Des 1801500 CE-4

Appendix F

Water Resources

Repeat maps have been removed. The full report can be made available upon request.

Waters Report
I-65 at 109th Avenue in Lake County, Indiana
Interchange Modification Project
Des. No. 1801500

Report Completed on: July 18, 2019

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Field Investigation Dates: May 22, 2019

Site Location:
Sections 3 and 10, Township 34 North, Range 8 West
Crown Point 1:24,000 Quadrangle
Lake County, Indiana
Latitude 41.420172, Longitude -87.321474

Project Description:
Des 1801500 includes the construction of 2 two-lane roundabouts and roadway widening to a four-lane cross section at the interchange of I-65 and 109th Avenue in Lake County, Indiana. The existing interchange is a signalized interchange providing a three-lane cross section with one lane of westbound and eastbound traffic and an auxiliary lane along 109th Avenue that functions as a left-turn lane at each ramp. The interchange is anticipated to be upgraded to include two roundabouts that will provide a four-lane cross section. Two lanes of traffic will available for use in either direction. The roadway will be widened to provide the added travel lanes and usable shoulders. The culvert on the east side of the eastern interchange will be extended to accommodate the widened roadway.

The investigated area is in the City of Crown Point. Land use in the vicinity of the investigated area is primarily disturbed area within the interchange, with a residential parcel adjacent to the eastern project terminus. The major features in the project area include I-65, 109th Avenue, and the Unnamed Tributary (UNT) carried by the culvert on the east side of the project area (detailed in report as UNT 1 to Main Beaver Dam Ditch). A riparian zone borders this UNT within the project area. The investigated area is mostly urban and level, with some steep slopes from the construction of I-65. The investigated area was chosen because it encompasses an area slightly larger than the area that may be needed for construction access for this project. The investigated area occurs entirely within the Midwest region.

Vegetation in the project area is primarily emergent vegetation that is common in highway interchanges, with some scrub/shrub vegetation present. Hydrology in the project area is influenced by several outlets from the interstate and the presence of steep slopes surrounding the bridge carrying I-65 over 109th Avenue. The geomorphology of the quadrants of the interchange is generally concave from the construction of I-65 and associated access ramps. The nearest major hydrological feature is Main Beaver Dam Ditch to the north. The attached floodplains map indicates that there is a mapped floodplain within the investigated area.

Soils:
According to the Soil Survey Geographic (SSURGO) Database for Lake County, Indiana, the investigated area does contain soil areas with nationally listed hydric soils. Soils within and near the investigated area are characterized by moderately well drained to poorly drained hydric soils.

Table 1. Soil Types Within the I-65 at 109th Avenue Investigated Area

Soil Name	Map Abbreviation	Hydric Range
Elliott silt loam, 0 to 2 percent slopes	El	1-32 (Hydric)
Markham silt loam, 2 to 6 percent slopes, eroded	MaB2	1-32 (Hydric)
Milford silt loam, 2 to 6 percent slopes, eroded	Mr	66-99 (Hydric)
Pewamo silty clay loam	Pc	100 (Hydric)

National Wetlands Inventory (NWI) Information:

There are twenty-eight mapped wetlands and linear water features within 0.25 mile of the investigated area. These include three labeled PEM1A (Freshwater Emergent Wetland), one labeled PEM1Ad (Freshwater Emergent Wetland, partially drained), two labeled PEM1Af (Freshwater Emergent Wetland, farmed), two labeled as PEM1C (Freshwater Emergent Wetland, seasonally flooded), one mapped as PFO1/EM1Ad (Freshwater Emergent/Forested Wetland, temporarily flooded, partially drained), three labeled as PFO1Ad (Freshwater Forested Wetland, temporarily flooded, partially drained), one labeled as PFO1C (Freshwater Forested Wetland, seasonally flooded), one labeled as PSS1/EM1A (Freshwater Scrub/Shrub/Emergent Wetland, temporarily flooded), eleven labeled as PUBGx (Palustrine, unconsolidated bottom, excavated pond), and three labeled as R2UBFx (Riverine, lower perennial, semi permanently flooded, excavated).

Table 2. Mapped NWI Features Near the Investigated Area

Wetland/Water Feature Type	Location
PEM1A	East of investigated area
PEM1Ad	West of investigated area
PEM1Af	East of investigated area
PEM1C	Southeast and southwest of investigated area
PFO1/EM1Ad	Northwest of investigated area
PRO1Ad	North of investigated area
PFO1C	Southeast of investigated area
PSS1/EM1A	Northwest of investigated area
PUBGx	Immediately adjacent to investigated area and in beyond all four quadrants of the interchange
R2UBFx	North and southeast of investigated area

HUC:

Main Beaver Dam Ditch – Deep River (040400010504)

Attached Documents:

- Maps (Project Location, Topographic, Aerial Imagery, NWI Map, Floodplain Map, LiDAR Map, Soil Series Map, Watershed Map, Water Resources Map)
- Photographs and Photograph Location and Orientation Map
- Wetland Data Sheets

Field Reconnaissance:

Prior to the field investigation, the USGS topographic map, aerial imagery, the U.S. Geological Survey's (USGS) National Hydrography Dataset (NHD), U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map, the Natural Resources Conservation Service (NRCS) Web Soil Survey for Lake County, and Indiana Geological Survey (IGS) LiDAR data were reviewed to identify potential water resources on the site.

The entire investigated area was visually surveyed during the site visit for potential water features. Areas that were identified during the preliminary desktop review and in the field visit were investigated to determine the potential jurisdictional status of these features. Delineation of wetlands and water features was completed using the *Corps of Engineers Wetland Delineation Manual (1987)* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (2010).* Soils in the project area were evaluated using the *2017 Pocket Guide to Hydric Soil Field Indicators* and a Munsell soil chart. Vegetation in the investigated area was evaluated using various plant identification guides and the USACE *State of Indiana 2016 Wetland Plant List*. Sample points were collected at potential wetland features and associated upland areas to verify the presence or absence of wetland indicators. Linear Features in the investigated area were evaluated using the Indiana Department of Environmental Management's Qualitative Habitat Evaluation Index (QHEI) guidelines. Jurisdictional recommendations were made according to the *US Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook*. Water features that were identified within the investigated area were documented using GPS location.

Stream Features:

UNT 1 to Main Beaver Dam Ditch (UNT 1)

UNT 1 is an intermittent stream that conveys drainage from south to north through the culvert on the east side of the investigated area to Main Beaver Dam Ditch. UNT 1 is not mapped on the attached NWI map but would have a Cowardin Classification of R2UBH (Riverine, perennial, unconsolidated bottom). A review of the US Geological Survey (USGS) *Streamstats* application indicated that UNT 1 had an upstream drainage area of 1.558 square miles. It is mapped as a dotted blue-line stream on the attached topographic map. UNT 1 exhibited an Ordinary High Water Marek (OHWM) width of 8 feet and depth of 18 inches. This stream is considered average quality because it has a substrate of cobble, gravel, and sand, provides moderate in-stream cover, exhibits low sinuosity, and provides riffle/run complexes. This feature is likely jurisdictional under the authority of the USACE because is exhibits an OHWM due to relatively permanent flow patterns and connectivity to Main Beaver Dam Ditch, which connects to Deep River, which connects to Burns Ditch, which connects to the East Arm Little Calumet River, which drains to Lake Michigan. Lake Michigan is a Navigable Waterway. UNT 1 is shown in photos 61 through 68 in the attached photo log.

Table 3. Stream Summary Table

Stream Name	Photos	Lat/Long	OHWM Width (ft)	OHWM Depth (in)	USGS Blue-line?	Riffles? Pools?	Substrate	Quality	Likely Water of U.S.?
UNT 1 to Main Beaver Dam Ditch	61-68	Latitude 41.420164 Longitude -87.319184	8	18	Yes	Yes	Cobble, Gravel, and Sand	Average	Yes

Wetlands:
No suspected wetlands were identified in the investigated area during the desktop review of the site. Ten suspected wetlands were identified during the site visit.

Sample Point 1/Wetland 1
Sample Point 1 (SP1) was taken in an emergent roadside ditch wetland in the southwest quadrant of the western interchange. This site was not mapped on the attached NWI map. Vegetation at this sample point was dominated by Kentucky Bluegrass (*Poa pratensis*, FAC). This vegetation community passed the dominance test and prevalence index for hydrophytic vegetation. Hydrology at SP1 met the conditions of Surface Water (A1), High Water Table (A2), and Saturation (A3). Soils at SP1 were 10 YR 2/1 (100%) from 0-4 inches, 10 YR 6/1 (90%) with redox concentrations of 10 YR 4/8 (10%) from 4-20 inches. All soil horizons were clay loam. This met the criteria for Depleted Below Dark Surface (A11) and Depleted Matrix (F3). This sample point met the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was within a wetland. Wetland 1 is approximately 0.15 acre in size. It is likely considered a Water of the State because it does not exhibit a significant nexus with a traditionally navigable waterway. It is likely considered exempt from isolated permitting requirements because it is under 0.5 acre in area and is an incidental feature of a roadside drainage ditch. The Indiana Department of Environmental Management (IDEM) retains the authority to determine if a wetland is considered exempt. Wetland 1 is considered poor quality due to its lack of biodiversity and habitat for aquatic flora and fauna.

Sample Point 2
Sample Point 2 (SP2) was taken south of and immediately adjacent to SP1. Vegetation at this sample point was dominated by Tall Fescue (*Schedonorous arundinaceus*, FACU), Kentucky Bluegrass (*Poa pratensis*, FAC), and Red Clover (*Trifolium pretense*, FACU). This vegetation community did not pass the rapid test, dominance test, or prevalence index for hydrophytic vegetation. No hydrology indicators were observed at SP2. Soils at SP2 were 10 YR 3/2 (55%) and 10 YR 2/2 (45%) from 0-12 inches, and 10 YR 2/1 (98%) with redox concentrations of 10 YR 5/8 (2%) from 12-18 inches. A restrictive layer of hardpan was encountered at 18 inches. All soil horizons were clay loam. No wetland criteria were met at this sample point.

Sample Point 3/Wetland 2

Sample Point 3 (SP3) was taken in a roadside ditch wetland in the northwest quadrant of the western interchange. This site was not mapped on the attached NWI map. Vegetation at this sample point was dominated by Reed Canary Grass (*Phalaris arundinacea*, FACW). This vegetation community passed the rapid test, dominance test, and prevalence index for hydrophytic vegetation. Hydrology at SP3 met the conditions of High Water Table (A2) and Saturation (A3). Soils at SP3 were 10 YR 2/1 (95%) from 0-8 inches with redox concentrations of 2.5 YR 5/8 in the pore lining (5%), and 10 YR 5/1 (90%) with redox concentrations of 10 YR 5/8 (10%) from 8-16 inches. All soil horizons were silty clay. SP3 exhibited Depleted Below Dark Surface (A11) and Depleted Matrix (F3). This sample point met the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was within a wetland. Wetland 2 is approximately 0.14 acre in size; however, wetland conditions continue beyond the boundary drawn in the attached graphics to Main Beaver Dam Ditch to the north. Wetland 2 is likely a Water of the United States due to its connectivity to Main Beaver Dam Ditch, which is another likely jurisdictional water feature. Wetland 2 is poor quality due to its lack of biodiversity and habitat for aquatic fauna and flora.

Sample Point 4

Sample Point 4 (SP4) was taken west of and immediately adjacent to SP3. Vegetation at this sample point was dominated by Red Fescue (*Festuca rubra*, FACU) and Kentucky Bluegrass (*Poa pratensis*, FAC). This vegetation community did not pass the rapid test, dominance test, or prevalence index for hydrophytic vegetation. No hydrology indicators were observed at SP4. Soils at SP4 were 10 YR 2/1 (100%) from 0-6 inches, and 10 YR 2/1 (60%) and 10 YR 5/2 (38%) with redox concentrations of 10 YR 5/6 (2%) in the matrix from 6-20 inches. All soil horizons were silty clay. This met the criteria for Redox Dark Surface (F6). This sample point met the criteria for hydric soils but did not meet the criteria for hydrophytic vegetation or wetland hydrology; therefore, it is not within a wetland.

Sample Point 5/Wetland 3

Sample Point 5 (SP5) was taken in a roadside ditch wetland in the northeast quadrant of the western interchange. This site was not mapped on the attached NWI map. Vegetation at this sample point was dominated by Common Reed (*Phragmites australis*, FACW). This vegetation community passed the rapid test, dominance test, and prevalence index for hydrophytic vegetation. Hydrology at SP5 met the conditions of Surface Water (A1), High Water Table (A2), and Saturation (A3). Soils at SP5 were 10 YR 2/1 (100%) from 0-5 inches with a texture of muck from 0-5 inches. From 5-10 inches, the soil was Gley N 3/1 (50%) with redox depletions of Gley N 5/1 (30%) and concentrations of 10 YR 5/8 (20%) in the matrix with a texture of silty clay. From 10-20 inches, the soil was Gley N 5/1 (90%) with redox concentrations of 10 YR 4/8 (10%) in the matrix with a texture of silty clay. This met the criteria for Hydrogen Sulfide (A4), 2cm Muck (A10), Loamy Mucky Mineral (F1), and Loamy Gleyed Matrix (F2). This sample point met the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was within a wetland. Wetland 3 is approximately 0.07 acre on the attached map; however, it extends north of the review area to a drainage culvert that is hydrologically connected to Wetland 2. Wetland 3 is likely a Waters of the US because it exhibits connectivity to Wetland 2, which is a likely jurisdictional water feature. Wetland 3 is poor quality because it lacks biodiversity and provides little habitat for aquatic flora and fauna.

Sample Point 6
Sample Point 6 (SP6) was taken east of and immediately adjacent to SP5. Vegetation at this sample point was dominated by Red Fescue (*Festuca rubra*, FACU) and Kentucky Bluegrass (*Poa pratensis*, FAC). This vegetation community did not pass the rapid test, dominance test, or prevalence index for hydrophytic vegetation. No hydrology indicators were observed at SP6. Soils at SP6 were 10 YR 3/2 (60%) and 10 YR 4/2 (40%) from 0-5 inches with a texture of silty clay loam, and 10 YR 4/2 (95%) with redox concentrations of 10 YR 5/8 (5%) from 5-18 inches with a texture of clay. A restrictive layer of hardpan was encountered at 18 inches. This met the criteria for Depleted Matrix (F3). This sample point met the criteria for hydric soils but did not meet the criteria for hydrophytic vegetation or wetland hydrology; therefore it is not within a wetland.

Sample Point 7/Wetland 4
Sample Point 7 (SP7) was taken in a wetland in the southeast quadrant of the western interchange. This site was not mapped on the attached NWI map. Vegetation at this sample point was dominated by Common Reed (*Phragmites australis*, FACW), Late Goldenrod (*Solidago gigantea*, FACW), and Black Willow (*Salix nigra*, OBL. This vegetation community passed the rapid test, dominance test, and prevalence index for hydrophytic vegetation. Hydrology at SP7 met the conditions of Surface Water (A1), High Water Table (A2), Saturation (A3), and Hydrogen Sulfide Odor (C1). Soils at SP7 were 10 YR 2/1 (100%) from 0-4 inches, and 10 YR 6/1 (95%) with redox concentrations of 10 YR 5/8 (5%) from 4-20 inches. All soil horizons were clay loam. This met the criteria for Hydrogen Sulfide (A4), Depleted Below Dark Surface (A11), and Depleted Matrix (F3). This sample point met the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was within a wetland. Wetland 4 is approximately 0.59 acre in size. Wetland 4 is likely considered a Water of the State because it does not exhibit connectivity to any other likely jurisdictional water features. It is likely considered exempt from isolated permitting requirements because it is an incidental feature of a roadside drainage ditch. The Indiana Department of Environmental Management (IDEM) retains the authority to determine if a wetland is considered exempt. Wetland 4 is considered poor quality because it lacks biodiversity and does not provide significant habitat for aquatic flora or fauna.

Sample Point 8
Sample Point 8 (SP8) was taken west of and immediately adjacent to SP7. Vegetation at this sample point was dominated by Red Fescue (*Festuca rubra*, FACU) and Kentucky Bluegrass (*Poa pratensis*, FAC). This vegetation community did not pass the rapid test, dominance test, or prevalence index for hydrophytic vegetation. No hydrology indicators were observed at SP8. Soils at SP8 were 10 YR 3/2 (100%) from 0-1 inches with silty clay texture, and 10 YR 4/2 (80%) and 10 YR 3/1 (15%) with redox concentrations of 10 YR 5/8 (5%) from 1-16 inches with a texture of silty clay. A restrictive layer of hardpan was encountered at 16 inches. This met the criteria for Depleted Below Dark Surface (A11) and Depleted Matrix (F3). This sample point met the criteria for hydric soils but did not meet the criteria for hydrophytic vegetation or wetland hydrology; therefore, it was not within a wetland.

Sample Point 9/Wetland 5
Sample Point 9 (SP9) was taken in a wetland in the southwest quadrant of the eastern interchange. This site was not mapped on the attached NWI map. Vegetation at this sample point was dominated by Common Reed (*Phragmites australis*, FACW), Wide-leaf Cattail (*Typha angustifolia*, OBL), and Lamp Rush (*Juncus effusus*, OBL). This vegetation community passed the rapid test, dominance test, and prevalence index for hydrophytic vegetation. Hydrology at SP9 met the conditions of Surface Water (A1), High Water Table (A2), and Saturation (A3). Soils at SP9 were 10 YR 2/1 (100%) from 0-4 inches with a texture of muck, and 10 YR 5/1 (95%) with redox concentrations of 10 YR 5/8 (5%) in the matrix from 4-12 inches with a texture of silty clay. This met the criteria for Hydrogen Sulfide (A4), 2cm Muck (A10), and Depleted Matrix (F3). This sample point met the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was within a wetland. Wetland 5 is approximately 1.37 acres in size. It is likely considered a Water of the US because it shares connectivity with Wetland 6 and Wetland 8 through culverts, which are likely jurisdictional water features. Wetland 5 is considered poor quality because it lacks biodiversity and does not provide significant habitat for wetland flora and fauna.

Sample Point 10
Sample Point 10 (SP10) was taken west of and immediately adjacent to SP9. Vegetation at this sample point was dominated by Kentucky Bluegrass (*Poa pratensis*, FAC), Purple Henbit (*Lamium purpureum*, UPL), and Black Medic (*Medicago lupulina*, FACU). This vegetation community did not pass the rapid test, dominance test, or prevalence index for hydrophytic vegetation. No hydrology indicators were observed at SP10. Soils at SP10 were 10 YR 3/1 (100%) from 0-13 inches, and 10 YR 5/2 (60%) with redox concentrations of 10 YR 5/8 (20%) and depletions of 10 YR 4/1 (20%) from 13-20 inches. All soil horizons were clay loam. This did not meet any criteria for hydric soils. This sample point did not meet the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was not within a wetland.

Sample Point 11/Wetland 6
Sample Point 11 (SP11) was taken in a roadside ditch wetland in the northwest quadrant of the eastern interchange. This site was not mapped on the attached NWI map. Vegetation at this sample point was dominated by Common Reed (*Phragmites australis*, FACW). This vegetation community passed the rapid test, dominance test, and prevalence index for hydrophytic vegetation. Hydrology at SP11 met the conditions of Surface Water (A1), High Water Table (A2) Saturation (A3), and Hydrogen Sulfide Odor (C1). Soils at SP11 were 10 YR 2/1 (100%) from 0-5 inches with a texture of muck, Gley N 3/1 (50%) with redox concentrations of 10 YR 5/8 (20%) and depletions of Gley N 5/1 from 5-10 inches with a texture of silty clay, and Gley N 5/1 (90%) with redox concentrations of 10 YR 5/8 (10%) from 10-20 inches with a texture of silty clay. This met the criteria for Hydrogen Sulfide (A4), Depleted Below Dark Surface (A11), and Loamy Gleyed Matrix (F2). This sample point met the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was within a wetland. Wetland 6 is approximately 0.38 acre in size. It is likely considered a Water of the US because it exhibits connectivity to Wetland 7 through a drainage culvert, which is a likely Water of the US. Wetland 6 is considered poor quality because it lacks biodiversity and does not provide significant habitat for aquatic flora and fauna.

Sample Point 12
Sample Point 12 (SP12) was taken west of and immediately adjacent to SP12. Vegetation at this sample point was dominated by Red Fescue (*Festuca rubra*, FACU) and Kentucky Bluegrass (*Poa pratensis*, FAC). This vegetation community did not pass the rapid test, dominance test, or prevalence index for hydrophytic vegetation. No hydrology indicators were observed at SP12. Soils at SP12 were 10 YR 2/2 (100%) from 0-3 inches, 10 YR 2/1 (100%) from 3-15 inches, and 10 YR 2/1 (97%) with redox concentrations of 10 YR 5/6 (3%) from 15-20 inches. All soil horizons had a texture of Silty Clay. This did not meet any criteria for hydric soils. This sample point did not meet the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was not within a wetland.

Sample Point 13/Wetland 7
Sample Point 13 (SP13) was taken in a roadside ditch wetland in the northeast quadrant of the eastern interchange that is immediately adjacent to UNT 1. This site was not mapped on the attached NWI map. Vegetation at this sample point was dominated by Red Fescue (*Festuca rubra*, FACU), Kentucky Bluegrass (*Poa pratensis*, FAC), and Common Reed (*Phragmites australis*, FACW). This vegetation community passed the dominance test and prevalence index for hydrophytic vegetation. Hydrology at SP13 met the conditions of Surface Water (A1), High Water Table (A2) and Saturation (A3). Soils at SP13 were 10 YR 2/1 (100%) from 0-4 inches with a texture of muck and 10 YR 5/1 (95%) with redox concentrations of 10 YR 5/8 (5%) from 4-20 inches with a texture of silty clay. This met the criteria for 2cm Muck (A10), Depleted Below Dark Surface (A12), and Depleted Matrix (F3). This sample point met the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was within a wetland. Wetland 7 is approximately 0.19 acre. It is likely considered a Water of the US because of its connectivity to UNT 1, which is another likely jurisdictional water feature. Wetland 7 is considered poor quality because it lacks biodiversity and provides relatively little habitat for aquatic flora and fauna.

Sample Point 14
Sample Point 14 (SP14) was taken east of and immediately adjacent to SP13. Vegetation at this sample point was dominated by Kentucky Bluegrass (*Poa pratensis*, FAC), Red Clover (*Trifolium pratense*, FACU), and Black Medic (*Medicago lupulina*, FACU). This vegetation community did not pass the rapid test, dominance test, or prevalence index for hydrophytic vegetation. No hydrology indicators were observed at SP14. Soils at SP14 were 10 YR 2/2 (100%) from 0-4 inches, 10 YR 5/2 (98%) with redox concentrations of 10 YR 5/6 (2%) from 4-15 inches, and 10 YR 5/1 (95%) with redox concentrations of 10 YR 5/6 (5%) from 15-20 inches. All soil horizons were clay. This met the criteria for Depleted Below Dark Surface (A11) and Depleted Matrix (F3). This sample point met the criteria for hydric soils but did not meet the criteria for hydrophytic vegetation or wetland hydrology; therefore, it was not within a wetland.

Sample Point 15/Wetland 8
Sample Point 15 (SP15) was taken in a roadside ditch wetland in the southeast quadrant of the eastern interchange and immediately adjacent to UNT 1. This site was not mapped on the attached NWI map. Vegetation at this sample point was dominated by Wide-leaf Cattails (*Typha angustifolia*, OBL) and Kentucky Bluegrass (*Poa pratensis*, FAC). This vegetation community passed the dominance test and prevalence index for hydrophytic vegetation. Hydrology at SP15

met the conditions of Surface Water (A1), High Water Table (A2), and Saturation (A3). Soils at SP15 were 10 YR 2/1 (100%) from 0-4 inches with a texture of muck, and 10 YR 5/1 (95%) with redox concentrations of 10 YR 5/8 (5%) from 4-20 inches with a texture of silty clay. This met the criteria for 2cm Muck (A10), Depleted Below Dark Surface (A11), and Depleted Matrix (F3). This sample point met the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was within a wetland. Wetland 8 is approximately 0.03 acre in area. It is likely considered a Water of the US because it is connected to UNT 1, which is a likely jurisdictional water feature. Wetland 8 is low quality because it lacks biodiversity and provides relatively little habitat for aquatic flora and fauna.

Sample Point 16

Sample Point 16 (SP16) was taken south of and immediately adjacent to SP15. Vegetation at this sample point was dominated by Red Fescue (*Festuca rubra*, FACU), Kentucky Bluegrass (*Poa pratensis*, FAC), and Red Clover (*Trifolium pretense*, FACU). This vegetation community did not pass the rapid test, dominance test, or prevalence index for hydrophytic vegetation. No hydrology indicators were observed at SP16. Soils at SP16 were 10 YR 2/2 (100%) from 0-12 inches with a texture of silty clay. A restrictive layer of gravel was encountered at 12 inches. This did not meet any criteria for hydric soils. This sample point did not meet the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was not within a wetland.

Sample Point 17/Wetland 9

Sample Point 17 (SP17) was taken in a roadside ditch wetland south of 109th Avenue and east of the eastern interchange. This wetland was immediately adjacent to UNT 1. This site was not mapped on the attached NWI map. Vegetation at this sample point was dominated by Kentucky Bluegrass (*Poa pratensis*, FAC), and Common Reed (*Phragmites australis*, FACW). This vegetation community passed the dominance test and prevalence index for hydrophytic vegetation. Hydrology at SP17 met the conditions of Surface Water (A1), High Water Table (A2), and Saturation (A3). Soils at SP17 were 10 YR 3/2 (100%) from 0-1 inches with a texture of muck, and 10 YR 5/2 (50%) with redox concentrations of 10 YR 5/8 (15%) and depletions of N 5/1 (35%) from 2-9 inches with a texture of silty clay. This met the criteria for 2cm Muck (A10), Depleted Below Dark Surface (A11) and Depleted Matrix (F3). This sample point met the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was within a wetland. Wetland 9 is approximately 0.15 acre in area. Wetland 9 is likely considered a Water of the US because of its connectivity to UNT 1, which is a likely jurisdictional feature. Wetland 9 is considered poor quality because it lacks biodiversity and provides relatively little habitat for aquatic flora and fauna.

Sample Point 18

Sample Point 18 (SP18) was taken south of and immediately adjacent to SP17. Vegetation at this sample point was dominated by Red Fescue (*Festuca rubra*, FACU), Kentucky Bluegrass (*Poa pratensis*, FAC), and Red Clover (*Trifolium pretense*, FACU). This vegetation community did not pass the rapid test, dominance test, or prevalence index for hydrophytic vegetation. No hydrology indicators were observed at SP18. Soils at SP18 were 10 YR 3/2 (100%) from 0-12 inches with a texture of silty clay, and 10 YR 5/2 (90%) with redox concentrations of 10 YR 5/8 (10%) from 12-20 inches with a texture of silty clay loam. This met the criteria for Depleted

Below Dark Surface (A11). This sample point met the criteria for hydric soils but did not meet the criteria for hydrophytic vegetation or wetland hydrology; therefore, it was not within a wetland.

Sample Point 19/Wetland 10

Sample Point 19 (SP19) was taken in a roadside ditch wetland north of 109th Avenue and east of the eastern interchange. This site was not mapped on the attached NWI map. Vegetation at this sample point was dominated by Kentucky Bluegrass (*Poa pratensis*, FAC). This vegetation community passed the dominance test and prevalence index for hydrophytic vegetation. Hydrology at SP19 met the conditions of Surface Water (A1), High Water Table (A2) and Saturation (A3). Soils at SP19 were Gley 5GY 4/1 (80%) and 10 YR 2/1 (10%) with redox concentrations of 7.5 YR 5/8 (10%) from 0-6 inches with a texture of silty clay. This met the criteria for Loamy Gleyed Matrix (F2). This sample point met the criteria for hydrophytic vegetation, wetland hydrology, and hydric soils; therefore, it was within a wetland. Wetland 10 is approximately 0.02 acre in area. It is likely a Water of the State because it lacks a significant nexus with a traditionally navigable waterway. It is likely considered exempt from isolated permitting requirements because it is under 0.5 acre in area and is an incidental feature in a residential lawn. The Indiana Department of Environmental Management (IDEM) retains the authority to determine if a wetland is considered exempt. Wetland 10 is poor quality because it lacks biodiversity and provides relatively little habitat for aquatic flora and fauna.

Sample Point 20

Sample Point 20 (SP20) was taken south of and immediately adjacent to SP19. Vegetation at this sample point was dominated by Red Fescue (*Festuca rubra*, FACU) and Kentucky Bluegrass (*Poa pratensis*, FAC). This vegetation community did not pass the rapid test, dominance test, or prevalence index for hydrophytic vegetation. No hydrology indicators were observed at SP20. Soils at SP20 were 10 YR 3/2 (100%) from 0-2 inches with a texture of silty clay loam, and 10 YR 3/1 (90%) with redox concentrations of 7.5 YR 5/8 (5%) and depletions of 10 YR 5/2 (5%) from 2-9 inches with a texture of silty clay loam. A restrictive layer of gravel was encountered at 9 inches. This met the criteria for Redox Dark Surface (F6). This sample point met the criteria for hydric soil but did not meet the criteria for hydrophytic vegetation or wetland hydrology; therefore, it was not within a wetland.

Table 4. Sample Point Summary Table

Data Point	Photos	Vegetation	Soils	Hydrology	Wetland
SP1	4-7	Yes	Yes	Yes	Yes
SP2	8-11	No	No	No	No
SP3	12-14	Yes	Yes	Yes	Yes
SP4	15-17	No	Yes	No	No
SP5	19-21	Yes	Yes	Yes	Yes
SP6	22-23	No	Yes	No	No
SP7	24, 28	Yes	Yes	Yes	Yes
SP8	29-31	No	Yes	No	No
SP9	35-37	Yes	Yes	Yes	Yes
SP10	38-40	No	No	No	No
SP11	44-45	Yes	Yes	Yes	Yes
SP12	47-48	No	No	No	No
SP13	50-51	Yes	Yes	Yes	Yes
SP14	52-54	No	Yes	No	No
SP15	55-57	Yes	Yes	Yes	Yes
SP16	59-60	No	No	No	No
SP17	71	Yes	Yes	Yes	Yes
SP18	72-74	No	Yes	No	No
SP19	75-76	Yes	Yes	Yes	Yes
SP20	77-78	No	Yes	No	No

Table 5. Wetland Summary Table

Wetland Name	Photos	Lat/Long	Type	Total Area (Acres)	Quality	Likely Water of the US?
Wetland 1	3-7	41.419995 N -87.323162 W	Emergent	0.15	Poor	No
Wetland 2	12-14	41.420484 N -87.322891 W	Emergent	0.14	Poor	Yes
Wetland 3	18-21	41.420530 N -87.322580 W	Emergent	0.07	Poor	Yes
Wetland 4	24-28	41.419973 N -87.321955 W	Emergent	0.59	Poor	No
Wetland 5	32-37	41.419834 N -87.319786 W	Emergent	1.37	Poor	Yes
Wetland 6	41-45	41.420486 N -87.319764 W	Emergent	0.38	Poor	Yes
Wetland 7	49-51	41.420563 N -87.319433 W	Emergent	0.19	Poor	Yes
Wetland 8	55-58	41.420009 N -87.319363 W	Emergent	0.03	Poor	Yes
Wetland 9	69-71	41.420073 N -87.317715 W	Emergent	0.15	Poor	Yes
Wetland 10	75-76	41.420286 N -87.316742 W	Emergent	0.02	Poor	No

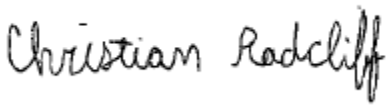
Open Water:
An open water body was identified outside of the investigated area during the desktop review on the NWI map southeast of the investigated area. The field visit confirmed that this open water feature is not located within the investigated area. No other open water features were identified within the investigated area.

Other Features:
The investigated area was assessed for the presence of other water features. Other water features include roadside ditches, areas of concentrated flow, or other unusual drainage features. These features may be considered jurisdictional if they exhibit a Significant Nexus to a Traditionally Navigable Waterway. No other features were identified during the site visit.

Conclusions:
The site investigation identified one intermittent stream and 10 wetlands. UNT 1 to Main Beaver Dam Ditch, Wetlands 2, 3, 5, 6, 7, 8, and 9 are likely Waters of the US. Wetlands 1, 4, and 10 are likely Waters of the State and are likely considered exempt. All wetlands are poor quality emergent wetlands. Every effort should be taken to avoid and minimize impacts to these waterways. 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 appropriate regulatory staff of the US Army Corps of Engineers. The exemption status of all Waters of the State is ultimately made by the appropriate regulatory staff of IDEM. This report is our best judgment based on the guidelines set forth by the Corps.

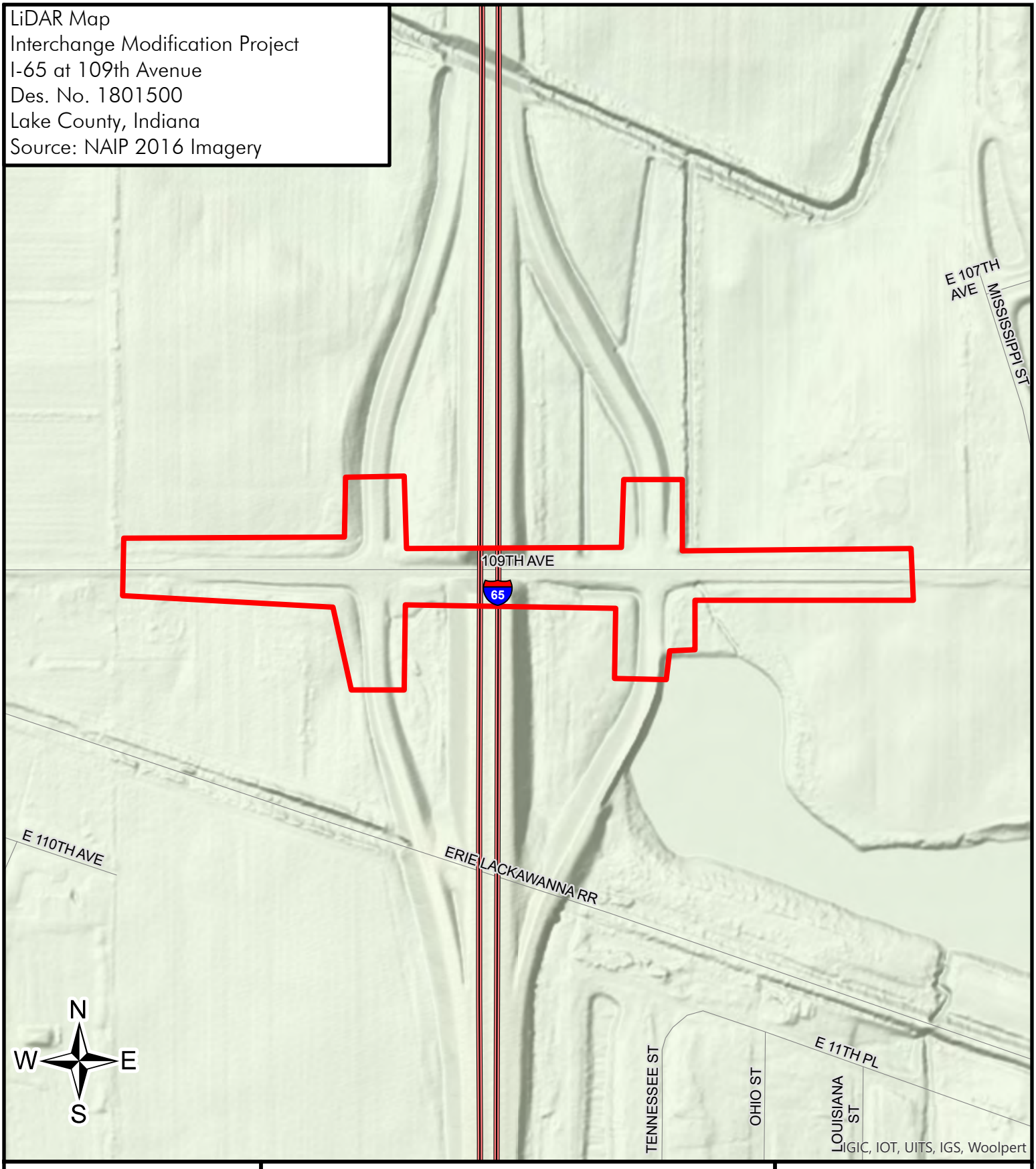
Acknowledgement:
This waters determination has been prepared based on the best available information, interpreted in the light of the investigator's training, experience and professional judgement in conformance with the *1987 Corps of Engineers Wetlands Delineation Manual*, the appropriate regional supplement, the USACE *Jurisdictional Determination Form Instructional Guidebook*, and other appropriate agency guidelines.

Christian Radcliff



Ecologist
Green 3, LLC
Date: July 18, 2019

Supporting Documentation:
- Maps
- Photos
- Wetland Delineation Data Sheet

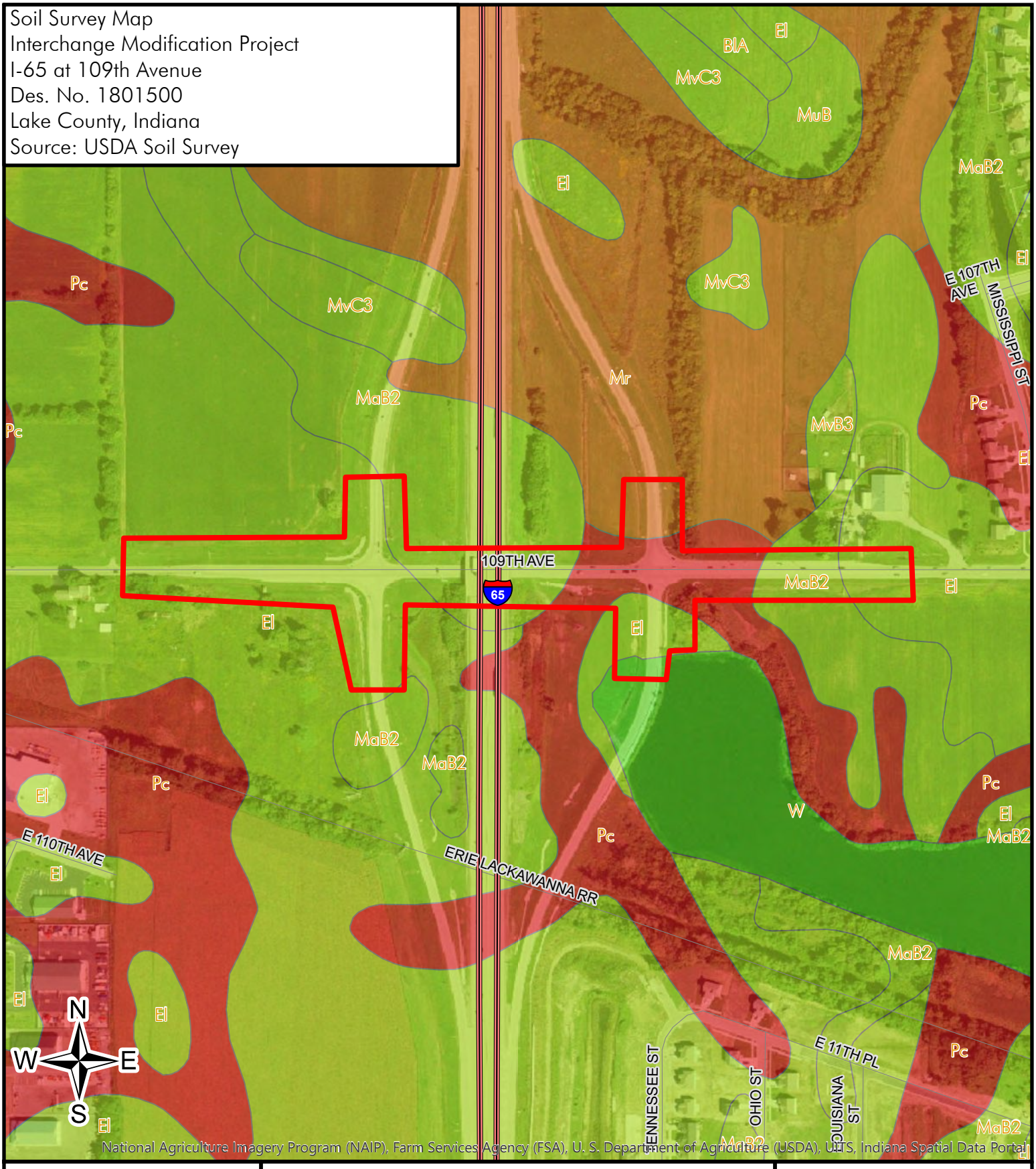


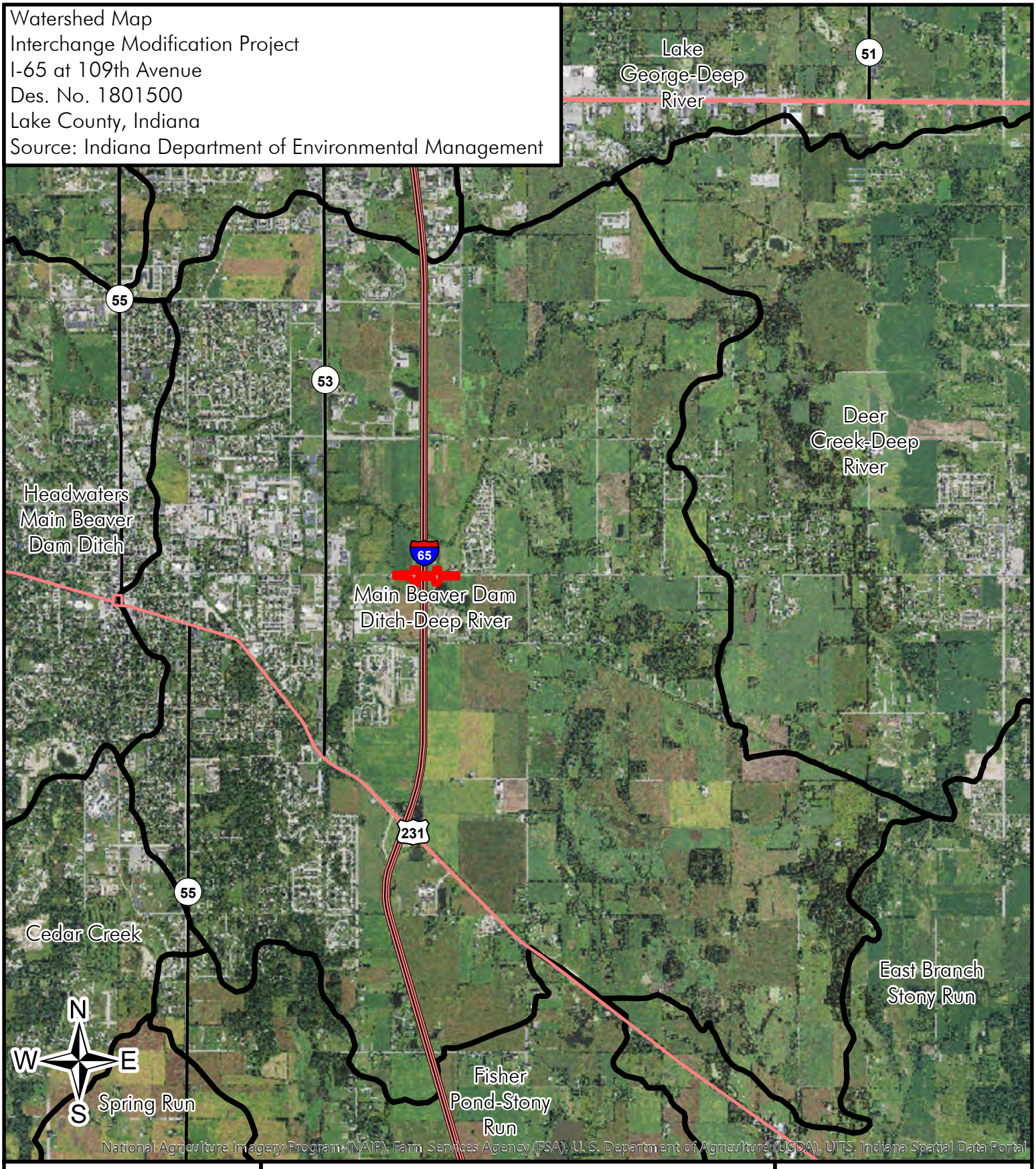
0 0.03 0.05 0.1 Miles

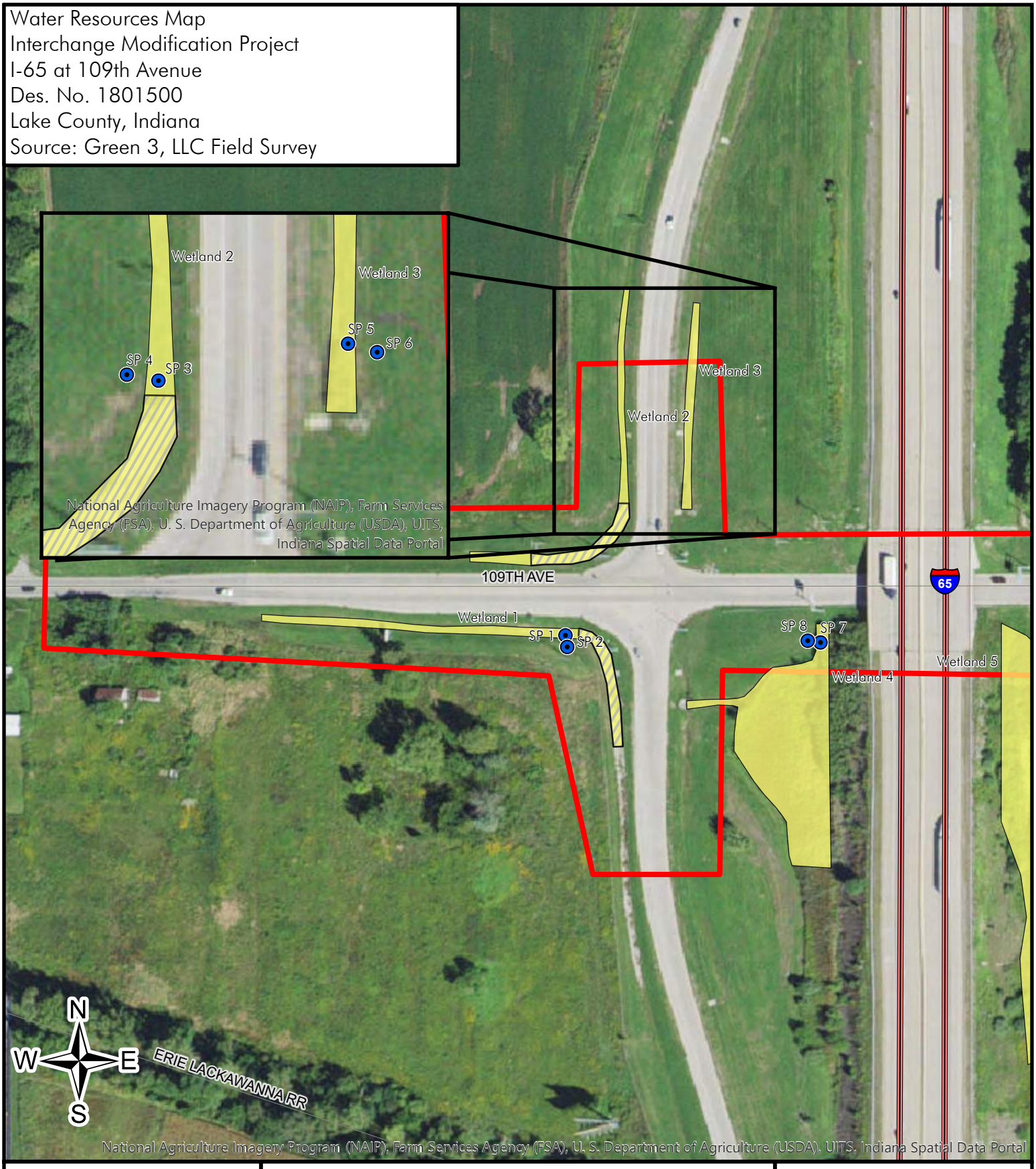
Investigated Area

7/16/2019

green • 3


Soil Survey Map
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: USDA Soil Survey
BlA
El
MvC3
MuB
MaB2
Pc
Mr
MvB3
109TH AVE
65
E 107TH AVE
MISSISSIPPI ST
E 110TH AVE
ERIE LACKAWANNA RR
E 11TH PL
TENNESSEE ST
OHIO ST
LOUISIANA ST
W
N
S
E
National Agriculture Imagery Program (NAIP), Farm Services Agency (FSA), U. S. Department of Agriculture (USDA), USTS, Indiana Spatial Data Portal
0 0.03 0.05 0.1
Miles
Investigated Area
0 (Non-hydric)
1-32 (Hydric)
66-99 (Hydric)
100 (Hydric)
7/16/2019
green • 3


Watershed Map
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: Indiana Department of Environmental Management
Lake George-Deep River
51
55
53
Deer Creek-Deep River
Headwaters Main Beaver Dam Ditch
65
Main Beaver Dam Ditch-Deep River
231
55
Cedar Creek
East Branch Stony Run
N
W
E
S
Spring Run
Fisher Pond-Stony Run
National Agriculture Imagery Program (NAIP), Farm Services Agency (FSA), U. S. Department of Agriculture (USDA), UITS, Indiana Spatial Data Portal
0 0.3 0.6 1.2
Miles
Investigated Area
HUC - 12
green • 3
7/16/2019


Water Resources Map
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: Green 3, LLC Field Survey
Wetland 2
Wetland 3
SP 5
SP 6
SP 4
SP 3
Wetland 3
Wetland 2
National Agriculture Imagery Program (NAIP), Farm Services Agency (FSA), U. S. Department of Agriculture (USDA), UITS, Indiana Spatial Data Portal
109TH AVE
65
Wetland 1
SP 1
SP 2
SP 8
SP 7
Wetland 5
Wetland 4
N
W
E
S
ERIE LACKAWANNA RR
National Agriculture Imagery Program (NAIP), Farm Services Agency (FSA), U. S. Department of Agriculture (USDA), UITS, Indiana Spatial Data Portal
0 0.01 0.02 0.04
Miles
Riprap
Sample Point
Emergent Wetland
Investigated Area
7/16/2019
green • 3

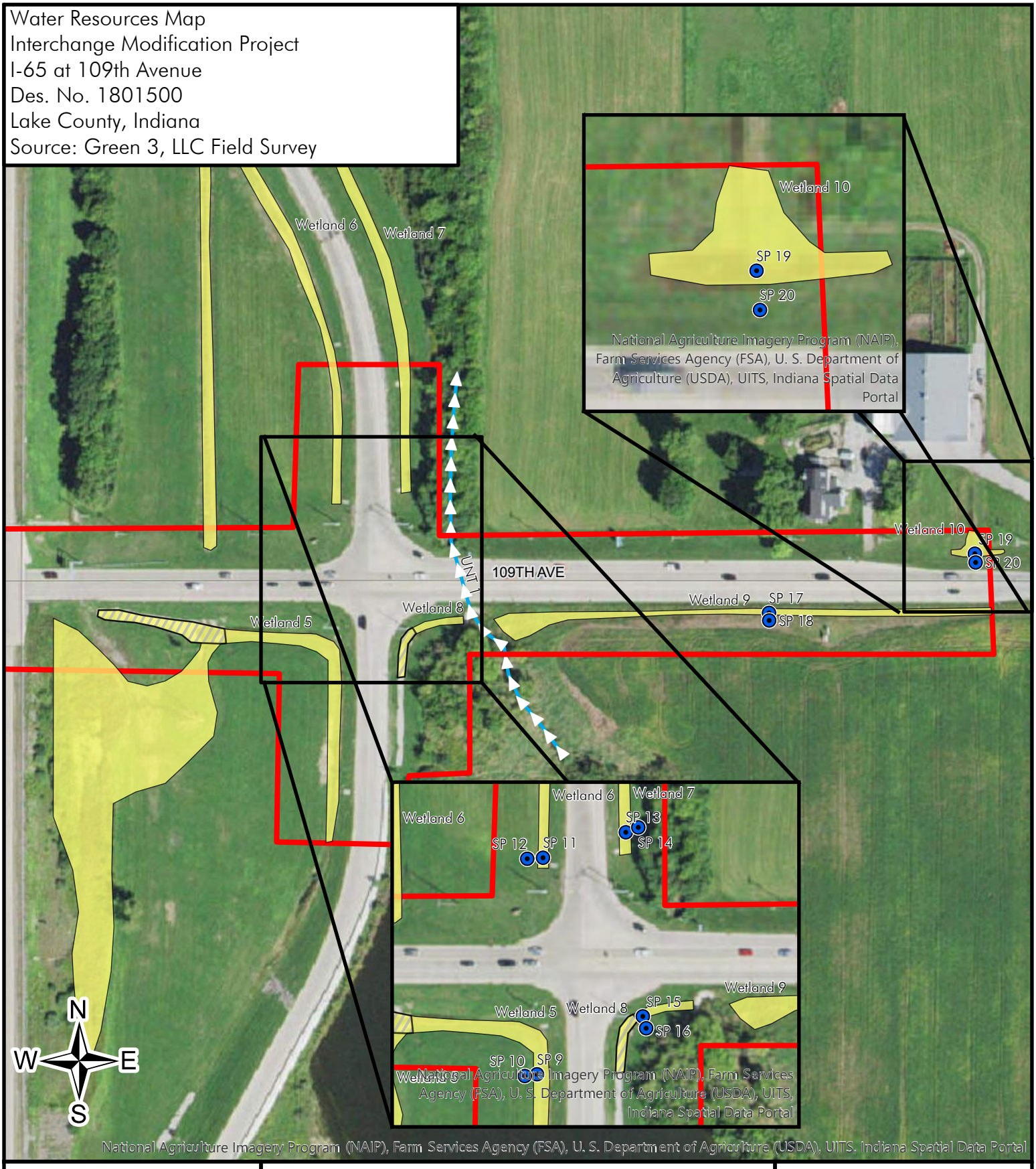
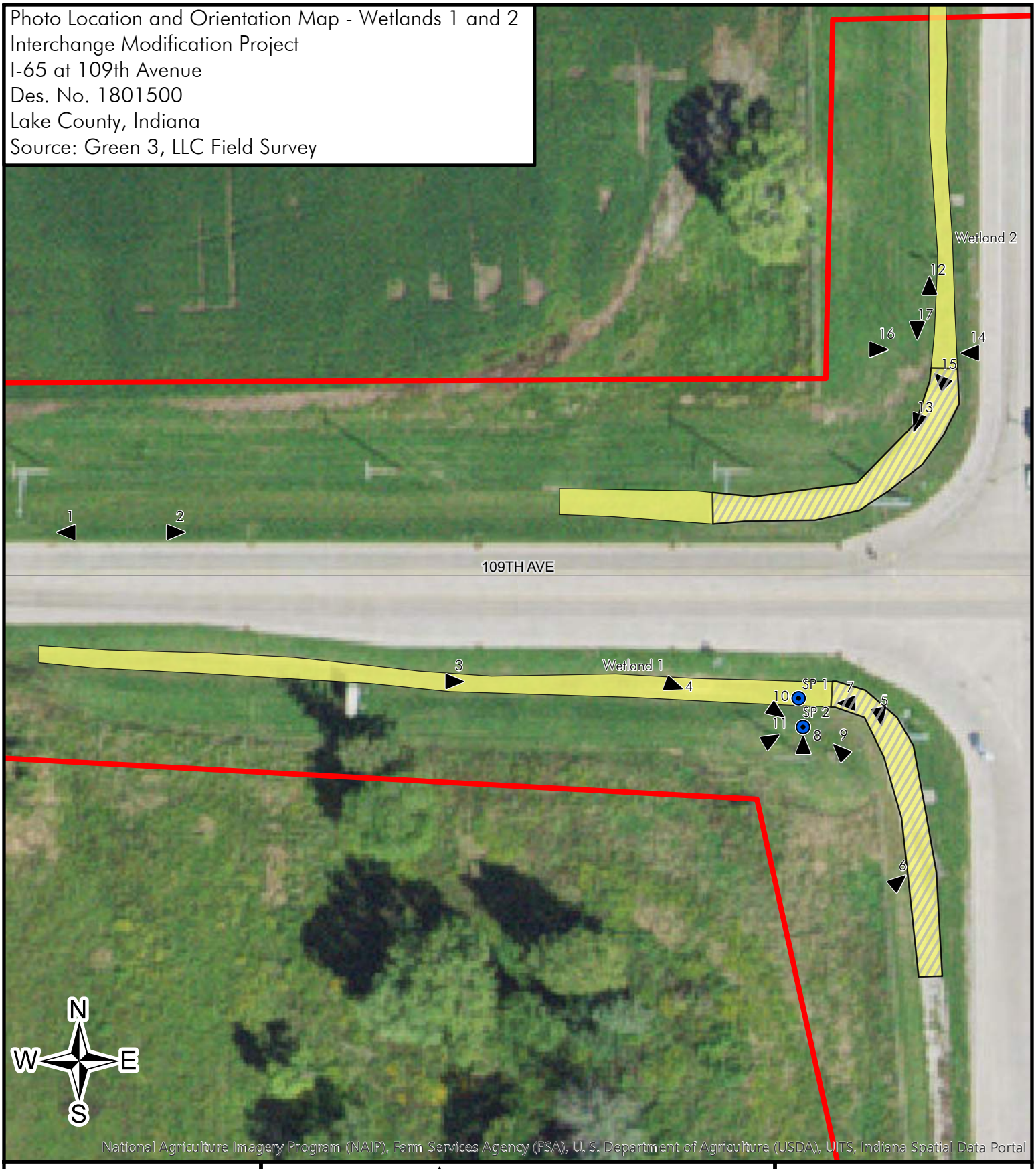

Water Resources Map
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: Green 3, LLC Field Survey
Wetland 6
Wetland 7
Wetland 10
SP 19
SP 20
National Agriculture Imagery Program (NAIP), Farm Services Agency (FSA), U. S. Department of Agriculture (USDA), UITS, Indiana Spatial Data Portal
UNT 1
109TH AVE
Wetland 8
Wetland 5
Wetland 9
SP 17
SP 18
SP 12
SP 11
SP 13
SP 14
SP 15
SP 16
SP 10
SP 9
N
W
E
S
0 0.01 0.02 0.04
Miles
Riprap
Sample Point
Emergent Wetland
Investigated Area
Stream
7/16/2019
green • 3

Photo Location and Orientation Map - Wetlands 1 and 2
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: Green 3, LLC Field Survey



0 0 0.01 0.02 Miles

Photo Location
Sample Point
Emergent Wetland
Investigated Area
Riprap

7/18/2019

green • 3

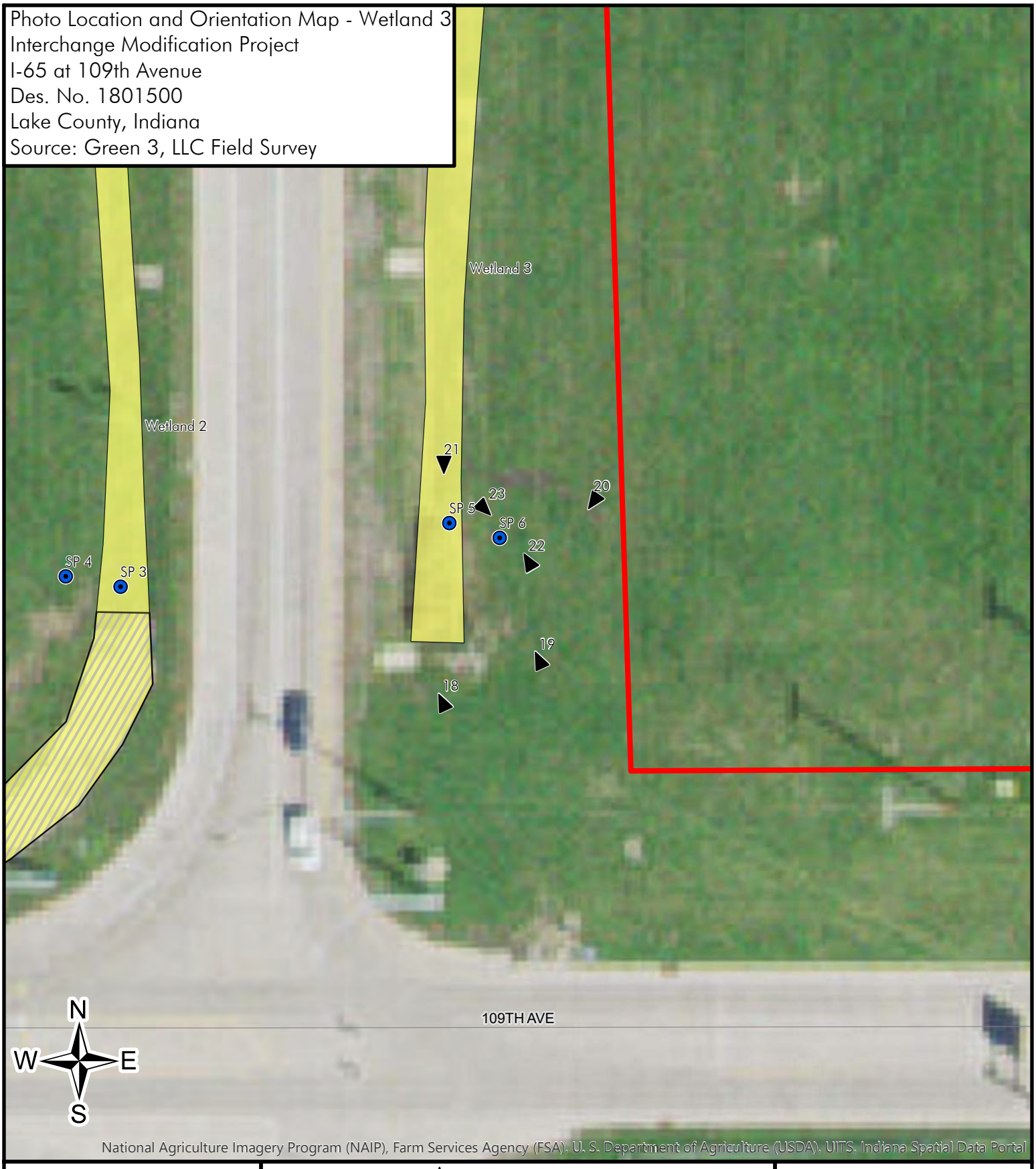
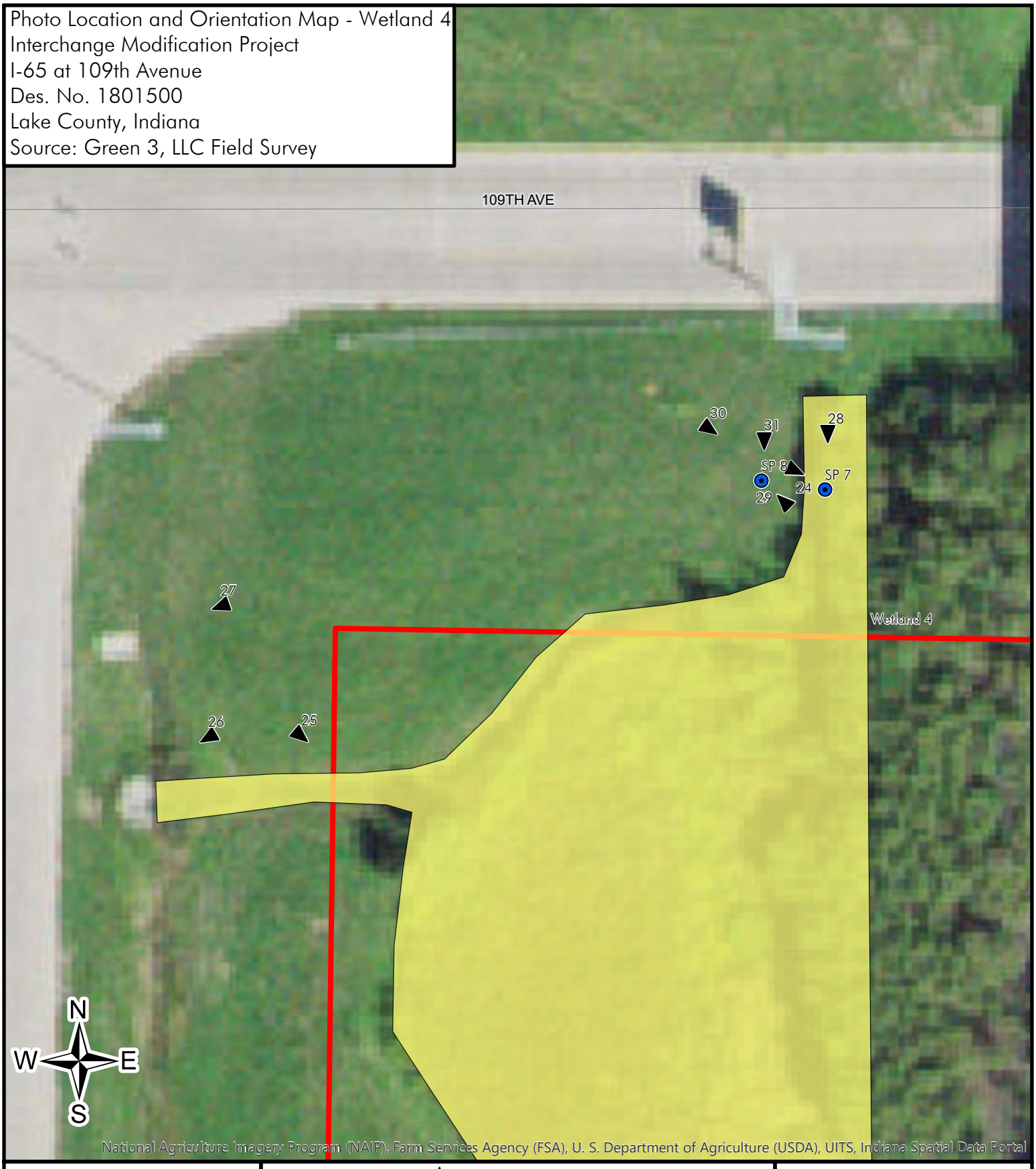


Photo Location and Orientation Map - Wetland 3
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: Green 3, LLC Field Survey
Wetland 3
Wetland 2
21
23
20
SP 5
SP 6
22
SP 4
SP 3
19
18
109TH AVE
N
W
E
S
National Agriculture Imagery Program (NAIP), Farm Services Agency (FSA). U. S. Department of Agriculture (USDA). UITS. Indiana Spatial Data Portal
0 0 0 0.01
Miles
Photo Location
Sample Point
Emergent Wetland
Investigated Area
Riprap
7/18/2019
green • 3

Photo Location and Orientation Map - Wetland 4
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: Green 3, LLC Field Survey

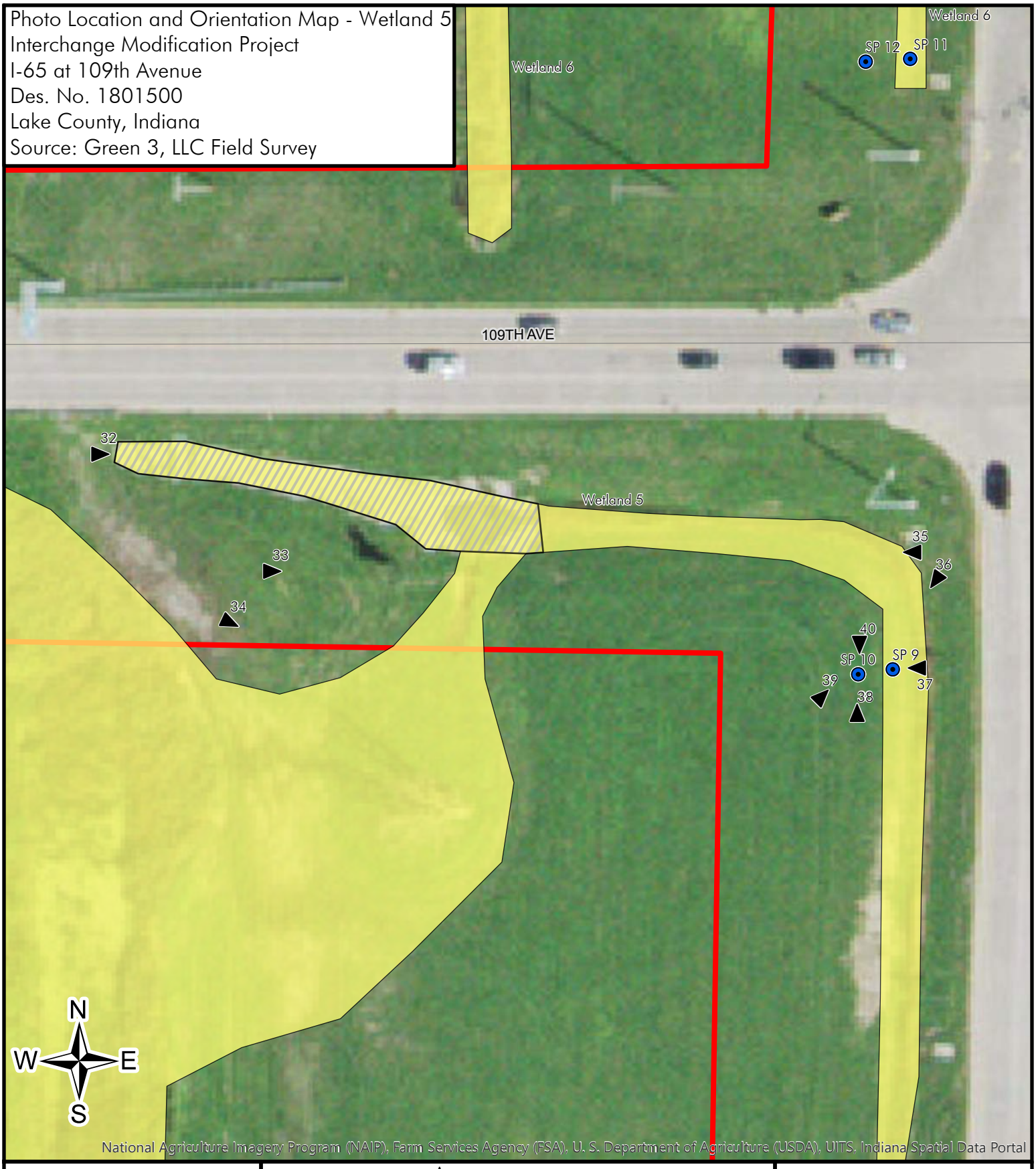


0 0 0 0.01 Miles

Photo Location
Sample Point
Emergent Wetland
Investigated Area

7/18/2019

green • 3



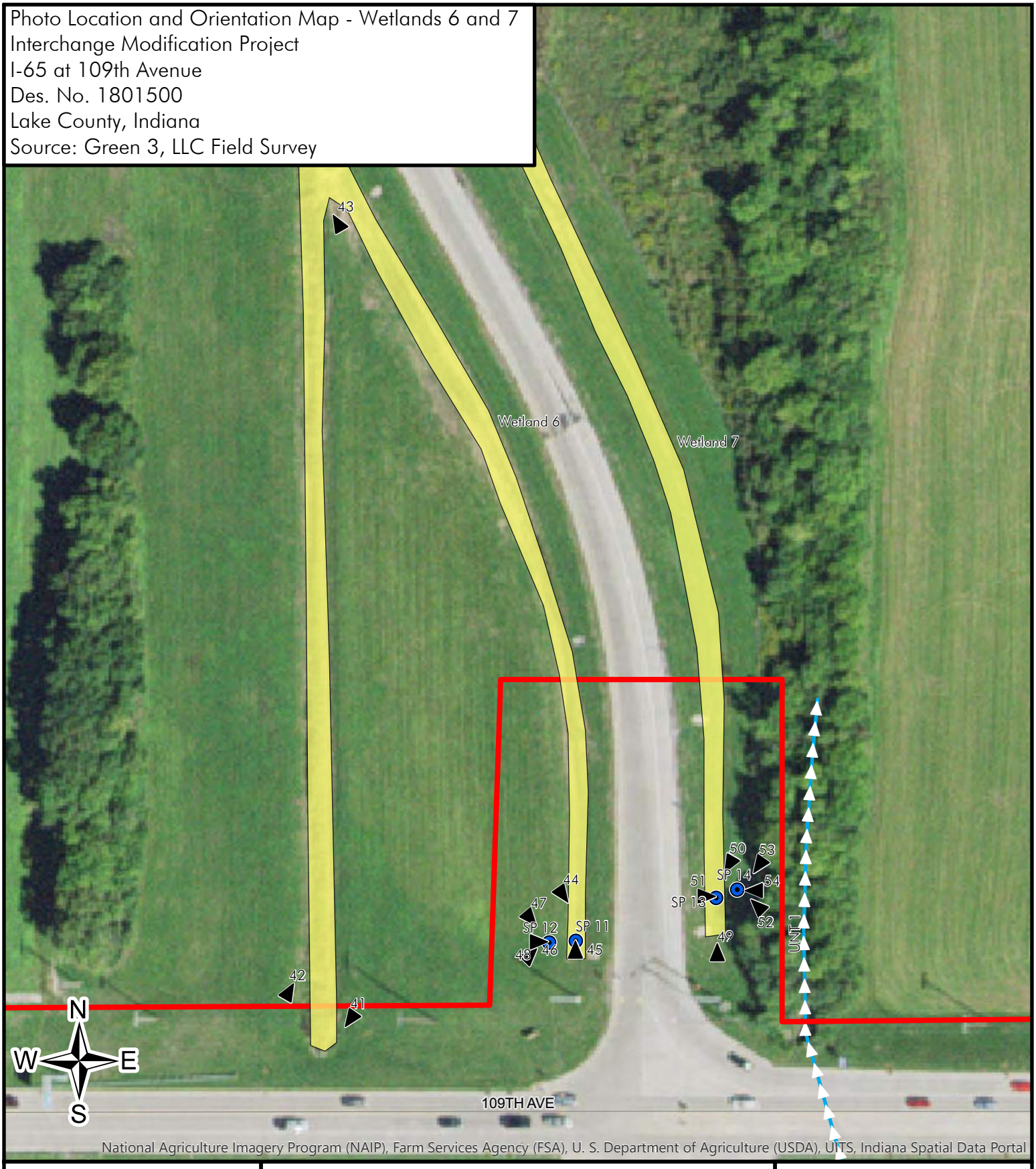
0 0 0.01 0.01 Miles

Photo Location
Sample Point
Emergent Wetland
Investigated Area
Riprap

7/18/2019

green • 3

Photo Location and Orientation Map - Wetlands 6 and 7
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: Green 3, LLC Field Survey



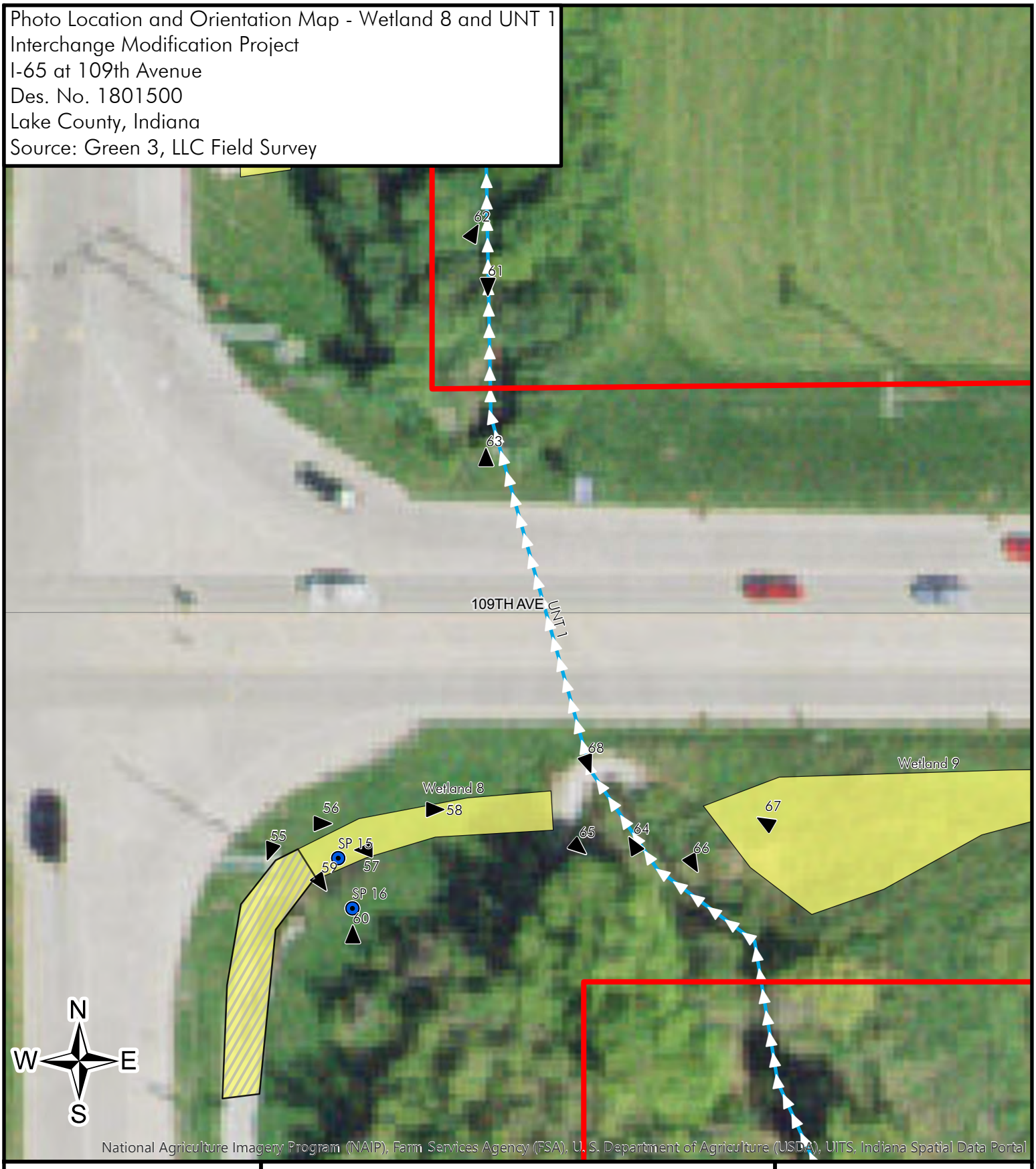
0 0.01 0.01 0.02 Miles

Investigated Area
Photo Location
Sample Point
Stream

7/18/2019

green • 3

Photo Location and Orientation Map - Wetland 8 and UNT 1
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: Green 3, LLC Field Survey



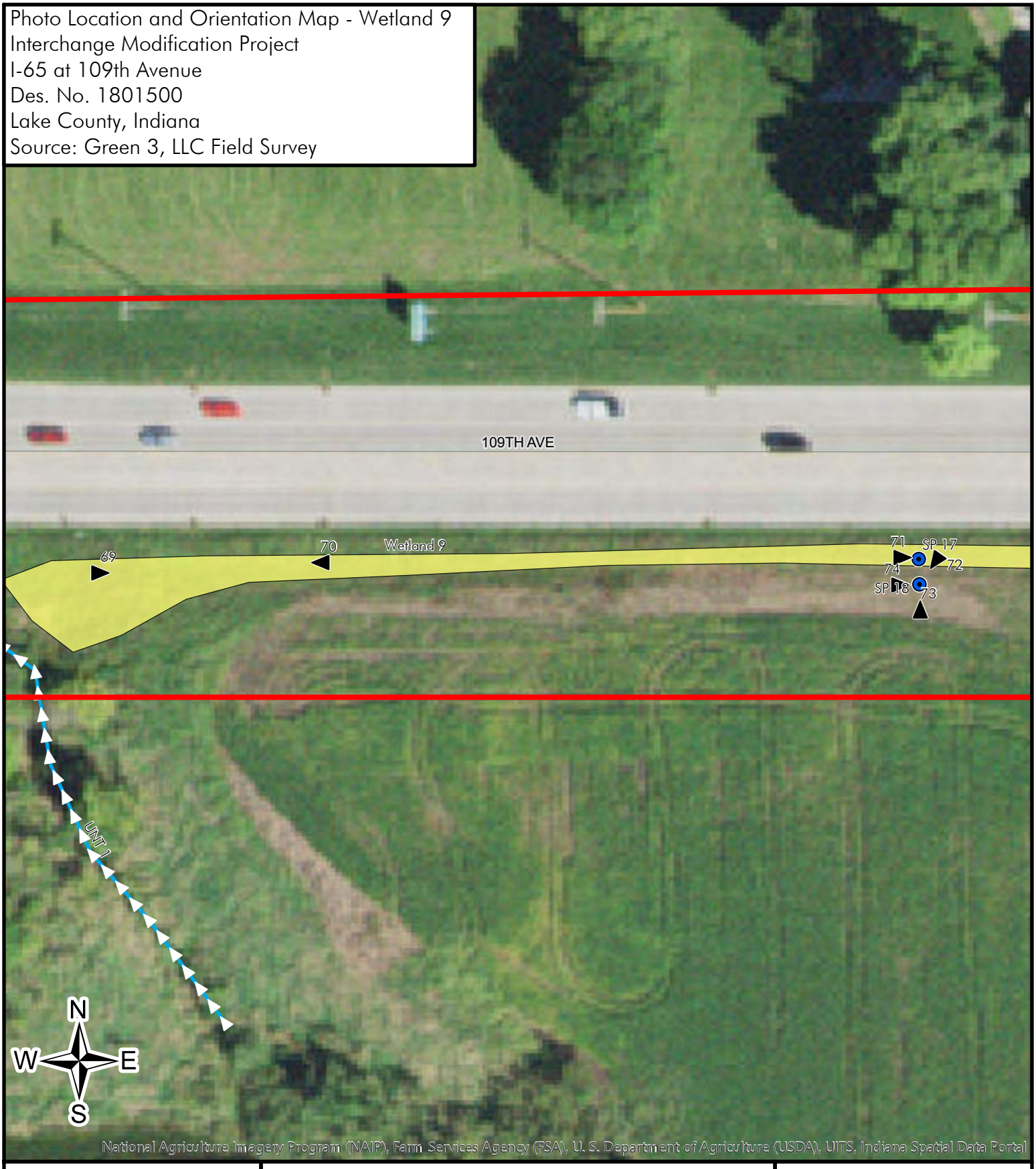
0 0 0 0.01 Miles

Photo Location
Sample Point
Emergent Wetland
Investigated Area
Riprap
Stream

7/18/2019

green • 3

Photo Location and Orientation Map - Wetland 9
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: Green 3, LLC Field Survey



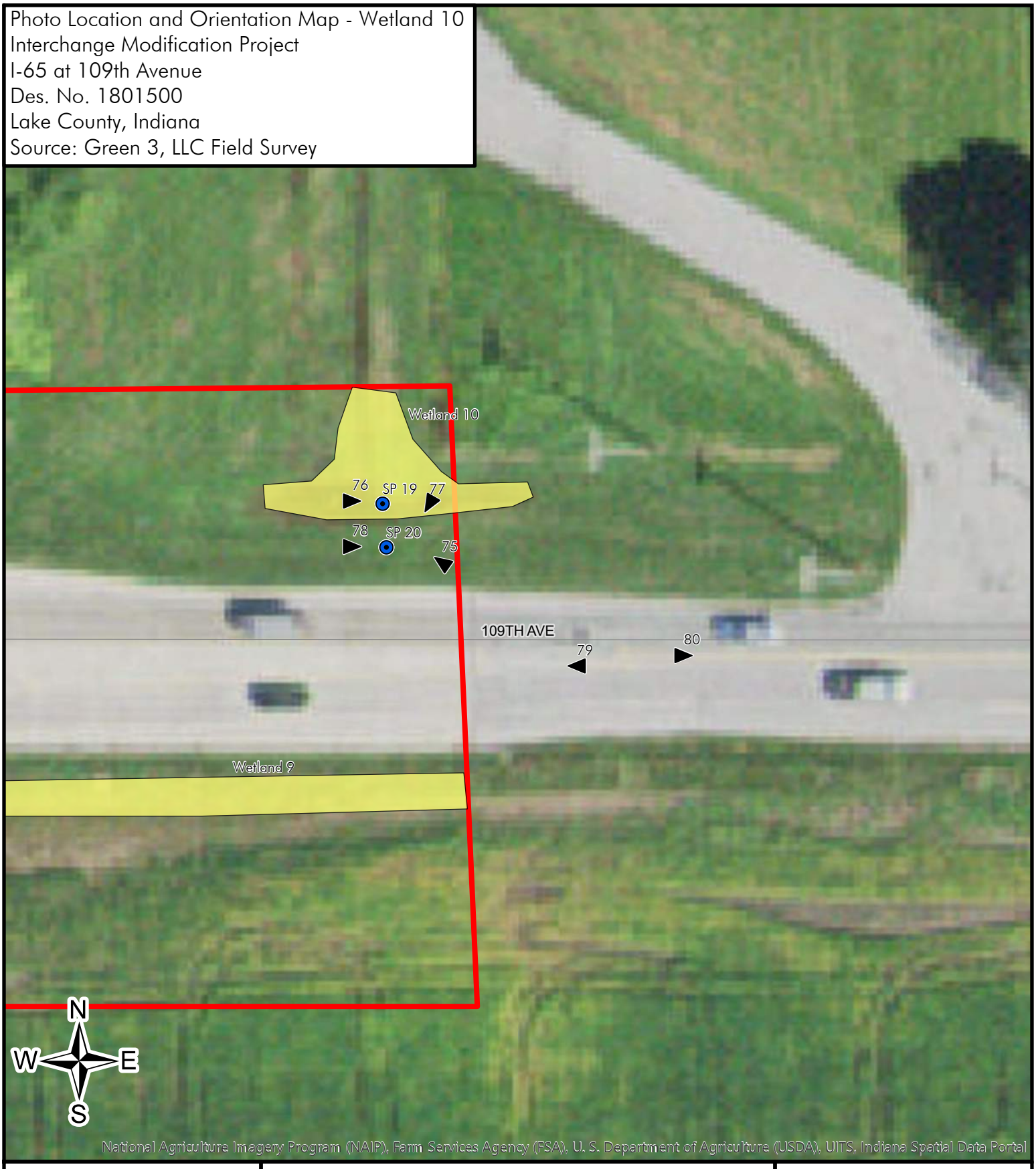
0 0 0.01 0.01 Miles

Photo Location
Sample Point
Emergent Wetland
Investigated Area
Stream

7/18/2019

green • 3

Photo Location and Orientation Map - Wetland 10
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: Green 3, LLC Field Survey



0 0 0 0.01 Miles

Photo Location
Sample Point
Emergent Wetland
Investigated Area

7/18/2019

green • 3

Photo 1. West Project Terminus Facing West

Photo 2. West Project Terminus Facing East

Photo 3. Wetland 1 Facing East

Photo 4. Wetland 1 Facing Southeast

Photo 5. Wetland 1 Facing Southeast

Photo 6. Culvert Conveying Drainage between Wetland 1 and Wetland 4 Facing Northeast

Photo 7. Wetland 1 Facing West

Photo 8. Upland 1 Soil

Photo 9. Upland 1 Facing Northwest

Photo 10. Upland 1 Facing Southeast

Photo 11. Upland 1 Facing Northeast

Photo 12. Wetland 2 Facing North

Photo 13. Wetland 2 Facing South

Photo 14. Wetland 2 Soil

Photo 15. Upland 2 Facing Northwest

Photo 16. Upland 2 Facing East

Photo 17. Upland 2 Soil

Photo 18. Culvert Conveying Drainage from Wetland 2 to Wetland 3 Facing Northwest

Photo 19. Wetland 3 Facing Northwest

Photo 20. Wetland 3 Facing Southwest

Photo 21. Wetland 3 Soil

Photo 22. Upland 3 Facing Northwest

Photo 23. Upland 3 Facing Southeast

Photo 24. Wetland 4 Facing Southeast

Photo 25. Wetland 4 Facing Southeast

Photo 26. Culvert Conveying Drainage Between Wetland 1 and Wetland 4

Photo 27. Culvert Conveying Drainage Between Wetland 1 and Wetland 4

Photo 28. Wetland 4 Soil

Photo 29. Upland 4 Facing Northwest

Photo 30. Upland 4 Facing Southeast

Photo 31. Upland 4 Soil

Photo 32. Wetland 5 Facing East

Photo 33. Wetland 5 Facing East

Photo 34. Wetland 5 Facing Southeast

Photo 35. Wetland 5 Facing West

Photo 36. Wetland 5 Facing Southwest

Photo 37. Wetland 5 Soil

Photo 38. Upland 5 Facing North

Photo 39. Upland 5 Facing Northeast

Photo 40. Upland 5 Soil

Photo 41. Culvert Conveying Drainage Between Wetland 5 and Wetland 6

Photo 42. Wetland 6 Facing Northeast

Photo 43. Northern Connection of East and West Portions of Wetland 6 Facing Northwest

Photo 44. Culvert Conveying Drainage Between Wetland 6 and Wetland 7

Photo 45. Wetland 6 Soil

Photo 46. Upland 6 Facing Northeast

Photo 47. Upland 6 Facing Southeast

Photo 48. Upland 6 Soil

Photo 49. Wetland 7 Facing North

Photo 50. Wetland 7 Facing Southwest

Photo 51. Wetland 7 Soil

Photo 52. Upland 7 Facing Northwest

Photo 53. Upland 7 Facing Southwest

Photo 54. Upland 7 Soil

Photo 55. Wetland 8 Facing Southwest

Photo 56. Wetland 8 Facing Northeast

Photo 57. Wetland 8 Soil

Photo 58. Wetland 8 Facing UNT 1

Photo 59. Upland 8 Facing Southeast

Photo 60. Upland 8 Soil

Photo 61. UNT 1 Downstream Side Facing South

Photo 62. UNT 1 Downstream Side Facing Northeast

Photo 63. UNT 1 Facing Downstream Side From Culvert

Photo 64. UNT 1 Upstream Side Facing Northwest

Photo 65. UNT 1 Upstream Side Facing Southeast

Photo 66. UNT 1 Upstream Side Facing Southeast

Photo 67. UNT 1 Upstream Side From Wetland 9 Facing Northwest

Photo 68. UNT 1 Upstream Side From Culvert Facing Southeast

Photo 69. Wetland 9 Facing East


Photo 71. Wetland 9 Soil


Photo 70. Wetland 9 Facing West


Photo 72. Upland 9 Facing Southwest

Photo 73. Upland 9 Facing North

Photo 74. Upland 9 Soil

Photo 75. Wetland 10 (Shovel is in Upland 10 Sample Point) Facing Northwest

Photo 76. Wetland 10 Soil

Photo 77. Upland 10 Facing Southwest

Photo 78. Upland 10 Soil

Photo 79. East Project Terminus Facing West

Photo 80. East Project Terminus Facing East

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP1

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 10, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Toe of Slope | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.419995 N | Long: -87.323162 W | Datum: WGS 84

Soil Map Unit Name: Elliot silt loam, 0 to 2 percent slopes | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓]	No [ ]	
Wetland Hydrology Present?	Yes [✓]	No [ ]	

Remarks:

Wetland point located on the south side of 109th Avenue and west of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Poa pratensis*	80	X	FAC
2. *Phalaris arundinacea*	10		FACW
3. *Solidago gigantea*	10		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species 20	x 2 =	40
FAC species 80	x 3 =	240
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: 100 (A)		280 (B)

Prevalence Index = B/A = 2.8

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [✓] 2 - Dominance Test is >50%
- [✓] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [✓] No [ ]

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

This vegetative community passed the dominance test and prevalence index. Hydrophytic vegetation is present at this community.

SOIL

Sampling Point: SP1

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	10 YR 2/1	100					CL	
4-20	10 YR 6/1	90	10 YR 4/8	10	C	M	CL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP1 exhibited Depleted Below Dark Surface (A11) and Depleted Matrix (F3). SP1 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 2 inches

Water Table Present? Yes ☑ No ☐ Depth (inches): At surface

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): At surface

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

SP1 exhibited Surface Water (A1), High Water Table (A2), and Saturation (A3). SP1 exhibits wetland hydrology.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP2

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 10, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Shoulder of Slope | Local relief (concave, convex, none): Convex

Slope (%): 2-4% | Lat: 41.419954 N | Long: -87.323153 W | Datum: WGS 84

Soil Map Unit Name: Elliot silt loam, 0 to 2 percent slopes | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [ ]	No [✓]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [ ]	No [✓]	
Wetland Hydrology Present?	Yes [ ]	No [✓]	

Remarks:

Upland point located on the south side of 109th Avenue and west of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Schedonorous arundinaceus*	40	X	FACU
2. *Poa pratensis*	30	X	FAC
3. *Trifolium pratense*	25	X	FACU
4. *Taraxacum officinale*	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 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	x 1 =
FACW species	x 2 =
FAC species 30	x 3 = 90
FACU species 70	x 4 = 280
UPL species	x 5 =
Column Totals: 100 (A)	370 (B)

Prevalence Index = B/A = 3.7

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [ ] No [✓]

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

This vegetative community did not pass the rapid test, dominance test, or prevalence index. Hydrophytic vegetation is not present at this community.

SOIL

Sampling Point: SP2

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
0-12	10 YR 3/2	55					CL	
	10 YR 2/2	45						
12-18	10 YR 2/1	98	2.5 YR 5/8	2	C	M	CL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Hardpan

Depth (inches): 18

Hydric Soil Present? Yes ☐ No ☑

Remarks:

SP2 did not exhibit any hydric soil indicators. SP2 does not contain hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☐ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

SP2 did not exhibit any wetland hydrology indicators.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP3

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 3, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Toe of Slope | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.420484 N | Long: -87.322891 W | Datum: WGS 84

Soil Map Unit Name: Elliot silt loam, 0 to 2 percent slopes | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [✓]	No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓]	No [ ]	
Wetland Hydrology Present?	Yes [✓]	No [ ]	

Remarks:

Wetland point located on the north side of 109th Avenue and west of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Phalaris arundinacea*	100	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

- [✓] 1 - Rapid Test for Hydrophytic Vegetation
- [✓] 2 - Dominance Test is >50%
- [✓] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [✓] No [ ]

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

This vegetative community passed the rapid test, the dominance test, and prevalence index. Hydrophytic vegetation is present at this community.

SOIL

Sampling Point: SP3

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	10 YR 2/1	95	2.5 YR 5/8	5	C	PL	SiC	
8-16	10 YR 5/1	90	10 YR 5/8	10	C	M	SiC	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP3 exhibited Depleted Below Dark Surface (A11) and Depleted Matrix (F3). SP3 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☑ No ☐ Depth (inches): 10 inches

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): At surface

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

SP3 exhibited a High Water Table (A2) and Saturation (A3). SP3 exhibited wetland hydrology.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP4

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 3, T 34 N, R 8 W

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

Slope (%): 2-4% | Lat: 41.420491 N | Long: -87.322943 W | Datum: WGS 84

Soil Map Unit Name: Elliot silt loam, 0 to 2 percent slopes | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [ ] No [✓]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [ ] No [✓]	

Remarks:

Upland point located on the north side of 109th Avenue and west of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Festuca rubra*	45	X	FACU
2. *Poa pratensis*	40	X	FAC
3. *Trifolium pratense*	15		FACU
4. *Taraxum officinale*	10		FACU
5. *Medicago lupulina*	10		FACU
6. *Plantago lanceolata*	5		FACU
7.			
8.			
9.			
10.			
	125 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species 40	x 3 = 120
FACU species 85	x 4 = 340
UPL species	x 5 =
Column Totals: 125 (A)	460 (B)

Prevalence Index = B/A = 3.68

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [ ] No [✓]

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

This vegetative community did not pass the rapid test, the dominance test, or prevalence index. Hydrophytic vegetation is not present at this community.

SOIL

Sampling Point: SP4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 2/1	100					SiC	
6-20	10 YR 2/1	60	10 YR 5/6	2	C	M	SiC	
	10 YR 5/2	38						

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP4 exhibited Redox Dark Surface (F6). SP4 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

SP4 did not exhibit any wetland hydrology indicators. SP4 did not exhibit wetland hydrology.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue City/County: Crown Point/Lake Sampling Date: 5/22/2019

Applicant/Owner: INDOT State: IN Sampling Point: SP5

Investigator(s): Christian Radcliff and Kevin McLane Section, Township, Range: S 3, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Toe of Slope Local relief (concave, convex, none): Concave

Slope (%): 2-4% Lat: 41.420530 N Long: -87.322580 W Datum: WGS 84

Soil Map Unit Name: Markham silt loam, 2 to 6 percent slopes, eroded NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [✓] No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [✓] No [ ]	

Remarks:

Wetland point located on the north side of 109th Avenue and west of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Phragmites australis*	100	X	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

- [✓] 1 - Rapid Test for Hydrophytic Vegetation
- [✓] 2 - Dominance Test is >50%
- [✓] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [✓] No [ ]

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

This vegetative community passed the rapid test, the dominance test, and prevalence index. Hydrophytic vegetation is present at this community.

SOIL

Sampling Point: SP5

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
0-5	10 YR 2/1	100					Muck	
5-10	Gley N 3/1	50	Gley N 5/1	30	D	M	SiC	
			10 YR 5/8	20	C	M		
10-20	Gley N 5/1	90	10 YR 4/8	10	C	M	SiC	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP5 was exhibited Hydrogen Sulfide (A4), 2cm Muck (A10), Loamy Mucky Mineral (F1), and Loamy Gleyed Matrix (F2). SP5 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 2 inches

Water Table Present? Yes ☑ No ☐ Depth (inches): At surface

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): At surface

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

SP5 exhibited Surface Water (A1), High Water Table (A2), and Saturation (A3). SP5 exhibited wetland hydrology.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP6

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 3, T 34 N, R 8 W

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

Slope (%): 2-4% | Lat: 41.420520 N | Long: -87.322533 W | Datum: WGS 84

Soil Map Unit Name: Markham silt loam, 2 to 6 percent slopes, eroded | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [ ] No [✓]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [ ] No [✓]	

Remarks:

Upland point located on the north side of 109th Avenue and west of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Festuca rubra*	45	X	FACU
2. *Poa pratensis*	40	X	FAC
3. *Trifolium pratense*	15		FACU
4. *Medicago lupulina*	10		FACU
5. *Taraxacum officianale*	10		FACU
6. *Plantago lanceolata*	5		FACU
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species 40	x 3 = 120
FACU species 85	x 4 = 340
UPL species	x 5 =
Column Totals: 125 (A)	460 (B)

Prevalence Index = B/A = 3.68

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [ ] No [✓]

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

This vegetative community did not pass the rapid test, the dominance test, or prevalence index. Hydrophytic vegetation is not present at this community.

SOIL

Sampling Point: SP6

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
0-5	10 YR 3/2	60					SiCL	
	10 YR 4/2	40						
5-18	10 YR 4/2	95	10 YR 5/8	5	C	M	C	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Hardpan

Depth (inches): 18

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP6 did exhibited Depleted Matrix (F3). SP6 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

SP6 did not exhibit any wetland hydrology indicators.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP7

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 10, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Toe of Slope | Local relief (concave, convex, none): None

Slope (%): 2-4% | Lat: 41.419973 N | Long: -87.321955 W | Datum: WGS 84

Soil Map Unit Name: Markham silt loam, 2 to 6 percent slopes, eroded | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [✓] No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [✓] No [ ]	

Remarks:

Wetland point located on the south side of 109th Avenue and west of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1. *Salix nigra*	30	X	OBL
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Phragmites australis*	50	X	FACW
2. *Solidago gigantea*	30	X	FACW
3. *Helianthus tuberosus*	15		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= 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	30	x 1 =	30
FACW species	80	x 2 =	160
FAC species		x 3 =	
FACU species	15	x 4 =	60
UPL species		x 5 =	
Column Totals:	125 (A)		250 (B)

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

- [✓] 1 - Rapid Test for Hydrophytic Vegetation
- [✓] 2 - Dominance Test is >50%
- [✓] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [✓] No [ ]

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

This vegetative community passed the rapid test, the dominance test, and prevalence index. Hydrophytic vegetation is present at this community.

SOIL

Sampling Point: SP7

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	10 YR 2/1	100					CL	
4-20	10 YR 6/1	95	10 YR 5/8	5	C	M	CL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Hardpan

Depth (inches): 18

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP7 exhibited Hydrogen Sulfide (A4), Depleted Below Dark Surface (A11), and Depleted Matrix (F3). SP7 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 2 inches

Water Table Present? Yes ☑ No ☐ Depth (inches): At surface

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): At surface

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

SP7 exhibited Surface Water (A1), High Water Table (A2), Saturation (A3), and Hydrogen Sulfide Odor (C1). Wetland hydrology was present at SP7.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP8

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 10, T 34 N, R 8 W

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

Slope (%): 2-4% | Lat: 41.419979 N | Long: -87.322016 W | Datum: WGS 84

Soil Map Unit Name: Markham silt loam, 2 to 6 percent slopes, eroded | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [ ] No [✓]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [ ] No [✓]	

Remarks:

Upland point located on the south side of 109th Avenue and west of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Festuca rubra*	40	X	FACU
2. *Poa pratensis*	40	X	FAC
3. *Trifolium pratense*	15		FACU
4. *Plantago lanceolata*	5		FACU
5. *Medicago lupulina*	2		FACU
6. *Rumex crispus*	2		FAC
7. *Taraxum officianale*	2		FACU
8.			
9.			
10.			
	106 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species 42	x 3 =	126
FACU species 64	x 4 =	256
UPL species	x 5 =	
Column Totals: 106 (A)		382 (B)

Prevalence Index = B/A = 3.60

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [ ] No [✓]

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

This vegetative community did not pass the rapid test, the dominance test, or prevalence index. Hydrophytic vegetation is not present at this community.

SOIL

Sampling Point: SP8

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10 YR 3/2	100					SiC	
1-16	10 YR 4/2	80						
	10 YR 3/1	15	10 YR 5/8	5	C	M	SiC	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Hardpan

Depth (inches): 16

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP8 exhibited Depleted Below Dark Surface (A11) and Depleted matrix (F3). SP8 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

SP8 did not exhibit any wetland hydrology indicators. Wetland hydrology was not present at SP8.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP9

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 10, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Toe of Slope | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.419834 N | Long: -87.319786 W | Datum: WGS 84

Soil Map Unit Name: Elliott silt loam, 0 to 2 percent slopes | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [✓] No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [✓] No [ ]	

Remarks:

Wetland point located on the south side of 109th Avenue and east of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Phragmites australis*	40	X	FACW
2. *Typha angusifolia*	40	X	OBL
3. *Juncus effusus*	20	X	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= 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	60	x 1 =	60
FACW species	40	x 2 =	80
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	100 (A)		140 (B)

Prevalence Index = B/A = 1.4

Hydrophytic Vegetation Indicators:

- [✓] 1 - Rapid Test for Hydrophytic Vegetation
- [✓] 2 - Dominance Test is >50%
- [✓] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [✓] No [ ]

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

This vegetative community passed the rapid test, the dominance test, and prevalence index. Hydrophytic vegetation is present at this community.

SOIL

Sampling Point: SP9

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	10 YR 2/1	100					Muck	
4-12	10 YR 5/1	95	10 YR 5/8	5	C	M	SiC	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Gravel

Depth (inches): 12

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP9 exhibited Hydrogen Sulfide (A4), 2cm Muck (A10), and Depleted Matrix (F3). SP9 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 3 inches

Water Table Present? Yes ☑ No ☐ Depth (inches): At surface

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): At surface

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

SP9 exhibited Surface Water (A1), High Water Table (A2), and Saturation (A3). Wetland hydrology was present at SP9.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP10

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 10, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Shoulder of Slope | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.419828 N | Long: -87.319835 W | Datum: WGS 84

Soil Map Unit Name: Elliott silt loam, 0 to 2 percent slopes | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [ ] No [✓]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [ ] No [✓]	
Wetland Hydrology Present?	Yes [ ] No [✓]	

Remarks:

Upland point located on the south side of 109th Avenue and east of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Poa pratensis*	30	X	FAC
2. *Lamium purpureum*	20	X	UPL
3. *Medicago lupulina*	20	X	FACU
4. *Trifolium pratense*	10		FACU
5. *Taraxum officianale*	10		FACU
6. *Daucus carota*	5		UPL
7. *Solidago canadensis*	5		FACU
8. *Plantago lanceolata*	5		FACU
9.			
10.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 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		x 1 =	
FACW species		x 2 =	
FAC species	30	x 3 =	90
FACU species	50	x 4 =	200
UPL species	25	x 5 =	125
Column Totals:	105 (A)		415 (B)

Prevalence Index = B/A = 3.95

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [ ] No [✓]

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

This vegetative community did not pass the rapid test, the dominance test, or prevalence index. Hydrophytic vegetation is not present at this community.

SOIL

Sampling Point: SP10

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
0-13	10 YR 3/1	100					CL	
13-20	10 YR 5/2	60	10 YR 4/1	20	D	M	CL	
			10 YR 5/8	20	C	M		

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

SP10 did not exhibit any hydric soil indicators. SP10 did not exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

SP10 did not exhibit any wetland hydrology indicators. Wetland hydrology was not present at SP10.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP11

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 3, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Toe of Slope | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.420486 N | Long: -87.319764 W | Datum: WGS 84

Soil Map Unit Name: Milford silty clay loam, 0 to 2 percent slopes | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [✓] No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [✓] No [ ]	

Remarks:

Wetland point located on the north side of 109th Avenue and east of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Phragmites australis*	60	X	FACW
2. *Poa pratensis*	10		FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	70 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species 60	x 2 = 120
FAC species 10	x 3 = 30
FACU species	x 4 =
UPL species	x 5 =
Column Totals: 70 (A)	150 (B)

Prevalence Index = B/A = 2.14

Hydrophytic Vegetation Indicators:

- [✓] 1 - Rapid Test for Hydrophytic Vegetation
- [✓] 2 - Dominance Test is >50%
- [✓] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [✓] No [ ]

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

This vegetative community passed the rapid test, the dominance test, and prevalence index. Hydrophytic vegetation is present at this community.

SOIL

Sampling Point: SP11

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
0-5	10 YR 2/1	100					Muck	
5-10	Gley N 3/1	50	Gley N 5/1	30	D	M	SiC	
			10 YR 5/8	20	C	M		
10-20	Gley N 5/1	90	10 YR 5/8	10	C	M	SiC	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP11 exhibited Hydrogen Sulfide (A4), Depleted Below Dark Surface (A11), and Loamy Gleyed Matrix (F2). SP11 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 2 inches

Water Table Present? Yes ☑ No ☐ Depth (inches): At surface

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): At surface

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

SP11 exhibited Surface Water (A1), High Water Table (A2), Saturation (A3), and Hydrogen Sulfide Odor (C1). Wetland hydrology was present at SP11.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP12

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 3, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Shoulder of Slope | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.420486 N | Long: -87.319764 W | Datum: WGS 84

Soil Map Unit Name: Milford silty clay loam, 0 to 2 percent slopes | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [ ] No [✓]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [ ] No [✓]	
Wetland Hydrology Present?	Yes [ ] No [✓]	

Remarks:

Upland point located on the north side of 109th Avenue and east of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Festuca rubra*	45	X	FACU
2. *Poa pratensis*	40	X	FAC
3. *Trifolium pratense*	15		FACU
4. *Taraxum officianale*	10		FACU
5. *Medicago lupulina*	10		FACU
6. *Plantago lanceolata*	5		FACU
7.			
8.			
9.			
10.			
	125 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species 40	x 3 = 120
FACU species 85	x 4 = 340
UPL species	x 5 =
Column Totals: 125 (A)	460 (B)

Prevalence Index = B/A = 3.68

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [ ] No [✓]

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

This vegetative community did not pass the rapid test, the dominance test, or prevalence index. Hydrophytic vegetation is not present at this community.

SOIL

Sampling Point: SP12

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10 YR 2/2	100					SiC	
3-15	10 YR 2/1	100					SiC	
15-20	10 YR 2/1	97	10 YR 5/6	3	C	M	SiC	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

SP12 did not exhibit any hydric soil indicators. SP12 did not exhibit hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

SP12 did not exhibit any wetland indicators. Wetland hydrology was not present at SP12.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP13

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 3, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Toe of Slope | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.420563 N | Long: -87.319433 W | Datum: WGS 84

Soil Map Unit Name: Milford silty clay loam, 0 to 2 percent slopes | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [✓] No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [✓] No [ ]	

Remarks:

Wetland point located on the north side of 109th Avenue and east of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Phragmites australis*	50	X	FACW
2. *Poa pratensis*	25	X	FAC
3. *Festuca rubra*	25	X	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	125 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species 50	x 2 =	100
FAC species 25	x 3 =	75
FACU species 25	x 4 =	100
UPL species	x 5 =	
Column Totals: 100 (A)		275 (B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [✓] 2 - Dominance Test is >50%
- [✓] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [✓] No [ ]

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

This vegetative community passed the dominance test and prevalence index. Hydrophytic vegetation is present at this community.

SOIL

Sampling Point: SP13

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	10 YR 2/1	100					Muck	
4-20	10 YR 5/1	95	10 YR 5/8	5	C	M	SiC	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP13 exhibited 2cm Muck (A10), Depleted Below Dark Surface (A12), and Depleted Matrix (F3). SP13 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 3 inches

Water Table Present? Yes ☑ No ☐ Depth (inches): At surface

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): At surface

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

SP13 exhibited Surface Water (A1), High Water Table (A2), and Saturation (A3). Wetland hydrology was present at SP13.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP14

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 3, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Shoulder of Slope | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.420578 N | Long: -87.319383 W | Datum: WGS 84

Soil Map Unit Name: Milford silty clay loam, 0 to 2 percent slopes | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [ ] No [✓]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [ ] No [✓]	

Remarks:

Upland point located on the north side of 109th Avenue and east of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Poa pratensis*	50	X	FAC
2. *Trifolium pratense*	20	X	FACU
3. *Medicago lupulina*	20	X	FACU
4. *Daucus carota*	5		UPL
5. *Solidago canadensis*	5		FACU
6.			
7.			
8.			
9.			
10.			
	125 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 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	x 1 =	
FACW species	x 2 =	
FAC species 50	x 3 =	150
FACU species 45	x 4 =	180
UPL species 5	x 5 =	25
Column Totals: 100 (A)		355 (B)

Prevalence Index = B/A = 3.55

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [ ] No [✓]

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

This vegetative community did not pass the rapid test, dominance test, or prevalence index. Hydrophytic vegetation is not present at this community.

SOIL

Sampling Point: SP14

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	10 YR 2/2	100					C	
4-15	10 YR 5/2	98	10 YR 5/6	2	C	M	C	
15-20	10 YR 5/1	95	10 YR 5/6	5	C	M	C	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP14 exhibited Depleted Below Dark Surface (A11) and Depleted Matrix (F3). SP14 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

SP14 did not exhibit any wetland hydrology indicators. Wetland hydrology was not present at SP14.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP15

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 10, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Toe of Slope | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.420009 N | Long: -87.319363 W | Datum: WGS 84

Soil Map Unit Name: Pewamo silty clay loam | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [✓] No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [✓] No [ ]	

Remarks:

Wetland point located on the southth side of 109th Avenue and east of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Typha angustifolia*	30	X	OBL
2. *Poa pratensis*	30	X	FAC
3. *Phalaris arundinacea*	10		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	125 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	10	x 2 =	20
FAC species	30	x 3 =	90
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	70 (A)		140 (B)

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [✓] 2 - Dominance Test is >50%
- [✓] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [✓] No [ ]

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

This vegetative community passed the dominance test and prevalence index. Hydrophytic vegetation is present at this community.

SOIL

Sampling Point: SP15

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	10 YR 2/1	100					Muck	
4-20	10 YR 5/1	95	10 YR 5/8	5	C	M	SiC	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP15 exhibited 2cm Muck (A10), Depleted Below Dark Surface (A11), and Depleted Matrix (F3). SP15 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 2 inches

Water Table Present? Yes ☑ No ☐ Depth (inches): At surface

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): At surface

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

SP15 exhibited Surface Water (A1), High Water Table (A2), and Saturation (A3). Wetland hydrology was present at SP15.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP16

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 10, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Shoulder of Slope | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.419973 N | Long: -87.319349 W | Datum: WGS 84

Soil Map Unit Name: Pewamo silty clay loam | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [ ] No [✓]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [ ] No [✓]	
Wetland Hydrology Present?	Yes [ ] No [✓]	

Remarks:

Upland point located on the south side of 109th Avenue and east of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Festuca rubra*	30	X	FACU
2. *Poa pratensis*	30	X	FAC
3. *Trifolium pratense*	25	X	FACU
4. *Taraxum officianale*	15		FACU
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 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	x 1 =	
FACW species	x 2 =	
FAC species 30	x 3 =	90
FACU species 70	x 4 =	280
UPL species	x 5 =	
Column Totals: 100 (A)		370 (B)

Prevalence Index = B/A = 3.70

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [ ] No [✓]

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

This vegetative community did not pass the rapid test, dominance test, or prevalence index. Hydrophytic vegetation is not present at this community.

SOIL

Sampling Point: SP16

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
0-12	10 YR 2/2	100					SiC	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Gravel

Depth (inches): 12

Hydric Soil Present? Yes ☐ No ☑

Remarks:

SP16 did not exhibit any hydric soil indicators. SP16 did not exhibit hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

SP16 did not exhibit any wetland hydrology indicators. Wetland hydrology was not present at SP16.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP17

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 10, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Toe of Slope | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.420073 N | Long: -87.317715 W | Datum: WGS 84

Soil Map Unit Name: Markham silt loam, 2 to 6 percent slopes, eroded | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [✓] No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [✓] No [ ]	

Remarks:

Wetland point located on the south side of 109th Avenue and east of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Poa pratensis*	55	X	FAC
2. *Phragmites australis*	40	X	FACW
3. *Solidago gigantea*	5		FACW
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species 45	x 2 = 90
FAC species 55	x 3 = 165
FACU species	x 4 =
UPL species	x 5 =
Column Totals: 100 (A)	255 (B)

Prevalence Index = B/A = 2.55

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [✓] 2 - Dominance Test is >50%
- [✓] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [✓] No [ ]

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

This vegetative community passed the dominance test and prevalence index. Hydrophytic vegetation is present at this community.

SOIL

Sampling Point: SP17

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10 YR 3/2	100					Muck	
2-9	10 YR 5/2	50	Gley N 5/1	35	D	M	SiC	
			10 YR 5/8	15	C	M		

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Gravel

Depth (inches): 9

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP17 exhibited 2cm Muck (A10), Depleted Below Dark Surface (A11), Depleted Matrix (F3). SP17 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 1 inch

Water Table Present? Yes ☑ No ☐ Depth (inches): At surface

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): At surface

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

SP17 exhibited Surface Water (A1), High Water Table (A2), and Saturation (A3). Wetland hydrology was present at SP17.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP18

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 10, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Shoulder of Slope | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.420046 N | Long: -87.317714 W | Datum: WGS 84

Soil Map Unit Name: Markham silt loam, 2 to 6 percent slopes, eroded | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [ ] No [✓]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [ ] No [✓]	

Remarks:

Upland point located on the south side of 109th Avenue and east of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Poa pratensis*	40	X	FAC
2. *Festuca rubra*	15	X	FACU
3. *Trifolium pratense*	15	X	FACU
4. *Medicago lupulina*	10		FACU
5. *Daucus carota*	10		UPL
6. *Taraxum lanceolata*	10		FACU
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 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	x 1 =	
FACW species	x 2 =	
FAC species 40	x 3 =	120
FACU species 50	x 4 =	200
UPL species 10	x 5 =	50
Column Totals: 100 (A)		370 (B)

Prevalence Index = B/A = 3.70

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [ ] No [✓]

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

This vegetative community did not pass the rapid test, dominance test, or prevalence index. Hydrophytic vegetation is not present at this community.

SOIL

Sampling Point: SP18

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
0-12	10 YR 3/2	100					SiC	
12-20	10 YR 5/2	90	10 YR 5/8	10	C	M	SiCL	

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP18 exhibited Depleted Below Dark Surface (A11). SP18 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

SP18 did not exhibit any wetland hydrology indicators. Wetland hydrology was not present at SP18.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP19

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 3, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.420286 N | Long: -87.316742 W | Datum: WGS 84

Soil Map Unit Name: Elliott silt loam, 0 to 2 percent slopes | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [✓] No [ ]	**Is the Sampled Area within a Wetland?** Yes [✓] No [ ]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [✓] No [ ]	

Remarks:

Wetland point located on the north side of 109th Avenue and east of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Poa pratensis*	80	X	FAC
2. *Schedonorus arundinaceus*	10		FACU
3. *Juncus effusus*	10		OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species		x 2 =	
FAC species	80	x 3 =	240
FACU species	10	x 4 =	40
UPL species		x 5 =	
Column Totals:	100 (A)		290 (B)

Prevalence Index = B/A = 2.90

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [✓] 2 - Dominance Test is >50%
- [✓] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [✓] No [ ]

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

This vegetative community passed the dominance test and prevalence index. Hydrophytic vegetation is present at this community.

SOIL

Sampling Point: SP19

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	Gley 5GY 4/1	80					SiC	
	10 YR 2/1	10	7.5 YR 5/8	10	C	M		

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Gravel

Depth (inches): 6 inches

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP19 exhibited Loamy Gleyed Matrix (F2). SP19 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 4 inches

Water Table Present? Yes ☑ No ☐ Depth (inches): At surface

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): At surface

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

SP19 exhibited Surface Water (A1), High Water Table (A2), and Saturation (A3). Wetland hydrology was present at SP19.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue | City/County: Crown Point/Lake | Sampling Date: 5/22/2019

Applicant/Owner: INDOT | State: IN | Sampling Point: SP20

Investigator(s): Christian Radcliff and Kevin McLane | Section, Township, Range: S 3, T 34 N, R 8 W

Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Concave

Slope (%): 2-4% | Lat: 41.420255 N | Long: -87.316738 W | Datum: WGS 84

Soil Map Unit Name: Elliott silt loam, 0 to 2 percent slopes | NWI classification: N/A

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes [✓] No [ ]

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

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

Hydrophytic Vegetation Present?	Yes [ ] No [✓]	**Is the Sampled Area within a Wetland?** Yes [ ] No [✓]
Hydric Soil Present?	Yes [✓] No [ ]	
Wetland Hydrology Present?	Yes [ ] No [✓]	

Remarks:

Upland point located on the north side of 109th Avenue and east of I-65.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 feet)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 feet)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5 feet)			
1. *Festuca rubra*	45	X	FACU
2. *Poa pratensis*	40	X	FAC
3. *Trifolium pratense*	15		FACU
4. *Taraxum officianale*	10		FACU
5. *Medicago lupulina*	10		FACU
6. *Plantago lanceolata*	5		FACU
7.			
8.			
9.			
10.			
	125 = Total Cover		
Woody Vine Stratum (Plot size: 30 feet)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species 40	x 3 = 120
FACU species 85	x 4 = 340
UPL species	x 5 =
Column Totals: 125 (A)	460 (B)

Prevalence Index = B/A = 3.68

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [ ] 2 - Dominance Test is >50%
- [ ] 3 - Prevalence Index is ≤3.0[1]
- [ ] 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes [ ] No [✓]

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

This vegetative community did not pass the rapid test, dominance test, or prevalence index. Hydrophytic vegetation is not present at this community.

SOIL

Sampling Point: SP20

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR 3/2	100					SiCL	
2-9	10 YR 3/1	90	10 YR 5/2	5	D	M	SiCL	
			7.5 YR 5/8	5	C	M		

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

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: Gravel

Depth (inches): 9 inches

Hydric Soil Present? Yes ☑ No ☐

Remarks:

SP20 exhibited Redox Dark Surface (F6). SP20 exhibited hydric soils.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Gauge or Well Data (D9)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

SP20 did not exhibit any wetland hydrology indicators. Wetland hydrology was not present at SP20.

Christian Radcliff

From: Todd, Kristi (INDOT) <KTodd1@indot.IN.gov>
Sent: Monday, July 29, 2019 10:32 AM
To: Christian Radcliff
Cc: Krueckeberg, John; Ewbank, Patrick
Subject: RE: DES # 1801500 R-41341 ENV Waters Rpt I-65 over 109th Street, 1.86mi N of US 231

Christian,

Thank you for submitting the waters report for **I-65 over 109th St, Des. No. 1801500**. Your most recent submission has been reviewed and approved. For the INDOT PM, the approved report can be found on Projectwise through this link: Final Waters Report 1801500.pdf. It is the responsibility of the Project Manager to forward a copy of this report to the Project Designer.

The information in this report should be used by the Project Designer to determine if waters of the U.S. will be impacted by the project. Avoidance and minimization of impacts must occur before mitigation will be considered. If mitigation is required, the Project Manager or Project Designer must coordinate with the Ecology and Waterway Permitting Office to discuss how adequate compensatory mitigation will be provided.

The Project Manager should notify the Ecology and Waterway Permitting Office if there is any change to the project footprint presented in this report. Such changes may require additional fieldwork and submittal of an updated waters report covering areas not previously investigated. This report is only valid for a period of five years from the date of earliest fieldwork. If the report expires prior to waterway permit application submittal, additional fieldwork and a revised waters report will be required.

Since this waters report contains isolated wetlands the report will be sent to USACE for an approved JD. I will notify you when we have received an approved JD from USACE.

Kristi Todd
Team Lead, Ecology and Waterway Permitting
INDOT Environmental Services
100 N Senate Ave, Room 642
Indianapolis, IN 46204
Phone: (317) 234-8220

From: Landry, James
Sent: Friday, July 19, 2019 9:40 AM
To: Christian Radcliff <christian@green3studio.com>
Cc: Todd, Kristi (INDOT) <KTodd1@indot.IN.gov>; Krueckeberg, John <JKrueckeberg@indot.IN.gov>
Subject: RE: DES # 1801500 R-41341 ENV Waters Rpt I-65 over 109th Street, 1.86mi N of US 231

Christian,

To save Kristi a bit of work, I went ahead and looked over the other changes besides the whole jurisdiction issue, and all of that looks good. Kristi will handle the final determination on whether or not we want to call those wetlands jurisdictional when she's back in the office next week. That should wrap everything up for this report once that's done. Best of luck on this project and any other future ones! It's been nice working with you on these reports.

Waters Report Addendum
I-65 at 109th Avenue in Lake County, Indiana
Interchange Modification Project
Des. No. 1801500

Report Completed on: May 13, 2020

Prepared for:
USI Consultants, Inc.

Prepared By:
Christian Radcliff
Green 3, LLC
Historic Fountain Square
1104 Prospect Street
Indianapolis, IN 46203

p. 317.634.4110 f. 866.422.2046 e. christian@green3studio.com

Field Investigation Date: May 22, 2019

Site Location:
Sections 3 and 10, Township 34 North, Range 8 West
Crown Point 1:24,000 Quadrangle
Lake County, Indiana
Latitude 41.420172, Longitude -87.321474

Original Project Description:
Des 1801500 includes the construction of 2 two-lane roundabouts and roadway widening to a four-lane cross section at the interchange of I-65 and 109th Avenue in Lake County, Indiana. The existing interchanges are signalized interchanges providing a three-lane cross section with one lane of westbound and eastbound traffic and an auxiliary lane along 109th Avenue that functions as a left-turn lane at each ramp. The interchange is anticipated to be upgraded to include two roundabouts that will provide a four-lane cross section. Two lanes of traffic will be available for use in either direction. The roadway will be widened to provide the added travel lanes and usable shoulders. The culvert on the east side of the eastern interchange will be extended to accommodate the widened roadway.

Additional Scope Items:
The bridge carrying I-65 over 109th Avenue (I65-249-04900 BNBL and BSBL) will be modified to accommodate the additional travel lanes. The existing slopewalls will be removed and retaining walls will be constructed to support the bridge. This will allow for one lane of traffic to utilize the space between the northern abutment and bridge pier and for a future pedestrian trail to be constructed between the southern abutment and bridge pier. The existing three-lane cross section will be maintained in the center span of the bridge. The existing auxiliary lane will be converted into a dedicated travel lane. Drainage improvements will occur along the project corridor.

The additional scope items will require construction beyond the original investigated area in five different areas. The attached aerial map indicates where these areas of concern are located.

Attached Documents:
- Aerial Map
- Photographs and Photograph Location and Orientation Map

Analysis of Additional Investigated Area:
The site was re-evaluated using the original site investigation data, site photographs, aerial imagery, and Google Street View imagery.

Upland Conditions:
The area west of the southbound ramp and north of 109th Avenue slopes upward away from Wetland 2 and drains water slowly toward Wetland 2. This area continues the upland conditions seen in Sample Point (SP) 4. The conditions of this area are shown in Photo 1 of the attached photo log. The area east of the southbound exit ramp and north of 109th Avenue is relatively flat but approximately 3 feet higher in elevation than Wetland 3. Water in this area drains generally

toward Wetland 3. The conditions in this area are that same as shown in SP 6 and are shown in Photo 2 of the attached photo log.

Wetland Conditions:
The area west of the northbound ramp and north of 109th Avenue contains Wetland 6. The conditions of Wetland 6 continue north of the original investigated area as shown in Photo 3 of the attached photo log. This area was included in the original report due to clear continuation of the wetland conditions on aerial imagery and from ground level photographs and is reflected in the acreage shown in the original report.

Stream Conditions:
The area east of the northbound ramps and north and south of 109th Avenue contains UNT 1 to Main Beaver Dam Ditch and the associated riparian area of that feature. The conditions of the stream in this additional area are homogenous to the conditions from the original report. The additional investigated area contains approximately 55 feet of additional stream. This feature is shown in Photos 4 and 5 in the attached photo log.

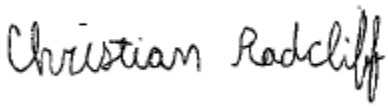
Open Water:
An open water body was identified outside of the investigated area during the desktop review on the NWI map southeast of the investigated area. The additional area of investigation does not contain this open water feature.

Other Features:
Other water features include roadside ditches, areas of concentrated flow, or other unusual drainage features. These features may be considered jurisdictional if they exhibit a Significant Nexus to a Traditionally Navigable Waterway. No other features were identified during the desktop review.

Conclusions:
The desktop review of the additional investigated area identified 1 intermittent stream and 1 wetland. These features are extensions of what was documented in the original report. An additional 55 feet of UNT 1 to Main Beaver Dam Ditch was identified and the additional area of Wetland 6 was previously documented in the original report. UNT 1 to Main Beaver Dam Ditch and Wetland 6 are likely waters of the US. Every effort should be taken to avoid and minimize impacts to these waterways. 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 appropriate regulatory staff of the US Army Corps of Engineers. This report is our best judgment based on the guidelines set forth by the Corps.

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 Delineation Manual*, the appropriate regional supplement, the USACE *Jurisdictional Determination Form Instructional Guidebook*, and other appropriate agency guidelines.

Christian Radcliff

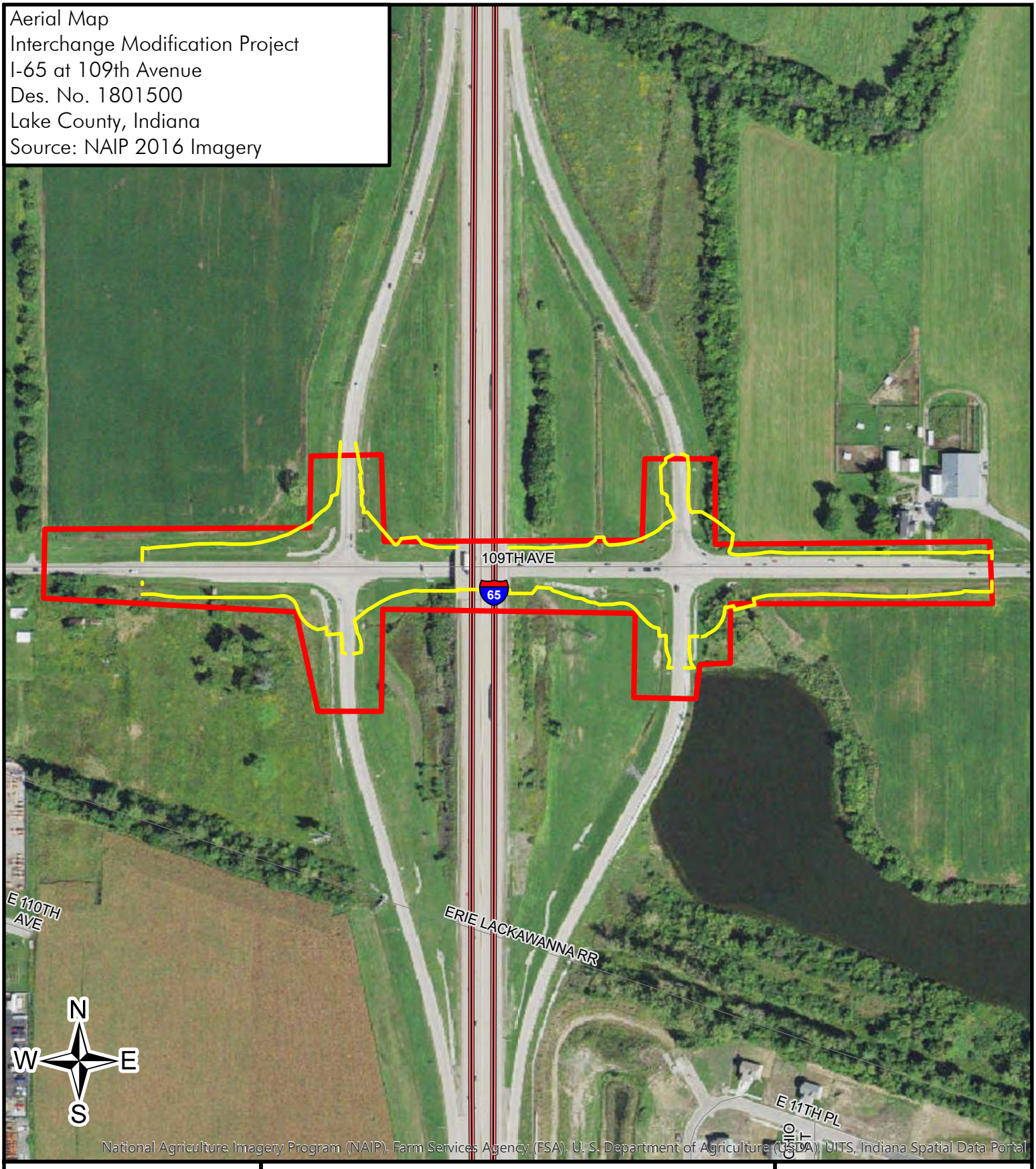


Ecologist
Green 3, LLC
Date: May 13, 2020

Supporting Documentation:

- Aerial Map
- Photo Location and Orientation Map

Aerial Map
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: NAIP 2016 Imagery



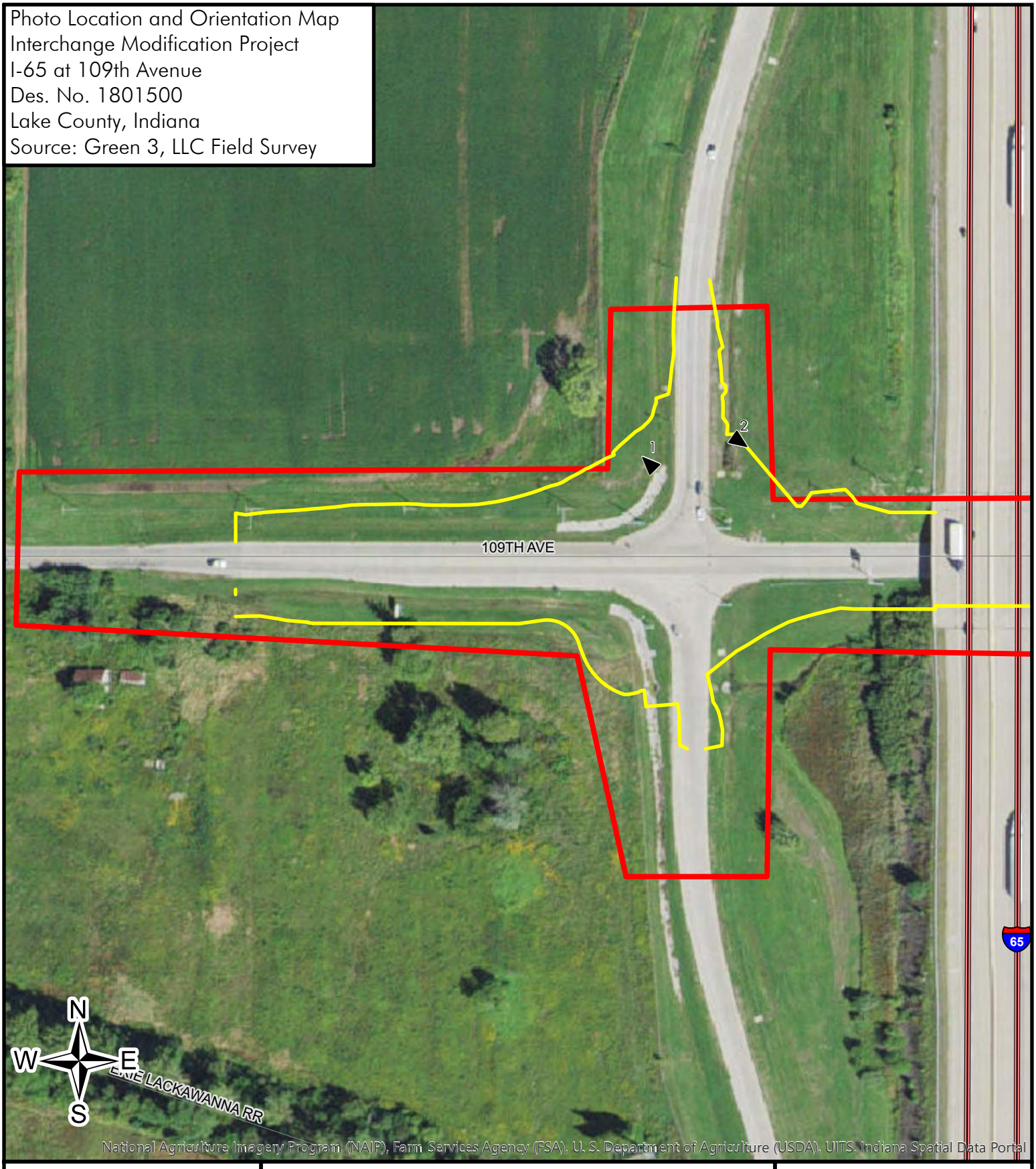
0 235 470 Feet

Investigated Area
Updated Construction Limits

5/7/2020

green • 3

Photo Location and Orientation Map
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: Green 3, LLC Field Survey



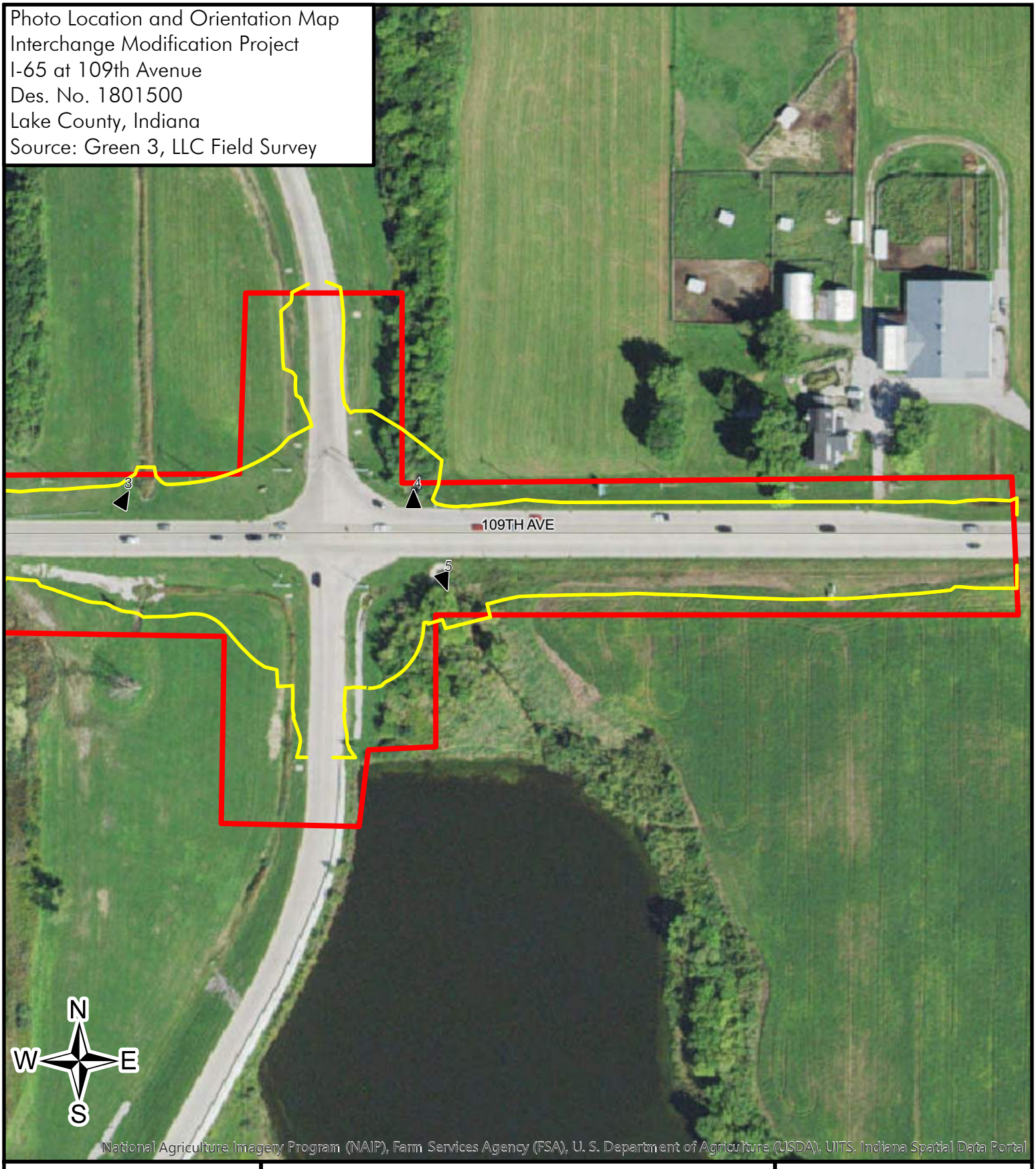
0 105 210 Feet

Investigated Area
Photo Location
Updated Construction Limits

5/7/2020

green • 3

Photo Location and Orientation Map
Interchange Modification Project
I-65 at 109th Avenue
Des. No. 1801500
Lake County, Indiana
Source: Green 3, LLC Field Survey



0 105 210 Feet

Investigated Area
Photo Location
Updated Construction Limits

5/7/2020

green • 3

Photo 1. West of southbound ramp and north of 109th Avenue facing northwest

Photo 2. East of southbound ramp and north of 109th Avenue facing southeast

Photo 3. Wetland 6 facing northeast

Photo 4. UNT 1 to Main Beaver Dam Ditch facing north

Photo 5. UNT 1 to Main Beaver Dam Ditch facing southeast

Christian Radcliff

From: Ewbank, Patrick <PEwbank@indot.IN.gov>
Sent: Monday, June 8, 2020 4:54 PM
To: Christian Radcliff
Cc: Rehder, Crystal
Subject: RE: DES# 1801500 R-41341 Waters Rpt I 65 over 109th Street, 1.86mi N of US 231

Christian,

The addendum looks good. Sorry it took me a while to get to it. I have been slammed the last few months. Please proceed with the permits. I will get on them as soon as I receive them.

Thanks,
Patrick Ewbank
Ecology and Waterway Permitting
INDOT Environmental Services
100 N Senate Ave, Room 642
Indianapolis, IN 46204
Phone: (317) 234-8223

From: Rehder, Crystal <CRehder@indot.IN.gov>
Sent: Thursday, May 14, 2020 1:25 PM
To: Ewbank, Patrick <PEwbank@indot.IN.gov>
Subject: FW: DES# 1801500 R-41341 Waters Rpt I 65 over 109th Street, 1.86mi N of US 231

NEW ASSIGNMENT

First review due 5/29/2020.

Crystal Rehder
(317) 233-2062

From: INDOT Coordinator 4 <indotcoordinator4@indot.IN.gov>
Sent: Thursday, May 14, 2020 1:19 PM
To: Rehder, Crystal <CRehder@indot.IN.gov>
Cc: Bales, Ronald <rbales@indot.IN.gov>; INDOT Coordinator 4 <indotcoordinator4@indot.IN.gov>; Ritzler, Julie <JRitzler@indot.IN.gov>; Miller, Jessica S <JesMiller@indot.IN.gov>; Krueckeberg, John <JKrueckeberg@indot.IN.gov>
Subject: DES# 1801500 R-41341 Waters Rpt I 65 over 109th Street, 1.86mi N of US 231

1 Waters Rpt file has been transitioned to CO Review.

Let me know if you have any questions.

Thanks,

Cheryl Tuholski
Program Coordinator
Coordinator 4
315 East Boyd Boulevard
LaPorte, IN 46350

Des 1801500 CE-4

Appendix G

Public Involvement

This section will be updated after the completion of public involvement activities.

HNTB Corporation
The HNTB Companies
Infrastructure Solutions

111 Monument Circle
Suite 1200
Indianapolis, IN 46204

Telephone (317) 636-4682
Facsimile (317) 917-5211
www.hntb.com

August 20, 2019

[redacted]

Re: Lake County Tax Parcel [redacted]

NOTICE OF SURVEY

Dear Property Owner:

HNTB, on behalf of The Indiana Department of Transportation (INDOT), will perform a survey for the improvements of the I-65 and 109th Avenue Interchange, located at Reference Post 249+0.37 on I-65 in Lake County, La Porte District, Des No. 1801500. A portion of this survey work may be performed on your property in order to provide design engineers information for project design. The survey work will include mapping the location of features such as trees, buildings, fences, drives, ground elevations, etc. The survey is needed for the proper planning and design of this highway project.

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

Indiana Code 8-23-7-26 allows HNTB, as the authorized employees of INDOT, *Right of Entry* to the project site (including private property) upon proper notification. A copy of a Notice of Survey discussion sheet, as found on INDOT's website (http://www.in.gov/indot/2888.htm), is attached to this letter. Pursuant to Indiana Code 8-23-7-27, this letter serves as written notification that we will be performing the above noted survey in the vicinity of your property on or after August 20, 2019

HNTB employees will show you their identification, if you are available, before coming onto your property.

If you own but are not the tenant of this property (i.e. rental, sharecrop), please inform us so that we may also contact the actual tenant of the property prior to commencement of our work. If you have any questions or concerns regarding our proposed survey work or schedule, please contact the HNTB Project Manager. This contact information is as follows:

Chris Buergelin, PS
111 Monument Circle, Suite 1200
Indianapolis, IN 46204
(317) 903-4852

Under Indiana Code 8-23-7-28, you have a right to compensation for any damage that occurs to your land or water as a result of the entry or work performed during the entry. To obtain such compensation, you should contact the La Porte District Real Estate Manager; contact information is below. The District Real Estate Manager can provide you with a form to request compensation for damages. Once you fill out this form, you can return it to the District Real Estate Manager for consideration. If you are not satisfied with the compensation that INDOT determines is owed to you, Indiana Code 8-23-7-28 provides the following:

> The amount of damages shall be assessed by the county agricultural extension educator of the county in which the land or water is located and two (2) disinterested residents of the county, one (1) appointed by the aggrieved party and one (1) appointed by the department. A written report of the assessment of damages shall be mailed to the aggrieved party and the department by first class United States mail. If either the department or the aggrieved party is not satisfied with the assessment of damages, either or both may file a petition, not later than fifteen (15) days after receiving the report, in the circuit or superior court of the county in which the land or water is located.

If you have questions regarding the rights and procedures outlined in this letter, please contact the La Porte District Real Estate Manager. This contact information is as follows:

John Krueckeberg
315 E. Boyd Blvd.
La Porte, IN 46350
1-855-463-6848

Thank you in advance for your cooperation in this matter.
Sincerely,
HNTB Corporation

William M. Jones
Supervisory Survey Technician

Des 1801500 CE-4

Appendix H

Air Quality

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
Indiana Department of Transportation	41214 / 1800814	Init.	US 41	Bridge Deck Overlay	SB ON RAMP J@.-I-80/94, CD/ RAMPS, AV, 0.10mi W of US 41	LaPorte	0	NHPP		Bridge Construction	CN	$2,353,732.00	$588,433.00	$20,000.00	$2,922,165.00			
										Bridge Consulting	PE	$211,760.00	$52,940.00		$264,700.00			
Indiana Department of Transportation	41277 / 1800751	Init.	VA VARI	ITS Traffic Management Systems	Camera/Communications/Detection/DMS Replacements in Northwest IN ATMS area - FY	LaPorte	0	NHPP		Statewide Construction	CN	$292,500.00	$32,500.00	$325,000.00				
Indiana Department of Transportation	41341 / 1801500	A 05	I 65	Interchange Modification	over 109th Street, 1.86mi N of US 231	LaPorte	0	NHPP	$3,969,394.00	Toll Lease Amendment Proceeds	PE	$450,000.00	$50,000.00	$500,000.00				
										Toll Lease Amendment Proceeds	RW	$166,500.00	$18,500.00	$185,000.00				
										Toll Lease Amendment Proceeds	CN	$2,700,000.00	$300,000.00		$3,000,000.00			
Comments:Please amend all phases into the STIP. NIRPC approved resolution 19-22 dated 8/15/19.																		
Indiana Department of Transportation	41429 / 1703001	Init.	SR 2	Bridge Replacement, Concrete	Sr 2@.-West Creek Ditch, 02.13 W US 41	LaPorte	0	STPBG		Bridge Construction	CN	$1,079,189.60	$269,797.40			$20,000.00	$1,328,987.00	
										Bridge Consulting	PE	$74,432.00	$18,608.00	$93,040.00				
										Bridge ROW	RW	$28,000.00	$7,000.00			$35,000.00		
Indiana Department of Transportation	41430 / 1703004	Init.	US 30	Bridge Replacement, Concrete	Us 30@.-Dyer Ditch, 01.10 W US 41	LaPorte	0	NHPP		Bridge Construction	CN	$1,021,475.20	$255,368.80			$20,000.00	$1,256,844.00	
										Bridge Consulting	PE	$70,400.00	$17,600.00	$88,000.00				
										Bridge ROW	RW	$32,000.00	$8,000.00			$40,000.00		
Indiana Department of Transportation	41439 / 1800257	Init.	US 6	Bridge Replacement, Concrete	Us 6@.-I-80/94 Eb/Wb, 02.27 W SR 51	LaPorte	0	NHPP		Bridge Construction	CN	$6,066,704.00	$1,516,676.00			$35,000.00	$7,548,380.00	
										Bridge Consulting	PE	$422,400.00	$105,600.00	$528,000.00				
										Bridge ROW	RW	$28,000.00	$7,000.00			$35,000.00		
Indiana Department of Transportation	41440 / 1703043	Init.	SR 51	Replace Superstructure	Sr 51@.-Deep River, 02.00mi N of US 30	LaPorte	0	NHPP		Bridge Construction	CN	$1,402,493.60	$350,623.40			$25,000.00	$1,728,117.00	
										Bridge Consulting	PE	$107,232.00	$26,808.00	$134,040.00				
										Bridge ROW	RW	$16,000.00	$4,000.00			$20,000.00		

*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.

Project Overview | Funding History | Amendment History

<< Go Back

Interchange Modification (1801500)

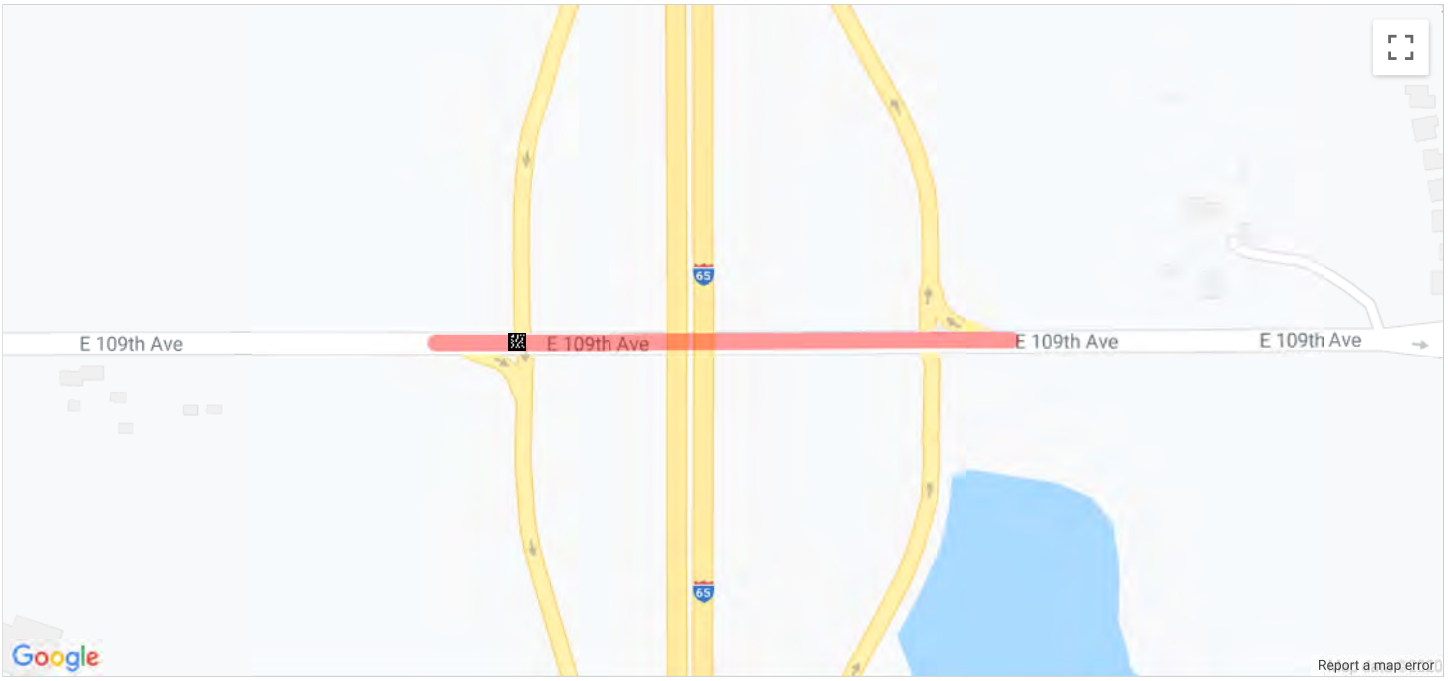
Des Number	1801500	*Amendment*	20-08.2 ADMIN MOD	*Exempt Category*	Non-Exempt	*Est Total Project Cost*	$3,640,500
Lead Agency	INDOT	*Contact (ERC)*	Julie Ritzler 2193257497			*County*	Lake
Project Type	Interchange Modification	*Letting Date*		*Functional Classification*	Interstate	*Bike/Ped Component(s)*	Yes 02%

Title Interchange Modification

Limits Primary Interchange: , Secondary Interchange:

Description Interchange Modification, I-65 & 109th, Roundabout with two lanes EB, one lane WB. This will improve the LOS from E/F to A/B, greatly improving congestion now and in the future as this area grows. This project is expected to be substantially complete by November 1 2022. According to the Regional Significance Guidance document, since this is an Interchange Modification on an Interstate Highway, an AQ Consultation is required.

Phase	Fund Source	Prior SFY	SFY2020	SFY2021	SFY2022	SFY2023	SFY2024	Future SFY	Total
PE	State Special Projects	-	$455,500	-	-	-	-	-	$455,500
	Total Preliminary Engineering	-	$455,500	-	-	-	-	-	$455,500
RW	State Special Projects	-	$185,000	-	-	-	-	-	$185,000
	Total Right of Way	-	$185,000	-	-	-	-	-	$185,000
CN	State Special Projects	-	-	$3,000,000	-	-	-	-	$3,000,000
	Total Construction	-	-	$3,000,000	-	-	-	-	$3,000,000
	Total Programmed	**-**	**$640,500**	**$3,000,000**	**-**	**-**	**-**	**-**	**$3,640,500**



Des 1801500 CE-4

Appendix I

Additional Studies

Des 1801500 LWCF Properties

1800005	1800005	Lake	Dowling Park
1800011	1800011	Lake	Tolleston Park
1800012	1800012	Lake	Washington Park
1800040	1800040	Lake	Homestead Park
1800055	1800055	Lake	Sheppard Memorial Park
1800059	1800059	Lake	Cheever Park
1800062	1800062	Lake	Leroy Township Park
1800063	1800063	Lake	Markley Memorial ParkEllendale Park
1800071	1800071	Lake	Cheever Park
1800087	1800087	Lake	Sheppard Memorial Park
1800102	1800102	Lake	Grand Boulevard Lake Recreation Area
1800108	1800108	Lake	Riverview Park
1800137	1800137	Lake	Northgate Park
1800150	1800150	Lake	Meadows Park
1800168	1800168	Lake	Sunnyside Park
1800170	1800170	Lake	Howe Park
1800189	1800189	Lake	Dowling Park
1800193	1800193	Lake	Harrison Park
1800194	1800194	Lake	Martin Luther King Jr. Park (Formerly Maywood Park
1800199	1800199	Lake	Ridgeway Park
1800202	1800202	Lake	Hatcher Park
1800206	1800206	Lake	Meadows Park
1800226	1800226	Lake	Hoosier Prairie Nature Preserve
1800227	1800227	Lake	Liberty Park
1800231	1800231	Lake	Pheasant Hills Community Park & Cherry Hill Tot-Lo
1800237	1800237	Lake	Wolf Lake Park (N & S)
1800239	1800239	Lake	Bluebird Park
1800253	1800253	Lake	Centennial Park
1800272	1800272	Lake	Wolf Lake Park (N & S)
1800273	1800273	Lake	Grand Kankakee Marsh County Park
1800302	1800302	Lake	Munster Community Park
1800311	1800311	Lake	25th Ave Park
1800329	1800329	Lake	Jackson Park
1800369	1800369H	Lake	Harrison Park
1800369	1800369D	Lake	Lemon Lake County Park
1800377	1800377	Lake	Main Square Park
1800386	1800386	Lake	Gibson Woods Nature PreserveTolleston Ridges Natu
1800405	1800405G	Lake	Clark and Pine Dune Swale Nature Preserve
1800414	1800414	Lake	Wolf Lake Park (N & S)
1800417	1800417	Lake	Centennial (Dan Rabin) Plaza & Trail
1800424	1800424	Lake	Lake Etta County Park
1800455	1800455	Lake	Deep River - Woods Mill County Park

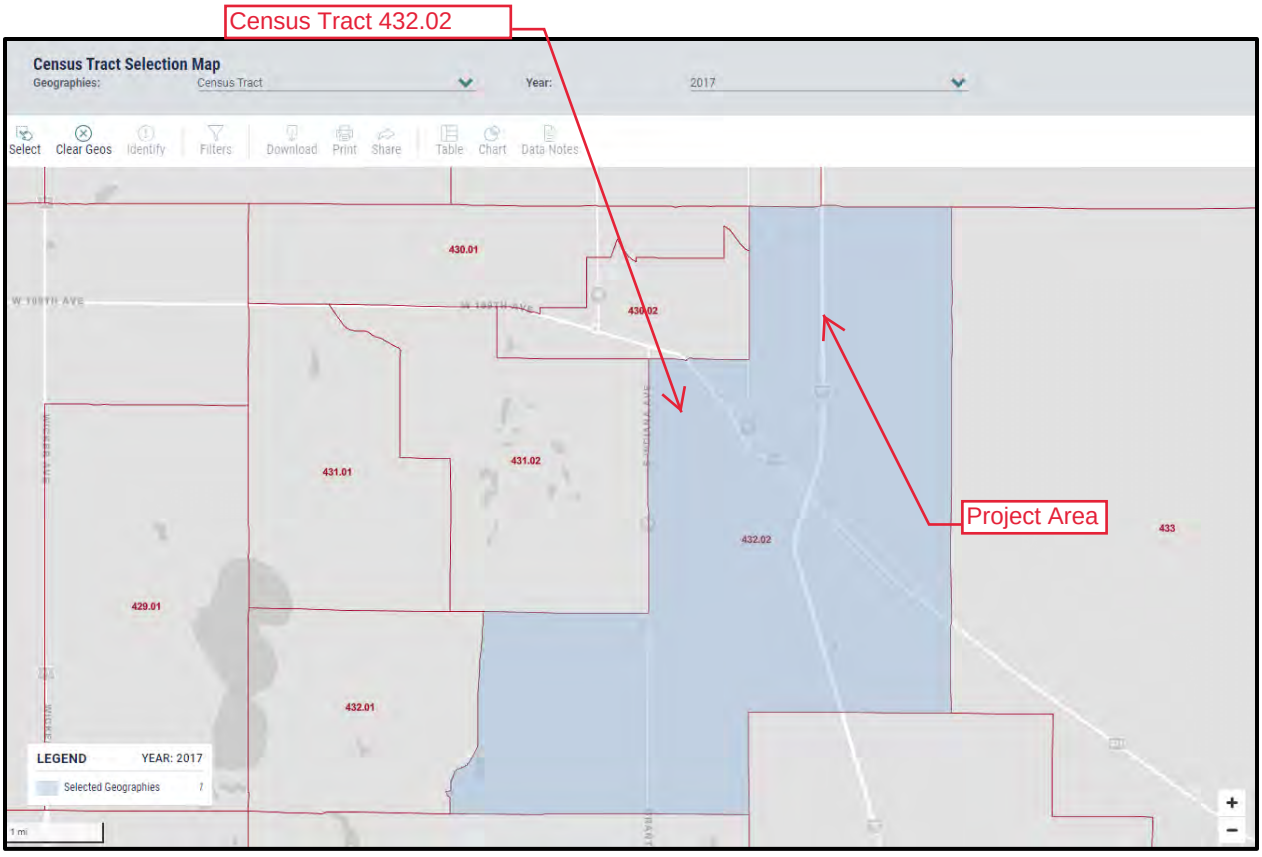
1800464	1800464	Lake	Festival Park & Lakefront Park
1800473	1800473	Lake	Oak Ridge Prairie Co. Park
1800488	1800488	Lake	Marquette Park
1800489	1800489	Lake	Festival Park & Lakefront Park
1800522	1800522	Lake	Pavese Park
1800523	1800523	Lake	Lakewood Park
1800523.5	1800523.5	Lake	River Drive Park
1800528	1800528	Lake	Lowell Sports Park
1800533	1800533	Lake	Hobart City Ball Park
1800555	1800555	Lake	Scherwood Golf Course
1800580	1800580	Lake	Oak Ridge Park
1800586	1800586	Lake	Teibel Nature Park
1800586.1	1800586.1	Lake	Teibel Nature Park
1800590	1800590	Lake	Deep River County Park
1800622	1800622	Lake	Fireman's Park
1800636	1800636	Lake	Parrish Avenue Park
1800328	1800594	1800611	1800626
1800328	1800594	1800611	1800626
Various*	Various*	Various*	Various*
Heritage program	Brown County State Park and Versailles State Park	Whitewater Memorial State Park/Salamonie Reservoir	Brown County S.P., Indiana Dunes S.P. and Cataract Falls SRA

Please note, some of the property names are cut off on the ends due to character limits

Also, park names may have changed and is not reflected on the list.
*Various - this may include multiple sites in multiple counties and should always be included in your searches by county.

Environmental Justice Analysis for Crown Point Interstate Access (Des 1801500)

		COC Center Township, Lake County, Indiana	AC1 Census Tract 432.02, Lake County, Indiana
	LOW-INCOME		
B 17001001	Population for whom poverty status is determined: Total	32,259	8,360
B 17001002	Population for whom poverty status is determined:Income in past 12 months below poverty	2,346	467
	Percent Low-Income	**7.3%**	**5.6%**
	125 Percent of COC	**9.1%**	**AC<125% COC**
	Potential Low-Income EJ Impact?		**No**
	MINORITY		
B 03002001	Total population: Total	33,015	8,669
B 03002002	Total population: Not Hispanic or Latino	30,824	7,775
B 03002003	Total population: Not Hispanic or Latino; White alone	29,387	7,099
B 03002004	Total population: Not Hispanic or Latino; Black or African American alone	479	329
B 03002005	Total population: Not Hispanic or Latino; American Indian and Alaska Native alone	23	21
B 03002006	Total population: Not Hispanic or Latino; Asian alone	530	230
B 03002007	Total population: Not Hispanic or Latino; Native Hawaiian and Other Pacific Islander alone	7	0
B 03002008	Total population: Not Hispanic or Latino; Some other race alone	18	18
B 03002009	Total population: Not Hispanic or Latino; Two or more races	380	78
B 03002010	Total population: Hispanic or Latino	2,191	894
B 03002011	Total population: Hispanic or Latino; White alone	1,305	607
B 03002012	Total population: Hispanic or Latino; Black or African American alone	65	65
B 03002013	Total population: Hispanic or Latino; American Indian and Alaska Native alone	0	0
B 03002014	Total population: Hispanic or Latino; Asian alone	14	0
B 03002015	Total population: Hispanic or Latino; Native Hawaiian and Other Pacific Islander alone	0	0
B 03002016	Total population: Hispanic or Latino; Some other race alone	448	189
B 03002017	Total population: Hispanic or Latino; Two or more races	359	33
	Number Non-White/Minority (P007001-P007003)	**3,628**	**1,570**
	Percent Non-White/Minority	**11.0%**	**18.1%**
	125 Percent of COC	**13.7%**	**AC>125% COC**
	Potential Minority EJ Impact?		**Yes**


Census Tract 432.02
Census Tract Selection Map
Geographies:
Census Tract
Year:
2017
Select
Clear Geos
Identify
Filters
Download
Print
Share
Table
Chart
Data Notes
430.01
430.02
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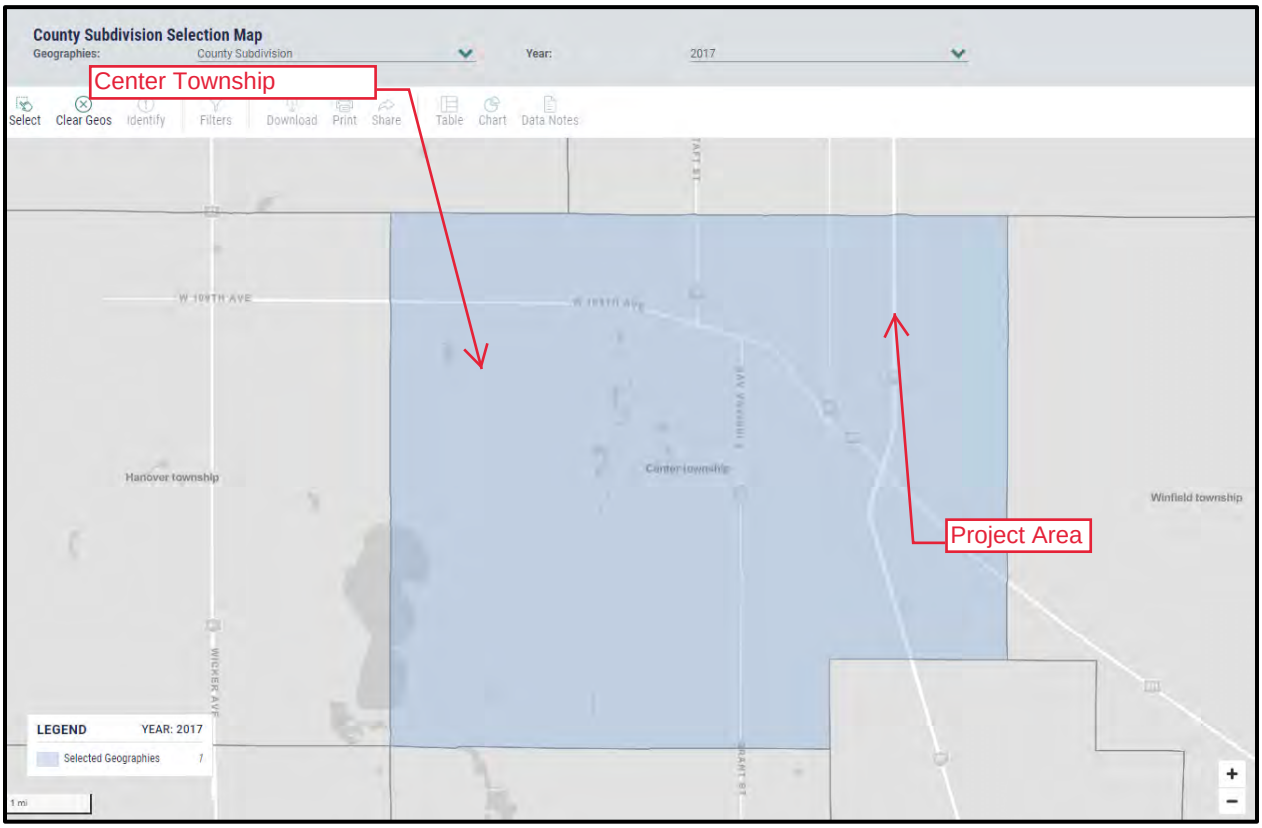
432.02
433
429.01
432.01
Project Area
LEGEND
YEAR: 2017
Selected Geographies
1 mi


County Subdivision Selection Map
Geographies:
County Subdivision
Year:
2017
Center Township
Select
Clear Geos
Identify
Filters
Download
Print
Share
Table
Chart
Data Notes
Hanover township
Center township
Winfield township
Project Area
LEGEND
YEAR: 2017
Selected Geographies
1 mi

Label	Center township, Lake County, Indiana		Census Tract 432.02, Lake County, Indiana	
	Estimate	Margin of Error	Estimate	Margin of Error
Total:	32,259	±206	8,360	±418
Income in the past 12 months below poverty level:	2,346	±541	467	±249
Male:	870	±257	242	±176
Female:	1,476	±395	225	±114
Income in the past 12 months at or above poverty level:	29,913	±555	7,893	±484

Label	Census Tract 432.02, Lake County, Indiana	
	Estimate	Margin of Error
Total:	8,669	±429
Not Hispanic or Latino:	7,775	±430
White alone	7,099	±572
Black or African American alone	329	±304
American Indian and Alaska Native alone	21	±20
Asian alone	230	±204
Native Hawaiian and Other Pacific Islander alone	0	±16
Some other race alone	18	±29
Two or more races:	78	±114
Two races including Some other race	0	±16
Two races excluding Some other race, and three or more races	78	±114
Hispanic or Latino:	894	±182
White alone	607	±177
Black or African American alone	65	±88
American Indian and Alaska Native alone	0	±16
Asian alone	0	±16
Native Hawaiian and Other Pacific Islander alone	0	±16
Some other race alone	189	±116
Two or more races:	33	±36
Two races including Some other race	0	±16
Two races excluding Some other race, and three or more races	33	±36

Label	Center township, Lake County, Indiana	
	Estimate	Margin of Error
Total:	33,015	±30
Not Hispanic or Latino:	30,824	±368
White alone	29,387	±499
Black or African American alone	479	±310
American Indian and Alaska Native alone	23	±22
Asian alone	530	±249
Native Hawaiian and Other Pacific Islander alone	7	±10
Some other race alone	18	±29
Two or more races:	380	±195
Two races including Some other race	0	±24
Two races excluding Some other race, and three or more races	380	±195
Hispanic or Latino:	2,191	±366
White alone	1,305	±291
Black or African American alone	65	±88
American Indian and Alaska Native alone	0	±24
Asian alone	14	±24
Native Hawaiian and Other Pacific Islander alone	0	±24
Some other race alone	448	±195
Two or more races:	359	±199
Two races including Some other race	285	±168
Two races excluding Some other race, and three or more races	74	±79

Interstate Access Request
At I-65 and 109th Street
Lake County

Des. No. 1801500

Alternative Evaluation Report
January 25, 2019

Prepared By:

USI consultants

Prepared For:

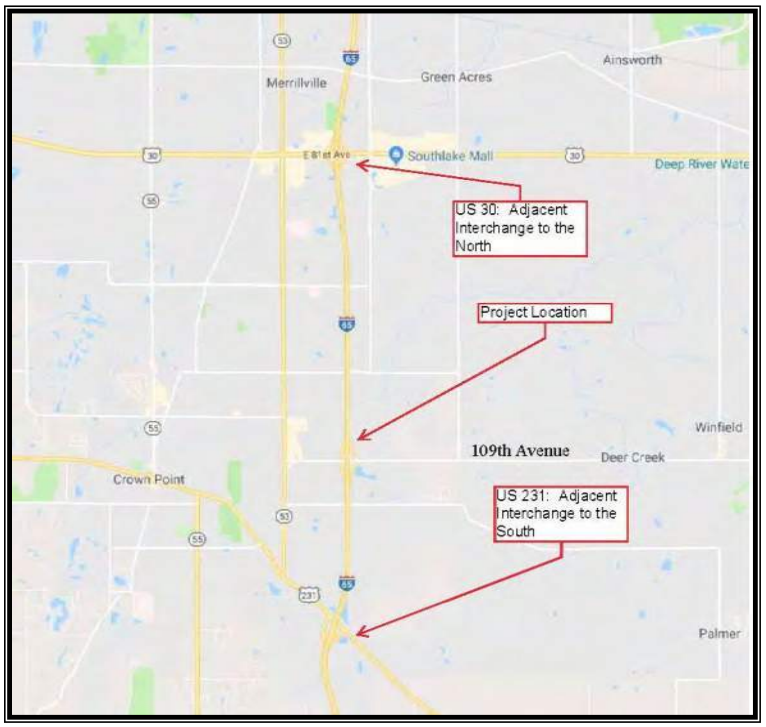
Indiana Department of Transportation
LaPorte District

Table of Contents

APPENDIX

1.0 Purpose of Report

The purpose of this report is to summarize the analysis of interchange alternatives for the modification of the I-65 at 109th Avenue interchange. This report documents the alternatives evaluation process and recommends the preferred alternative from the traffic and safety operations perspective. The analysis within constitutes the alternatives analysis for the subsequent Interstate Access Request.



2.0 Location

The interchange of I-65 and 109th Street is located central Lake County, Indiana, within the City of Crown Point. The adjacent project location map shows the project location.

3.0 Interstate Access Request Process

This Alternative Evaluation Report (AER) is the 2nd document in the Interstate Access Request process. The first document, the Framework Document, details the area to be studied, the methodology of the analysis and what alternatives to study. This Framework Document was approved on October 16, 2018, and provided the following alternatives to be studied:

-No-Build
-Improvements to the Standard Diamond Interchange
-Roundabouts at the ramp terminals
-Diverging Diamond Interchange (DDI)

4.0 Area of Influence

The Area of Influence was discussed during the September 19, 2018 Framework meeting. The Area of Influence will include the I-65 ramp terminals along 109th Street, 109th Street ramp junctions with I-65, and include adjacent interchanges north (US 30) and south (US 231) of 109th Street for merge/diverge analysis. No additional intersections along 109th Street, beyond the ramp terminals will be included as no major intersections exist within 1800' of either ramp terminal.

5.0 I-65 Mainline Capacity

Mainline capacity and Merge/Diverge areas were analyzed using HCS 2010. Level of Service (LOS) is analyzed for the existing year (2018), the construction year (2024) and the design year (2044). Traffic Data was obtained from the INDOT Traffic Count Database System (TCDS). LOS values range from "A" to "F". A value of "A" represents free flow conditions, while a value of "F" represents unstable operation where queues have formed on the interstate.

Table 1: Mainline Capacity Analysis Summary

		2018				2024				2044			
		AM		PM		AM		PM		AM		PM	
		LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density
Northbound	Merge from US 231	B	12.8	B	11.2	B	13.0	B	11.4	B	13.7	B	12.0
	Mainline South of 109th	A	10.0	A	9.4	A	10.2	A	9.6	A	10.8	A	10.1
	Diverge to 109th	A	8.8	A	7.9	A	9.1	A	8.1	A	9.8	A	8.8
	Mainline between gores	A	9.3	A	8.9	A	9.5	A	9.0	A	10.0	A	9.6
	Merge from 109th	B	18.4	B	16.1	B	18.8	B	16.4	C	20.1	B	17.4
	Mainline North of 109th	B	14.3	B	13.6	B	14.6	B	13.8	B	15.5	B	14.6
	Diverge to US 30	B	14.6	B	13.7	B	14.9	B	13.9	B	15.9	B	14.9
Southbound	Merge from US 30	B	11.3	C	20.3	B	11.5	C	20.7	B	12.2	C	22.1
	Mainline North of 109th	A	10.4	C	18.1	A	10.6	C	18.4	B	11.2	C	19.6
	Diverge to 109th	B	10.1	C	20.6	B	10.3	C	21.1	B	11.3	C	22.8
	Mainline between gores	A	7.9	B	12.9	A	8.1	B	13.2	A	8.5	B	14.0
	Merge from 109th	A	9.5	B	13.2	A	9.6	B	13.5	B	10.2	B	14.3
	Mainline South of 109th	A	8.3	B	11.9	A	8.4	B	12.5	A	8.9	B	13.3
	Diverge to US 231	A	6.9	B	12.7	A	7.1	B	13.0	A	7.8	B	13.8

All of the proposed alternatives to be evaluated will have the same interchange ramp junction configurations. Traffic volumes and ramp geometry are the same for all of the alternatives, therefore the mainline traffic analysis detailed in the following table applies to all of the alternatives.

Table 1 shows that all sections of mainline I-65 and ramp merge/diverge areas perform better than LOS D in the design year. This can be attributed to the recently constructed added travel lanes project that produced a 3-lane cross section per direction.

An analysis of the ramp junction geometrics, comparing the existing acceleration and taper lengths to the requirements shown in chapter 48 of the Indiana Design Manual (IDM) was performed. The complete analysis is included in the appendix, on pages D-1 to D-14. Although there are a couple of tapers that do not meet the criteria, a review of crash data revealed no accidents at the ramp junctions. No modifications to the ramp junctions are being considered as a part of any of the improvement alternatives.

6.0 Alternatives Considered

The alternatives being considered for analysis include No-Build, Standard Diamond, Roundabout Diamond and Diverging Diamond. Each alternative is detailed below.

For the No-Build alternative, the interchange geometry would remain as it currently exists. A drawing of the existing conditions is included in the report on page A-1.

The Standard Diamond alternative includes continuation to the east of the 5-lane cross section that Crown Point is building, through the interchange, with additional auxiliary lanes added to the ramp terminals. Existing traffic signals will be modernized or replaced as necessary. A schematic of the Standard Diamond alternative is shown in the appendix on page A-2.

The Roundabout Diamond alternative includes multiple variations through the analysis process. The first, Single Lane Roundabout with or without slip lanes, employs single lane roundabouts at the ramp terminals. The second, Two Lane Eastbound Only Roundabout, employs roundabouts at the ramp terminals that have 2-lanes in the eastbound direction and 1-lane in the westbound direction with slip lanes for westbound to northbound and southbound to eastbound. The third, Two Lane Roundabout, employs 2-lane roundabouts at the ramp terminals with 2 lanes in each direction through the interchange. Schematics for the Roundabout Diamond alternatives are shown in the appendix on pages A-3 to A-5.

The Diverging Diamond alternative reconfigures traffic flow so eastbound and westbound traffic diverge and cross over to the opposite side of the roadway in order to allow left turn movements to have free flow entry to the Interstate highway after the first 2-phase traffic signal. The interchange layout requires a 2-phase traffic signal at each of the two intersection points. A schematic of the Diverging Diamond interchange is shown in the appendix on page A-6.

All alternatives considered shall not impact the I-65 bridge superstructure, nor impact the pond in the southeast quadrant. It is anticipated that some of the alternatives require that the I-65 bridge will have the slope walls removed from each outer span. Anchor rods or soil nails will be utilized along with retaining wall that will allow for roadway widening in each outer span.

7.0 Traffic Analysis

7.1 No-Build

A Synchro (10.0) traffic signal analysis has been performed at the two existing traffic signals at the I-65 ramp terminals. The summary tables provides LOS, Delay and queuing length for each movement. Separate tables are included for the existing condition (2018), Construction year (2024) and the Design year (2044).

Table 2: 2018 No-Build LOS Summary

Intersection			AM Peak Hour			PM Peak Hour		
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
I-65 NB Ramp	Overall		B	20		C	25	
	EB	Lt	C	28	205	C	22	206
		Th	B	11	113	C	29	676
	WB	Th	D	39	284	C	28	285
		Rt	A	06	62	A	04	39
	NB	Lt	B	19	56	C	23	39
		Th						
		Rt	A	01	0	A	01	0
I-65 SB Ramp	Overall		C	22		D	38	
	EB	Th	D	39	390	D	53	976
		Rt	A	01	0	A	04	19
	WB	Lt	A	10	16	B	14	24
		Th	B	18	172	B	17	272
	SB	Lt	B	19	91	E	62	666
		Th						
		Rt	A	05	64	B	15	231
			Synchro results on pages C-136 to C-147 of Appendix					

Table 3: 2024 No-Build LOS Summary

Intersection			AM Peak Hour			PM Peak Hour		
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
I-65 NB Ramp	Overall		C	23		C	24	
	EB	Lt	D	37	202	C	26	235
		Th	B	11	123	C	27	724
	WB	Th	D	40	321	C	28	326
		Rt	A	06	64	A	04	41
	NB	Lt	C	22	64	C	26	43
		Th						
		Rt	A	01	0	A	02	6
I-65 SB Ramp	Overall		C	26		D	46	
	EB	Th	D	39	408	E	56	1046
		Rt	A	01	0	A	04	21
	WB	Lt	B	19	17	B	15	27
		Th	C	31	229	B	17	318
	SB	Lt	B	19	99	F	85	731
		Th						
		Rt	A	07	93	B	20	291
			Synchro results on pages C-148 to C-159 of Appendix					

Table 4: 2044 No-Build LOS Summary

Intersection			AM Peak Hour			PM Peak Hour		
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
I-65 NB Ramp	Overall		C	27		D	40	
	EB	Lt	D	52	333	D	38	356
		Th	A	09	123	E	54	1126
	WB	Th	D	46	454	C	32	515
		Rt	A	07	89	A	04	45
	NB	Lt	C	27	81	D	37	59
		Th						
		Rt	A	02	5	A	07	266
I-65 SB Ramp	Overall		C	22		F	89	
	EB	Th	D	39	408	F	128	1235
		Rt	A	01	0	A	05	27
	WB	Lt	A	10	17	B	17	34
		Th	B	19	194	C	23	480
	SB	Lt	B	19	99	F	147	977
		Th						
		Rt	A	07	93	C	35	503
			Synchro results on pages C-160 to C-171 of Appendix					

The analysis results in Table 4 show the southbound ramp terminal performs at LOS F during the design year. Long delays with excessive queuing is expected on multiple approaches. During the 2044 PM peak hour, the southbound left turn movement onto eastbound 109th Avenue performs at

LOS F with queuing that approaches the end of the ramp creating a conflict with fast moving Interstate highway traffic. The eastbound movement at the southbound ramp terminal also performs at LOS F with over 1200' of queuing. Additionally, eastbound traffic, stopped at the northbound ramp terminal is expected to back up beyond the western intersection. The No-Build Alternative does not address the existing traffic concerns, nor does it handle the projected traffic growth in the area. This alternative is being dismissed as a viable option as it does not address the operation and safety concerns that exist at this location.

7.2 Standard Diamond (with 5 lane section and Ramp Improvements)

The City of Crown Point is expected to construct a 5-lane cross section from Broadway to the west side of I-65 during the 2020 construction season. Improvements associated with this alternative will extend the 5-lane section through the interchange ramp terminals and include additional auxiliary lanes on the ramps.

A drawing of the added travel lanes and conventional ramp improvement alternative is included on page A-2 of the Appendix. Improvements associated with the alternative include the removal of the bridge slope walls to allow for the construction of 5 lanes under the I-65 bridge as well as double left turn and double right turn auxiliary lanes for the southbound exit ramp.

Table 5 provides LOS, delay and queuing length for each movement in the construction year 2024 and the design year 2044.

Table 5: Standard Diamond Ramp Improvement LOS Summary

Intersection			2024 (5-lane)						2044 (5-lane)					
			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
I-65 NB Ramp	Overall		B	17		B	18		B	19		B	18	
	EB	Lt	D	39	218	C	32	244	D	37	290	C	26	279
		Th	A	09	52	B	13	249	B	12	86	B	12	242
	WB	Th	B	19	104	C	22	132	C	24	151	C	29	188
		Rt	A	06	61	A	06	43	A	08	77	A	06	51
	NB	Lt	B	17	52	B	18	33	B	20	64	C	21	41
		Th												
		Rt	A	01	0	A	01	0	A	01	0	A	02	7
I-65 SB Ramp	Overall		B	16		B	19			B	20	B	19	
	EB	Th	C	25	149	C	26	239	C	26	162	C	27	273
		Rt	A	01	0	A	01	3	A	01	0	A	02	12
	WB	Lt	B	12	18	A	24	30	C	21	28	A	09	19
		Th	B	17	83	B	28	169	C	27	133	B	12	104
	SB	Lt	B	14	49	B	19	180	B	18	66	C	24	260
		Th												
		Rt	A	03	30	A	04	42	A	55	40	A	09	84
			Synchro results on pages C-173 to C-184 of Appendix						Synchro results on pages C-185 to C-196 of Appendix					

Adding through travel lanes on 109th Avenue along with auxiliary turn lanes on the ramps, improves LOS, delay and queuing. One limiting factor with this alternative is that the eastbound left turn

movement onto the northbound I-65 ramp is restricted to one single lane due to the geometric constraints associated with the I-65 bridge. The eastbound left turn movement is a fairly high volume (342 vpd, AM Design Year peak, 413 vpd, PM Design Year peak). Providing an eastbound double left turn lane would necessitate complete reconstruction of the I-65 bridge over 109th Avenue.

7.3 Roundabout Diamond Interchange

Sidra 8.0 Plus was utilized to analyze roundabout capacity for all of the layout scenarios. The results provided show LOS, delay and queue length.

7.3.1 Single Lane Roundabout

Table 6 shows the operational performance of a single lane roundabout interchange. The ramp terminals are each a single lane with results shown without and with slip lanes.

Table 6: Single Lane Roundabout LOS Summary 2024

Intersection			2024 Single Lane Roundabout						2024 Single Lane with Slip Lanes					
			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
I-65 NB Ramp	Overall		C	27		D	38		A	06		C	36	
	EB	Lt	B	11	0	F	55	1056	B	11	0	F	55	1056
		Th	A	04	0	F	48	1056	A	04	0	F	48	1056
	WB	Th	F	43	1023	B	12	287	A	06	71	A	06	94
		Rt	F	43	1023	B	12	287	A	04	0	A	04	0
	NB	Lt	B	16	29	D	54	132	B	16	29	D	54	132
		Th	A	09	29	D	45	132	A	09	29	D	45	132
		Rt	A	10	29	D	46	132	A	10	29	D	46	132
I-65 SB Ramp	Overall		A	07		F	93		A	05		B	15	
	EB	Th	A	06	126	F	106	1843	A	05	85	E	30	708
		Rt	A	07	126	F	107	1843	A	04	85	A	04	0
	WB	Lt	B	11	0	B	10	0	B	11	0	B	10	0
		Th	A	044	0	A	04	0	A	04	0	A	04	0
	SB	Lt	B	17	143	F	127	2244	B	13	20	B	14	103
		Th	A	10	143	F	121	2244	A	07	20	A	08	103
		Rt	A	10	143	F	121	2244	A	04	0	A	04	0
			Roundabout Layout sheets are on pages C-198 to C-200. Sidra Results are on pages C-201 to C-204.						Roundabout Layout sheets are on pages C-205 to C-207. Sidra Results are on pages C-208 to C-211.					

Table 7: Single Lane Roundabout LOS Summary 2044

Intersection			2044 Single Lane Roundabout						2044 Single Lane with Slip Lanes					
			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
I-65 NB Ramp	Overall		This Option is being dismissed as a Viable Alternative due to delays in the 2024 Build Year.						A	06		E	63	
	EB	Lt							B	11	0	F	95	2226
		Th							A	04	0	F	89	2226
	WB	Th							A	06	80	A	06	111
		Rt							A	04	0	A	04	0
	NB	Lt							B	16	32	C	109	221
		Th							A	09	32	C	100	221
		Rt							A	10	0	C	101	221
I-65 SB Ramp	Overall		This Option is being dismissed as a Viable Alternative due to delays in the 2024 Build Year.						A	05		C	35	
	EB	Th							A	05	85	F	93	1698
		Rt							A	04	0	A	04	0
	WB	Lt							B	11	0	B	10	0
		Th							A	04	0	A	04	0
	SB	Lt							B	14	27	B	16	167
		Th							A	07	27	B	10	167
		Rt							A	04	0	A	04	0
									Roundabout Layout sheets are on pages C-205 to C-207. Sidra Results are on pages C-212 to C-215.					

The results in Table 7 show the Single Lane Roundabout without slip lanes experiences widespread delays under 2024 traffic conditions. As a result, the alternative is eliminated from further consideration.

The addition of slip lanes to the roundabout increases capacity and reduces delay. However, the single lane eastbound through lane has significant delay and LOS F for both the Design year and the Build year due to the high volume of vehicles attempting to use the single lane. This alternative is being dismissed as a viable option

7.3.2 Two Lanes Eastbound, One Lane Westbound

As the traffic is heavier eastbound, than it is westbound, and there is the existing constraint of room for only 3 lanes of traffic under the center span of the bridge, this alternative was developed in order to address the operational concerns, while using practical design (avoiding impacts to the I-65 mainline bridge) to lower the anticipated construction costs. Right turn slip lanes are provided for the southbound to westbound movement along with the westbound to northbound movement. The traffic pattern underneath the I-65 bridge would remain unchanged. A display of this option is shown on page A-3 of the appendix. As can be seen in the display, two eastbound through lanes are extended through the northbound ramp terminal, then the outside lane merges downstream to the east.

An alternative was considered with one eastbound lane going through the northbound ramp terminal, however, the eastbound through movement had a LOS D due to a volume/capacity (v/c) ratio of 0.86. A v/c ratio that high in the roundabout represents a volatile situation that could quickly devolve to LOS F due to randomness of arrival flow from the other roundabout ramp terminal. With the 20% traffic growth associated with the Sensitivity Analysis, this movement went to a LOS of F and a v/c ratio above 1.0 (full saturation) Sidra results for this dismissed

alternative are included on pages C-228 to C-239 of the appendix. The Sidra results for the Sensitivity Analysis are on pages C-321 to C322 of the appendix.

Table 8: Two Lane Eastbound Only Roundabout LOS Summary 2024 & 2044

Intersection			2024 Two Lane Eastbound Only Roundabout								2044 Two Lane Eastbound Only Roundabout							
			AM Peak Hour				PM Peak Hour				AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	v/c ratio	Queue (ft)	LOS	Delay (s)	v/c ratio	Queue (ft)	LOS	Delay (s)	v/c ratio	Queue (ft)	LOS	Delay (s)	v/c ratio	Queue (ft)
I-65 NB Ramp	Overall		A	06			A	06			A	06			A	06		
	EB	Lt	A	10	0.30	0	A	10	0.55	0	A	10	0.30	0	A	10	0.61	0
		Th	A	05	0.26	0	A	04	0.55	0	A	05	0.27	0	A	04	0.61	0
	WB	Th	A	06	0.38	63	A	06	0.42	71	A	06	0.44	80	A	07	0.49	90
		Rt	A	04	0.31	0	A	04	0.13	0	A	04	0.40	0	A	04	0.16	0
	NB	Lt	B	13	0.19	18	B	15	0.16	14	B	13	0.19	18	B	16	0.17	17
		Th	A	06	0.19	18	A	08	0.16	14	A	06	0.19	18	A	09	0.17	17
		Rt	A	08	0.19	18	A	09	0.16	14	A	07	0.19	18	A	09	0.17	17
I-65 SB Ramp	Overall		A	06			A				A	06			B	12		
	EB	Th	A	06	0.26	41	A	10	0.58	148	A	06	0.27	46	B	17	0.72	270
		Rt	A	06	0.26	41	A	10	0.58	148	A	06	0.27	46	B	16	0.72	270
	WB	Lt	B	11	0.49	0	A	10	0.47	0	B	11	0.57	0	A	10	0.55	0
		Th	A	04	0.49	0	A	04	0.47	0	A	04	0.57	0	A	04	0.55	0
	SB	Lt	B	13	0.14	20	B	14	0.52	103	B	14	0.17	28	B	17	0.63	183
		Th	A	07	0.14	20	A	08	0.52	103	A	08	0.17	28	B	11	0.63	183
		Rt	A	04	0.25	0	A	04	0.33	0	A	04	0.27	0	A	04	0.63	0
			Roundabout Layout sheets are on pages C-217 to C-219. Sidra Results are on pages C-220 to C-223.								Roundabout Layout sheets are on pages C-217 to C-219. Sidra Results are on pages C-224 to C-227.							

The results in Table 8 show all movements associated with this alternative perform at a LOS A or B through the design year. The highest queuing of traffic for this option occurs at the southbound ramp intersection for both the eastbound through movement and the southbound left turn movement. These two movement both provide a reduction in queuing of over 60% as compared to existing conditions. Further consideration of this alternative will continue throughout the report.

7.3.3 Two-Lane Roundabout

Construction of the two-lane roundabout, as shown on pages A-3 and A-4 of the appendix, would require removal of the slope walls that exist in the northern and southern span of the existing bridge.

The following tables show the capacity and operational performance of a two-lane roundabout.

Table 9: Two Lane Roundabout LOS Summary 2024

Intersection			2024 Two Lane Roundabout								2024 Two Lane Roundabout with Slip Lanes							
			AM Peak Hour				PM Peak Hour				AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	v/c ratio	Queue (ft)	LOS	Delay (s)	v/c ratio	Queue (ft)	LOS	Delay (s)	v/c ratio	Queue (ft)	LOS	Delay (s)	v/c ratio	Queue (ft)
I-65 NB Ramp	Overall		A	06			A	07			A	06			A	06		
	EB	Lt	A	10	0.30	0	A	10	0.55	0	A	10	0.30	0	A	10	0.55	0
		Th	A	05	0.26	0	A	04	0.55	0	A	05	0.26	0	A	04	0.55	0
	WB	Th	A	06	0.47	66	A	07	0.35	41	A	06	0.19	23	A	06	0.21	26
		Rt*	A	04	0.48	66	A	06	0.35	41	A	04	0.31	0	A	04	0.13	0
	NB	Lt	B	13	0.07	6	B	16	0.08	7	B	13	0.07	6	B	16	0.08	7
		Th	A	06	0.11	11	A	08	0.07	6	A	06	0.11	11	A	08	0.07	6
		Rt	A	08	0.11	11	A	08	0.07	6	A	07	0.11	11	A	08	0.07	6
I-65 SB Ramp	Overall		A	06			A	09			A	06			B	07		
	EB	Th	A	05	0.28	35	A	09	0.58	115	A	05	0.28	33	A	08	0.53	80
		Rt	A	06	0.28	35	A	09	0.58	115	A	06	0.28	34	A	08	0.53	80
	WB	Lt	B	11	0.21	0	A	10	0.21	0	B	11	0.21	0	A	10	0.21	0
		Th	A	05	0.21	0	A	05	0.21	0	A	05	0.21	0	A	05	0.21	0
	SB	Lt	B	13	0.22	20	B	13	0.55	76	B	12	0.07	6	B	12	0.24	23
		Th	A	06	0.40	44	A	07	0.55	76	A	05	0.07	6	A	06	0.24	23
		Rt*	A	07	0.40	44	A	08	0.55	76	A	04	0.25	0	A	04	0.33	0
			Roundabout Layout sheets are on pages C-241 to C-243. Sidra Results are on pages C-244 to C-247.								Roundabout Layout sheets are on pages C-252 to C-254. Sidra Results are on pages C-255 to C-258.							

Table 10: Two Lane Roundabout LOS Summary 2044

Intersection			2044 Two Lane Roundabout								2044 Two Lane Roundabout with Slip Lanes							
			AM Peak Hour				PM Peak Hour				AM Peak Hour				PM Peak Hour			
			LOS	Delay (s)	v/c ratio	Queue (ft)	LOS	Delay (s)	v/c ratio	Queue (ft)	LOS	Delay (s)	v/c ratio	Queue (ft)	LOS	Delay (s)	v/c ratio	Queue (ft)
I-65 NB Ramp	Overall		A	06			A	06			A	06			A	06		
	EB	Lt	A	10	0.30	0	A	10	0.61	0	A	10	0.30	0	A	10	0.61	0
		Th	A	05	0.27	0	A	04	0.61	0	A	05	0.27	0	A	04	0.61	0
	WB	Th	A	06	0.56	94	A	07	0.41	53	A	06	0.23	30	A	06	0.25	34
		Rt*	A	04	0.56	94	A	06	0.41	53	A	04	0.40	0	A	04	0.16	0
	NB	Lt	B	13	0.07	7	B	16	0.09	9	B	13	0.07	7	B	16	0.09	9
		Th	A	06	0.11	10	A	08	0.08	8	A	06	0.11	10	A	08	0.08	8
		Rt	A	08	0.11	10	A	08	0.08	8	A	07	0.11	10	A	08	0.08	8
I-65 SB Ramp	Overall		A	06			A	09			A	06			B	08		
	EB	Th	A	05	0.29	38	A	09	0.62	123	A	05	0.29	36	B	08	0.58	98
		Rt	A	006	0.29	38	A	09	0.62	123	A	06	0.29	36	B	08	0.58	98
	WB	Lt	B	11	0.25	0	A	10	0.25	0	B	11	0.25	0	A	10	0.25	0
		Th	A	05	0.25	0	A	05	0.25	0	A	05	0.25	0	A	05	0.25	0
	SB	Lt	B	13	0.23	21	B	14	0.62	98	B	12	0.08	7	B	12	0.29	28
		Th	A	06	0.39	41	A	08	0.62	98	A	05	0.08	7	B	06	0.29	28
		Rt*	A	07	0.39	41	A	08	0.62	98	A	04	0.27	0	A	04	0.36	0
			Roundabout Layout sheets are on pages C-241 to C-243. Synchro Results are on pages C-248 to C-251.								Roundabout Layout sheets are on pages C-252 to C-254. Synchro Results are on pages C-259 to C-262.							

* Slip Lane provided for this movement

The results in Table 9 & 10 show Two lane roundabouts, with and without right turn slip lanes for selected movements both provide a satisfactory LOS, with no individual approach movements falling below LOS B. Further consideration of these alternatives will continue throughout the report.

7.4 Diverging Diamond Interchange (DDI)

Synchro 10 was utilized to model the DDI. Double left and right turn lanes were developed for the southbound exit ramp. The following table 11 shows the capacity and operational performance of the DDI. A display of the alternative is shown on page A-5 of the appendix.

Table 11: Diverging Diamond LOS Summary 2024 & 2044

Intersection			2024 DDI						2044 DDI					
			AM Peak Hour			PM Peak Hour			AM Peak Hour			PM Peak Hour		
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
NB I-65 Ramp	Overall		A	12		B	11		B	13		B	15	
	EB	Th	A	09	74	A	10	157	B	12	84	B	13	223
	WB	Th	B	17	76	B	16	84	B	16	94	C	21	10
	NB	Lt	A	01	0	A	01	0	A	01	6	A	01	6
		Rt	A	01	0	A	06	16	A	01	0	A	09	28
SB I-65 Ramp	Overall		A	08		B	13		A	09		B	15	
	EB	Th	B	19	114	B	19	182	B	17	117	B	18	206
	WB	Th	A	03	17	B	13	89	A	05	45	B	16	135
	SB	Lt	A	01	4	A	10	83	A	02	8	A	14	134
		Rt	A	02	18	A	05	50	A	06	43	A	09	80
			Synchro results on pages C-264 to C-287 of Appendix						Synchro results on pages C-288 to C-311 of Appendix					

The DDI removes all eastbound and westbound turning movements from the signalized intersection. Signal phasing is simplified, thus providing more green time for motorists. All movements within the interchange are expected to operate at LOS C or better through the design year. Further consideration of this alternative will continue throughout the report.

7.5 Sensitivity Analysis

A comparison of the alternatives was performed for the PM peak with traffic data that exceeded the 2044 design year by 20%. This analysis will help determine which build option responds to increased volumes in the best manner. The intent is not to design to this additional traffic load, rather provide an evaluation of where the operational concerns would occur if traffic volumes ever exceeded the design year volumes. The following tables summarize the results.

Table 12: Sensitivity Analysis LOS Summary Table

			5-Lane Section				DDI			
			2044 PM Peak				2044 PM Peak			
			LOS	Delay (s)	v/c	Queue	LOS	Delay (s)	v/c	Queue
I-65 NB Ramp	Overall		C	25			B	19		
	EB	Lt	D	40	0.90	411				
		Th	B	14	0.72	340	B	15	0.83	257
	WB	Th	D	45	0.90	302	C	30	0.83	229
		Rt*	A	07	0.51	60				
	NB	Lt	C	25	0.12	47	A	03	0.06	13
		Th								
		Rt	A	04	0.17	21	B	12	0.16	38
I-65 SB Ramp	Overall		C	24			B	20		
	EB	Th	C	32	0.89	406	C	24	0.88	330
		Rt	A	05	0.13	24				
	WB	Lt	B	12	0.27	28				
		Th	B	15	0.45	161	C	25	0.68	153
	SB	Lt	C	29	0.71	366	B	20	0.74	184
		Th								
		Rt*	B	15	0.59	167	A	10	0.50	113
			LOS Results on pages C313 to C318				LOS Results on pages C325 to C337			

The 5-Lane section performs at a LOS C for both the southbound and northbound ramp terminals. The only movement that performs below LOS C is the eastbound left turn movement onto northbound I-65. As stated previously, the existing I-65 bridge over 109th Avenue limits this movement to a single left turn lane. Of the 4 alternatives analyzed with this sensitivity analysis, it has the highest expected user delay.

The DDI provides a LOS B (LOS nearing C) for both the Southbound and Northbound ramp terminals. The DDI performs better than the 2-Lane Eastbound Only alternative, under this sensitivity analysis, and would allow for greater control of the traffic through the 2-phase signals.

Table 12.1: Sensitivity Analysis LOS Summary Table

			2 Lanes EB thru the NB Ramp Intersection				2 Lanes EB, dropping the 2nd EB thru Lane at the NB Ramp Intersection				Two Lane Roundabout No Slip Lanes			
			2044 PM Peak				2044 PM Peak				2044 PM Peak			
			LOS	Delay (s)	v/c	Queue	LOS	Delay (s)	v/c	Queue	LOS	Delay (s)	v/c	Queue
I-65 NB Ramp	Overall		A	07			B	14			A	07		
	EB	Lt	A	10	0.73	0	A	10	0.50	0	A	10	0.73	0
		Th	A	04	0.73	0	F	18	1.03	349	A	04	0.73	0
	WB	Th	A	09	0.62	71	A	10	0.63	174	A	08	0.53	87
		Rt*	A	04	0.19	0	A	04	0.19	0	A	08	0.53	87
	NB	Lt	B	18	0.25	14	D	42	0.61	112	B	19	0.13	13
		Th	B	11	0.25	14	D	34	0.61	112	A	10	0.11	13
		Rt	B	11	0.25	14	D	34	0.61	112	A	10	0.11	13
I-65 SB Ramp	Overall		C	25			C	25			B	11		
	EB	Th	E	50	0.99	798	E	50	0.99	798	B	13	0.80	228
		Rt	E	49	0.99	798	E	49	0.99	798	B	13	0.80	228
	WB	Lt	A	10	0.66	0	A	10	0.66	0	A	10	0.29	0
		Th	A	04	0.66	0	A	04	0.66	0	A	05	0.29	0
	SB	Lt	B	24	0.75	308	C	24	0.75	308	B	16	0.74	154
		Th	B	18	0.75	308	B	18	0.75	308	B	09	0.74	154
		Rt*	A	04	0.44	0	A	04	0.44	0	B	10	0.74	154
			LOS Results on pages C319 to C320				LOS Results on pages C321 to C322 This Alternative is dismissed, due to LOS F for the EB movement at the north ramp.				LOS Results on pages C323 to C324			

The 2-Lane Eastbound Only roundabout provides an overall intersection LOS A for the northbound ramp terminal and LOS C for the southbound ramp terminal. The two movements that have an LOS below C are the eastbound approach movements at the southbound ramp terminal.

The results show that the 2-Lane Roundabout and DDI operate similarly and somewhat better than the 2-Lane Eastbound Only Roundabout for the sensitivity analysis case. The Diverging Diamond interchange can be operated with more control for the +20% case but as noted previously, the sensitivity case is not intended to establish design but rather to ensure the preferred traffic design has spare capacity rather than experiencing failure with higher than expected growth. To that end, the 2-Lane Eastbound Only Roundabout alternative satisfies the check but with near failing stress for the eastbound movement at the southbound ramp terminal.

8.0 Safety Analysis

For all of the interchange alternatives, the safety analysis for I-65 will remain unchanged, and is not discussed in this report.

Existing crashes from 2015 to 2017 were analyzed along 109th Avenue and the ramp terminals. The location and type of these crashes are plotted on drawing A-1 of the Appendix. As can be seen on this drawing, rear end type crashes and left turn type crashes comprise the vast majority of the crashes. A total of 78 crashes occurred during the 3 year period. The crashes resulted in 17 reported injuries.

RoadHat 3.0 was utilized to analyze the crash data. The southbound ramp terminal had a total of 43 crashes, 6 of which resulted in injury. No incapacitating injuries or fatalities occurred. The results of the RoadHat analysis shows that the crash frequency (ICF = 3.5) at this intersection is in the 99th percentile in terms of crash frequency as compared to similar intersections. The northbound ramp terminal had a total of 35 crashes, 6 of which resulted in injury. No incapacitating injuries or fatalities occurred. The results of the RoadHat analysis show that the crash frequency (ICF = 2.8) is in the 98th percentile in terms of crash frequency as compared to similar intersections. Long delays, queuing of vehicles, and impatient and distracted drivers all contribute to the high rate of crashes.

The safety characteristics of each alternative will be briefly discussed.

No build: No change to the existing configuration. No reduction in crossing or merging conflict points would occur. Accidents would be expected to increase as additional volumes create longer delays and more vehicle queuing. A total of 30 conflict points (10 crossing, 10 merging, and 10 diverging) exist with the diamond interchange

5-Lane Section: The proposed 5-Lane section (with additional ramp auxiliary lanes) would reduce delays and queuing. No change or reduction in conflict points would occur.

Roundabout: The 2-Lane roundabout alternative would greatly reduce driver delay and queuing. This alternative would eliminate all crossing conflict points. A total of 16 conflict points exist with this roundabout alternative (8 merging, 8 diverging).

The roundabout with 2 lanes eastbound only keeps the existing lane configuration underneath the I-65 bridge. Although separation of the eastbound and westbound traffic is usually provided within a roundabout pair, there is no evidence of operational or safety concerns with the existing lane configuration (i.e. no head on crashes).

Diverging Diamond: The DDI alternative reduces delay and queuing. This alternative would reduce the crossing conflicts from the 10 that exist today, to 2 crossing conflict locations. A total of 18 conflict points exist with this alternative (2 crossing, 8 merging, 8 diverging).

9.0 Additional Considerations

In addition to traffic and safety operations, other items to consider when evaluating interchange alternatives include construction costs, right of way impacts, environmental impacts, constructability and future expandability

Construction Costs: Detailed construction cost estimates for the 3 build alternatives are included in the appendix on pages B-1 to B-3. A summary of the results is shown in the table 13.

Table 13: Estimated Construction Costs

Interchange Type	Bridge	Roadway	MOT	Total
Standard Diamond (5-Lane)	300,000	2,730,000	100,000	$3,130,000
2-Lane Eastbound Roundabout (keep 3-lane section under bridge)	0	2,830,000	150,000	$2,980,000
2-Lane Roundabout	300,000	3,800,000	200,000	$4,300,000
2-Lane Roundabout with Slip Lanes	300,000	4,000,000	200,000	$4,500,000
DDI	300,000	3,620,000	280,000	$4,200,000

The lowest cost alternative is the Roundabout option that provides 2 lanes for eastbound traffic only. This alternative assumes that the existing pavement can be utilized via widening and resurfacing.

Future traffic accommodations: As shown in section titled "Sensitivity Analysis", the 2-Lane Roundabout provides the best option for accommodating future traffic. If traffic volumes dictated additional capacity requirements, the slip lanes could be constructed with minor costs and little impact to traffic.

Right-of-way Impacts: The estimated amount of right-of-way for each alternative is shown in the table 14 below:

Table 14: Right-of-way Summary

Interchange Type	# of Parcels	Total Acreage
Standard Diamond (5-Lane)	4	0.40
2-Lane Eastbound Only Roundabout	4	0.20
2-Lane Roundabout	4	0.32
2-Lane Roundabout with Slip Lanes	4	0.52
DDI	4	0.89

The roundabout option has the least amount of right of way impact. The DDI alternative and 2-lane roundabout with slip lanes, would require a Level 2 Categorical Exclusion (CE), while the other 2 alternatives would require a Level 1 CE.

Environmental Impacts:

Environmental impacts for all build alternatives are fairly minor. All will impact the existing 10' x 4; concrete box culvert that exists east of the northbound ramp terminal. Waterway permits (401 & 404) are likely required for all of the build alternatives. No wetland delineation has occurred. Some wetlands may be present in the footprint of the existing interchange. No build alternative is expected to require wetland mitigation, as any impact would be less than 0.1 acre.

10.0 Recommendations

Alternative Evaluation Summary:

The table below (15) is an alternative evaluation matrix, that ranks the alternatives, relative to each other, from 1-4, then sums the total ranking. The alternative with the lowest number is the highest ranking alternative. In cases where there is little difference between alternatives, they will receive the same ranking.

Table 15: Alternative Evaluation Matrix

Interchange Type	Traffic Operations Performance	Safety	Cost	Constructability	Environmental Impacts	Right-of-way Impacts	Future Expandability	Total Matrix Evaluation Score
Diamond Interchange (with 5-lane section	4	3	1	1	1	2	2	14
2-Lane Eastbound Only Roundabout	**3**	**1**	**1**	**1**	**1**	**1**	**1**	**9**
2-Lane Roundabout	1	1	2	2	1	1	3	11
2-Lane Roundabout With Slip Lanes	1	1	2	2	2	2	3	13
Diverging Diamond Interchange (DDI)	2	2	2	3	3	3	3	18

The DDI is being dismissed as the preferred alternative, as it did not perform operationally as well as the 2-Lane roundabout alternatives, it had a larger footprint, and scored the worst on the above Evaluation Matrix.

Maintaining the Diamond Interchange, with a 5-lane section, along with ramp improvements is also being dismissed as a preferred alternative. This alternative was the worst performing in terms of traffic operations, and had the highest amount of crossing movements (right-angle, more severe crashes). With the existing I-65 bridge constraints, this alternative is limited to providing a single eastbound to northbound left-turn auxiliary lane for this heavy movement.

In general, the roundabout alternatives had the highest level of performance in terms of traffic operations and safety. The roundabout alternatives are preferred over the DDI and the Diamond Interchange.

The addition of slip lanes on the full 2-lane roundabout does very little to improve the traffic operations over that of the full 2-lane roundabout. Providing the slip lanes increases the costs, amount of required right-of-way, and environmental impacts. The 2-Lane Roundabout with Slip Lanes is not preferred.

Both the full 2-Lane roundabout and the 2-lane Eastbound Only roundabout are shown to provide a high level of traffic operation, eliminate all crossing movements (eliminate right angle crashes), and have fairly low impact in terms of right-of-way requirements and environmental impacts. The

2-Lane Eastbound only roundabout is clearly the lowest cost option, as it utilizes the existing section of 109th Avenue underneath the center span of the I-65 bridge. Only as traffic growth is pushed 20% higher than the anticipated design year traffic does the 2-Lane Eastbound Only roundabout start to show some operational stress.

The proposal for the I-65 at 109th Avenue interchange modification is to move forward with the 2-Lane Eastbound Only Roundabout Interchange Alternative as the preferred alternative from the traffic and safety operations perspective. This preferred alternative will be the focus of the Interstate Access Document and be vetted in the environmental process to determine ultimate selection for construction. There is potential that, during the subsequent design process, funding support for the full 2-Lane Roundabout Alternative could be coordinated. If this occurs, the 2-Lane Roundabout will become the preferred alternative. At this point in time, the 2-Lane Eastbound Only Roundabout is the most cost effective alternative for INDOT.