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



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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, 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 Petermination 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 Gleved 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 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

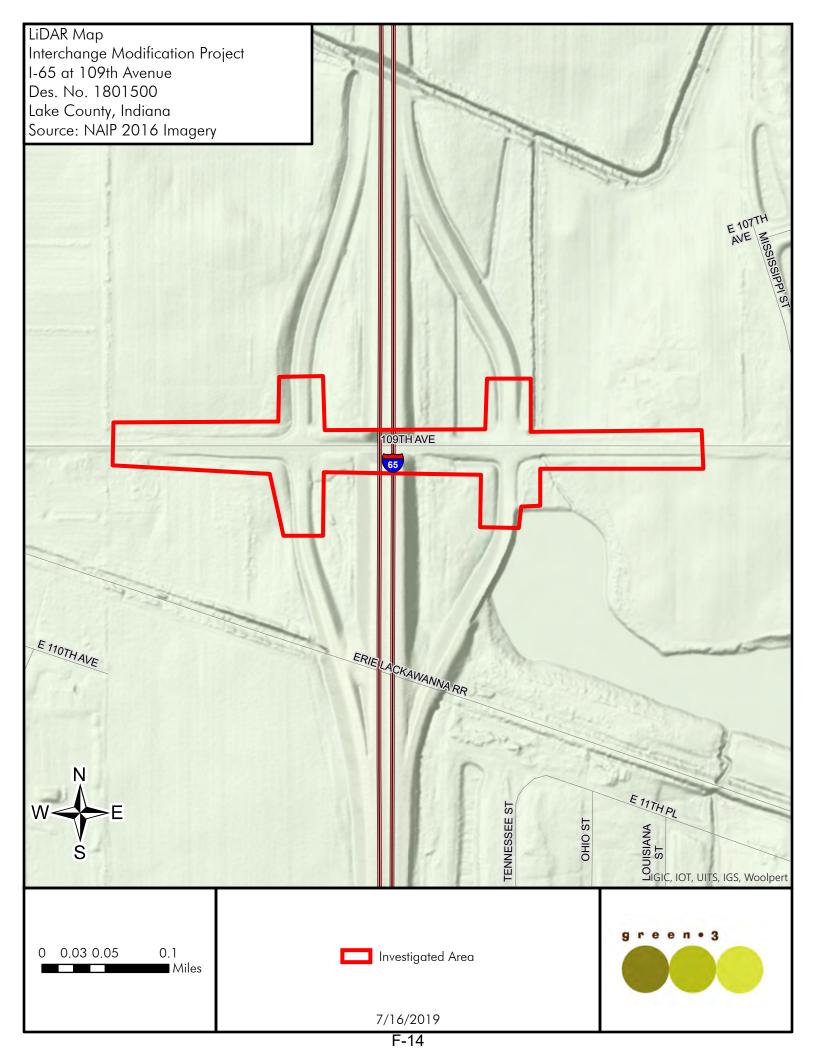
Ecologist Green 3, LLC

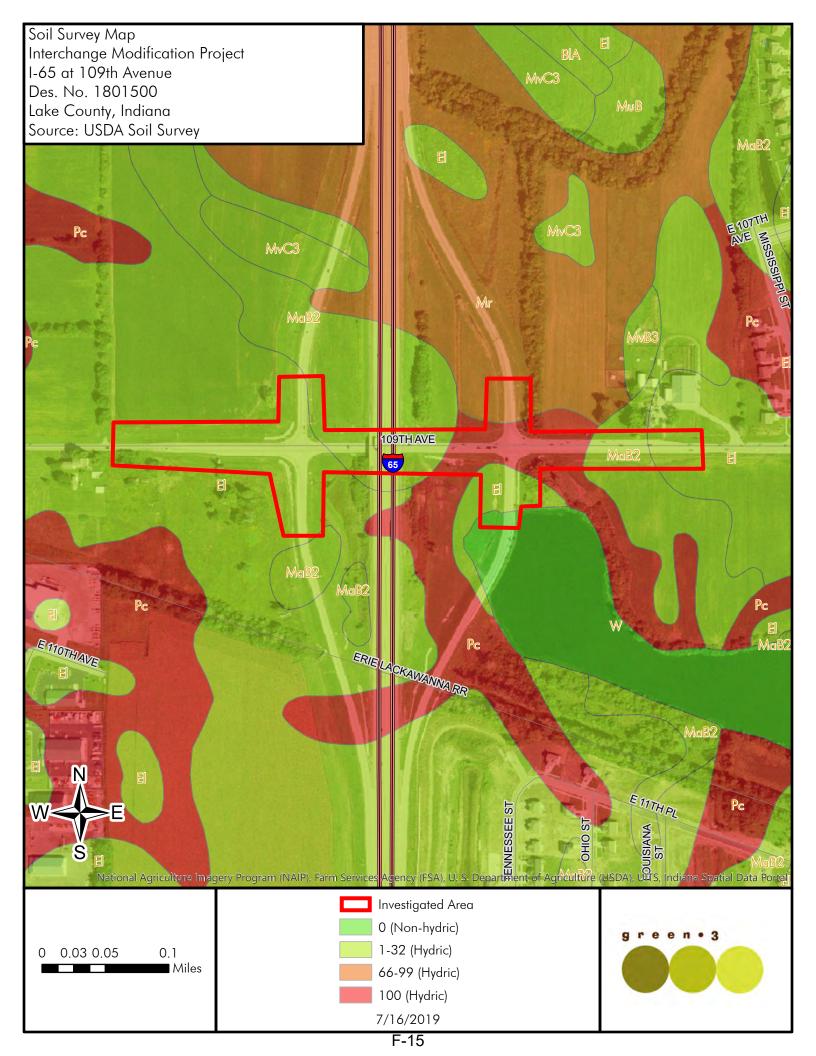
Date: July 18, 2019

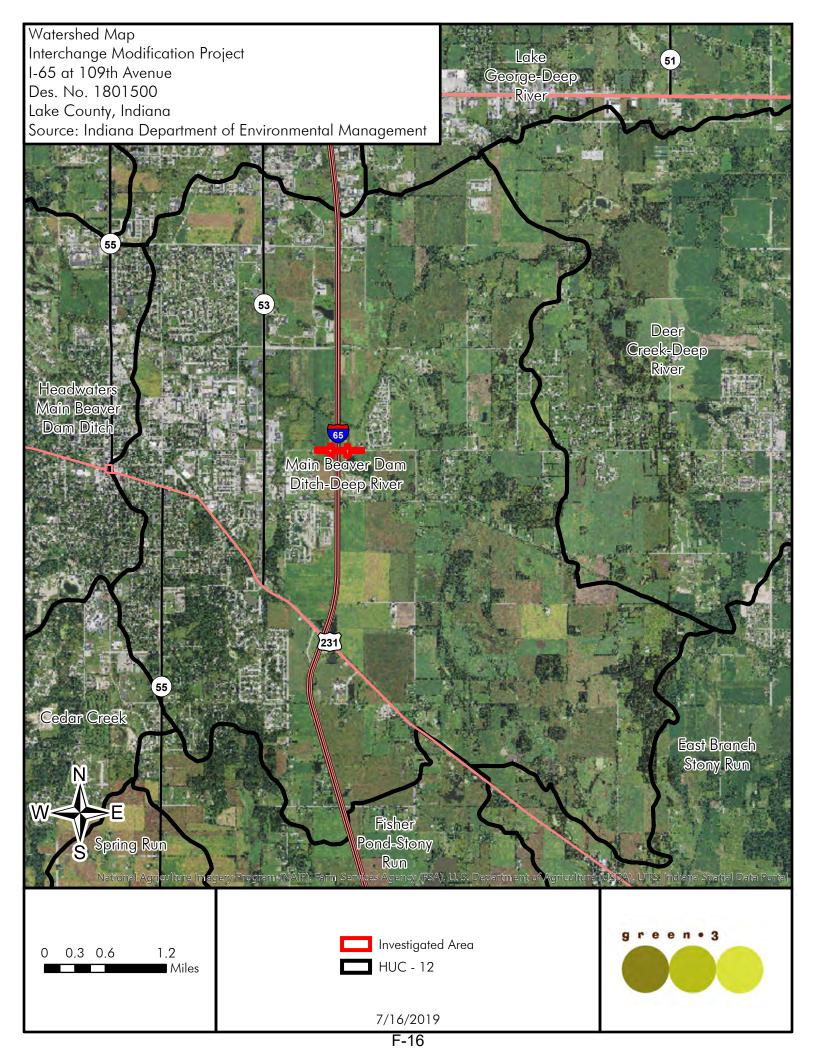
Supporting Documentation:

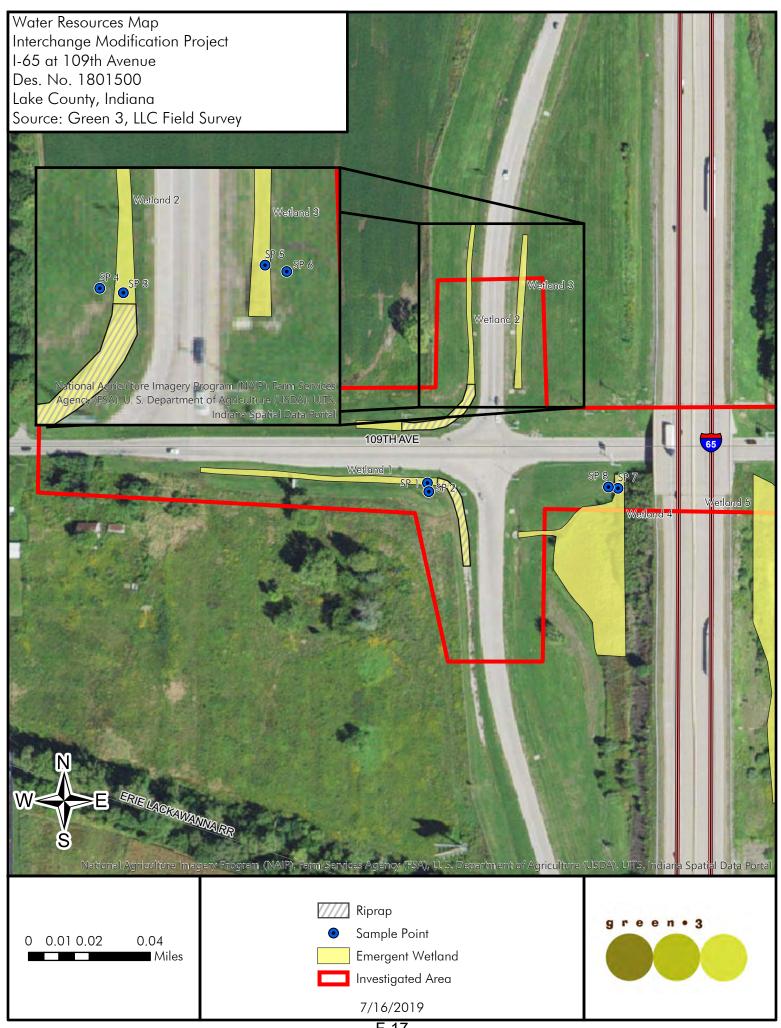
Christian Radcliff

- Maps
- Photos
- Wetland Delineation Data Sheet

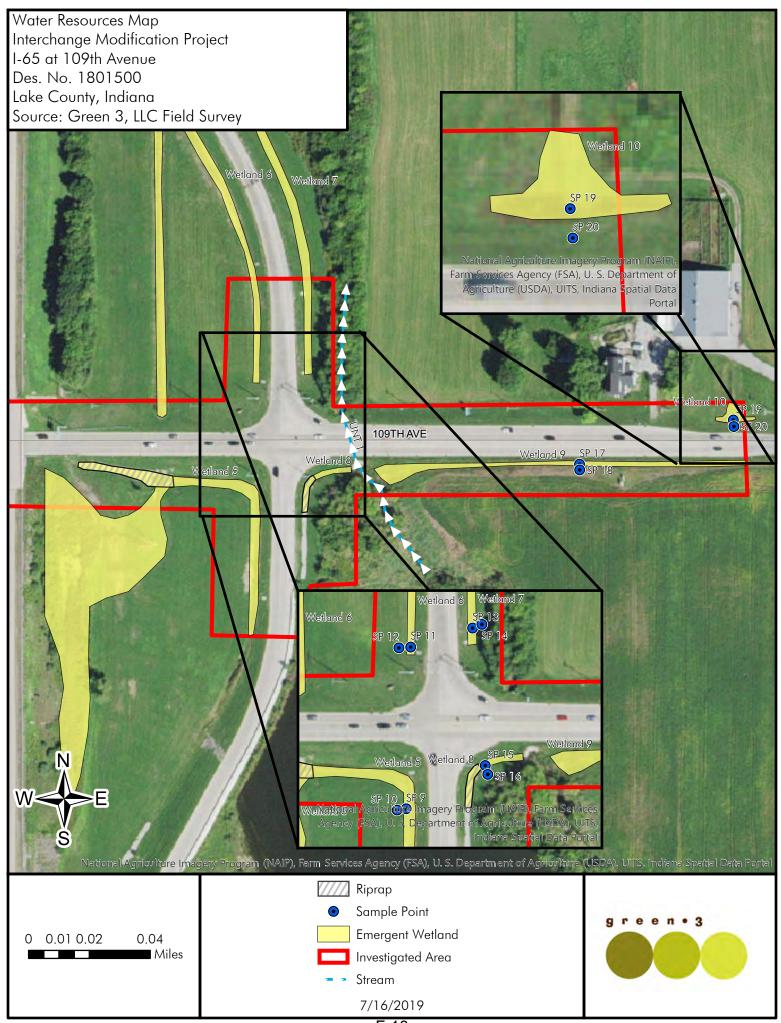




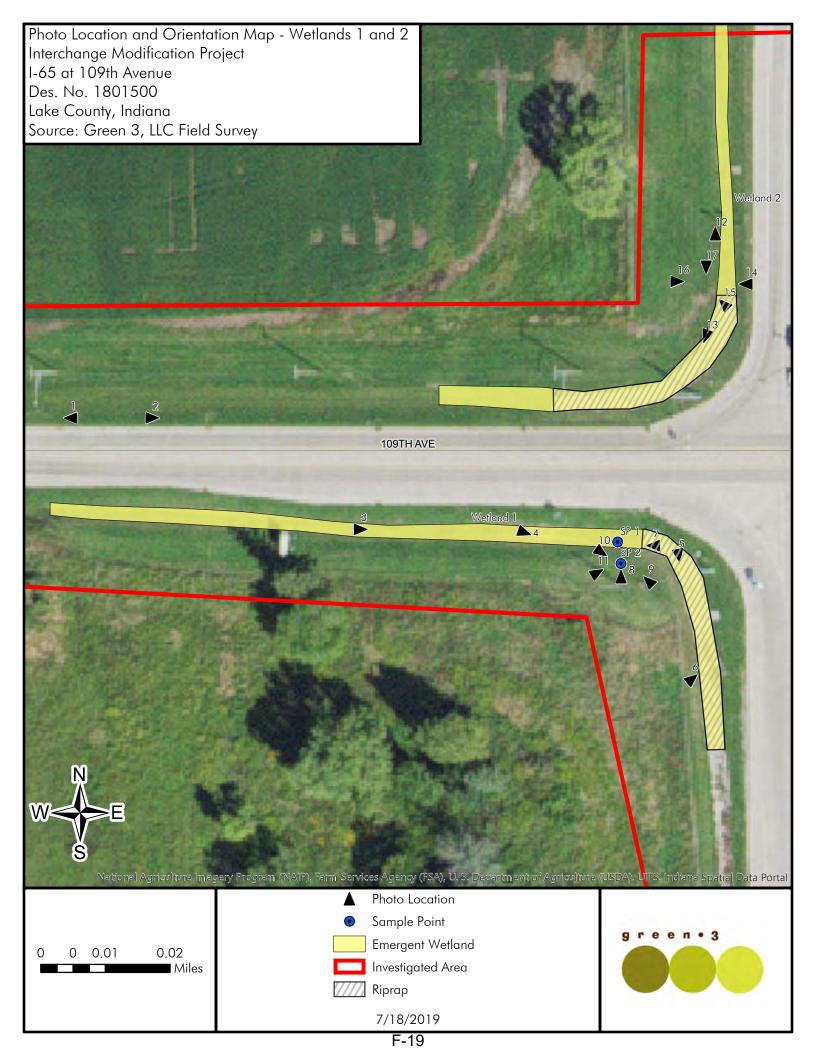


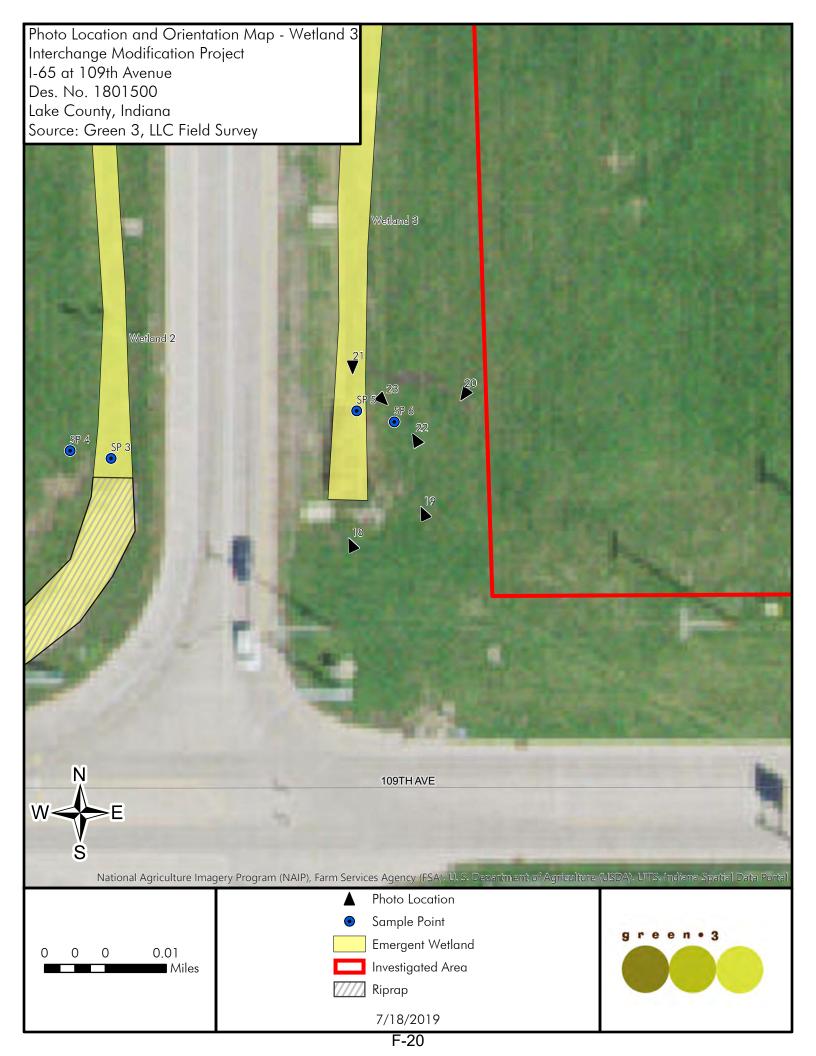


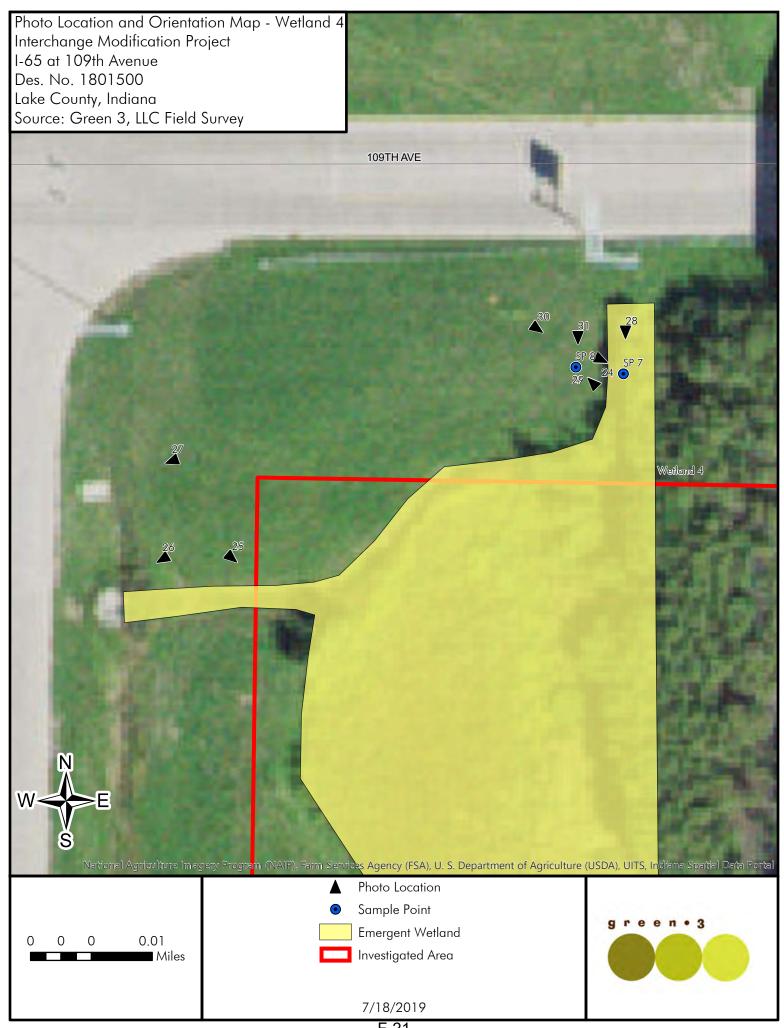
F-17

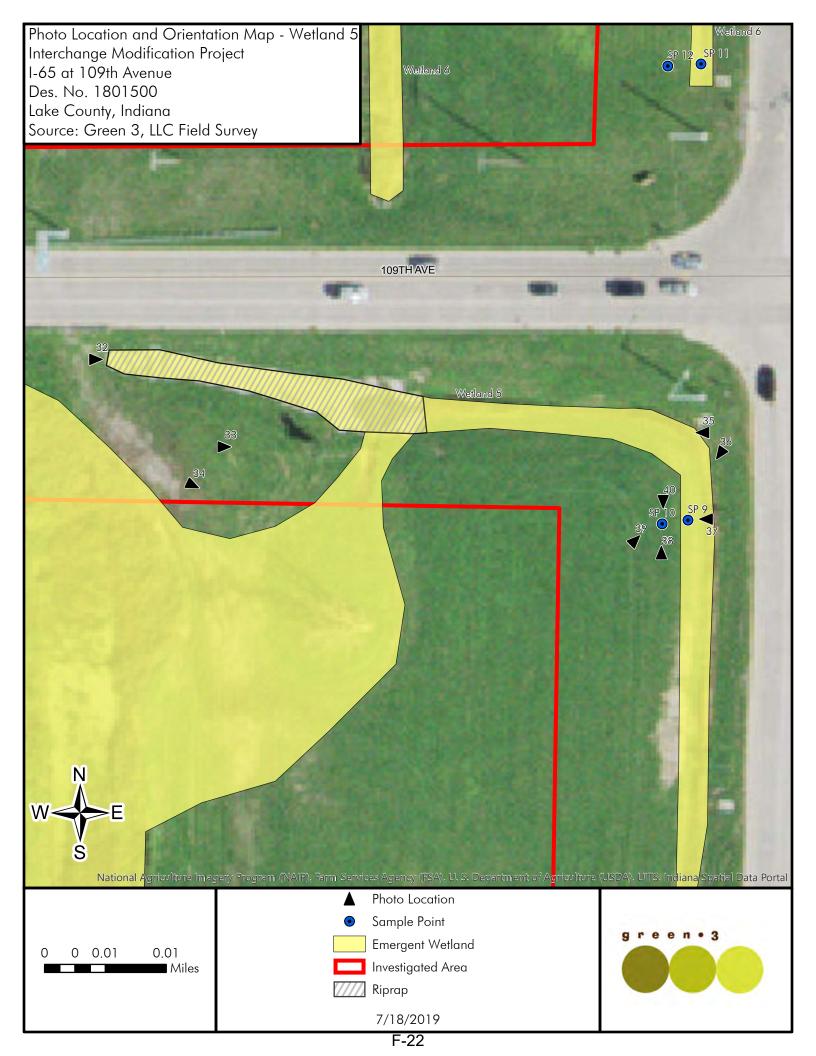


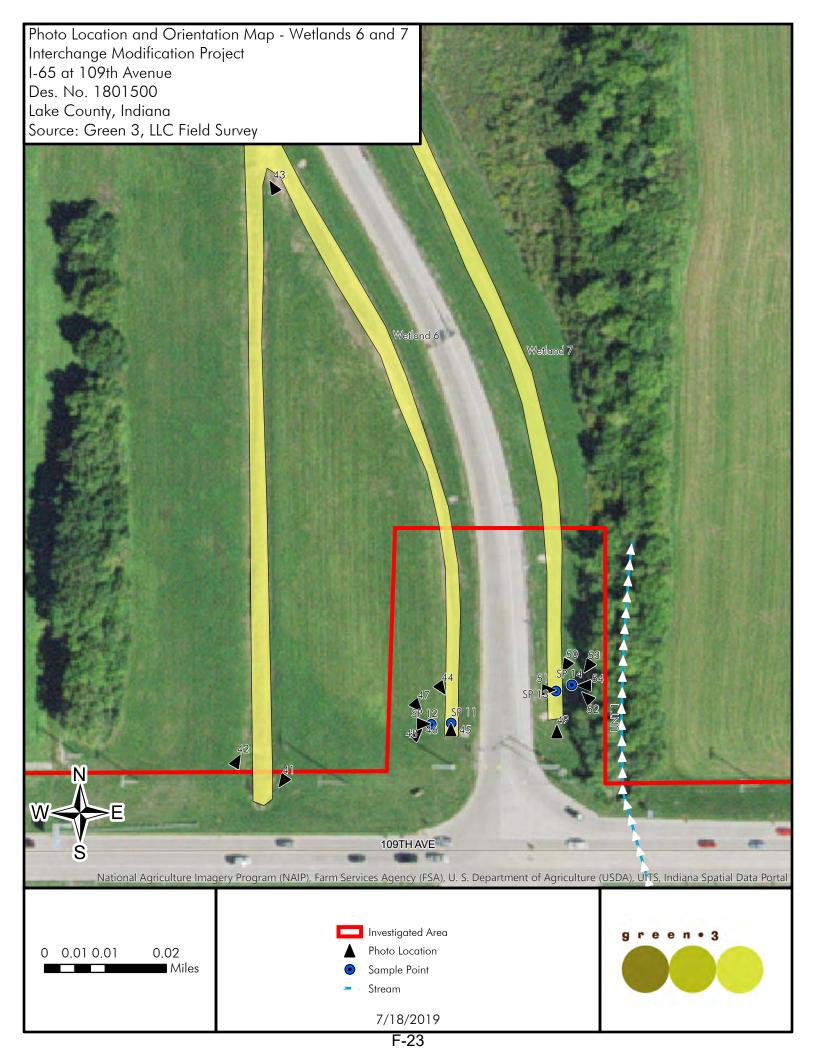
F-18

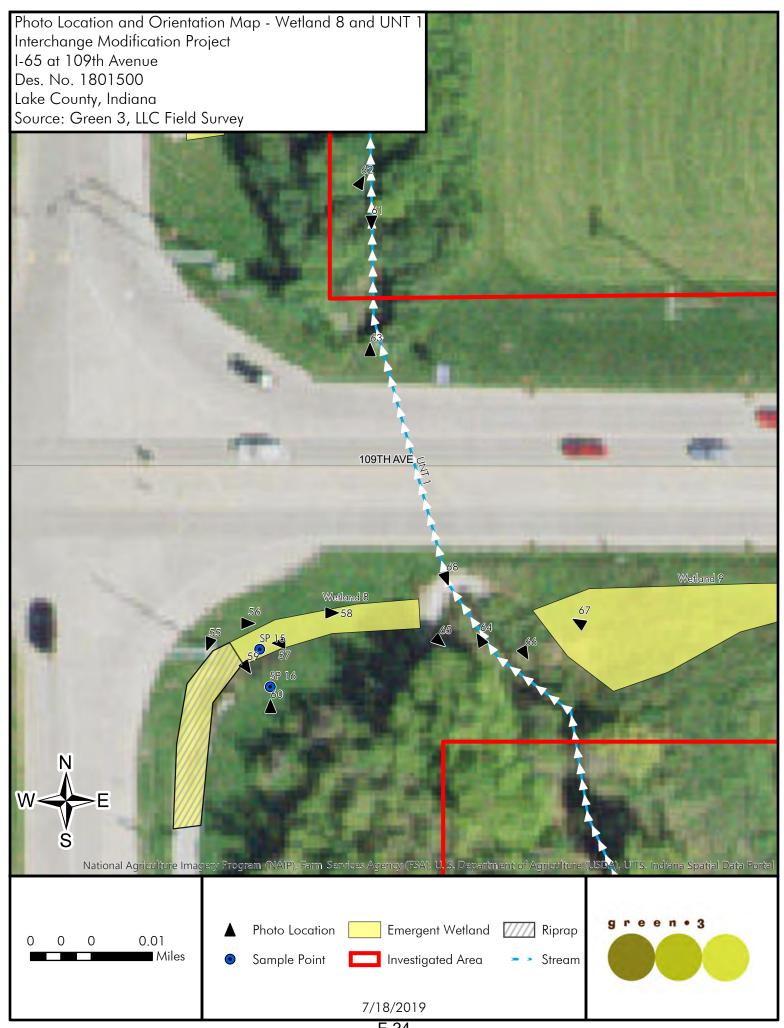




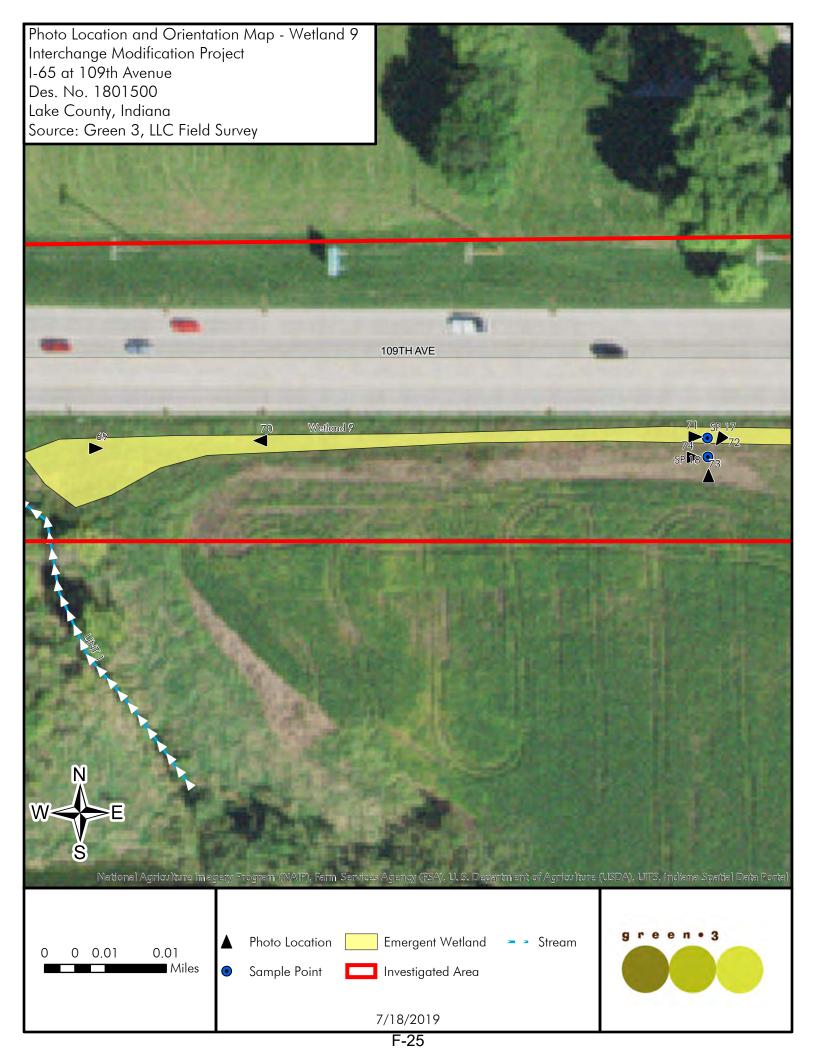








F-24



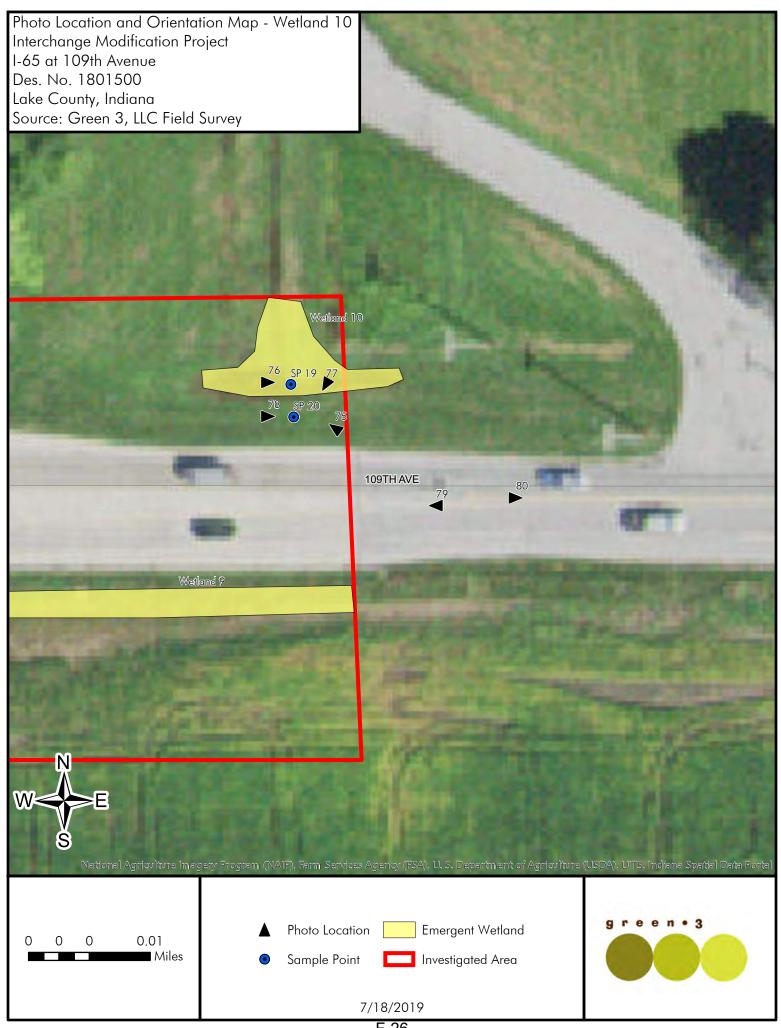




Photo 1. West Project Terminus Facing West



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 70. Wetland 9 Facing West



Photo 71. Wetland 9 Soil



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

Project/Site:I-65 at 109th Avenue	c	city/Count	ty: Crown Po	oint/Lake	Sampling [Date: 5/22/20)19
Applicant/Owner: INDOT				State: IN			
	5	Section, T	ownship, Rai	nge: S 10, T 34 N, R 8 \	W		
Landform (hillslope, terrace, etc.):Toe of Slope				(concave, convex, none):			
			'.323162 W		Datum: W	GS 84	
Soil Map Unit Name: Elliot silt loam, 0 to 2 percent slopes		<u> </u>		NWI classific			
Are climatic / hydrologic conditions on the site typical for this ti	ime of yea	r? Yes	✓ No	(If no, explain in R			
	nificantly d			Normal Circumstances" p		es 🗸 No	0
Are Vegetation, Soil, or Hydrology nati				eded, explain any answe			
SUMMARY OF FINDINGS – Attach site map sh				ocations, transects	, importa	nt feature	s, etc.
Hydrophytic Vegetation Present? Yes ✓ No							
Hydric Soil Present? Yes No			he Sampled	Area	7 [
Wetland Hydrology Present? Yes ✓ No		wit	hin a Wetlan	nd? Yes	No		
Remarks:							
Wetland point located on the south side of 109th Avenue	and west	of I-65.					
VEGETATION – Use scientific names of plants.							
To Obstant (District 30 feet	Absolute		nt Indicator	Dominance Test work	sheet:		
	% Cover	Species	? Status	Number of Dominant S That Are OBL, FACW,		1	(A)
1							(^)
3.				Total Number of Domin Species Across All Stra		1	(B)
4.							(-)
5				Percent of Dominant Sp That Are OBL, FACW,		100%	(A/B)
Sapling/Shrub Stratum (Plot size: 15 feet)		= Total Co	over	Prevalence Index wor	ksheet.		
1				Total % Cover of:		Multiply by:	
2.				OBL species		=	_
3.				FACW species20	x 2 =	40	_
4				FAC species80	x 3 =	240	_
5				FACU species	x 4 =		_
Herb Stratum (Plot size: 5 feet)	:	= Total Co	over	'	x 5 =		_
1 Poa pratensis	80	Χ	FAC	Column Totals: 100	(A)	280	_ (B)
2 Phalaris arundinacea	10		FACW	Prevalence Index	= B/A =	2.8	_
3. Solidago gigantea	10		FACW	Hydrophytic Vegetation	on Indicator	rs:	
4				1 - Rapid Test for I		Vegetation	
5				2 - Dominance Tes			
6				3 - Prevalence Inde			
7				4 - Morphological A data in Remarks			porting
8				Problematic Hydro	-		in)
9							
10	100 :	= Total Co	over	¹ Indicators of hydric soi			nust
Woody Vine Stratum (Plot size: 30 feet)		- Total Ot	3461	be present, unless distu	urbed or prol	blematic.	
1				Hydrophytic			
2				Vegetation Present? Ye	$_{\rm s}$	No	
Demorks: (Include photo purchase have as a second state		= Total Co	over				
Remarks: (Include photo numbers here or on a separate she This vegetative community passed the dominance test an		nce inde	v Hydronbyt	ic vegetation is present	at this come	munity	
This vegetative community passed the dominance test an	iu prevale	nce mue	A. I IYUI OPIIYI	io vegetation is present	at tills COIIII	nunity.	

								004
SOIL								Sampling Point: SP1
Profile Desc	cription: (Describe	to the dep	th needed to docu	ment the	indicator	or confi	rm the absence	of indicators.)
Depth	Matrix			ox Featur	-	. 2		
(inches)	Color (moist)	%	Color (moist)	%	Type¹	_Loc ²		Remarks
0-4	10 YR 2/1	_ 100					CL	
4-20	10 YR 6/1	90	10 YR 4/8	_ 10	_ <u>C</u>	M	_ CL	
				_				
	oncentration, D=De	pletion, RM=	Reduced Matrix, N	1S=Maske	ed Sand Gr	ains.		: PL=Pore Lining, M=Matrix.
Hydric Soil							_	for Problematic Hydric Soils ³ :
Histosol	. ,				Matrix (S4)			Prairie Redox (A16)
	pipedon (A2) istic (A3)			Redox (S ed Matrix (Surface (S7) anganese Masses (F12)
	en Sulfide (A4)				lineral (F1)			Shallow Dark Surface (TF12)
	d Layers (A5)				Matrix (F2)			(Explain in Remarks)
2 cm Mu	uck (A10)			ed Matrix			_	
	d Below Dark Surfac	ce (A11)	=	Dark Sur				
_	ark Surface (A12)				Surface (F7)		s of hydrophytic vegetation and
Sandy Mucky Mineral (S1) 5 cm Mucky Peat or Peat (S3)				Depressi	ons (F8)			d hydrology must be present, disturbed or problematic.
	Layer (if observed)						unless	disturbed or problematic.
	Layer (ii observed)							
	ches):						Hydric Soil	Present? Yes V No No
Remarks:								
	ted Depleted Below	Dark Surfa	ce (A11) and Denl	eted Matr	rix (E3) SE	21 exhibit	ed hydric soils	
Or T CATILOT	ted Bepleted Belew	Dank Gana	oc (7117) and Depi	otou mati	11% (1 0). 01	CALIBI	iod Trydrio Solio.	
HYDROLO	GY							
	drology Indicators							
1	cators (minimum of		ed: check all that a	nnly)			Second	ary Indicators (minimum of two required)
	Water (A1)	one is requi	☐ Water-Sta		ves (RQ)			face Soil Cracks (B6)
	ater Table (A2)		Aquatic F		` '		=	inage Patterns (B10)
Saturation	, ,		True Aqu	,	,		_	-Season Water Table (C2)
	farks (B1)				Odor (C1)			yfish Burrows (C8)
ı —	nt Deposits (B2)		= ' '		eres on Liv	ing Root		uration Visible on Aerial Imagery (C9)
	posits (B3)		=		ced Iron (C	•	` _	nted or Stressed Plants (D1)
	at or Crust (B4)				tion in Tille		_	omorphic Position (D2)
☐ Iron Dep	posits (B5)		Thin Muc	k Surface	(C7)			C-Neutral Test (D5)
Inundati	ion Visible on Aerial	Imagery (B	7) 🔲 Gauge or	Well Data	a (D9)			
Sparsel	y Vegetated Concav	e Surface (l	38) 🔲 Other (Ex	plain in R	Remarks)			
Field Obser	vations:							
Surface Wat	ter Present?	Yes <u>√</u> I	No Depth (ir	nches):	2 inches	_		
Water Table	Present?	Yes <u>√</u> I	No Depth (ir	nches):	At surface	_		
Saturation P		Yes <u>√</u>	No Depth (ir	nches):	At surface	We	tland Hydrolog	y Present? Yes 🚺 No 📗
	pillary fringe) corded Data (strean	n dalide mo	nitoring well aerial	photos r	revious in	spections) if available:	
		99-, 1110		P			,,	

Midwest Region - Version 2.0

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

Remarks:

Project/Site:I-65 at 109th Avenue	(City/Count	y: Crown Po	oint/Lake	Sampling D	oate: 5/22/20)19
Applicant/Owner: INDOT				State: IN			
	;	Section, T	ownship, Rar	nge: S 10, T 34 N, R 8 V	N		
Landform (hillslope, terrace, etc.): Shoulder of Slope				(concave, convex, none):			
Slope (%): 2-4% Lat: 41.419954 N			.323153 W		Datum: W	GS 84	
Soil Map Unit Name: Elliot silt loam, 0 to 2 percent slopes				NWI classific			
Are climatic / hydrologic conditions on the site typical for this til	me of yea	r? Yes	✓ No	(If no, explain in R			
		disturbed?		Normal Circumstances" p		es 🚺 No	o
Are Vegetation, Soil, or Hydrology natu	urally prol	blematic?	(If ne	eded, explain any answe	rs in Remark	(s.)	
SUMMARY OF FINDINGS - Attach site map sh			ng point lo	ocations, transects	, importa	nt feature	s, etc.
Hydrophytic Vegetation Present? Yes No	√						
Hydric Soil Present? Yes No	$\overline{}$		he Sampled		7 [./	
Wetland Hydrology Present? Yes No _	<u> </u>	wit	hin a Wetlan	id? Yes	No _	<u> </u>	
Remarks:							
Upland point located on the south side of 109th Avenue a	nd west o	of I-65.					
VEGETATION – Use scientific names of plants.							
30 foot	Absolute		t Indicator	Dominance Test work	sheet:		
	% Cover	Species?	Status	Number of Dominant Sp		1	(4)
1				That Are OBL, FACW, o	or FAC:		(A)
3				Total Number of Domini Species Across All Stra		3	(B)
4							(D)
5.				Percent of Dominant Sp That Are OBL, FACW, o		33%	(A/B)
15 feet		= Total Co	over				
Sapling/Shrub Stratum (Plot size: 15 feet)				Prevalence Index worl Total % Cover of:		fultiply by:	
1						:	_
3				FACW species			_
4				FAC species 30		90	
5.				FACU species70	× 4 =	280	_
Herb Stratum (Plot size: 5 feet)		= Total Co	over		x 5 =		_
11010 Ottatatii (1 101 0120.	40	Χ	FACU	Column Totals: 100	(A)	370	_ (B)
Poa pratensis	30	X	FAC	Prevalence Index	= B/A =	3.7	
3 Trifolium pratense	25	X	FACU	Hydrophytic Vegetation			
4. Taraxacum officianale	5		FACU	1 - Rapid Test for H			
5				2 - Dominance Tes	t is >50%		
6				3 - Prevalence Inde	ex is ≤3.0 ¹		
7				4 - Morphological A			porting
8				data in Remarks Problematic Hydrog	-	-	in)
9				Problematic Hydrop	Jilytic veget	ation (Explai	111)
10	400			¹ Indicators of hydric soil	l and wetlan	d hvdrology n	nust
Woody Vine Stratum (Plot size: 30 feet)	100	= Total Co	over	be present, unless distu			
1				Hydrophytic			
2				Vegetation Present? Yes	<u>,</u> ,	No 🗸	
		= Total Co	over	. resent: Tes			
Remarks: (Include photo numbers here or on a separate she		toot	ovolen - : !	lov. I hydrau by 45 C. C	lon le miti	000mt =# 41: !	
This vegetative community did not pass the rapid test, dor community.	illinance	iesi, or pr	evalence ind	iex. Hydropnytic vegetat	ion is not pr	esent at this	

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)	SOIL			Sampling Point:	SP2		
· · · ·	Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)						

Profile Desc	cription: (Describe	to the dept	h needed to docur	nent the	indicator	or confin	m the absence of indicators.)	
Depth	Matrix		Redo	x Feature				
(inches)	Color (moist)	%	Color (moist)	%	_Type ¹	_Loc ²		
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			CL CL	
	10 11(2/1	- —	2.0 11(0/0	- -	· —			
		- —						
1							2	_
	oncentration, D=Dep	letion, RM=	Reduced Matrix, M	S=Masked	d Sand Gr	ains.	² Location: PL=Pore Lining, M=Matrix.	
Hydric Soil					(0.1)		Indicators for Problematic Hydric Soils ³ :	
Histosol			_	Gleyed Ma				
	pipedon (A2) istic (A3)		_	Redox (S5 d Matrix (S			☐ Dark Surface (S7) ☐ Iron-Manganese Masses (F12)	
	en Sulfide (A4)		=	,	neral (F1)		☐ Very Shallow Dark Surface (TF12)	
	d Layers (A5)			Gleyed M			Other (Explain in Remarks)	
=	uck (A10)			d Matrix (
	d Below Dark Surfac	e (A11)		Dark Surfa				
	ark Surface (A12)	, ,	Deplete	d Dark Su	urface (F7))	³ Indicators of hydrophytic vegetation and	
Sandy N	Mucky Mineral (S1)		Redox	Depressio	ns (F8)		wetland hydrology must be present,	
☐ 5 cm Mι	ucky Peat or Peat (S	3)					unless disturbed or problematic.	
Restrictive	Layer (if observed)	:						
Type: H	ardpan							7
Depth (in	ches): <u>18</u>						Hydric Soil Present? Yes No	
Remarks:								
SP2 did no	t exhibit any hydric s	coil indicato	re SD2 does not o	ontain hw	dric soils			
J Si Z did ilo	t exhibit any nyuno s	son maicato	13. 01 2 4063 1101 0	ontain ny	ario solis.			
HYDROLO	GY							
Wetland Hy	drology Indicators:							
Primary India	cators (minimum of o	ne is requir	ed; check all that ag	oply)			Secondary Indicators (minimum of two require	ed)
	Water (A1)		☐ Water-Sta		res (B9)		☐ Surface Soil Cracks (B6)	
	ater Table (A2)		Aquatic Fa		, ,		Drainage Patterns (B10)	
Saturati	, ,		True Aqua	,	,		Dry-Season Water Table (C2)	
1 ==	larks (B1)		Hydrogen		, ,		Crayfish Burrows (C8)	
ı —	nt Deposits (B2)		Oxidized F		, ,	ina Roots		
	posits (B3)		Presence	•		•	Stunted or Stressed Plants (D1)	
	at or Crust (B4)		Recent Iro				_	
ı —	posits (B5)		Thin Muck			u 00113 (0	FAC-Neutral Test (D5)	
	on Visible on Aerial	lmagany (P7	$\overline{}$				TAC-Neutral Test (D3)	
					' '			
	y Vegetated Concav	e Suriace (E	38) U Other (Exp	plain in Re	emarks)			
Field Obser		,	In Donath (in	-1 \.				
Surface Wat		$\overline{}$	No Depth (in			-		
Water Table						_		
Saturation P		es L	No Depth (in	ches):		Wet	tland Hydrology Present? Yes No	
(includes ca	onded Data (stream	dande mo	nitoring well aerial	nhotos pr	evious ins	nections)) if available:	
Booonibo i to	oorada Data (otroan	gaage, me	moning won, donar	priotoo, pr	CVICUO IIIC	podiono	, il avallabio.	
Pamarka								
Remarks:								
SP2 did no	t exhibit any wetland	d hydrology	indicators.					

Project/Site:I-65 at 109th Avenue	_ City/County: Crown F	oint/Lake	Sampling Date: <u>5/22/2019</u>				
Applicant/Owner: INDOT		State: IN					
		ange: S 3, T 34 N, R 8 W					
		(concave, convex, none):					
	Long: <u>-87.322891</u> W						
Soil Map Unit Name: Elliot silt loam, 0 to 2 percent slopes		NWI classific					
Are climatic / hydrologic conditions on the site typical for this time of y	year? Yes ✓ No						
			present? Yes ✓ No				
Are Vegetation, Soil, or Hydrology naturally p	•	eeded, explain any answe					
SUMMARY OF FINDINGS – Attach site map showin			,				
Hydrophytic Vegetation Present? Yes ✓ No	1	,	, ,				
Hydric Soil Present? Yes V No	Is the Sample	d Area	а 🗀				
Wetland Hydrology Present? Yes Ves No	within a Wetla	nd? Yes <u></u> ✓	No				
Remarks:	'						
Wetland point located on the north side of 109th Avenue and west of I-65.							
VEGETATION – Use scientific names of plants.							
Absolut	e Dominant Indicator	Dominance Test work	sheet:				
20 to ot	er Species? Status	Number of Dominant S					
1		That Are OBL, FACW,	or FAC: (A)				
2		Total Number of Domin					
3		Species Across All Stra	ata: (B)				
4		Percent of Dominant S					
5	= Total Cover	That Are OBL, FACW,	or FAC: (A/B)				
Sapling/Shrub Stratum (Plot size: 15 feet)		Prevalence Index wor	ksheet:				
1		Total % Cover of:					
2			x 1 =				
3		FACW species100					
4			x 3 = x 4 =				
5	= Total Cover		x 5 =				
Herb Stratum (Plot size: 5 feet)	_ = Total Cover	Column Totals: 100					
1. Phalaris arundinacea 100	X FACW		0.0				
2		Prevalence Index					
3		Hydrophytic Vegetation					
4		2 - Dominance Tes	Hydrophytic Vegetation				
5		✓ 3 - Prevalence Inde					
6		$\perp =$	Adaptations ¹ (Provide supporting				
7			s or on a separate sheet)				
9		Problematic Hydro	phytic Vegetation ¹ (Explain)				
10							
Woody Vine Stratum (Plot size: 30 feet)	_ = Total Cover	¹ Indicators of hydric so be present, unless distr	il and wetland hydrology must urbed or problematic.				
1		Lively a minutio					
2		Hydrophytic Vegetation					
	= Total Cover	Present? Ye	s V No L				
Remarks: (Include photo numbers here or on a separate sheet.)		1					
This vegetative community passed the rapid test, the dominance	e test, and prevalence i	ndex. Hydrophytic vegeta	ation is present at this				
community.							

SOIL		Sampling Point: SP3	
Profile Desc	cription: (Describe to the dep	oth needed to document the indicator or confirm the absence of indicators.)	_
Depth	Matrix	Redox Features	

		to the dep	th needed to docu			or confire	n the absence	of indicators.)
Depth (inches)	Matrix Color (moist)	%	Color (moist)	x Feature %	Type ¹	Loc²	Texture	Remarks
0-8	10 YR 2/1	95	2.5 YR 5/8	5	C	PL	SiC	Remarks
8-16	10 YR 5/1	90	10 YR 5/8	10	- - C		SiC	
	10 11(0/1		10 11(3/0		- —			
¹ Type: C=Cc	ncentration D=De	nletion RM:		S=Maske	d Sand Gr	ains	² l ocation:	PL=Pore Lining, M=Matrix.
Hydric Soil I		piction, ravi	Treduced Matrix, M	O-Waske	a cana ci	anis.		for Problematic Hydric Soils ³ :
Histosol	(A1)		☐ Sandy	Gleyed Ma	atrix (S4)		☐ Coast F	Prairie Redox (A16)
_	pipedon (A2)			Redox (S			=	urface (S7)
Black His			=	d Matrix (,			anganese Masses (F12)
	n Sulfide (A4)		= '	-	neral (F1)			hallow Dark Surface (TF12)
Stratified	Layers (A5)				atrix (F2)		U Other (Explain in Remarks)
	ck (A10) I Below Dark Surfa	ce (Δ11)		ed Matrix (Dark Surfa	,			
	rk Surface (A12)	00 (/ (/ / /	=		urface (F7)	3Indicators	of hydrophytic vegetation and
_	lucky Mineral (S1)		·	Depression	•	,		hydrology must be present,
	cky Peat or Peat (S	-					unless	disturbed or problematic.
Restrictive L	ayer (if observed):						
Туре:							Hydric Soil	Present? Yes V
Depth (inc	ches):						Hydric 30ii	riesent: Tes No
Remarks:								
SP3 exhibite	ed Depleted Below	Dark Surfa	ce (A11) and Deple	eted Matri	x (F3). SF	23 exhibite	ed hydric soils.	
HYDROLO								
	drology Indicators							
		one is requi	red; check all that a	oply)			Seconda	ry Indicators (minimum of two required)
	Water (A1)		Water-Sta				_	ace Soil Cracks (B6)
I 💳	ter Table (A2)		Aquatic Fa	,	-		_	nage Patterns (B10)
Saturation	' '		True Aqua				= '	Season Water Table (C2)
_	arks (B1)		Hydrogen			: D4-		fish Burrows (C8)
	t Deposits (B2) osits (B3)		Oxidized I			-	` _	ration Visible on Aerial Imagery (C9) ted or Stressed Plants (D1)
ı —	t or Crust (B4)					d Soils (C	_	morphic Position (D2)
ı —	osits (B5)		Thin Much			u 00113 (0	_	-Neutral Test (D5)
ı —	on Visible on Aerial	Imagery (B						110dilai 100t (20)
	Vegetated Concav	0 , (. ,			
Field Observ	vations:	,	, —					
Surface Wate	er Present?	Yes	No V Depth (in	ches):		_		
Water Table	Present?	Yes <u>√</u>	No Depth (in	ches): _1	0 inches			
Saturation Pr	esent?	Yes ✓	No Depth (in	ches): _ A	At surface	Wet	land Hydrology	Present? Yes V
(includes cap								
Describe Red	corded Data (strear	n gauge, mo	onitoring well, aerial	pnotos, p	revious ins	spections),	, it available:	
Remarks:				0.000				
SP3 exhibite	ed a High Water T	able (A2) ar	nd Saturation (A3).	SP3 exhil	oited wetla	and hydrol	logy.	

Project/Site: I-65 at 109th Avenue	(City/C	ounty:	Crown Po	oint/Lake	Sampling Da	ate: 5/22/20	19
Applicant/Owner: INDOT					State: IN			
					nge: S 3, T 34 N, R 8 W			
Landform (hillslope, terrace, etc.):Terrace					(concave, convex, none):			
		Long:			(consuve, convex, none).		S 84	
Soil Map Unit Name: Elliot silt loam, 0 to 2 percent slopes		Long.			NWI classific			
Are climatic / hydrologic conditions on the site typical for this		0 \	Г.	/ N= [
	gnificantly				Normal Circumstances"			·
Are Vegetation, Soil, or Hydrology na	aturally pro	blema	itic?	(If ne	eded, explain any answe	rs in Remarks	S.)	
SUMMARY OF FINDINGS – Attach site map s	showing	sam	pling	g point l	ocations, transects	, importan	t feature:	s, etc.
Hydrophytic Vegetation Present? Yes No								
Hydric Soil Present? Yes No				e Sampled		٦	/	
Wetland Hydrology Present? Yes No			withi	in a Wetlan	nd? Yes	No No		
Remarks:								
Upland point located on the north side of 109th Avenue	and west o	of I-65	i.					
VEGETATION – Use scientific names of plants.								
Tree Stratum (Plot size: 30 feet)	Absolute % Cover			Indicator Status	Dominance Test work			
1			<u> </u>	Otatas	Number of Dominant S That Are OBL, FACW,		1	(A)
2.								()
3.					Total Number of Domin Species Across All Stra		2	(B)
4					Paraent of Daminant S			, ,
5					Percent of Dominant S That Are OBL, FACW,		50%	(A/B)
a residue of the state of the s		= Tota	al Cov	er	Dravalance Index was	drahaat.		
Sapling/Shrub Stratum (Plot size: 15 feet)					Prevalence Index wor Total % Cover of:		ultiply by:	
1		_				x 1 =		_
3					FACW species			
4					FAC species 40		120	
5.					FACU species 85	x 4 =	340	
55.4		= Tota	al Cov	er	UPL species	x 5 =		
Herb Stratum (Plot size: 5 feet)	45	~		FACIL	Column Totals: 125	(A)	460	_ (B)
1. Festuca rubra 2. Poa pratensis	40	$\frac{x}{x}$		FACU FAC	Prevalence Index	- D/A -	3.68	
Tuifelium mustamas	15			FACU	Hydrophytic Vegetation			
3. Trilolium praterise 4. Taraxum officinale	10			FACU	1 - Rapid Test for I			
5. Medicago lupulina	10	_		FACU	2 - Dominance Tes		ogotation	
6 Plantago lanceolata	5			FACU	3 - Prevalence Inde			
7					4 - Morphological	Adaptations¹ (Provide sup	porting
8.					data in Remark			
9.					Problematic Hydro	phytic Vegeta	tion¹ (Explai	n)
10.					1			
30 feet	125	= Tota	al Cov	er	¹ Indicators of hydric soil be present, unless distri			nust
Woody Vine Stratum (Plot size: 30 feet)								
1					Hydrophytic Vegetation			
2			al Cov		Present? Ye	s N	。 <u> </u>	
Remarks: (Include photo numbers here or on a separate s		- 100	ai COV	ei ei	l			
This vegetative community did not pass the rapid test, the	,	nce te	st, or	prevalence	e index. Hydrophytic ved	etation is not	present at	this
community.				-	, , ,		-	
I								

SOIL								Sampling Point: _	SP4
Profile Des	scription: (Describe	to the de	pth needed to docu	ment the	indicator	or confir	m the absence	of indicators.)	
Depth	Matrix	,		ox Feature				•	
(inches)	Color (moist)	%	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		М	SiC		
	10 YR 5/2	38							
¹ Type: C=0	Concentration, D=De	oletion. RM	I=Reduced Matrix. N	– ——— IS=Maske	ed Sand Gr	ains.	² Location	n: PL=Pore Lining, M=Matri	ix.
	I Indicators:							for Problematic Hydric S	
☐ Histoso	ol (A1)		☐ Sandy	Gleyed M	latrix (S4)		Coast	Prairie Redox (A16)	
	Epipedon (A2)			Redox (S				Surface (S7)	
	Histic (A3)			ed Matrix (langanese Masses (F12)	
	gen Sulfide (A4)				ineral (F1)			Shallow Dark Surface (TF12	2)
=	ed Layers (A5) luck (A10)			Gleyed IV ed Matrix	Matrix (F2)		U Other	(Explain in Remarks)	
	ed Below Dark Surfac	e (A11)		Dark Sur					
	Dark Surface (A12)	(,			urface (F7)	3Indicators	s of hydrophytic vegetation	and
=	Mucky Mineral (S1)			Depressi		,		d hydrology must be preser	
5 cm M	lucky Peat or Peat (S	3)					unless	disturbed or problematic.	
Restrictive	Layer (if observed)	:							
Type:							Hydric Soil	Present? Yes	No
Depth (i	nches):						Hydric 30ii	rresent: les <u>tv</u>	140
Remarks:									
SP4 exhib	ited Redox Dark Su	face (F6).	SP4 exhibited hydri	ic soils.					
HYDROLO	OGY								
	DGY ydrology Indicators	:							
Wetland H			iired; check all that a	pply)			Seconda	ary Indicators (minimum of	two required)
Wetland H	ydrology Indicators		_	pply)	ves (B9)			ary Indicators (minimum of the face Soil Cracks (B6)	two required)
Wetland H	ydrology Indicators licators (minimum of		☐ Water-Sta		, ,		Sur		two required)
Wetland H	ydrology Indicators licators (minimum of e Water (A1)		☐ Water-Sta	ained Lea auna (B1	3)		Sur	face Soil Cracks (B6)	two required)
Wetland H	ydrology Indicators licators (minimum of e Water (A1) /ater Table (A2)		☐ Water-Sta ☐ Aquatic F ☐ True Aqu	ained Lea auna (B1	3) s (B14)		Sur Dra Dry	face Soil Cracks (B6) inage Patterns (B10)	two required)
Primary Ind Surface High W Saturar Water	ydrology Indicators licators (minimum of e Water (A1) /ater Table (A2) tion (A3)		☐ Water-Standard Graduatic F☐ True Aqu	ained Lea auna (B1 atic Plant Sulfide C	3) s (B14)	ring Roots	Suri	face Soil Cracks (B6) inage Patterns (B10) -Season Water Table (C2)	
Wetland H	ydrology Indicators licators (minimum of e Water (A1) /ater Table (A2) tion (A3) Marks (B1)		☐ Water-Sta ☐ Aquatic F ☐ True Aqu ☐ Hydroger ☐ Oxidized	ained Lea auna (B1) atic Plant Sulfide C Rhizosph	3) s (B14) Odor (C1)	•	Suri Dra Dry Cra s (C3) Sati	face Soil Cracks (B6) inage Patterns (B10) -Season Water Table (C2) yfish Burrows (C8)	agery (C9)
Wetland H Primary Ind Surface High W Saturar Water Sedime Drift De	ydrology Indicators licators (minimum of the Water (A1) /ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) flat or Crust (B4)		Water-Sta Aquatic F True Aqu Hydroger Oxidized Presence	ained Lea auna (B1 atic Plants Sulfide C Rhizosph	3) s (B14) Odor (C1) eres on Liv	4)	Suri Dra Dry Cra S (C3) Sati	face Soil Cracks (B6) inage Patterns (B10) -Season Water Table (C2) yfish Burrows (C8) uration Visible on Aerial Ima	agery (C9)
Wetland H Primary Ind Surface High W Satura Water Sedime Drift De Algal N	ydrology Indicators dicators (minimum of de Water (A1) Vater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) Vat or Crust (B4) eposits (B5)	one is requ	Water-Sta Aquatic F True Aqu Hydroger Oxidized Presence Recent In Thin Muc	ained Lea fauna (B1) atic Plants n Sulfide C Rhizosph of Reduc on Reduc k Surface	3) s (B14) Odor (C1) eres on Liv ed Iron (C4 tion in Tille (C7)	4)	Suri Suri Dra Dry Cra Sturi Sturi	face Soil Cracks (B6) inage Patterns (B10) -Season Water Table (C2) yfish Burrows (C8) uration Visible on Aerial Ima nted or Stressed Plants (D1	agery (C9)
Wetland H Primary Ind Surface High W Satura Water Sedime Drift De Algal M Iron De	ydrology Indicators licators (minimum of the Water (A1) //ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) //at or Crust (B4) eposits (B5) tion Visible on Aerial	one is requ	Water-Sta Aquatic F True Aqu Hydroger Oxidized Presence Recent In Thin Muc	ained Lea fauna (B1 atic Plants a Sulfide C Rhizosph of Reduc on Reduc k Surface	3) s (B14) Odor (C1) eres on Liv ted Iron (C4 tion in Tille (C7) a (D9)	4)	Suri Suri Dra Dry Cra Sturi Sturi	face Soil Cracks (B6) inage Patterns (B10) -Season Water Table (C2) yfish Burrows (C8) uration Visible on Aerial Ima nted or Stressed Plants (D1 omorphic Position (D2)	agery (C9)
Primary Ind Surface High W Satural Water Sedime Drift De Algal N Iron De Inunda Sparse	ydrology Indicators licators (minimum of the Water (A1) l/ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) l/at or Crust (B4) eposits (B5) tion Visible on Aerial	one is requ	Water-Sta Aquatic F True Aqu Hydroger Oxidized Presence Recent In Thin Muc	ained Lea fauna (B1 atic Plants a Sulfide C Rhizosph of Reduc on Reduc k Surface	3) s (B14) Odor (C1) eres on Liv ted Iron (C4 tion in Tille (C7) a (D9)	4)	Suri Suri Dra Dry Cra Sturi Sturi	face Soil Cracks (B6) inage Patterns (B10) -Season Water Table (C2) yfish Burrows (C8) uration Visible on Aerial Ima nted or Stressed Plants (D1 omorphic Position (D2)	agery (C9)
Wetland H Primary Ind Surface High W Saturat Sedime Drift De Algal M Iron De Inunda Sparse Field Obse	ydrology Indicators dicators (minimum of the Water (A1) dater Table (A2) dition (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) dition Visible on Aerial ely Vegetated Concavervations:	Imagery (E	Water-Sta Aquatic F True Aqu Hydroger Oxidized Presence Recent In Thin Muc G7) Gauge or (B8) Other (Ex	ained Lea auna (B1 atic Plants Sulfide C Rhizosph of Reduc on Reduc k Surface Well Data	3) s (B14) Odor (C1) eres on Liv ed Iron (C4) tion in Tille (C7) a (D9) emarks)	4)	Suri Suri Dra Dry Cra Sturi Sturi	face Soil Cracks (B6) inage Patterns (B10) -Season Water Table (C2) yfish Burrows (C8) uration Visible on Aerial Ima nted or Stressed Plants (D1 omorphic Position (D2)	agery (C9)
Wetland H Primary Ind Surface High W Saturat Sedime Drift De Algal N Iron De Inunda Sparse Field Obse	ydrology Indicators dicators (minimum of the Water (A1) dater Table (A2) dition (A3) Marks (B1) ent Deposits (B2) eposits (B3) Mat or Crust (B4) eposits (B5) dition Visible on Aerial ely Vegetated Concavervations:	one is requ	Water-Sta Aquatic F True Aqu Hydroger Oxidized Presence Recent In Thin Muc G7) Gauge or (B8) Other (Ex	ained Lea fauna (B1 atic Plants a Sulfide C Rhizosph of Reduc on Reduc k Surface	3) s (B14) Odor (C1) eres on Liv ed Iron (C4) tion in Tille (C7) a (D9) emarks)	4)	Suri Suri Dra Dry Cra Sturi Sturi	face Soil Cracks (B6) inage Patterns (B10) -Season Water Table (C2) yfish Burrows (C8) uration Visible on Aerial Ima nted or Stressed Plants (D1 omorphic Position (D2)	agery (C9)
Wetland H Primary Ind Surface High W Saturat Sedime Drift De Algal M Iron De Inunda Sparse Field Obse	ydrology Indicators licators (minimum of the Water (A1) //ater Table (A2) tion (A3) Marks (B1) ent Deposits (B2) eposits (B3) //at or Crust (B4) eposits (B5) tion Visible on Aerial ely Vegetated Concavervations: ater Present?	Imagery (E	Water-Sta Aquatic F Aquatic F True Aqu Hydroger Oxidized Presence Recent In Thin Muc Gauge or (B8) Other (Ex	ained Lea auna (B1 atic Plants Sulfide C Rhizosph of Reduc on Reduc k Surface Well Data	3) s (B14) Odor (C1) eres on Liv ed Iron (C4) tion in Tille (C7) a (D9) emarks)	4) d Soils (C	Suri Dra Dry Cra S (C3) Satu Sturi G6) Geo	face Soil Cracks (B6) inage Patterns (B10) -Season Water Table (C2) yfish Burrows (C8) uration Visible on Aerial Ima nted or Stressed Plants (D1 omorphic Position (D2)	agery (C9)

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

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

(includes capillary fringe)

Remarks:

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 Are climatic / hydrologic conditions on the site typical for this time of year? Yes V Are Vegetation Soil One or Hydrology Instituted in a naturally problematic? Are Vegetation One or Hydrology Instituted in a naturally problematic? Bummary OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes V No Is the Sampled Area within a Wetland? Yes V No Is the Sample Area within a Wetland? Yes V No Is the Sample Area within a Wetland? Yes V No Is the Sample Area within a Wetland? Yes V No Is the Sample Area Wetland Area within a Wetland? Yes V No Is the Sa	Project/Site:I-65 at 109th Avenue	City/Co	ounty: Crown Po	oint/Lake	Sampling Date: 5	5/22/2019
Investigator(s) Christian Radcilif and Kevin McLane						
Landform (Nilstope, terrace, etc.): Toe of Slope Loar Elef (concave, convex, none): Concave Slope (%): 24%						
Signe (%): 2-4% Lat: 41.420530 N Long. 47.322580 W Datum WGS 84						
Soil Map Unit Name: Markham slit loam, 2 to 6 percent slopes, eroded NWI classification: N/A		Long:		, , ,		
Are climatic / hydrologic conditions on the site typical for this time of year? Yes				NWI classific		
Are Vegetation Soil or Hydrology significantly disturbed? (if needed, explain any answers in Remarks.) SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc. Hydrophyto Vegetation Present? Yes No I set the Sampled Area within a Wetland? Ves No No No Wetland Hydrology Present? Yes No	Are climatic / hydrologic conditions on the site typical for this time	of year? Ye	es 🗸 No			
SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes						No
SUMMARY OF FINDINGS — Attach site map showing sampling point locations, transects, important features, etc. Hydrophytic Vegetation Present? Yes		•		eded, explain any answe	rs in Remarks.)	
Hydric Soil Present? Yes				ocations, transects	, important fea	atures, etc.
Hydric Soil Present? Yes	Hydrophytic Vegetation Present? Yes ✓ No					
Remarks Wetland point located on the north side of 109th Avenue and west of I-65.			Is the Sampled		7 🖂	
WEGETATION – Use scientific names of plants. Tree Stratum (Plot size:	, , ,	<u></u>	within a Wetlar	nd? Yes <u>V</u>	No L	
VEGETATION - Use scientific names of plants. Absolute Dominant Indicator Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)						
Dominant Indicator	Wetland point located on the north side of 109th Avenue and	west of I-6	5.			
Number of Dominant Species 1	VEGETATION – Use scientific names of plants.					
1.	_ 30 feet Abso			Dominance Test work	sheet:	
Species Across All Strata: 1		over Spec	cies? Status			(A)
Species Across All Strata:	2			Total Number of Domin	ant 1	
Sapling/Shrub Stratum (Plot size: 15 feet 1. 2. 2. 3. 4. 4. 4. 4. 4. 4. 4	3			Species Across All Stra	ıta:	(B)
Sapling/Shrub Stratum (Plot size: 15 feet						0/0
Prevalence Index worksheet: Total % Cover of:	5			That Are OBL, FACW,	or FAC:	(A/B)
1	Sapling/Shrub Stratum (Plot size: 15 feet)	100	ai Cover	Prevalence Index wor	ksheet:	
3.				Total % Cover of:	Multiply	by:
4.	2			100		
FACU species	I .			TACW species	^2	
Herb Stratum (Plot size: 5 feet 100	4					
Herb Stratum (Plot size: 5 feet 100	5		-1.0			
1. Phragmites australis 2. Prevalence Index = B/A = 2.0 Hydrophytic Vegetation Indicators: 1. Phragmites australis 2. Prevalence Index = B/A = 2.0 Hydrophytic Vegetation Indicators: 1. Phragmites australis 2. Prevalence Index = B/A = 2.0 Hydrophytic Vegetation Indicators: 2. Prevalence Index is ≥50% 2. Prevalence Index is ≥3.0¹ 4. Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) 1. Problematic Hydrophytic Vegetation¹ (Explain) 1. Hydrophytic Vegetation 2. Prevalence Index = B/A = 2.0 Hydrophytic Vegetation 1. Provides upporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation¹ (Explain) 1. Hydrophytic Vegetation 1. Provides upporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation 1. Provides upporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation 1. Provides upporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation 1. Provides upporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation 1. Provides upporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation 1. Provides upporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation 1. Provides upporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation 1. Provides upporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation 1. Provides upporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation 1. Provides upporting data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation 1. Provides upporting data in Remarks or on a separate sheet)	TIEID GUALUIII (1 lot size.		ai Cover			
3.	1. Phragmites australis 100	0 <u>X</u>	FACW			(5)
4	2					
5						
6	I .			I —		ition
7	I and the second			l 		
8				=		de sunnortina
9						
10				Problematic Hydro	phytic Vegetation ¹ ((Explain)
Woody Vine Stratum (Plot size: 30 feet) 1 = Total Cover Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes ✓ No ✓ N						
1	100	0 = Tota	al Cover			
2 = Total Cover Vegetation Present? Yes Vegetation No				Hydrophytic		
= Total Cover	I and the second			Vegetation	. 🗸 [7
Remarks: (Include photo numbers here or on a separate sheet.)			al Cover	Present? Ye	s_ <u>V</u> No_L	
, and the second se						
This vegetative community passed the rapid test, the dominance test, and prevalence index. Hydrophytic vegetation is present at this community.		nce test, ar	nd prevalence in	dex. Hydrophytic vegeta	tion is present at t	his

SOIL	oint:	SP5	
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Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)									
Depth	Matrix		Redo	x Feature	es				
(inches)	Color (moist)	%	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					
10-20	Gley N 5/1	90	10 YR 4/8	10			SiC		
					· —				
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ² Location: PL=Pore Lining, M=Matrix.									
Hydric Soil	Indicators:						Indicators for Problematic Hydric Soils ³ :		
Histosol			_	-	atrix (S4)		Coast Prairie Redox (A16)		
	pipedon (A2)			Redox (St			Dark Surface (S7)		
	istic (A3)		_ ::	l Matrix (,		Iron-Manganese Masses (F12)		
	en Sulfide (A4)		Loamy I	Mucky Mi	neral (F1)		Very Shallow Dark Surface (TF12)		
	d Layers (A5)		✓ Loamy 0	Gleyed M	atrix (F2)		Other (Explain in Remarks)		
<u>✓</u> 2 cm Mu	uck (A10)		Deplete	d Matrix ((F3)				
Deplete	d Below Dark Surfac	e (A11)	Redox [Dark Surfa	ace (F6)				
Thick Da	ark Surface (A12)		Deplete	d Dark Su	urface (F7))	³ Indicators of hydrophytic vegetation and		
☐ Sandy N	Mucky Mineral (S1)		Redox [Depressio	ns (F8)		wetland hydrology must be present,		
□ 5 cm Mu	ucky Peat or Peat (S	3)					unless disturbed or problematic.		
Restrictive	Layer (if observed):	:							
Type:							Hudvia Sail Breaant? Vac V		
Depth (inches): Hydric Soil Present? Yes V No No									
Remarks:									
SP5 was exhibited Hydrogen Sulfide (A4), 2cm Muck (A10), Loamy Mucky Mineral (F1), and Loamy Gleyed Matrix (F2). SP5 exhibited hydric									
soils.									
HYDROLO	GY								
	drology Indicators:								
1 -	cators (minimum of c		red: check all that an	nly)			Secondary Indicators (minimum of two required)		
		nie is requi	_		(DO)				
	Water (A1)		Water-Sta				Surface Soil Cracks (B6)		
l ≡ '''³'' '''	ater Table (A2)		Aquatic Fa	,	,		Drainage Patterns (B10)		
Saturati	on (A3)		True Aqua	tic Plants	(B14)		Dry-Season Water Table (C2)		
│ <u>□</u> Water №	/larks (B1)		<u> </u>	Sulfide O	dor (C1)		Crayfish Burrows (C8)		
Sedime	nt Deposits (B2)		Oxidized F	Rhizosphe	eres on Liv	ing Roots	(C3) Saturation Visible on Aerial Imagery (C9)		
Drift De	posits (B3)		Presence	of Reduce	ed Iron (C4	1)	Stunted or Stressed Plants (D1)		
	at or Crust (B4)		Recent Iro		•	,	_		
ı —	posits (B5)		Thin Muck			u 00110 (0	FAC-Neutral Test (D5)		
		l (D	$\overline{}$				TAC-Neutral Test (DO)		
_	ion Visible on Aerial		_		' '				
Snarce	y Vegetated Concave	e Surface (B8)	lain in Re	emarks)				
						- 1			
Field Obser	vations:	/ [/]	Na Danta (in	-1\. 2	inches				
Field Obser	rvations: ter Present?	$\overline{}$	No Depth (inc			_			
Field Obser Surface Wat Water Table	rvations: ter Present? Present? Y	es 🗸	No Depth (in	ches):	At surface	_			
Field Obser Surface Wat Water Table Saturation P	vations: ter Present? Y Present? Y Present? Y	es 🗸		ches):	At surface	 Wet	land Hydrology Present? Yes Vo No		
Field Obser Surface Wat Water Table Saturation P (includes ca	rvations: ter Present? Present? Y	'es 🗸	No Depth (inc	ches): _A	At surface At surface				
Field Obser Surface Wat Water Table Saturation P (includes ca	vations: ter Present? Present? Y Present? Y Present? Y Poillary fringe)	'es 🗸	No Depth (inc	ches): _A	At surface At surface				
Field Obser Surface Wat Water Table Saturation P (includes ca	vations: ter Present? Present? Y Present? Y Present? Y Poillary fringe)	'es 🗸	No Depth (inc	ches): _A	At surface At surface				
Field Obser Surface Wat Water Table Saturation P (includes ca Describe Re	revations: ter Present? Present? Present? Yresent? Yresent? Pillary fringe) Proorded Data (stream	res V res V	No Depth (incomposition of the control of the	ches): A	At surface At surface revious ins	pections)			
Field Obser Surface Wat Water Table Saturation P (includes ca Describe Re	revations: ter Present? Present? Present? Yresent? Yresent? Pillary fringe) Proorded Data (stream	res V res V	No Depth (incomposition of the control of the	ches): A	At surface At surface revious ins	pections)	, if available:		

Project/Site: I-65 at 109th Avenue		City/County	: Crown Po	int/Lake	Sampling Date:	5/22/2019		
Applicant/Owner: INDOT				State: IN				
	Investigator(s): Christian Radcliff and Kevin McLane Section, Tow							
Landform (hillslope, terrace, etc.):Terrace				(concave, convex, none):				
			322533 W	(conduct, convex, none).	Datum: WGS 8	 34		
Soil Map Unit Name: Markham silt loam, 2 to 6 percent slo	pes. erode	-ong -d		NWI classific				
•			✓ No [
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?								
					-	✓ No		
Are Vegetation, Soil, or Hydrology na	aturally prob	blematic?	(If ne	eded, explain any answe	rs in Remarks.)			
SUMMARY OF FINDINGS - Attach site map s	howing	samplin	ng point lo	ocations, transects	, important f	eatures, etc.		
Hydrophytic Vegetation Present? Yes No								
Hydric Soil Present? Yes No			Is the Sampled Area					
Wetland Hydrology Present? Yes No		with	nin a Wetlan	d? Yes	No ▼	<u> </u>		
Remarks:								
Upland point located on the north side of 109th Avenue	and west o	of I-65.						
VEGETATION – Use scientific names of plants.								
Tree Stratum (Plot size: 30 feet)	Absolute		Indicator	Dominance Test work	sheet:			
1.	% Cover	Species?	Status	Number of Dominant S That Are OBL, FACW,		(A)		
2				I That Are OBL, FACW,	UI FAC	(A)		
3				Total Number of Domin Species Across All Stra	/	(B)		
4				·		(5)		
5.				Percent of Dominant Sp That Are OBL, FACW,)% (A/B)		
15 foot	:	= Total Co	ver					
Sapling/Shrub Stratum (Plot size: 15 feet)				Prevalence Index wor		also base		
1				Total % Cover of: OBL species		oly by:		
2				FACW species				
3				FAC species 40	x 3 = 1			
5.				FACU species 85	x 4 = 3			
- First		= Total Co	ver	UPL species	x 5 =			
Herb Stratum (Plot size: 5 feet)	45	X	FACU	Column Totals: 125	(A)4	160 (B)		
1. Festuca rubra 2 Poa pratensis	40	$\frac{\wedge}{X}$	FAC	Prevalence Index	= B/A = 3.6	8		
2. Poa pratensis 3. Trifolium pratense	15		FACU	Hydrophytic Vegetation				
4 Medicago lupulina	10		FACU	1 - Rapid Test for H		etation		
5. Taraxacum officianale	10		FACU	2 - Dominance Tes				
6. Plantago lanceolata	5		FACU	3 - Prevalence Inde	ex is ≤3.0 ¹			
7				4 - Morphological A				
8				l	s or on a separate			
9				Problematic Hydro	phytic Vegetation	(Explain)		
10				Indicators of hydric soi	il and wetland by	drology must		
Woody Vine Stratum (Plot size: 30 feet)	100	= Total Co	ver	be present, unless dist				
1				Hydrophytic Vegetation				
		= Total Co	ver	Present? Ye	sNo_	V		
Remarks: (Include photo numbers here or on a separate s				I				
This vegetative community did not pass the rapid test, the	ne dominar	nce test, o	r prevalence	e index. Hydrophytic veg	etation is not pre	esent at this		
community.								

SOIL								Sampling Point: SP6	
Profile De	escription: (Describ	e to the d	epth needed to docu	ıment the	indicator	or confi	rm the absence o	f indicators.)	
Depth	Matrix			ox Feature	-	Loc ²	- Taytura	Domarko	
(inches) 0-5	Color (moist) 10 YR 3/2	<u>%</u> 60	Color (moist)	%	Type¹	LOC	_ <u>Texture</u> _ SiCL	Remarks	
		_					_ SICL _		
	10 YR 4/2	40							
5-18	10 YR 4/2	<u>95</u> 	10 YR 5/8	_ <u>5</u> 	_ <u>C</u>		_ <u>C</u>		
	_								
¹ Type: C=	Concentration, D=D	epletion, R	– ————————————————————————————————————	– — //S=Maske	d Sand G	rains.	² Location:	PL=Pore Lining, M=Matrix.	
	oil Indicators:	•						or Problematic Hydric Soils³:	
Histic Black Hydro Stratif Deple Thick Sandy	sol (A1) Epipedon (A2) Histic (A3) Igen Sulfide (A4) Fied Layers (A5) Muck (A10) Ited Below Dark Surfa Dark Surface (A12) If Mucky Mineral (S1) Mucky Peat or Peat (Inc.)	(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)				□ Coast Prairie Redox (A16) □ Dark Surface (S7) □ Iron-Manganese Masses (F12) □ Very Shallow Dark Surface (TF12) □ Other (Explain in Remarks) 3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
Type: _	e Layer (if observed Hardpan (inches): 18	a): 					Hydric Soil P	Present? Yes No No	
Remarks: SP6 did e	exhibited Depleted N	Лatrix (F3).	SP6 exhibited hydri	c soils.			,		
HYDROL									
	Hydrology Indicator		odansk skalt 1990 i				6	u la dia da a fasialia de	
		t one is req	uired; check all that a		(DO)			y Indicators (minimum of two requir	
_	ce Water (A1) Water Table (A2)		_	ained Lea auna (B1	, ,			ce Soil Cracks (B6) age Patterns (B10)	
	ation (A3)		= '	atic Plant	,		_	eason Water Table (C2)	
	Marks (B1)		= '	n Sulfide C			– 1	ish Burrows (C8)	
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Saturation Visible on Aerial Imagery									

HYDROLOGY							
Wetland Hydrology Indicators:							
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)						
□ Surface Water (A1) □ Water-Stained Leaves (B9) □ High Water Table (A2) □ Aquatic Fauna (B13) □ Saturation (A3) □ True Aquatic Plants (B14) □ Water Marks (B1) □ Hydrogen Sulfide Odor (C1) □ Sediment Deposits (B2) □ Oxidized Rhizospheres on Living R □ Drift Deposits (B3) □ Presence of Reduced Iron (C4) □ Algal Mat or Crust (B4) □ Recent Iron Reduction in Tilled Soil □ Iron Deposits (B5) □ Thin Muck Surface (C7) □ Inundation Visible on Aerial Imagery (B7) □ Gauge or Well Data (D9) □ Sparsely Vegetated Concave Surface (B8) □ Other (Explain in Remarks)	Surface Soil Cracks (B6) Drainage Patterns (B10) Dry-Season Water Table (C2) Crayfish Burrows (C8) coots (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1)						
Field Observations:							
Surface Water Present? Yes No Depth (inches):							
Water Table Present? Yes No Depth (inches):							
	Wetland Hydrology Present? Yes No _▼ _						
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:							
Remarks:							
SP6 did not exhibit any wetland hydrology indicators.							

Project/Site:I-65 at 109th Avenue	(City/Cour	nty: Crown Po	oint/Lake	Sampling Date:	5/22/2019		
				State: IN Sampling Point: SP7				
			Township, Range: S 10, T 34 N, R 8 W					
Landform (hillslope, terrace, etc.):Toe of Slope				(concave, convex, none):				
Slope (%): 2-4% Lat: 41.419973 N		Long:8	7.321955 W		Datum: WGS 8	34		
Soil Map Unit Name: Markham silt loam, 2 to 6 percent slo	NWI classific							
Are climatic / hydrologic conditions on the site typical for this	time of year	ar? Yes	✓ No					
Are Vegetation, Soil, or Hydrology significantly disturbed?								
Are Vegetation, Soil, or Hydrology na				eded, explain any answe	ers in Remarks.)			
SUMMARY OF FINDINGS - Attach site map s	showing	sampl	ing point le	ocations, transects	, important fe	eatures, etc.		
Hydrophytic Vegetation Present? Yes ✓ No								
Hydric Soil Present? Yes No	· 🔲		Is the Sampled Area					
Wetland Hydrology Present? Yes ✓ No	<u> </u>	w	ithin a Wetlar	nd? Yes <u></u> ✓	No			
Remarks:								
Wetland point located on the south side of 109th Avenue	e and west	1 Of I-65.						
VEGETATION – Use scientific names of plants.								
30 feet	Absolute		nt Indicator	Dominance Test work	sheet:			
<u>Tree Stratum</u> (Plot size:30 feet) 1	% Cover	Species	Status	Number of Dominant S That Are OBL, FACW,	' 1	(A)		
2				Total Number of Domin	ant o			
3				Species Across All Stra		(B)		
4				Percent of Dominant S	pecies 10	0%		
5		- Total C		That Are OBL, FACW,	or FAC:	(A/B)		
Sapling/Shrub Stratum (Plot size: 15 feet)		= Total C	over	Prevalence Index wor	ksheet:			
1. Salix nigra	30	X	OBL	Total % Cover of:	Multip			
2				OBL species 30	x 1 =30			
3				FACW species80	^2	60		
4				FACIL species 15	x 3 = x 4 =6			
5		= Total C		FACU species 15 UPL species	x 5 =			
Herb Stratum (Plot size: 5 feet)		- Total C	over	Column Totals: 125		250 (B)		
1. Phragmites australis	50 ———	X	_ FACW					
2. Solidago gigantea	30	<u>X</u>	_ FACW	Prevalence Index				
3. Helianthus tuberosus			_ FACU_	Hydrophytic Vegetation				
4				1 - Rapid Test for I		tation		
5				✓ 2 - Dominance Tes				
6				4 - Morphological A		vide supporting		
7 8					s or on a separate			
9.				Problematic Hydro	phytic Vegetation	¹ (Explain)		
10.								
	100	= Total C	Cover	¹ Indicators of hydric soil be present, unless distri				
Woody Vine Stratum (Plot size: 30 feet)				be present, unless dist	arbed or probleme	atio.		
1				Hydrophytic				
2				Vegetation Present? Ye	s V No			
Remarks: (Include photo numbers here or on a separate s		= Total C	over					
This vegetative community passed the rapid test, the do	,	est, and	prevalence in	dex. Hydrophytic vegeta	ition is present at	t this		
community.			•	, , , ,	•			

SOIL								Sampling Point	t:
Profile Des	cription: (Describe	to the dep	oth needed to docu	ment the	indicator	or confir	m the absence	of indicators.)	
Depth	Matrix		Red	ox Featur	es		_		
(inches)	Color (moist)	%	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	_ <u>C</u>	M	CL		
1Type: C=C	oncentration, D=Dep	letion PM	=Peduced Matrix M	– ———		aine	2l ocation	PL=Pore Lining, M=Ma	atriv
Hydric Soil		DIELIOIT, KIVI	-Reduced Matrix, IV	IO-IVIASKE	d Sand Gi	all 15.		for Problematic Hydric	
Histic E Black H Hydrogo Stratifie 2 cm M Deplete Thick D Sandy N	Histosol (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4) Stripped Matrix (S4) Loamy Mucky Mineral (F1) Stratified Layers (A5) Company Mucky Mineral (F2) Depleted Matrix (F3))	☐ Coast Prairie Redox (A16) ☐ Dark Surface (S7) ☐ Iron-Manganese Masses (F12) ☐ Very Shallow Dark Surface (TF12) ☐ Other (Explain in Remarks) 3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.				
	Layer (if observed)	-						· · · · · · · · · · · · · · · · · · ·	
Type: H	lardpan nches): 18						Hydric Soil	Present? Yes	
Remarks:									
SP7 exhibi	ted Hydrogen Sulfid	e (A4), De	pleted Below Dark	Surface (A11), and	Depleted	Matrix (F3). SP	7 exhibited hydric soils.	
HYDROLC									
-	drology Indicators:								
	cators (minimum of o	one is requ	ired; check all that a	pply)				ry Indicators (minimum o	of two required
High Warder Market Mark	water (A1) ater Table (A2) ion (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial y Vegetated Concav		Presence Recent Ir Thin Muc Gauge or	auna (B1 atic Plant Sulfide (Rhizosph of Reduc on Reduc k Surface	3) s (B14) Odor (C1) eres on Liv ced Iron (C- tion in Tille (C7) a (D9)	4)	☐ Draii ☐ Dry- ☐ Cray Satur ☐ Stun ☐ Geo	ace Soil Cracks (B6) nage Patterns (B10) Season Water Table (C2 rfish Burrows (C8) iration Visible on Aerial II ited or Stressed Plants (I morphic Position (D2) -Neutral Test (D5)	magery (C9)
Field Obser									
Surface Wat	ter Present?	∕es ✓	No Depth (in	nches):	2 inches	_			

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

Yes V No Depth (inches): At surface

Depth (inches): At surface

Remarks:

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

Wetland Hydrology Present?

(includes capillary fringe)

Water Table Present?

Saturation Present?

Project/Site:I-65 at 109th Avenue	City/0	County: Crown Po	oint/Lake	Sampling Date: <u>5/22/2019</u>				
Applicant/Owner: INDOT								
	Investigator(s): Christian Radcliff and Kevin McLane Section, Township,							
Landform (hillslope, terrace, etc.): _ Terrace			(concave, convex, none)					
	Long	-87.322016 W	(concave, convex, none)					
Soil Map Unit Name: _Markham silt loam, 2 to 6 percent slo	opes eroded							
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 signs and, signs are signs as a signs are signs as a signs are signs are signs as a signs are si	-							
Are Vegetation, Soil, or Hydrology na	aturally problem	atic? (If ne	eded, explain any answe	ers in Remarks.)				
SUMMARY OF FINDINGS - Attach site map s	showing sar	npling point l	ocations, transects	, important features, etc.				
Hydrophytic Vegetation Present? Yes No								
Hydric Soil Present? Yes No	· 🔲	Is the Sampled						
Wetland Hydrology Present? Yes No) <u> </u>	within a Wetlar	nd? Yes	No <u></u>				
Remarks:								
Upland point located on the south side of 109th Avenue	and west of I-6	85.						
VEGETATION – Use scientific names of plants.								
Tree Stratum (Plot size: 30 feet)		minant Indicator ecies? Status	Dominance Test work					
1		<u> Ctatas</u>	Number of Dominant S That Are OBL, FACW,					
2								
3			Total Number of Domir Species Across All Stra					
4.								
5			Percent of Dominant S That Are OBL, FACW,					
15 foot	= To	tal Cover						
Sapling/Shrub Stratum (Plot size: 15 feet)			Prevalence Index wor					
1			Total % Cover of:					
2				x 1 =				
3				x 2 = x 3 =126				
4			FACU species 64	x 4 =256				
o		tal Cover		x 5 =				
Herb Stratum (Plot size: 5 feet)	40		Column Totals: 106					
1. Festuca rubra	40 X	FACU						
2. Poa pratensis	40 X	FAC	Prevalence Index					
3. Trifolium pratense		FACU	Hydrophytic Vegetati					
4. Plantago lanceolata	5	FACU	I — '	Hydrophytic Vegetation				
5. Medicago lupulina Rumex crispus		FACU FAC	2 - Dominance Tes					
		FACU		Adaptations ¹ (Provide supporting				
· ·				s or on a separate sheet)				
8			Problematic Hydro	ophytic Vegetation ¹ (Explain)				
9								
	106 = To	tal Cover		il and wetland hydrology must				
Woody Vine Stratum (Plot size: 30 feet)		ital Covel	be present, unless dist	urbed or problematic.				
1			Hydrophytic					
2			Vegetation Present? Ye	No				
		tal Cover	Present? Ye	15 NO				
Remarks: (Include photo numbers here or on a separate s	,							
This vegetative community did not pass the rapid test, the	ne dominance t	est, or prevalence	e index. Hydrophytic veg	jetation 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 indic	ators.)	

Profile Desc	ription: (Describe	to the dept	th needed to docur	nent the	indicator	or confire	m the absence	of indicators.)		
Depth (inches)	Color (moist)	%	Redo Color (moist)	x Feature %	Type ¹	Loc²	Texture	Remarks		
(inches) 0-1	10 YR 3/2	100	Color (moist)				SiC	Remarks		
1-16							310			
1-10	10 YR 4/2	_ 80								
	10 YR 3/1	_ 15	10 YR 5/8	5			SiC			
1							2:			
Hydric Soil		pletion, RM=	Reduced Matrix, MS	S=Masked	d Sand Gr	ains.		PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :		
l <u> </u>			Condu.	Clayed M	ntriv (CA)		_	•		
Histosol	oipedon (A2)			Sleyed Ma Redox (S5			_	Prairie Redox (A16) urface (S7)		
Black Hi				Matrix (S				anganese Masses (F12)		
	n Sulfide (A4)		=	,	neral (F1)			hallow Dark Surface (TF12)		
	Layers (A5)				atrix (F2)			Explain in Remarks)		
	ck (A10)			d Matrix (_ `			
□ Depleted	Below Dark Surfac	ce (A11)	Redox [Dark Surfa	ace (F6)					
│ <u>□</u> Thick Da	ark Surface (A12)		Deplete	d Dark Su	ırface (F7)	³ Indicators of hydrophytic vegetation and			
	lucky Mineral (S1)		Redox [Depressio	ns (F8)			hydrology must be present,		
	cky Peat or Peat (S						unless	disturbed or problematic.		
	_ayer (if observed)):								
Type: Ha	thes): 16						Hydric Soil	Present? Yes V No		
	nes):									
Remarks:										
SP8 exhibit	ed Depleted Below	Dark Surfa	ce (A11) and Deple	ted matri	x (F3). SF	P8 exhibite	ed hydric soils.			
HYDROLO										
	drology Indicators									
		one is requir	ed; check all that ap	ply)				ry Indicators (minimum of two required)		
	Water (A1)		Water-Sta		, ,			ace Soil Cracks (B6)		
	ter Table (A2)		Aquatic Fa	-	-		_	nage Patterns (B10)		
Saturatio	on (A3)		True Aqua	tic Plants	(B14)		⊢ Dry-۹	Season Water Table (C2)		
ı —	arks (B1)		Hydrogen		, ,			fish Burrows (C8)		
=	nt Deposits (B2)		Oxidized F			•	· · —	ration Visible on Aerial Imagery (C9)		
	oosits (B3)		Presence		,	,		ted or Stressed Plants (D1)		
	it or Crust (B4)		Recent Iro			d Soils (C	_	morphic Position (D2)		
	osits (B5)		H Thin Muck				<u></u> FAC⋅	-Neutral Test (D5)		
	on Visible on Aerial									
	Vegetated Concav	e Surface (E	38) 📙 Other (Exp	lain in Re	emarks)					
Field Obser										
Surface Wate		Yes 1	No Depth (in	. —		-				
Water Table	Present?	Yes 1	No Depth (in	ches):		_				
Saturation P		Yes N	No <u> </u>	ches):		Wet	land Hydrology	Present? Yes No V		
(includes cap Describe Red		n gauge, mo	nitoring well, aerial p	ohotos, pr	evious ins	spections).	, if available:			
	,					,				
Remarks:										
SP8 did not	exhibit any wetlan	d hydrology	indicators. Wetland	d hydrolog	gy was no	t present	at SP8.			
, , , , , , , , , , , , , , , , , , , ,										

Project/Site: I-65 at 109th Avenue	(City/Cou	unty: _C	Crown Po	oint/Lake	Sampling Da	te: 5/22/20	19
Applicant/Owner: INDOT					State: IN			
		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:	87.319	9786 W		Datum: WG	S 84	
Soil Map Unit Name: Elliott silt loam, 0 to 2 percent slopes					NWI classific	cation: N/A		
Are climatic / hydrologic conditions on the site typical for this	No [(If no, explain in R	lemarks.)					
Are Vegetation, Soil, or Hydrology sig	nificantly	disturbe	ed?	Are "	Normal Circumstances" p	present? Yes	✓ No	
Are Vegetation, Soil, or Hydrology na				(If ne	eded, explain any answe	ers in Remarks	.)	
SUMMARY OF FINDINGS - Attach site map s				point le	ocations, transects	, importan	t features	s, etc.
Hydrophytic Vegetation Present? Yes ✓ No								
Hydric Soil Present? Yes ✓ No	$\overline{}$	l:	s the S	Sampled		7 F	\neg	
Wetland Hydrology Present? Yes ✓ No		v	within	a Wetlan	ıd? Yes <u></u> ✓	No		
Remarks:								
Wetland point located on the south side of 109th Avenue	and east	of I-65.						
VEGETATION – Use scientific names of plants.								
	Absolute	Domin	nant In	ndicator	Dominance Test work	sheet:		
Tree Stratum (Plot size: 30 feet) 1.	% Cover	Specie	es?	Status	Number of Dominant S That Are OBL, FACW,	•	3	(A)
2.						. –		()
3					Total Number of Domin Species Across All Stra		3	(B)
4					Percent of Dominant S	necies	4000/	
5					That Are OBL, FACW,		100%	(A/B)
Sapling/Shrub Stratum (Plot size: 15 feet)		= Total	Cover		Prevalence Index wor	ksheet:		
1					Total % Cover of:	Mu	ıltiply by:	_
2					OBL species 60	x 1 = _	60	_
3					FACW species 40	x 2 = _	80	-
4								_
5						x 4 = _		-
Herb Stratum (Plot size: 5 feet)		= Total	Cover		'	x 5 = _	140	- (5)
1. Phragmites australis	40	Χ	F	ACW	Column Totals:100	(A) _	140	_ (B)
2. Typha angusifolia	40	X		OBL	Prevalence Index	= B/A =	1.4	_
3. Juncus effusus	20	<u>X</u>		OBL	Hydrophytic Vegetation			
4					1 - Rapid Test for I		egetation	
5					2 - Dominance Tes			
6								
7					4 - Morphological A			oorting
8			— –		Problematic Hydro		,	n)
9			— –					
10 30 feet	100	= Total	Cover		¹ Indicators of hydric soil be present, unless distri			nust
Woody Vine Stratum (Plot size: 30 feet)								
1					Hydrophytic Vegetation			
		= Total	Cover		Present? Ye	s V No	ــــــــــــــــــــــــــــــــــــــ	
Remarks: (Include photo numbers here or on a separate sh					I			
This vegetative community passed the rapid test, the dor	minance te	est, and	d preva	alence in	dex. Hydrophytic vegeta	ition is presen	t at this	
community.								

SOIL								Sampling Point:	SP9
	cription: (Describ	e to the de	pth needed to docu	ment the	e indicator	or confi	rm the absence of		
Depth	Matrix		•	ox Featu				,	
(inches)	Color (moist)	%	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	С	М	SiC		
Type: C=C		epletion, RN	∕I=Reduced Matrix, M	S=Mask	ed Sand Gr	ains.		PL=Pore Lining, M=Matrix	
Histoso Histic E Black H Hydrogo Stratifie 2 cm M Deplete Thick D Sandy N 5 cm M Restrictive	I (A1) pippedon (A2) listic (A3) en Sulfide (A4) d Layers (A5) uck (A10) d Below Dark Surfa eark Surface (A12) Mucky Mineral (S1) ucky Peat or Peat (Layer (if observed	(S3)	☐ Sandy ☐ Strippe ☐ Loamy ☐ Loamy ☐ Deplete ☐ Redox ☐ Deplete	Redox (Sold Matrix Mucky Mucky	(S6) Mineral (F1) Matrix (F2) (F3) face (F6) Surface (F7		☐ Coast F☐ Dark St☐ Iron-Ma☐ Very Sh☐ Other (€	Prairie Redox (A16) urface (S7) urface (S7) unganese Masses (F12) nallow Dark Surface (TF12) Explain in Remarks) of hydrophytic vegetation a hydrology must be presen disturbed or problematic.	nd
SP9 exhibi	ted Hydrogen Sulf	ide (A4), 2d	m Muck (A10), and	Depleted	l Matrix (F3	3). SP9 e.	xhibited hydric so	bils.	
HYDROLC									
	drology Indicator								
		r one is req	uired; check all that a		(50)			ry Indicators (minimum of to	wo required
	Water (A1)		Water-Sta		` '			ace Soil Cracks (B6)	
	ater Table (A2)		Aquatic F					nage Patterns (B10)	
=	ion (A3)		True Aqu		. ,			Season Water Table (C2)	
=	Marks (B1)		Hydrogen			B		fish Burrows (C8)	(22)
	ent Deposits (B2)		=		neres on Liv ced Iron (C	•	· · —	ration Visible on Aerial Ima	
i L. I Drift De	posits (B3)		L Presence	of Redu	ced Iron (C	4)	L I Stunt	ted or Stressed Plants (D1)	1

TITBROLOGI									
Wetland Hydrology Indicators:									
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)								
Surface Water (A1) Water-Stained Leaves (B9)	Surface Soil Cracks (B6)								
High Water Table (A2) Aquatic Fauna (B13)	Drainage Patterns (B10)								
Saturation (A3) True Aquatic Plants (B14)	Dry-Season Water Table (C2)								
☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1)	Crayfish Burrows (C8)								
Sediment Deposits (B2) Oxidized Rhizospheres on Living F	Roots (C3) 📃 Saturation Visible on Aerial Imagery (C9)								
Drift Deposits (B3) Presence of Reduced Iron (C4)	Stunted or Stressed Plants (D1)								
Algal Mat or Crust (B4)	ils (C6) Geomorphic Position (D2)								
Iron Deposits (B5)	FAC-Neutral Test (D5)								
Inundation Visible on Aerial Imagery (B7)	Inundation Visible on Aerial Imagery (B7)								
Sparsely Vegetated Concave Surface (B8)									
Field Observations:									
Surface Water Present? Yes No Depth (inches):3 inches									
Water Table Present? Yes No Depth (inches): _At surface									
Saturation Present? Yes Ves Depth (inches): At surface (includes capillary fringe)	Wetland Hydrology Present? Yes ✓ No No								
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspect	ions), if available:								
Remarks:									
SP9 exhibited Surface Water (A1), High Water Table (A2), and Saturation (A3). Wetl	and hydrology was present at SP9.								
	-								

Project/Site: I-65 at 109th Avenue	(City/Cou	ınty: Crown Po	oint/Lake	Sampling D	ate: 5/22/20	119
Applicant/Owner: INDOT				State: IN			
	,	Section,	Township, Rar	nge: S 10, T 34 N, R 8 V			
				(concave, convex, none):			
			87.319835 W		Datum: WC	 3S 84	
Soil Map Unit Name: Elliott silt loam, 0 to 2 percent slopes				NWI classifica			
Are climatic / hydrologic conditions on the site typical for this	lima of va	or2 Voo	√ No [(If no, explain in Re			
					,	N	
				Normal Circumstances" p			,
Are Vegetation, Soil, or Hydrology na	turally pro	blematic	c? (If ne	eded, explain any answer	s in Remark	.s.)	
SUMMARY OF FINDINGS – Attach site map s	howing	samp	ling point lo	ocations, transects,	importar	nt features	s, etc.
Hydrophytic Vegetation Present? Yes No	√						
Hydric Soil Present? Yes No	$\overline{}$		s the Sampled		1 [.	7	
Wetland Hydrology Present? Yes No		W	vithin a Wetlan	id? Yes	No L	<u> </u>	
Remarks:							
Upland point located on the south side of 109th Avenue a	and east o	of I-65.					
VEGETATION – Use scientific names of plants.							
20 foot	Absolute		ant Indicator	Dominance Test works	sheet:		
	% Cover	Specie	es? Status	Number of Dominant Sp That Are OBL, FACW, o		1	(A)
1 2				That Are OBL, PACW, 0	FAC		(A)
3				Total Number of Domina Species Across All Strat		3	(B)
4				Opecies Across Air Otrat	a		(D)
5.				Percent of Dominant Sp That Are OBL, FACW, o		33%	(A/B)
45.5		= Total	Cover				(/45)
Sapling/Shrub Stratum (Plot size:15 feet)				Prevalence Index work			
1				Total % Cover of:		fultiply by:	_
2				· —			_
3				FACW species		90	-
4				FACU species 50		200	-
5		= Total	Cover	UPL species 25		125	_
Herb Stratum (Plot size: 5 feet)		- Total	Cover	Column Totals: 105	(A)	415	– (B)
1. Poa pratensis	30	<u>X</u>	FAC			2.05	_ (-,
2. Lamium purpureum		<u>X</u>	UPL	Prevalence Index		3.95	
3. Medicago lupulina	20	<u>X</u>	FACU	Hydrophytic Vegetatio			
4. Trifolium pratense	10		FACU	1 - Rapid Test for H		/egetation	
5. Taraxum officianale			FACU	2 - Dominance Test 3 - Prevalence Inde			
6. Daucus carota 7 Solidago canadensis	5 5		— UPL FACU	4 - Morphological A		(Dravida aunu	norting
7. Solidago cariaderisis 8. Plantago lanceolata	5		FACU	data in Remarks			porting
				Problematic Hydrop	hytic Vegeta	ation¹ (Explai	n)
9							
10	105	= Total	Cover	¹ Indicators of hydric soil			nust
Woody Vine Stratum (Plot size: 30 feet)		- Total	Cover	be present, unless distu	rbed or prob	lematic.	
1				Hydrophytic		_	
2				Vegetation	\Box .		
		= Total	Cover	Present? Yes	, <u> </u>	No <u>V</u>	
Remarks: (Include photo numbers here or on a separate sh	,						
This vegetative community did not pass the rapid test, the	e dominar	nce test	, or prevalence	e index. Hydrophytic vege	etation is no	t present at t	this
community.							

so	IL														San	npling Po	int:	SP10	
		 		 		 	 _		_			 		 					

Profile Desc	cription: (Describe	to the dept	th needed to docur	nent the	indicator	or confin	rm the absence of indicators.)	
Depth	Matrix			x Feature			_	
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	_Loc ²		
0-13	10 YR 3/1	100						
13-20	10 YR 5/2	60	10 YR 4/1	20	D	M	CL	
			10 YR 5/8	20				_
								—
l ———								—
								_
1Type: C=C	oncentration, D=Dep	lotion PM-	Poducod Matrix M	S-Maska	d Sand Gr	nine	² Location: PL=Pore Lining, M=Matrix.	_
Hydric Soil		netion, Kivi-	Reduced Matrix, Mi	3-IVIASKE	u Sanu Gi	allis.	Indicators for Problematic Hydric Soils ³ :	
Histosol			Sandy (Gleyed Ma	atriv (SA)		Coast Prairie Redox (A16)	
_	pipedon (A2)		_	Redox (S			Dark Surface (S7)	
	istic (A3)		_	d Matrix (Iron-Manganese Masses (F12)	
	en Sulfide (A4)		=	,	neral (F1)		Very Shallow Dark Surface (TF12)	
	d Layers (A5)				atrix (F2)		Other (Explain in Remarks)	
2 cm Mu	uck (A10)		Deplete	d Matrix ((F3)			
	d Below Dark Surfac	e (A11)	Redox I	Dark Surf	ace (F6)			
	ark Surface (A12)		= '		urface (F7)	³ Indicators of hydrophytic vegetation and	
	Mucky Mineral (S1)		Redox I	Depressio	ns (F8)		wetland hydrology must be present,	
	ucky Peat or Peat (S						unless disturbed or problematic.	
	Layer (if observed)	:						п
Type:							Hydric Soil Present? Yes No	
Depth (in	ches):						nyunc son Present: Tes No	
Remarks:							·	
SP10 did n	ot exhibit any hydric	soil indicat	tors. SP10 did not e	xhibited	hydric soil	s.		
HYDROLO	GY							
	drology Indicators:							
1 -			and, also als all that an				Consider Indicator (minimum of two require	- d\
	cators (minimum of c	one is requir			(DO)		Secondary Indicators (minimum of two require	<u> 30)</u>
	Water (A1)		Water-Sta				Surface Soil Cracks (B6)	
I = 1	ater Table (A2)		Aquatic Fa	-	-		Drainage Patterns (B10)	
Saturati	, ,		True Aqua		. ,		Dry-Season Water Table (C2)	
ı —	farks (B1)		Hydrogen		, ,		Crayfish Burrows (C8)	
	nt Deposits (B2)		Oxidized F			•		
	posits (B3)		Presence				Stunted or Stressed Plants (D1)	
ı —	at or Crust (B4)		Recent Iro			d Solls (C		
	posits (B5)		Thin Muck					
_	on Visible on Aerial				' '			
	y Vegetated Concav	e Surface (E	38) 📙 Other (Exp	plain in Re	emarks)			
Field Obser								
Surface Wat	er Present? Y	′es <u> </u>	No Depth (in	ches):		-		
Water Table	Present? Y	'es N	No L	ches):		_		7
Saturation P		'es N	No 🔽 Depth (in	ches):		Wet	tland Hydrology Present? Yes No <u>▼</u>	
	pillary fringe) corded Data (stream	nalide mo	nitoring well aerial	nhotos n	revious ins	nections)) if available:	
Describe Ne	colded Data (Stream	rgauge, mo	mitoring well, aerial	priotos, p	ievious ilis	spections)), il avallable.	
Domasi								
Remarks:								
SP10 did n	ot exhibit any wetlar	nd hydrolog	ıy ındicators. Wetlaı	nd hydrol	ogy was r	not presen	nt at SP10.	

Project/Site:I-65 at 109th Avenue	City	y/County:	Crown Po	int/Lake	Sampling Date:	5/22/201	9
Applicant/Owner: INDOT				State: IN			
	Se	ction, Tow	nship, Ran	nge: S 3, T 34 N, R 8 W	1		
Landform (hillslope, terrace, etc.):Toe of Slope				concave, convex, none):			
Slope (%): 2-4% Lat: 41.420486 N	Loi	ng:87.3	19764 W		Datum: WGS 8	34	
Soil Map Unit Name: Milford silty clay loam, 0 to 2 percent slo	opes			NWI classific			
Are climatic / hydrologic conditions on the site typical for this time	e of year?	Yes 🗸	No [(If no, explain in R	emarks.)		
Are Vegetation, Soil, or Hydrology signifi	ficantly dis	turbed?	Are "I	Normal Circumstances" p	oresent? Yes	✓ No	
Are Vegetation, Soil, or Hydrology natura			(If nee	eded, explain any answe	rs in Remarks.)		
SUMMARY OF FINDINGS - Attach site map sho			point lo	ocations, transects	, important f	eatures	, etc.
Hydrophytic Vegetation Present? Yes ✓ No							
Hydric Soil Present? Yes ✓ No _		Is the	Sampled		7 🗔	l	
Wetland Hydrology Present? Yes ✓ No		withir	n a Wetlan	d? Yes <u></u> ✓	No	<u> </u>	
Remarks:							
Wetland point located on the north side of 109th Avenue an	nd east of	I-65.					
VEGETATION – Use scientific names of plants.							
Δh	solute D	Oominant	Indicator	Dominance Test work	sheet:		
Tree Stratum (Plot size: 30 feet) %	Cover S	species?	Status_	Number of Dominant S That Are OBL, FACW,		((A)
2				Total Number of Domin	ant 4		
3				Species Across All Stra		((B)
4				Percent of Dominant Sp	pecies 10	00%	
5		Total Cave		That Are OBL, FACW,	or FAC:	((A/B)
Sapling/Shrub Stratum (Plot size: 15 feet)	=	Total Cove	er I	Prevalence Index wor	ksheet:		$\overline{}$
1				Total % Cover of:	Multig	oly by:	.
2				OBL species	x 1 =		,
3				FACW species 60	^2	20	
4				FAC species	x 3 =3		
5				FACU species UPL species			
Herb Stratum (Plot size: 5 feet)		Total Cove	er	Column Totals: 70		150	(B)
1. Phragmites australis 6	50 ×	<u> </u>	FACW_				(5)
Z			FAC	Prevalence Index		4	
3				Hydrophytic Vegetation			
4				✓ 1 - Rapid Test for I✓ 2 - Dominance Test		tation	
5				✓ 3 - Prevalence Inde			
6				4 - Morphological A		vide suppo	ortina
7					s or on a separat		J9
9				Problematic Hydro	phytic Vegetation	ı ¹ (Explain))
10							
	= 7	Total Cove	er	¹ Indicators of hydric soi be present, unless distu			ust
1				Hydrophytic			
2				Vegetation Present? Ye	e V No]	
_		Total Cove	er	rresentr Te	- NO_	<u> </u>	
Remarks: (Include photo numbers here or on a separate shee This vegetative community passed the rapid test, the domin		and are	valence in	dev Hydrophytic yearts	tion is propert a	it this	
community.	ianoe lest	., and prev	vaicille IIIC	aon. i iyuropiiyile vegeta	aon is present a	C 11113	

SOIL	Sampling Point: SP11

Depth				mont the	maioutoi .	JI COIIIIII	m the absence of	maioators.)
	Matrix		Redo	x Feature				
(inches)	Color (moist)	%	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		SiC	
			10 YR 5/8		_ <u>C</u>	_M		
10-20	Gley N 5/1	90	10 YR 5/8	10			SiC	
¹ Type: C=C	oncentration, D=Dep	oletion, RM	I=Reduced Matrix, M	S=Maske	d Sand Gra	ains.	² Location: F	PL=Pore Lining, M=Matrix.
Hydric Soil	Indicators:		_				Indicators for	r Problematic Hydric Soils³:
☐ Histosol	I (A1)		☐ Sandy (Gleyed M	atrix (S4)		Coast Pra	airie Redox (A16)
Histic E	pipedon (A2)		☐ Sandy I	Redox (S	5)		Dark Surf	face (S7)
	istic (A3)		Stripped	d Matrix (S6)			ganese Masses (F12)
	en Sulfide (A4)				neral (F1)		Very Shall	llow Dark Surface (TF12)
_	d Layers (A5)				atrix (F2)		Other (Ex	rplain in Remarks)
	uck (A10)		= '	d Matrix (,			
	d Below Dark Surfac	e (A11)	=	Dark Surf	, ,		2	
	ark Surface (A12)		= '		urface (F7)			hydrophytic vegetation and
	Mucky Mineral (S1)	0)	<u></u> Redox I	Depression	ns (F8)			ydrology must be present,
	ucky Peat or Peat (S Layer (if observed)	-					unless dis	sturbed or problematic.
Type:	Layer (II observed)							
Depth (in	ches):						Hydric Soil Pr	esent? Yes V No No
Remarks:								
	sited Hydrogon Culfi	do (A4) D	anlated Polow Dark	Surface	(A11) and	Loomy	Sloved Matrix (E2)	SD11 exhibited hydric soils
SPITEXIII	ntea myarogen Sulli	de (A4), D	repleted below Dark	Surface	(ATT), and	Loamy G	sieyed Matrix (F2)	. SP11 exhibited hydric soils.
HYDROLO	nGY							
Wetland Hy	drology Indicators:		irod: abook all that a	anha)			Secondary	Indicators (minimum of two required)
Wetland Hy	drology Indicators: cators (minimum of c		ired; check all that ar		(700)			Indicators (minimum of two required)
Wetland Hy Primary Indi	drology Indicators: cators (minimum of c Water (A1)		Water-Sta	ined Leav	(,		Surface	e Soil Cracks (B6)
Wetland Hy Primary Indi Surface High Wa	drology Indicators: cators (minimum of c Water (A1) ater Table (A2)		☐ Water-Sta ☐ Aquatic Fa	ined Leav auna (B13	3)		Surface	e Soil Cracks (B6) ge Patterns (B10)
Wetland Hy Primary India Surface High Wa Saturati	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3)		☐ Water-Sta ☐ Aquatic Fa ☐ True Aqua	ined Leav auna (B13 atic Plants	3) 5 (B14)		☐ Surface ☐ Drainae ☐ Dry-Se	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2)
Primary Indi Surface High Wa Saturati Water M	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) flarks (B1)		☐ Water-Sta☐ Aquatic Fa☐ True Aqua☐ Hydrogen	ined Leav auna (B13 atic Plants Sulfide C	3) s (B14) edor (C1)		Surface Drainae Dry-Se Crayfis	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) th Burrows (C8)
Wetland Hy Primary India Surface High Wa Saturati Water M Sedime	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2)		☐ Water-Sta ☐ Aquatic Fa ☐ True Aqua ☐ Hydrogen ☐ Oxidized F	ined Leav auna (B13 atic Plants Sulfide O Rhizosphe	B) (B14) dor (C1) eres on Liv	•	Surface Drainag Dry-Se Crayfis (C3) Saturat	e Soil Cracks (B6) ge Patterns (B10) ason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9)
Wetland Hy Primary India Surface High Wa Saturati Water M Sedime	drology Indicators: cators (minimum of o Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3)		Water-Sta Aquatic Fa True Aqua Hydrogen Oxidized F	ined Leav auna (B13 atic Plants Sulfide O Rhizosphe of Reduc	B) (B14) (dor (C1) (eres on Livied Iron (C4)	Surface Drainag Dry-Se Crayfis (C3) Satural Stunted	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1)
Wetland Hy Primary India Surface High Wa Saturati Water M Sedime Drift De Algal Ma	drology Indicators: cators (minimum of of Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4)		☐ Water-Sta ☐ Aquatic Fa ☐ True Aqua ☐ Hydrogen ☐ Oxidized F ☐ Presence ☐ Recent Iro	ined Leav auna (B13 atic Plants Sulfide O Rhizosphe of Reduct on Reduct	B) (B14) (dor (C1) eres on Livi ed Iron (C4) ion in Tilled)	Surface Drainag Dry-Se Crayfis (C3) Saturat Stunted	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2)
Wetland Hy Primary India Surface High Wa Saturati Water M Sedime Drift De Algal Ma	drology Indicators: cators (minimum of	one is requ	☐ Water-Sta ☐ Aquatic Fa ☐ True Aqua ☐ Hydrogen ☐ Oxidized Fa ☐ Presence ☐ Recent Iro	ined Leavauna (B13 atic Plants Sulfide O Rhizosphe of Reduct on Reduct s Surface	B) (B14) (dor (C1) eres on Livi ed Iron (C4) ion in Tilled (C7))	Surface Drainag Dry-Se Crayfis (C3) Saturat Stunted	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1)
Wetland Hy Primary Indi Surface High Wa Saturati Water M Sedime Drift De Algal Ma Iron Dep Inundati	drology Indicators: cators (minimum of comparison of compa	one is requ	Water-Sta Aquatic Fa Aquatic Fa True Aqua VHydrogen Oxidized Fa Presence Recent Iro Thin Muck Gauge or	ined Leavanna (B13 atic Plants Sulfide C Rhizosphe of Reduct on Reduct Surface Well Data	B) (B14) dor (C1) eres on Livi ed Iron (C4) ion in Tilled (C7) I (D9))	Surface Drainag Dry-Se Crayfis (C3) Saturat Stunted	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2)
Wetland Hy Primary Indi Surface High Wa Saturati Water M Sedime Drift De Algal Ma Iron Dep Inundati Sparsel	drology Indicators: cators (minimum of	one is requ	Water-Sta Aquatic Fa Aquatic Fa True Aqua Hydrogen Oxidized Fa Presence Recent Iro Thin Muck Gauge or	ined Leavanna (B13 atic Plants Sulfide C Rhizosphe of Reduct on Reduct Surface Well Data	B) (B14) dor (C1) eres on Livi ed Iron (C4) ion in Tilled (C7) I (D9))	Surface Drainag Dry-Se Crayfis (C3) Saturat Stunted	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2)
Wetland Hy Primary Indi Surface High Wa Saturati Water M Sedime Drift De Algal Ma Iron Dep Inundati	drology Indicators: cators (minimum of	Imagery (E	Water-Sta Aquatic Fa Aquatic Fa True Aqua Hydrogen Oxidized Fa Presence Recent Iro Thin Muck G7) Gauge or (B8) Other (Exp	ined Leav auna (B13 atic Plants Sulfide C Rhizosphe of Reduct on Reduct a Surface Well Data plain in Re	B) I (B14) I ()	Surface Drainag Dry-Se Crayfis (C3) Saturat Stunted	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2)
Wetland Hy Primary Indi Surface High Wa Saturati Water M Sedime Drift De Algal Ma Iron Dep Inundati Sparsel	drology Indicators: cators (minimum of	one is requ	Water-Sta Aquatic Fa Aquatic Fa True Aqua Hydrogen Oxidized Fa Presence Recent Iro Thin Muck G7) Gauge or (B8) Other (Exp	ined Leav auna (B13 atic Plants Sulfide O Rhizosphe of Reduct on Reduct Surface Well Data plain in Ro	(B14) dor (C1) eres on Livied Iron (C4) ion in Tilled (C7) I (D9) emarks))	Surface Drainag Dry-Se Crayfis (C3) Saturat Stunted	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2)
Wetland Hy Primary Indi Surface High Wa Saturati Water M Sedimee Drift De Algal Ma Iron Dep Inundati Sparsel	drology Indicators: cators (minimum of of of other (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial by Vegetated Concavity vations: ter Present?	Imagery (E	Water-Sta Aquatic Fa Aquatic Fa True Aqua Hydrogen Oxidized Fa Presence Recent Iro Thin Muck Thin Muck Gauge or (B8) Other (Exp	ined Leavanna (B13 atic Plants Sulfide OR Reduct Surface Well Data plain in Roches):2 ches):2	(C7) (ID9) emarks) et surface	d Soils (C	Surface Drainage Dry-Se Crayfis (C3) Saturate Stunted Geomo	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2) eutral Test (D5)
Wetland Hy Primary India Surface High Wa Saturati Water M Sedime Drift De Algal Ma Iron Dep Inundati Sparsel Field Obser Surface Wat Water Table Saturation P	drology Indicators: cators (minimum of of of other (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial by Vegetated Concave rvations: ter Present? Present? Yeresent?	Imagery (Ee Surface	Water-Sta Aquatic Fa Aquatic Fa True Aqua Hydrogen Oxidized Fa Presence Recent Iro Thin Muck Thin Muck Gauge or (B8) Other (Exp	ined Leavanna (B13 atic Plants Sulfide OR Reduct Surface Well Data plain in Roches):2 ches):2	(B14) dor (C1) eres on Livied Iron (C4) ion in Tilled (C7) I (D9) emarks)	d Soils (C	Surface Drainag Dry-Se Crayfis (C3) Saturat Stunted	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2) eutral Test (D5)
Wetland Hy Primary India Surface High Wa Saturati Water M Sedime Drift De Algal Ma Iron Dep Inundati Sparsel Field Obser Surface Wat Water Table Saturation P (includes ca	drology Indicators: cators (minimum of of of other (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial by Vegetated Concave vations: der Present? Present? Present? Yeresent? Present? Yeresent? Yeresent? Yeresent? Yeresent? Yeresent? Yeresent? Yeresent?	Imagery (Ee Surface	Water-Sta Aquatic Fa Aquatic Fa True Aqua VHydrogen Oxidized Fa Presence Recent Iro Thin Muck S7) Gauge or (B8) Other (Exp	ined Leavanna (B13 atic Plants Sulfide ORhizosphe of Reduct Surface Well Data plain in Reduct ches): _2 ches): _4	(C7) a (D9) emarks) elinches at surface	d Soils (C	Surface Drainage Dry-Se Crayfis (C3) Saturate Stunted FAC-N	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2) eutral Test (D5)
Wetland Hy Primary India Surface High Wa Saturati Water M Sedime Drift De Algal Ma Iron Dep Inundati Sparsel Field Obser Surface Wat Water Table Saturation P (includes ca	drology Indicators: cators (minimum of of of other (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial by Vegetated Concave vations: der Present? Present? Present? Yeresent? Present? Yeresent? Yeresent? Yeresent? Yeresent? Yeresent? Yeresent? Yeresent?	Imagery (Ee Surface	Water-Sta Aquatic Fa Aquatic Fa True Aqua Hydrogen Oxidized Fa Presence Recent Iro Thin Muck Thin Muck Gauge or (B8) Other (Exp	ined Leavanna (B13 atic Plants Sulfide ORhizosphe of Reduct Surface Well Data plain in Reduct ches): _2 ches): _4	(C7) a (D9) emarks) elinches at surface	d Soils (C	Surface Drainage Dry-Se Crayfis (C3) Saturate Stunted FAC-N	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2) eutral Test (D5)
Wetland Hy Primary India Surface High Wa Saturati Water M Sedime Drift De Algal Ma Iron Dep Inundati Sparsel Field Obser Surface Wat Water Table Saturation P (includes ca	drology Indicators: cators (minimum of of of other (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial by Vegetated Concave vations: der Present? Present? Present? Yeresent? Present? Yeresent? Yeresent? Yeresent? Yeresent? Yeresent? Yeresent? Yeresent?	Imagery (Ee Surface	Water-Sta Aquatic Fa Aquatic Fa True Aqua VHydrogen Oxidized Fa Presence Recent Iro Thin Muck S7) Gauge or (B8) Other (Exp	ined Leavanna (B13 atic Plants Sulfide ORhizosphe of Reduct Surface Well Data plain in Reduct ches): _2 ches): _4	(C7) a (D9) emarks) elinches at surface	d Soils (C	Surface Drainage Dry-Se Crayfis (C3) Saturate Stunted FAC-N	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2) eutral Test (D5)
Wetland Hy Primary India Surface High Wa Saturati Water M Sedime Drift De Algal Ma Iron Dep Inundati Sparsel Field Obser Surface Wat Water Table Saturation P (includes ca Describe Re	drology Indicators: cators (minimum of of of water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial by Vegetated Concave vations: ter Present? Present? Present? Yeresent?	Imagery (Ee Surface (Yes V) Yes V In gauge, m	Water-Sta Aquatic Fa Aquatic Fa True Aqua Hydrogen Oxidized Fa Presence Recent Iro Thin Muck G7) Gauge or (B8) Other (Exp No Depth (in No Depth (in No Depth (in No Depth (in	ined Leav auna (B13 atic Plants Sulfide O Rhizosphe of Reduct on Reduct c Surface Well Data plain in Re ches):	(C7) a (D9) emarks) continued surface at surface arevious ins	d Soils (Co	Surface Drainage Dry-Se Crayfis Saturate Stunted Geomo	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2) eutral Test (D5)
Wetland Hy Primary India Surface High Wa Saturati Water M Sedime Drift De Algal Ma Iron Dep Inundati Sparsel Field Obser Surface Wat Water Table Saturation P (includes ca Describe Re	drology Indicators: cators (minimum of of of water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial by Vegetated Concave vations: ter Present? Present? Present? Yeresent?	Imagery (Ee Surface (Yes V) Yes V In gauge, m	Water-Sta Aquatic Fa Aquatic Fa True Aqua Hydrogen Oxidized Fa Presence Recent Iro Thin Muck G7) Gauge or (B8) Other (Exp No Depth (in No Depth (in No Depth (in No Depth (in	ined Leav auna (B13 atic Plants Sulfide O Rhizosphe of Reduct on Reduct c Surface Well Data plain in Re ches):	(C7) a (D9) emarks) continued surface at surface arevious ins	d Soils (Co	Surface Drainage Dry-Se Crayfis Saturate Stunted Geomo	e Soil Cracks (B6) ge Patterns (B10) eason Water Table (C2) th Burrows (C8) tion Visible on Aerial Imagery (C9) d or Stressed Plants (D1) orphic Position (D2) eutral Test (D5)

Project/Site: I-65 at 109th Avenue		City/C	ounty:	Crown Po	oint/Lake	Sampling Da	ate: 5/22/20)19
Applicant/Owner: INDOT					State: IN			
					nge: S 3, T 34 N, R 8 W			
Landform (hillslope, terrace, etc.): Shoulder of Slope		Occilo			(concave, convex, none):			
Slope (%): 2-4% Lat: 41.420486 N		Long			(concave, convex, none).		SS 84	
Soil Map Unit Name: Milford silty clay loam, 0 to 2 percer		Long.			NWI classific			
		0 V	[,	/ Na [
Are climatic / hydrologic conditions on the site typical for this								
	significantly				Normal Circumstances" p			o <u> </u>
Are Vegetation, Soil, or Hydrology n	aturally pro	blema	itic?	(If ne	eded, explain any answe	rs in Remark	s.)	
SUMMARY OF FINDINGS – Attach site map	showing	sam	pling	point l	ocations, transects	, importar	nt feature:	s, etc.
Hydrophytic Vegetation Present? Yes N	0 🗸							
	٥ 🕌			Sampled		No [/	
, , ,	o <u> </u>		withii	n a Wetlar	nd? Yes	No		
Remarks:								
Upland point located on the north side of 109th Avenue	and east o	of I-65						
VIOLET I TON III I I I I I I I I I I I I I I I I I								
VEGETATION – Use scientific names of plants.		Daw		la dia atau	Daminana Tasturat			
Tree Stratum (Plot size: 30 feet)	Absolute % Cover			Indicator Status	Dominance Test work			
1					Number of Dominant S That Are OBL, FACW,		1	(A)
2					Total Number of Domin	ant	_	
3					Species Across All Stra		2	(B)
4					Percent of Dominant S	necies	=00/	
5					That Are OBL, FACW,		50%	(A/B)
Sapling/Shrub Stratum (Plot size: 15 feet)		= Tota	al Cove	er	Prevalence Index wor	ksheet:		
1					Total % Cover of:		ultiply by:	
2.						x 1 =		
3.					FACW species			
4					FAC species 40	x 3 =	120	
5					FACU species 85	x 4 =	340	_
Herb Stratum (Plot size: 5 feet		= Tota	al Cove	er		x 5 =		_
Herb Stratum (Plot size: 5 Teet) Festuca rubra	45	Χ		FACU	Column Totals: 125	(A)	460	_ (B)
2. Poa pratensis	40	$\frac{x}{x}$		FAC	Prevalence Index	= B/A =	3.68	
3. Trifolium pratense	15			FACU	Hydrophytic Vegetation		3:	
4 Taraxum officianale	10			FACU	1 - Rapid Test for I			
5. Medicago lupulina	10			FACU	2 - Dominance Tes			
6. Plantago lanceolata	5			FACU	3 - Prevalence Inde	ex is ≤3.0 ¹		
7.					4 - Morphological A			porting
8.					data in Remark	-		
9					Problematic Hydro	phytic Vegeta	ition' (Explai	in)
10					1 Indicators of budgings			4
Woody Vine Stratum (Plot size: 30 feet)	125	= Tota	al Cove	er	¹ Indicators of hydric soi be present, unless dist			nust
1					Hydrophytic Vegetation			
		= Tota	al Cove	er	Present? Ye	sN	lo V	
Remarks: (Include photo numbers here or on a separate s	sheet.)	. 010	5540		I			
This vegetative community did not pass the rapid test, t	the domina	nce te	st, or p	orevalence	e index. Hydrophytic veg	etation is no	t present at	this
community.								

SOIL	Sampling Point:	SP12
Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of	cators.)	

Profile Desc	cription: (Describe	to the dep	th needed to docur	nent the	indicator	or confir	m the absence of	indicators.)
Depth	Matrix			x Feature			_	
(inches)	Color (moist)		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	С	M	SiC	
	oncentration, D=Dep	letion, RM=	Reduced Matrix, MS	S=Maske	d Sand Gra	ains.		PL=Pore Lining, M=Matrix.
Hydric Soil			П				_	Problematic Hydric Soils ³ :
Histosol					atrix (S4)		_	airie Redox (A16)
	oipedon (A2) istic (A3)		_	Redox (St d Matrix (☐ Dark Surf	ganese Masses (F12)
	en Sulfide (A4)				neral (F1)			low Dark Surface (TF12)
	d Layers (A5)				atrix (F2)			plain in Remarks)
□ 2 cm Mι	ıck (A10)			d Matrix (_ `	,
	d Below Dark Surfac	e (A11)	_	Dark Surf	, ,			
	ark Surface (A12)		= '		urface (F7)			hydrophytic vegetation and
	Mucky Mineral (S1)		<u></u> Redox □	Depression	ons (F8)			ydrology must be present,
	ucky Peat or Peat (Since Layer (if observed):						unless dis	sturbed or problematic.
	Layer (II observed):	•						
Type: Depth (in	chee):		_				Hydric Soil Pro	esent? Yes No V
Remarks:								
	. 4		0D40 did		data a site			
SP12 did no	ot exhibit any hydric	soii indica	tors. SP12 did not e	exhibit nye	aric soils.			
HYDROLO	GY							
	drology Indicators:							
1	cators (minimum of c		ed: check all that an	nlv)			Secondary	Indicators (minimum of two required)
	Water (A1)	nio io roquii	☐ Water-Sta		/es (R9)			e Soil Cracks (B6)
	ater Table (A2)		Aquatic Fa		` '			ge Patterns (B10)
Saturation	, ,		True Aqua	-			= `	ason Water Table (C2)
	larks (B1)		Hydrogen		, ,		— '	h Burrows (C8)
_	nt Deposits (B2)				eres on Liv	ing Roots	— ·	ion Visible on Aerial Imagery (C9)
	posits (B3)		Presence	-		-		d or Stressed Plants (D1)
ı —	at or Crust (B4)		Recent Iro	n Reduct	ion in Tille	d Soils (C	=	orphic Position (D2)
Iron Dep	posits (B5)		Thin Muck	Surface	(C7)	,	_	eutral Test (D5)
Inundati	on Visible on Aerial	magery (B7	7) 🔲 Gauge or	Well Data	(D9)			
☐ Sparsely	y Vegetated Concave	e Surface (E	38) 🔲 Other (Exp	olain in Re	emarks)			
Field Obser	vations:							
Surface Wat	er Present? Y	es I	No 🔽 Depth (in	ches):		_		
Water Table	Present? Y	'es 🔲 I	No 🔽 Depth (in	ches):		_		
Saturation P	resent? Y	es 🔲 I	No Depth (in	ches):		_ We	tland Hydrology P	resent? Yes No
(includes cap			-141	-1			\	
Describe Re	corded Data (stream	gauge, mo	nitoring well, aerial	pnotos, p	revious ins	pections;), if available:	
Remarks:								
	ot evhibit any water	nd indicator	e Wetland budgele	av waa e	ot procest	at SD10		
JE 12 UIU III	ot exhibit any wetlar	iu iriulcat0l	s. vveuanu nyurolo(gy was n	or bieseill	at OF 12.		

Project/Site: I-65 at 109th Avenue	C	itv/Count	v: Crown Po	oint/Lake	Sampling Date: 5/22/20)19
Applicant/Owner: INDOT		•	′ —	State: IN		
	S			nge: S 3, T 34 N, R 8 V		
Landform (hillslope, terrace, etc.): Toe of Slope	0			(concave, convex, none)		
			.319433 W	(concave, convex, none)		
Soil Map Unit Name: Milford silty clay loam, 0 to 2 percent	L	orig	10 10 100 11			
		<u></u> Г	<u> </u>	NWI classific		
Are climatic / hydrologic conditions on the site typical for this t						
Are Vegetation, Soil, or Hydrology sig					present? Yes ✓ No	٥
Are Vegetation, Soil, or Hydrology nat	turally prob	lematic?	(If ne	eded, explain any answe	ers in Remarks.)	
SUMMARY OF FINDINGS - Attach site map si	howing s	samplii	ng point le	ocations, transects	s, important feature	s, etc.
Hydrophytic Vegetation Present? Yes ✓ No						
Hydric Soil Present? Yes No			he Sampled	Area	7 🗆	
Wetland Hydrology Present? Yes ✓ No		wit	hin a Wetlar	nd? Yes <u></u> ✓	No	
Remarks:						
Wetland point located on the north side of 109th Avenue	and east o	f I-65.				
VEGETATION – Use scientific names of plants.						
20 toot			nt Indicator	Dominance Test work	(sheet:	
1	% Cover _	Species:	Status	Number of Dominant S That Are OBL, FACW,		(A)
2				That Ale OBL, FACVV,	01 FAC.	(^)
3				Total Number of Domir Species Across All Stra	.)	(B)
4				Openies Across Air otte		(D)
5				Percent of Dominant S That Are OBL, FACW,		(A/B)
45.5.4	=	Total Co	over			(700)
Sapling/Shrub Stratum (Plot size:15 feet)				Prevalence Index wor		
1				Total % Cover of:		_
2				OBL species 50	x 1 = x 2 =100	_
3				FACW species 25	x 2 = 100 x 3 = 75	_
4				FACU species 25	x 4 = 100	_
J		Total Co	over		x 5 =	_
Herb Stratum (Plot size: 5 feet)		Total Oc	3461	Column Totals: 100		— (B)
1. Phragmites australis	50 ————————————————————————————————————	Х	FACW			_ (-/
2. Poa pratensis		X	FAC	Prevalence Index		
3. Festuca rubra		X	FACU_	Hydrophytic Vegetati		
4				I — '	Hydrophytic Vegetation	
5				2 - Dominance Tes		
6					ex is ≤3.0 Adaptations¹ (Provide sup	norting
7					s or on a separate sheet)	
8				Problematic Hydro	phytic Vegetation¹ (Explai	in)
9						
	125 =	Total Co	over		il and wetland hydrology r	nust
Woody Vine Stratum (Plot size: 30 feet)		Total Oc	3461	be present, unless dist	urbed or problematic.	
1				Hydrophytic	<u></u>	
2				Vegetation Present? Ye	No No	
		Total Co	over	riesellir fe	:3_ <u></u>	
Remarks: (Include photo numbers here or on a separate sh						
This vegetative community passed the dominance test ar	nd prevaler	nce index	x. Hydrophyt	tic vegetation is present	at this community.	

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Profile Des	cription: (Describe	to the de	pth needed to docu	ment the i	ndicator	or confir	m the absence of	Sampling Point: SP13 of indicators.)
Depth	Matrix		Redo	ox Feature				
(inches) 0-4	Color (moist) 10 YR 2/1	<u>%</u> 100	Color (moist)	%	_Type ¹ _	_Loc ²	<u>Texture</u> Muck	Remarks
4-20	10 YR 5/1	95	10 YR 5/8	5	С	М	SiC	
Tuno: C=C	Consentration D=Der	alotion DN	- 	S-Marked	L Sand Cr		21 continu	PL=Pore Lining, M=Matrix.
Hydric Soil Histoso Histic E Black F Hydrog Stratifie 2 cm M Deplete Thick D Sandy	Indicators:	e (A11)	Sandy Sandy Strippe Loamy Loamy Deplete Redox	Gleyed Ma Redox (S5 d Matrix (S Mucky Mir Gleyed Ma ed Matrix (I Dark Surfa ed Dark Su Depression	atrix (S4) (S6) (S6) (Meral (F1) (F2) (F3) (Ace (F6) (F7)		Indicators f Coast F Dark Su Iron-Ma Very Sh Other (B	For Problematic Hydric Soils ³ : Prairie Redox (A16) Inface (S7) Inganese Masses (F12) Inallow Dark Surface (TF12) Explain in Remarks) of hydrophytic vegetation and hydrology must be present, disturbed or problematic.
	Layer (if observed)	,					Hydric Soil F	
Remarks: SP13 exhil	bited 2cm Muck (A10	D), Deplet	ed Below Dark Surfa	ice (A12),	and Depl	eted Matı	rix (F3). SP13 ex	hibited hydric soils.

HYDROLOGY	
Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9)	Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13)	☐ Drainage Patterns (B10)
☑ Saturation (A3) ☐ True Aquatic Plants (B14)	Dry-Season Water Table (C2)
☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1)	Crayfish Burrows (C8)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Root	ts (C3) 🔲 Saturation Visible on Aerial Imagery (C9)
□ Drift Deposits (B3) □ Presence of Reduced Iron (C4)	Stunted or Stressed Plants (D1)
Algal Mat or Crust (B4)	C6) Geomorphic Position (D2)
☐ Iron Deposits (B5) ☐ Thin Muck Surface (C7)	FAC-Neutral Test (D5)
Inundation Visible on Aerial Imagery (B7) Gauge or Well Data (D9)	
Sparsely Vegetated Concave Surface (B8)	
Field Observations:	
Surface Water Present? Yes No Depth (inches):3 inches	
Water Table Present? Yes No Depth (inches): _At surface	
	etland Hydrology Present? Yes <u></u>
(includes capillary fringe) Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections	s) if available:
Describe Necorded Data (stream gauge, monitoring well, aerial priotos, previous inspections	5), II available.
Parada	
Remarks:	
SP13 exhibited Surface Water (A1), High Water Table (A2), and Saturation (A3). Wetlar	nd hydrology was present at SP13.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue	c	City/County	y: Crown Po	int/Lake	Sampling [Date: 5/22/20	19
Applicant/Owner: INDOT				State: IN			
	5	Section, To	ownship, Rar	nge: S 3, T 34 N, R 8 W			
				concave, convex, none):			
			.319383 W		Datum: W	GS 84	
Soil Map Unit Name: Milford silty clay loam, 0 to 2 percent sl	lopes			NWI classifica			
Are climatic / hydrologic conditions on the site typical for this tin		r2 Ves	√ No [(If no, explain in Re			
Are Vegetation, Soil, or Hydrology signi	-			Normal Circumstances" pi	,	es 🗸 No	
Are Vegetation, Soil, or Hydrology natu				eded, explain any answer			′
SUMMARY OF FINDINGS – Attach site map she			`			,	e etc
	<u>`</u>	Sampin	ig point it	cations, transects,	ппрогта	iii ieatures	s, e.c.
Hydrophytic Vegetation Present? Yes No Hydric Soil Present? Yes ✓ No	<u> </u>	ls ti	he Sampled	Area	, ,		
Hydric Soil Present? Yes ✓ No Wetland Hydrology Present? Yes No	√		hin a Wetlan		No_	\checkmark	
Remarks:							
Upland point located on the north side of 109th Avenue an	d east of	f I-65.					
VEGETATION – Use scientific names of plants.							
30 foot	bsolute		t Indicator	Dominance Test works	sheet:		
	Cover	Species?	Status_	Number of Dominant Sp		1	(4)
				That Are OBL, FACW, o	r FAC: _		(A)
2				Total Number of Domina Species Across All Strat		3	(B)
4				Species Across All Strat	a		(D)
5				Percent of Dominant Sp That Are OBL, FACW, o		33%	(A/B)
15 foot	:	= Total Co	ver				(,,,,
Sapling/Shrub Stratum (Plot size: 15 feet)				Prevalence Index work		Aultiply by:	
1				Total % Cover of: OBL species		Multiply by:	_
2				FACW species			-
4				FAC species 50		150	_
5.				FACU species 45		180	_
E foot		= Total Co	ver	UPL species5	x 5 =	25	_
Herb Stratum (Plot size: 5 feet)	50	Χ	FAC	Column Totals: 100	(A)	355	_ (B)
Trife lines and transfer	20	$\frac{\wedge}{X}$	FACU	Prevalence Index	= B/A =	3.55	
-	20	X	FACU	Hydrophytic Vegetatio		'S:	
3	5		UPL	1 - Rapid Test for H			
5. Solidago canadensis	5		FACU	2 - Dominance Test	is >50%		
6				3 - Prevalence Inde	x is ≤3.0 ¹		
7.				4 - Morphological A			oorting
8				data in Remarks Problematic Hydrop	-		~ \
9				Problematic Hydrop	nytic veget	ation (Explain	11)
10				¹ Indicators of hydric soil	and wetlan	d hydrology m	nust
Woody Vine Stratum (Plot size: 30 feet)	125:	= Total Co	ver	be present, unless distu			1431
1				Hydrophytic			
2				Vegetation Present? Yes	$[\]$	No 🗸	
		= Total Co	ver	rieselli: Yes	· ——	140 _ [+]	
Remarks: (Include photo numbers here or on a separate she							
This vegetative community did not pass the rapid test, dom community.	ninance t	est, or pre	evalence ind	ex. Hydrophytic vegetati	on is not pr	esent at this	
Community.							

sol	L														San	npling Point:	SP14	

Profile Desc	cription: (Describe	to the dept	th needed to docum	nent the	indicator	or confi	rm the absence of indicators.)
Depth	Matrix		Redo	x Feature	s		_
(inches)	Color (moist)	%	Color (moist)	%	_Type ¹ _	_Loc ²	
0-4	10 YR 2/2	100					<u>C</u>
4-15	10 YR 5/2	98	10 YR 5/6	2	С	M	С
15-20	10 YR 5/1	95	10 YR 5/6	5			-
					. ——		
l							
¹ Type: C=C	oncentration, D=Dep	letion RM=	Reduced Matrix MS	S=Masker	d Sand Gr	aine	² Location: PL=Pore Lining, M=Matrix.
Hydric Soil		netion, rawi-	rteduced Matrix, Mc	- Washer	J Garia Gr	ali io.	Indicators for Problematic Hydric Soils ³ :
☐ Histosol			☐ Sandy (Sleyed Ma	atrix (S4)		Coast Prairie Redox (A16)
_	pipedon (A2)		_	Redox (S5			Dark Surface (S7)
	istic (A3)		_	Matrix (S			Iron-Manganese Masses (F12)
	en Sulfide (A4)		_ ::	,	neral (F1)		Very Shallow Dark Surface (TF12)
	d Layers (A5)			Gleyed M			Other (Explain in Remarks)
2 cm Mu	uck (A10)		✓ Deplete	d Matrix (F3)		
	d Below Dark Surfac	e (A11)	=	oark Surfa	, ,		
	ark Surface (A12)				urface (F7))	³ Indicators of hydrophytic vegetation and
	Mucky Mineral (S1)	٥.	<u></u> Redox □	Depressio	ns (F8)		wetland hydrology must be present,
	ucky Peat or Peat (S						unless disturbed or problematic.
	Layer (if observed):						
Type:							Hydric Soil Present? Yes No
Depth (in	ches):		<u> </u>				Tydno com recome: Tee No
Remarks:							
SP14 exhib	oited Depleted Belov	v Dark Surf	ace (A11) and Depl	eted Mat	rix (F3). S	P14 exh	ibited hydric soils.
HYDROLO	GY						
Wetland Hy	drology Indicators:						
1	cators (minimum of c		ed: check all that an	(vla			Secondary Indicators (minimum of two required)
	Water (A1)		☐ Water-Stai		res (R9)		Surface Soil Cracks (B6)
	ater Table (A2)		Aquatic Fa				Drainage Patterns (B10)
Saturati	, ,		True Aqua	,	,		Dry-Season Water Table (C2)
1 =	Marks (B1)		Hydrogen		. ,		Crayfish Burrows (C8)
_	nt Deposits (B2)		Oxidized F		, ,	ina Root	
	posits (B3)		Presence			•	Stunted or Stressed Plants (D1)
	at or Crust (B4)		Recent Iro				= \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
ı —	posits (B5)		Thin Muck			u 00113 (0	FAC-Neutral Test (D5)
	ion Visible on Aerial I	lmagery (B7	$\overline{}$				<u>=</u> 1716 1104444 1061 (50)
	y Vegetated Concave				. ,		
Field Obser		o ouridoo (E			, marke,		
Surface Wat		es 🔲 I	No Depth (inc	chae).			
Water Table		$\overline{}$	No Depth (inc			_	
				-		- .	41411-4-1
Saturation P	resent? Y pillary fringe)	es L	No Depth (inc	cnes):		_ we	etland Hydrology Present? Yes No No V
	corded Data (stream	gauge, mo	nitoring well, aerial p	hotos, pr	evious ins	pections	s), if available:
Remarks:							
	ot exhibit any wetlar	nd hydrolog	v indicators Wetler	nd bydrol	ody was p	nt nreso	nt at SP14
51 14 414 11	ot Gariibit ariy wellal	ia riyarolog	y mulcalors. Wellar	ia riyurur	ogy was II	or brese	iii at 01 14.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: I-65 at 109th Avenue	c	ity/Count	ty: Crown Po	oint/Lake	Sampling Date	5/22/2019
Applicant/Owner: INDOT				State: IN	Sampling Point	t: SP15
Investigator(s): Christian Radcliff and Kevin McLane	s	ection, T	ownship, Rar	nge: S 10, T 34 N, R 8 \	N	
				(concave, convex, none):	Concave	
Slope (%): 2-4% Lat: 41.420009 N	L	ong: <u>-</u> 87	7.319363 W		Datum: WGS	84
Soil Map Unit Name: Pewamo silty clay loam				NWI classific		
Are climatic / hydrologic conditions on the site typical for this t	time of year	r? Yes [✓ No	(If no, explain in R	emarks.)	
Are Vegetation, Soil, or Hydrology sig	nificantly d	isturbed?	? Are "	Normal Circumstances" p	resent? Yes	✓ No
Are Vegetation, Soil, or Hydrology nat	turally prob	lematic?	(If ne	eded, explain any answe	rs in Remarks.)	
SUMMARY OF FINDINGS - Attach site map s	howing	sampli	ng point lo	ocations, transects	, important	features, etc.
Hydrophytic Vegetation Present? Yes ✓ No						
Hydric Soil Present? Yes No	$\overline{}$		the Sampled		7 \square	1
Wetland Hydrology Present? Yes ✓ No	<u> </u>	wit	thin a Wetlan	ıd? Yes <u></u> ▼	No	<u></u>
Remarks:		-4105				
Wetland point located on the soutth side of 109th Avenue	e and east	01 1-05.				
VEGETATION – Use scientific names of plants.						
20 to ot			nt Indicator ? Status	Dominance Test work		
			· Status	Number of Dominant Sport That Are OBL, FACW, or		(A)
2				Total Number of Domin	ant o	
3				Species Across All Stra	/	(B)
4				Percent of Dominant Sp		00%
5		Total Co	over	That Are OBL, FACW,	or FAC:	(A/B)
Sapling/Shrub Stratum (Plot size: 15 feet)		- Total Ot	ovei	Prevalence Index wor	ksheet:	
1				Total % Cover of:		iply by:
2				OBL species 30	x1 = x2 =	
3				FACW species 30	x 2 =	
4				FACU species		
5.6.4		Total Co	over	UPL species	x 5 =	
Herb Stratum (Plot size: 5 feet)	30	V	ODI	Column Totals: _70	(A)	140 (B)
1. Typha angustifolia Poa pratensis		X	- OBL FAC	Prevalence Index	= B/A = 2.	0
2. Poa pratensis Phalaris arundinacea	10		FACW	Hydrophytic Vegetation		
4.				1 - Rapid Test for H		jetation
5				2 - Dominance Tes	t is >50%	
6				3 - Prevalence Inde	ex is ≤3.0 ¹	
7				4 - Morphological A data in Remarks	Adaptations ¹ (Pre	ovide supporting
8				Problematic Hydro	-	
9					ony no vogotano	··· (Explain)
10	125 =	T.1.10		¹ Indicators of hydric soi		
Woody Vine Stratum (Plot size: 30 feet)	=	Total Co	over	be present, unless distu	irbed or problen	natic.
1				Hydrophytic		
2				Vegetation Present? Yes	s No	
Remarks: (Include photo numbers here or on a separate sh		Total Co	over			
This vegetative community passed the dominance test at		nce inde	x. Hydrophyt	ic vegetation is present	at this commun	ity.
	•		, , ,	,		-

SOIL									5	Sampling Point	SP15
Profile Des	cription: (Describe	to the depth r	eeded to docun	nent the i	ndicator	or confir	m the a	bsence	of indicat	ors.)	
Depth	Matrix		Redo	x Feature:			_				
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	_Loc ²	Te:	xture		Remarks	
0-4	10 YR 2/1	100					Muck				
4-20	10 YR 5/1	95 10	YR 5/8	5	<u>C</u>	M	SiC				
¹Type: C=C	Concentration, D=Dep	letion, RM=Re	duced Matrix, MS	S=Masked	Sand Gr	ains.	₂ l	ocation	: PL=Pore	E Lining, M=Ma	ıtrix.
Hydric Soil	Indicators:						Ind	licators	for Proble	ematic Hydric	Soils ³ :
Black F Hydrog Stratifie 2 cm M	epipedon (A2) distic (A3) en Sulfide (A4) ed Layers (A5) duck (A10)		Sandy F Stripped Loamy I Loamy 0	Gleyed Ma Redox (S5 I Matrix (S Mucky Mir Gleyed Ma d Matrix (I	66) 66) neral (F1) atrix (F2) F3)			Dark S Iron-M Very S	Shallow Da		12)
Thick D	ed Below Dark Surfac Park Surface (A12) Mucky Mineral (S1) lucky Peat or Peat (S		Deplete	Dark Surfa d Dark Su Depression	ırface (F7)	³ In	wetlan	d hydrolog	hytic vegetatio y must be pres or problematic	ent,
Туре:	Layer (if observed)		- -				Hyd	ric Soil	Present?	Yes	No
Remarks: SP15 exhil	bited 2cm Muck (A10)), Depleted Be	elow Dark Surfac	ce (A11),	and Depl	eted Matı	rix (F3).	SP15 e	xhibited h	ydric soils.	
HYDROLO	OGY										
Wetland Hy	drology Indicators:										
Primary Ind	icators (minimum of o	ne is required:	check all that ap	ply)				Seconda	ary Indicato	ors (minimum o	of two required)
Surface	Water (A1)		☐ Water-Stai	ned Leave	es (B9)		[Sur	face Soil C	racks (B6)	
☐ High W	ater Table (A2)		Aquatic Fa	una (B13))]	☐ Dra	inage Patte	erns (B10)	
✓ Saturat	ion (A3)		True Aqua	tic Plants	(B14)		J	☐ Dry	-Season W	ater Table (C2	2)
☐ Water N	Marks (B1)		Hydrogen	Sulfide O	dor (C1)		Ì	Cra	yfish Burro	ws (C8)	
ı —	ent Deposits (B2)		Oxidized F		, ,	ing Roots	s (C3)	Sat	uration Visi	ible on Aerial Ir	magery (C9)
_	eposits (B3)		Presence			•	, ,	$\overline{}$		essed Plants ([
	lat or Crust (B4)		Recent Iro				26)	_		osition (D2)	•
	posits (B5)		Thin Muck			(-	ĺ	_	C-Neutral T		
	tion Visible on Aerial	Imagery (B7)	Gauge or \	,	,		-			\- \- \- \	
	ly Vegetated Concav		Other (Exp		. ,						

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

Depth (inches): 2 inches

Depth (inches): At surface

Depth (inches): At surface

Wetland Hydrology Present? Yes

Yes ____ No _

Yes _ No _

Yes No [

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

Field Observations:

Surface Water Present?

Water Table Present?

Saturation Present? (includes capillary fringe)

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:I-65 at 109th Avenue	(City/Coun	ty: Crown Po	oint/Lake	Sampling Da	ite: 5/22/20	19
Applicant/Owner: INDOT				State: IN			
	;	Section, T	Township, Rar	nge: S 10, T 34 N, R 8 V	٧		
Landform (hillslope, terrace, etc.): Shoulder of Slope				(concave, convex, none):			
Slope (%): 2-4% Lat: 41.419973 N	I	Long:87	7.319349 W		Datum: WG	S 84	
Soil Map Unit Name: Pewamo silty clay loam				NWI classific			
Are climatic / hydrologic conditions on the site typical for this ti	me of yea	ar? Yes	✓ No	(If no, explain in Re			
Are Vegetation, Soil, or Hydrology sign	nificantly o	disturbed'	? Are "	Normal Circumstances" p	resent? Yes	. ✓ No	
Are Vegetation, Soil, or Hydrology nati	urally prol	blematic?	(If ne	eded, explain any answei	rs in Remarks	i.)	
SUMMARY OF FINDINGS - Attach site map sh				ocations, transects	, importan	t feature:	s, etc.
Hydrophytic Vegetation Present? Yes No	√						
Hydric Soil Present? Yes No	$\overline{}$		the Sampled		1	7	
Wetland Hydrology Present? Yes No _	<u> </u>	wit	thin a Wetlan	id? Yes	No <u>¥</u>	<u>'</u>	
Remarks:							
Upland point located on the south side of 109th Avenue a	nd east c	of I-65.					
VEGETATION – Use scientific names of plants.							
30 foot	Absolute		nt Indicator	Dominance Test work	sheet:		
	% Cover	Species	? Status	Number of Dominant Sp		1	(4)
1				That Are OBL, FACW, o	or FAC:		(A)
3				Total Number of Domina Species Across All Strate		3	(B)
4							(D)
5.				Percent of Dominant Sp That Are OBL, FACW, of		33%	(A/B)
15 feet		= Total C	over				
Sapling/Shrub Stratum (Plot size: 15 feet)				Prevalence Index work Total % Cover of:		ultiply by:	
1					x 1 = _		_
3				FACW species			_
4				FAC species 30	x 3 =		
5.				FACU species70	x 4 = _	280	_
Herb Stratum (Plot size: 5 feet)		= Total C	over		x 5 = _		_
Herb Stratum (Plot size: 5 Teet) 1 Festuca rubra	30	Χ	FACU	Column Totals:100	(A) _	370	_ (B)
Poa pratensis	30	$\frac{X}{X}$	FAC	Prevalence Index	= B/A =	3.70	
3 Trifolium pratense	25	X	FACU	Hydrophytic Vegetatio			
4. Taraxum officianale	15		FACU	1 - Rapid Test for H			
5				2 - Dominance Tes	t is >50%		
6				3 - Prevalence Inde	x is ≤3.0 ¹		
7				4 - Morphological A			porting
8				data in Remarks Problematic Hydrog	-		n)
9				- Problematic Hydrop	mytic vegetat	ion (Explai	11)
10	400			¹ Indicators of hydric soil	and wetland	hvdrology n	nust
Woody Vine Stratum (Plot size: 30 feet)	100	= Total C	over	be present, unless distu			
1				Hydrophytic			
2				Vegetation Present? Yes	s No	。 ✔	
Demorks: (Include photo supplies have a second		= Total C	over	100			
Remarks: (Include photo numbers here or on a separate she		toot or =	rovalonas i s t	lov Uudrophyticyca-t-ti	ion io not n==	cont of this	
This vegetative community did not pass the rapid test, do community.	пшапсе	iesi, or p	revalence inc	іех. пуцгорнуцс vegetati	on is not pre	seni al inis	
,							

SOIL								Sampl	ing Point:	SP16
Profile Des	cription: (Describe	to the depth n	eeded to docun	nent the in	ndicator o	or confin	n the absence			
Depth	Matrix	-	Redo	x Features	6					
(inches) 0-12	Color (moist)	100	Color (moist)	%	_Type ¹ _	_Loc ²	Texture	R	Remarks	
0-12	10 YR 2/2	. — — —					SiC			
¹ Type: C=C	concentration, D=Dep	letion. RM=Re	duced Matrix. MS	======================================	Sand Gra	ins.	² Location	: PL=Pore Linin	g. M=Matrix	
Hydric Soil Histoso Histic E Black H Hydrog Stratifie 2 cm M	Indicators: I (A1) pipedon (A2) listic (A3) en Sulfide (A4) d Layers (A5) uck (A10)		Sandy G Sandy F Stripped Loamy M Loamy C	Gleyed Mar Redox (S5) I Matrix (S Mucky Min Gleyed Ma d Matrix (F	trix (S4)) 6) eral (F1) trix (F2)		Indicators Coast Dark S Iron-M Very S	for Problemation Prairie Redox (A Surface (S7) anganese Masso Shallow Dark Sur (Explain in Rema	c Hydric So (16) es (F12) face (TF12)	
☐ Thick D☐ Sandy I☐ 5 cm M	ed Below Dark Surfac Park Surface (A12) Mucky Mineral (S1) Bucky Peat or Peat (S	3)	Depleted	Dark Surfa d Dark Sur Depression	rface (F7)		wetland	of hydrophytic vod hydrology mus disturbed or pro	t be present	
Type: _G	Layer (if observed): Gravel aches): 12		- -				Hydric Soil	Present? Yes	s	No 🗸
Remarks: SP16 did r	ot exhibit any hydric	soil indicators	. SP16 did not e	xhibit hyd	ric soils.					
HYDROLO	GY									
Wetland Hy	drology Indicators:									
Surface High W Saturat Water M Sedime Drift De Algal M Iron De Inundat Sparse	cators (minimum of of of water (A1) ater Table (A2) ion (A3) Marks (B1) int Deposits (B2) iposits (B3) at or Crust (B4) posits (B5) ion Visible on Aerial I by Vegetated Concave	magery (B7)	check all that ap Water-Stai Aquatic Fa True Aqua Hydrogen Oxidized R Presence of Recent Iron Thin Muck Gauge or \ Other (Exp	ned Leave una (B13) tic Plants (Sulfide Od Rhizospher of Reduce n Reductic Surface (Well Data	(B14) flor (C1) res on Livi d Iron (C4 on in Tilleo C7) (D9)	-)	Surf Drai Dry. Cray CS3 Satu Sturf Sturf Geo.	ary Indicators (mi face Soil Cracks inage Patterns (B Season Water T yfish Burrows (C uration Visible or nted or Stressed imorphic Position C-Neutral Test (D	(B6) 310) Fable (C2) 8) n Aerial Imag Plants (D1) n (D2)	
Water Table Saturation F (includes ca	ter Present? Y Present? Y	es No es No gauge, monito	Depth (inc	ches):	evious ins			y Present? Ye	es	No V

US Army Corps of Engineers Midwest Region – Version 2.0

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

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site:I-65 at 109th Avenue	(City/Co	ounty:	Crown Po	oint/Lake	_ Sampling D	oate: 5/22/20	19
Applicant/Owner: INDOT					State: IN			
					nge: S 10, T 34 N, R 8			
Landform (hillslope, terrace, etc.): _Toe of Slope					(concave, convex, none)			
		Long:					GS 84	
Soil Map Unit Name: Markham silt loam, 2 to 6 percent slo	opes, erod	ed			NWI classifi			
Are climatic / hydrologic conditions on the site typical for this			es 🗔	✓ No				
Are Vegetation Soil , or Hydrology sie					Normal Circumstances"		es 🗸 No	0
Are Vegetation, Soil, or Hydrology na					eded, explain any answe			
SUMMARY OF FINDINGS – Attach site map s				g point le	ocations, transects	s, importa	nt feature:	s, etc.
Hydrophytic Vegetation Present? Yes ✓ No								
Hydric Soil Present? Yes Ves No	· -			e Sampled	1.4	7 [
Wetland Hydrology Present? Yes ✓ No	<u> </u>		withi	in a Wetlar	nd? Yes <u> ▼</u>	No _		
Remarks:		-610	_					
Wetland point located on the south side of 109th Avenue	e and east	OT I-6	5.					
VEGETATION – Use scientific names of plants.								
Tree Stratum (Plot size: 30 feet)	Absolute % Cover			Indicator	Dominance Test worl			
1			JIES !	Status	Number of Dominant S That Are OBL, FACW,		2	(A)
2.								(* */
3					Total Number of Domii Species Across All Stra		2	(B)
4					Percent of Dominant S	inecies	1000/	
5					That Are OBL, FACW,		100%	(A/B)
Sapling/Shrub Stratum (Plot size: 15 feet)		= Tota	al Cov	er	Prevalence Index wo	rksheet:		
1					Total % Cover of:	N	fultiply by:	_
2.					OBL species			_
3					FACW species 45		90	_
4					FAC species55		165	_
5						x 4 =		-
Herb Stratum (Plot size: 5 feet)		= Tota	al Cov	er	UPL species	x 5 =	255	- (B)
1. Poa pratensis	55	Х		FAC	Column Totals:	(A)		_ (B)
2. Phragmites australis	40	Х		FACW	Prevalence Index	κ = B/A =	2.55	_
3. Solidago gigantea	5			FACW	Hydrophytic Vegetati			
4					1 - Rapid Test for		Vegetation	
5					2 - Dominance Te			
6					✓ 3 - Prevalence Ind		/Danida aus	
7					4 - Morphological data in Remark			porting
8					Problematic Hydro	phytic Veget	ation¹ (Explai	n)
9								
	100	= Tota	al Cov	er	¹ Indicators of hydric so be present, unless dist			nust
Woody Vine Stratum (Plot size: 30 feet)					be present, unless dist	urbed or proc	Diematic.	
1					Hydrophytic			
2					Vegetation Present? Ye	es 🗸 🛮	No	
Remarks: (Include photo numbers here or on a separate si		= Tota	al Cov	er				
This vegetative community passed the dominance test a		ence i	ndex	Hydrophyt	tic vegetation is present	at this comm	nunitv.	
	F. 2. MI	"		, py.	J 5 p. 223/10	20	<i>)</i> .	
I .								

SOIL	Sampling Point: _	SP17

Profile Desc	cription: (Describe	to the dep	th needed to docur	ment the	indicator	or confire	m the absence o	f indicato	ors.)	
Depth	Matrix			x Feature						
(inches)	Color (moist)	%	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	- <u></u> 15						_
					- —					_
l ———										_
										_
										_
17			Deduced Metric M	C-MI			211:	DI D	Lining Manager	_
Hydric Soil	oncentration, D=Dep	pletion, Rivi-	Reduced Matrix, M	S=Maske	d Sand Gr	ains.			Lining, M=Matrix. matic Hydric Soils³:	_
1 <u>-</u>			Const.	Olaal M	-4-i (C.4)		_			
Histosol	pipedon (A2)		_	Gleyed M Redox (S			_	rairie Red rface (S7)		
	istic (A3)			d Matrix (=	, ,	Masses (F12)	
	en Sulfide (A4)				neral (F1)			-	Surface (TF12)	
	d Layers (A5)			Gleyed M				xplain in f	, ,	
	uck (A10)			ed Matrix (, , , , , , , , , , , , , , , , , , , ,	
	d Below Dark Surfac	e (A11)		Dark Surf						
	ark Surface (A12)	` ,	Deplete	d Dark S	urface (F7)	³ Indicators of	f hydroph	ytic vegetation and	
Sandy N	Mucky Mineral (S1)		Redox	Depression	ns (F8)		wetland l	hydrology	must be present,	
☐ 5 cm Mt	ucky Peat or Peat (S	3)					unless d	isturbed o	or problematic.	
Restrictive	Layer (if observed)	:								
Type: _G	ravel									
Depth (in	ches): 9						Hydric Soil P	resent?	Yes <u>I▼ No L</u>	L
Remarks:										
SP17 eyhih	oited 2cm Muck (A10	1) Denleter	d Below Dark Surfa	ce (Δ11)	Denleted	Matrix (F	3) SP17 evhibite	d hydric (enile	
OI I/ EXIIIL	nted Zeili Muck (Alt), Depleted	d Delow Dark Suria	CC (A11),	Depleted	iviatiix (i	o). Of 17 exhibite	a riyuno s	30113.	
HYDROLO	GY									
Wetland Hy	drology Indicators:									
Primary Indi	cators (minimum of o	one is requi	red; check all that ar	oply)			Secondary	/ Indicator	rs (minimum of two required	d)
	Water (A1)		☐ Water-Sta		res (B9)		□ Surfac	ce Soil Cra	acks (B6)	_
	ater Table (A2)		Aquatic Fa					age Patter		
Saturati	, ,		True Aqua	,	,		=	•	ater Table (C2)	
	farks (B1)		Hydrogen		. ,		= 1	sh Burrow	` '	
ı —	nt Deposits (B2)		Oxidized F		, ,	ina Poots	— ·		ole on Aerial Imagery (C9)	
	posits (B3)		Presence			•	· · =		ssed Plants (D1)	
	at or Crust (B4)		Recent Iro				=		esition (D2)	
ı == °	posits (B5)		Thin Muck			u Solis (C		Neutral Te		
		lmagan, (D	$\overline{}$				<u> </u>	veutrai re	(D5)	
	on Visible on Aerial		_		' '					
	y Vegetated Concav	e Surrace (i	38)	plain in Re	emarks)					
Field Obser		. 🖂	. 🗀	1	inch					
Surface Wat		一一	No Depth (in			-				
Water Table					At surface	-				1
Saturation P		′es <u> </u>	No Depth (in	ches):	At surface	Wet	land Hydrology	Present?	Yes V No	\perp
	pillary fringe) corded Data (stream	naune ma	nitoring well serial	nhotoe n	revioue inc	nections)	if available:			
Describe ive	corded Data (Stream	r gauge, me	mitoring well, aerial	priotos, p	ievious iris	spections),	, ii avallable.			
Damaria										
Remarks:										
SP17 exhib	ited Surface Water	(A1) Lliab	\\/-+ T-bl- /\(\O\\\\-	and Satur	-+: (A O)	11/-41	larratual a autoria a un l	rocent at	CD47	
	nica canace water	(AT), HIGH	vvater rable (AZ), a	ariu Satui	ation (A3)	. vvetiand	nydrology was p	neseni ai	SP17.	
	nica canace water	(AT), Figit	vvater rable (A2), a	anu Satui	ation (A3)	. vveuand	nydrology was p	neseni ai	SP17.	

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: I-65 at 109th Avenue		City/County	: Crown Po	int/Lake	Sampling Date:	5/22/2019
Applicant/Owner: INDOT				State: IN		
Investigator(s): Christian Radcliff and Kevin McLane		Section, To	wnship, Rar	nge: S 10, T 34 N, R 8 V	٧	
				(concave, convex, none):		
				,		4
Soil Map Unit Name: Markham silt loam, 2 to 6 percent slo				NWI classifica		
Are climatic / hydrologic conditions on the site typical for this t			√ No [
Are Vegetation, Soil, or Hydrology sig				Normal Circumstances" p	· -	√ No
Are Vegetation , Soil , or Hydrology , and	-			eded, explain any answer		<u> </u>
SUMMARY OF FINDINGS – Attach site map si			•		,	eatures. etc.
Hydrophytic Vegetation Present? Yes No			3	,	,	, , , , ,
Hydric Soil Present? Yes V No	$\overline{}$	ls th	e Sampled	Area	7 🔽	
Wetland Hydrology Present? Yes No		with	in a Wetlan	d? Yes	No √	_
Remarks:						
Upland point located on the south side of 109th Avenue a	and east o	of I-65.				
VEGETATION – Use scientific names of plants.						
20 foot	Absolute	Dominant	Indicator	Dominance Test works	sheet:	
	% Cover	Species?	<u>Status</u>	Number of Dominant Sp		
1				That Are OBL, FACW, o	or FAC:	(A)
2				Total Number of Domina	.)	(5)
3				Species Across All Strat	ta:	(B)
4				Percent of Dominant Sp		%
J		= Total Co		That Are OBL, FACW, o	or FAC:	(A/B)
Sapling/Shrub Stratum (Plot size: 15 feet)		10141 00		Prevalence Index work	ksheet:	
1				Total % Cover of:	Multip	ly by:
2				OBL species	x 1 =	
3				FACW species	x 2 =	
4				FAC species 40	x 3 =1	
5				FACU species 50	x 4 = 20 x 5 = 5	00
Herb Stratum (Plot size: 5 feet)		= Total Co	ver			70
1. Poa pratensis	40	Χ	FAC	Column Totals:100_	(A)	(B)
2. Festuca rubra	15	X	FACU	Prevalence Index	= B/A =3.70	0
3. Trifolium pratense	15	<u>X</u>	FACU	Hydrophytic Vegetatio	n Indicators:	
4. Medicago lupulina	10		FACU	1 - Rapid Test for H	lydrophytic Vege	tation
5. Daucus carota	10		UPL	2 - Dominance Test		
6. Taraxum lanceolata	10		FACU_	3 - Prevalence Inde		
7				4 - Morphological A	اdaptations' (Pro، s or on a separate	
8				Problematic Hydron		
9					,,,, and v ogetamen	(=14,0)
10	100			¹ Indicators of hydric soil	and wetland hyc	rology must
Woody Vine Stratum (Plot size: 30 feet)	100	= Total Co	ver	be present, unless distu		
1				Hydrophytic		
2				Vegetation		1
		= Total Co	/er	Present? Yes	sNo_	V
Remarks: (Include photo numbers here or on a separate sh						
This vegetative community did not pass the rapid test, do	minance	test, or pre	valence ind	lex. Hydrophytic vegetati	ion is not presen	t at this
community.						

SOIL								Sampling Point: SP18			
Profile Des	scription: (Describe	to the de	pth needed to docum	ent the	indicator	or confir	m the absence	of indicators.)			
Depth	Matrix			Feature							
(inches)	Color (moist)	%	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	_ <u>C</u>	<u>M</u>	SiCL				
		pletion, RM	1=Reduced Matrix, MS	=Maske	d Sand Gr	ains.		: PL=Pore Lining, M=Matrix.			
Hydric Soil	I Indicators:		_				Indicators	for Problematic Hydric Soils ³ :			
Black H Hydrog Stratifie 2 cm M	ol (A1) Epipedon (A2) Histic (A3) gen Sulfide (A4) ed Layers (A5) Muck (A10) ed Below Dark Surfa	ce (A11)	Sandy R Stripped Loamy M	ledox (Si Matrix (Mucky Mi Bleyed M d Matrix	S6) ineral (F1) latrix (F2) (F3)		Dark S Iron-Ma	Prairie Redox (A16) surface (S7) anganese Masses (F12) hallow Dark Surface (TF12) (Explain in Remarks)			
	Dark Surface (A12)	· · · · · /	=		urface (F7))	3Indicators	of hydrophytic vegetation and			
	Mucky Mineral (S1)		Redox D			,		d hydrology must be present,			
	lucky Peat or Peat (S3)			(, ,)		unless disturbed or problematic.				
	Layer (if observed	-									
Type:	nches):						Hydric Soil	Present? Yes No No			
Remarks:											
	ibited Depleted Belo	w Dark Su	rface (A11). SP18 ext	hibited h	ydric soils						
HYDROLO											
Wetland Hy	ydrology Indicators	:									
Primary Ind	licators (minimum of	one is requ	iired; check all that ap	ply)			<u>Seconda</u>	ary Indicators (minimum of two required			
Surface	e Water (A1)		Water-Stair	ned Lea	ves (B9)		Surfa	ace Soil Cracks (B6)			
│ <u>□</u> High W	/ater Table (A2)		Aquatic Fa	una (B13	3)		L Drai	nage Patterns (B10)			
Saturat	tion (A3)		True Aquat	tic Plants	s (B14)	☐ Dry-	Season Water Table (C2)				
	Marks (B1)		Hydrogen S	☐ Cray	yfish Burrows (C8)						
_			Outdined D	hizoenh	eres on Liv	ina Roots	s (C3) Satu	ration Visible on Aerial Imagery (C9)			
Water I	ent Deposits (B2)		Uxidized R	ilizospili	SIGS OII LIV	ing root	· (**) = ***	ration visible on Aeriai imagery (Ca)			
Water I	ent Deposits (B2) eposits (B3)		Presence of			•	· · —	nted or Stressed Plants (D1)			
Water I Sedime	,		_	of Reduc	ed Iron (C	4)	Stun				
Water I Sedime Drift De	eposits (B3)		Presence of	of Reduc	ed Iron (C4 tion in Tille	4)	Stun	nted or Stressed Plants (D1)			
Water I Sedime Drift De Algal M	eposits (B3) Mat or Crust (B4)	Imagery (E	Presence of Recent Iron Thin Muck	of Reduc n Reduct Surface	ed Iron (Cation in Tille (C7)	4)	Stun	nted or Stressed Plants (D1) morphic Position (D2)			

Yes ____ No ___ Depth (inches): ___

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

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

Yes ____ No ___ Depth (inches): ____

No Depth (inches): ___

Field Observations:

Surface Water Present?

Water Table Present?
Saturation Present?

(includes capillary fringe)

US Army Corps of Engineers

Remarks:

Wetland Hydrology Present? Yes

Midwest Region - Version 2.0

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: I-65 at 109th Avenue		City/Co	ounty:	Crown Po	oint/Lake	Sampling Date:	5/22/2019
Applicant/Owner: INDOT					State: IN		
	(Sectio	n, Tov	wnship, Rai	nge: S 3, T 34 N, R 8 W	v	
					(concave, convex, none):		
	ι						84
Soil Map Unit Name: Elliott silt loam, 0 to 2 percent slopes					NWI classific		
Are climatic / hydrologic conditions on the site typical for this		ar? Ye	es 🔽	/ No			
	nificantly o				Normal Circumstances"		√ No
Are Vegetation, Soil, or Hydrology na					eeded, explain any answe		
SUMMARY OF FINDINGS – Attach site map s				,		,	eatures, et
Hydrophytic Vegetation Present? Yes ✓ No							
Hydric Soil Present? Yes No				e Sampled	Area	7 🗀	1
Wetland Hydrology Present? Yes ✓ No			withi	n a Wetlar	nd? Yes <u></u> ✓	No	<u> </u>
Remarks:			_				
Wetland point located on the north side of 109th Avenue	and east	of I-65	Ο.				
VEGETATION – Use scientific names of plants.							
20 to ot	Absolute			Indicator	Dominance Test work		
1	% Cover		ies?	Status	Number of Dominant S That Are OBL, FACW,		(A)
2							(',
3					Total Number of Domin Species Across All Stra		(B)
4					Percent of Dominant S	necies 4.c	200/
5					That Are OBL, FACW,		00% (A/B)
Sapling/Shrub Stratum (Plot size: 15 feet)		= Tota	al Cov	er	Prevalence Index wor	ksheet:	
1					Total % Cover of:	Multip	ply by:
2					OBL species10_	x 1 = <u>1</u>	0
3					FACW species		
4					FAC species 80	x 3 =2	
5					FACU species10_	x 4 =4	
Herb Stratum (Plot size: 5 feet)		= Tota	al Cov	er	UPL species Column Totals: 100	x 5 = (A)	200
1. Poa pratensis	80	Х		FAC	Column Totals	(A)	290 (B)
2. Schedonorus arundinaceus	10			FACU	Prevalence Index	c = B/A =2.9	90
3. Juncus effusus				OBL	Hydrophytic Vegetation		
4					1 - Rapid Test for I		etation
5					2 - Dominance Tes		
6					✓ 3 - Prevalence Ind		
7					4 - Morphological A	Adaptations" (Pro	
8					Problematic Hydro	phytic Vegetation	n¹ (Explain)
9							
10	100	 = Tota	al Cov		¹ Indicators of hydric so		
Woody Vine Stratum (Plot size: 30 feet)		1010	001	01	be present, unless distr	urbed or problem	atic.
1					Hydrophytic		
2					Vegetation Present? Ye	s No	
Pomarke: (Include photo numbers have as an acceptable		= Tota	al Cov	er			
Remarks: (Include photo numbers here or on a separate shifting This vegetative community passed the dominance test at		anco i	ndev	Hydrophyt	tic vegetation is present	at this communi	tv
This vegetative community passed the dominance test at	nu prevale	nice II	iucx.	ι ιγαιοριιγί	uo vegetation is present	at uno commulii	ty.

SOIL								Sampling Point: SP19			
	scription: (Describe	to the de	-			or confir	m the absence of	indicators.)			
Depth (inches) 0-6	Color (moist) Gley 5GY 4/1	80	Color (moist)	ox Feature %	Type ¹		Texture SiC	Remarks			
	10 YR 2/1		7.5 YR 5/8		C	M					
Hydric Soil Histoso Histic E Black H Hydrog	Concentration, D=Deplications: I Indicators: I (A1) Epipedon (A2) Histic (A3) Igen Sulfide (A4) Ed Layers (A5)	oletion, RI	Sandy Sandy Strippe Loamy	Gleyed M Redox (S d Matrix (Mucky M	atrix (S4) 5)		Indicators for Coast Pra	ganese Masses (F12) Illow Dark Surface (TF12)			
2 cm M Deplete Thick D Sandy 5 cm M	fuck (A10) ed Below Dark Surfac Dark Surface (A12) Mucky Mineral (S1) fucky Peat or Peat (S	3)	Deplete Redox Deplete	ed Matrix Dark Sur	(F3) ace (F6) urface (F7)	Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.				
Type: _C	trictive Layer (if observed): ype: _Gravel lepth (inches): _6 inches						Hydric Soil Pr	resent? Yes No No			
Remarks: SP19 exhi	bited Loamy Gleyed	Matrix (F	2). SP19 exhibited h	ydric soils	S.		•				
HYDROLO	DGY										
	ydrology Indicators		uivadi ahaali allittat -				Coconde	Indicators (minimum of tors			
	<u>licators (minimum of o</u> e Water (A1)	one is led	uired, check air that a		/es (R9)			Indicators (minimum of two require Soil Cracks (B6)			

HYDROLOGY	
Wetland Hydrology Indicators:	
Primary Indicators (minimum of one is required; check all that apply)	Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9)	Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13)	Drainage Patterns (B10)
Saturation (A3) True Aquatic Plants (B14)	Dry-Season Water Table (C2)
☐ Water Marks (B1) ☐ Hydrogen Sulfide Odor (C1)	Crayfish Burrows (C8)
Sediment Deposits (B2)	s (C3) 🖳 Saturation Visible on Aerial Imagery (C9)
Drift Deposits (B3) Presence of Reduced Iron (C4)	Stunted or Stressed Plants (D1)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C	Geomorphic Position (D2)
Iron Deposits (B5)	FAC-Neutral Test (D5)
Inundation Visible on Aerial Imagery (B7) Gauge or Well Data (D9)	
Sparsely Vegetated Concave Surface (B8)	
Field Observations:	
Surface Water Present? Yes No Depth (inches):4 inches	
Water Table Present? Yes No Depth (inches): _At surface	
	tland Hydrology Present? Yes 🔽 No 📗 📗
(includes capillary fringe)) if a verile black
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	d hydrology was present at SP19.

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site:I-65 at 109th Avenue		City/C	ounty:	Crown Po	oint/Lake	Sampling Da	te: 5/22/20	19
Applicant/Owner: INDOT		-			State: IN			
					nge: S 3, T 34 N, R 8 W			
					(concave, convex, none):			
					(consuve, convex, none).		S 84	
Soil Map Unit Name: Elliott silt loam, 0 to 2 percent slopes		Long.			NWI classific			
		0 V	Г.	/ N= [
Are climatic / hydrologic conditions on the site typical for this								
	gnificantly				Normal Circumstances"			·
Are Vegetation, Soil, or Hydrology na	aturally pro	blema	atic?	(If ne	eded, explain any answe	rs in Remarks	.)	
SUMMARY OF FINDINGS – Attach site map s	showing	sam	pling	g point l	ocations, transects	, importan	t feature:	s, etc.
Hydrophytic Vegetation Present? Yes No								
Hydric Soil Present? Yes ✓ No				e Sampled		٦ ٦	/	
Wetland Hydrology Present? Yes No			withi	in a Wetlar	nd? Yes	No <u>V</u>		
Remarks:								
Upland point located on the north side of 109th Avenue	and east c	of I-65						
VEGETATION – Use scientific names of plants.								
Tree Stratum (Plot size: 30 feet)	Absolute % Cover			Indicator	Dominance Test work			
1			0100.	<u>Otatao</u>	Number of Dominant S That Are OBL, FACW,		1	(A)
2						. –		(/
3.					Total Number of Domin Species Across All Stra		2	(B)
4					'			(-)
5					Percent of Dominant S That Are OBL, FACW,		50%	(A/B)
15 feet		= Tot	al Cov	er				
Sapling/Shrub Stratum (Plot size: 15 feet)					Prevalence Index wor Total % Cover of:		ıltiply by:	
1						x1=		_
2 3		_			FACW species			
4					FAC species 40	x3=		_
5.					FACU species 85	x 4 =		_
56.4		= Tota	al Cov	er	UPL species	x 5 =		
Herb Stratum (Plot size: 5 feet)	45			E4011	Column Totals: 125	(A)	460	_ (B)
1. Festuca rubra		X		FACU	Donata a la des	- D/A -	3.68	
2. Poa pratensis Trifolium pratense	40 15	<u>X</u>		FACU	Prevalence Index Hydrophytic Vegetation			
Torovium officionale	10	_		FACU	1 - Rapid Test for I			
Madiana lunulina	10	_		FACU	2 - Dominance Tes		getation	
6. Plantago lanceolata	5			FACU	3 - Prevalence Inde			
7					4 - Morphological		Provide sup	porting
8					data in Remark	s or on a sepa	rate sheet)	
9					Problematic Hydro	phytic Vegetat	tion¹ (Explai	n)
10.								
20 foot	125	= Tota	al Cov	er	¹ Indicators of hydric soil be present, unless distri			nust
Woody Vine Stratum (Plot size: 30 feet)					po process, urnoce alex	and or probin		
1		_			Hydrophytic			
2			-10		Vegetation Present? Ye	s_LN	o ▼	
Remarks: (Include photo numbers here or on a separate s		= 10t	al Cov	er	<u> </u>		_ _	
This vegetative community did not pass the rapid test, d	,	test o	or prev	valence inc	dex. Hydrophytic vegetat	tion is not pre	sent at this	
community.		, '	. 6.0		, , 1090101	p. 0.		

SOIL	Sampling Point: _	SP20
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Profile Desc	cription: (Describe	to the dep	th needed to docur	nent the	indicator	or confin	m the absence of indi	cators.)
Depth	Matrix		Redo	x Feature				
(inches)	Color (moist)	%	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		M		
l ———								
l								
¹ Type: C=C	oncentration, D=Dep	letion RM=	Reduced Matrix M	S=Maske	d Sand Gr	ains	² I ocation: PI =P	Pore Lining, M=Matrix.
Hydric Soil		iotion, rtivi	rtoddood matrix, mi	o maone.	a cana ch	uiiio.		blematic Hydric Soils ³ :
Histosol	(A1)		☐ Sandy (Gleyed Ma	atrix (S4)		Coast Prairie	•
_	pipedon (A2)		_	Redox (S5			Dark Surface	
	istic (A3)			d Matrix (S			Iron-Mangane	ese Masses (F12)
☐ Hydroge	en Sulfide (A4)		Loamy	Mucky Mi	neral (F1)		Very Shallow	Dark Surface (TF12)
_	d Layers (A5)		Loamy	Gleyed M	atrix (F2)		Other (Explain	n in Remarks)
_	uck (A10)		= '	d Matrix (,			
	d Below Dark Surfac	e (A11)	=	Dark Surfa	, ,		3	
	ark Surface (A12)				urface (F7))	•	rophytic vegetation and
	Mucky Mineral (S1) ucky Peat or Peat (S3	3)	<u></u> Redox i	Depressio	ns (F8)			logy must be present, ed or problematic.
	Layer (if observed):						unless disturb	ed of problematic.
Type: G								
	ches): 9 inches						Hydric Soil Preser	nt? Yes No
	cnes):							
Remarks:								
SP20 exhib	oited Redox Dark Su	rface (F6).	SP20 exhibited hyd	dric soils.				
HYDROLO	GY							
Wetland Hy	drology Indicators:							
Primary India	cators (minimum of o	ne is requi	red; check all that ap	ply)			Secondary Indic	cators (minimum of two required)
Surface	Water (A1)		■ Water-Sta	ined Leav	res (B9)		Surface So	il Cracks (B6)
│ <u>□</u> High Wa	ater Table (A2)		Aquatic Fa	auna (B13	5)		Drainage P	atterns (B10)
☐ Saturati	on (A3)		True Aqua	itic Plants	(B14)		☐ Dry-Seasor	Water Table (C2)
☐ Water M	larks (B1)		Hydrogen	Sulfide O	dor (C1)		Crayfish Bu	rrows (C8)
Sedime	nt Deposits (B2)		Oxidized F	Rhizosphe	res on Liv	ing Roots	(C3) 🔲 Saturation '	Visible on Aerial Imagery (C9)
Drift De	posits (B3)		Presence	of Reduce	ed Iron (C4	1)	Stunted or	Stressed Plants (D1)
Algal Ma	at or Crust (B4)		Recent Iro	n Reduct	ion in Tille	d Soils (C	6) 🔲 Geomorphi	c Position (D2)
Iron Dep	posits (B5)		Thin Muck	Surface	(C7)		FAC-Neutra	al Test (D5)
<u> </u> Inundati	on Visible on Aerial I	magery (B	7) 🔲 Gauge or	Well Data	(D9)			
Sparsely	y Vegetated Concave	e Surface (l	38) 🔲 Other (Exp	olain in Re	emarks)			
Field Obser	vations:							
Surface Wat	er Present? Y	es 🔲 I	No 🔽 Depth (in	ches):		_		
Water Table	Present? Y	es _	No Depth (in	ches):		_		
Saturation P	resent? Y	es 🔲	No Depth (in	ches):		_ Wet	land Hydrology Prese	ent? Yes No ✓
(includes ca	pillary fringe)							
Describe Re	corded Data (stream	gauge, mo	onitoring well, aerial	photos, pr	evious ins	pections)	, if available:	
Remarks:								
SP20 did n	ot exhibit any wetlar	nd hydrolog	y indicators. Wetla	nd hydrol	ogy was n	ot presen	nt at SP20.	
I								

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 109**th **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: <u>Final Waters Report 1801500.pdf</u>. 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 Services100 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

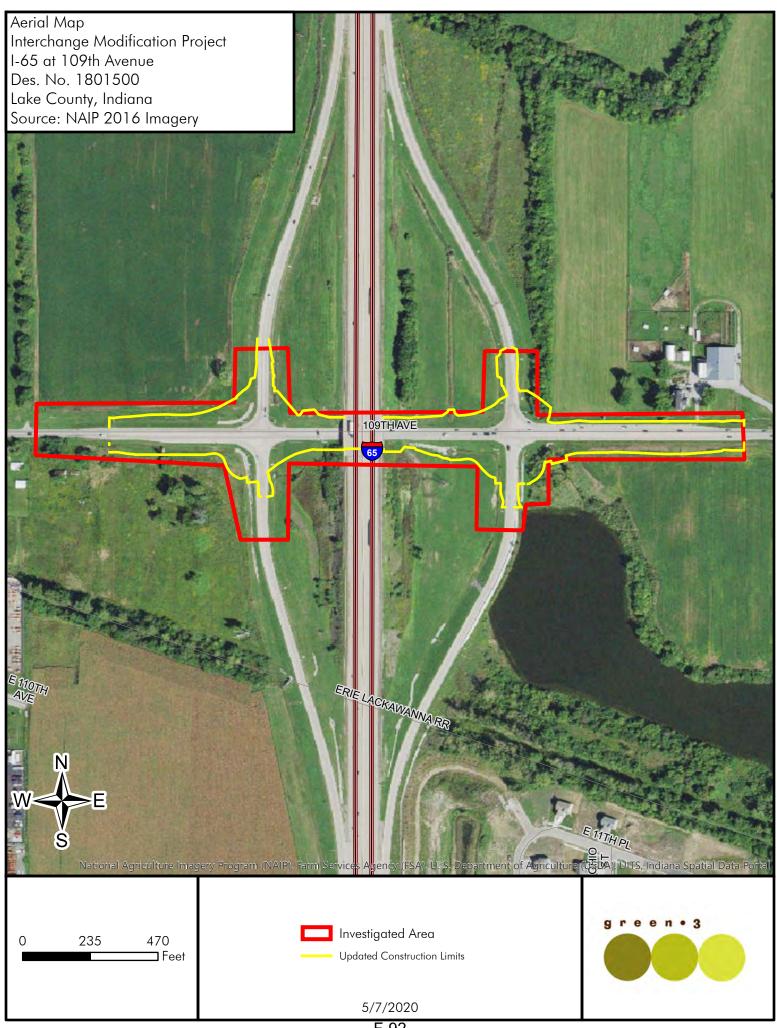
Date: May 13, 2020

Supporting Documentation:

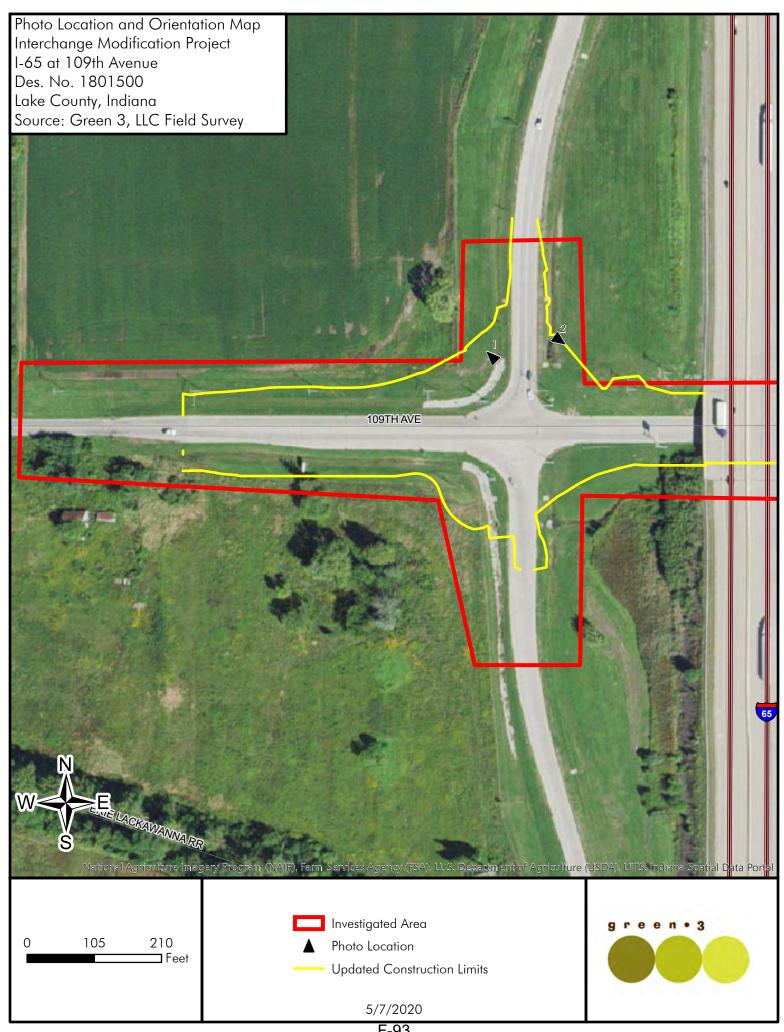
Christian Radcliff

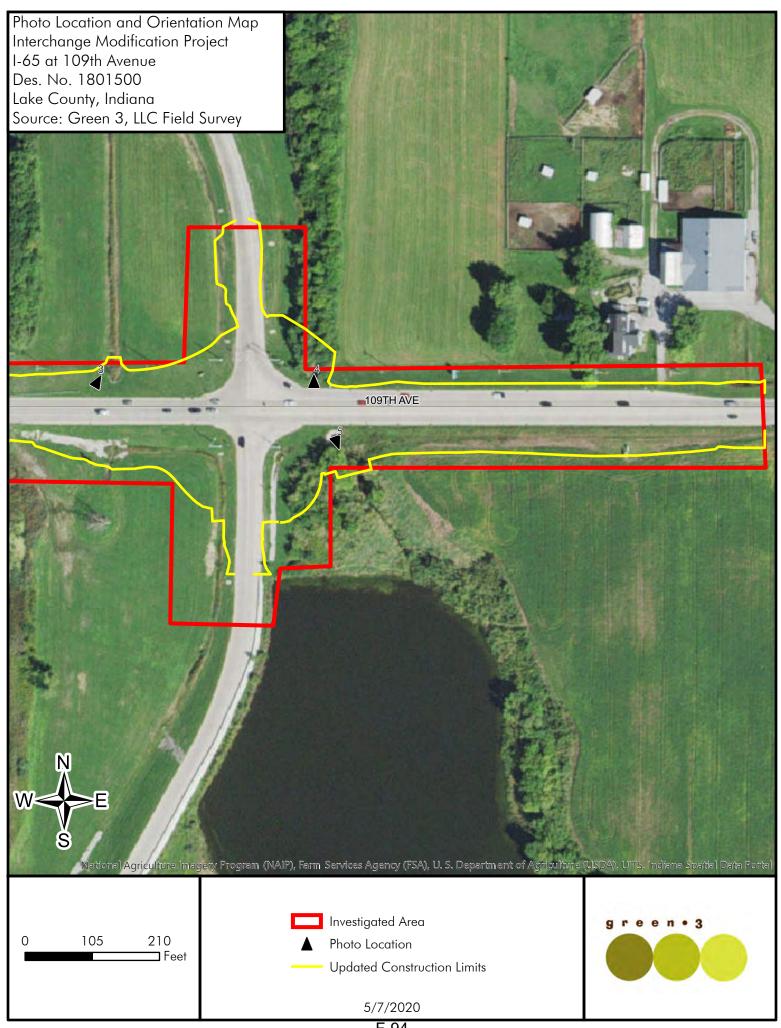
Aerial Map

• Photo Location and Orientation Map



F-92





F-94



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 < indotcoordinator 4@indot.IN.gov>

Sent: Thursday, May 14, 2020 1:19 PM **To:** Rehder, Crystal < CRehder@indot.IN.gov>

Cc: Bales, Ronald <<u>rbales@indot.IN.gov</u>>; INDOT Coordinator 4 <<u>indotcoordinator4@indot.IN.gov</u>>; Ritzler, Julie <<u>JRitzler@indot.IN.gov</u>>; Miller, Jessica S <<u>JesMiller@indot.IN.gov</u>>; Krueckeberg, John <<u>JKrueckeberg@indot.IN.gov</u>>

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.



August 20, 2019

Re: Lake County Tax Parcel

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 State Preservation and Local Initiated Projects FY 2020 - 2024

SPONSOR	CONTR ACT#/	STIP NAME	ROUTE	WORK TYPE	LOCATION	DISTRICT	MILES	FEDERAL CATEGORY	Estimated Cost left to	PROGRAM	PHASE	FEDERAL	MATCH	2020	2021	2022	2023	2024
	LEAD DES								Complete Project*									
ndiana Department f 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			
ndiana Department	41277 /	Init.	VA VARI	ITS Traffic		LaPorte	0	NHPP		Statewide	CN	\$292,500.00	\$32,500.00	\$325,000.00				
f Transportation	1800751			Management Systems	ion/DMS Replacements in Northwest IN ATMS area - FY					Construction								
ndiana Department f Transportation	41341 / 1801500	A 05		Interchange Modification	over 109th Street, 1.86mi N of US 231	LaPorte	0	NHPP	\$3,969,394.00	Toll Lease Amendment	PE	\$450,000.00	\$50,000.00	\$500,000.00				
										Proceeds Toll Lease	RW	\$166,500.00	\$18,500.00	\$185,000.00				
										Amendment Proceeds								
										Toll Lease Amendment	CN	\$2,700,000.00	\$300,000.00		\$3,000,000.00			
Comments:Please an	nend all phas	ses into th	e STIP. NII	RPC approved resolution	19-22 dated 8/15/19.					Proceeds								
ndiana Department	41429 / 1703001			Bridge Replacement, Concrete		LaPorte	0	STPBG		Bridge Construction	CN	\$1,079,189.60	\$269,797.40			\$20,000.00	\$1,328,987.00	
f Transportation	1703001			Concrete	3 W 05 41						PE	\$74,432.00	\$18,608.00					
										Bridge Consulting	PE	\$74,432.00	\$10,000.00	\$93,040.00				
										Bridge ROW	RW	\$28,000.00	\$7,000.00			\$35,000.00		
ndiana Department	41430 /	Init.	US 30	Bridge Replacement,	Us 30@Dyer Ditch, 01.10 W	LaPorte	0	NHPP		Bridge	CN	\$1,021,475.20	\$255,368.80			\$20,000.00	\$1,256,844.00	
f Transportation	1703004			Concrete	US 41					Construction								
										Bridge Consulting	PE	\$70,400.00	\$17,600.00	\$88,000.00				
										Bridge ROW	RW	\$32,000.00	\$8,000.00			\$40,000.00		
ndiana Department	41439 /	Init.		Bridge Replacement,		LaPorte	0	NHPP		Bridge	CN	\$6,066,704.00	\$1,516,676.00			\$35,000.00	\$7,548,380.00	
f Transportation	1800257			Concrete	W SR 51					Construction Bridge Consulting	PE	\$422,400.00	\$105,600.00	\$528,000.00				
										J. age consuming	-	ψ : <u>2</u> =, :σσ:σσ	\$ 100,000.00	\$328,000.00				
										Bridge ROW	RW	\$28,000.00	\$7,000.00			\$35,000.00		
diana Department Transportation	41440 / 1703043	Init.		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		

H-1

8/3/2020 *Project Info*



Project Overview Funding History Amendment History

<< Go Back

Interchange Modification (1801500)

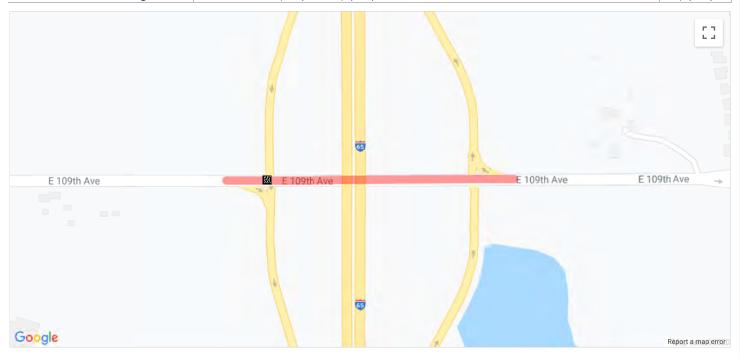
Des Number	1801500	Amendment	20-08.2 ADMIN MOD	Exempt Category	Non-Exempt	Est Total Project Cost	\$3,640,500
Lead Agency	INDOT	Contact (ERC)	Julie Ritzler 2193257497			County	Lake
Project Type	Interchange Modification	Letting Date		Functional Classification	Interstate	Bike/Ped Component(s)	Yes 02%

Title Interchange Modification

Primary Interchange: , Secondary Interchange: Limits

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 Description 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



н∩мғ AROUT NIRPO HOT TOPICS (NEWS) TRANSPORTATION **HUMAN & ECONOMIC RESOURCES**

FV/FNTS GROWTH & CONSERVATION STEWARDSHIP & GOVERNANCE STAFF EMAIL STAFF INTRANET STAFF PORTAL & CONDITIONS

FNI/IRONMENT & GREEN INFRASTRICTURE

TERMS

Des 1801500 CE-4 Appendix I Additional Studies

Des 1801500 LWCF Properties

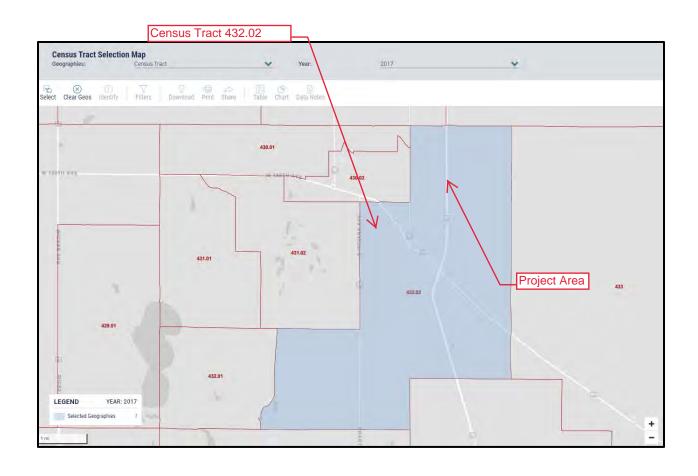
	D C3 1	901200 FA	· · · · · · · · · · · · · · · · · ·
1800005	1800005	Lake	Dowling Park
1800011	1800011	Lake	Tolleston Park
1800012	1800012	Lake	Washington Park
1800040	1800040	Lake	Homestead Park
1800055	1800055	Lake	Sheppard Memorial Park
1800059	1800059	Lake	Cheever Park
1800062	1800062	Lake	Leroy 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

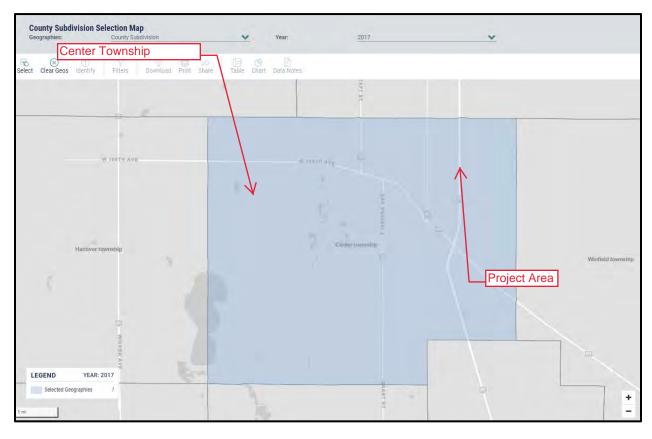
1800464	1800464	Lake	Festival Park & Lakefront Park		
1800473	1800473	Lake	Oak Ridge Prairie Co. Park		
1800488	1800488	Lake	Marquette Park		
1800489	1800489	Lake	Festival Park & Lakefront Park		
1800522	1800522	Lake	Pavese Park		
1800523	1800523	Lake	Lakewood Park		
1800523.5	1800523.5	Lake	River Drive 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/Salam onie 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.

EI	Environmental Justice Analysis for Crown Point Interstate Access (Des 180° coc		
	LOW INCOME	Center Township, Lake County, Indiana	Census Tract 432.02, Lake County, Indiana
B 17001001	Population for whom poverty status is determined: Total	32,259	8,360
B 17001001	Population for whom poverty status is determined. Total Population for whom poverty status is determined: Income in past 12 months below poverty	2,346	,
Б 17001002	Population for whom poverty status is determined. Income in past 12 months below poverty	2,340	407
	Percent Low-Income	7.3%	5.6%
	125 Percent of COC	9.1%	AC<125% COC
	Potential Low-Income EJ Impact?		No
	MINODITY	-	-
B 03002001	MINORITY Total population: Total	33,015	8,669
B 03002001	Total population: Not Hispanic or Latino	30,824	7,775
B 03002002	Total population: Not Hispanic or Latino; White alone	29,387	7,099
B 03002004	Total population: Not Hispanic or Latino; White diship	479	
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	
B 03002009	Total population: Not Hispanic or Latino; Two or more races	380	
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/Minerity (D007004 D007002)	2 620	4 570
	Number Non-White/Minority (P007001-P007003) Percent Non-White/Minority	3,628 11.0%	
	125 Percent of COC		18.1% AC>125% COC
	120 Felcell Of COC	13.1%	JAC/123% CUC





	Center township, Lake County, Indiana		Census Tract 432.02, Lake County, Indiana	
Label	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

	Census Tract 432.02, Lake County, Indiana	
abel	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

	Center township, Lake County, Indiana	
Label	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:



Prepared For:

Indiana Department of Transportation LaPorte District

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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				1	20		Summa	2044				
		AM		I	PM		AM	-	PM	A	AM]	PM	
		LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	LOS	Density	
	Merge from US 231	В	12.8	В	11.2	В	13.0	В	11.4	В	13.7	В	12.0	
	Mainline South of 109 th	A	10.0	A	9.4	A	10.2	A	9.6	A	10.8	A	10.1	
p	Diverge to 109 th	A	8.8	A	7.9	A	9.1	A	8.1	A	9.8	A	8.8	
Northbound	Mainline between gores	A	9.3	A	8.9	A	9.5	A	9.0	A	10.0	A	9.6	
No	Merge from 109 th	В	18.4	В	16.1	В	18.8	В	16.4	C	20.1	В	17.4	
	Mainline North of 109 th	В	14.3	В	13.6	В	14.6	В	13.8	В	15.5	В	14.6	
	Diverge to US 30	В	14.6	В	13.7	В	14.9	В	13.9	В	15.9	В	14.9	
	Merge from US 30	В	11.3	С	20.3	В	11.5	С	20.7	В	12.2	С	22.1	
	Mainline North of 109 th	A	10.4	С	18.1	A	10.6	С	18.4	В	11.2	С	19.6	
р	Diverge to 109 th	В	10.1	С	20.6	В	10.3	С	21.1	В	11.3	С	22.8	
Southbound	Mainline between gores	A	7.9	В	12.9	A	8.1	В	13.2	A	8.5	В	14.0	
So	Merge from 109 th	A	9.5	В	13.2	A	9.6	В	13.5	В	10.2	В	14.3	
	Mainline South of 109 th	A	8.3	В	11.9	A	8.4	В	12.5	A	8.9	В	13.3	
	Diverge to US 231	A	6.9	В	12.7	A	7.1	В	13.0	A	7.8	В	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

			1 abit	2. 2010 NO-	Bulla LOS Su	illilliai y		
Intersect	ion		1	AM Peak Hou	r	F	PM Peak Hour	
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
	Ov	erall	В	20		С	25	
	EB	Lt	С	28	205	С	22	206
		Th	В	11	113	С	29	676
duı	WB	Th	D	39	284	С	28	285
Ra		Rt	A	06	62	A	04	39
I-65 NB Ramp	NB	Lt	В	10	5.0	C	22	20
[29		Th	В	19	56	С	23	39
Ť		Rt	A	01	0	A	01	0
	Overall		С	22		D	38	
	EB	Th	D	39	390	D	53	976
Q.		Rt	A	01	0	A	04	19
am.j	WB	Lt	A	10	16	В	14	24
SB Ramp		Th	В	18	172	В	17	272
	SB	Lt	В	19	91	E	62	666
I-65		Th						
- Rt			A	05	64	В	15	231
			Synchro resu	ılts on pages (C-136 to C-147	7 of Appendix		

Table 3: 2024 No-Build LOS Summary

Intersect	ion			AM Peak Hour			PM Peak Hour	
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
	Ove	erall	С	23		С	24	
	EB	Lt	D	37	202	C	26	235
		Th	В	11	123	C	27	724
I-65 NB Ramp	WB	Th	D	40	321	C	28	326
Ra		Rt	A	06	64	A	04	41
E E	NB	Lt	С	22	6.4	С	26	42
55]	Th		C	22	64	C	26	43
Ť		Rt	A	01	0	A	02	6
	Overall		С	26		D	46	
	EB	Th	D	39	408	E	56	1046
۵		Rt	A	01	0	A	04	21
am]	WB	Lt	В	19	17	В	15	27
SB Ramp		Th	С	31	229	В	17	318
SE	SB	Lt	В	19	99	F	85	731
-65	Th							
·I		Rt	A	07	93	В	20	291
			Synchro resu	lts on pages C-	-148 to C-159	of Appendix		

Table 4: 2044 No-Build LOS Summary

Intersect	ion			AM Peak Hour			PM Peak Hour	,
			LOS	Delay (s)	Queue (ft)	LOS	Delay (s)	Queue (ft)
	Ov	erall	С	27		D	40	
	EB	Lt	D	52	333	D	38	356
		Th	A	09	123	E	54	1126
duu	WB	Th	D	46	454	С	32	515
I-65 NB Ramp		Rt	A	07	89	A	04	45
l <u>B</u>	NB	Lt	С	27	0.1	D	27	50
[59]		Th	C	27	81	D	37	59
Ť		Rt	A	02	5	A	07	266
	Overall		С	22		F	89	
	EB	Th	D	39	408	F	128	1235
۵		Rt	A	01	0	A	05	27
amj	WB	Lt	A	10	17	В	17	34
SB Ramp		Th	В	19	194	С	23	480
SE	SB	Lt	В	19	99	F	147	977
-65	S Th							
·I		Rt	A	07	93	С	35	503
				Synchro resu	ılts 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

Intersec	tion				2024 (5-lane)					2044 (5-lane)		
			AM P	eak Hour	•	PM Pe	eak Hour	•	AM P	eak Hour		PM Peak Hour		
			LOS	Delay	Queu	LOS	Delay	Queu	LOS	Delay	Queue	LOS	Delay	Queue
				(s)	e		(s)	e		(s)	(ft)		(s)	(ft)
					(ft)			(ft)						
	Ove	rall	В	17		В	18		В	19		В	18	
	EB	Lt	D	39	218	C	32	244	D	37	290	C	26	279
		Th	A	09	52	В	13	249	В	12	86	В	12	242
du	WB	Th	В	19	104	С	22	132	С	24	151	С	29	188
I-65 NB Ramp		Rt	A	06	61	A	06	43	A	08	77	A	06	51
B	NB	Lt	В	17	52	В	18	33	В	20	64	С	21	41
55 1		Th												
I-(Rt	A	01	0	A	01	0	A	01	0	A	02	7
	Over	all	В	16		В	19			В	20	В	19	
	EB	Th	С	25	149	С	26	239	С	26	162	С	27	273
		Rt	A	01	0	A	01	3	A	01	0	A	02	12
SB Ramp	WB	Lt	В	12	18	A	24	30	С	21	28	A	09	19
Ra		Th	В	17	83	В	28	169	С	27	133	В	12	104
SB	SB	Lt	В	14	49	В	19	180	В	18	66	С	24	260
I-65		Th												
-I		Rt	A	03	30	A	04	42	A	55	40	A	09	84
			Synch	ro result	s on pag	ges C-1	73 to C	-184 of	Synch	ro result	s on pag	ges C-1	85 to C	-196 of
			Apper	ndix					Appen	ndix				

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

Intersect	ion		2024 Single Lane Roundabout							2024 Sir	igle Lane	with Sli	p Lanes	
			Al	M Peak H	our	PN	M Peak H	our	AN	1 Peak H	our	PN	1 Peak H	our
			LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue
			LOS	(s)	(ft)	LOS	(s)	(ft)	LOS	(s)	(ft)	LOS	(s)	(ft)
	Overall		С	27		D	38		A	06		C	36	
	EB	Lt	В	11	0	F	55	1056	В	11	0	F	55	1056
ď		Th	A	04	0	F	48	1056	A	04	0	F	48	1056
am	WB	Th	F	43	1023	В	12	287	A	06	71	A	06	94
I-65 NB Ramp		Rt	F	43	1023	В	12	287	A	04	0	A	04	0
岩	NB	Lt	В	16	29	D	54	132	В	16	29	D	54	132
65		Th	A	09	29	D	45	132	A	09	29	D	45	132
Ţ		Rt	A	10	29	D	46	132	A	10	29	D	46	132
	Overa	all	A	07		F	93		A	05		В	15	
	EB	Th	A	06	126	F	106	1843	A	05	85	Е	30	708
0.		Rt	A	07	126	F	107	1843	A	04	85	A	04	0
Ramp	WB	Lt	В	11	0	В	10	0	В	11	0	В	10	0
22		Th	A	044	0	A	04	0	A	04	0	A	04	0
SB	SB	Lt	В	17	143	F	127	2244	В	13	20	В	14	103
I-65		Th	A	10	143	F	121	2244	A	07	20	A	08	103
-i	Rt A 10 143 F					F	121	2244	A	04	0	A	04	0
			Round	about Lay	yout shee	ts are or	n pages (C-198 to	Rounda	bout Lay	out sheets	are on p	ages C-2	05 to C-
			C-200.	Sidra Re	sults are	on pages	s C-201 to	o C-204.	207. Si	dra Resul	ts are on	pages C-2	208 to C-	211.

Table 7: Single Lane Roundabout LOS Summary 2044

Intersect	ion		2044 Single Lane Roundabout							2044 Sir	ngle Land	e with Sl	ip Lanes	
			AM Pe	eak Hour		PM Pe	ak Hour		AM Pea	ık Hour		PM Pea	k Hour	
			LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue
				(s)	(ft)		(s)	(ft)		(s)	(ft)		(s)	(ft)
Overall This Option is being dismissed as a Viable							Viable	A	06		Е	63		
	EB	Lt	Altern	ative due	to delays	in the 2	024 Build	d Year.	В	11	0	F	95	2226
d		Th							A	04	0	F	89	2226
I-65 NB Ramp	WB	Th							A	06	80	A	06	111
3 R		Rt							A	04	0	A	04	0
岂	NB	Lt							В	16	32	C	109	221
65		Th							A	09	32	C	100	221
·I		Rt							A	10	0	C	101	221
	Overa	all	This (Option is	s being	dismiss	ed as a	Viable	A	05		С	35	
	EB	Th	Altern	ative due	to delays	in the 2	024 Build	d Year.	A	05	85	F	93	1698
0.		Rt							A	04	0	A	04	0
SB Ramp	WB	Lt							В	11	0	В	10	0
R		Th							A	04	0	A	04	0
	SB	Lt							В	14	27	В	16	167
I-65		Th							A	07	27	В	10	167
Ţ		Rt							A	04	0	A	04	0
							Rounda	bout Lay	out sheets	s are on p	ages C-2	05 to C-		
								207. Si	Roundabout Layout sheets are on pages C-205 to C-207. Sidra Results are on pages C-212 to C-215.				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

Inters	ection		2024 Two Lane Eastbound Only Roundabout									44 Two	Lane	Eastbo	und	Only R	Rounda	bout
			AM Pe	ak Hou	ır		PM l	Peak H	our	_	AM	Peak I	Hour		PM	Peak F	Iour	
			SOT	Delay (s)	v/c ratio	Queue	SOT	Delay (s)	v/c ratio	Queue (ft)	SOT	Delay (s)	v/c ratio	Queue (ft)	SOT	Delay (s)	v/c ratio	Queue (ft)
	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	Α	06	0.42	71	A	06	0.44	80	A	07	0.49	90
dui		Rt	A	04	0.31	0	Α	04	0.13	0	A	04	0.40	0	A	04	0.16	0
I-65 NB Ramp	NB	Lt	В	13	0.19	18	В	15	0.16	14	В	13	0.19	18	В	16	0.17	17
Z		Th	A	06	0.19	18	A	08	0.16	14	A	06	0.19	18	A	09	0.17	17
59-I		Rt	A	08	0.19	18	A	09	0.16	14	A	07	0.19	18	A	09	0.17	17
	Overa	all	A	06			A				Α	06			В	12		
	EB	Th	A	06	0.26	41	A	10	0.58	148	Α	06	0.27	46	В	17	0.72	270
ο.		Rt	A	06	0.26	41	A	10	0.58	148	A	06	0.27	46	В	16	0.72	270
SB Ramp	WB	Lt	В	11	0.49	0	A	10	0.47	0	В	11	0.57	0	A	10	0.55	0
- R		Th	A	04	0.49	0	A	04	0.47	0	A	04	0.57	0	Α	04	0.55	0
	SB	Lt	В	13	0.14	20	В	14	0.52	103	В	14	0.17	28	В	17	0.63	183
I-65		Th	A	07	0.14	20	A	08	0.52	103	A	08	0.17	28	В	11	0.63	183
1		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				20	024 Two	Lane	Rour	ıdabou	t		2024 Two Lane Roundabout with Slip Lanes						anes	
			AM Pe	ak Hou	ır		PM I	Peak H	our		AM	Peak I	Hour		PM	Peak F	Iour	
			SOT	Delay (s)	v/c ratio	Queue	SOT	Delay (s)	v/c ratio	Queue (ft)	SOT	Delay (s)	v/c ratio	Queue (ft)	SOT	Delay (s)	v/c ratio	Queue (ft)
	Overall			06			A	07			Α	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
dui		Rt*	A	04	0.48	66	A	06	0.35	41	A	04	0.31	0	A	04	0.13	0
I-65 NB Ramp	NB	Lt	В	13	0.07	6	В	16	0.08	7	В	13	0.07	6	В	16	0.08	7
Z		Th	A	06	0.11	11	A	08	0.07	6	A	06	0.11	11	A	08	0.07	6
59-I		Rt	A	08	0.11	11	A	08	0.07	6	A	07	0.11	11	A	08	0.07	6
	Overa	11	A	06			A	09			A	06			В	07		
	EB	Th	A	05	0.28	35	A	09	0.58	115	A	05	0.28	33	A	08	0.53	80
Q		Rt	A	06	0.28	35	A	09	0.58	115	A	06	0.28	34	A	08	0.53	80
am)	WB	Lt	В	11	0.21	0	A	10	0.21	0	В	11	0.21	0	A	10	0.21	0
SB Ramp		Th	A	05	0.21	0	Α	05	0.21	0	A	05	0.21	0	A	05	0.21	0
	SB	Lt	В	13	0.22	20	В	13	0.55	76	В	12	0.07	6	В	12	0.24	23
S9-I		Th	A	06	0.40	44	A	07	0.55	76	A	05	0.07	6	A	06	0.24	23
Rt 11 07 0.40 44 11 00 0.5						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				20	044 Two	Lane	Rour	ıdabou	ıt		2044 Two Lane Roundabout with Slip Land						anes	
			AM Pe	eak Hou	ır		PM I	Peak H	our		AM	Peak I	Hour		PM	Peak I	Iour	
			SOT	Delay (s)	v/c ratio	Queue	SOT	Delay (s)	v/c ratio	Queue (ft)	ros	Delay (s)	v/c ratio	Queue (ft)	SOT	Delay (s)	v/c ratio	Queue (ft)
	Ove	rall	A	06			A	06			A	06			A	06		
	EB	Lt	A	10	0.30	0	Α	10	0.61	0	A	10	0.30	0	A	10	0.61	0
		Th	A	05	0.27	0	Α	04	0.61	0	Α	05	0.27	0	Α	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
dui		Rt*	A	04	0.56	94	Α	06	0.41	53	A	04	0.40	0	A	04	0.16	0
I-65 NB Ramp	NB	Lt	В	13	0.07	7	В	16	0.09	9	В	13	0.07	7	В	16	0.09	9
Z		Th	A	06	0.11	10	Α	08	0.08	8	A	06	0.11	10	A	08	0.08	8
59-I		Rt	A	08	0.11	10	A	08	0.08	8	A	07	0.11	10	A	08	0.08	8
	Overa	ı11	A	06			Α	09			A	06			В	08		
	EB	Th	A	05	0.29	38	A	09	0.62	123	A	05	0.29	36	В	08	0.58	98
Q.		Rt	A	006	0.29	38	A	09	0.62	123	A	06	0.29	36	В	08	0.58	98
SB Ramp	WB	Lt	В	11	0.25	0	A	10	0.25	0	В	11	0.25	0	A	10	0.25	0
R.		Th	A	05	0.25	0	Α	05	0.25	0	A	05	0.25	0	A	05	0.25	0
SE	SB	Lt	В	13	0.23	21	В	14	0.62	98	В	12	0.08	7	В	12	0.29	28
59-I		Th	A	06	0.39	41	Α	08	0.62	98	A	05	0.08	7	В	06	0.29	28
İ	Kt 11 07 0.57 41 11 00 0.02 70							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 C-254. Synchro Results are on pages C-259 to 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 Pe	eak Hour		PM Pe	ak Hour		AM Pea	ak Hour		PM Pea	k Hour		
			LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue	LOS	Delay	Queue	
				(s)	(ft)		(s)	(ft)		(s)	(ft)		(s)	(ft)	
NB	Ove	rall	A	12		В	11		В	13		В	15		
Z	EB	Th	A	09	74	A	10	157	В	12	84	В	13	223	
d	WB	Th	В	17	76	В	16	84	В	16	94	С	21	10	
I-65 Ramp	NB	Lt	A	01	0	A	01	0	A	01	6	A	01	6	
I- R		Rt	A	01	0	A	06	16	A	01	0	A	09	28	
SB	Overa	all	A	08		В	13		A	09		В	15		
∞	EB	Th	В	19	114	В	19	182	В	17	117	В	18	206	
đ	WB	Th	A	03	17	В	13	89	A	05	45	В	16	135	
I-65 Ramp	SB	Lt	A	01	4	A	10	83	A	02	8	A	14	134	
I- R		Rt	A	02	18	A	05	50	A	06	43	A	09	80	
					s on pag	$\overline{\text{C-2}}$	64 to C	-287 of	Synchro results on pages C-288 to C-311 of						
			Appen	dix					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.

I-65 at 109th Street Interstate Access Request Alternative Evaluation Report Table 12: Sensitivity Analysis LOS Summary Table

					Section	1,515 1100	DDI						
				2044 P	M Peak			2044 P	M Peak				
			LOS	Delay	v/c	Queue	LOS	Delay	v/c	Queue			
				(s)				(s)					
	Ove	rall	C	25			В	19					
	EB	Lt	D	40	0.90	411							
ф		Th	В	14	0.72	340	В	15	0.83	257			
am	WB Th		D	45	0.90	302	С	30	0.83	229			
3 R		Rt*	A	07	0.51	60							
I-65 NB Ramp	NB	Lt	C	25	0.12	47	A	03	0.06	13			
65		Th											
<u>'</u>		Rt	A	04	0.17	21	В	12	0.16	38			
	Overa	ıll	C	24			В	20					
	EB	Th	C	32	0.89	406	C	24	0.88	330			
م		Rt	A	05	0.13	24							
Ramp	WB	Lt	В	12	0.27	28							
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		Th	В	15	0.45	161	С	25	0.68	153			
SB	SB	Lt	C	29	0.71	366	В	20	0.74	184			
I-65		Th											
Τ-		Rt*	В	15	0.59	167	A	10	0.50	113			
			LOS Re	sults on pa	ages 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 Lan		u the NB ection	Ramp		Lane at	pping the the NB R section		Two Lane Roundabout No Slip Lanes					
				2044 P	M Peak			2044 P	M Peak			2044 P	4 PM Peak			
			LOS	Delay	v/c	Queue	LOS	Delay	v/c	Queue	LOS	Delay	v/c	Queue		
				(s)				(s)				(s)				
	Ove		A	07			В	14			A	07				
	EB	Lt	A	10	0.73	0	A	10	0.50	0	A	10	0.73	0		
dı		Th	A	04	0.73	0	F	18	1.03	349	A	04	0.73	0		
Ramp	WB	Th	A	09	0.62	71	A	10	0.63	174	A	08	0.53	87		
3 R		Rt*	A	04	0.19	0	A	04	0.19	0	A	08	0.53	87		
NB	NB	Lt	В	18	0.25	14	D	42	0.61	112	В	19	0.13	13		
I-65		Th	В	11	0.25	14	D	34	0.61	112	A	10	0.11	13		
-I		Rt	В	11	0.25	14	D	34	0.61	112	A	10	0.11	13		
	Overa	11	С	25			С	25			В	11				
	EB	Th	Е	50	0.99	798	Е	50	0.99	798	В	13	0.80	228		
0.		Rt	Е	49	0.99	798	Е	49	0.99	798	В	13	0.80	228		
Ramp	WB	Lt	A	10	0.66	0	A	10	0.66	0	A	10	0.29	0		
Ré		Th	A	04	0.66	0	A	04	0.66	0	A	05	0.29	0		
SB	SB	Lt	В	24	0.75	308	С	24	0.75	308	В	16	0.74	154		
I-65		Th	В	18	0.75	308	В	18	0.75	308	В	09	0.74	154		
Ι-	T Rt*		A	04	0.44	0	A	04	0.44	0	В	10	0.74	154		
			LOS Res	sults on pa	ages C319	to C320	LOS Res	sults on pa	to C322	LOS Results on pages C323 to						
				_			This Alternative is dismissed, due to				C324					
							LOS F for the EB movement at the									
							north ramp.									

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 $\pm 20\%$ 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 99^{th} 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 98^{th} 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	300,000		2,730,000	100,000	\$3,130,000
(5-Lane)					
2-Lane Eastbound	0		2,830,000	150,000	\$2,980,000
Roundabout					
(keep 3-lane section					
under bridge)					
2-Lane Roundabout	300,000		3,800,000	200,000	\$4,300,000
2-Lane Roundabout	300,000		4,000,000	200,000	\$4,500,000
with Slip Lanes					
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	4	3	1	1	1	2	2	14
Interchange								
(with 5-lane section								
2-Lane Eastbound	3	1	1	1	1	1	1	9
Only								
Roundabout								
2-Lane Roundabout	1	1	2	2	1	1	3	11
2-Lane Roundabout	1	1	2	2	2	2	3	13
With Slip Lanes								
Diverging Diamond	2	2	2	3	3	3	3	18
Interchange (DDI)								

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.