min(A)}$	$L_{90(A)}$	$L_{50(A)}$	$L_{10(A)}$	$L_{5(A)}$	$L_{max(A)}$
41.6	—	37.8	40.9	43.6 n/a	n/a	51.1
$L_{dn(A)}$	$CNEL_{(A)}$	$L_{peak(C)}$	$TWA_{(A)}$	%OL	dB RANGE	
n/a	n/a	47.3	n/a	n/a		

Comments:

Roadway 1	Direction 1	Direction 2	Direction 3	Direction 4		Roadway 3	Direction 1	Direction 2
Autos, Vans, Light Trucks	0					Autos, Vans, Light Trucks		
Medium Trk.						Medium Trk.		
Heavy Trucks						Heavy Trucks		
Buses						Buses		
Motorcycles						Motorcycles		

Roadway 2	Direction 1	Direction 2	Direction 3	Direction 4		Roadway 4	Direction 1	Direction 2
Autos, Vans, Light Trucks	0					Autos, Vans, Light Trucks		
Medium Trk.						Medium Trk.		
Heavy Trucks	one Semi idled for 30 seconds					Heavy Trucks		
Buses						Buses		
Motorcycles						Motorcycles		

Trains: 0, set up near tracks

Noise Analysis Field Log

DLZ

Date:	6-4-19	Technician:	Jim Dos
Project Name:	Vernal Pike	Temp. and Cloud Cover:	Partly cloudy / 62°
Project Number:		Wind Speed/Dir:	5mph

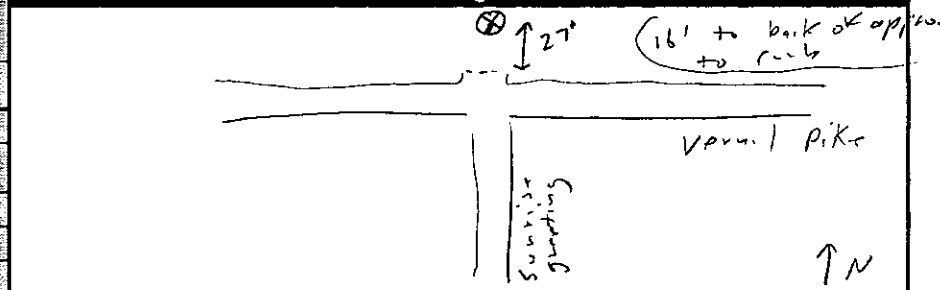
Measurement Number	Datalog Measurement ID	Run Time	Time Start	Time Stop	Distance to Roadway
2		15:09	7:10	7:25	27'

Noise Meter Readings

$L_{eq(A)}$	$L_{min(A)}$	$L_{90(A)}$	$L_{50(A)}$	$L_{10(A)}$	$L_{5(A)}$	$L_{max(A)}$
64.6	—	54.2	60.3	~~n/a~~	n/a	84.3

$L_{dn(A)}$	$CNEL_{(A)}$	$L_{peak(C)}$	$TWA_{(A)}$	%OL	dB RANGE
n/a	n/a	74.2	n/a	n/a	

Site Diagram



Comments:

Eastbound (Vernal Pike) Westbound

Roadway 1	Direction 1	Direction 2	Direction 3	Direction 4	
Autos, Vans, Light Trucks	[many tally marks]	[many tally marks]			
Medium Trk.					
Heavy Trucks	|	|||			
Buses					
Motorcycles	||				

Roadway 3	Direction 1	Direction 2
Autos, Vans, Light Trucks		
Medium Trk.		
Heavy Trucks		
Buses		
Motorcycles		

Roadway 2	Direction 1	Direction 2	Direction 3	Direction 4	
Autos, Vans, Light Trucks	|	||||			
Medium Trk.					
Heavy Trucks	||				
Buses					
Motorcycles					

Roadway 4	Direction 1	Direction 2
Autos, Vans, Light Trucks		
Medium Trk.		
Heavy Trucks		
Buses		
Motorcycles		

Northbound (Sunning) Southbound

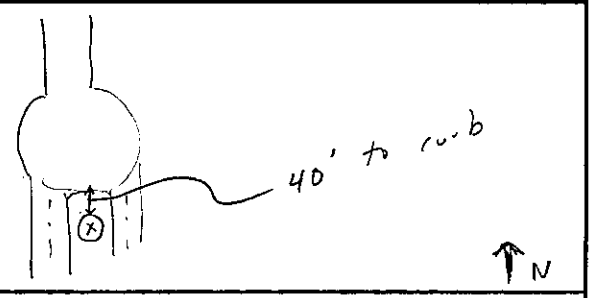
Noise Analysis Field Log

DLZ

Date:	6-4-19	**Technician:**	SJW + DJS
Project Name:	Vernal Pike	**Temp. and Cloud Cover:**	Partly Cloudy / 62
Project Number:		**Wind Speed/Dir:**	none / —

Measurement Number	Datalog Measurement ID	Run Time	Time Start	Time Stop	Distance to Roadway
3		15:00	7:30	7:45	40'

Site Diagram



Noise Meter Readings

$L_{eq(A)}$	$L_{min(A)}$	$L_{90(A)}$	$L_{50(A)}$	$L_{10(A)}$	$L_{5(A)}$	$L_{max(A)}$
56.1	—	51.0	53.5	n/a	n/a	73.7
$L_{dn(A)}$	$CNEL_{(A)}$	$L_{peak(C)}$	$TWA_{(A)}$	%OL	dB RANGE	
n/a	n/a	—	n/a	n/a		

Comments:

Total Vehicles

Roadway 1	Direction 1	Direction 2	Direction 3	Direction 4		Roadway 3	Direction 1	Direction 2
Autos, Vans, Light Trucks	HHT LHT I					Autos, Vans, Light Trucks		
Medium Trk.	I					Medium Trk.		
Heavy Trucks	I					Heavy Trucks		
Buses						Buses		
Motorcycles						Motorcycles		

Roadway 2	Direction 1	Direction 2	Direction 3	Direction 4		Roadway 4	Direction 1	Direction 2
Autos, Vans, Light Trucks						Autos, Vans, Light Trucks		
Medium Trk.						Medium Trk.		
Heavy Trucks						Heavy Trucks		
Buses						Buses		
Motorcycles						Motorcycles		

Noise Analysis Field Log

DLZ

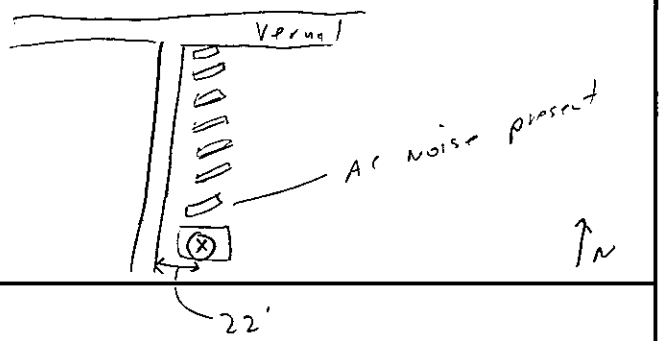
Date:	6-5-19	**Technician:**	SJW + DJS
Project Name:	Vernal Pike	**Temp. and Cloud Cover:**	Partly Cloudy / 60°
Project Number:		**Wind Speed/Dir:**	none

Measurement Number	Datalog Measurement ID	Run Time	Time Start	Time Stop	Distance to Roadway
4		15:00	7:50	8:05	22'

Noise Meter Readings

$L_{eq(A)}$	$L_{min(A)}$	$L_{90(A)}$	$L_{50(A)}$	$L_{10(A)}$	$L_{5(A)}$	$L_{max(A)}$
52.5	/	50.0	51.5	n/a	n/a	62.4
$L_{dn(A)}$	$CNEL_{(A)}$	$L_{peak(C)}$	$TWA_{(A)}$	%OL	dB RANGE	
n/a	n/a	/	n/a	n/a		

Site Diagram



Comments:

I-69 background noise noticible

southbound

northbound

Roadway 1	Direction 1	Direction 2	Direction 3	Direction 4		Roadway 3	Direction 1	Direction 2
Autos, Vans, Light Trucks	111	1				Autos, Vans, Light Trucks		
Medium Trk.						Medium Trk.		
Heavy Trucks						Heavy Trucks		
Buses						Buses		
Motorcycles						Motorcycles		

Roadway 2	Direction 1	Direction 2	Direction 3	Direction 4		Roadway 4	Direction 1	Direction 2
Autos, Vans, Light Trucks						Autos, Vans, Light Trucks		
Medium Trk.						Medium Trk.		
Heavy Trucks						Heavy Trucks		
Buses						Buses		
Motorcycles						Motorcycles		

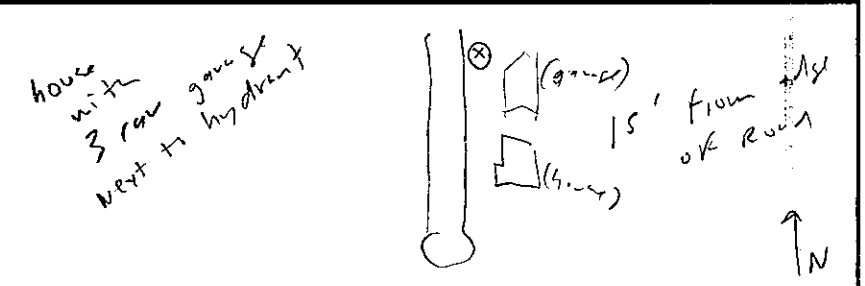
Noise Analysis Field Log

DLZ

Date:	6-4	**Technician:**	SJW D
Project Name:	Vernal Pike	**Temp. and Cloud Cover:**	62° / clear
Project Number:		**Wind Speed/Dir:**	5mph / South

Measurement Number	Datalog Measurement ID	Run Time	Time Start	Time Stop	Distance to Roadway
5		15	8:40	8:55	15'

Site Diagram



Noise Meter Readings

$L_{eq(A)}$	$L_{min(A)}$	$L_{90(A)}$	$L_{50(A)}$	$L_{10(A)}$	$L_{5(A)}$	$L_{max(A)}$
51.4		46.6	48.6	n/a	n/a	
$L_{dn(A)}$	$CNEL_{(A)}$	$L_{peak(C)}$	$TWA_{(A)}$	%OL	dB RANGE	
n/a	n/a		n/a	n/a		

Comments:

NB SB

Roadway 1	Direction 1	Direction 2	Direction 3	Direction 4		Roadway 3	Direction 1	Direction 2
Autos, Vans, Light Trucks	11	1				Autos, Vans, Light Trucks		
Medium Trk.						Medium Trk.		
Heavy Trucks						Heavy Trucks		
Buses						Buses		
Motorcycles						Motorcycles		

Roadway 2	Direction 1	Direction 2	Direction 3	Direction 4		Roadway 4	Direction 1	Direction 2
Autos, Vans, Light Trucks						Autos, Vans, Light Trucks		
Medium Trk.						Medium Trk.		
Heavy Trucks						Heavy Trucks		
Buses						Buses		
Motorcycles						Motorcycles		

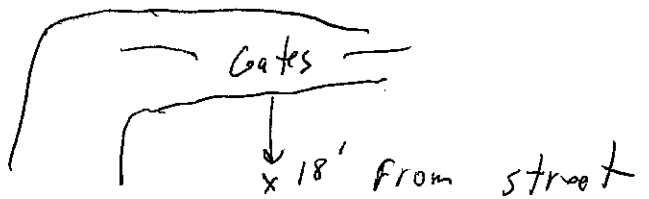
Noise Analysis Field Log

DLZ

Date:	1-28-20	Technician:	Dan Stevens
Project Name:	Vernal Bike	Temp. and Cloud Cover:	33° cloudy
Project Number:		Wind Speed/Dir:	N. 3 mph

Measurement Number	Datalog Measurement ID	Run Time	Time Start	Time Stop	Distance to Roadway
6		15:01	8:43	8:58	18'

Site Diagram



Noise Meter Readings

[redacted]	$L_{min(A)}$	[redacted]	[redacted]	[redacted]	$L_{5(A)}$	[redacted]
55.3	—	47.4	48.7	57.0 p/er	n/a	71.2
$L_{dn(A)}$	$CNEL_{(A)}$	[redacted]	$TWA_{(A)}$	%OL	dB RANGE	
n/a	n/a	86.4	n/a	n/a		

Comments:

N

Roadway 1	Direction 1	Direction 2	Direction 3	Direction 4		Roadway 3	Direction 1	Direction 2
Autos, Vans, Light Trucks	𝍸 𝍸 ||	|||				Autos, Vans, Light Trucks		
Medium Trk.						Medium Trk.		
Heavy Trucks						Heavy Trucks		
Buses						Buses		
Motorcycles						Motorcycles		

Roadway 2	Direction 1	Direction 2	Direction 3	Direction 4		Roadway 4	Direction 1	Direction 2
Autos, Vans, Light Trucks						Autos, Vans, Light Trucks		
Medium Trk.						Medium Trk.		
Heavy Trucks						Heavy Trucks		
Buses						Buses		
Motorcycles						Motorcycles		

APPENDIX D

TRAFFIC VOLUMES

Table D-1 AMBIENT EXISTING TRAFFIC DATA VERNAL PIKE CONNECTOR TRAFFIC NOISE STUDY						
	AM Peak Hour			PM Peak Hour		
Ambient Location	**Total Vehicles**	**Cars**	**Heavy Trucks**	**Total Vehicles**	**Cars**	**Heavy Trucks**
A-1						
Grass Area -South of Sunset Greeting Court	-	-	-	0	0	0
A-2						
WB Vernal Pike	468	120	12	-	-	-
EB Vernal Pike		332	4		-	-
A-3						
Sunset Greeting Court	48	44	4	-	-	-
A-4						
Mobile Home Park Interior Private Road	16	16	0	-	-	-
A-5						
Loagn Street	12	12	0	-	-	-
A-6						
WB North Gates Drive	-	-	-	60	12	0
EB North Gates Drive		-	-		48	0

Table D-2 YEAR 2035 PROJECTED NO-BUILD TRAFFIC DATA VERNAL PIKE CONNECTOR TRAFFIC NOISE STUDY			
Ambient Location	**Peak Hour**		
	Total Vehicles	**Cars**	**Heavy Trucks**
WB Vernal Pike	439	430	9
EB Vernal Pike	439	430	9

Table D-3 YEAR 2035 PROJECTED TRAFFIC DATA VERNAL PIKE CONNECTOR TRAFFIC NOISE STUDY			
Ambient Location	**Peak Hour**		
	Total Vehicles	**Cars**	**Heavy Trucks**
WB Vernal Pike	613	601	12
EB Vernal Pike	613	601	12
WB Vernal Pike Connector	267	262	5
EB Vernal Pike Connector	267	262	5

APPENDIX E

RECEPTOR INPUTS

APPENDIX E RECEPTOR INPUT DATA						
Name	X_COORD	Y_COORD	ELEV	NAC	NAC_Cat	Type
R-1	3096913	1430570	893	66	B	Residential
R-2	3096898	1430759	893	66	B	Residential
R-3	3096957	1430860	894	66	B	Residential
R-4	3096948	1430937	893	66	B	Residential
R-5	3096933	1431056	896	66	B	Residential
R-6	3096922	1431134	896	66	B	Residential
R-7	3096936	1431248	897	66	B	Residential
R-8	3096932	1431325	898	66	B	Residential
R-9	3096940	1431441	904	66	B	Residential
R-10	3096870	1431651	912	66	B	Residential
R-11	3096961	1431792	904	66	B	Residential
R-12	3096961	1431890	906	66	B	Residential
R-13	3096924	1432040	914	66	B	Residential
R-14	3097000	1432244	914	72	E	Commercial
R-15	3095626	1432323	871	66	C	Park
R-16	3095756	1432031	874	66	B	Residential
R-17	3095760	1431972	876	66	B	Residential
R-18	3095757	1431924	877	66	B	Residential
R-19	3095758	1431867	879	66	B	Residential
R-20	3095760	1431819	881	66	B	Residential
R-21	3095759	1431757	883	66	B	Residential
R-22	3095761	1431716	884	66	B	Residential
R-23	3095670	1431802	879	66	B	Residential
R-24	3095658	1431878	876	66	B	Residential
R-25	3095639	1431913	873	66	B	Residential
R-26	3095615	1431952	871	66	B	Residential
R-27	3095853	1432039	880	66	B	Residential
R-28	3095877	1431856	883	66	B	Residential
R-29	3095860	1431747	886	66	B	Residential
R-30	3095863	1431990	881	66	B	Residential
R-31	3095874	1431667	887	66	B	Residential
R-32	3095888	1431616	889	66	B	Residential
R-33	3095881	1431713	888	66	B	Residential
R-34	3095871	1431800	885	66	B	Residential
R-35	3095874	1431917	882	66	B	Residential
A-1	3096423	1430515	890	-	-	Existing Noise Level Reading
A-2	3096427	1432150	895	-	-	Existing Noise Level Reading
A-3	3096447	1431209	894	-	-	Existing Noise Level Reading
A-4	3097096	1431065	890	-	-	Existing Noise Level Reading
A-5	3095834	1431644	887	-	-	Existing Noise Level Reading
A-6	3096692	1429363	877	-	-	Existing Noise Level Reading

APPENDIX F

SUMMARY OF MODELING RESULTS

APPENDIX F-1: SUMMARY OF MODELING RESULTS

Substantial Increase Impact
Displacement
NAC Impact
Substantial Increase of 15-20 dBA
Substantial Increase of 20-25 dBA
Substantial Increase greater than 25 dBA
No Predicted Levels for No-Build
3 < dBA compared to No-Build
+/- 3dBA compared to No-Build

Receptor Name	Dwelling Units	Activity Category Classification	Noise Abatement Criteria (dBA)	Year 2019 Measured Ambient Noise Level		Year 2019 Predicted-Existing Conditions (dBA)	Year 2035 No-Build Scenario		Year 2035 Proposed Build Scenario		
				Existing Noise Level Reading ID	Existing Noise Level (dBA)		Future No-Build (dBA)	Increase Over Existing (dBA)	Predicted Noise Levels (dBA)	Increase Over Existing (dBA)	Increase Over Future No-Build (dBA)
R-1	1	B	67	A-5	51.4	-	-	-	48.2	-3.2	-
R-2	1	B	67	A-5	51.4	-	-	-	48.1	-3.3	-
R-3	1	B	67	A-5	51.4	-	-	-	47.0	-4.4	-
R-4	1	B	67	A-5	51.4	-	-	-	46.9	-4.5	-
R-5	1	B	67	A-5	51.4	-	-	-	47.0	-4.4	-
R-6	1	B	67	A-5	51.4	-	-	-	47.2	-4.2	-
R-7	1	B	67	A-5	51.4	-	-	-	47.6	-3.8	-
R-8	1	B	67	A-5	51.4	-	-	-	47.9	-3.5	-
R-9	1	B	67	A-5	51.4	-	-	-	48.3	-3.1	-
R-10	1	B	67	A-5	51.4	-	-	-	50.7	-0.7	-
R-11	1	B	67	A-5	51.4	-	-	-	52.6	1.2	-
R-12	1	B	67	A-5	51.4	-	-	-	53.9	2.5	-
R-13	1	B	67	-	-	57.0	58.9	1.9	61.4	4.4	2.5
R-14	1	E	72	-	-	55.7	57.5	1.8	59.8	4.1	2.3
R-15	1	C	67	-	-	50.1	51.7	1.6	53.6	3.5	1.9
R-16	1	B	67	-	-	58.3	60.2	1.9	61.9	3.6	1.7
R-17	1	B	67	-	-	53.8	55.5	1.7	57.4	3.6	1.9
R-18	1	B	67	A-4	52.5	-	-	-	55.1	2.6	-
R-19	1	B	67	A-4	52.5	-	-	-	53.1	0.6	-
R-20	1	B	67	A-4	52.5	-	-	-	51.9	-0.6	-
R-21	1	B	67	A-4	52.5	-	-	-	50.6	-1.9	-
R-22	1	B	67	A-4	52.5	-	-	-	49.9	-2.6	-
R-23	1	B	67	A-4	52.5	-	-	-	51.2	-1.3	-
R-24	1	B	67	A-4	52.5	-	-	-	53.2	0.7	-
R-25	1	B	67	A-4	52.5	-	-	-	54.4	1.9	-
R-26	1	B	67	-	-	52.7	54.4	1.7	56.1	3.4	1.7
R-27	1	B	67	-	-	59.3	61.1	1.8	63.0	3.7	1.9
R-28	1	B	67	A-4	52.5	-	-	-	53.3	0.8	-
R-29	1	B	67	A-4	52.5	-	-	-	50.9	-1.6	-
R-30	1	B	67	-	-	54.9	56.6	1.7	58.8	3.9	2.2
R-31	1	B	67	A-4	52.5	-	-	-	49.8	-2.7	-

APPENDIX F-1: SUMMARY OF MODELING RESULTS

Substantial Increase Impact	Substantial Increase of 15-20 dBA	No Predicted Levels for No-Build
Displacement	Substantial Increase of 20-25 dBA	3 < dBA compared to No-Build
NAC Impact	Substantial Increase greater than 25 dBA	+/- 3dBA compared to No-Build

Receptor Name	Dwelling Units	Activity Category Classification	Noise Abatement Criteria (dBA)	Year 2019 Measured Ambient Noise Level		Year 2019 Predicted-Existing Conditions (dBA)	Year 2035 No-Build Scenario		Year 2035 Proposed Build Scenario		
							Future No-Build (dBA)	Increase Over Existing (dBA)	Predicted Noise Levels (dBA)	Increase Over Existing (dBA)	Increase Over Future No-Build (dBA)
R-32	1	B	67	A-4	52.5	-	-	-	49.3	-3.2	-
R-33	1	B	67	A-4	52.5	-	-	-	50.5	-2.0	-
R-34	1	B	67	A-4	52.5	-	-	-	51.9	-0.6	-
R-35	1	B	67	A-4	52.5	-	-	-	55.2	2.7	-
Number of Dwelling Units Receptors									35		
Number of Impacts									0		
NAC Only Impacts									0		
Substantial Increase Only Impacts									0		
Substantial Increases 15 dBA to 20 dBA									0		
Substantial Increases 20 dBA to 25 dBA									0		
Substantial Increases 25 dBA and Greater									0		
Increase >3 dBA Compared to No-Build									-		
Decrease >3 dBA Compared to No-Build									0		
No Change +/- 3 dBA Compared to No-Build									8		

APPENDIX G

TNM OUPUT TABLES – EXISTING AMBIENT MEASUREMENT VALIDATION

DLZ Indiana
SJW

14 February 2020
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 1863-2010-90
RUN: Vernal Pike _Model Verification
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
A-2	13	1	0.0	64.0	66	64.0	15	----	64.0	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	1	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX H

TNM OUPUT TABLES – 2019 EXISTING SOUND LEVELS

DLZ Indiana
SJW

14 February 2020
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 1863-2010-90
RUN: Vernal Pike _2019 Existing Conditions
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-13	13	1	0.0	57.0	66	57.0	15	----	57.0	0.0	5	-5.0
R-14	14	1	0.0	55.7	66	55.7	15	----	55.7	0.0	5	-5.0
R-15	15	1	0.0	50.1	66	50.1	15	----	50.1	0.0	5	-5.0
R-16	16	1	0.0	58.3	66	58.3	15	----	58.3	0.0	5	-5.0
R-17	17	1	0.0	53.8	66	53.8	15	----	53.8	0.0	5	-5.0
R-26	26	1	0.0	52.7	66	52.7	15	----	52.7	0.0	5	-5.0
R-27	27	1	0.0	59.3	66	59.3	15	----	59.3	0.0	5	-5.0
R-30	30	1	0.0	54.9	66	54.9	15	----	54.9	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	8	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX I

TNM OUPUT TABLES – 2035 FUTURE NO-BUILD SOUND LEVELS

DLZ Indiana
SJW

14 February 2020
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 1863-2010-90
RUN: Vernal Pike _2035 No-Build
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-13	13	1	0.0	58.9	66	58.9	15	----	58.9	0.0	5	-5.0
R-14	14	1	0.0	57.5	66	57.5	15	----	57.5	0.0	5	-5.0
R-15	15	1	0.0	51.7	66	51.7	15	----	51.7	0.0	5	-5.0
R-16	16	1	0.0	60.2	66	60.2	15	----	60.2	0.0	5	-5.0
R-17	17	1	0.0	55.5	66	55.5	15	----	55.5	0.0	5	-5.0
R-26	26	1	0.0	54.4	66	54.4	15	----	54.4	0.0	5	-5.0
R-27	27	1	0.0	61.1	66	61.1	15	----	61.1	0.0	5	-5.0
R-30	30	1	0.0	56.6	66	56.6	15	----	56.6	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	8	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX J

TNM OUTPUT TABLES – 2035 PROPOSED BUILD SOUND LEVEL

DLZ Indiana
SJW

14 February 2020
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 1863-2010-90
RUN: Vernal Pike Connector - 2035 Build
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-1	1	1	51.4	48.2	66	-3.2	15	----	48.2	0.0	5	-5.0
R-2	2	1	51.4	48.1	66	-3.3	15	----	48.1	0.0	5	-5.0
R-3	3	1	51.4	47.0	66	-4.4	15	----	47.0	0.0	5	-5.0
R-4	4	1	51.4	46.9	66	-4.5	15	----	46.9	0.0	5	-5.0
R-5	5	1	51.4	47.0	66	-4.4	15	----	47.0	0.0	5	-5.0
R-6	6	1	51.4	47.2	66	-4.2	15	----	47.2	0.0	5	-5.0
R-7	7	1	51.4	47.6	66	-3.8	15	----	47.6	0.0	5	-5.0
R-8	8	1	51.4	47.9	66	-3.5	15	----	47.9	0.0	5	-5.0
R-9	9	1	51.4	48.3	66	-3.1	15	----	48.3	0.0	5	-5.0
R-10	10	1	51.4	50.7	66	-0.7	15	----	50.7	0.0	5	-5.0
R-11	11	1	51.4	52.6	66	1.2	15	----	52.6	0.0	5	-5.0
R-12	12	1	51.4	53.9	66	2.5	15	----	53.9	0.0	5	-5.0
R-13	13	1	57.1	61.4	66	4.3	15	----	61.4	0.0	5	-5.0
R-14	14	1	55.7	59.8	66	4.1	15	----	59.8	0.0	5	-5.0
R-15	15	1	50.1	53.6	66	3.5	15	----	53.6	0.0	5	-5.0
R-16	16	1	58.3	61.9	66	3.6	15	----	61.9	0.0	5	-5.0
R-17	17	1	53.7	57.4	66	3.7	15	----	57.4	0.0	5	-5.0
R-18	18	1	52.5	55.1	66	2.6	15	----	55.1	0.0	5	-5.0
R-19	19	1	52.5	53.1	66	0.6	15	----	53.1	0.0	5	-5.0
R-20	20	1	52.5	51.9	66	-0.6	15	----	51.9	0.0	5	-5.0
R-21	21	1	52.5	50.6	66	-1.9	15	----	50.6	0.0	5	-5.0
R-22	22	1	52.5	49.9	66	-2.6	15	----	49.9	0.0	5	-5.0
R-23	23	1	52.5	51.2	66	-1.3	15	----	51.2	0.0	5	-5.0

R-24	24	1	52.5	53.2	66	0.7	15	----	53.2	0.0	5	-5.0
R-25	25	1	52.5	54.4	66	1.9	15	----	54.4	0.0	5	-5.0
R-26	26	1	52.7	56.1	66	3.4	15	----	56.1	0.0	5	-5.0
R-27	27	1	59.3	63.0	66	3.7	15	----	63.0	0.0	5	-5.0
R-28	28	1	52.5	53.3	66	0.8	15	----	53.3	0.0	5	-5.0
R-29	29	1	52.5	50.9	66	-1.6	15	----	50.9	0.0	5	-5.0
R-30	30	1	54.9	58.8	66	3.9	15	----	58.8	0.0	5	-5.0
R-31	31	1	52.5	49.8	66	-2.7	15	----	49.8	0.0	5	-5.0
R-32	44	1	52.5	49.3	66	-3.2	15	----	49.3	0.0	5	-5.0
R-33	45	1	52.5	50.5	66	-2.0	15	----	50.5	0.0	5	-5.0
R-34	46	1	52.5	51.9	66	-0.6	15	----	51.9	0.0	5	-5.0
R-35	47	1	52.5	55.2	66	2.7	15	----	55.2	0.0	5	-5.0

Dwelling Units	**# DUs**	**Noise Reduction**		
		Min	**Avg**	**Max**
		dB	**dB**	**dB**
All Selected	35	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Steven Winters

From: Bales, Ronald <rbales@indot.IN.gov>
Sent: Thursday, March 19, 2020 1:01 PM
To: Steven Winters
Subject: RE: Vernal Pike Connector Traffic Noise Study

INDOT Environmental Services Division (ES) has reviewed the noise study for the above-referenced project and found it to be technically sufficient. As you are aware, INDOT no longer comments on recommendations provided in noise studies for local agency projects. However, it is our assessment that the study has been completed in accordance with federal guidelines and state policy.

Ron Bales
INDOT-Environmental Services Division
Office: (317) 234-4916
Email: rbales@indot.in.gov

From: Steven Winters <swinters@dlz.com>
Sent: Monday, March 16, 2020 10:54 AM
To: Bales, Ronald <rbales@indot.IN.gov>
Subject: RE: Vernal Pike Connector Traffic Noise Study

Ron,

Thanks for the review comments. I have made the requested changes and have attached the final report.

I did change the commercial receptor from an Activity Category C classification to an Activity Category E classification. Not sure, why I called it a C category, but thanks for catching it.

If you have any questions or need any additional information, please let me know.

Thanks,
Steve

From: Bales, Ronald <rbales@indot.IN.gov>
Sent: Thursday, February 27, 2020 12:57 PM
To: Steven Winters <swinters@dlz.com>
Subject: RE: Vernal Pike Connector Traffic Noise Study

APPENDIX J

Karst Study

hydrogeology inc.
1211 S Walnut St
Bloomington, IN 47401

Vernal Pike Extension

Des#1702957

Bloomington, Indiana

Karst Feature Survey

DLZ Indiana, LLC

Attn: Daniel Stevens

157 East Maryland St.

Indianapolis IN 46204

September 4, 2019

hydrogeology inc.

Jason N. Krothe, LPG -2511
Senior Geologist, President

Karst Feature Survey

Vernal Pike Extension
DES#: 1702957
Bloomington, Indiana

Prepared for:
DLZ Indiana, LLC

Prepared by:
Hydrogeology, Inc.
1211 S. Walnut Street
Bloomington, Indiana 47401
Tel 812.339.3560
Fax 812.339.3557

Date:
September 4, 2019

Table of Contents - DES 1702957

Figures

Appendices

Executive Summary

On behalf of the DLZ Indiana, LLC (DLZ)Hydrogeology Inc. (HGI) conducted a karst survey for the Vernal Pike Extension (DES 1702957) in Bloomington, Indiana, Monroe County - Figure 1. The survey area is underlain by the Ste. Genevieve Limestone and is in an area of known karst geology. Sinkholes and springs were identified within 0.5 miles of the karst survey area. One potential sinkhole was identified within the karst survey area for the project. Any potential karst feature identified during ground clearing or excavation should be protected with erosion and sediment control measures and inspected by a karst expert.

1.0 Project Overview

1.1 Introduction

This survey was conducted to identify any karst features that could be impacted by construction of the Vernal Pike Extension (DES 1702957) (the Site) in Bloomington, Richland Township, Monroe County, Indiana- Figure 1. The Site is in Sections 25 and 36; Township 9 North; Range 2 West and in the Bloomington, IN 7.5-minute Quadrangle United States Geological Survey (USGS) (Figure 2) and within the known karst area of Indiana (Figure 3). The survey was conducted by Hydrogeology Inc. (HGI) of Bloomington, Indiana to satisfy the objectives of the 1993 Karst Memorandum of Understanding (1993 Karst MOU).

1.2 Methodology

The study methodology was developed and conducted to ensure adherence to the objectives of the 1993 Karst MOU (in italics below) in the following manner:

Research available public and private sources for information relative to karst features:

These sources included: the Indiana Geological Survey (IGS), Indiana Cave Survey, Indiana Karst Conservancy, National Speleological Society, and karst experts knowledgeable about the area. Specific karst studies and mapping for the study area were examined and field checked, including cave maps and other karst feature data and mapping. Additional resources included high resolution aerial photography, LIDAR, and USGS topographic maps.

Field check karst and cave features that appear from the first task and identify any additional karst features:

A field survey was conducted to identify any previously unmapped karst features.

1.3 Karst Survey Area

The karst survey area for this project consisted of an approximately 9-acre area (Figure 4).

1.4 Geology / Physiography

The karst survey area is in the Mitchell Plateau physiographic region, which is the primary karst forming area in Indiana. The bedrock in the study area is the Mississippian aged Ste. Genevieve Limestone (Hasenmueller, Estell, Keith, & Thompson, 2009) (Figure 5), which predominately consists of oolitic, skeletal, micritic and detrital limestone. (Shaver, 1986).

1.5 Karst Desktop Review

A desktop review was conducted prior to field survey to identify any previously mapped karst features at the Site. Topographic maps, LIDAR data, IDNR Water Well Database and GIS data were utilized to identify sinkholes, caves and springs within 0.5 miles of the survey area. Sinkholes (USGS, 1980) and springs (Powell, Frushour, Harper, 1997) were identified within 0.5 miles of the karst survey area (Figure 6).

A review of the IDNR Water Well Database identified the closest water well 200 ft east of the study area (Figure 7, Appendix A). The water well record indicates the depth to bedrock at that location is approximately 7 ft. A LIDAR digital elevation map of the vicinity of the karst survey area can be viewed in Figure 8.

2.0 Karst Survey Results

2.1 – Field Survey

Field surveys were conducted on November 30, 2018 and August 22, 2019. One potential sinkhole was identified within the survey area (Figure 9). Photos of the karst survey area can be seen in Appendix B.

VP-1 - One potential sinkhole was identified in the survey area. The surface depression was approximately 15 ft in diameter and approximately 1 ft deep. The depression was water filled upon initial field inspection and had been marked by previous survey teams with flagging. During the second field survey the depression was dry. No surface openings or bedrock were visible with the depression. It is possible the depression is man-made in nature.

2.2 Karst Feature Management Plan

There was one potential sinkhole identified in the survey area. The sinkhole and any potential other karst features that are identified during construction should be protected with erosion and sediment control measures and examined by a karst expert. The following are general mitigation measures for karst features:

1.) Avoidance –When possible, avoidance of sinkholes is the preferred mitigation measure. If a sinkhole is avoided any drainage from the project area to the sinkhole should flow through the appropriate erosion and sediment control measures.

2.) Aggregate Cap – Any sinkhole within the construction limits, that cannot be avoided, and is not under pavement should receive an aggregate cap.

3.) Concrete Cap – Any sinkhole under pavement should receive as concrete cap.

2.3 Study Limitations

Thick vegetation and undergrowth were present in the southern portion of the karst survey area (Figure 10). Vegetation and undergrowth can obscure karst features. Vegetation clearing was beyond the scope of work for this project.

3.0 Summary and Conclusions

One potential sinkhole was identified within the karst survey area. The sinkhole should be avoided if possible, and during construction it should be protected with erosion and sediment control measures. A review of relevant karst data indicates there are previously mapped karst features with 0.5 miles of the karst survey area. A water well log registered with the IDNR indicates the karst survey area is underlain by limestone bedrock. If any potential karst feature is discovered during ground clearing operations or excavation, the feature should be protected by erosion and sediment control measures and inspected by a karst expert.

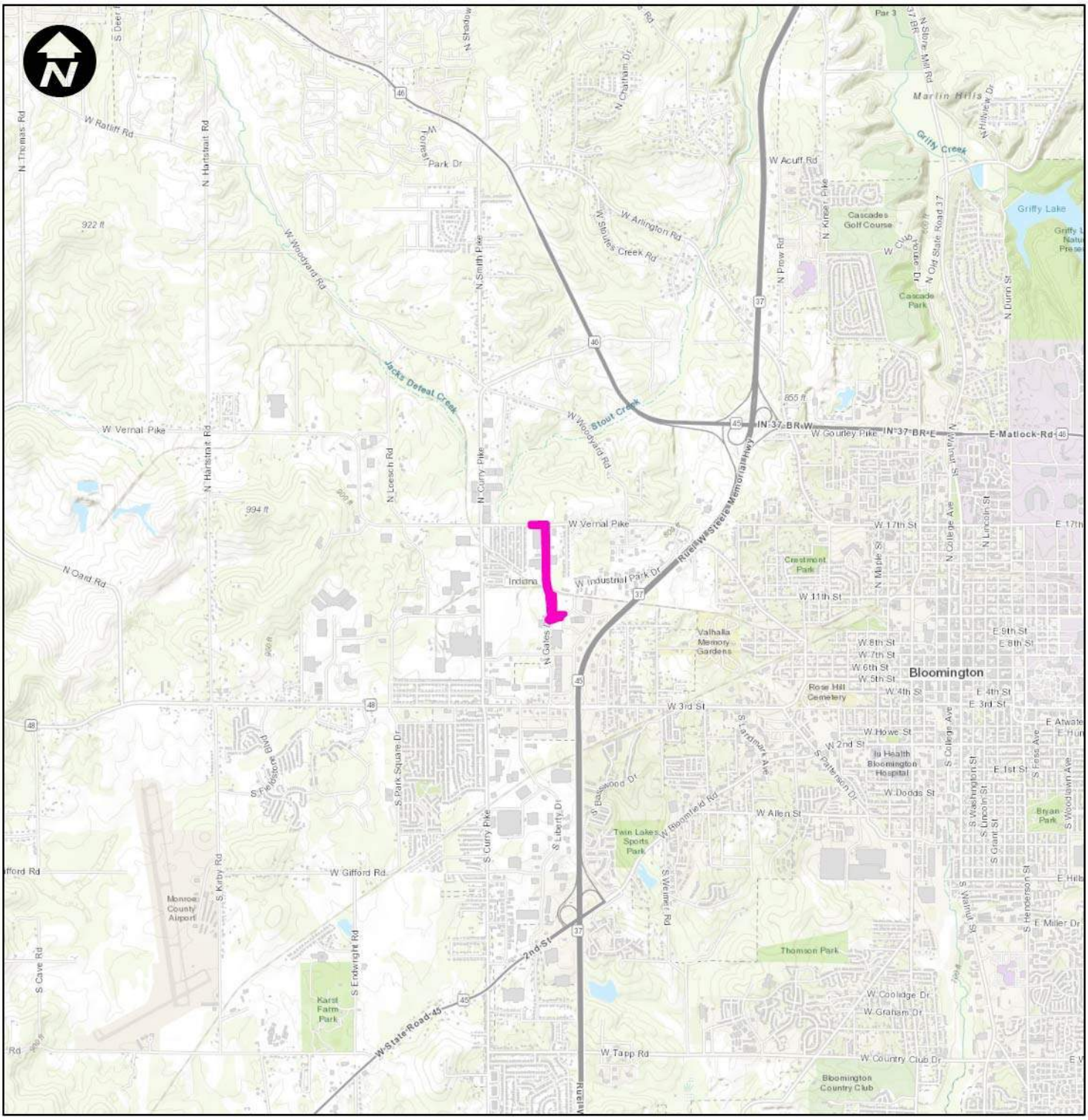
4.0 REFERENCES

Hasenmueller, W. A., Estell, C. M., Keith, B., Thompson, T. A. 2009, Bedrock Geologic Map of Monroe County, Indiana: Indiana Geological Survey Miscellaneous Map 73.

Powell, R. L., Frushour, S. S., and Harper, D., 1997, Areas of sinkhole and sinking-stream basins, with cave locations and springs, in south-central Indiana, Indiana Geological Survey Miscellaneous Map 65.

Revision, Bulletin 59.U.S. Geologic Survey. 1980b. Bloomington Quadrangle, Indiana: 7.5-minute series (topographic).

Shaver, R.H., 1986, Compendium of Paleozoic Rock – Unit Stratigraphy in Indiana – A revision: Indiana Geological Survey Bulletin 59, 203 p., 2 fig., 2 pl.



LEGEND

Karst Survey Area

0 0.5 1 Miles

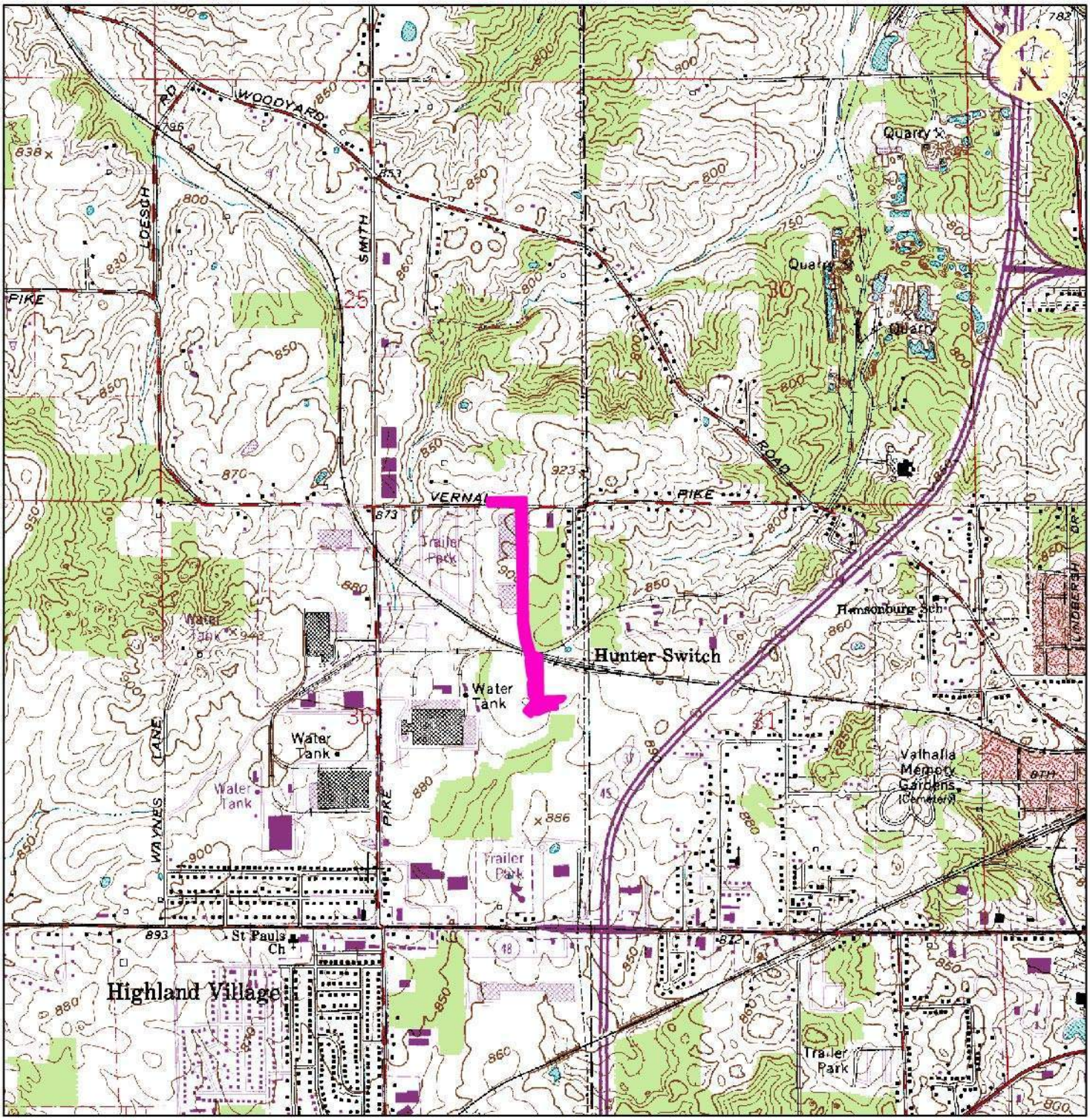
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Vernal Pike Extension (Des. No.1702957) BLOOMINGTON, IN KARST SURVEY

SITE LOCATION

hydrogeology inc.

FIGURE 1



LEGEND

Karst Survey Area

0 1,000 2,000 Feet

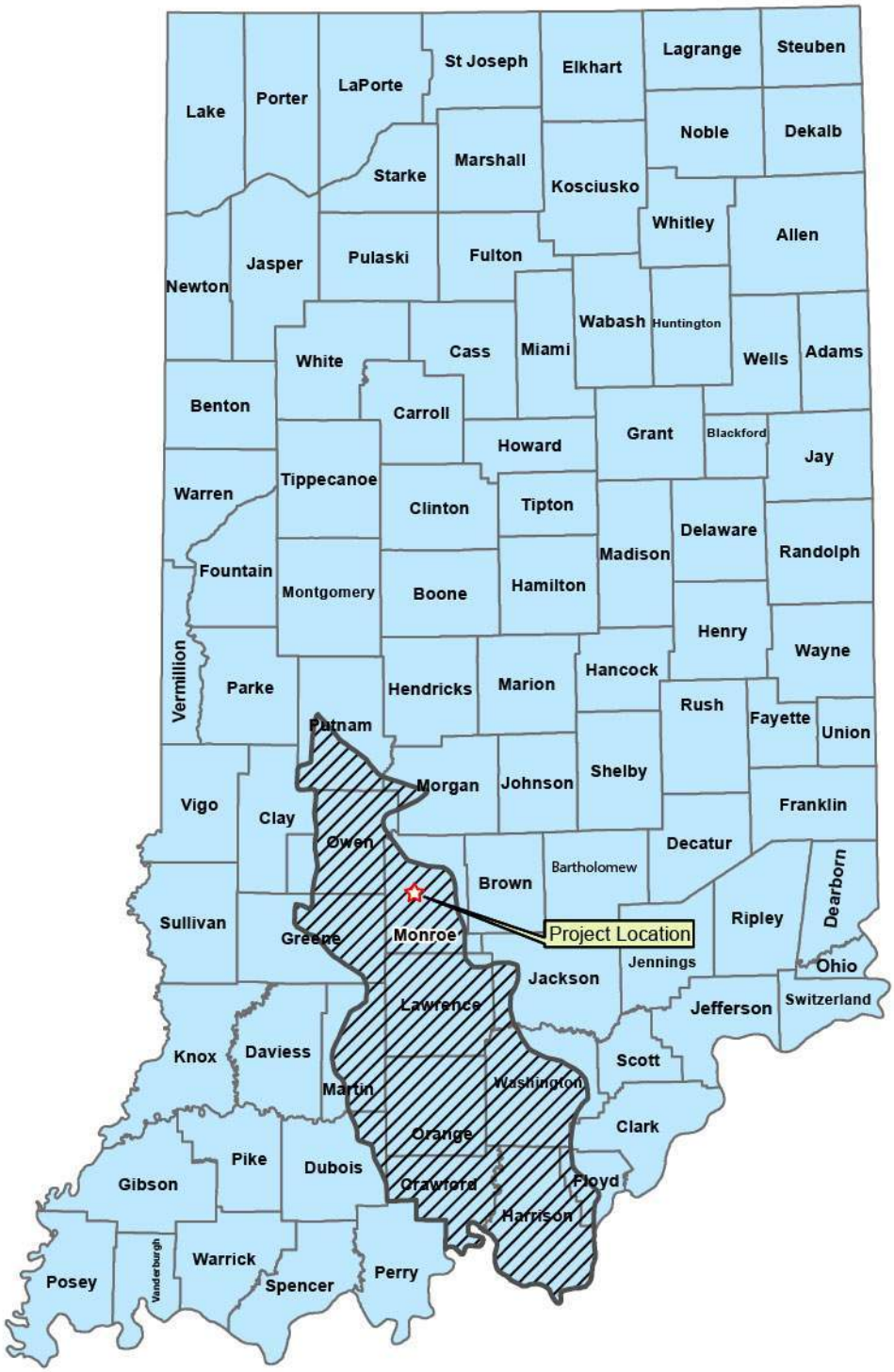
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Vernal Pike Extension (Des. No.1702957) BLOOMINGTON, IN KARST SURVEY

USGS TOPOGRAPHIC MAP

hydrogeology inc.

FIGURE 2



LEGEND

Potential Karst Features Region

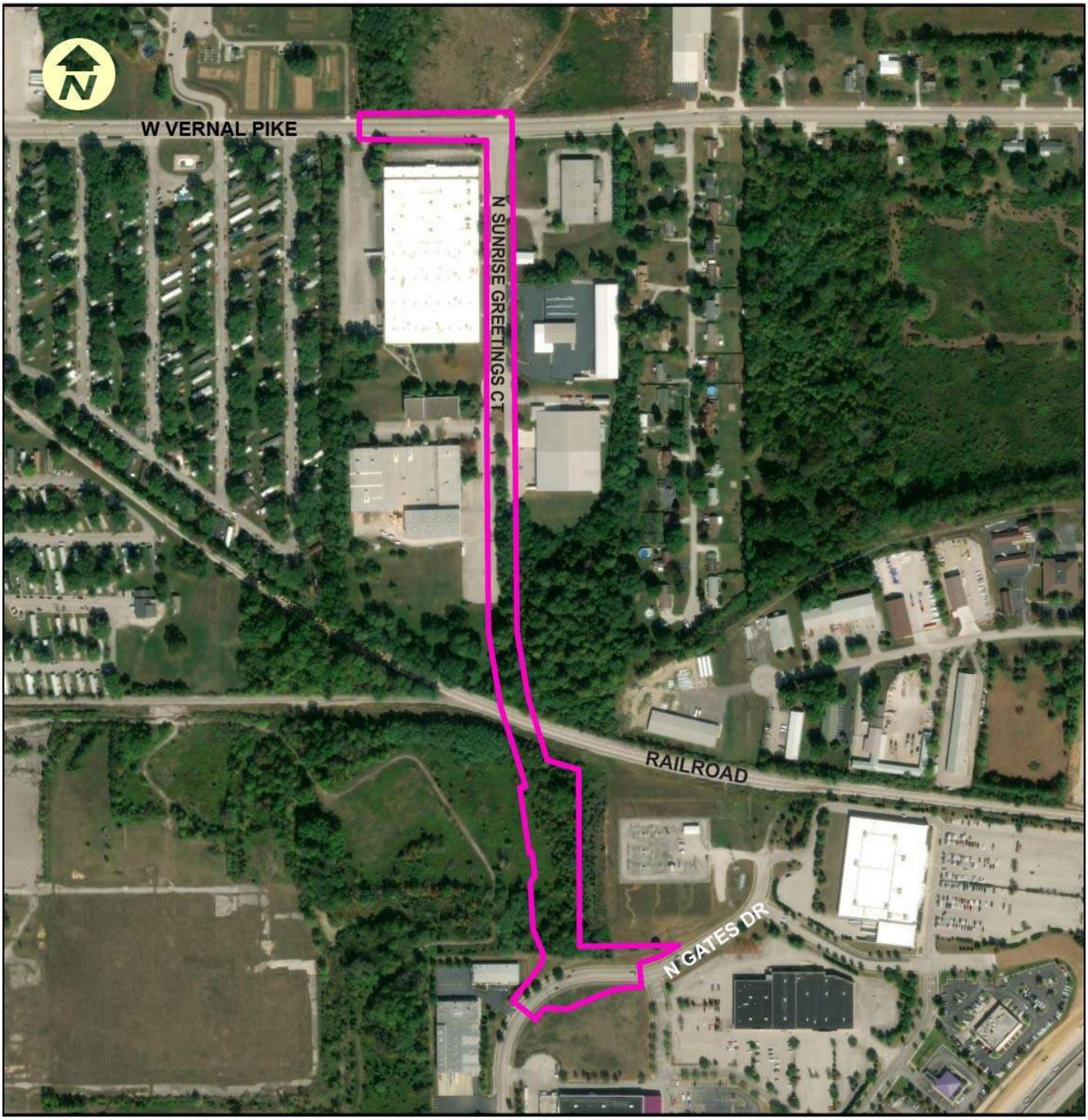
Source: 1993 Karst Memorandum of Understanding

Vernal Pike Extension
(Des. No.1702957)
BLOOMINGTON, IN
KARST SURVEY

MOU KARST AREAS

hydrogeology inc.

FIGURE
3



LEGEND

Karst Survey Area

0 250 500 Feet

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Vernal Pike Extension (Des. No.1702957) BLOOMINGTON, IN KARST SURVEY

KARST SURVEY AREA

hydrogeology inc.

FIGURE 4

hydrogeology inc.
1211 S Walnut St
Bloomington, IN 47401

July 13, 2020

Daniel Stevens
DLZ Indiana, LLC
2211 E. Jefferson Blvd.
South Bend IN 46615

Re: Vernal Pike Connector Karst Survey - DES# 1702957
Bloomington, Indiana

Dear Mr. Stevens:

Hydrogeology Inc. (HGI) respectfully submits the following information regarding Sinkhole VP-01.

Overview

HGI conducted karst field surveys for DES# 1702957 on November 30, 2018 and August 22, 2019. One potential sinkhole was identified within the survey area, identified as VP-1. The surface depression is approximately 15 feet in diameter and approximately 1 foot deep. The depression was water filled upon initial field inspection (11/30/18) and dry during the second field inspection (8/22/19). No surface openings or bedrock were visible within the soil filled depression. Due to the lack of surface openings the depression would not be suitable habitat for cave organisms.

Electrical Resistivity Imaging (ERI)

On June 8, 2020 Earth Exploration Inc. conducted an Electrical Resistivity Imaging (ERI) survey adjacent to the depression to better define subsurface conditions (Attachment 1). That report notes the following conclusions:

- The ERI profiles indicate low resistivity discontinuities near the surficial extents of the potential sinkhole;
- The discontinuities are likely comprised of a deeper zone of weathered rock and clay-filled joints (red dashed lines);
- Although determination of size of karst features is not feasible with ERI, the subtle nature of the discontinuities at the top of the weathered zone is consistent with small or low-activity/inactive features. Evidence of increased weathering with depth was not observed; and,

- Data quality is considered high with low interference.

The ERI profiles did not show evidence of a large karst void in the bedrock or preferential pathways in the soil. The ERI profiles also did not show evidence that the surface depression is a large sinkhole that had been filled in the past. It should be noted that the ERI survey was not conducted directly over the surface depression due to it being water filled. Additionally, brush and soil had been piled adjacent to the depression which further limited the locations of the ERI profiles.

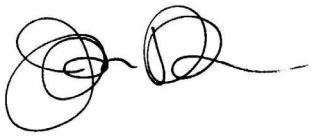
Conclusions

Due to the lack of surface openings VP-1 would not be suitable habitat for cave organisms. ERI profiles conducted adjacent to VP-1 showed no evidence of a large karst void in bedrock or preferential pathways from the surface depression through the soil. Additionally, ERI profiles showed no evidence that the depression was a large sinkhole that had been filled. The ERI profiles showed potential karst development near the top of bedrock, likely the result of epikarst. As currently designed, the surface depression will be under Sunrise Greeting Court. It is recommended that the surface depression be further investigated by excavation during construction to rule out the possibility it could pose a structural concern for the roadway.

HGI appreciates the opportunity to provide this information. If you have any questions, concerns, or comments please do not hesitate to contact me directly at (812) 219-0210.

Sincerely,

Hydrogeology, Inc.



Jason N. Krothe, LPG IN-2511
President

June 26, 2020

Mr. Haseeb Ghumman, P.E.
DLZ Indiana, LLC.
157 E. Maryland Street
Indianapolis, Indiana 46204

Re: Geophysical Assessment
Vernal Pike Connector
Monroe County, Indiana
EEI Project No. CJ185307

Dear Haseeb:

This memorandum summarizes the results of the geophysical survey Earth Exploration, A Terracon Company (EEI) performed as part of the Vernal Pike Connector project. The purpose of the survey was to provide additional information regarding the subsurface conditions surrounding a potential sinkhole located near the proposed alignment.

A karst survey conducted by Hydrogeology, Inc. for DLZ Indiana, Inc (DLZ) identified a potential sinkhole near the south extent of the Vernal Pike Connector project area. Soil borings near the potential sinkhole completed during the geotechnical evaluation indicated weathered limestone at depths in the range of 14 and 23 ft, overlain by medium stiff to stiff red clay. An Electrical Resistivity Imaging (ERI) survey was performed on June 8, 2020 to the west and north of the potential sinkhole, shown on the attached Geophysical Site Plan. The ERI arrays consisted of electrodes spaced at 10 ft along the alignment, resulting in a resolution of no less than 5 ft.

At the time of the survey, the site consisted of brush cut area surrounding by heavy woods to the north and east. Brush and soil piles bounded the brush cut area, which limited the accessibility to the east and south sides of the potential sinkhole. The potential sinkhole was full of water at the time of the geophysical assessment.

DATA INTERPRETATION

Changes in the earth resistivity can indicate changes in lithology, saturation, bedrock surface and bedrock characteristics. Electrical resistivity measurements are primarily controlled by the moisture content of the material. The geophysical data was interpreted with the following concepts in mind:

1. Air-filled fractured zones and voids within the bedrock will produce a high-resistivity discontinuity relative to background.
2. Smaller voids and fractures that are saturated with moist-soil or water within the bedrock will produce a low-resistivity discontinuity relative to the background.

The ERI profiles are included in Exhibit 2. Boring logs from the geotechnical evaluation are projected on the profiles and aided in the interpretation of the geophysical dataset. Our interpretations of the geophysical dataset are provided on the profiles and are also summarized below:

ERI-1

- ERI-1 was collected on a south-north alignment west of the potential sinkhole.
- Discontinuities in the resistivity model centered near Station 95 and 150 along the profile are interpreted as potential karstic features (red dashed lines).
- Using soil boring information from MSE-2 and 4, the top of weathered bedrock zone (epikarst) is estimated to be between 21 and 29 ft deep.

ERI-2

- ERI-2 was collected on a southwest-northeast alignment west of the potential sinkhole.
- Discontinuities in the resistivity model centered near Station 115 along the profile are interpreted as potential karstic features.
- The top of bedrock weathered zone is estimated to be between 23 and 27 ft deep.

ERI-3

- ERI-3 was collected on a south-north alignment west of the potential sinkhole.
- Discontinuities in the resistivity model centered near Station 125 along the profile are interpreted as potential karstic features.
- The top of bedrock weathered zone is estimated to be between 23 and 27 ft deep.

CONCLUSIONS

- The ERI profiles indicate low resistivity discontinuities near the surficial extents of the potential sinkhole;
- The discontinuities are likely comprised of a deeper zone of weathered rock and clay-filled joints (red dashed lines);
- Although determination of size of karst features is not feasible with ERI, the subtle nature of the discontinuities at the top of the weathered zone is consistent with small or low-activity/inactive features. Evidence of increased weathering with depth was not observed; and,
- Data quality is considered high with low interference.

Please note that the ERI profiles primarily indicative of the subsurface directly beneath the survey line and these interpreted areas are not meant to encompass all weathered or karstic conditions in the vicinity. These areas contain the highest potential for karst conditions based on our interpretation of the geophysical dataset and available subsurface information. It is likely that karstic conditions of varying degrees exist outside of our interpreted areas, as well as out-of-plane of our geophysical dataset. Out-of-plane effects, (that is, geologic anisotropy surrounding the survey line) can influence the resistivity values, causing the profile to not only represent the resistivity of structures directly beneath, but also adjacent to the survey line.

LIMITATIONS

EEI has developed these geophysical interpretations based on our professional knowledge of the methods used and their limitations, our knowledge of the site-specific conditions at the time of the survey, and the results obtained using these methods in similar conditions. However, site conditions (i.e., interferences from other objects, moisture content, etc.) will ultimately dictate the validity of the interpretations. Geophysical methods rely on the indirect measurements of the physical properties and geometries of subsurface materials, which can result in non-unique datasets and interpretations. Consequently, all geophysical methods are inherently subject to error. Because of these inherent limitations, EEI does not guarantee that the geophysical surveys have detected all subsurface objects

that are present, or that the interpreted or uninterpreted identities, locations, or depths are exact or in fact correct.

Thank you for the opportunity to provide our professional services. Please call with any questions regarding this report.

Sincerely,

EARTH EXPLORATION INC. A TERRACON COMPANY

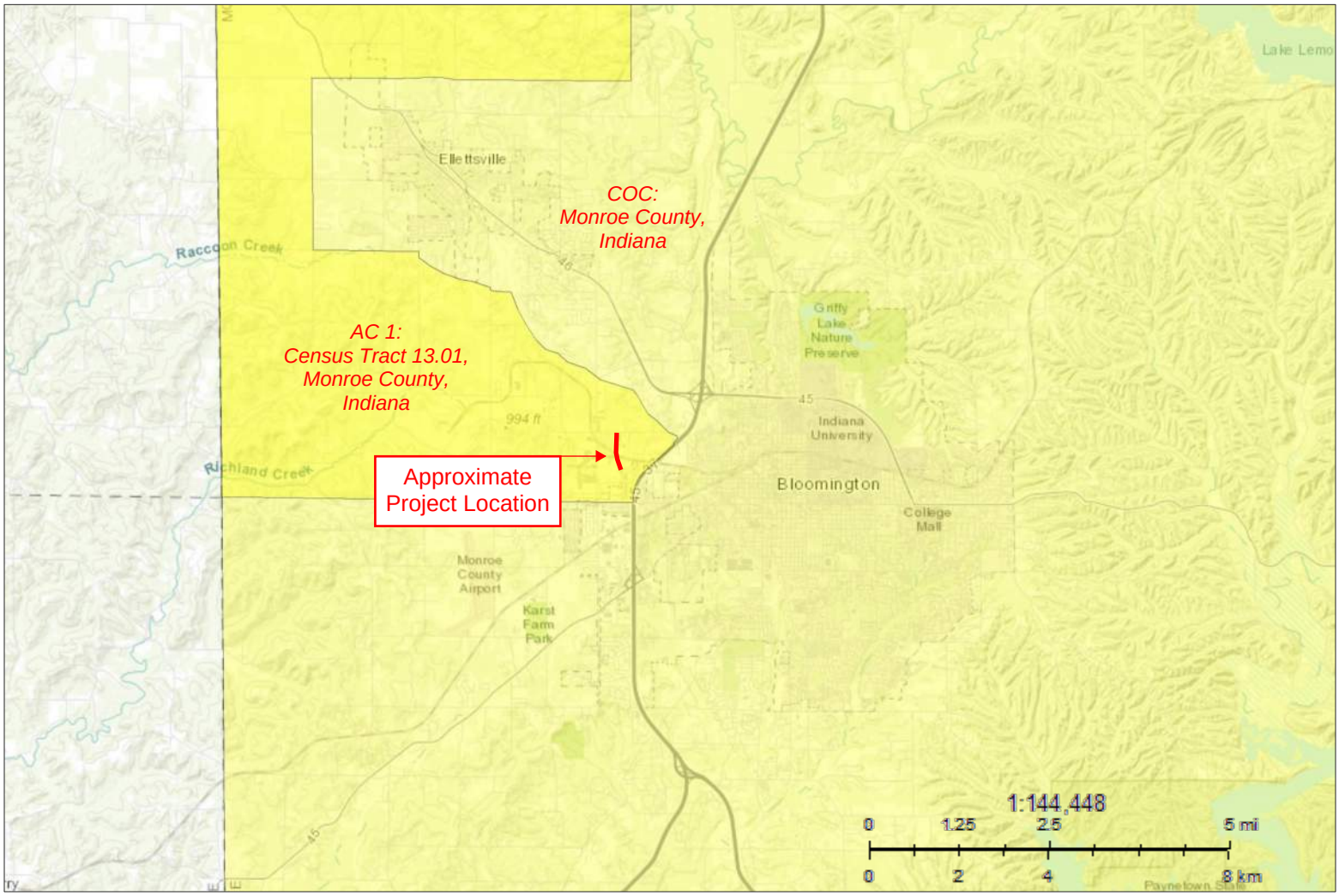
Stephen Brellenthin, L.P.G.
Senior Staff Geophysicist

Kellen Heavin P.E.
Group Manager

Attachments: Exhibit 1 - Geophysical Site Plan
Exhibit 2 – ERI Profiles

APPENDIX K

Environmental Justice Documentation



Legend

Your Selections	Selection Results	Boundaries
☐ 2017 boundaries were used to map 'Your Selections'	No Legend	No Legend

B03002: HISPANIC OR LATINO ORIGIN BY RACE - Universe: Total population
2013-2017 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Technical Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities, and towns and estimates of housing units for states and counties.

	Monroe County, Indiana		Census Tract 13.01,	
	Estimate	Margin of	Estimate	Margin of
Total:	144,436	*****	5,780	+/-321
Not Hispanic or Latino:	139,637	*****	5,723	+/-329
White alone	121,518	+/-69	5,376	+/-392
Black or African American alone	4,395	+/-313	76	+/-109
American Indian and Alaska Native	260	+/-124	0	+/-16
Asian alone	9,093	+/-379	113	+/-135
Native Hawaiian and Other Pacific	44	+/-37	0	+/-16
Some other race alone	85	+/-52	0	+/-16
Two or more races:	4,242	+/-519	158	+/-121
Two races including Some other race	51	+/-56	0	+/-16
Two races excluding Some other	4,191	+/-512	158	+/-121
Hispanic or Latino:	4,799	*****	57	+/-61
White alone	3,462	+/-314	41	+/-56
Black or African American alone	107	+/-106	0	+/-16
American Indian and Alaska Native	27	+/-30	16	+/-25
Asian alone	33	+/-55	0	+/-16
Native Hawaiian and Other Pacific	0	+/-27	0	+/-16
Some other race alone	737	+/-250	0	+/-16
Two or more races:	433	+/-174	0	+/-16
Two races including Some other race	199	+/-126	0	+/-16
Two races excluding Some other	234	+/-138	0	+/-16

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error

(for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

While the 2013-2017 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural populations, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

Explanation of Symbols:

1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be

displayed because the number of sample cases is too small.
8. An '(X)' means that the estimate is not applicable or not available.

B17001: POVERTY STATUS IN THE PAST 12 MONTHS BY SEX BY AGE - Universe: Population for whom poverty status is determined

2013-2017 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Technical Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities, and towns and estimates of housing units for states and counties.

	Monroe County, Indiana		Census Tract 13.01, Monroe	
	Estimate	Margin of Error	Estimate	Margin of Error
Total:	129,312	+/-946	5,780	+/-321
Income in the past 12 months below	31,974	+/-1,311	407	+/-218
Male:	15,442	+/-833	174	+/-110
Under 5 years	854	+/-213	3	+/-4
5 years	126	+/-87	0	+/-16
6 to 11 years	841	+/-196	0	+/-16
12 to 14 years	265	+/-109	0	+/-16
15 years	109	+/-76	0	+/-16
16 and 17 years	188	+/-89	0	+/-16
18 to 24 years	8,539	+/-571	25	+/-35
25 to 34 years	1,769	+/-289	31	+/-44
35 to 44 years	951	+/-228	32	+/-48
45 to 54 years	837	+/-165	38	+/-56
55 to 64 years	669	+/-167	25	+/-29
65 to 74 years	250	+/-112	20	+/-26
75 years and over	44	+/-41	0	+/-16
Female:	16,532	+/-944	233	+/-126
Under 5 years	872	+/-211	1	+/-3
5 years	168	+/-73	1	+/-3
6 to 11 years	580	+/-174	57	+/-87
12 to 14 years	207	+/-90	0	+/-16
15 years	72	+/-68	0	+/-16
16 and 17 years	270	+/-133	0	+/-16
18 to 24 years	8,344	+/-651	2	+/-4
25 to 34 years	2,585	+/-329	15	+/-21
35 to 44 years	1,145	+/-230	51	+/-50
45 to 54 years	910	+/-226	41	+/-37
55 to 64 years	761	+/-199	65	+/-62
65 to 74 years	325	+/-109	0	+/-16
75 years and over	293	+/-112	0	+/-16
Income in the past 12 months at or	97,338	+/-1,311	5,373	+/-350
Male:	49,607	+/-832	2,893	+/-271
Under 5 years	2,465	+/-232	138	+/-87
5 years	403	+/-130	73	+/-56
6 to 11 years	3,048	+/-291	195	+/-88
12 to 14 years	1,696	+/-234	129	+/-77
15 years	540	+/-168	24	+/-30
16 and 17 years	1,120	+/-166	53	+/-51
18 to 24 years	5,475	+/-537	188	+/-111
25 to 34 years	8,857	+/-343	347	+/-136
35 to 44 years	6,293	+/-269	325	+/-154
45 to 54 years	6,222	+/-198	499	+/-129

55 to 64 years	6,408	+/-193	363	+/-121
65 to 74 years	4,329	+/-124	362	+/-116
75 years and over	2,751	+/-83	197	+/-96
Female:	47,731	+/-924	2,480	+/-254
Under 5 years	2,160	+/-215	67	+/-57
5 years	520	+/-171	23	+/-29
6 to 11 years	2,716	+/-266	173	+/-115
12 to 14 years	1,660	+/-266	140	+/-94
15 years	541	+/-152	0	+/-16
16 and 17 years	1,068	+/-177	5	+/-5
18 to 24 years	4,307	+/-538	232	+/-139
25 to 34 years	7,106	+/-320	348	+/-141
35 to 44 years	5,850	+/-277	199	+/-95
45 to 54 years	6,427	+/-228	372	+/-102
55 to 64 years	6,839	+/-211	429	+/-116
65 to 74 years	4,826	+/-150	270	+/-82
75 years and over	3,711	+/-163	222	+/-93

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

While the 2013-2017 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural populations, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau, 2013-2017 American Community Survey 5-Year Estimates

Explanation of Symbols:

1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval or upper interval of an open-ended distribution.
3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
8. An '(X)' means that the estimate is not applicable or not available.

APPENDIX L

Additional Studies:

L1: List of LWCF Properties in Monroe County

L1: List of LWCF Properties in Monroe County

A	B	C	D
Land and Water Conservation Fund (LWCF) County Property List for Indiana (Last Updated December 2019)			
ProjectNumb	SubProjectCo	County	Property
1800449	1800449A	Miami	Miami State Recreation Area, Mississinewa Res
1800563	1800563	Miami	Mississinewa Reservoir - Miami SRA
1800026	1800026	Monroe	Fairfax Beach & State Recreation Area, Monroe Res
1800033	1800033	Monroe	Paynetown State Recreation Area, Monroe Reservoir
1800039	1800039	Monroe	Fairfax Beach & State Recreation Area, Monroe Res
1800084	1800084	Monroe	Moore+s Creek State Recreation Area, Monroe Reserv
1800118	1800118E	Monroe	Fairfax SRA
1800129	1800129	Monroe	Karst Farm Park
1800157	1800157	Monroe	Southeast Park
1800158	1800158	Monroe	Crestmont Park
1800160	1800160	Monroe	Park Square Park (Highland Village Park)
1800171	1800171W	Monroe	Paynetown SRA
1800190	1800190A	Monroe	Cascades Community Park
1800190	1800190B	Monroe	Park Ridge East Park
1800190	1800190C	Monroe	Park Ridge West Park
1800190	1800190D	Monroe	Winslow Sports Complex
1800232	1800232	Monroe	Allens Creek State Recreation Area, Monroe Reservoir
1800363	1800363T	Monroe	Allens Creek SRA
1800423	1800423	Monroe	Bryan Park & Pool
1800487	1800487	Monroe	Thomson Park
1800490	1800490	Monroe	Jackson Creek County Park
1800504	1800504	Monroe	Thomson Park
1800509	1800509	Monroe	Thomson Park
1800572	1800572	Monroe	Will Detmer Park
1800133	1800133	Montgomery	Lincoln Activity Area (Lincoln Recreation Center)
1800161	1800161E	Montgomery	Shades State Park