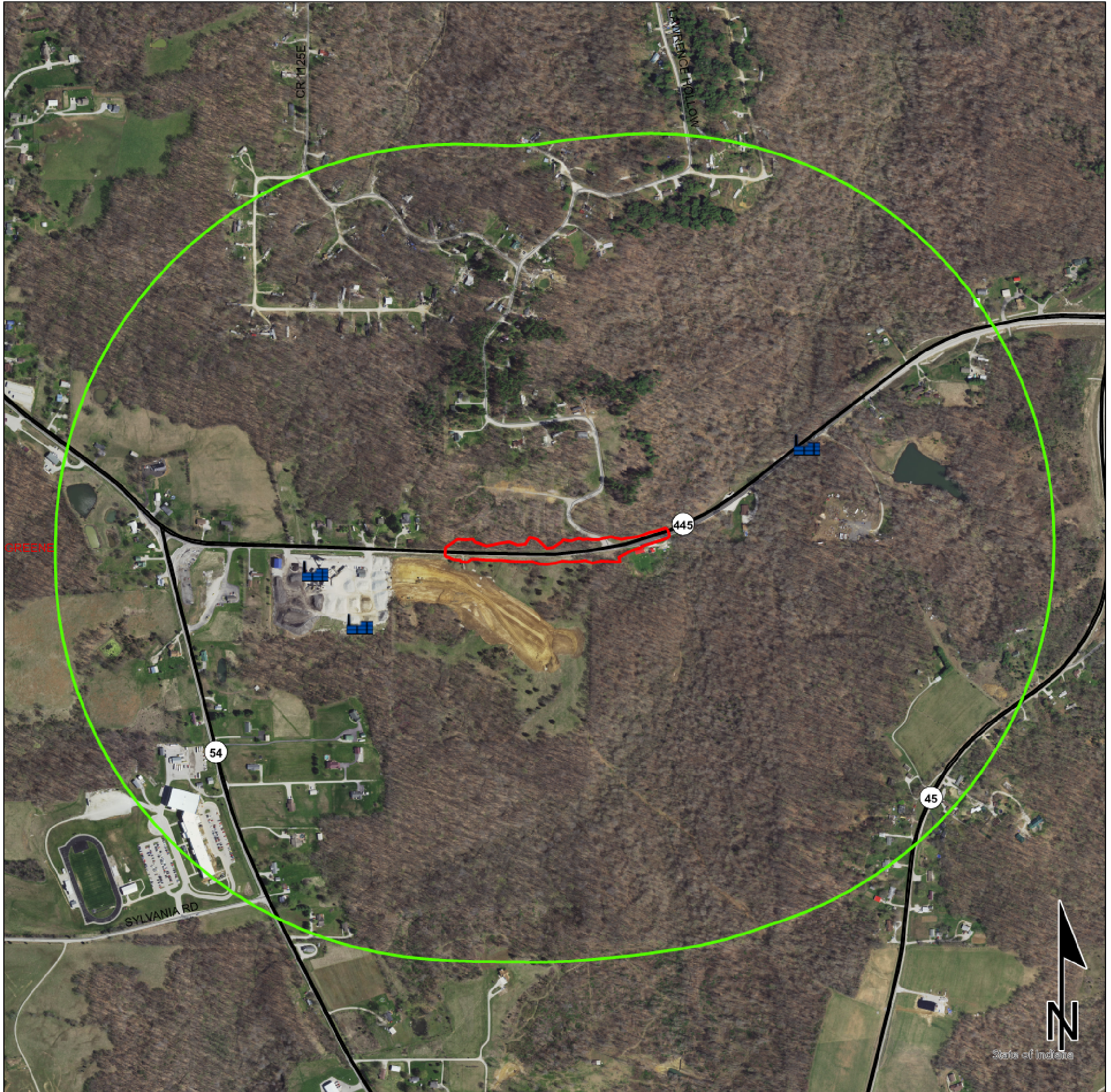


# Red Flag Investigation - Hazardous Material Concerns

## SR 445, from 0.39 Mile East of SR 54 to 0.62 Mile East of SR 54

### Des. No. 2100161, Guardrail Improvement

#### Greene County, Indiana



	Brownfield		RCRA Generator/TSD		Institutional Controls
	RCRA Corrective Action Sites		Restricted Waste Site		County Boundary
	Confined Feeding Operation		Septage Waste Site		Project Area
	Notice_of_Contamination		Solid Waste Landfill		Half Mile Radius
	Construction/Demolition Site		State Cleanup Site		Toll
	Infectious/Medical Waste Site		Superfund		Interstate
	Leaking Underground Storage Tank		Tire Waste Site		State Route
	Manufactured Gas Plant		Underground Storage Tank		US Route
	NPDES Facilities		Voluntary Remediation Program		Local Road
	NPDES Pipe Locations		Waste Transfer Station		
	Open Dump Waste Site				



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

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

## APPENDIX F

# Water Resources

## Waters of the U.S. Determination Report

*Mary M. Moffett*  
 Approved 9/21/2022

**SR 445, from 0.39 Mile East of SR 54 to 0.62 Mile East of SR 54**  
**Greene County, Indiana**  
**Guardrail Improvement**  
**Des. No. 2100161**  
**Asset # ID: CV 445-28-000.52**

Prepared by: Payton Fischer, Faelan Hoese, and Tamra Reece  
 Hanson Professional Services Inc.  
 6510 Telecom Dr., Suite 210  
 Indianapolis, IN 46278  
 Completed: September 20, 2022

### 1.0 Project Description

**Date of Waters Field Investigation:**  
 May 13, 2022, and July 7, 2022

**Project Location:**  
 Stanford, Indiana Quadrangle  
 Sections 15 and 22, Township 7 North, Range 3 West  
 Central GPS Point: 39.036206, -86.729204  
 Center Township, Greene County, Indiana

Hanson Professional Services Inc. (Hanson) was contracted by the Indiana Department of Transportation (INDOT) Vincennes District to perform a wetland delineation and waters investigation for the proposed guardrail improvement project on State Road (SR) 445, from 0.39 mile east of SR 54 to 0.62 mile east of SR 54, in Center Township, Greene County, Indiana. The proposed project is anticipated to install guardrail along the SR 445 roadway. This is expected to include a minimum paved shoulder of 4 feet (ft.) and widening of the embankment to accommodate the guardrail. The roadside embankment will range from a 2:1 slope to a 4:1 slope with riprap placement for slope stabilization along SR 445. Four structures (Str.) within the investigated area are included with the proposed work. See Table 1 for more information on the structure work within the investigated area. The project need is due to the crash history within the area. The project purpose is to reduce the potential for severe roadway runoff crashes related to the steep slopes. The length of the investigated area is approximately 0.28 mile along SR 445.

**Table 1. Structure Summary**

Structure Number	Culvert ID	Existing Structure	Proposed Work
Str. 1	CLV-67648	15 inch (in.) corrugated metal pipe (CMP)	Riprap placement at outlet
Str. 2	N/A	15 in. CMP	Removal
Str. 3	CLV-67652	18 in. reinforced concrete pipe (RCP)	Abandon in place with flowable fill
Str. 4	CV 445-28-000.52	100 ft. long, 5 ft. by 5 ft. RCB	Extending inlet 24 ft. and outlet 14 ft. with extended wingwalls

## 2.0 Desktop Reconnaissance

Data from the U.S. Geological Survey (USGS) 7.5-Minute quadrangle maps (2019), the U.S. Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS) *Web Soil Survey* (2019), the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (USDOI - FWS, 2014), the Indiana Department of Natural Resources – Division of Water (IDNR-DOW) Best Available floodplain dataset (2021), USGS StreamStats 4.9.0 (2022), and the USGS National Geospatial Program National Hydrography Dataset (NHD) (2020) were used to provide an indication of areas where waters and wetlands potentially occur. See Figures 1 through 5 for information on potential water resources.

### 2.1 USGS Quadrangle Map

The investigated area is located on the Stanford USGS 7.5-Minute quadrangle map. The investigated area is located in sections 15 and 22, Township 7 North, Range 3 West. There are no water features mapped within the investigated area.

### 2.2 National Wetlands Inventory Information

The NWI was reviewed for the investigated area. There are no mapped NWI wetlands within the investigated area. The nearest wetland is adjacent to the investigated area and is classified as Palustrine, Unconsolidated Bottom, Intermittently Exposed, Diked/Impounded (PUBGh) under the Cowardin Classification System (Wetland Subcommittee, 2013).

### 2.3 Soils

The USDA - NRCS *Web Soil Survey* was generated from USDA-NRCS certified data for Greene County, Indiana. According to the Soil Survey Geographic (SSURGO) Database for Greene County, Indiana, the investigated area does not contain soil with nationally listed hydric soils (see Table 2).

**Table 2: Soils**

Soil Unit Name	Symbol	NRCS Flooding Frequency	NRCS Drainage Class	NRCS Hydric Soils Category	SSURGO Hydric Rating
Gilpin-Wellston silt loams, 18 to 25 percent slopes	GmE	None	Well Drained	Non-Hydric	0% Hydric
Wellston silt loam, 12 to 18 percent slopes, eroded	WeD2	None	Well Drained	Non-Hydric	0% Hydric

### 2.4 Floodways and Floodplains

IDNR – DOW Best Available floodplain dataset (2022) was reviewed for the investigated area. The investigated area is located in an area of minimal flood hazard (Zone X). Based on USGS StreamStats, the upstream drainage area of the stream at the outlet of CV 445-28-000.52 is 0.049 square mile.

### 2.5 12-Digit Hydrologic Unit Code

The USGS 12-Digit Hydrologic Unit Code (HUC-12) (Indiana Geological Survey, 2011) mapping was reviewed for the investigated area. The investigated area is located entirely in Beech Creek HUC-12 subwatershed (051202020304).

## 2.6 National Hydrography Dataset Flowlines

One NHD flowline flows through the investigated area. The flowline is an unclassified flowline flowing from northwest to southeast through CV 445-28-000.52.

## 3.0 Field Reconnaissance

The field investigation was conducted on May 13, 2022, and July 7, 2022, by Hanson personnel to determine and identify jurisdictional Waters of the United States (WOTUS) or Waters of the State within the investigated area. The investigated area was determined by preliminary construction limits and expanded to incorporate nearby water resources. The investigated area is appropriate to the project scope as the guardrail improvement will include widening the shoulders and the lengthening of the structure due to slope stabilization. The length of the investigated area was walked, and photos were taken of any suspected features. FieldMaps for ArcGIS installed on an iPad equipped with a BadElf GPS receiver was used to collect data points and photographs throughout the investigated area. See Figures 6 through 7-4 for collected data and selected photo locations.

Existing riprap at Str. 3, CLV-67652, was present at the outlet of the structure, extending approximately two feet from the outlet (Photo 22). The remaining three structures had no existing riprap at the inlet or outlet. Str. 4, CV 445-28-000.52 had large cobble present within the stream bed at the inlet and outlet but would not be considered riprap from a constructability standpoint (Photos 43 and 45).

Within the two weeks prior to the field investigation conducted on May 13, 2022, precipitation amounts ranged from a minimum of 0.87 inches (in.) to a maximum of 1.7 in. Two weeks prior to the July 7, 2022, field investigation precipitation amounts ranged from a minimum of 0.47 in. to a maximum of 1.2 in. Rainfall within the months of May and July was considered normal in comparison to historic precipitation data (NOAA). The sinuosity index was calculated using the methods in Fitzpatrick et al., 1998 where straight streams have a value of 1 and meandering streams have a value of 1.5 or greater.

### 3.1 Streams

Four streams were identified during the field investigation. No other features exhibiting an ordinary high water mark (OHWM) were observed within the investigated area. None of the documented streams are listed as a *Federal Wild and Scenic River*, a *State Natural, Scenic and Recreational River*, or on the *Indiana Register's listing of Outstanding Rivers and Streams*, nor are they located within two miles of any such resources. All of the streams are unnamed tributaries (UNTs) of Beech Creek which flows to the White River, a traditionally navigable waterway (TNW). Due to their connection to downstream waters, all the streams identified within the investigated area would likely be considered WOTUS by the USACE.

#### Unnamed Tributary 1 (UNT 1) to Beech Creek

UNT 1 to Beech Creek is an intermittent stream in a heavily forested area. The stream flows from northwest to southeast and crosses under SR 445 through the existing culvert, CV 445-28-000.52. UNT 1 to Beech Creek has an OHWM measuring 5.00 ft. wide by 0.92 ft. deep. Approximately 406 linear ft. of stream lies within the investigated area.

UNT 1 to Beech Creek has substantial canopy cover and herbaceous plants covering the banks north of SR 445. Vegetation consisted of jewelweed (*Impatiens capensis*, FACW),

poison ivy (*Toxicodendron radicans*, FAC), and fowl mannagrass (*Glyceria striata*, OBL). UNT 1 to Beech Creek has moderate canopy cover and herbaceous plants covering the banks south of SR 445 with a mowed lawn consisting of Kentucky bluegrass (*Poa pratensis*, FACU). The substrate of the stream consists of sand, gravel, cobble, and small boulders. Flow was present within the stream and had many areas of riffles and pools. The stream channel sinuosity would be classified as sinuous (1.05). This stream is classified as excellent because of these features. Due to the normal amount of rainfall and the presence of flowing water, UNT 1 to Beech Creek is classified as an intermittent stream.

#### Unnamed Tributary 2 (UNT 2) to Beech Creek

UNT 2 to Beech Creek is an intermittent stream that flows into a moderately forested area. The stream flows from south to north and crosses under SR 445 through the existing small structure, CLV-67652. UNT 2 to Beech Creek has an OHWM measuring 1.42 ft. wide by 0.42 ft. deep. Approximately 156 linear ft. of stream lies within the investigated area.

UNT 2 to Beech Creek has little canopy cover near the roadsides and moderate canopy cover in the forested area. Vegetation consisted of yellow foxtail (*Setaria pumila*, FAC), *T. radicans*, amur honeysuckle (*Lonicera maackii*, UPL), and Christmas fern (*Polystichum acrostichoides*, FACU). The substrate of the stream consists of gravel and silt. Flow was present within the stream, but there were no riffles or pools. The stream channel sinuosity would be classified as straight (1.03). This stream is classified as poor because of these features. Due to the normal amount of rainfall and the presence of flowing water, UNT 2 to Beech Creek is classified as an intermittent stream.

#### Unnamed Tributary 3 (UNT 3) to Beech Creek

UNT 3 to Beech Creek is an ephemeral stream that flows into a moderately forested area. Vegetation consisted of bloody-butcher (*Trillium recurvatum*, UPL) and reed canary grass (*Phalaris arundinacea*, FACW). The stream flows from south to northeast and crosses under SR 445 through the existing small structure, CLV-67648. UNT 3 to Beech Creek has an OHWM measuring 1.33 ft. wide by 0.25 ft. deep. Approximately 202 linear ft. of stream lies within the investigated area.

UNT 3 to Beech Creek has little canopy cover near the roadside and moderate canopy cover in the forested area. The substrate of the stream consists of gravel and silt. No flow was present within the stream and there were no riffles or pools. The stream channel sinuosity would be classified as sinuous (1.13). This stream is classified as poor because of these features. Due to the normal amount of rainfall and the absence of flowing water, UNT 3 to Beech Creek is classified as an ephemeral stream.

#### Unnamed Tributary 4 (UNT 4) to Beech Creek

UNT 4 to Beech Creek is an intermittent stream in a heavily forested area. Vegetation covering the banks included *I. capensis*, *T. radicans*, and *G. striata*. The stream flows from southwest to northeast draining from Wetland A to UNT 1 to Beech Creek. UNT 4 to Beech Creek has an OHWM measuring 1.42 ft. wide by 0.25 ft. deep. Approximately 33 linear ft. of stream lies within the investigated area.

UNT 4 to Beech Creek has substantial canopy cover in the forested area. The substrate of the stream consists of silt and gravel. Flow was present within the stream, but there were no riffles or pools. The stream channel sinuosity would be classified as straight (1.00). This stream is classified as average because of these features and due to not being manually

altered. Due to the normal amount of rainfall and flowing water from Wetland A, UNT 4 to Beech Creek is classified as an intermittent stream.

**Table 3. Stream Summary**

Stream	Photos	Linear Feet	OHWL Lat/Long	OHWL Width	OHWL Depth	USGS Blue Line	Riffles/ Pools	Quality	Substrate	Likely WOTUS?
UNT 1 to Beech Creek	40-48, 50	406 ft.	39.036055, -86.727865	5.00 ft.	0.92 ft.	No	Yes, both	Excellent	Sand, gravel, cobble, small boulders	Yes
UNT 2 to Beech Creek	19-23, 25-27	156 ft.	39.036332, -86.729754	1.42 ft.	0.42 ft.	No	No	Poor	Gravel, silt	Yes
UNT 3 to Beech Creek	3-6, 8, 10, 11	202 ft.	39.036262, -86.731319	1.33 ft.	0.25 ft.	No	No	Poor	Gravel, silt	Yes
UNT 4 to Beech Creek	34, 39-40, 54	33 ft.	39.036325, -86.728865	1.42 ft.	0.25 ft.	No	No	Average	Silt, gravel	Yes

### 3.2 Wetlands

The investigated area was surveyed for wetlands using the methods in accordance with the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (Version 2.0) (U.S. Army Corps of Engineers, 2012). Supporting materials used for this survey were plant lists (USACE NRCS, 2018), plant photo identification apps (Glory Global Group Ltd., 2020), field indicators of hydric soils (Vasilas, Hurt, and Noble, 2010), and data gathered from the desktop reconnaissance.

The investigated area was surveyed for wetlands by identifying potential areas exhibiting hydrophytic vegetation and hydrology in microtopographic/geomorphic positions that are conducive to the formation of wetlands. If one or a combination of these features was observed in the field a wetland determination data form was completed for the potential wetland area.

#### Wetland A

Wetland A is a forested wetland approximately 0.018 acres in size. The area of the wetland was determined by the change in vegetation and toe of slope. Wetland A is located in the forested area between UNT 1 to Beech Creek and SR 445. Wetland A was considered average quality due to sparse vegetation and low wildlife suitability. The wetland would be classified as Palustrine, Forested, Broad Leaved Deciduous, Seasonally Flooded (PFO1C) under the Cowardin Classification System. Wetland A drains into UNT 1 to Beech Creek via UNT 4 to Beech Creek, which ultimately flows to White River, a TNW. Due to the surface connection to downstream waters, Wetland A would likely be considered a WOTUS by the USACE.

#### *Data Point 1 (DP-1) – Wetland*

The area associated with DP-1 was evaluated because it exhibited hydrophytic vegetation and hydrology indicators. Dominant vegetation included white ash (*Fraxinus americana*, FACU), *G. striata*, and *I. capensis*. Hydrophytic vegetation was present due to passing the dominance test and prevalence index. Four hydric soil indicators were present (Stratified Layers (A5), Sandy Mucky Mineral (S1), Depleted Matrix (F3), Redox Depressions (F8)). Two primary indicators of hydrology (Saturation (A3), Water-Stained Leaves (B9)) and four secondary indicators of hydrology (Sparsely Vegetated Concave

Surface (B8), Drainage Patterns (B10), Geomorphic Position (D2), FAC-Neutral Test (D5)) were present. Due to the presence of all three wetland criteria, DP-1 is considered a wetland point.

**Data Point 2 (DP-2) – Upland**

DP-2 was taken upslope from DP-1 on a convex vegetated area along UNT 1 to Beech Creek. Dominant vegetation included American beech (*Fagus grandifolia*, FACU), tulip poplar (*Liriodendron tulipifera*, FACU), border privet (*Ligustrum obtusifolium*, UPL), *F. americana*, golden ragwort (*Packera aurea*, FACW), and red raspberry (*Rubus idaeus*, FAC). Hydrophytic vegetation, hydric soils, and wetland hydrology were not present. Due to the lack of wetland criteria, DP-2 is considered an upland point.

**Potential Wetland Area**

An area along roadside ditch (RSD) 5 was evaluated for potential wetland characteristics. This area was determined to not be a wetland due to lack of wetland indicators (see Data Point 3).

**Data Point 3 (DP-3) – Potential Wetland Point**

The area associated with DP-3 was evaluated because it appeared to exhibit hydrophytic vegetation and hydrology indicators. Dominant vegetation included broom sedge bluestem (*Andropogon virginicus*, FACU) and tall flatsedge (*Cyperus eragrostis*, FACW). Hydrophytic vegetation and hydric soils were not present. One secondary indicator (Geomorphic Position (D2)) was present but lacked additional secondary indicators. Therefore, wetland hydrology was not present. Due to the lack of all three wetland criteria, DP-3 was not a wetland point and required no further investigation.

**Table 4. Data Point Summary**

Data Point	Photos	Lat/Long	Hydrophytic Vegetation	Hydric Soils	Hydrology	Wetland
1	35-36	39.036266, -86.728933	Yes	Yes	Yes	Yes, Wetland A
2	37-38	39.036322, -86.728961	No	No	No	No
3	30-31	39.036039, -86.729565	No	No	No	No

**Table 5. Wetland Summary**

Wetland Name	Photos	Center Point Lat/Long	Type	Total Area (acres)	Quality	Likely WOTUS?
Wetland A	32-35, 39, 54	39.036297, -86.728939	PFO1C	0.018 acre	Average	Yes

**3.3 Ditch Features**

Five RSDs were observed within the investigated area. All ditches were vegetated or showed evidence of erosion. RSD 4 and RSD 5 show signs of heavy erosion and have exposed soils. RSDs 4 and 5 had water present but no apparent flow. No RSDs exhibited an OHWM or defined bed and bank. See Table 5 for details of the RSDs observed within the investigated area. Due to lack of an OHWM and defined bed and bank, the five RSDs are likely considered non-jurisdictional by the USACE.



**Table 6. Ditch Summary**

Ditch Name	Photos	Center Point Lat/Long	Linear Feet	Flow Direction	Output Location
RSD 1	1-2	39.036232, -86.731559	87 ft.	East	UNT 3 to Beech Creek
RSD 2	7, 9	39.036101, -86.731588	70 ft.	East	UNT 3 to Beech Creek
RSD 3	12-13	39.036082, -86.730834	222 ft.	East	Str. 2
RSD 4	15, 17-18	39.036056, -86.730166	119 ft.	East	UNT 2 to Beech Creek
RSD 5	28-29	39.036076, -86.728984	472 ft.	East	UNT 1 to Beech Creek

### 3.4 Open Water

No open water features were observed within the investigated area.

### 3.5 Bat/Birds and Wildlife

No evidence of bats or birds were observed in structures present within the investigated area during the Hanson field survey, or in the INDOT culvert inspection report for CV 445 - 028-00.53, dated March 24, 2022. Additionally, no animal crossings were observed within the structures investigated.


## 4.0 Conclusions

Five likely jurisdictional features were identified within the investigated area which included two intermittent streams (UNT 1 and 2 to Beech Creek), two ephemeral streams (UNT 3 and 4 to Beech Creek), and one forested wetland (Wetland A). Every effort should be taken to avoid and minimize impacts to the waterway and wetlands. If impacts are necessary, then mitigation may be required. The INDOT Environmental Services Division should be contacted immediately if impacts will occur. The final determination of jurisdictional waters is ultimately made by the USACE. This report is our best judgement on the guidelines set forth by the USACE.

## 5.0 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 *Corps of Engineers Wetlands Determination Manual*, the appropriate regional supplement, the USACE *Jurisdictional Determination Form Instructional Guidebook*, and other appropriate agency guidelines.

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Faelan Hoese



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## 6.0 Supporting Documentation

### Maps:

- Figure 1 – Project Location
- Figure 2 – USGS Topographic Map
- Figure 3 – USGS NHD, NWI and Soil Survey
- Figure 4 – IDNR Floodplain
- Figure 5 – USGS StreamStats
- Figures 6 to 6-3 – Field Identified Resources
- Figures 7 to 7-4 Photo Locations

Photos 1 to 54

Wetland Determination Forms

Preliminary Jurisdictional Determination (PreJD) Form

## 7.0 References

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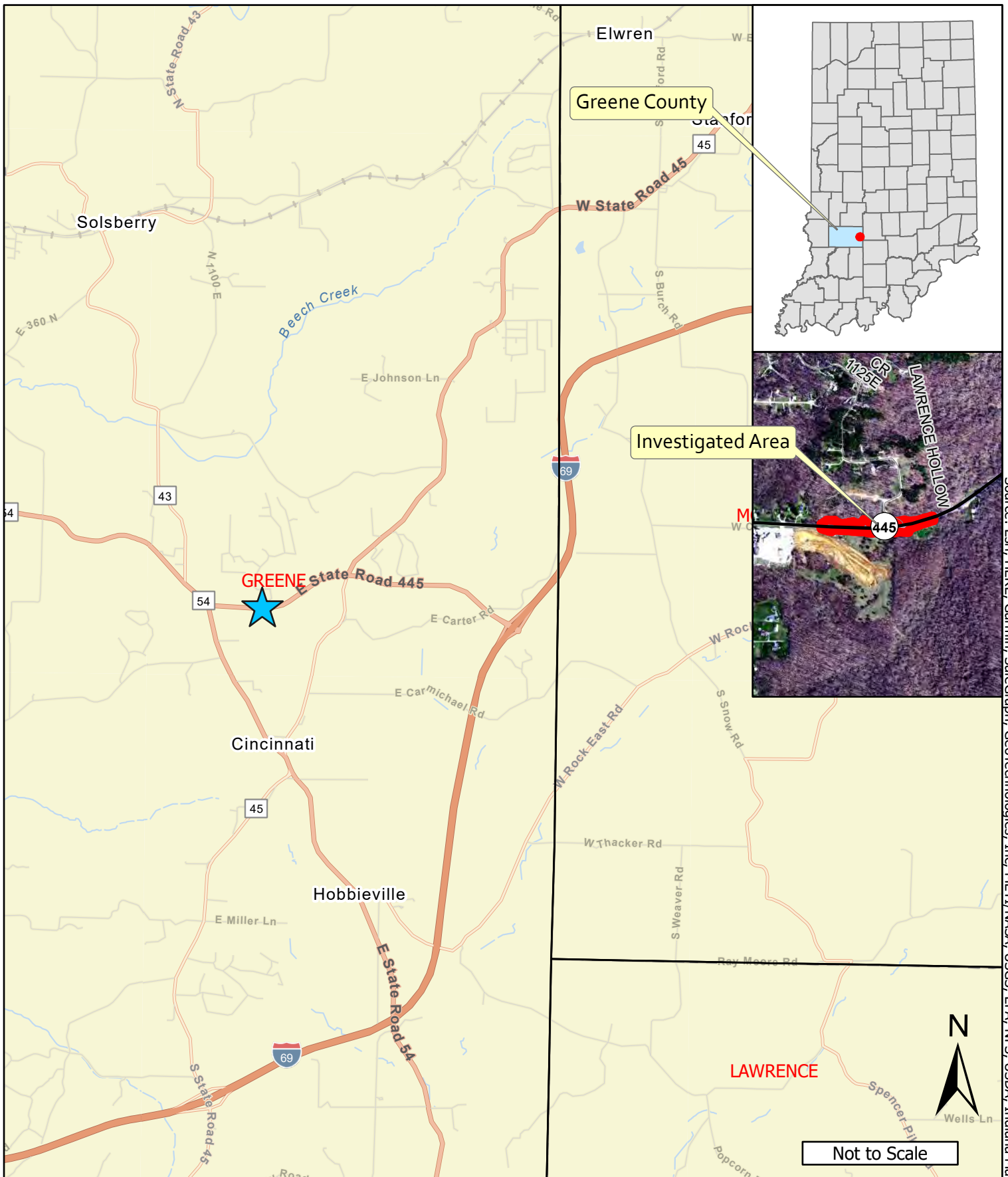
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Source: Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NSA, USGS, EPA, NPS, USDA, Indiana Map ([www.indianamap.org](http://www.indianamap.org))

**Figure 1 Project Location**

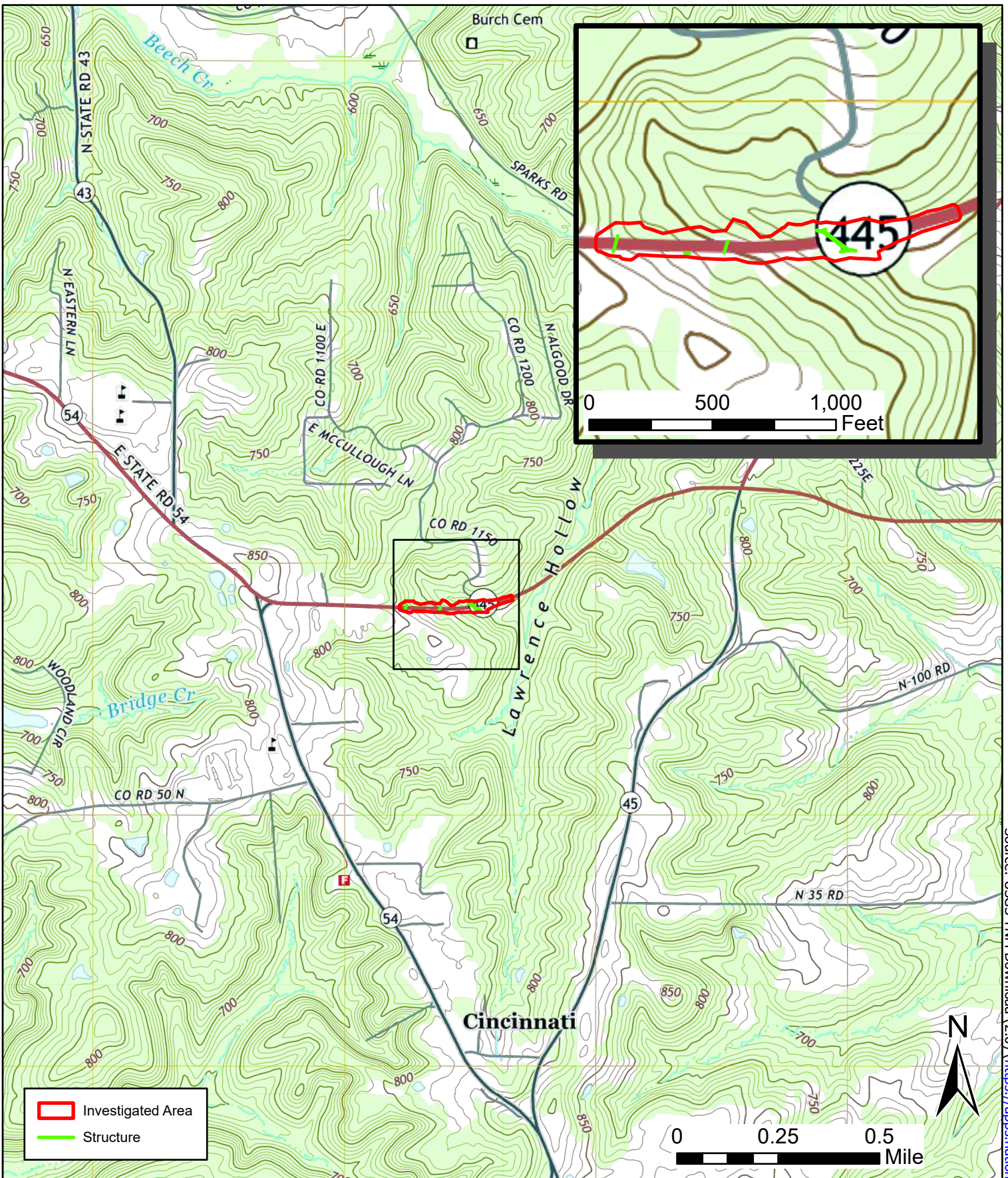
**Waters Report**  
 SR 445 Guardrail Improvement  
 Greene County, Indiana

Des. No. 2100161

Created: 5/27/2022

**Indiana Department of Transportation**  
 100 North Senate Avenue  
 Indianapolis, IN 46204





Source: USGS TNM Download (2.0) (<https://apps.nationalmap.gov/downloader/>)

**Figure 2 USGS Topographic Map**

**Waters Report**

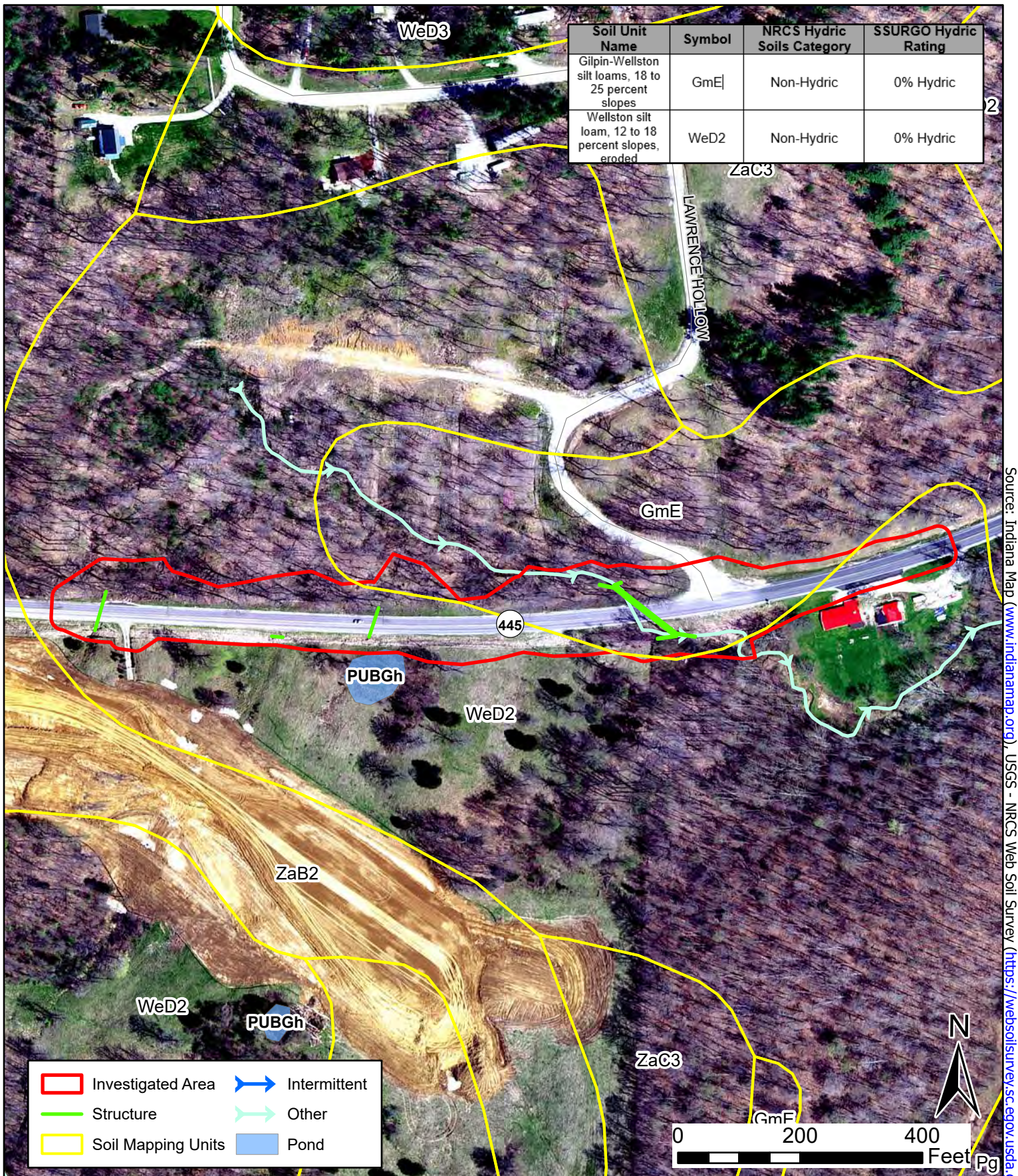
SR 445 Guardrail Improvement  
Greene County, Indiana

Des. No. 2100161


Created: 6/29/2022

**Indiana Department  
of Transportation**  
100 North Senate Avenue  
Indianapolis, IN 46204






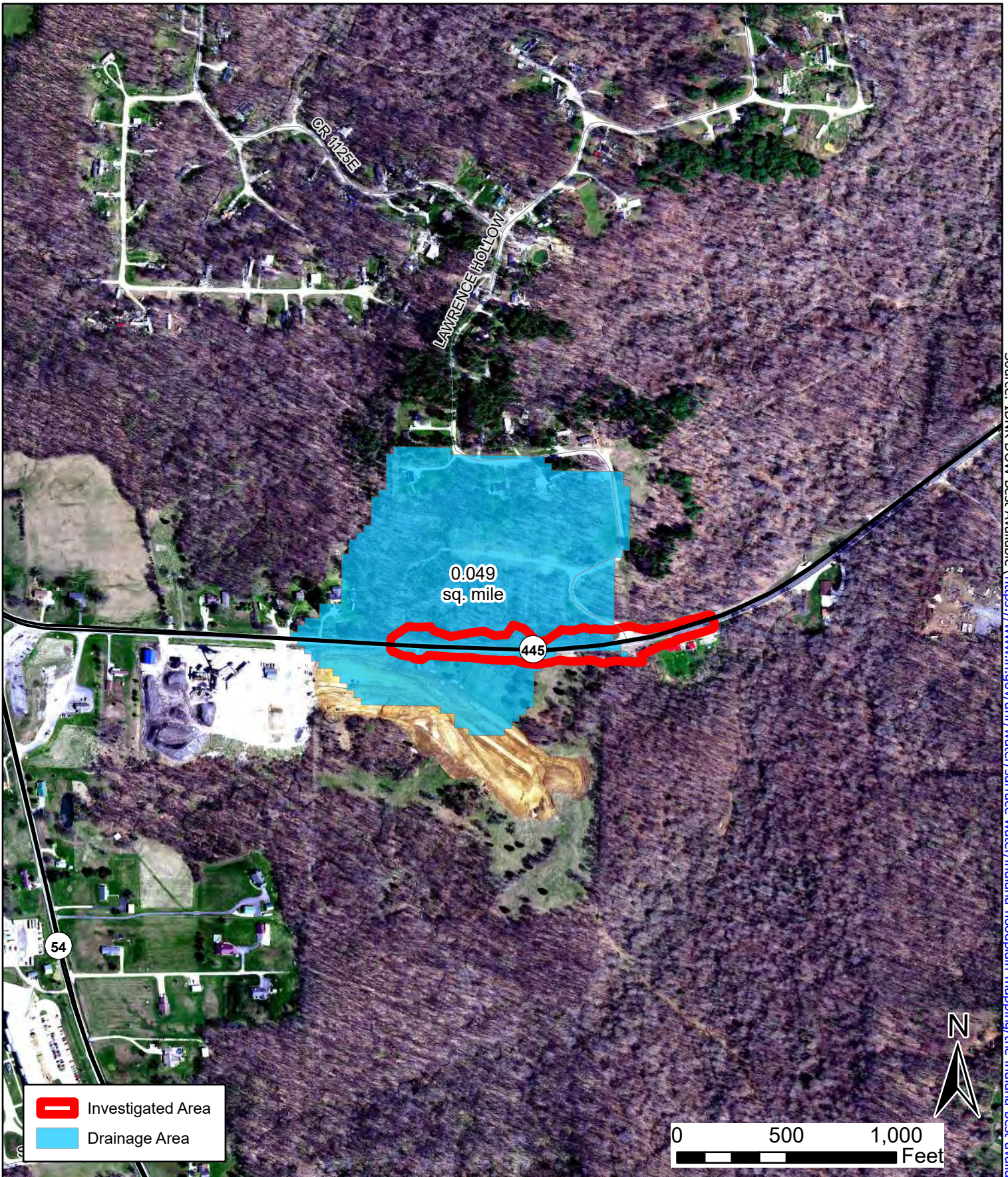
Source: Indiana Map ([www.indianamap.org](http://www.indianamap.org)), USGS - NRCS Web Soil Survey (<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>)

 <b>HANSON</b> Hanson Professional Services Inc.	<b>Figure 3 NHD, NWI, and Soil Survey</b>	<b>Indiana Department of Transportation</b> 100 North Senate Avenue Indianapolis, IN 46204
	<b>Waters Report</b> SR 445 Guardrail Improvement Greene County, Indiana	
	Des. No. 2100161 <span style="float: right;">Created: 6/29/2022</span>	



Source: IDNR-DOW Best Available (<https://www.in.gov/dnr/water/surface-water/indiana-floodplain-mapping/the-indiana-best-available-floodplain-mapping/>)

 Hanson Professional Services Inc.	<b>Figure 4 IDNR Floodplain Map</b> <b>Waters Report</b> SR 445 Guardrail Improvement Greene County, Indiana		<b>Indiana Department of Transportation</b> 100 North Senate Avenue Indianapolis, IN 46204
	Des. No. 2100161	Created: 5/27/2022	



Source: IDNR-DOW Best Available (<https://www.in.gov/dnr/water/surface-water/indiana-floodplain-mapping/the-indiana-best-available-floodplain-mapping/>)

**Figure 5 USGS StreamStats**

**Waters Report**

SR 445 Guardrail Improvement  
Greene County, Indiana

Des. No. 2100161

Created: 5/27/2022

**Indiana Department  
of Transportation**  
100 North Senate Avenue  
Indianapolis, IN 46204





- ▭ Investigated Area
- ▬ Structure
- ⏏ Feature Limits
- 📍 OHWM Observation
- Data Points
- ➡ Ephemeral
- ➡ Intermittent
- ➡ Ditch
- Wetlands



**Figure 6 Field Identified Resources Reference**

**Waters Report**  
 SR 445 Guardrail Improvement  
 Greene County, Indiana

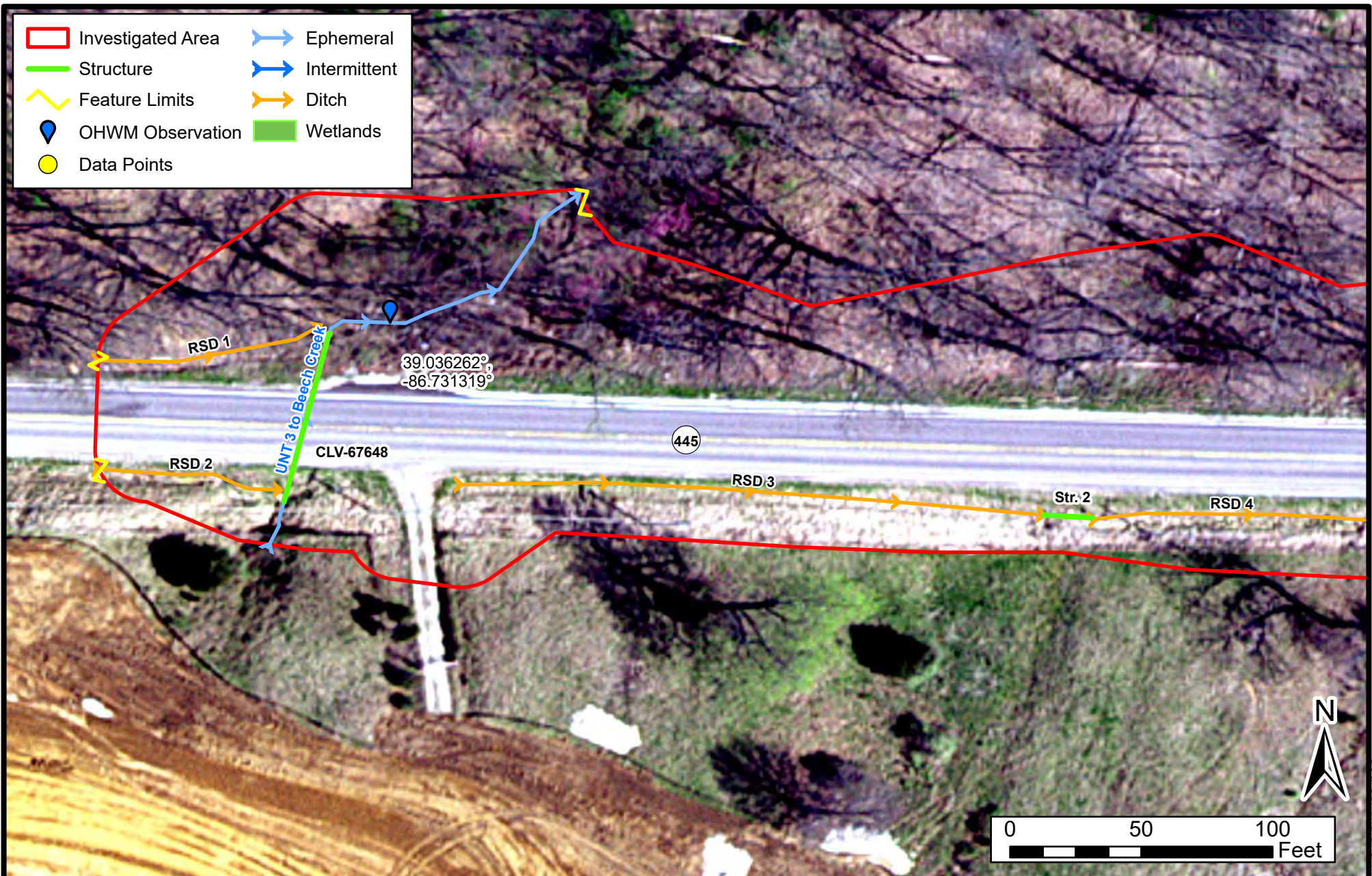
Des. No. 2100161

Created: 9/6/2022

**Indiana Department of Transportation**  
 100 North Senate Avenue  
 Indianapolis, IN 46204



Source: Indiana Map ([www.indianamap.org](http://www.indianamap.org))



**Figure 6-1 Field Identified Resources**

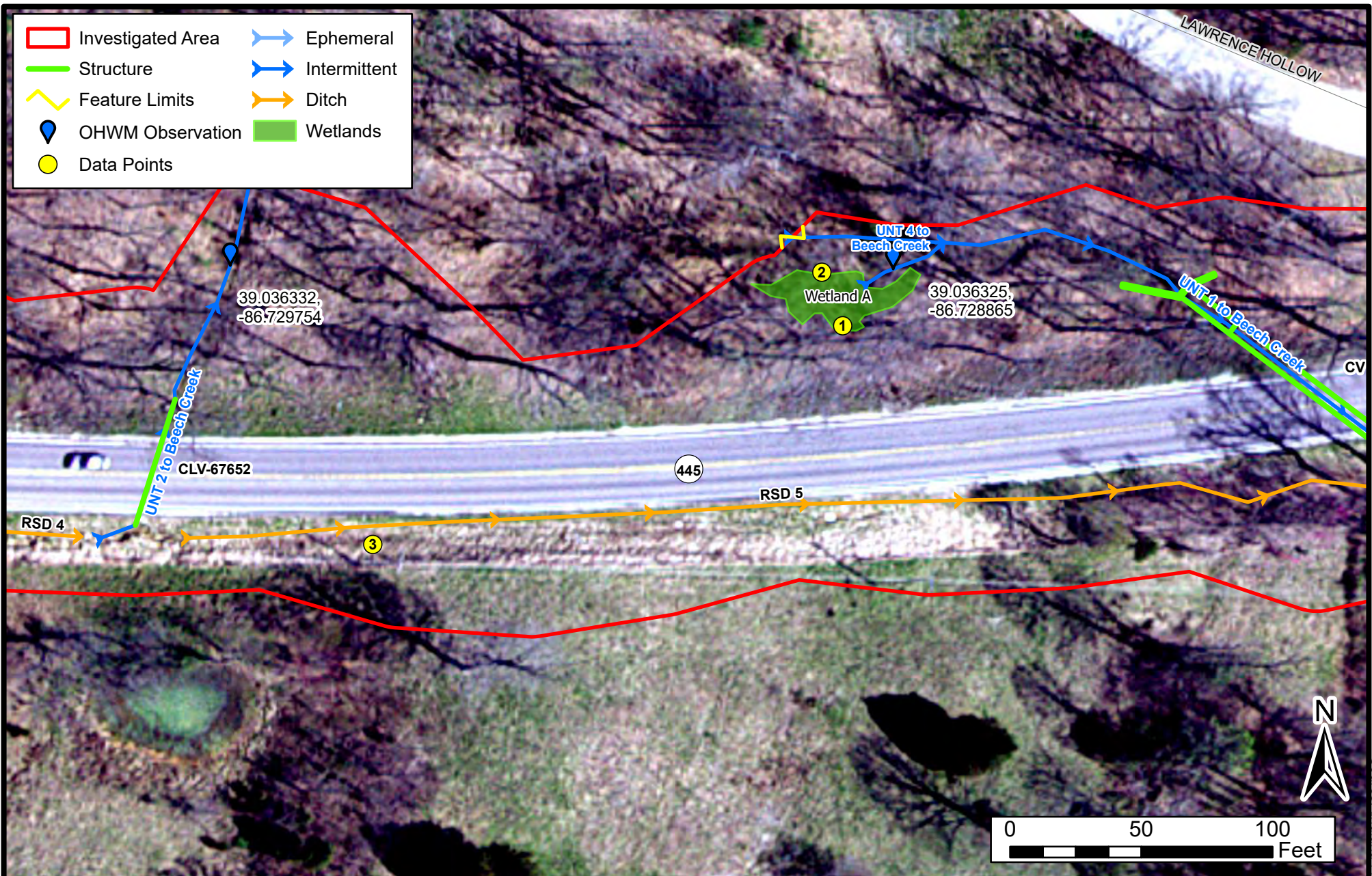


**Waters Report**  
SR 445 Guardrail Improvement  
Greene County, Indiana

**Indiana Department of Transportation**  
100 North Senate Avenue  
Indianapolis, IN 46204

Des. No. 2100161 Created: 9/19/2022

Source: Indiana Map ([www.indianamap.org](http://www.indianamap.org))



**Figure 6-2 Field Identified Resources**

**Waters Report**  
 SR 445 Guardrail Improvement  
 Greene County, Indiana

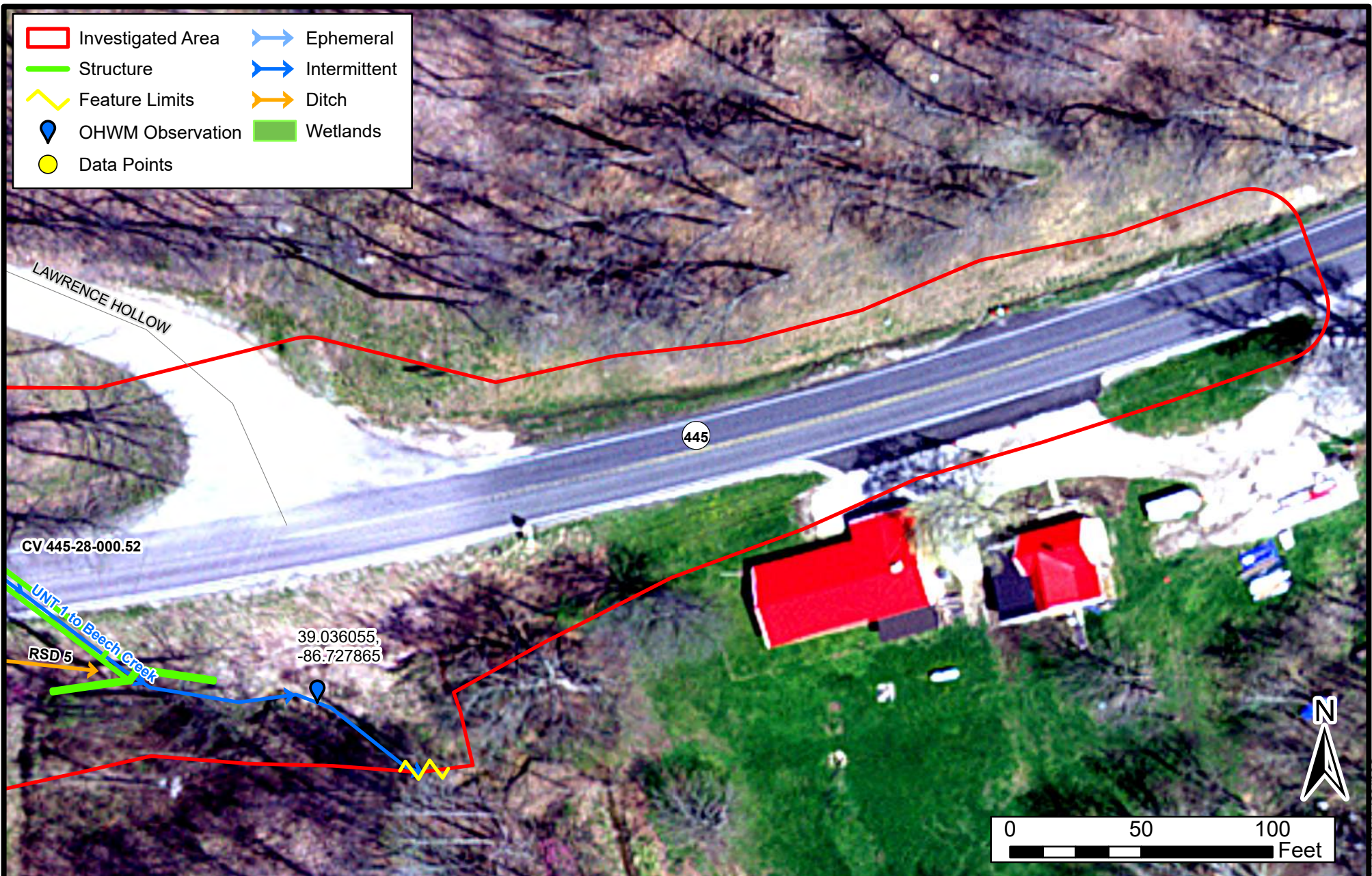
**Indiana Department of Transportation**  
 100 North Senate Avenue  
 Indianapolis, IN 46204



Des. No. 2100161

Created: 9/19/2022

Source: Indiana Map ([www.indianamap.org](http://www.indianamap.org))



**Figure 6-3 Field Identified Resources**



**Waters Report**  
 SR 445 Guardrail Improvement  
 Greene County, Indiana

**Indiana Department of Transportation**  
 100 North Senate Avenue  
 Indianapolis, IN 46204

Des. No. 2100161

Created: 9/19/2022

- ▭ Investigated Area
- ▬ Structure
- Photo Locations
- ▬ Feature Limits
- 📍 OHWM Observation
- ↔ Ephemeral
- ↔ Intermittent
- ↔ Ditch
- ▭ Wetlands
- Data Points

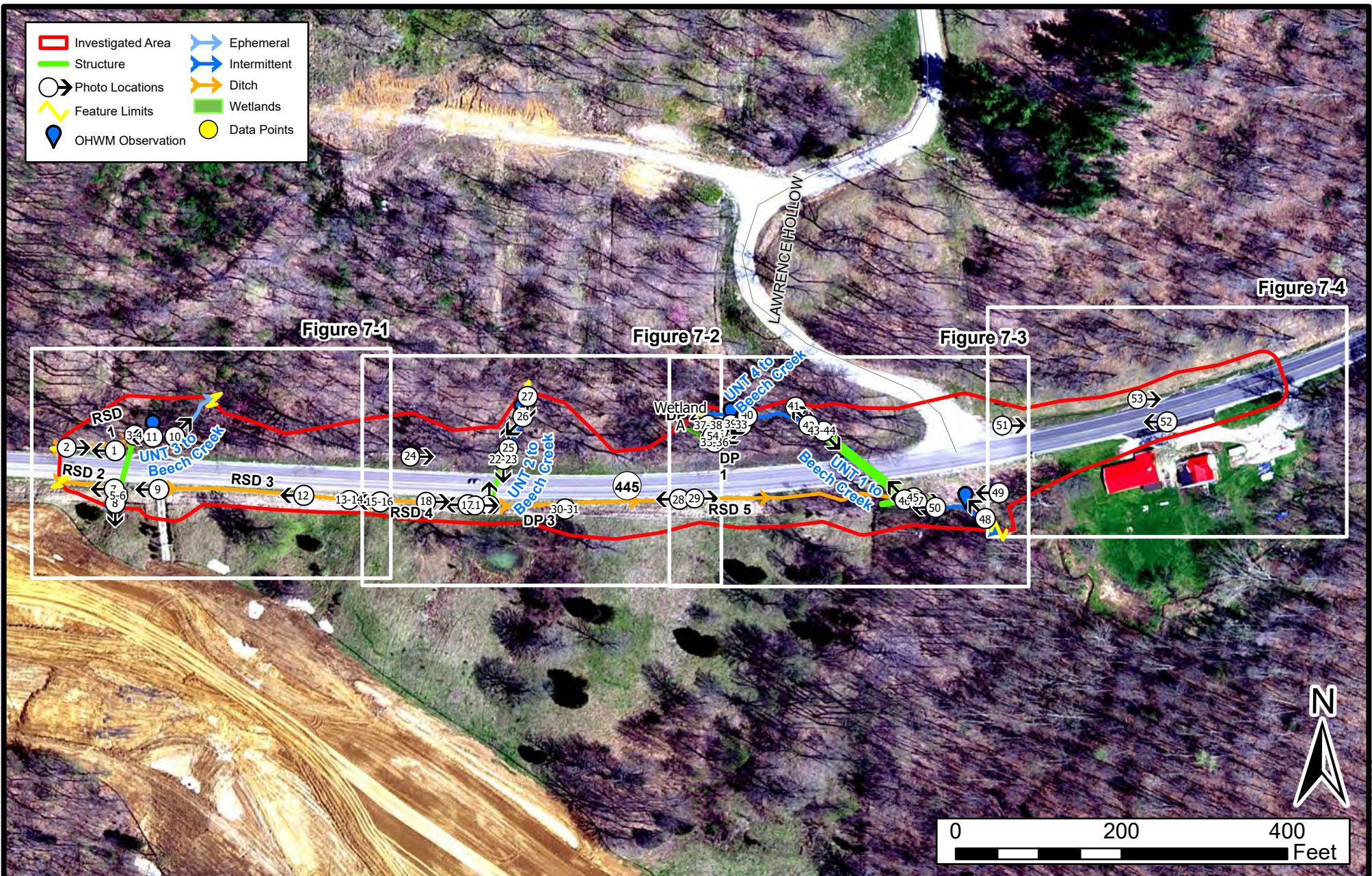


Figure 7-4

Figure 7-1

Figure 7-2

Figure 7-3



**Figure 7 Photo Locations Reference**

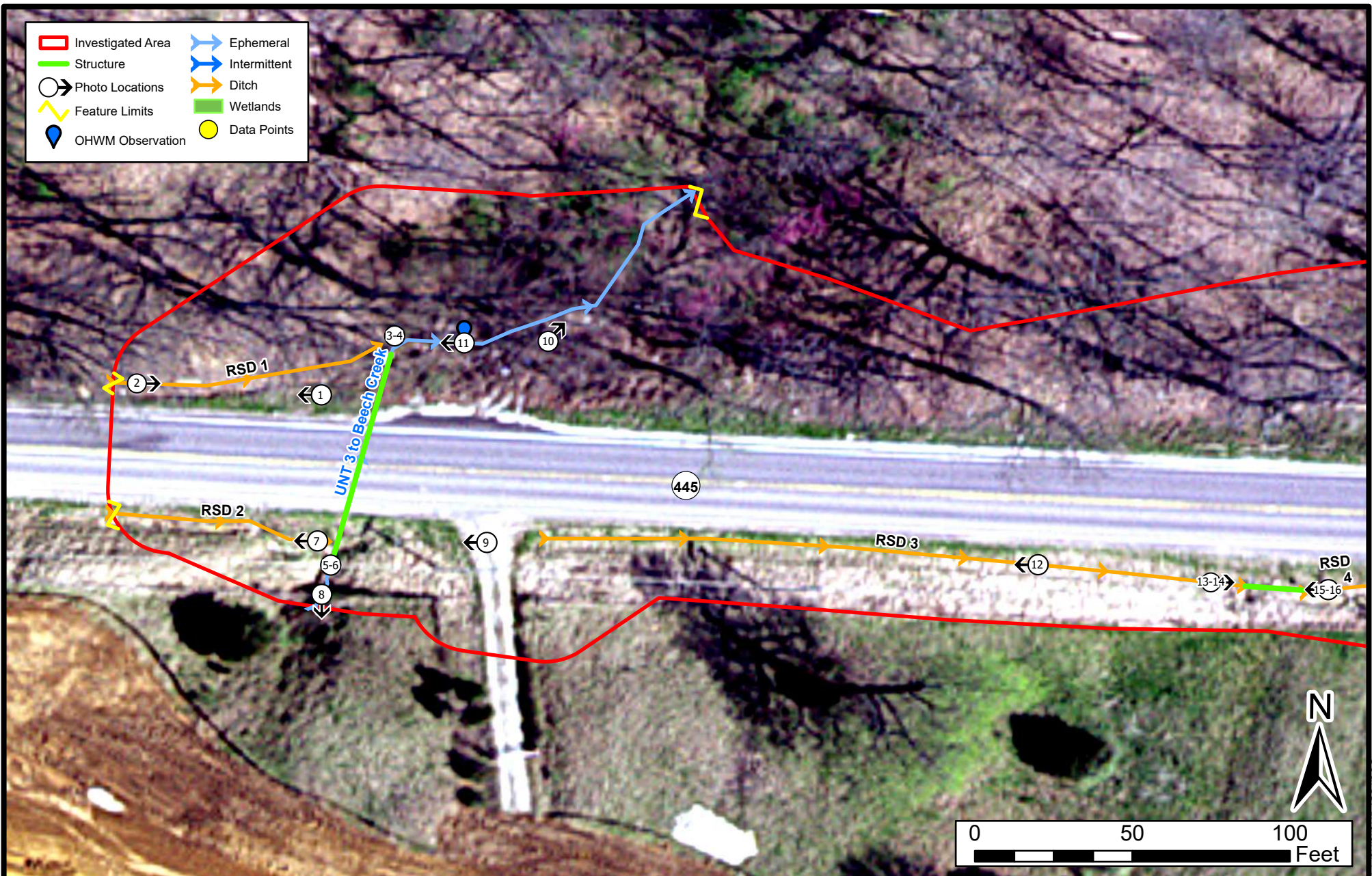
**Waters Report**  
 SR 445 Guardrail Improvement  
 Greene County, Indiana

**Indiana Department of Transportation**  
 100 North Senate Avenue  
 Indianapolis, IN 46204

Des. No. 2100161

Created: 9/6/2022

Source: Indiana Map (www.indianamap.org)



**Figure 7-1 Photo Locations**

**Waters Report**  
 SR 445 Guardrail Improvement  
 Greene County, Indiana

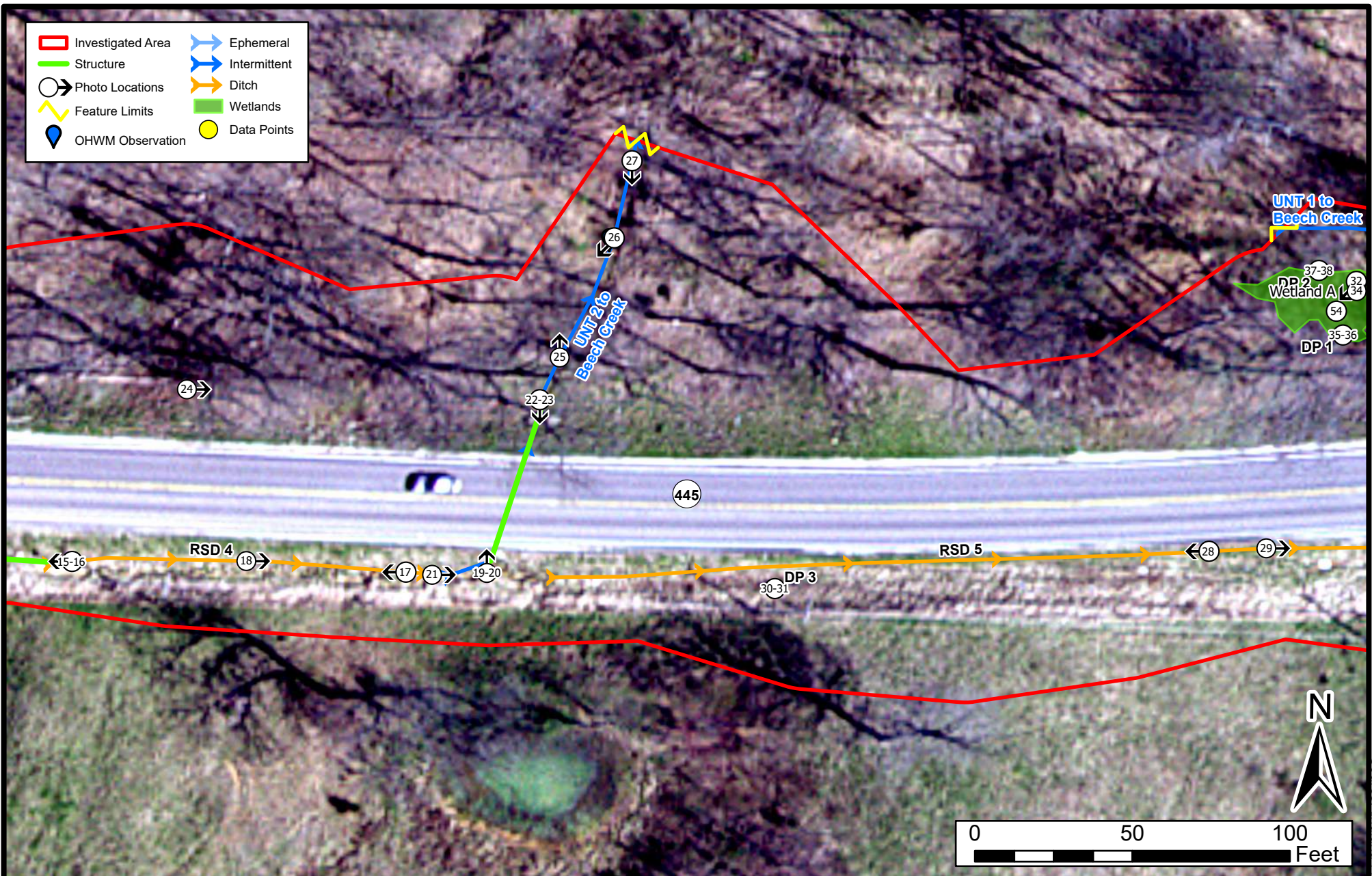
**Indiana Department of Transportation**  
 100 North Senate Avenue  
 Indianapolis, IN 46204



Des. No. 2100161

Created: 9/6/2022

Source: Indiana Map ([www.indianamap.org](http://www.indianamap.org))



- ▭ Investigated Area
- ▬ Structure
- Photo Locations
- ▬ Feature Limits
- 📍 OHWM Observation
- ⇄ Ephemeral
- ⇄ Intermittent
- ⇄ Ditch
- ▭ Wetlands
- Data Points

**Figure 7-2 Photo Locations**

**Waters Report**  
 SR 445 Guardrail Improvement  
 Greene County, Indiana

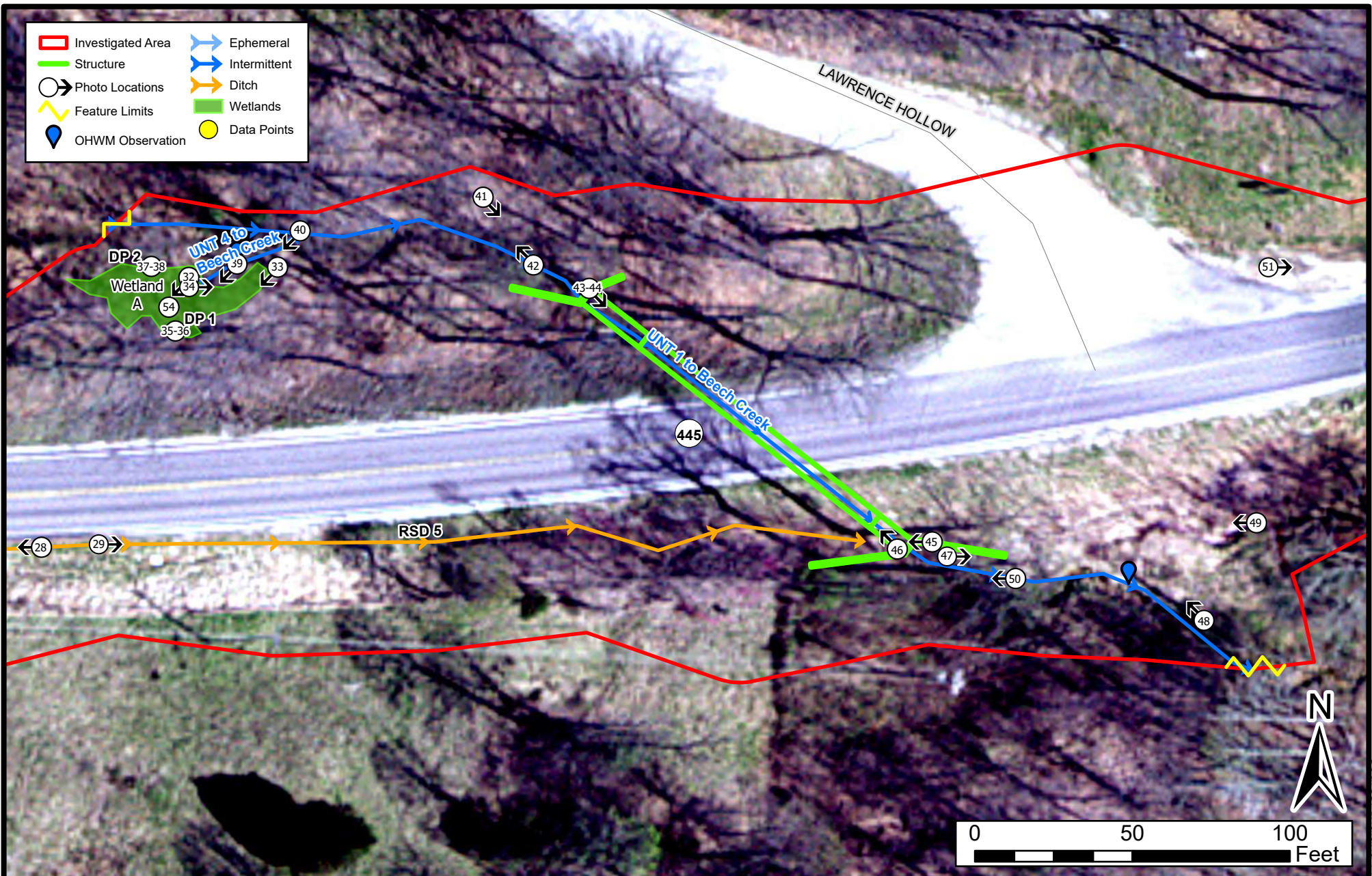
Des. No. 2100161

Created: 9/6/2022

**Indiana Department of Transportation**  
 100 North Senate Avenue  
 Indianapolis, IN 46204



Source: Indiana Map ([www.indianamap.org](http://www.indianamap.org))



**Figure 7-3 Photo Locations**

**Waters Report**  
 SR 445 Guardrail Improvement  
 Greene County, Indiana

Des. No. 2100161

Created: 9/6/2022

**Indiana Department of Transportation**  
 100 North Senate Avenue  
 Indianapolis, IN 46204



Source: Indiana Map ([www.indianamap.org](http://www.indianamap.org))





**Figure 7-4 Photo Locations**

**Waters Report**  
 SR 445 Guardrail Improvement  
 Greene County, Indiana

Des. No. 2100161 Created: 9/6/2022

**Indiana Department of Transportation**  
 100 North Senate Avenue  
 Indianapolis, IN 46204

Source: Indiana Map ([www.indianamap.org](http://www.indianamap.org))



Photo 1. RSD 1 on north side of SR 445, viewing west, 5/13/2022



Photo 2. RSD 1 and eroded soils north of SR 445, viewing east, 7/7/2022



Photo 3. Outlet of CLV-67648 with UNT 3 to Beech Creek, facing upstream, viewing south, 5/13/2022



Photo 4. Looking through CLV-67648 at outlet with UNT 3 to Beech Creek, facing upstream, viewing south, 5/13/2022



Photo 5. Inlet of CLV-67648 with UNT 3 to Beech Creek, facing downstream, viewing north, 5/13/2022



Photo 6. Looking through CLV-67648 at inlet with UNT to Beech Creek, facing downstream, viewing north 5/13/2022



Photo 7. RSD 2 south of SR 445, viewing west, 5/13/2022



Photo 8. UNT 3 to Beech Creek at inlet of CLV-67648, facing downstream, viewing south, 5/13/2022



Photo 9. RSD 2 and roadside around CLV-67648 roadside of SR 445, viewing west, 5/13/2022



Photo 10. UNT 3 to Beech Creek facing downstream, viewing northeast, 5/13/2022



Photo 11. UNT 3 to Beech Creek OHWM measurement, facing upstream, viewing west, 5/13/2022



Photo 12. RSD 3 south of SR 445, viewing west, 5/13/2022



Photo 13. Inlet of Str. 2 with RSD 3, viewing east, 5/13/2022



Photo 14. Looking through Str. 2 at inlet, viewing east, 5/13/2022



Photo 15. Outlet of Str. 2 with RSD 4, viewing west, 5/13/2022



Photo 16. Looking through Str. 2 at outlet, viewing west, 5/13/2022



Photo 17. RSD 4 with eroded areas south of SR 445, viewing west, 5/13/2022



Photo 18. RSD 4 with heavy erosion, viewing east, 5/13/2022



Photo 19. Looking through CLV-67652 at inlet with UNT 2 to Beech Creek, facing downstream, viewing north, 5/13/2022



Photo 20. Inlet of CLV-67652 with UNT 2 to Beech Creek, facing downstream, viewing north, 5/13/2022



Photo 21. UNT 2 to Beech Creek with flowing water sourced from groundwater flowing from southern bank, facing downstream, viewing east, 5/13/2022



Photo 22. Outlet of CLV-67652 with UNT 2 to Beech Creek, facing upstream, viewing south, 5/13/2022



Photo 23. Looking through CLV-67652 at outlet with UNT 2 to Beech Creek, facing upstream, viewing south, 5/13/2022



Photo 24. Roadside north of SR 445 around the outlet of CLV-67652, viewing east, 5/13/2022



Photo 25. UNT 2 to Beech Creek directly north of SR 445, facing downstream, viewing north, 5/13/2022



Photo 26. UNT 2 to Beech Creek and OHWM measurement, facing upstream, viewing southwest, 7/7/2022



Photo 27. UNT 2 to Beech Creek and after slope change with cobble in stream bed, facing upstream, viewing south, 7/7/2022



Photo 28. RSD 5 with vegetation, south of SR 445, viewing west, 5/13/2022





Photo 29. RSD 5 flowing towards UNT 1 to Beech Creek, eroded area starts at trees within the ditch line, viewing east, 5/13/2022



Photo 30. DP-3 potential wetland point reference photo, 5/13/2022



Photo 31. DP-3 potential wetland point soil profile, 5/13/2022



Photo 32. Wetland A within the forested area north of SR 445, viewing southwest, 7/7/2022



Photo 33. Wetland A with standing water and iron deposits after rain event, viewing southwest, 7/7/2022



Photo 34. Wetland A channelizing into UNT 4 to Beech Creek, facing downstream, viewing east, 7/7/2022



Photo 35. DP-1 wetland point reference photo for Wetland A, 5/13/2022



Photo 36. DP-1 wetland point soil profile for Wetland A, 5/13/2022



Photo 37. DP-2 upland point reference photo for Wetland A

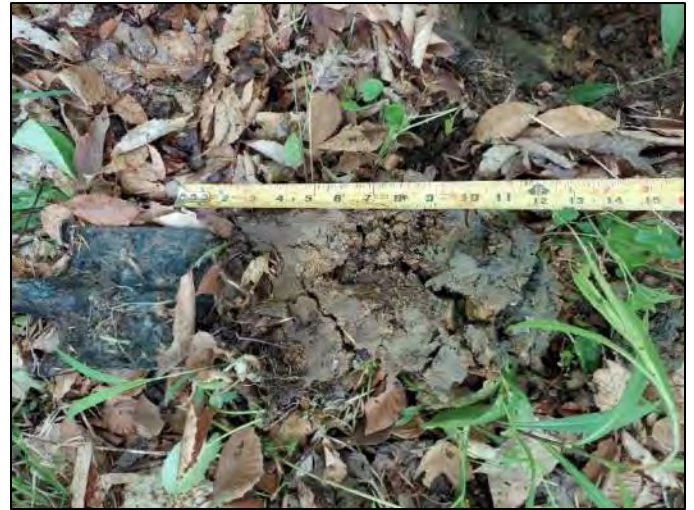


Photo 38. DP-2 upland point soil profile for Wetland A



Photo 39. UNT 4 to Beech Creek OHWM measurement draining from Wetland A, facing upstream, viewing southwest, 7/7/2022

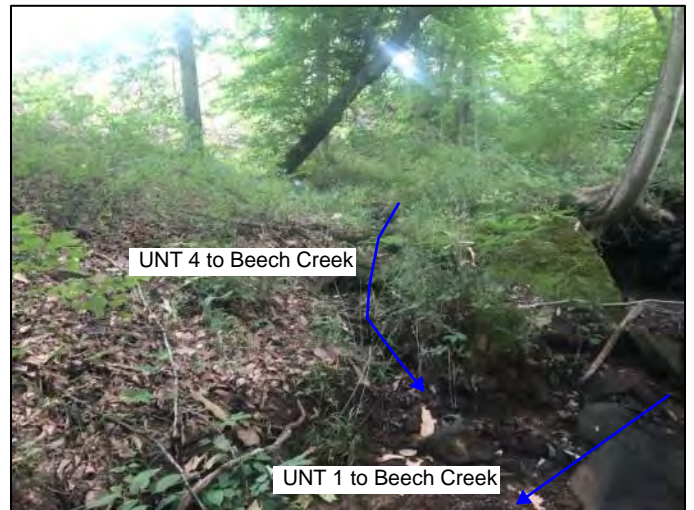


Photo 40. UNT 4 to Beech Creek flowing into UNT 1 to Beech Creek, facing upstream of UNT 4 to Beech Creek, viewing southwest, 7/7/2022



Photo 41. Outlet of culvert (CV 445-28-000.52) and UNT 1 to Beech Creek, facing downstream, viewing southeast, 5/13/2022



Photo 42. UNT 1 to Beech Creek with cobble, gravel and sand substrate, facing upstream, viewing northwest, 5/13/2022



Photo 43. Inlet of culvert (CV 445-28-000.52) and UNT 1 to Beech Creek, facing downstream, viewing southeast, 5/13/2022



Photo 44. Looking through culvert (CV 445-28-000.52) at inlet with UNT 1 to Beech Creek, facing downstream, viewing southeast, 5/13/2022



Photo 45. Outlet of culvert (CV 445-28-000.52) with UNT 1 to Beech Creek, viewing west, 5/13/2022



Photo 46. Looking through culvert (CV 445-28-000.52) at outlet with UNT 1 to Beech Creek, facing upstream, viewing northwest, 5/13/2022



Photo 47. UNT 1 to Beech Creek facing downstream, viewing east, 5/13/2022



Photo 48. UNT 1 to Beech Creek OHWM measurement, facing upstream, viewing northwest, 5/13/2022



Photo 49. Mowed lawn east of UNT 1 to Beech Creek, viewing west, 5/13/2022



Photo 50. Eroded bank of UNT 1 to Beech Creek, viewing south, 5/13/2022



Photo 51. Roadside swale northeast of the SR 445 and Lawrence Hollow Drive intersection, viewing east, 5/13/2022



Photo 52. Roadside with residence south of SR 445, viewing west, 5/13/2022



Photo 53. Roadside swale north of SR 445 and east of the intersection, viewing east, 5/13/2022



Photo 54. Panoramic view of Wetland A and UNT 4 to Beech Creek, 7/7/2022

**Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM**

**BACKGROUND INFORMATION**

**A. REPORT COMPLETION DATE FOR PJD:** 9/20/2022

**B. NAME AND ADDRESS OF PERSON REQUESTING PJD:** Payton Fischer, 6510 Telecom Dr., Suite 210, Indianapolis, IN 46278

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

**D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:**

The proposed guardrail improvement project (Des 2100161) is on State Road (SR) 445, from 0.39 mile east of SR 54 to 0.62 mile east of SR 54, in Center Township, Greene County, Indiana. The proposed project is anticipated to install guardrail along the SR 445 roadway. This is expected to include a minimum paved shoulder of 4 feet (ft.) and widening of the embankment to accommodate the guardrail. Four structures (Str.) are within the investigated area with proposed work. The existing reinforced box culvert (RCB) will have the end sections lengthened due to the shoulder widening. The need is due to the crash history within the area. The purpose is to reduce the potential for severe roadway runoff crashes related to the steep slopes. The length of the investigated area is approximately 0.28 mile long along SR 445.

**(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)**

State: IN County/parish/borough: Greene Co. City: Cincinnati

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

Lat.: 39.036206 Long.: -86.729204

Universal Transverse Mercator: NAD 83 Zone 16N (523437 Easting, 4320829 Northing)

Name of nearest waterbody: UNT 1 to Beech 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.**

<b>Site number</b>	<b>Latitude (decimal degrees)</b>	<b>Longitude (decimal degrees)</b>	<b>Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)</b>	<b>Type of aquatic resource (i.e., wetland vs. non-wetland waters)</b>	<b>Geographic authority to which the aquatic resource “may be” subject (i.e., Section 404 or Section 10/404)</b>
UNT 1 to Beech Creek	39.036055	-86.727865	406 linear ft./0.047 acre	non-wetland	Section 404
UNT 2 to Beech Creek	39.036332	-86.729754	156 linear ft./0.005 acre	non-wetland	Section 404
UNT 3 to Beech Creek	39.036262	-86.731319	202 linear ft./0.006 acre	non-wetland	Section 404
UNT 4 to Beech Creek	39.036325	-86.728865	33 linear ft./0.001 acre	non-wetland	Section 404
Wetland A	39.036297	-86.728939	<b>0.018 acre</b>	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) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) 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: Figures 1 through 7-4
- 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: Standford, Indiana Quadrangle 1:24,000
- Natural Resources Conservation Service Soil Survey. Citation: SSURGO Greene Co., Indiana
- National wetlands inventory map(s). Cite name: USFWS Wetland Mapper, HUC-08 05120202
- State/local wetland inventory map(s): \_\_\_\_\_
- FEMA/FIRM maps: \_\_\_\_\_
- 100-year Floodplain Elevation is: \_\_\_\_\_.(National Geodetic Vertical Datum of 1929)
- Photographs:  Aerial (Name & Date): Indiana Best Available  
or  Other (Name & Date): Site Photos 5/13/2022, 7/7/2022
- Previous determination(s). File no. and date of response letter: \_\_\_\_\_
- Other information (please specify): IDNR Best Available floodplain dataset



**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.**

\_\_\_\_\_  
Signature and date of  
Regulatory staff member  
completing PJD

*Raymond Fischer* 9/20/2022  
\_\_\_\_\_  
Signature and date of  
person requesting PJD  
(REQUIRED, unless obtaining  
the signature is impracticable)<sup>1</sup>

<sup>1</sup> 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.



-  Point of Interest
-  Base Flood Elevation Point

Point of Interest Coordinates  
(WGS84)  
Long: **-86.7278923222**  
Lat: **39.0363834764**

*The information provided below is based on the point of interest shown in the map above.*

County: **Greene**

Approximate Ground Elevation: **717.4 feet (NAVD88)**

Stream Name:  
**Unnamed Tributary**

Base Flood Elevation: **Not Available**

Drainage Area: **Not available**

Best Available Flood Hazard Zone: **Not Mapped**

National Flood Hazard Zone: **Not Mapped**

Is a Flood Control Act permit from the DNR needed for this location? **See following pages**

Is a local floodplain permit needed for this location? **Contact your local Floodplain Administrator-**

Floodplain Administrator: **Edward Strong, Greene County Surveyor**

Community Jurisdiction: **Greene County, County proper**

Phone: **(812) 384-2026**

Email: **edward.strong@co.greene.in.us**

US Army Corps of Engineers District: **Louisville**

Date Generated: 11/8/2022

## Payton Fischer

---

**From:** Moffett, Mary <MMoffett@indot.IN.gov>  
**Sent:** Thursday, October 20, 2022 3:01 PM  
**To:** Tamra Reece; Thomas, Michael J  
**Cc:** Payton Fischer; Jeff Bushur; Jason Rowley; Rehder, Crystal; Elizabetha Stojanovska; Couch, Gregory  
**Subject:** Permit Determination for Des. No. 2100161 - SR 445 Guardrail Improvement in Greene County  
**Attachments:** 2100161 Permit Determination 10.20.22.pdf; USP DISCOVERY OF KARST FEATURES.pdf

Good afternoon, Tammy,

Please see attached permit determination form. In summary, based on the information provided, the following permits are required for **Des. No. 2100161, RFC Date 5/17/2023** (the designer should confirm all schedules with the Project Manager):

- **401/404 NWP 14** (Use State Form 51937), with PCN to both USACE and IDEM.
- **Construction Stormwater General Permit (CSGP):** Soil disturbance is greater than one acre.
- Please follow early coordination guidance regarding bats in the area.
- Please also refer to the USP regarding the discovery of karst features within construction limits (attached).

*We are providing **preliminary** permit determinations based on the information presented at the time of the request. **If scope and plans change the designer should contact us for a revised determination.** A final permit determination will be done at the time of permit application submittal and/or any changes to the scope of the project.*

### Mary Margaret Moffett

Ecology and Waterway Permitting Office  
Indiana Department of Transportation  
100 N. Senate Avenue N758-ES  
Indianapolis, IN 46204  
**Phone:** 317-694-3038  
**Email:** [mmoffett@indot.in.gov](mailto:mmoffett@indot.in.gov)



---

**From:** Tamra Reece <TReece@hanson-inc.com>  
**Sent:** Monday, October 3, 2022 1:35 PM  
**To:** Moffett, Mary <MMoffett@indot.IN.gov>  
**Cc:** Payton Fischer <pfischer@hanson-inc.com>; Jeff Bushur <JBushur@hanson-inc.com>; Jason Rowley <jrowley@hanson-inc.com>; Rehder, Crystal <CRehder@indot.IN.gov>; Elizabetha Stojanovska <EStojanovska@hanson-inc.com>  
**Subject:** FW: Permit Determination Request: Des. No. 2100161

## APPENDIX G

# Public Involvement



Hanson Professional Services Inc.  
6510 Telecom Dr., Suite 210  
Indianapolis, IN 46278  
(317) 293-9024  
[www.hanson-inc.com](http://www.hanson-inc.com)

January 12, 2022

**NOTICE OF SURVEY**



**RE: DES #2100161: SR 445 Guardrail Improvement, in Greene County, Indiana.**

Dear Property Owner:

Our information indicates that you own or occupy property near the subject proposed highway project. Our employees will be performing 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 permitted by law per Indiana Code IC 8-23-7-26. They will show you their identification if you are available, before coming onto your property. If you have sold this property, or it is occupied by someone else, please let us know the name and address of the new owner or current occupant so we can contact them about the survey.

At this stage, we generally do not know what effect, if any, our project can eventually have on your property. If we determine later that your property is involved, we will contact you with additional information.

The survey work will include mapping the location of features such as trees, buildings, fences, and drives, as well as obtaining ground elevations. This survey is needed for the proper planning and design of this highway project. Please be assured of our sincere desire to cause you as little inconvenience as possible during this survey. If problems do occur, please contact our field crew, or contact me at the telephone number or address shown above.

Sincerely,

HANSON PROFESSIONAL SERVICES INC.

A handwritten signature in black ink that reads "Richard P. McPhail".

Richard P. McPhail, PS  
Senior Surveyor

## APPENDIX H

# **Air Quality**



Indiana Department of Transportation (INDOT)  
 State Preservation and Local Initiated Projects FY 2022 - 2026

SPONSOR	CONTR ACT # / LEAD DES	STIP NAME	ROUTE	WORK TYPE	LOCATION	DISTRICT	MILES	FEDERAL CATEGORY	Total Cost of Project*	PROGRAM	PHASE	FEDERAL	MATCH	2022	2023	2024	2025	2026
Indiana Department of Transportation	43042 / 2001602	Init.	I 69	Install Lighting	I-69/ US 231 interchange and US 231/ SR 45 intersection	Vincennes	.9	NHPP	\$1,421,508.00	Safety Construction	CN	\$941,400.00	\$104,600.00	\$1,046,000.00				
Performance Measure Impacted: Safety																		
Comments:Include DES 2001602																		
Indiana Department of Transportation	43251 / 2001921	Init.	SR 157	Pavement Replacement	From North End of White River Bridge to S. Jct US 231 (Worthington S. Limits)	Vincennes	1.072	STBG	\$5,196,762.00	Road Consulting	PE	\$400,320.00	\$100,080.00	\$500,400.00				
										Road Construction	CN	\$3,593,889.60	\$898,472.40			\$10,000.00	\$4,482,362.00	
										Road ROW	RW	\$163,200.00	\$40,800.00			\$204,000.00		
Performance Measure Impacted: Pavement Condition																		
Comments:Include DES 2001918, 2001921																		
Indiana Department of Transportation	43663 / 2100161	Init.	SR 445	Guardrail Attenuators, New Or Modernize	From 0.39 mi E of SR 54 to 0.62 mi E of SR 54	Vincennes	.23	STBG	\$914,332.00	Safety Construction	CN	\$564,265.60	\$141,066.40			\$705,332.00		
										Safety Consulting	PE	\$143,200.00	\$35,800.00	\$179,000.00				
										Safety ROW	RW	\$24,000.00	\$6,000.00		\$30,000.00			
Performance Measure Impacted: Safety																		
Comments:Include DES 2100161																		
Indiana Department of Transportation	43966 / 2100588	Init.	I 69	Bridge Thin Deck Overlay	NB over CR 600 E, BLACK ANKLE CR, 05.30 S SR 45	Vincennes	0	NHPP	\$11,874,250.00	Bridge Consulting	PE	\$1,754,325.00	\$194,925.00	\$1,949,250.00				
										Bridge Construction	CN	\$8,932,500.00	\$992,500.00					\$9,925,000.00
Performance Measure Impacted: Bridge Condition																		
Comments:Include DES 2100589, 2100609, 2100610, 2100611, 2100612, 2100613, 2100614, 2100615, 2100616, 2100617, 2100618, 2100656, 2100657, 2100701, 2100702, 2100725, 2100727, 2100588																		
Indiana Department of Transportation	43993 / 2100571	Init.	SR 43	Bridge Replacement	over RICHLAND CREEK, 06.72 N SR 54	Vincennes	0	STBG	\$3,522,723.00	Bridge Consulting	PE	\$279,200.00	\$69,800.00	\$349,000.00				
										Bridge ROW	RW	\$32,000.00	\$8,000.00			\$40,000.00		
										Bridge Construction	CN	\$2,506,978.40	\$626,744.60					\$3,133,723.00
Performance Measure Impacted: Bridge Condition																		
Comments:Include DES 2100571																		
Indiana Department of Transportation	43994 / 2100034	Init.	SR 45	Intersection Improvement, Roundabout	Intersection of SR 45 and SR 445	Vincennes	.18	STBG	\$1,339,148.00	Safety Construction	CN	\$904,518.40	\$226,129.60					\$1,130,648.00
										Safety Consulting	PE	\$166,800.00	\$41,700.00	\$208,500.00				
Performance Measure Impacted: Safety																		

\*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.

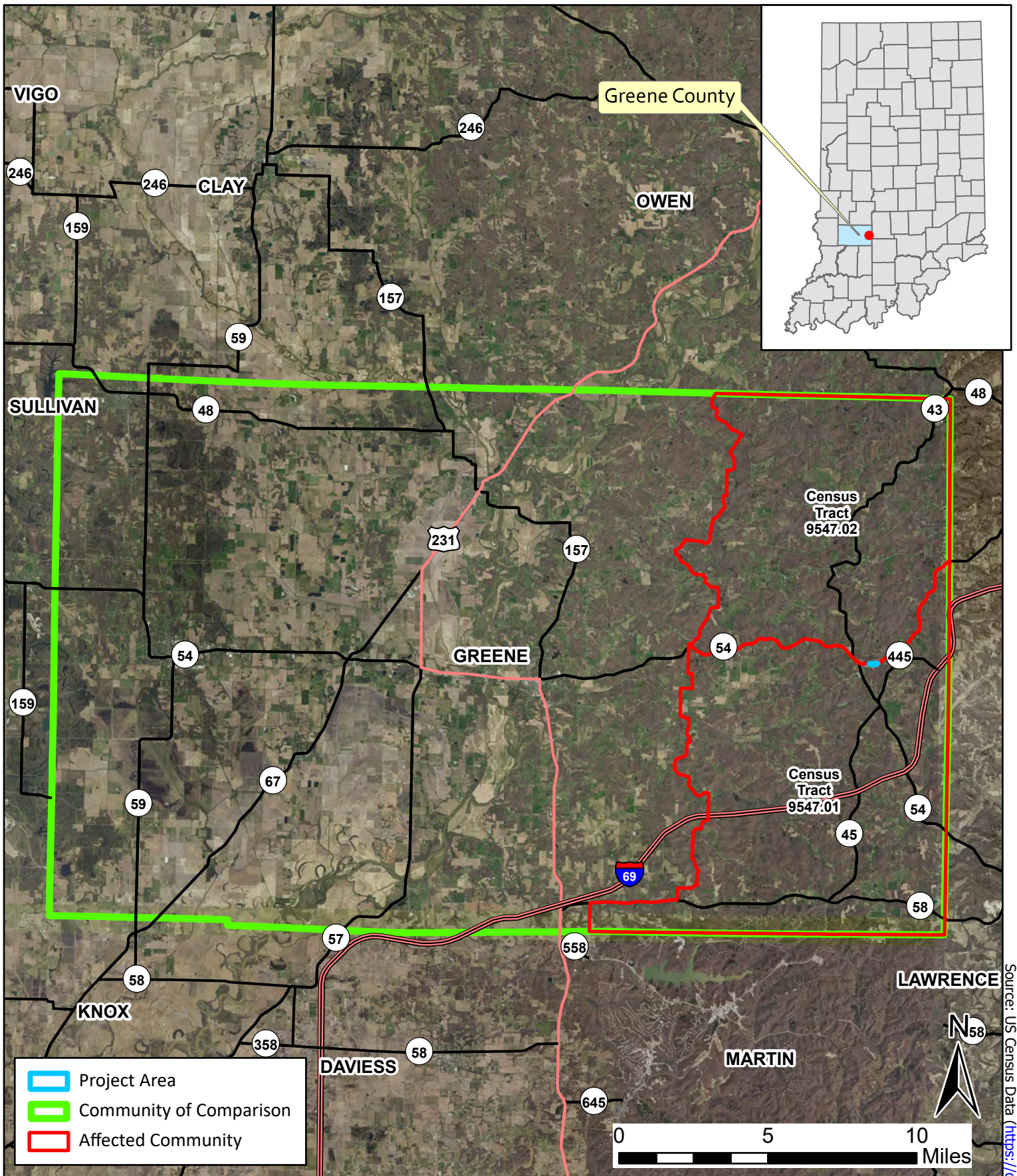
## APPENDIX I

# **Additional Studies**

## Environmental Justice

**Figure 1.**

	<b>COC</b>	<b>AC1</b>	<b>AC2</b>
<b>Minority Populations (ACS 2020, 5-Year Estimate)</b>	<b>Greene County, Indiana</b>	<b>Census Tract 9547.01, Greene County, Indiana</b>	<b>Census Tract 9547.02, Greene County, Indiana</b>
Total Population: Total	32,174	4,660	3,560
Total Population: Not Hispanic or Latino	31,643	4,632	3,557
Total Population: Not Hispanic or Latino; White Alone	30,935	4,542	3,546
Total Population: Not Hispanic or Latino; Black or African American alone	100	19	-
Total Population: Not Hispanic or Latino; American Indian and Alaska Native alone	-	-	-
Total Population: Not Hispanic or Latino; Asian alone	50	11	-
Total Population: Not Hispanic or Latino; Native Hawaiian and Other Pacific Islander alone	20	-	-
Total Population: Not Hispanic or Latino; Some other race alone	-	-	-
Total Population: Not Hispanic or Latino; Two or more races	528	60	11
Total Population: Hispanic or Latino	531	28	3
Total Population: Hispanic or Latino; White alone	332	28	-
Total Population: Hispanic or Latino; Black or African American alone	-	-	-
Total Population: Hispanic or Latino; American Indian and Alaska Native alone	4	-	-
Total Population: Hispanic or Latino; Asian alone	-	-	-
Total Population: Hispanic or Latino; Native Hawaiian and Other Pacific Islander alone	-	-	-
Total Population: Hispanic or Latino; Some other race alone	86	-	-
Total Population: Hispanic or Latino; Two or more races	109	-	3
<b>Number Non-White/Minority</b>	<b>1,239</b>	<b>118</b>	<b>14</b>
<b>Percent Non-White/Minority</b>	<b>3.9%</b>	<b>2.5%</b>	<b>0.39%</b>
<b>125-Percent of COC</b>	<b>4.8%</b>	<b>AC &lt; 125% COC</b>	<b>AC &lt; 125% COC</b>
<b>Potential Minority EJ Impact</b>		<b>No</b>	<b>No</b>
<b>Low-Income (ACS 2020, 5-Year Estimate)</b>			
Population where poverty status is determined: Total	31,777	4,660	3,520
Population where poverty status is determined: Income in the past 12 mo. below poverty level	4,240	566	311
<b>Percent Low-Income</b>	<b>13%</b>	<b>12%</b>	<b>9%</b>
<b>125-Percent of COC</b>	<b>17%</b>	<b>AC &lt; 125% COC</b>	<b>AC &lt; 125% COC</b>
<b>Potential Low-Income EJ Impact?</b>		<b>No</b>	<b>No</b>



Source: US Census Data (<https://data.census.gov/cedsci/>)

**Figure 1 Affected Community**

**EJ Analysis**

SR 445 Guardrail Improvement  
Greene County, Indiana

Des. No. 2100161

Created: 11/8/2022

**Indiana Department  
of Transportation**  
100 North Senate Avenue  
Indianapolis, IN 46204



**Land and Water Conservation Fund (LWCF) County Property List for Indiana (Last Updated March 2022)**

<b>ProjectNumber</b>	<b>SubProjectCode</b>	<b>County</b>	<b>Property</b>
1800021	1800021	Greene	Shakamak State Park
1800131	1800131	Greene	Lyons Community Park
1800156	1800156	Greene	Shakamak State Park
1800363	1800363I	Greene	Green-Sullivan State Forest
1800593	1800593	Greene	Bloomfield Pool

\*Park names may have changed. If acquisition of publically owned land or impacts to publically owned land is anticipated, coordination with IDNR, Division of Outdoor Recreation, should occur.

## Crash Summary

<b>Table 1: Overall Summary</b>	
Total Number of Crashes	9
Number of People Killed	0
Number of People Injured	4
Number of Property Damage Only Crashes	5
Number of Fatal Crashes	0
Number of Incapacitating Injury Crashes	0
Number of Non-incapacitating Injury Crashes	4

<b>Table 2: Summary of Manner of Collisions</b>		
<b>Crash Type</b>	<b>Number of Crashes</b>	<b>Percentage</b>
Collision with Deer	5	56%
Ran Off Road	3	33%
Rear Ended	1	11%
<b>Grand Total</b>	<b>9</b>	<b>100%</b>

<b>Table 3. Summary of Light Conditions</b>		
<b>Time of Day</b>	<b>Number of Crashes</b>	<b>Percentage</b>
Dawn/Dusk	2	22%
Dark (Not Lighted)	5	56%
Daylight	2	22%
<b>Grand Total</b>	<b>9</b>	<b>100%</b>

<b>Table 4. Summary of Injury Crashes</b>		
<b>Crash Type</b>	<b>Number of Crashes</b>	<b>Number of People Injured</b>
Ran Off Road	2	2
Rear Ended	1	2
<b>Grand Total</b>	<b>3</b>	<b>4</b>

<b>Table 5. Summary of Primary Factors</b>		
<b>Primary Factor</b>	<b>Number of Crashes</b>	<b>Percentage</b>
Animal/Object in Roadway	5	56%
Ran Off Road Right	2	22%
Driver Asleep or Fatigued	1	11%
Roadway Surface Condition	1	11%
<b>Grand Total</b>	<b>9</b>	<b>100%</b>

<b>Table 6: Summary of Weather Conditions</b>				
<b>Crash Type</b>	<b>Clear</b>	<b>Rain</b>	<b>Snow</b>	<b>Grand Total</b>
Collision with Deer	4	1	0	5
Ran Off Road	1	1	1	3
Rear Ended	0	0	1	1
<b>Grand Total</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>9</b>

<b>Table 7. Summary of Pavement Conditions</b>				
<b>Crash Type</b>	<b>Dry</b>	<b>Wet</b>	<b>Snow/Slush</b>	<b>Grand Total</b>
Collision with Deer	4	1	0	5
Ran Off Road	1	2	0	3
Rear Ended	0	0	1	1
<b>Grand Total</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>9</b>

<b>Table 8. Summary of Time of Day</b>		
<b>Time of Day</b>	<b>Number of Crashes</b>	<b>Percentage</b>
AM Peak	0	0%
Off Peak	7	78%
PM Peak	2	22%
<b>Grand Total</b>	<b>9</b>	<b>100%</b>

## INDOT Inspection Report Excerpt

Inspector: Chawn,Bawi      Structure Number: 93008356  
 Inspection Date: 03/24/2022      Facility Carried: SR 445

Culvert Inspection Report

**Structure Number:** CV 445-028-00.53

**Inspector:** Chawn,Bawi

### Large Culvert Inspection Report

(8) Asset Code:	93008356	(27) Year Built:	0000
Asset Name:	CV 445-028-00.53	(90) Inspection Date:	03/24/2022
OLD Culvert ID:	445-28-0.53	(91) Inspection Frequency:	48
Team Assignment:	06	<input type="checkbox"/> Additional Treatment Exists	

#### Identification

(2) Highway Agency District:	06	(3) County Code:	028
Sub District:	6100	Ramp ID:	
(42B) Type of Service (Under):	5	<input type="checkbox"/> Adjacent to Roadway	
(7) Facility Carried:	SR 445	(6) Features Intersected:	
(9) Location:	SR 445 0+53 N JCT SR 54	(9.01) Location Additional Description:	
(11) Milepoint:	0	(16) Latitude:	39.03616
		(17) Longitude:	-86.72854
Classification:			
(104) Highway System of the Inventory Route:	0	(26) Functional Classification of Inventory Route:	02

#### Geometric Data

Culvert: Kind of Material:	1. Concrete	Culvert: Type of Structure:	19. 4 Sided Box Culvert
		Min Est Fill Cover (ft):	10.00
Culvert: Max. Horizontal Opening (ft.):	5	Culvert: Max. Vertical Opening (ft.):	5
Barrel Length (ft.):	100.0	(34) Skew:	
		Original Culvert Shape:	Box

Measurement Remarks:

Structure Additional Description: *Reinforced Concrete Box 5' X 5' RCB*

**Openings:**

Direction	Opening Latitude	Opening Longitude	Direction	Opening Latitude	Opening Longitude
1.			3.		
2.			4.		

Openings Comments:

**Follow Up Required:**

\*\*If checked, please describe for follow up:

#### Endangered Species

Bats: seen or heard under structure? \* N  
 Birds/swallows/nests seen? Empty nests present? N  
 \* If yes, add one photo to the dropdown field



### General Condition Ratings

(36A) Bridge Railings:	N	(36C) Approach Guardrail:	N
(36B) Transitions:	N	(36D) Approach Guardrail Ends:	N

**Culvert:**

(62) Culvert - Rating: 6

(62) Culvert Rating Comments: *Spalling in both copings with exposed reinforcement and efflorescence. Random areas of minor honeycombing throughout. Minor to moderate width vertical cracks in both sides of the box. Moderate scaling of invert to the full length.*

**Deck:**

(58) Deck: N

(58a) Deck Comments:

**Superstructure:**

(59) Superstructure: N

(59.01) Superstructure Comments:

**Substructure:**

(60) Substructure: N

(60.01) Substructure Comments: *Scaling and cracking with efflorescence in headwalls. Moderate map cracking with efflorescence in the wing walls.*

CV-Headwall/Anchor Rating 6

CV-Wingwalls Rating 6

**Channel:**

(61) Channel and Channel Protection: 6

(61.01) Channel and Channel Protection Comments: *Moderate scour hole at the east outlet undermining concrete apron. East concrete apron exhibits section loss with exposed reinforcement catching drifts.*

Bank Erosion Rating: 6

Drift/Sediment Rating: 6

Channel Alignment Rating: 6

Check this box if culvert has **OBSTRUCTED** flow

Describe Obstruction:

Overtopping Frequency: